

Haddock (*Melanogrammus aeglefinus*) in Subarea 4, Division 6.a, and Subdivision 20 (North Sea, West of Scotland, Skagerrak)

ICES advice on fishing opportunities

Please note: This advice was updated in November 2019 (ICES, 2019c).

ICES advises that when the MSY approach is applied, total catches in 2020 should be no more than 30 228 tonnes.

Stock development over time

Fishing mortality (F) has declined since the beginning of the 2000s but it has been above F_{MSY} for the entire time series. Spawning-stock biomass (SSB) has been above $MSY B_{trigger}$ in most of the years since 2000. Recruitment since 2000 has been low with occasional larger year classes, the size of which is diminishing.

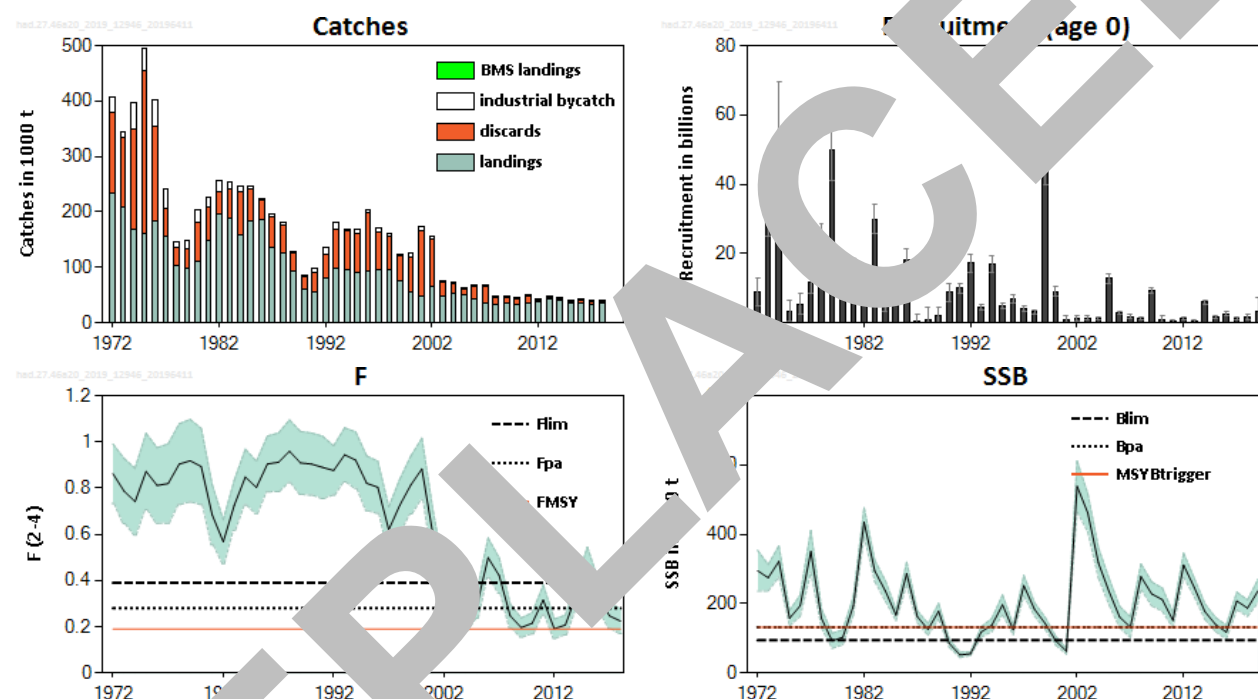


Figure 1 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Summary of the stock assessment. Shaded areas (F, SSB) and error bars (recruitment) indicate 95% confidence intervals.

Stock exploitation status

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

Table 1 Haddock in Subarea 4, Division 6.a, and Subdivision 20. 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	MSY	✓	✓
Precautionary approach	F_{pa}, F_{lim}	○	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	✓	✓
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—
								Above trigger
								Full reproductive capacity
								Not applicable

Catch scenarios

Table 2 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
F ages 2–4 (2019)	0.194	F based on TAC for 2019 of 33 956 tonnes plus industrial bycatch of 32 tonnes
SSB (2020)	203 239	Short-term forecast (STF), in tonnes
R _{age 0} (2019 and 2020)	3 287 400	Assessment model forecast, in thousands
Total catch, excluding industrial bycatch (2019)	33 956	TAC 2019; TAC constraint applied to human consumption fishery catch only, in tonnes
Wanted catch (2019)	30 508	STF, relative contribution to total catch by age = average 2016–2018, in tonnes
Unwanted catch (2019)	3 448	STF, relative contribution to total catch by age = average 2016–2018, in tonnes
Industrial bycatch (2019)	32	STF, relative contribution to total catch by age = average 2016–2018, in tonnes

Table 3 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Annual catch options. All weights are in tonnes (t)

Basis	Total catch (2020)	Wanted catch * (2020)	Unwanted catch * (2020)	IBC ** (2020)	HCF ** catch (2020)	F _{total} (ages 2–4) (2020)	F _{wanted} (ages 2–4) (2020)	F _{unwanted} (ages 2–4) (2020)	F _{pa} (ages 2–4) (2020)	SSB (2021)	% SSB change ***	% change ^	% Advice change ^^
ICES advice basis													
MSY approach: F _{MSY}	30228	25537	4662	30	30199	0.194	0.163	0.030	0.00020	196212	–3.4%	–11.1%	–11.1%
Other scenarios													
F = MAP ^{^^^}	26269	22207	4032	30	26239	0.167	0.141	0.026	0.00020	1800542	–1.33%	–23%	–23%
F _{MSY lower}													
F = MAP F _{MSY upper} #	30228	25537	4 662	30	30199	0.194	0.163	0.030	0.00020	196243	–3.4%	–11.1%	–11.1%
F = 0 (IBC only)	32	0	0	32	0	0.000	0.000	0.000	0.00020	229410	12.9%	–100%	–100%
F _{pa}	41488	34971	6 489	29	41460	0.222	0.182	0.040	0.00020	184091	–9.4%	22%	22%
F _{lim}	55822	46886	8 908	28	55794	0.333	0.272	0.060	0.00020	168805	–16.9%	64%	64%
SSB (2021) = B _{lim}	114594	93181	21 392	21	114573	1.000	0.890	0.166	0.00020	94000	–54%	237%	237%
SSB (2021) = B _{pa} = MSY B _{trigger}	88573	73499	15 049	29	88549	0.580	0.480	0.108	0.00020	132000	–35%	161%	161%
F ₂₀₁₉	30257	25561	4666	30	30227	0.194	0.164	0.030	0.00020	196212	–3.5%	–11.0%	–11.0%
Rollover TAC	33985	28600	5 265	29	33956	0.22	0.19	0.034	0.00020	192176	–5.4%	0%	0%

* “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. Unwanted catch includes discards and below minimum size (BMS) landings.

** IBC = Industrial bycatch, HCF = Human consumption fishery.

*** SSB 2021 relative to SSB 2019.

^ Human Consumption fishery (HCF) catch in 2020 relative to TAC in 2019: Subdivision 20 (1 780 t) + Subarea 4 (28 950 t) + Division 6.a (3 226 t) = 33 956 t.

^^ Total catch 2020 relative to advice value 2019 (33 956 t).

^^^ F = MAP is the annual plan for 2019 in the North Sea (EU, 2018).

F = MSY upper = 1.1%

The change in advice (–11.1%) is due to continued low recruitment for this stock.

Basis of advice

Table 4 Haddock in Subarea 4, Division 6.a, and Subdivision 20. The basis of the advice.

Advice basis	MSY approach
Management plan	An EU multiannual management plan (MAP) has been agreed by the EU for this stock (EU, 2018). This plan is not adopted by Norway, thus, not used as the basis of the advice for this shared stock. ICES was requested by the EC to provide advice based on the MSY approach and to include the MAP as a catch option. EU-Norway have requested an evaluation of multiple management strategies (ICES, 2019a), which are currently under consideration.

Quality of the assessment

The assessment uses North Sea (Subarea 4 and Subdivision 20) survey indices, which are considered to be sufficiently representative of the whole stock (which also includes Division 6a). No combined survey index for the whole area is available.

Management strategy evaluation analyses (ICES, 2019a) indicate potential issues with the current assessment model which need to be investigated.

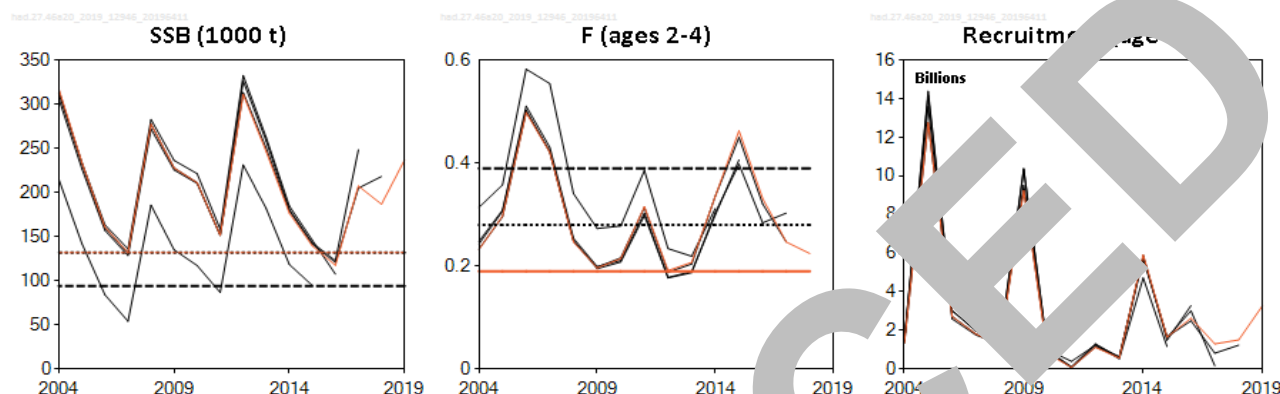


Figure 2 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Historical assessment results.

Issues relevant for the advice

ICES provides total catch advice, assuming that fishing mortality in the recreational fishery remains constant; this implies that the catch in the human consumption fishery in 2020 should not be more than 30 199 tonnes.

More abundant year classes were produced prior to 2000; recruitment since then has, however, tended to be consistently lower. Because of the larger 2014 year class the SSB remains above $MSY B_{trigger}$. The principal driver of the stock is the occasional larger year classes, which results in strongly fluctuating stock size and advice. The magnitude of these strong year classes is decreasing.

The EU landing obligation has been phased in to all catches of haddock in ICES Subarea 4 since 2016. Since 2019, the stock is fully under EU landing obligation. Landings of fish below the minimum conservation reference size (MCRS) are very low, and discarding still takes place. The estimated discard amount is 4 895 tonnes in 2018 (12.4%), based on observer data.

Reference points

Table 5 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	132 000	B_{pa}	ICES (2016)
	F_{MSY}	0.194	EQsim analysis based on the recruitment period 2000–2015	ICES (2017)
Precautionary approach	B_{lim}	94 000	Lowest estimated SSB that resulted in high recruitment (1979)	ICES (2016)
	B_{pa}	132 000	$B_{lim} \times \exp(1.645 \times 0.2) \approx 1.4 \times B_{lim}$	ICES (2016)
	F_{lim}	0.384	EQsim analysis based on recruitment period 2000–2015	ICES (2016)
	F_{pa}	0.274	$F_{lim} \times \exp(-1.645 \times 0.2) \approx F_{lim} / 1.4$	ICES (2016)
EU Management Plan (MAP)*	MAP MSY $B_{trigger}$	132 000	MSY $B_{trigger}$	ICES (2016)
	MAP B_{lim}	94 000	B_{lim}	
	MAP F_{MSY}	0.194	F_{MSY}	ICES (2017)
	MAP range F_{lower}	0.167-0.194	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared to MAP F_{MSY}	ICES (2017)
	MAP range F_{upper} **	0.194-0.194	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MAP F_{MSY}	ICES (2017)

* EU multiannual plan (MAP) for the North Sea (EU, 2018).

** For this stock, $F_{MSY upper} = F_{MSY}$.

Basis of the assessment

Table 6 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018).
Assessment type	Age-based analytical assessment (ICES, 2019a). ICES uses catches in the model and in the forecast.
Input data	Commercial catches (international and domestic), two survey indices: IBTS Q1, IBTS Q3. Maturity data are assumed to be constant over time and knife-edged at age 3, while natural mortality data vary with age and over time (estimates updated in ICES, 2019b).
Discards, BMS landings and bycatch	Included in the assessment, data from the main fleets (covering around 94% of the landings). BMS landings, where reported, are included with discards as unwanted catch in the assessment from 2016 onwards.
Indicators	No indicators.
Other information	The assessment was benchmarked in 2014 (ICES, 2014), at which time it was decided that the previously separate stocks in the North Sea and Skagerrak, and West of Scotland, should be assessed as one stock. The ICES Working Group on Northern Haddock Stocks (WKHAD; ICES, 2014) also updated biological parameters and selected a new assessment model. The 2016 inter-benchmark protocol (ICES, 2016) corrected an error in the computer code, derived a model configuration that reduced the retrospective bias in the current assessment model, and re-estimated the reference points accordingly.
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

Information from stakeholders

The number of stakeholders used to derive the input data for the assessment has increased since 2012, through extended sampling programs such as the Scottish Industry/Science observer sampling scheme.

History of the advice, catch, and management

Table 7a Haddock in Subarea 4, Division 6.a, and Subdivision 20. ICES advice, TAC, official landings, and ICES catch estimates. All weights are in tonnes. Values of landings, discards, and catches for the period 1987 to 2014 are presented to the nearest thousand tonnes.

Haddock in Subarea 4

Year	ICES advice	Wanted catch corresponding to advice	Total catch corresponding to advice ^	Agreed TAC	Official landings	ICES landings	ICES discards ^^	ICES industrial bycatch	ICES total
1987	80% of F(85)	105000		140000	109000	108000	59000		172000
1988	77% of F(86); TAC	185000		185000	105000	105000	62000	4000	171000
1989	Reduce decline in SSB; TAC; protect juveniles	68000		68000	64000	76000	2000	2000	14000
1990	80% of F(88); TAC	50000		50000	43000	51000	33000	3000	17000
1991	70% of effort (89)			50000	45000	45000	40000	1000	90000
1992	70% of effort (89)			60000	51000	50000	2000	1000	129000
1993	70% of effort (89)			133000	80000	80000	50000	11000	170000
1994	Significant reduction in effort; mixed fishery			160000	87000	87000	65000	4000	150000
1995	Significant reduction in effort; mixed fishery			120000	75000	75000	10000	8000	140000
1996	Mixed fishery to be taken into account			120000	75000	75000	73000	5000	154000
1997	Mixed fishery to be taken into account			114000	73000	73000	52000	7000	138000
1998	No increase in F	100300		100300	72000	77000	45000	5000	128000
1999	Reduction of 10% F(95–97)	72000		88000	64000	64000	43000	4000	111000
2000	F less than F_{pa}	< 51700		73000	70000	45000	47000	8000	100000
2001	F less than F_{pa}	< 58000		70000	40000	39000	118000	8000	165000
2002	F less than F_{pa}	< 94000		90000	54000	53000	45000	4000	101000
2003	No cod catches	-		70000	42000	42000	23000	1000	76000
2004	Mixed-fisheries considerations / F should be below F_{pa}	No forecast		85000	48000	47000	17000	1000	65000
2005	Mixed-fisheries considerations / F should be below F_{pa}	30000*		66000	31000	48000	10000	0	57000
2006	Mixed-fisheries considerations / F < 0.3	39000*		52000	36000	36000	17000	0	55000
2007	Mixed-fisheries considerations / F < 0.3	41000*		55000	31000	31000	30000	0	61000
2008	Mixed-fisheries considerations / 1% TAC	49300***		46000	30000	29000	13000	0	42000
2009	Mixed-fisheries considerations / Apply management plan	44700***		42000	31000	31000	10000	0	41000
2010	Mixed-fisheries considerations / Apply management plan	38000***		36000	28000	28000	10000	0	38000
2011	See scenarios	-		34000	26000	34000	11000	0	46000
2012	Apply management plan	41575***		39000	30000	30000	4000	1000	35000
2013	Apply management plan	47811***		45041	37000***	39000***	2000***	0***	41000***
2014	Apply management plan	38201*		38284	35000	35000	4000	65***	39000
2015	(November update) MSY approach		68690	40711	30276	30015	4650	17	34682
2016	MSY approach		≤ 59945	61933	30162^^^	29647	6243	30	35920
2017	MSY approach		≤ 39461	33643	29682^^^	28563	5341	16	33921

Year	ICES advice	Wanted catch corresponding to advice	Total catch corresponding to advice ^	Agreed TAC	Official landings	ICES landings	ICES discards ^^	ICES industrial bycatch	ICES total
2018	MSY approach		≤ 48990	41767	29210 ^^^	29389	3710	1	33100
2019	MSY approach		≤ 33956	28950					
2020	MSY approach		≤ 30228						

* The exploitation of this stock should be conducted in the context of mixed fisheries, protecting stocks outside safe biological limits.

** Including industrial bycatch.

*** Subarea 4 and Subdivision 20 combined.

^ Catch advice since 2015 is given for Subarea 4, Division 6.a, and Subdivision 20.

^^ Since 2016 discards estimated by ICES correspond to unwanted catch (including BMS landings).

^^^ Since 2016 official landings include officially reported BMS landings

Table 7b Haddock in Subarea 4, Division 6.a, and Subdivision 20. ICES advice, TAC, official landings and ICES catch estimates. All weights are in tonnes. Values of landings, discards, and catches for the period 1987 to 2005 are presented to the nearest hundred tonnes.

Haddock in Subdivision 20

Year	ICES advice	Wanted catch corresponding to advice	Catch corresponding to advice **	Agreed TAC	Official landings	ICES landings	ICES discards	ICES Industrial bycatch	ICES total catch
1987	Precautionary TAC	-		11500		3800		1400	5300
1988	Precautionary TAC	-		10000		4000		1500	4300
1989	Precautionary TAC	-		10000		4000		400	4500
1990	Precautionary TAC	-		10000		4000		2000	6100
1991	Precautionary TAC	4600		4600		4100		2600	6700
1992	TAC	4600				4400		4600	9000
1993	Precautionary TAC	-		4600		2000		2400	4400
1994	Precautionary TAC	-		10000		1800		2200	4000
1995	If required, precautionary TAC; link to North Sea			10000		2200		2200	4400
1996	If required, precautionary TAC; link to North Sea			10000		3100		2900	6100
1997	Combined advice with North Sea	-		7000		3400		600	4000
1998	Combined advice with North Sea	3400		7000		3800		300	4000
1999	Combined advice with North Sea	3400		5400		1400		300	1700
2000	Combined advice with North Sea	< 1800		4500		1500		600	2100
2001	Combined advice with North Sea	< 2000		4000		1900		200	2100
2002	Combined advice with North Sea	< 3000		6300		4100		60	4100
2003	Combined advice with North Sea	-		3200		1800	200	n/a	1800
2004	Combined advice with North Sea / F should be below F_{pa}	No forecast		4900		1400	100	n/a	1400
2005	Combined advice with North Sea / F should be below F_{pa}	-		4000		800	200	0	800

Year	ICES advice	Wanted catch corresponding to advice	Catch corresponding to advice **	Agreed TAC	Official landings	ICES landings	ICES discards ^	ICES Industrial bycatch	ICES total catch
2006	Combined advice with North Sea / F < 0.3	-		3200		1500	1000	0	1500
2007	Combined advice with North Sea / F < 0.3	-		3400		1600	800	0	2500
2008	Combined advice with North Sea / 15% TAC reduction	2900		2900		1400			2000
2009	Combined advice with North Sea / Apply management plan	-		2600		1500	600		2100
2010	Combined advice with North Sea / Apply management plan	-		2200		1500	600	0	1900
2011	See scenarios	-		2100		9900	1700	0	11600
2012	Apply management plan North Sea	-		2095	2500	2500	700	0	3300
2013	Apply management plan North Sea	-		2000	2000	*	*	*	*
2014	Apply management plan North Sea	2438		2200	2200	2300	100	*	2400
2015	(November update) MSY approach		68690	1404	1432	1411	96	4	1512
2016	MSY approach		5994	3926	1213^^	1201	38	7	1246
2017	MSY approach		5994	2069	1094^^	1078	105	1	1183
2018	(November update) MSY approach		≤ 48990	2569	717^^	790	57	4	851
2019	MSY approach		≤ 33956	1780					
2020	MSY approach		≤ 30228						

* Combined in 2017a.

** Catch advice should be given for Subarea 4, Division 6.a, and Subdivision 20.

^ Since 2016 discards estimated by ICES correspond to unwanted catch (including BMS landings).

^^ Since 2016 official landings include officially reported BMS landings.

Table 7c Haddock in Subarea 4, Division 6.a, and Subdivision 20. ICES advice, TAC, official landings, and ICES catch estimates. All weights are in tonnes. Values for the period from 1987 to 2014 are presented to the nearest thousand (official landings) or nearest hundred (ICES landings, discards, and total) tonnes.

Haddock in Division 6.a.

Year	ICES advice/ Single-stock exploitation boundaries from 2004 onwards *	Wanted catch corresponding to advice	Catch corresponding to advice ^^	Agreed TAC	Official landings	ICES landings	ICES discards #	ICES industrial bycatch	ICES total catch
1987	Reduce F towards F_{max}	20000		32000	27000	27000	16200		43200
1988	No increase in F; TAC	25000		35000	21000	21200	9500		30700
1989	80% of F(87); TAC	15000		35000	24000	16700	3000		19700
1990	80% of F(88); TAC	14000		24000	13000	10100	5400		15500
1991	70% of effort (89)	-		15200	10000	10600	8000		19200
1992	70% of effort (89)	-		12500	7000	11400	9300		20700 **
1993	70% of effort (89)	-		17600	13000	19100	16800		35900 **
1994	30% reduction in effort	-		16000	9000	14200	11100		25300 **
1995	Significant reduction in effort	-		21000	13000	13000	11000		20900
1996	Significant reduction in effort	-		22900	13000	13500	11400		24800
1997	Significant reduction in effort	-		20000	13000	12900	11000		19300
1998	No increase in F	20800 ***		25700	14000	14400	5500		19900
1999	F reduced to F_{pa}	14300 ***		19000	11000	10500	4900		15300
2000	Maintain F below F_{pa}	< 14900 ***		19000	11000	7000	7900		14900
2001	Reduce F below F_{pa}	< 11200 ***		13900	7000	7000	6600		13400
2002	Reduce F below F_{pa}	< 14100 ***		14000	7000	7100	8900		16000
2003	No cod catches	-		14000	4900	5300	4100		9400
2004	F_{pa} *	12200		6500	3200	3900	3700		7600
2005	$0.75 \times F_{pa}$ *	7600		6500	3200	3800	2900		6700
2006	$0.7 \times F_{pa}$ *	8000		6510	5700	6300	4600		10900
2007	$0.87 \times F_{pa}$ *	10200		6500	3700	3800	4000		7700
2008	$SSB > B_{pa}$ *	10200		6520	2800	2800	1200		4100
2009	No fishing and recovery plan*	0		3520	2800	2900	1600		4500
2010	No fishing and recovery plan	0		2670	2900	3000	2800		5800
2011	See scenarios	0		2005	1700	1700	1500		3300
2012	MSY framework	5600		6015	5000	5100	500		5600
2013	MSY framework	3100		4211	4700	4600	1000		5600
2014	MSY approach	6432^		3988	4000	4000	800		4800
2015	(November update) MSY approach		68690	4536	3889	3868	1509	0	5377
2016	MSY approach		≤ 59945	6462	4265 ^^^	4209	1669	0	5878
2017	MSY approach		≤ 39461	3697	3263 ^^^	3186	1584	2	4772
2018	(November update) MSY approach		≤ 48990	4654	4172 ^^^	4291	1283	0	5575
2019	MSY approach		≤ 33956	3226					
2020	MSY approach		≤ 30228						

* Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries, protecting stocks outside safe biological limits.

** Adjusted for misreporting.

*** For Division 6.a only.

^ This value (6432) refers to total catch, including discards. Therefore, it is not directly comparable to the value advised for 2013 (3100), which referred only to landings.

^^ Catch advice since 2015 is given for Subarea 4, Division 6.a, and Subdivision 20.

Since 2016 discards estimated by ICES correspond to unwanted catch (including BMS landings).

^^^ Since 2016, official landings include officially reported BMS landings.

History of the catch and landings

Table 8 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Wanted catch			Unwanted catch	Industrial bycatch
39 525 tonnes	Demersal trawl and seine > 100 mm	Trawl 70–99 mm	Others	5 050 tonnes	5 tonnes
	95%	< 1%	4%		
34 470 tonnes					

Table 9 Haddock in Subarea 4, Division 6.a, and Subdivision 20. History of official commercial catch and landings, along with ICES estimates for individual areas. All weights are in tonnes.

Subdivision 20											
Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*	2018*
Germany	87	105	65	102	120	90	114	103	125	0	31
Denmark	1052	1263	1139	1661	1916	1456	1763	1057		852	542
Netherlands	0	0	1	0	0	5	6			20	4
Norway	170	121	81	125	239	223	81	63	70		0
Portugal	0	0	0	0	0	0	0	0	0		0
Sweden	276	166	126	198	210	217	215	20	129	103	140
UK	0	0	0	0	0	3	0			0	0
BMS landings										< 1	< 1
Subarea 4											
Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*	2018*
Belgium	112	108	78	106	78		98	45	53	30	29
Germany	393	657	634	575	548		677	599	554	534	347
Denmark	501	552	725	697	947	128	1079	1426	1213	1185	1117
Spain	0	0	0	0	0	0		0	0	0	0
Faroes	3	32	5	0		0	0	0	0	0	0
France	448	135	276	320	75		209	101	121	140	201
Greenland	0	4	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0		0	0	0	0	0	0
Iceland	0	0	0	0		0	0	0	0	0	0
Netherlands	29	24		71	19	172	99	43	146	75	89
Norway	1482	1278	111	1195	1069	1661	2705	2004	1484	2164	1431
Poland	16	0	0	0	0	0	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	0	0	0	0
Sweden	83	11	0		103	113	154	135	117	179	99
UK	27365	393	13	2334	0	32993	29758	25852	26374	25376	25880
BMS landings										< 1	15
Division 6.a											
Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*	2018*
Germany	1	0	1	0	0	0	0	0	0	0	0
Denmark		0	0	0	0	0	0	0	2	2	1
Spain		2	28	36	15	0	19	9	33	28	28
Faroes	0		0	0	0	0	0	0	0	0	0
France		36	89	73	32	51	67	41	62	68	66
Greenland	875	297	396	290	845	746	653	768	1033	641	758
Netherlands	0	0	0	0	0	0	0	0	28	31	15
Portugal	18	18	9	4	0	6	15	7	5	1	7
UK	1776	2380	2415	1364	0	3878	3230	3051	3090	2492	3295
BMS landings										0	2

Subarea 4, Division 6.a, and Subdivision 20											
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Official landings	34862	35831	32308	30288	6488	43830	40945	35520	35614	32290*	34083
ICES landings	33058	35590	31940	36570	38162	43734	41143	35295	35058	32827	34470
ICES discards^	14503	12326	13071	13067	5032	3305	5090	6255	7950^	7029^	5050^
ICES IBC	199	52	431	24	1	54	65	21	37	19	5
ICES total catch	47759	47968	45442	49661	43195	47092	46295	41571	43133	40801	39524
TAC 4	46444	42110	35794	34057	39000	45041	38284	40711	61933	33643	41767
TAC 3.a 20	2856	2590	2201	2100	2095	2770	2355	2504	3926	2069	2569
TAC 6.a	6120	3520	2670	2005	6015	4211	3988	4536	6462	2597	4654
Total TAC	55420	48220	40665	38162	47110	52022	44627	47751	72352	38307	48990

* Preliminary

^ Since 2016 ICES discards correspond to unwanted catch (including BMS landings).

Summary of the assessment

Table 10 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Assessment summary. Recruitment in thousands. Weights in tonnes. High and low refers to 95% confidence intervals.[†]

Year	Recruitment (Age 0)			SSB			Landings *	Discards	Industrial bycatch	Landings*	F		
	Age 0	High	Low	SSB	High	Low					Ages 2–4	High	Low
1972	8897047	12876959	4917134	294702	353738	235666	234019	1445	29585		0.86	0.99	0.73
1973	32877662	40666067	25089256	274524	312634	236414	207489	126105	112		0.79	0.93	0.65
1974	53042168	69454673	36629664	321618	366530	276706	167528	81802	715		0.74	0.89	0.60
1975	3460809	6491659	429960	157849	179819	135880	1602	293321	2487		0.87	1.04	0.71
1976	5458582	8330460	2586703	193714	224636	162791	184	169776	48163		0.81	0.97	0.65
1977	11845426	15268635	8422216	350331	410648	290013	156	4873	35022		0.82	0.99	0.65
1978	24774409	28693980	20854838	157408	184715	130101	1029	3286	10903		0.90	1.08	0.73
1979	49783830	58624270	40943389	92555	114369	70741	97896	25	16240		0.92	1.10	0.74
1980	9098298	11163800	7032795	102738	124430	810	111371	331	22472		0.89	1.06	0.73
1981	15397809	18621583	12174034	193876	220381	1673	61683		17041		0.68	0.81	0.55
1982	9257265	10916429	7598100	435007	476410	39360	41297		19383		0.57	0.66	0.47
1983	29956735	34209802	25703669	294138	324633	263643	754	51584	12898		0.73	0.83	0.62
1984	5814892	8565849	3063934	236480	265813	207148	158205	79012	10080		0.85	0.97	0.73
1985	9559588	11966714	7152462	166810	188398	150221	182946	58373	5998		0.80	0.92	0.69
1986	18058148	21498132	14618164	286791	328341	254158	85137	36063	2643		0.90	1.02	0.78
1987	331750	2483222	0	162245	179	144703	135022	55674	4410		0.91	1.04	0.79
1988	1050173	4464403	0	125316	142296	1083	126227	49833	4002		0.96	1.09	0.82
1989	1979345	4503599	0	177	487	2	92840	32453	2410		0.91	1.04	0.77
1990	8687179	11220953	6153405	14	434	395	61605	22548	2589		0.90	1.04	0.77
1991	9895037	11443169	8346905	5	9658	44071	55208	36610	5386		0.89	1.02	0.76
1992	17124698	19616741	14632655	55	60816	49785	81566	42477	10927		0.88	0.98	0.77
1993	4295180	5074233	35161	118132	132898	103366	98631	70748	10766		0.94	1.06	0.83
1994	16997410	19300283	1460	8111	7451	118771	95141	70668	3576		0.92	1.04	0.80
1995	4790999	5567379	619	6413	4780	168047	89859	71262	7695		0.82	0.94	0.70
1996	6849311	8005705	50	124446	138824	110069	92615	107207	5000		0.80	0.92	0.69
1997	4112149	4893186	3331	2518	281090	222518	95391	67879	6684		0.62	0.72	0.52
1998	3101245	3652	548634	19	202702	164250	95472	61399	5101		0.73	0.84	0.61
1999	46518857	53	42018	730	160275	125185	76009	43562	3835		0.81	0.94	0.69
2000	9077862	101984	853740	92626	105381	79871	54504	64185	8134		0.88	1.02	0.75
2001	899610	1054		62639	71444	53835	47592	117882	7879		0.60	0.70	0.49
2002	1220443	18	575228	538076	610951	465201	65405	86051	3717		0.37	0.45	0.30
2003	1371758	18705	872994	462130	517283	406978	47282	25975	1150		0.23	0.28	0.182

[†] Version 2. Official BMS landings and Industrial bycatch columns corrected.

Year	Recruitment (Age 0)			SSB			Landings *	Discards *	Industrial Bycatch	Landings	F		
	Age 0	High	Low	SSB	High	Low					Ages 2–4	High	Low
2004	1345295	1696293	994298	317376	360959	273792	51896	20020	4		0.23	0.28	0.182
2005	12761202	14105120	11417283	234188	272264	196112	51528	12389			0.30	0.36	0.24
2006	2712346	3115193	2309499	160913	191580	130247	43334	23094	53		0.50	0.58	0.41
2007	1806883	2457654	1156113	132007	162296	101718	34672	326	48		0.42	0.50	0.34
2008	1271674	1767835	775513	277624	314082	241166	33058	1	199		0.25	0.30	0.195
2009	9243723	10179946	8307500	227942	262512	193372	35590	12	52		0.196	0.24	0.155
2010	793470	2019104	0	211325	244775	177876	31940	1307	4		0.21	0.26	0.169
2011	82155	1031999	0	151577	173733	129420	36570	13067	4		0.32	0.38	0.25
2012	1117754	1562626	672882	311353	345806	276901	381	5032	1		0.191	0.23	0.149
2013	566276	944069	188484	246434	273045	219823	43	3305	54		0.21	0.25	0.165
2014	5906614	6611629	5201599	176827	199341	154313	41	509	65		0.34	0.40	0.27
2015	1646562	1957200	1335924	139537	159795	119279	352	625	21		0.46	0.54	0.38
2016	2631177	3190303	2072051	117461	137762	97161	35058	705	37	201	0.33	0.40	0.27
2017	1294733	1709322	880143	207480	232744	182	32827		19	93	0.25	0.30	0.192
2018	1503943	2280464	727422	186846	210674	1630		5032 **	5	155	0.22	0.28	0.170
2019	3287400 ^	7165339	0	236941 ^^	270559	20332							

* ICES estimates.

** Since 2016, discards correspond to unwanted catch minus BMS landings from EU fleets officially reported in logbooks.

^ In 2019, recruitment is the TSA estimate for 2019

^^ In 2019, SSB is from estimated survivors in 2018

Sources and references

- EU. 2018. Regulation (EU) 2018/973 of the European Parliament and of the council of 4 July 2018 establishing a multiannual plan for demersal stocks in the North Sea and the fisheries exploiting those stocks, specifying details of the implementation of the landing obligation in the North Sea and repealing Council Regulations (EC) No 676/2007 and (EC) No 1342/2008. Official Journal of the European Union, L 179: 1–13. <http://data.europa.eu/eli/reg/2018/973/oj>
- ICES. 2014. Report of the ICES Benchmark Meeting on Northern Haddock Stocks (WKHAD), 27–29 January 2014, Aberdeen, Scotland, and 24–28 February 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:41. 150 pp. <https://doi.org/10.17895/ices.pub.5327>
- ICES. 2016. Report of the Inter-benchmark Protocol on Haddock (*Melanogrammus aeglefinus*) in Subarea 4, Division 6.a and Subdivision 3.a.20 (North Sea, West of Scotland, Skagerrak) (IBPHaddock), 29 June–5 September 2016, by correspondence. ICES CM 2016/ACOM:58. 65 pp. <https://doi.org/10.17895/ices.pub.5328>
- ICES. 2017. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 26 April–5 May 2017, ICES Headquarters, Copenhagen, Denmark. ICES CM 2017/ACOM:1248. 1248 pp. <https://doi.org/10.17895/ices.pub.5323>
- ICES. 2018. 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. 2019a. EU and Norway request concerning the long-term management strategy of cod, haddock, and whiting, and of North Sea autumn-spawning herring. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, sr.2019.12, <https://doi.org/10.17895/ices.advice.5332>
- ICES. 2019b. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports. 1:7. <http://doi.org/10.17895/ices.pub.5329>
- ICES. 2019c. Haddock (*Melanogrammus aeglefinus*) in Subarea 4, Division 6.a, and Subdivision 20 (North Sea, West of Scotland, Skagerrak). In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, had.27.46a20, <https://doi.org/10.17895/ices.advice.5637>

Recommended citation: ICES. 2019. Haddock (*Melanogrammus aeglefinus*) in Subarea 4, Division 6.a, and Subdivision 20 (North Sea, West of Scotland, Skagerrak). In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, had.27.46a20, <https://doi.org/10.17895/ices.advice.4861>