

EU request to ICES on in-year advice on haddock (*Melanogrammus aeglefinus*) in Division 7.a (Irish Sea)

Advice summary

Please note: The present advice replaces the advice given for this stock in June 2016.

ICES advises that when the MSY approach is applied, catches in 2017 for the Division 7.a haddock stock should be no more than 3061 tonnes*.

Request

The present advice is in response to a request from the European Commission to update the advice on fishing opportunities in 2017 for the haddock stock in Division 7.a, using the assessment method and reference points agreed on for this stock during the stock assessment benchmark for Irish Sea stocks (WKIrish3) held 30 January–3 February 2017. In the original request the European Commission asked ICES to advise on TAC levels for 2016 and 2017, using the results of an assessment provided by the European Commission. However, after a dialogue between the European Commission and ICES it was agreed that ICES should await the results of the Irish Sea benchmark and use the results of the benchmark as basis for an update of the advice for 2017.

Stock development over time

The spawning-stock biomass (SSB) is currently at the highest observed levels as the 2013 year class has matured. SSB is currently well above $MSY B_{trigger}$. Fishing mortality (F) has been below F_{MSY} since 2012. Recent recruitment has been slightly above the time-series mean, although recruitment has been highly variable throughout the time-series.



Figure 1 Haddock in Division 7.a. Summary of stock assessment (weights in tonnes), Recruitment, F, and SSB have uncertainty boundaries ($1 \times$ standard deviation) in the plot. The predicted recruitment value is not shaded.

* Catches taken or reported in rectangles 33E2 and 33E3 are not believed to belong to the haddock stock in Division 7.a but rather to the stock in divisions 7.b–k (Southern Celtic Seas and English Channel). Catches of haddock taken or reported in rectangles 33E2 and 33E3 are therefore included in the assessment of the stock in divisions 7.b–k.

Stock and exploitation status

Table 1 Haddock in Division 7.a. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size					
		2013	2014	2015	2014	2015	2016			
Maximum sustainable yield	F_{MSY}	✓	✓	✓	Below	MSY	✓	✓	✓	Above trigger
Precautionary approach	F_{pa} , F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa} , B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	-	-	-	Not applicable	SSB_{MGT}	-	-	-	Not applicable

Catch options

Table 2 Haddock in Division 7.a. The basis for the catch options.

Variable	Value	Source	Notes
F ages 2–4 (2016)	0.112	ICES (2017)	Average F (2013–2015)
SSB (2017)	16884 t	ICES (2017)	Short-term forecast
$R_{age 0}$ (2016 and 2017) (n)	331699	ICES (2017)	Geometric mean (1993–2013)
Catch (2016)	1470 t	ICES (2017)	Short-term forecast, assuming $F = 0.112$. Preliminary information indicates that the total catch in 2016 will be close to this value.
Wanted catch * (2016)	1084 t	ICES (2017)	Average discard pattern (1993–2015)
Unwanted catch *(2016)	386 t	ICES (2017)	Average discard pattern (1993–2015)

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

Table 3 Haddock in Division 7.a. The catch options. Weights are in tonnes.

Basis	Catch (2017)	Wanted catch * (2017)	Unwanted catch * (2017)	F catch (2017)	F wanted catch ** (2017)	F unwanted catch ** (2017)	SSB (2018)	% SSB change ***	% TAC change ^
ICES advice basis									
MSY approach: F_{MSY}	3061	2348	713	0.27	0.20	0.073	14575	-13.68%	42.0%
Other options									
F = 0	0	0	0	0	0	0	18363	8.8%	-100%
B_{lim}	14928	11308	3621	2.6	1.90	0.70	2300	-86%	584%
B_{pa}	13911	10577	3334	2.2	1.61	0.59	3093	-82%	539%
$B_{trigger}$	13911	10577	3334	2.2	1.61	0.59	3093	-82%	539%
Stable SSB	1181	905	275	0.098	0.071	0.026	16884	0%	-45%
-15% TAC	1833	1406	427	0.155	0.113	0.049	16076	-4.8%	-15.0%
Stable TAC	2157	1654	503	0.184	0.135	0.058	15678	-7.1%	0%
+ 15% TAC	2480	1902	578	0.21	0.157	0.058	15282	-9.5%	15.0%
F = F_{lim}	4961	3806	1155	0.47	0.34	0.25	12310	-27%	130%
F = F_{pa}	3759	2883	898	0.34	0.26	0.091	13736	-18.7%	74%

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

** Total F was split into a “wanted” and “unwanted” catch component, based on the average ratio of landings and discards-at-age over the full time-series (see “Issues relevant for the advice” for more detail).

*** SSB 2018 relative to SSB 2017.

^ Wanted catch 2017 relative to TAC 2016 (t).

Basis of the advice

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

Advice basis	MSY approach
Management plan	ICES is not aware of any agreed precautionary management plan for haddock in this area.

Quality of the assessment

There is uncertainty around the historical discard estimates and reported landings in the period 2003–2007, but stock trends in the assessment appear to be robust to this uncertainty (ICES, 2017).

This stock was benchmarked in January 2017. The result of the benchmark was that the stock was lifted from a category 3 stock (trend-based assessment) to a category 1 stock (analytical assessment). The assessment includes information from the commercial fishery, including both landings and discards, and takes into account selectivity changes that have occurred in 2000 and 2008. Maturity and natural mortality parameters have been updated to reflect the current stock dynamics. Four surveys are used in the present assessment, as opposed to only one survey in the past.

The assessment is based on catch data until and including 2015. The 2016 data was not available to the benchmark and has not been included in the assessment.

Issues relevant for the advice

Landings have been adjusted since 2003 to exclude landings taken from the southern rectangles (33E2 and 33E3) in the Irish Sea as they are not believed to be part of this stock (Table 10). This should be considered when setting TACs for the two management areas for haddock in divisions 7.a and 7.b–k.

Vessels actively targeting haddock have been subject to the EU landing obligation since 2016. Other fleets, for which haddock is a bycatch species, are not currently under a landing obligation (EU, 2016). ICES is not in a position to advise on landings corresponding to the advised catch.

Increasing the TAC may result in increased directed fishing effort for haddock using mid-water trawls and seine nets. Bycatch of cod in these fisheries have to date been considered low (ICES, 2016a). However, any additional directed effort on whitefish could increase fishing mortality on cod.

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 $B_{trigger}$	3093 t	B_{pa}	ICES (2017)
	F_{MSY}	0.27	Median point estimates of EqSim with segmented regression stock–recruitment relationship	ICES (2017)
Precautionary approach	B_{lim}	2300 t	Lowest observed: SSB in 1993	ICES (2017)
	B_{pa}	3093 t	B_{lim} combined with the assessment error; $B_{lim} \times \exp(1.645 \times \sigma)$; $\sigma = 0.15$	ICES (2017)
	F_{lim}	0.47	F with 50% probability of SSB < B_{lim}	ICES (2017)
	F_{pa}	0.34	F_{lim} combined with the assessment error; $F_{lim} \times \exp(-1.645 \times \sigma)$; $\sigma = 0.2$	ICES (2017)
Management plan	SSB_{MGT}	Not applicable		
	F_{MGT}	Not applicable		

Basis of the assessment

Table 6 Haddock in Division 7.a. The basis of the assessment.

ICES stock data category	1 (ICES, 2016b)
Assessment type	Age-structured model (ASAP)
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 samples of commercial landings in quarter 1. Commercial catch at age.
Discards and bycatch	Included in the assessment for the full time-series.
Indicators	Surveys: IS-APEM (ICES, 2016c)
Other information	This stock was benchmarked in 2017 (ICES, 2017).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

The fishing industry reported that the abundance and distribution of haddock has increased substantially in 2016. Based on the restrictive quotas for some fleets and perceived recruitment levels, the industry reported to national scientists that there is increased discarding, with haddock potentially becoming a “choke” species.

History of the advice, catch, and management

Table 7 Haddock in Division 7.a. History of ICES advice, the agreed TAC, and ICES estimates of landings, discards, and catches. Weights are in tonnes.

Year	ICES advice	Predicted catch corresp. to advice	Predicted landings corresp. 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 req'd			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				
2017	MSY approach	≤ 3061	≤ 2348	2074				

* 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.

^ Underestimate because of inadequate sampling.

History of catch and landings

Table 8 Haddock in Division 7.a. Catch distribution by fleet in 2015 as estimated by ICES.

Catch (2015)	Estimated landings				
	otter trawls		Scottish seines	mid-water trawl	other gear-types
1485 tonnes	<i>Nephrops</i> , directed fishery	Demersal fish, directed fishery	21.4%	46.7%	1.60%
	17.7%	12.7%			
	833 tonnes				
	Estimated discards				
	otter trawls		Scottish seines	mid-water trawl	other gear types
	<i>Nephrops</i> , directed fishery	Demersal fish, directed fishery	0.80%	2.3%	6.1%
	67.0%	23.8%			
	652 tonnes				

Table 9 Haddock in Division 7.a. History of landings; the official landings for each country participating in the fishery and ICES landings estimates. Weights are in tonnes.

Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Belgium	3	4	5	10	12	4	4	1	8	18
France	38	31	39	50	47	n/a	n/a	n/a	73	41
Ireland	199	341	275	797	363	215	80	254	251	252
Netherlands	-	-	-	-	-	-	-	-	-	-
UK (England & Wales)*	29	28	22	41	74	252	177	204	244	260
UK (Isle of Man)	2	5	4	3	3	3	5	14	13	19
UK (N. Ireland)*	38	215	358	230	196
UK (Scotland)	78	104	23	156	52	86	316	143	114	140
Total	387	728	726	1287	747	560	582	616	703	730
ICES landings	387	728	726	1287	747	560	582	616	656	813

Country	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Belgium	22	32	34	55	104	53	22	68	44	20
France	22	58	105	74	86	n/a	49	184	72	146
Ireland	246	320	798	1005	1699	759	1238	652	401	229
Netherlands	-	-	1	14	10	5	2	-	-	-
UK (England & Wales)*	301	294	463	717	1023	1479	1061	1238	551	248
UK (Isle of Man)	24	27	38	9	13	7	19	1	-	-
UK (N. Ireland)*										
UK (Scotland)	66	110	14	51	80	67	56	86	47	31
Total	681	841	1453	1925	3015	2370	2447	2229	1115	674
ICES landings	1042	1736	2981	3547	4874	4095	1357	2246	1817	n/a

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium	15	22	23	30	15	7	9	16	13	6
France	20	36	20	11	6	3	2	8	3	1
Ireland	296	139	184	477	319	388	333	434	561	492
Netherlands	-	-	-	-	-	-	-	-	-	-
UK (England & Wales)*	421	344	419	559	521	446	593	355	-	-
UK (Isle of Man)	-	-	-	-	1	1	-	-	-	<.1
UK (N. Ireland)*										
UK (Scotland)	9	6	9	1	17	1	2	-	-	-
United Kingdom									236*	155
Total	761	547	655	1078	879	846	939	813	813*	656
ICES landings	1217	666	633	886	786	581	679	446	343	254

Country	2014	2015**
Belgium	7	7
France	0.0	7
Ireland	541	507
Netherlands	-	
UK (England & Wales)*		
UK (Isle of Man)	< 1	< 1
UK (N. Ireland)*		
UK (Scotland)		
United Kingdom	426	633
Total	974	1154
ICES landings	518	833

* Since 1989 Northern Ireland has been included with England and Wales.

** Preliminary.

n/a = not available.

Table 10 Haddock in Division 7.a. ICES landings, discards, catch, % discards by weight for Division 7.a haddock stock, and landings taken or reported in rectangles 33E2 and 33E3. 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	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	444
2015	833	652	1485	44	322

* Underestimate or not available because of inadequate sampling.

Summary of the assessment

Table 11 Haddock in Division 7.a. Assessment summary. Weights are in tonnes. Recruitment numbers are the geometric mean (1993–2015).

Year	Recruitment (age 0)	High	Low	SSB	High	Low	Landings	Discards	F (Ages 2–4)	High	Low
	numbers			tonnes			tonnes	tonnes	per year		
1993	151952	170546	133358	2301	2629	1973	813	365	0.65	0.79	0.51
1994	522626	574233	471019	2363	2789	1938	1042	468	0.67	0.82	0.51
1995	59756	71413	48099	2489	2957	2022	1736	780	0.89	1.10	0.68
1996	1355904	1488054	1223754	5006	5659	4353	2981	709	0.72	0.85	0.59
1997	206302	236748	175856	4167	4886	3447	3547	895	0.90	1.08	0.71
1998	337280	378827	295733	8327	9236	7417	4874	1015	0.95	1.10	0.80
1999	672237	740192	604282	5811	6612	5011	4095	634	1.36	1.606	1.12
2000	94662	111616	77708	2863	3370	2357	1357	802	0.96	1.17	0.74
2001	703482	778393	628571	4036	4657	3414	2246	269	0.67	0.79	0.55
2002	130790	151658	109922	3164	3740	2589	1817	387	0.81	0.99	0.64
2003	419643	475677	363609	3761	4407	3115	1517	389	0.66	0.81	0.52
2004	641733	714505	568961	2998	3662	2334	1217	392	0.59	0.74	0.45
2005	502344	558750	445938	2926	3569	2282	666	551	0.49	0.61	0.36
2006	577368	637088	517648	3785	4528	3043	633	306	0.29	0.36	0.22
2007	214018	240109	187927	4855	5675	4036	886	722	0.45	0.55	0.36
2008	153150	174083	132217	4935	5829	4041	786	643	0.45	0.56	0.35
2009	331303	371348	291258	4243	5196	3289	581	579	0.37	0.45	0.28
2010	261305	297392	225218	3588	4496	2680	679	508	0.50	0.63	0.36
2011	337506	384449	290563	3261	4176	2345	446	307	0.26	0.33	0.188
2012	335803	388860	282746	3719	4697	2740	343	599	0.26	0.33	0.191
2013	1309488	1490268	1128708	5001	6243	3759	254	282	0.075	0.093	0.057
2014	427531	501259	353803	6660	8042	5277	518	488	0.123	0.151	0.095
2015	401608	494668	308548	12788	15048	10529	833	652	0.137	0.169	0.105
2016	331699			16122					0.112		
Average	436645	496962	385454	4965	5309	3652	1472	554	0.56	0.70	0.45

Sources and references

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