

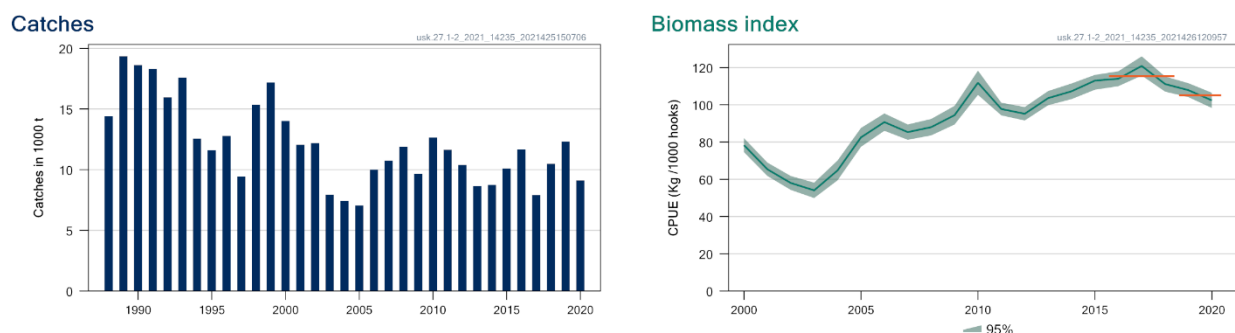
## Tusk (*Brosme brosme*) in subareas 1 and 2 (Northeast Arctic)

### ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 8076 tonnes in each of the years 2022 and 2023.

### Stock development over time

ICES cannot assess the stock and exploitation status relative to MSY and precautionary approach (PA) reference points because the reference points are undefined.



**Figure 1** Tusk in subareas 1 and 2. Summary of the stock assessment. Left: catches. Right: standardized CPUE (mean and 95% confidence interval) from the Norwegian longline fleet targeting ling for all areas combined (kg per 1000 hooks). The horizontal orange lines indicate the average of the most recent two years and the previous three years.

### Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2012). The standardized CPUE series from the Norwegian longline fleet was used as the index for the stock development. The advice is based on a comparison of the two latest index values (index A) with the three preceding values (index B), multiplied by the recent (2019 and 2020) advised catch. The index is estimated to have decreased by less than 20%; thus, the uncertainty cap was not applied in estimating the catch advice. The precautionary buffer was last applied in 2012, and has therefore been considered this year. The stock status relative to candidate reference points is unknown; therefore, the precautionary buffer was applied in the advice. Discarding is considered negligible.

**Table 1** Tusk in subareas 1 and 2. The basis for the catch scenarios.<sup>^</sup>

Index A (2019–2020)	105
Index B (2016–2018)	115
Index ratio (A/B)	0.91
Uncertainty cap	Not applied
Advised catch for 2020–2021	11 077 tonnes
Discard rate	Negligible
Precautionary buffer	Applied
Catch advice *	8 076 tonnes
% Advice change **	–27%

<sup>^</sup>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.

\* [Advised catch for 2020 and 2021] × [index ratio] × [precautionary buffer].

\*\* Advice value for 2022 and 2023 relative to advice value for 2020 and 2021.

The catch advice has decreased because of a decrease in the CPUE index, and the precautionary buffer has been applied.

## Basis of the advice

**Table 2** Tusk in subareas 1 and 2. The basis of the advice.

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

## Quality of the assessment

The advice is based on a standardized CPUE series from the Norwegian longline fleet which covers the main areas of the stock (Helle *et al.*, 2015).

The SPiCT model used as an indicator of stock status and exploitation in the previous advice was evaluated during a benchmark this year and was no longer considered appropriate (ICES, 2021a).

## 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) and therefore management measures are not taken by NEAFC unless complementary to coastal state conservation and management measures (NEAFC, 2016).

## Reference points

No reference points are defined for this stock. The SPiCT reference points presented in previous advice are no longer considered to be robust (ICES, 2021a).

## Basis of the assessment

**Table 4** Tusk in subareas 1 and 2. Basis of the assessment and advice.

ICES stock data category	3 ( <a href="#">ICES, 2021b</a> )
Assessment type	CPUE trends-based assessment (ICES, 2021c)
Input data	Total international commercial catches; and standardized CPUE from the Norwegian longline reference fleet
Discards and bycatch	Discarding is considered to be negligible
Indicators	None
Other information	None
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources ( <a href="#">WGDEEP</a> )

## History of the advice, catch, and management

**Table 5** Tusk in subareas 1 and 2. ICES advice, TACs and ICES catches (corresponding to official landings). All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	TAC EU subareas 1, 2, and 14	ICES catches subareas 1 and 2
2003	Reduce effort by 30%*	-	35	7940
2004	Biennial*	-	35	7426
2005	Effort should be reduced by 30% of 1998 effort*	-	35	7050
2006	Biennial*	-	35	9988
2007	Reduce catches to 5000 t	5000	25	10744
2008	Biennial	5000	23	11882
2009	Constrain catches to 5000 t	5000	24	9657
2010	Biennial	5000	21	12658
2011	Less than 9900 t and a reduction below recent levels (2005–2008) should be considered	< 9900	21	11646
2012	No new advice, same as 2011	< 9900	21	10394

Year	ICES advice	Catch corresponding to advice	TAC EU subareas 1, 2, and 14	ICES catches subareas 1 and 2
2013	20% reduction in catches (last three years' average)	< 9040	21	8662
2014	No new advice, same as 2013	< 9040	21	8744
2015	No new advice, same as 2013	< 9040	21	10091
2016	Precautionary approach	9492	21	11659
2017	Biennial	9492	21	7926
2018	Precautionary approach	≤ 10451	21	10487
2019	Precautionary approach (same catch advice 2018)	≤ 10451	21	12 310
2020	Precautionary approach	≤ 11077	21	9 122
2021	Precautionary approach (same catch advice 2020)	≤ 11077	**	
2022	Precautionary approach	≤ 8 076		
2023	Precautionary approach (same catch advice 2022)	≤ 8 076		

\* Advice for tusk in the Northeast Atlantic.

\*\* A TAC was not agreed at the time of publication.

### History of the catch and landings

There are no reported catches for this stock in the NEAFC regulatory area.

**Table 6** Tusk in subareas 1 and 2. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings			Discards
9 122 tonnes	Longlines 92%	Gillnets 7%	Other gear 1%	Negligible
	9 122 tonnes			

**Table 7** Tusk in subareas 1 and 2. History of official commercial catch by area and country. All weights are in tonnes.

Year	Subarea 1							Division 2.a											Division 2.b						
	Norway	Russia	Faroes	Iceland	Ireland	France	Total	Faroes	France	Germany	Greenland	Norway	E & W	Scotland	Russia	Ireland	Iceland	Total	Norway	E & W	Russia	Ireland	France	Total	Total
1988								115	32	13		14241	2					14403						0	14403
1989								75	55	10		19206	4					19350						0	19350
1990								153	63	13		18387	12					18628						0	18628
1991								38	32	6		18227	3					18306						0	18306
1992								33	21	2		15908	10					15974						0	15974
1993								-	23	2	11	17545	3					17584		1				1	17585
1994								281	14	2		12266	3					12566						0	12566
1995								77	16	3	20	11271	1					11388	229					229	11617
1996	587						587	0	12	5		12029	1					12047	161					161	12795
1997	665						665	1	21	1		8642	2					8667	92	2				94	9426
1998	805						805		9	1		14463	1	1				14475	73					73	15353
1999	907						907		7			16213		2	28			16250	26			4		30	17187
2000	738	43	1	16			798		8	1		13120	3	2	58			13192	15		3			18	14008
2001	595	6		13			614	11	15			11200	1	3	66	5		11301	141		5			146	12061
2002	791	8	n/a	0			799		3			11303	1	4	39	5		11355	30		7			37	12191
2003	571	5			5		581	6	2			7284		3	21			7316	43					43	7940
2004	620	2			1		623	12	2			6607		1	61	1		6684	114		5			119	7426
2005	562						562	29	6			6249			37	3		6324	148		16			164	7050
2006	442	4					446	33	9			9246	1		51	11		9351	168		23			191	9988
2007	355	2					357	54	7			9856	0	5	85	12		10019	350		17	1		368	10744
2008	627	7					634	52	6			10848	1	3	56	0		10966	271		11	0		282	11882
2009	869	1					870	59	3			8354		1	82			8499	249		39			288	9657
2010	725	1				1	727	39	6			11445	0	1	49			11540	334		57			391	12658
2011	941						941	59	5			10290		1	41			10405	299		20		5	324	11646
2012	1024						1024	54	7	1		8764	2		48		1	8877	453		40			493	10394
2013	692						692	24	13	3		7729		7	52		2	7830	121	3	16			140	8662
2014	766	5					771	10	9	1		7682		7	38			7747	185		41			226	8744
2015	904						904	19	5			8906			90			9021	97		69			166	10091
2016	890	2					892	61	2	1	2	10331		1	57		3	10458	165		144			309	11659
2017	1036	1					1037	14	4	2	3	6521		2	106		3	6655	153		81			234	7926
2018	555	2					557	12	2	5	1	8651		1	63		731	9466	427		37			464	10487
2019	944	1		1			946	13	3	3		10980			70		1	11070	241		53			294	12310
2020*	813	4					817	18	1	1	1	7964			92		2	8079	200		26			226	9122

\* Preliminary

## Summary of the assessment

**Table 8** Tusk in subareas 1 and 2. Summary of assessment. Standardized CPUE series from the Norwegian longline reference fleet (kg per 1000 hooks) and landings. High and low indicate 95% confidence bounds.

Year	Biomass index	High	Low	Landings (tonnes)
1988				14403
1989				19350
1990				18628
1991				18306
1992				15974
1993				17585
1994				12566
1995				11617
1996				12795
1997				9426
1998				15353
1999				17187
2000	78.32	82.09	74.55	14008
2001	65.38	68.98	61.77	12061
2002	58.02	61.77	54.27	12191
2003	54.07	58.19	49.94	7940
2004	64.77	70.12	59.43	7426
2005	82.51	87.58	77.43	7050
2006	90.71	95.37	86.04	9988
2007	85.33	89.44	81.22	10744
2008	87.99	92.41	83.57	11882
2009	94.43	99.45	89.41	9657
2010	111.85	118.36	105.33	12658
2011	97.74	101.14	94.33	11646
2012	95.19	98.80	91.58	10394
2013	103.59	107.40	99.78	8662
2014	107.26	111.47	103.06	8744
2015	112.08	116.06	108.10	10091
2016	114.00	118.01	110.00	11659
2017	120.87	126.05	115.70	7926
2018	111.15	115.24	107.07	10487
2019	107.84	111.59	104.09	12310
2020	102.38	106.48	98.28	9122

## Sources and references

Helle, K., Pennington, M., Hareide, N-R., and Fossen, I. 2015. Selecting a subset of the commercial catch data for estimating catch per unit effort series for ling (*Molva molva* L.). Fisheries Research, 165: 115–120. <https://doi.org/10.1016/j.fishres.2014.12.015>.

ICES. 2012. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM:68. 42 pp.

ICES. 2021a. Benchmark Workshop on the development of MSY advice for category 3 stocks using Surplus Production Model in Continuous Time; SPiCT (WKMSYSPICT). ICES Scientific Reports, 3:20. 316 pp. <https://doi.org/10.17895/ices.pub.7919>.

ICES. 2021b. Advice on fishing opportunities. In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. <https://doi.org/10.17895/ices.advice.7720>.

ICES. 2021c. Working Group on the Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP). ICES Scientific Reports. 3:47. 944 pp. <http://doi.org/10.17895/ices.pub.8108>.

NEAFC. 2016. The NEAFC approach to conservation and management of deep-sea species and categorization of deep-sea species/stocks. Adopted at the 35th Annual Meeting, November 2016  
[https://www.neafc.org/system/files/NEAFC\\_approach\\_to\\_DSS\\_conservation-and-management\\_Nov16.pdf](https://www.neafc.org/system/files/NEAFC_approach_to_DSS_conservation-and-management_Nov16.pdf).

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

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