

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

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, total catches in 2022 should be no more than 128 708 tonnes.

ICES notes the existence of a precautionary management plan, developed and adopted by one 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} .

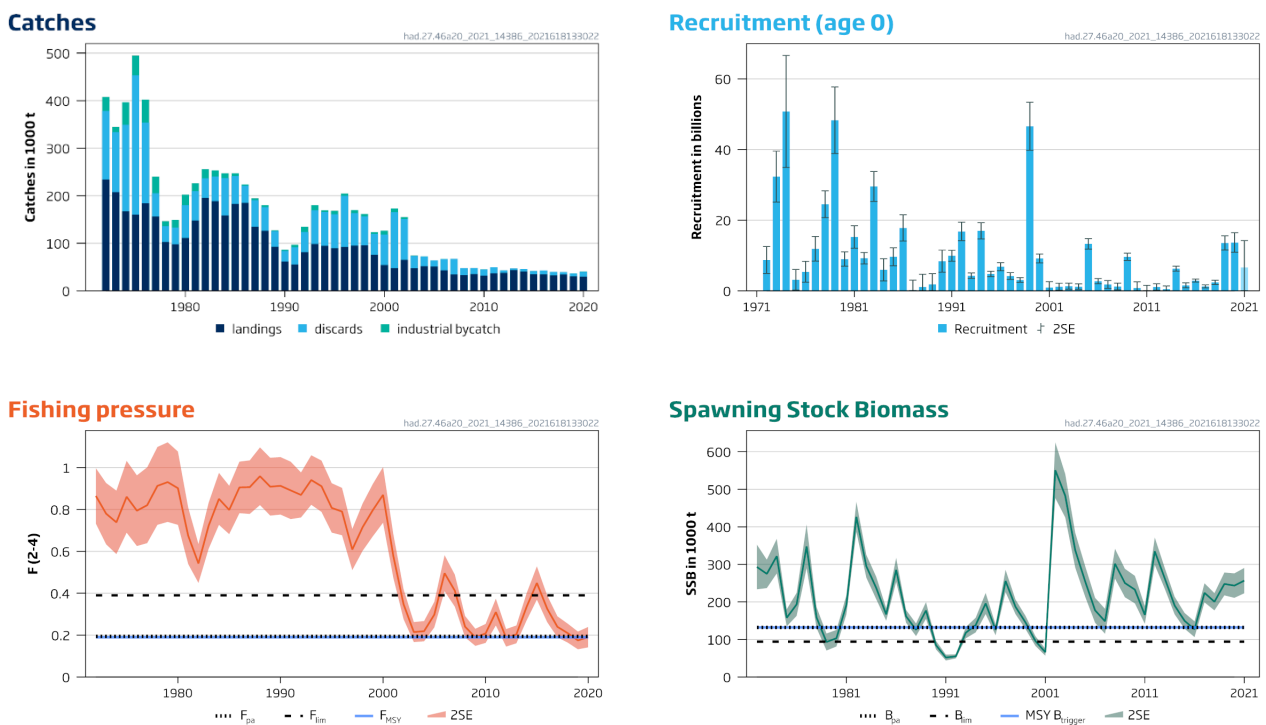


Figure 1 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Summary of the stock assessment. The assumed recruitment value for 2021 is shaded in a lighter colour.

Catch scenarios

Table 1 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Values in the forecast and for the interim year.

Variable	Value	Notes
$F_{ages\ 2-4}$ (2021)	0.117	F based on a human consumption TAC in 2021 of 50 182 tonnes, plus IBC of 849 tonnes
SSB (2022)	573 051	Short-term forecast (STF); tonnes
$R_{age\ 0}$ (2021, 2022)	6 640	Assessment model forecast; millions
Total catch, excluding industrial bycatch (2021)	50 182	TAC 2021; TAC constraint applied to human consumption fishery catch only; tonnes
Projected landings (2021)	34 514	STF, assuming 2018–2020 average landings fraction by age; tonnes
Projected discards (2021)	15 668	STF, assuming 2018–2020 average discards fraction by age; tonnes
Industrial bycatch (2021)	849	STF, assuming 2018–2020 average industrial bycatch fraction by age; tonnes

Table 2 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Annual catch scenarios. All weights are in tonnes (t).

Basis	Total catch (2022)	Projected landings* (2022)	Projected discards** (2022)	Industrial bycatch (2022)	Human consumption catch (2022)	F _{total} (ages 2–4) (2022)	F _{projected landings} (ages 2–4) (2022)	F _{projected discards} (ages 2–4) (2022)	F _{IBC***} (ages 2–4) ++ (2022)	SSB (2023)	% SSB change^	% TAC change ^^	% advice change^^^
ICES advice basis													
MSY approach: F _{MSY}	128708	101908	25339	1460	127248	0.194	0.155	0.037	0.0021	723334	26%	154%	86%
Other scenarios													
F = F _{MSY lower}	111702	88316	21909	1477	110225	0.167	0.133	0.031	0.0021	740295	29%	120%	61%
F = F _{MSY upper} [#]	128708	101908	25339	1460	127248	0.194	0.155	0.037	0.0021	723334	26%	154%	86%
F = 0 (IBC only)	1586	0	0	1586	0	0	0	0	0.0021	850838	48%	-100%	-98%
F _{pa}	128708	101908	25339	1460	127248	0.194	0.155	0.037	0.0021	723334	26%	154%	86%
F _{lim}	248379	197557	49482	1340	247039	0.384	0.309	0.073	0.0021	603983	5.4%	392%	259%
SSB (2023) = B _{lim}	759578	606204	152547	826	758751	1.19	0.964	0.227	0.0021	94000	-84%	1412%	996%
SSB (2023) = B _{pa} = MSY B _{trigger}	721485	575754	144866	864	720620	1.13	0.916	0.215	0.0021	132000	-77%	1336%	941%
F ₂₀₂₁	79958	62944	15504	1509	78448	0.117	0.093	0.022	0.0021	771954	35%	56%	15%
Rollover TAC	51719	40368	9814	1537	50182	0.072	0.057	0.013	0.0021	800133	40%	0%	-25%

* Marketable landings.

** Including below minimum size (BMS) landings, assuming recent discard rate.

*** F_{IBC} = Fishing mortality due to industrial bycatch which is assumed to be constant in all scenarios at *status quo* value.

^ SSB 2023 relative to SSB 2022.

^^ Human consumption fishery (HCF) catch in 2022 relative to TAC in 2021: Subdivision 20 (2630 t) + Subarea 4 (42 785 t) + Division 6.a (4767 t) = 50 182 t.

^^^ Total catch 2022 relative to the advice value 2021 (69 280 t).

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

The change in advice (86%) is due to both the 2019 and 2020 year classes that are substantially larger than any of the the most recent recruitments for this stock.

Basis of the advice

Table 3 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). There is no agreement with Norway regarding this plan, and it is not used as the basis of the advice for this shared stock. ICES was requested by the EC and UK to provide advice based on the MSY approach, and to include F_{MSY} ranges in the catch scenarios.

Quality of the assessment

Scottish observer and market sampling was not possible during Q2 of 2020 because of the COVID-19 disruption. Sampling proceeded as normal during Q1 and at a reduced level in Q3 and Q4, but this reduced coverage is not thought to have impacted significantly on the quality of catch data for Scotland (which has the main fleets catching haddock).

The assessment uses North Sea (Subarea 4 and Subdivision 20) survey indices (IBTS Q1 and Q3), which are considered to be sufficiently representative of the whole stock (which also includes Division 6.a). No combined survey index for the entire area is available.

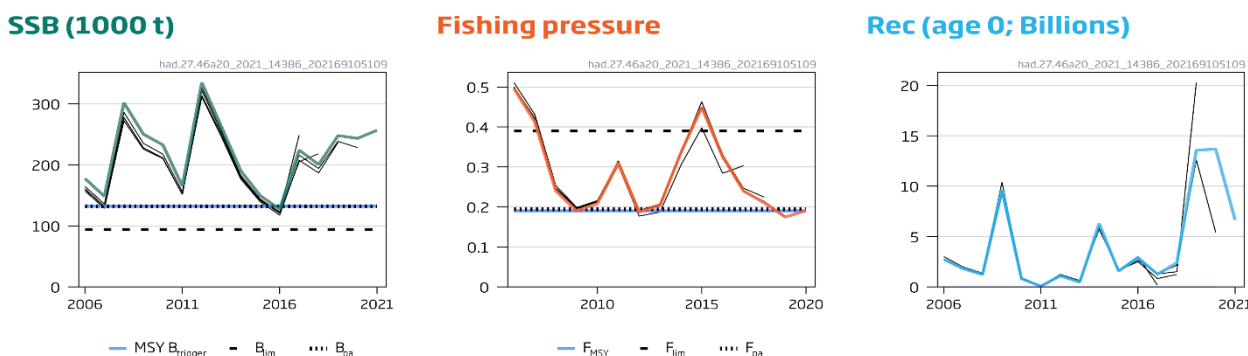


Figure 2 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Historical assessment results (final-year SSB and recruitment included for each line, corresponding respectively to the estimated survivors at the start of the interim year, and the forecast recruitment in the interim year).

Issues relevant to the advice

More abundant year classes were produced prior to 2000; recruitment since then has tended to be consistently lower. However, the 2019 and 2020 year classes are estimated to be the largest since 2000, which significantly impacts the catch forecast but also increases the risk of catching undersized fish.

The EU landing obligation has been phased in to all catches of haddock in ICES Subarea 4 since 2016, and the stock has been fully under this obligation since 2019. Landings of fish below the minimum conservation reference size (MCRS) are very low, however, and discarding still takes place. The estimated discards in 2020 were 9112 tonnes (23.1% of the total catch by weight), based on observer data.

Reference points

Table 4 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 the recruitment period 2000–2015	ICES (2016)
	F_{pa}	0.194	F that provides a 95% probability for SSB to be above B_{lim} (F_{P05} with advice rule [AR]).	ICES (2017, 2021)
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 with 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 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 5 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2021a)
Assessment type	Age-based analytical assessment (TSA; ICES, 2021b) that uses catches and surveys in the model and in the forecast
Input data	Commercial catches (international landings, ages from catch sampling), two survey indices: IBTS Q1 (G1022), IBTS Q3 (G2829). Maturity data are assumed fixed over time and knife-edged at age 3, while natural mortality data vary with age and over time (estimates updated in ICES [2019]).
Discards, BMS landings and bycatch	Included in the assessment, data from the main fleets (covering around 68% of the landings). BMS landings, where reported, are included with discards in the assessment from 2016 onwards.
Indicators	None
Other information	Last benchmarked in 2014 during ICES Benchmark Meeting on Northern Haddock Stocks (WKHAD; ICES, 2014), at which time it was decided that the previously separate stocks in the North Sea and Skagerrak and in the West of Scotland should be assessed as one stock. 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 point accordingly.
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

History of the advice, catch, and management

Table 6a Haddock in Subarea 4, Division 6.a, and Subdivision 20. **North Sea (Subarea 4)**. 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.

Year	ICES advice	Landings corresp. to advice	Total catch corresp. 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	4000	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	26000	2000	104000
1990	80% of F (88); TAC	50000		50000	43000	51000	33000	3000	87000
1991	70% of effort (89)			50000	45000	45000	40000	5000	90000
1992	70% of effort (89)			60000	51000	70000	48000	11000	129000
1993	70% of effort (89)			133000	80000	80000	80000	11000	170000
1994	Significant reduction in effort; mixed fishery			160000	87000	81000	65000	4000	150000
1995	Significant reduction in effort; mixed fishery			120000	75000	75000	57000	8000	140000
1996	Mixed fishery to be taken into account			120000	75000	76000	73000	5000	154000
1997	Mixed fishery to be taken into account			114000	73000	79000	52000	7000	138000
1998	No increase in F	100300		115000	72000	77000	45000	5000	128000
1999	Reduction of 10% F (95–97)	72000		88600	64000	64000	43000	4000	111000
2000	F less than F _{pa}	< 51700		73000	47000	45000	47000	8000	100000
2001	F less than F _{pa}	< 58000		61000	40000	39000	118000	8000	165000
2002	F less than F _{pa}	< 94000		104000	54000	53000	45000	4000	101000
2003	No cod catches	-		52000	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}	92000*		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	55400*		55000	31000	31000	30000	0	61000
2008	Mixed-fisheries considerations/15% TAC reduction	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

Year	ICES advice	Landings corresp. to advice	Total catch corresp. to advice [^]	Agreed TAC	Official landings	ICES landings	ICES discards ^{^^}	ICES industrial bycatch	ICES total
2016	MSY approach		≤ 59945	61933	30162	29647	6243	30	35920
2017	MSY approach		≤ 39461	33643	30051	28563	5341	16	33921
2018	MSY approach		≤ 48990	41767	29195	29277	3425	1	32703
2019	MSY approach		≤ 33956	28950	25453	25616	3575	177	29369
2020	MSY approach		≤ 41818	35653	26240	26442 ^{^^^}	8434 ^{^^^}	1241 ^{^^^}	36116 ^{^^^}
2021	MSY approach		≤ 69280	42785					
2022	MSY approach		≤ 128708						

* 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 provided for Subarea 4, Division 6.a, and Subdivision 20.

^{^^} Since 2016 discards estimated by ICES include BMS landings.

^{^^^} Due to an InterCatch issue when generating area-specific catch estimates, these values do not sum to the catch-component totals in tables 7, 8, and 9 when added across areas. The latter are used in the assessment.

Table 6b Haddock in Subarea 4, Division 6.a, and Subdivision 20. **Skagerrak (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 hundred tonnes.

Year	ICES advice	Landings corresp. to advice	Catch corresp. 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		2900		1500	4300
1989	Precautionary TAC	-		10000		4100		400	4500
1990	Precautionary TAC	-		10000		4100		2000	6100
1991	Precautionary TAC	4600		4600		4100		2600	6700
1992	TAC	4600		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	4700		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
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	600	0	2000
2009	Combined advice with North Sea/ apply management plan	-		2600		1500	600	0	2100
2010	Combined advice with North Sea/ apply management plan	-		2200		1300	600	0	1900
2011	See scenarios	-		2100		9900	1700	0	11600

Year	ICES advice	Landings corresp. to advice	Catch corresp. to advice**	Agreed TAC	Official landings	ICES landings	ICES discards [^]	ICES industrial bycatch	ICES total catch
2012	Apply North Sea management plan	-		2095	2500	2600	700	0	3300
2013	Apply North Sea management plan	-		2770	2000	*	*	*	*
2014	Apply North Sea management plan	2438		2355	2200	2300	100	*	2400
2015	(November update) MSY approach		68690	2504	1432	1411	96	4	1512
2016	MSY approach		≤ 59945	3926	1213	1201	38	7	1246
2017	MSY approach		≤ 39461	2069	1012	1078	105	1	1183
2018	(November update) MSY approach		≤ 48990	2569	717	787	53	4	844
2019	MSY approach		≤ 33956	1780	550	613	75	3	691
2020	MSY approach		≤ 41818	2193	532	414 ^{^^}	259 ^{^^}	196 ^{^^}	869 ^{^^}
2021	MSY approach		≤ 69280	2630					
2022	MSY approach		≤ 128708						

* Subarea 4 and Subdivision 20 combined (see Table 4a).

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

[^] Since 2016, discards estimated by ICES include BMS landings.

^{^^} Due to an InterCatch issue when generating area-specific catch estimates, these values do not sum to the catch-component totals in Tables 7, 8, and 9 when added across areas. The latter are used in the assessment.

Table 6c Haddock in Subarea 4, Division 6.a, and Subdivision 20. **West of Scotland (Division 6.a).** 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.

Year	ICES advice/Single-stock exploitation boundaries from 2004 onwards *	Landings corresp. to advice	Catch corresp. 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	8700		19200
1992	70% of effort (89)	-		12500	7000	11400 ^{**}	9300 ^{**}		20500 ^{**}
1993	70% of effort (89)	-		17600	13000	19100 ^{**}	16800 ^{**}		35900 ^{**}
1994	30% reduction in effort	-		16000	9000	14200 ^{**}	11100 ^{**}		25000 ^{**}
1995	Significant reduction in effort	-		21000	13000	12400	8600		20900
1996	Significant reduction in effort	-		22900	13000	13500	11400		24800
1997	Significant reduction in effort	-		20000	13000	12900	6500		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	7000	7000	7900		14900
2001	Reduce F below F_{pa}	< 11200 ^{***}		13900	7000	6870	6600		13400
2002	Reduce F below F_{pa}	< 14100 ^{***}		14100	7000	7100	8900		16000
2003	No cod catches	-		8700	4900	5300	4100		9400
2004	F_{pa} [*]	12200		6500	3000	3900	3700		7600
2005	$0.75 \times F_{pa}$ [*]	7600		7600	3200	3800	2900		6700
2006	$0.7 \times F_{pa}$ [*]	8000		7810	5700	6300	4600		10900
2007	$0.87 \times F_{pa}$ [*]	7200		7200	3700	3800	4000		7700
2008	$SSB > B_{pa}$ [*]	4200		6120	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

Year	ICES advice/Single-stock exploitation boundaries from 2004 onwards *	Landings corresp. to advice	Catch corresp. to advice^^	Agreed TAC	Official landings	ICES landings	ICES discards#	ICES industrial bycatch	ICES total catch
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	3251	3186	1584	2	4772
2018	(November update) MSY approach		≤ 48990	4654	4171	4272	1190	0	5462
2019	MSY approach		≤ 33956	3226	3545	3575	1861	0	5436
2020	MSY approach		≤ 41818	3973	2653	2827^^^	776^^^	0^^^	3603^^^
2021	MSY approach		≤ 69280	4767					
2022	MSY approach		≤ 128708						

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

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

^^^ Due to an InterCatch issue when generating area-specific catch estimates, these values do not sum to the catch-component totals in tables 7, 8, and 9 when added across areas. The latter are used in the assessment.

Since 2016, discards estimated by ICES include BMS landings.

History of the catch and landings

Table 7 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Catch distribution by fleet in 2020 as used in the assessment model.

Catch (2020)	Landings*			Discards**	Industrial bycatch
	Demersal trawl and seine > 100 mm	Trawl 70–99 mm	Others		
40588 tonnes	88%	8%	4%	9335 tonnes	1077 tonnes
	30 176 tonnes				

*Landings include the Norwegian component of BMS landings.

**Discards include BMS landings from EU and UK fleets.

Table 8 Haddock in Subarea 4, Division 6.a, and Subdivision 20. History of official commercial 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	2019*	2020*
Germany	87	105	65	102	120	90	114	103	125	0	31	30	12
Denmark	1052	1263	1139	1661	1916	1456	1763	1057	973	852	542	458	448
Netherlands	0	0	1	0	0	5	6	4	2	20	4	4	1
Norway	170	121	81	125	239	223	81	63	70	65	0	27	0
Portugal	0	0	0	0	0	0	0	0	0	0	0	0	15
Sweden	276	166	126	198	210	217	219	202	129	103	140	93	56
UK	0	0	0	0	0	3	0	0	0	0	0	0	0
BMS landings										< 1	< 1	0	1
Subarea 4													
Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*	2020*
Belgium	112	108	78	106	78	78	98	45	53	30	29	29	40
Germany	393	657	634	575	548	677	677	599	554	534	347	311	331
Denmark	501	552	725	697	947	1283	1079	1426	1213	1185	1117	1203	1683
Spain	0	0	0	0	0	0	0	0	0	0	0	0	0
Faroese	3	32	5	0	0	0	0	0	0	0	0	1	0
France	448	135	276	320	175	177	209	101	121	140	201	189	144
Greenland	0	4	0	0	0	0	0	0	0	0	0	0	0

Ireland	0	0	0	0	0	0	0	0	0	0	0	0	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0	0	0	0	0	0	0	130
Netherlands	29	24	41	71	191	172	99	43	146	75	89	162	175
Norway	1482	1278	1126	1195	1069	1661	2705	2004	1484	2164	1431	1517	3171
Poland	16	0	0	0	0	0	0	0	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	83	141	90	128	103	113	154	135	117	179	99	111	114
UK	27365	28393	24983	23343	0	32993	29758	25852	26374	25376	25880	21930	20452
BMS landings										< 1	15	160	287
Division 6.a													
Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*	2020*
Germany	1	0	1	0	0	0	0	0	0	0	0	0	0
Denmark	0	0	0	0	0	0	0	0	2	2	1	9	4
Spain	10	21	28	36	15	0	19	9	33	28	28	64	26
Faroese	0	0	0	0	0	0	0	0	0	0	0	0	0
France	151	136	89	73	32	51	67	41	62	68	66	57	86
Ireland	879	297	396	290	845	746	653	768	1033	641	758	562	441
Netherlands	0	0	0	0	0	0	0	0	28	31	15	54	13
Norway	28	18	9	4	0	6	15	7	5	1	7	10	2
UK	1776	2380	2415	1364	0	3878	3230	3051	3090	2492	3295	2789	2081
BMS landings										0	2	15	26
Subarea 4, Division 6.a, and Subdivision 20													
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*	2020*
Official landings	34862	35831	32308	30288	6488	43830	40945	35520	35614	32290	34083	29609	29425
ICES landings	33058	35590	31940	36570	38162	43734	41143	35295	35058	32827	34470	30743	30176
ICES discards [^]	14503	12326	13071	13067	5032	3305	5090	6255	7950 [^]	7029 [^]	5050 [^]	5524 [^]	9335 [^]
ICES IBC	199	52	431	24	1	54	65	21	37	19	5	186	1077
ICES total catch	47759	47968	45442	49661	43195	47092	46295	41571	43133	40801	39524	36602	40558
TAC 4	46444	42110	35794	34057	39000	45041	38284	40711	61933	33643	41767	28950	35653
TAC 3.a 20	2856	2590	2201	2100	2095	2770	2355	2504	3926	2069	2569	1780	2193
TAC 6.a	6120	3520	2670	2005	6015	4211	3988	4536	6462	3697	4654	3226	3973
Total TAC	55420	48220	40665	38162	47110	52022	44627	47751	72321	46538	48990	33956	41819

* Preliminary.

[^] Since 2016 ICES discards include BMS landings.

Summary of the assessment

Table 9 Haddock in Subarea 4, Division 6.a, and Subdivision 20. Assessment summary. Recruitment is in thousands, weights are in tonnes. High and low refers to ± 2 SEs.

Year	Recruitment (age 0)			SSB			Landings*	Discards*	Industrial bycatch*	Fishing pressure (ages 2–4)		
	Age 0	High	Low	SSB	High	Low				Ages 2–4	High	Low
	thousands			tonnes						tonnes		
1972	8738656	12555645	4921666	293120	352626	233614	234019	144366	29585	0.86	1.00	0.73
1973	32331910	39549850	25113970	274699	312640	236758	207489	126105	11267	0.78	0.93	0.63
1974	50765467	66624861	34906072	321906	368128	275684	167528	181802	47505	0.74	0.89	0.59
1975	3121856	6057975	185737	157703	180564	134843	160271	293321	41487	0.86	1.03	0.69
1976	5393141	8355471	2430810	193539	224298	162779	184421	169776	48163	0.79	0.96	0.63
1977	11907538	15392910	8422166	348050	406383	289717	156639	48732	35022	0.82	1.00	0.64
1978	24519908	28311787	20728029	158339	186347	130330	102970	32860	10903	0.91	1.10	0.73
1979	48276386	57692950	38859823	93237	115966	70507	97896	35054	16240	0.93	1.12	0.74
1980	8994401	11022772	6966029	103372	125440	81305	111371	68831	22472	0.90	1.08	0.73
1981	15261807	18449625	12073989	192108	217660	166556	147806	61683	17041	0.67	0.81	0.54
1982	9232003	10864227	7599779	426693	467030	386357	195456	41297	19383	0.54	0.64	0.45
1983	29543509	33771287	25315731	295226	325752	264701	188754	51584	12898	0.72	0.83	0.61

Year	Recruitment (age 0)			SSB			Landings*	Discards*	Industrial bycatch*	Fishing pressure (ages 2–4)		
	Age 0	High	Low	SSB	High	Low				Ages 2–4	High	Low
	thousands			tonnes						tonnes		
1984	5949746	9078805	2820687	237031	267009	207052	158205	79012	10080	0.85	0.97	0.73
1985	9642389	12180488	7104289	166700	183527	149874	182946	58373	5998	0.80	0.91	0.68
1986	17814510	21537457	14091563	285507	317679	253335	185137	36063	2643	0.91	1.03	0.78
1987	210743	3029066	0	161662	178813	144512	135022	55674	4410	0.91	1.03	0.78
1988	1115116	4681595.9	0	125842	142706	108977	126227	49833	4002	0.96	1.10	0.82
1989	1853396	4864379.4	0	177242	199598	154886	92840	32453	2410	0.91	1.05	0.77
1990	8410272	11534414	5286130	85160	96688	73633	61605	22548	2589	0.91	1.05	0.78
1991	9933569	11497035	8370103	51828	59697	43960	55208	36610	5386	0.89	1.03	0.75
1992	16817751	19424006	14211495	55015	60408	49623	81566	42477	10927	0.87	0.98	0.76
1993	4286522	5054575	3518469	117925	132905	102945	98631	70748	10766	0.94	1.06	0.82
1994	16989806	19283164	14696448	138404	157999	118809	95141	70668	3576	0.91	1.03	0.79
1995	4782853	5546655	4019050	195770	224047	167494	89859	71262	7695	0.81	0.93	0.69
1996	6840430	7983176	5697683	125611	140032	111189	92615	107207	5000	0.79	0.90	0.68
1997	4193095	5156119	3230072	255801	285761	225842	95391	67879	6684	0.61	0.71	0.51
1998	3077120	3742849	2411391	186995	206540	167449	95472	61399	5101	0.71	0.83	0.60
1999	46584026	53393890	39774162	145643	163307	127978	76009	43562	3835	0.80	0.92	0.67
2000	9156133	10395978	7916288	95954	109053	82855	54504	64185	8134	0.87	1.00	0.74
2001	920372	2597322	0	66008	75404	56612	47592	117882	7879	0.58	0.68	0.47
2002	1164424	2172026	156821	550753	625082	476424	65405	86051	3717	0.35	0.42	0.28
2003	1326733	2191770	461697	482786	540676	424896	47282	25975	1150	0.21	0.26	0.167
2004	1192405	1964710	420099	338047	384507	291586	51896	20020	554	0.22	0.27	0.170
2005	13297296	14783864	11810728	254992	295954	214029	51528	12389	168	0.30	0.36	0.24
2006	2738267	3468503	2008030	177633	210920	144347	43334	23094	535	0.50	0.58	0.41
2007	1799180	2919518	678842	148434	181777	115091	34672	32651	48	0.41	0.49	0.34
2008	1221123	2176313	265933	301827	341603	262051	33058	14503	199	0.24	0.29	0.189
2009	9633460	10653813	8613108	250312	288272	212352	35590	12326	52	0.190	0.23	0.149
2010	804222	2542674	0	232743	269484	196002	31940	13071	431	0.21	0.25	0.163
2011	65563	1576678	0	165311	189150	141472	36570	13067	24	0.31	0.37	0.25
2012	1082830	2001254	164406	334919	371654	298183	38162	5032	1	0.187	0.23	0.145
2013	457363	1369489	0	263066	290895	235237	43734	3305	54	0.20	0.25	0.161
2014	6285135	6995502	5574767	190277	213774	166779	41143	5090	65	0.34	0.40	0.27
2015	1557364	2265444	849285	149626	170693	128560	35295	6255	21	0.45	0.53	0.37
2016	2910963	3324635	2497290	127240	148339	106141	35058	7950	37	0.33	0.39	0.26
2017	1257282	1691820	822744	224216	249771	198661	32827	7029	19	0.24	0.29	0.189
2018	2402113	3013110	1791116	200462	223486	177439	34404	5008	5	0.21	0.26	0.164
2019	13559848	15559863	11559833	247936	278414	217459	30743	5348	186	0.175	0.22	0.132
2020	13682503	16453544	10911462	243433	276088	210778	30176	9335	1077	0.190	0.24	0.142
2021^	6640480	14239815	0	256765	290585	222945						

* ICES estimates, presented as the sum of product (SOP) values from the catch and weight-at-age used in the assessment model.

** Since 2016, discards include BMS landings from EU and UK fleets, as officially reported in logbooks.

^ In 2021, recruitment is the time-series analysis (TSA) estimate for 2021. SSB is the assessment model estimate of survivors on 1 January 2021.

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