ICES Advice on fishing opportunities, catch, and effort
Arctic Ocean, Barents Sea, and Norwegian Sea ecoregions
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ICES
CIEM

International Council for
the Exploration of the Sea
Conseil International pour
l'Exploration de la Mer

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 11 077 tonnes in each of the years 2020 and 2021. All catches are assumed to be landed.

Stock development over time

A standardized CPUE based on data from the Norwegian longline fleet shows a positive trend from 2003.
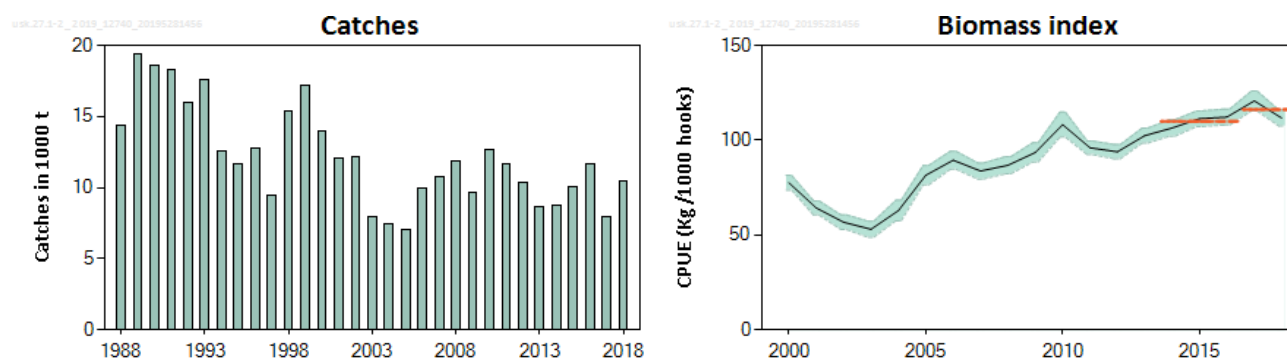

Figure 1   Tusk in subareas 1 and 2. Summary of the stock assessment. Standardized CPUE (median and 95% confidence interval) from the Norwegian longline fleet targeting ling for all areas combined (kg per 1000 hooks). Horizontal lines indicate the average CPUE index of the respective year range used to calculate the advice.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below $F_{MSY\ proxy}$, while the relative spawning stock size is above MSY $B_{trigger\ proxy}$.

Table 1   Tusk in subareas 1 and 2. State of the stock and fishery relative to reference points.

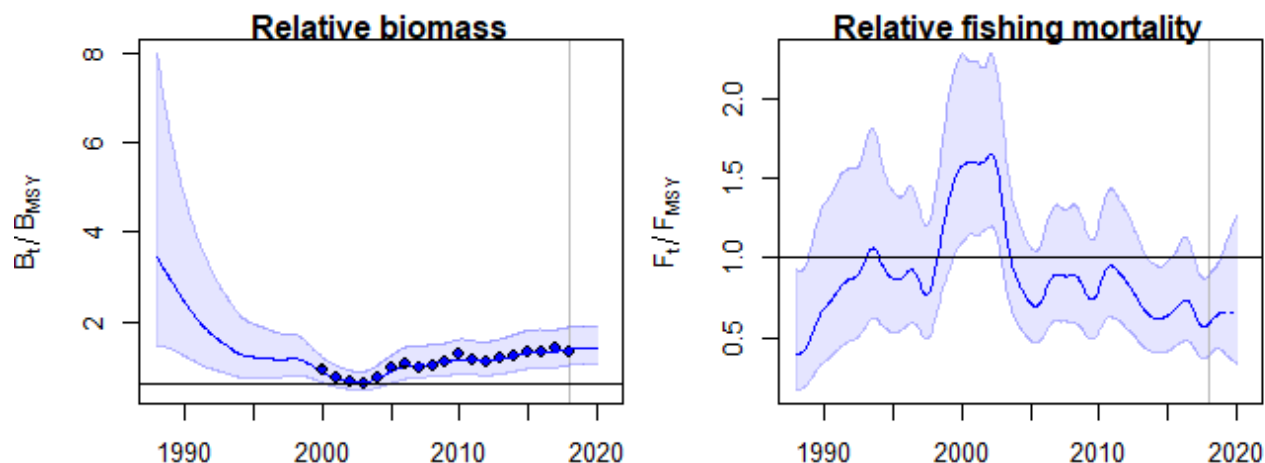|		Fishing pressure				Stock size			
		2016	2017	2018			2017	2018	2019
Maximum sustainable yield	$F_{MSY\ proxy}$	✅	✅	✅ Below	MSY $B_{trigger\ proxy}$		✅	✅	✅ Above
Precautionary approach	F_{pa}, F_{lim}	✅	✅	✅ Below possible reference points	B_{pa}, B_{lim}		✅	✅	✅ Above possible reference points
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}		—	—	— Not applicable
Qualitative evaluation	-	❓	❓	❓ Undefined	-		➡️	↗️	↘️ Decreasing

Figure 2   Tusk in subareas 1 and 2. SPiCT model results used for the evaluation of the stock and exploitation status. The horizontal lines indicate the reference points MSY $B_{trigger_{proxy}}$ and $F_{MSY_{proxy}}$.

Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The standardized CPUE series from the Norwegian longline fleet was used as 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 (2018 and 2019) advised catch. The index is estimated to have increased by less than 20%; thus, the uncertainty cap was not applied in estimating the catch advice.

The relative fishing mortality is below, and the relative stock size above proxies of the MSY reference points; therefore, no additional precautionary buffer was applied.

Discarding is considered negligible.

Table 2   Tusk in subareas 1 and 2. The basis for the catch scenarios.

Index A (2017–2018)		116
Index B (2014–2016)		110
Index ratio (A/B)		1.06
Uncertainty cap	Not applied	-
Advised catch for 2018–2019		10 451 tonnes
Precautionary buffer	Not applied	-
Catch advice *		11 077 tonnes
% Advice change **		6%

* [advised catch for 2018 and 2019] × [index ratio]. 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.
** Advice value for 2020 and 2021 relative to advice value for 2018 and 2019.

The catch advice has increased because of an increase in the index ratio.

Basis of the advice

Table 3   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).

Issues relevant for the advice [†]

This stock is classified as Category 4 in the [NEAFC categorization of deep-sea species/stocks](#) which 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.

Reference points

Table 4   Tusk in subareas 1 and 2. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach*	MSY $B_{trigger_{proxy}}$	$\frac{B}{B_{MSY}} = 0.5$	Relative value from SPiCT model. B_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2019)
	$F_{MSY_{proxy}}$	$\frac{F}{F_{MSY}} = 1$	Relative value from SPiCT model. F_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2019)
Precautionary approach	B_{lim}			
	B_{pa}			
	F_{lim}			
	F_{pa}			
Management plan	SSB_{mgt}			
	F_{mgt}			

* No reference points are defined for this stock in terms of absolute values. The SPiCT-estimated values of the ratios F/F_{MSY} and B/B_{MSY} are used to estimate stock status relative to the proxy MSY reference points.

Basis of the assessment

Table 5   Tusk in subareas 1 and 2. Basis of the assessment and advice.

ICES stock data category	3 ([ICES, 2018](#)).
Assessment type	CPUE trends-based assessment (ICES, 2019).
Input data	Catch and CPUE from relevant fleets.
Discards and bycatch	Discarding is considered to be negligible.
Indicators	SPiCT model.
Other information	None.
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources ([WGDEEP](#))

Information from stakeholders

There is no additional available information.

[†] Version 2: NEAFC categorisation of deep-sea stocks added to section.

History of the advice, catch, and management

Table 6   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
2013	20% reduction in catches (last 3 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	
2020	Precautionary approach	≤ 11077		
2021	Precautionary approach (same catch advice 2020)	≤ 11077		

* Advice for tusk in the Northeast Atlantic.

History of the catch and landings

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

Table 7   Tusk in subareas 1 and 2. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Landings			Discards
10487 tonnes	Longlines 89%	Gillnets 9%	Other gear 2%	Discarding is negligible
	10487 tonnes			

Table 8 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						Total
	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	
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

Summary of the assessment

Table 9 Tusk in subareas 1 and 2. Summary of assessment. Standardized CPUE series from the Norwegian longline 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				17183
2000	77.55	81.44	73.66	14008
2001	64.27	68.02	60.52	12061
2002	56.73	60.62	52.84	12191
2003	53.01	57.25	48.77	7940
2004	62.87	68.26	57.47	7426
2005	81.5	86.65	76.36	7050
2006	89.44	94.19	84.68	9988
2007	83.72	87.96	79.49	10744
2008	86.74	91.26	82.22	11882
2009	93.49	98.58	88.39	9657
2010	108.18	114.78	101.58	12658
2011	95.97	99.56	92.38	11646
2012	93.88	97.66	90.1	10394
2013	102.38	106.34	98.42	8662
2014	106.43	110.78	102.08	8744
2015	111.32	115.45	107.18	10091
2016	112.18	116.38	107.98	11659
2017	120.71	125.98	115.44	7926
2018	111.66	115.88	107.43	10487

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.

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