

Tusk (*Brosme brosme*) in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b (Northeast Atlantic)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches should be no more than 6 924 tonnes in each of the years 2024 and 2025. If discard rates do not change from the average of the last five years (2018–2022), this implies landings of no more than 6 804 tonnes.

ICES advice on conservation aspects

ICES has not identified any conservation aspects.

Stock development over time

Fishing pressure on the stock is below the F_{MSY} proxy, and the stock size index is above $I_{trigger}$.

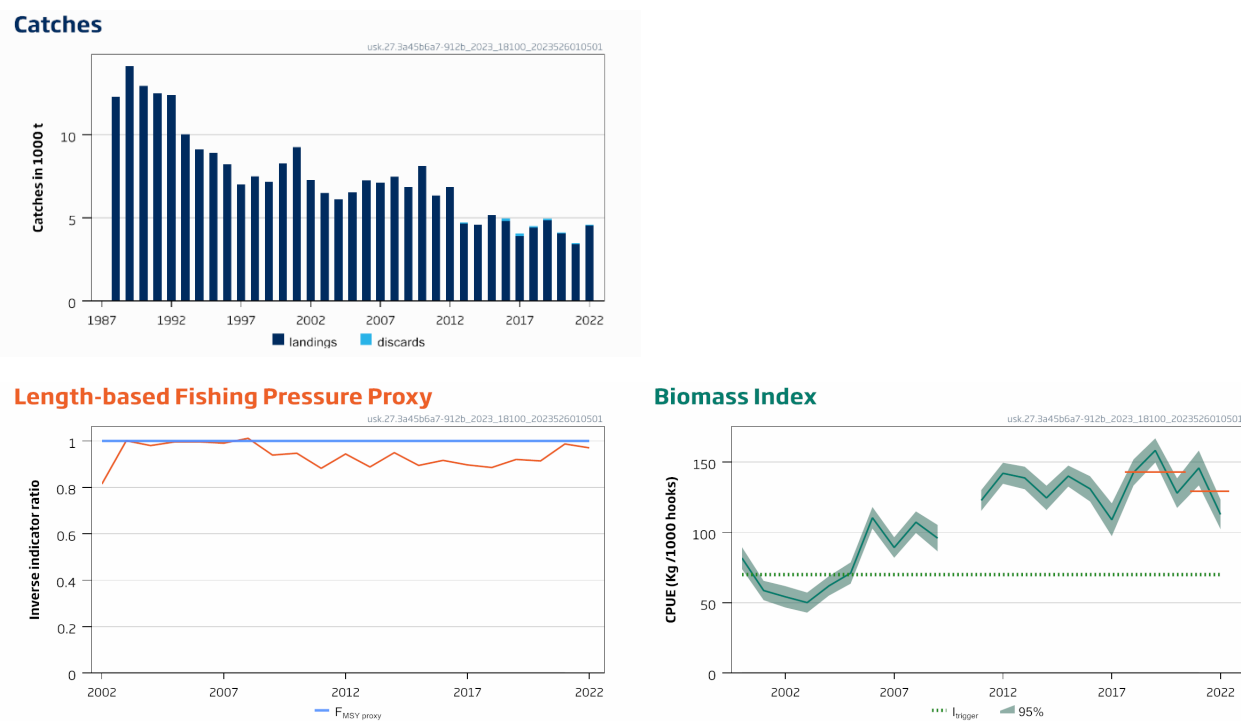


Figure 1 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. Summary of the stock assessment. Top left: Landings and discards (in thousand tonnes), discard data are only available from 2013 onwards. Bottom left: Indicator ratio $L_{F=M}/L_{mean}$ (inverse of the indicator ratio, f) from the length-based indicator (LBI) method is used for the evaluation of the exploitation status in subareas 1 and 2. The proxy fishing pressure is less than that corresponding to the F_{MSY} proxy ($L_{F=M}$) when the indicator ratio value is lower than 1 (shown by the horizontal blue line). Bottom right: Standardized CPUE (kg per 1 000 hooks) from the Norwegian longline fishery (mean and 95% confidence interval). The horizontal orange lines indicate the average of the most recent two years and the previous three years.

Conservation status

ICES is not aware of any information on stock/species-specific conservation status.

Catch scenarios

ICES framework for category 3 stocks was applied (rfb rule, method 2.1, ICES, 2022). The standardized CPUE series from the Norwegian longline reference fleet was used as an indicator of stock development. The advice is based on the recent advised catches (2023), multiplied by the ratio of the mean of the last two index values (index A) and the mean of the three preceding values (index B), a ratio of observed mean length in the catch relative to the target mean length, a biomass safeguard, and a precautionary multiplier. The stability clause was not applied since the change from the previous advice was between +20% and -30%.

Discarding is only available since 2013 and considered negligible (< 4%).

Table 1 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. The basis for the catch scenarios*.

Previous catch advice A_y (2023)	7 821 tonnes	
Stock biomass trend		
Index A (2021, 2022)	129 kg per 1 000 hooks	
Index B (2018, 2019, 2020)	143 kg per 1 000 hooks	
r: stock biomass trend (index ratio A/B)	0.90	
Fishing pressure proxy		
Mean catch length ($L_{\text{mean}} = L_{2022}$)	54 cm	
MSY proxy length ($L_{F=M}$)	52 cm	
f: fishing pressure proxy relative to MSY proxy ($L_{2022}/L_{F=M}$)	1.03	
Biomass safeguard		
Last index value (I_{2022})	113 kg per 1 000 hooks	
Index trigger value ($I_{\text{trigger}} = I_{\text{loss}} \times 1.4$)	70 kg per 1 000 hooks	
b: index relative to trigger value, $\min\{I_{2022}/I_{\text{trigger}}, 1\}$	1	
Precautionary multiplier to maintain biomass above B_{lim} with 95% probability		
m: multiplier (generic multiplier based on life history)	0.95	
Stability clause (+20%/–30% compared to A_y , only applied if $b \geq 1$)	Not applied	
Discard rate ^{^^}	1.73%	
Catch advice for 2024 and 2025 ^{**}	6 924 tonnes	
Projected landings corresponding to advice ^{***}	6 804 tonnes	
% advice change [^]	–11.5%	

*The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

** Formula $[A_y \times r \times f \times b \times m]$.

*** $[\text{Advised catch for 2024 and 2025}] \times [1 - \text{discard rate}]$.

[^] Advice value for 2024 and 2025 relative to the advice value for 2022 and 2023 (7 821 tonnes).

^{^^} Discard rate is calculated based on data for the period 2018–2022.

The advice has decreased by 11.5% because of a decrease in the biomass index and the application of a new assessment method (rfb).

Basis of the advice

Table 2 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. The basis of the advice.

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

Quality of the assessment

The standardized CPUE series from the Norwegian longline fishery is considered robust, with consistent trends among the main areas of the fishery on this stock (divisions 4.a, 5.b, and 6.a).

Issues relevant for the advice

This stock is classified as Category 4 in the NEAFC categorization of deep-sea species/stocks. This implies that fisheries are primarily restricted to coastal state exclusive economic zones (EEZs); therefore, management measures are not taken by NEAFC unless complementary to coastal state conservation and management measures (NEAFC, 2016).

Reference points

Table 3 Tusk in subareas 1 and 2. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	I_{trigger}	70.11	$I_{\text{loss}} \times 1.4$. I_{loss} is defined as the lowest observed CPUE from the time series.	ICES (2023b)
	$F_{\text{MSY proxy}}$	$L_{\text{mean}}/L_{F=M} = 1$	Relative value from LBI analysis, assuming $M/k = 1.5$. $L_{F=M}$ is based on L_c (length at 50% of modal abundance).	ICES (2023b)

Basis of the assessment

Table 4 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2023a)
Assessment type	CPUE trends-based assessment (ICES, 2023b)
Input data	Total international commercial catches. Standardized CPUE data from the Norwegian longline reference fleet targeting tusk Subarea 4 and in divisions 5.b and 6.a. Growth parameters: $k = 0.17 \text{ years}^{-1}$, $L_{\text{inf}} = 77.9 \text{ cm}$. Length frequencies (2002–2022) (ICES, 2023b).
Discards and bycatch	Discards are estimated at 1.73% of the catch over the period 2018–2022
Indicators	None
Other information	None
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP)

History of the advice, catch, and management

Table 5 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. ICES advice, TACs, and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	TAC EU Subarea 3	TAC EU Subarea 4 (EU waters)	TAC EU Subarea 4 (Norwegian waters)	TAC EU + Norway subareas 5, 6, and 7	TAC Norway divisions 2.a and 5.b, and subareas 4, 6, and 7	ICES landings
2003	Reduce effort by 30%*	-	40	370	710	-	6 510	6 500
2004	Biennial*	-	40	370	710	-	6 140	6 125
2005	Effort should be reduced by 30% of 1998 effort*	-	40	317	604	-	6 700	6 553
2006	Biennial*	-	40	317	604	-	7 260	7 249
2007	Constrain catches to 5 000 t**	5 000	28	231	170	435	3 350	7 119
2008	Biennial**	5 000	28	231	170	435	3 350	7 466
2009	Constrain catches to 5 000 t	5 000	28	231	170		3 350	6 849
2010	Biennial	5 000	24	196	170	283	2 923	8 132
2011	Less than 6 900 t, and a reduction from recent levels catches should be considered	6 900	24	196	170	283	2 938	6 365
2012	No new advice, same as 2011	6 900	24	196	170	294	2 923	6 848
2013	No more than a 20% increase in catches	8 500	24	235	170	353	2 923	4 673
2014	No new advice, same as 2013	8 500	29	235	170	535	2 923	4 585
2015	No new advice, same as 2013	8 500	29	235	170	937	2 923	5 155
2016	Precautionary	8 415	29	235	170	937	2 923	4 820
2017	Biennial	8 415	29	235	170	937	2 923	3 916
2018	Precautionary approach	≤ 8 984	31	251	170	1 207	2 923	4 411
2019	Precautionary (same catch value as in 2018)	≤ 8 984	31	251	170	1 207	2 923	4 863
2020	Precautionary approach	≤ 8 627	31	251	170	1 207	2 923	4 065
2021	Precautionary approach (same catch value as in 2020)	≤ 8 627	-	251	75	4 294	***	3 408
2022	Precautionary approach	≤ 7 821		228	50	4 294	30 000^	4 550
2023	Precautionary approach (same catch value as in 2022)	≤ 7 821		228	50	4 294	30 000^	
2024	MSY approach	≤ 6 924						
2025	MSY approach, same as 2024	≤ 6 924						

* Advice for tusk in the Northeast Atlantic.

** Advice for this stock included the Mid-Atlantic Ridge and Division 6.b (Rockall).

*** TACs were not agreed.

^ Norwegian vessels can fish up to 30 000 tons of demersal fish in the UK zone Subarea 4.

History of the catch and landings

There are no reported catches in the NEAFC regulatory area.

Table 6 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. Catch distribution by fleet in 2022 as estimated by ICES.

Catch	Landings				Discards
	Longline	Trawl	Gillnet	Others	
4 604 tonnes	81%	15%	2%	3%	54 tonnes
4 550 tonnes					

Table 7 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. History of official commercial landings by area. All weights are in tonnes.

Year	3	4.a	4.b	5.b.1	5.b.2	6.a	7.a	7.b–c	7.g–k	8.a	All areas
1988	61	4 429		4 059	1 606	2 120		17	5	1	12 298
1989	93	6 418	4	3 722	1 400	2 297	2	108	86		14 130
1990	60	4 254	5	5 202	979	2 256	4	155	33		12 948
1991	84	4 537	2	5 170	1 096	1 543	2	52	14		12 500
1992	85	4 932	12	4 399	992	1 682	3	218	47		12 370
1993	79	5 141	14	2 862	577	1 223		120	32		10 048
1994	51	3 375	7	3 407	909	1 262		94	31		9 136
1995	42	3 348	15	3 347	631	1 435	1	48	37		8 904
1996	44	3 369	33	2 728	582	1 391		58	29		8 234
1997	31	2 272	38	2 742	577	1 261	1	75	19		7 016
1998	21	3 387	66	2 073	637	1 281	1	33	10	1	7 510
1999	29	2 435	34	3 517	447	539		147	8	0	7 156
2000	36	3 260	116	2 367	333	2 011		164	13		8 300
2001	57	3 095	56	3 526	469	1 767	1	263	14		9 248
2002	50	2 961	71	2 722	281	1 124		66	5		7 280
2003	51	1 997	8	2 733	559	1 128		21	3		6 500
2004	45	1 666	23	3 536	107	726		21	1		6 125
2005	44	1 826	7	3 272	360	1 019		23	2		6 553
2006	29	2 159	32	3 560	317	1 059		90	3		7 249
2007	21	2 180	15	3 468	344	1 077		13	1		7 119
2008	46	2 139	71	3 798	61	1 347		4	0		7 466
2009	19	2 268	17	3 135	164	1 242		4	0		6 849
2010	21	1 861	15	4 889	127	1 216		3	0	4	8 136
2011	17	1 623	96	3 287	0	1 337		5	0	0	6 365
2012	20	1 749	47	3 793	0	1 174		63	2		6 848
2013	22	1 510	31	1 500	12	1 594		4	0		4 673
2014	9	1 463	11	2 310	129	662		1			4 585
2015	9	1 530	18	2 081	324	1 193		0			5 155
2016	14	1 650	9	2 261	42	844		0			4 820
2017	10	1 206	18	2 035	135	511		1			3 916
2018	8	1 439	17	1 983	21	940		3			4 411
2019	8	1 247	34	1 960	684	927		3			4 863
2020	13	1 024	9	2 462	191	359		5	1	1	4 065
2021	14	450	11	2 001	542	382		7	1	0	3 408
2022	17	1 212	3	2 401	399	505		13	0	0	4 550

Summary of the assessment

Table 8 Tusk in subareas 4 and 7–9 and in divisions 3.a, 5.b, 6.a, and 12.b. Assessment summary. Standardized biomass index from the Norwegian longline reference fleet (kg per 1 000 hooks; data not representative in 2010), landings, and discards. All weights are in tonnes. High and Low refer to the 95% confidence bounds.

Year	Biomass index			Length-based fishing pressure proxy ($L_F=M/L_{mean}$)	ICES landings	ICES discards
	Low	Value	High			
1988					12 298	
1989					14 130	
1990					12 948	
1991					12 500	
1992					12 370	
1993					10 048	
1994					9 136	
1995					8 904	
1996					8 234	
1997					7 016	
1998					7 510	
1999					7 156	
2000	74.002	81.847	89.692		8 300	
2001	51.782	58.687	65.591		9 248	
2002	46.578	54.192	61.806	0.81	7 280	
2003	42.91	50.082	57.254	1.00	6 500	
2004	55.023	61.958	68.892	0.98	6 125	
2005	63.489	71.11	78.731	1.00	6 553	
2006	102.732	110.435	118.138	1.00	7 249	
2007	81.895	89.256	96.617	0.99	7 119	
2008	99.553	107.273	114.992	1.01	7 466	
2009	86.443	95.873	105.303	0.94	6 849	
2010				0.95	8 136	
2011	115.285	122.727	130.169	0.88	6 361	
2012	134.545	142.065	149.585	0.94	6 848	
2013	130.677	138.725	146.773	0.89	4 673	52
2014	115.838	124.558	133.278	0.95	4 585	0
2015	132.542	140.052	147.563	0.89	5 155	18
2016	121.97	130.998	140.026	0.92	4 820	153
2017	97.257	108.988	120.718	0.90	3 916	143
2018	133.27	142.629	151.989	0.89	4 411	96
2019	149.687	158.312	166.938	0.92	4 863	73
2020	117.338	127.928	138.517	0.91	4 065	69
2021	133.384	145.823	158.263	0.99	3 408	76
2022	102.182	112.737	123.292	0.97	4 550	54

Sources and references

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[Download the stock assessment data and figures](#)

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