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

ICES advice on fishing opportunities

Please note: The current advice for 2022 replaces the advice provided in June 2021.

ICES advises that when the MSY approach is applied, catches in 2022 should be no more than 3038[‡] tonnes.

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

Stock development over time

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

Figure 1 Haddock in Division 7.a. Summary of stock assessment. The assumed 2021 recruitment value is shaded in a light colour.

Catch scenarios

Table 1 Haddock in Division 7.a. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{ages\ 2–4}$ (2021)	0.138	$F_{sq} = F_{average(2017–2019)}$ *
SSB 2022	13768	Short-term forecast; fishing at F_{sq}, in tonnes
$R_{age\ 0}$ (2021-2022)	371740	Geometric Mean (1993–2018), in thousands
Catch (2021)	1896	Fishing at F_{sq}; in tonnes
Projected landings (2021)	1474	Assuming average landing patterns (2018–2020); in tonnes
Projected discards (2021)	395	Assuming average discard patterns (2018–2020); in tonnes

* F in 2020 was assumed to be unrepresentatively low for the fishery due to the COVID-19 disruption and hence F_{sq} was assumed as $F_{average}$ (2017–2019).

[‡] The advice was revised due to the discovery of an error in the software for the setting of the recruitment assumption in the forecast. Values and figures have been updated.

Table 2   Haddock in Division 7.a. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2022)	Projected landings (2022)	Projected discards (2022)	F_{total} (2022)	$F_{projected\ landings}$ (2022)	$F_{projected\ discards}$ (2022)	SSB (2023)	% SSB change*	% advice change**
ICES advice basis									
MSY approach: F_{MSY}	3038	2533	505	0.28	0.170	0.110	10274	−25	−9.9
Other scenarios									
EU MAP***: F_{MSY}	3038	2533	505	0.28	0.170	0.110	10274	−25	−9.9
F = MAP $F_{MSY\ lower}$	2245	1875	370	0.20	0.121	0.079	11073	−20	−33
F = MAP $F_{MSY\ upper}$	3689	3070	618	0.35	0.21	0.138	9624	−30	9.4
F = 0	0	0	0	0	0	0	13361	−2.9	−100
F = F_{pa}	4215	3504	711	0.41	0.25	0.162	9100	−34	25
F = F_{lim}	4956	4112	844	0.50	0.30	0.197	8369	−39	47
SSB_{2023} = B_{lim}	10759	8716	2043	1.62	0.99	0.64	2994	−78	219
SSB_{2023} = B_{pa}	9415	7686	1729	1.26	0.76	0.50	4160	−70	179
SSB_{2023} = SSB_{2022}^									
SSB_{2023} = $MSY_{Btrigger}$	9280	7581	1700	1.23	0.75	0.48	4281	−69	175
F = F_{2021}	1587	1327	260	0.138	0.083	0.054	11739	−15	−53

* SSB 2023 relative to SSB 2022.
** Advice value for 2022 relative to the F_{MSY} advice value for 2021 (3371 tonnes).
*** EU multiannual plan (MAP) for the Western Waters (EU, 2019).
^ SSB_{2023} = SSB_{2022} cannot be achieved even with zero catches.

The advised catch for 2022 is lower than that for 2021 owing to a lower recent recruitment.

Basis of the advice

Table 3   Haddock in Division 7.a. The basis of the advice.

Advice basis	MSY approach
Management plan	ICES is aware of the multiannual management plan (MAP) which has been adopted by the EU for this stock (EU, 2019) and which 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

The NIMIK survey was not available for 2020, and catch sampling of the fisheries was reduced in 2020 owing to the disruption caused by COVID-19. This may have resulted in a higher uncertainty associated with discard estimates and the age structure of the catch. Weight-at-age was lower because of length sampling restricted to Q1 and therefore average weights-at-age 2017–2019 were used as weight-at-age in 2020. However, sensitivity analyses indicated that this has minimal impact on the perception of the stock status.

Despite the lack of NIMIK survey, the estimate of the 2020 recruitment is still reliable and is the lowest in the time-series based on Q4 survey observations. Nevertheless, recruitment estimates have been revised substantially between assessments, with a high degree of interannual variation.
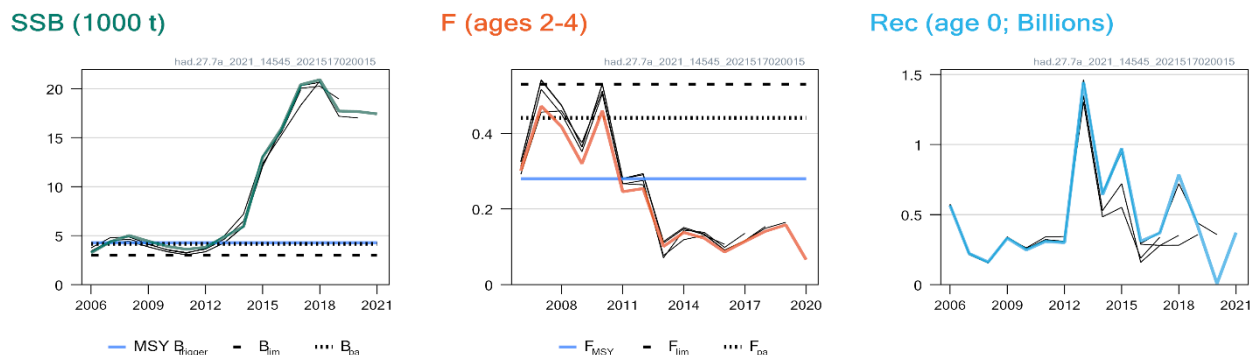
Figure 2   Haddock in Division 7.a. Historical assessment results (final-year SSB estimate and recruitment assumption included).

Issues relevant for the advice

Recruitment in 2020 is considered the lowest in the past 25 years. This has a considerable effect on forecast SSB.

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 9). The annual reallocation has increased since 2006, peaking in 2017, with the highest realloaction rate in 2020. In 2020 the reallocation accounted for 43% of the reported landings in Division 7.a and contributed 7% of the estimated landings in divisons 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 4   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 (2018)
	F_{MSY}	0.28	Median point estimates of EqSim with a model averaged stock–recruitment relationship	ICES (2018)
Precautionary approach	B_{lim}	2994	Tonnes; lowest observed SSB with > 75th percentile recruitment	ICES (2018)
	B_{pa}	4160	Tonnes; B_{lim} combined with the assessment error; $B_{lim} \times \exp(1.645 \times \sigma)$; σ = 0.20	ICES (2018)
	F_{lim}	0.50	F with 50% probability of SSB < B_{lim}	ICES (2018)
	F_{pa}	0.41	F_{P05}; the F that leads to SSB > B_{lim} with 95% probability	ICES (2018, 2021a)
Management plan	MAP MSY $B_{trigger}$	4281	Tonnes; MSY $B_{trigger}$	ICES (2018), EU (2019)
	MAP B_{lim}	2994	Tonnes; B_{lim}	ICES (2018), EU (2019)
	MAP F_{MSY}	0.28	F_{MSY}	ICES (2018), 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 (2018), 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 (2018), EU (2019)

Basis of the assessment

Table 5   Haddock in Division 7.a. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2021b)
Assessment type	ASAP (Age-Structured Assessment Programme; NOAA toolbox) that uses catches in the model and in the forecast (ICES, 2021a).
Input data	Four survey indices (NIGFS-WIBTS-Q1 [G7144], NIGFS-WIBTS-Q4 [G7655], NIMIK [I9826], UKFSPW [B7897]); annual maturity and growth data from the NIGFS-WIBTS-Q1 (G7144) 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)

History of the advice, catch, and management

Table 6   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	2540^	1778	672	2450
2020	Management plan	3156 (range 2333–3830)		3156	1296^	742	234	976
2021	Management plan	3371 (range 2491–4092)		3371				

Year	ICES advice	Catch corresponding to advice	Landings corresponding to advice	Agreed TAC*	Official landings	ICES landings	ICES discards	ICES catches
2022	MSY approach	3038						

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

** Underestimate because of inadequate sampling.

\# Revised TAC in March 2017.

^ Preliminary.

History of the catch and landings

Table 7   Haddock in Division 7.a. Catch distribution by fleet in 2020 as estimated by ICES.

Catch	Landings					
	Otter trawls		Scottish seines	Mid-water trawl	Beam trawl	Other gear types
	Nephrops directed fishery	Demersal fish directed fishery	6%	36%	1%	< 1%
	7%	51%				
	742 tonnes					
976 tonnes	Discards					
	Otter trawls		Scottish seines	Mid-water trawl	Beam trawl	Other gear types
	Nephrops directed fishery	Demersal fish directed fishery	< 1%	3%	11%	2%
	77%	6%				
	234 tonnes					

Table 8   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
2019***	9	0	1891	-					1196	3296	2537
2020***	3	0	754	-					539	1296	742

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

** Since 2012, Northern Ireland, Scotland, England, and Wales have been combined to UK.

*** Preliminary official landings.

^ Landings in the southern part of Division 7.a (rectangles 33E2 and 33E3) are excluded.

Table 9 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	% discards	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
2019	1778	672	2450	27	759
2020	742	234	976	24	554

* Underestimate or low confidence due to inadequate sampling.

Summary of the assessment

Table 10   Haddock in Division 7.a. Assessment summary. All weights are in tonnes, recruitment in thousands. Low and high refer to 95% confidence intervals.

Year	Recruitment			SSB			Landings	Discards*	F 2–4		
	Low	Value	High	Low	Value	High			Low	Value	High
1993	122641	158889	195137	1608	2252	2897	813	365	0.50	0.77	1.05
1994	418965	518805	618646	1481	2247	3013	1042	468	0.60	0.92	1.23
1995	41335	65196	89057	1577	2449	3322	1736	780	0.65	1.07	1.49
1996	1110525	1365893	1621261	4007	5232	6457	2981	709	0.56	0.82	1.09
1997	154601	215082	275564	2938	4256	5574	3547	895	0.84	1.21	1.58
1998	257241	339367	421493	6198	7831	9464	4874	1015	0.76	1.06	1.35
1999	571722	703224	834726	4556	6012	7467	4095	634	1.22	1.71	2.2
2000	63654	97860	132066	1829	2738	3647	1357	802	0.99	1.42	1.86
2001	621579	766937	912294	2622	3707	4793	2246	269	0.52	0.76	1.01
2002	100426	141647	182868	1799	2787	3775	1817	387	0.54	0.90	1.26
2003	313122	423621	534120	2580	3663	4746	1517	390	0.41	0.72	1.03
2004	503525	646582	789638	1687	2686	3685	1217	392	0.30	0.62	0.94
2005	390009	496745	603481	1859	2779	3698	666	551	0.28	0.55	0.82
2006	456491	565159	673828	2268	3235	4202	633	306	0.150	0.30	0.45
2007	171085	222498	273911	3262	4364	5466	886	722	0.27	0.47	0.68
2008	122144	161848	201552	3763	5004	6245	786	643	0.24	0.42	0.60
2009	257675	330701	403726	3158	4436	5715	581	579	0.174	0.32	0.47
2010	188429	246812	305194	2700	3895	5091	679	508	0.23	0.46	0.69
2011	235613	307231	378850	2445	3599	4753	446	307	0.120	0.25	0.37
2012	217683	298889	380096	2618	3807	4996	343	599	0.124	0.25	0.38
2013	1135440	1445630	1755820	3360	4875	6390	254	282	0.047	0.101	0.154
2014	476733	640987	805241	4197	5941	7686	518	488	0.073	0.138	0.20
2015	730237	972160	1214083	9778	12991	16205	833	652	0.068	0.123	0.177
2016	218232	310080	401927	11929	15948	19967	1008	298	0.050	0.086	0.122
2017	255507	368283	481060	15222	20404	25586	1662	333	0.067	0.114	0.161
2018	532330	783680	1035030	15347	20904	26461	1993	568	0.080	0.141	0.20
2019	250352	414332	578311	12517	17707	22897	1778	672	0.087	0.158	0.23
2020	0	6914	33054	12740	17659	22578	742	234	0.029	0.066	0.102
2021		371740**			17423						

* Discard estimates available from 2007; prior to 2007, discard estimates are based on limited sampling.
** Geometric mean (1993–2019).

Sources and references

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