ICES Advice on fishing opportunities, catch, and effort
Bay of Biscay and the Iberian Coast, Celtic Seas, Faroes,
Icelandic Waters, Greater North Sea, and Oceanic Northeast Atlantic Ecoregions
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Tusk (*Brosme brosme*) in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b (Northeast Atlantic)

ICES stock advice

ICES advises that when the precautionary approach is applied, catches should be no more than 8984 tonnes in each of the years 2018 and 2019. Discarding is considered to be negligible.

Stock development over time

Catches in all subareas were stable from 2002 to 2012, lower the last four years. The Norwegian longline cpue series, based on catches when tusk is targeted, shows a positive trend since 2004.
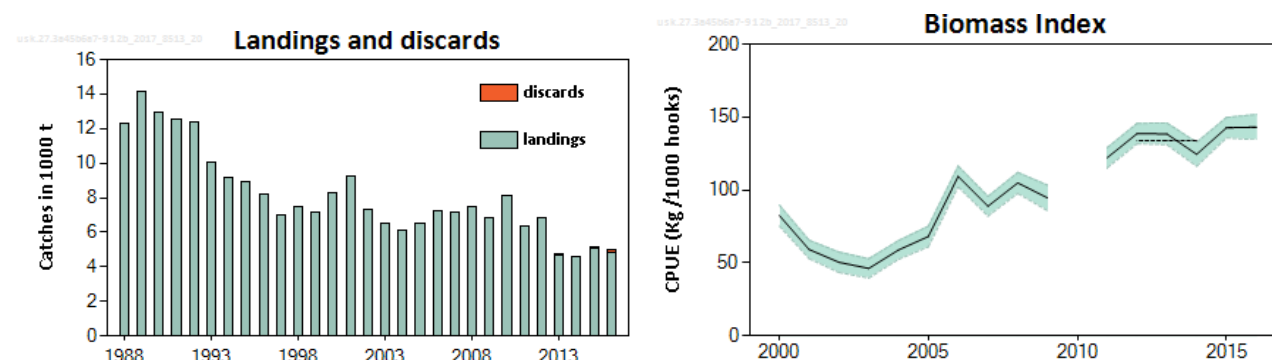

Figure 1   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Summary of the stock assessment. Landings and discards (in thousand tonnes). Cpue (kg per 1000 hooks) from the Norwegian longline fleet (median and 95% confidence interval). The dashed horizontal lines indicate the average stock size index of the respective year range used to calculate the advice.

Stock and exploitation status

Table 1   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. State of the stock and fishery relative to reference points. The status evaluation is based on the reference point proxy for F_{MSY}, using the SPiCT model (ICES, 2017).

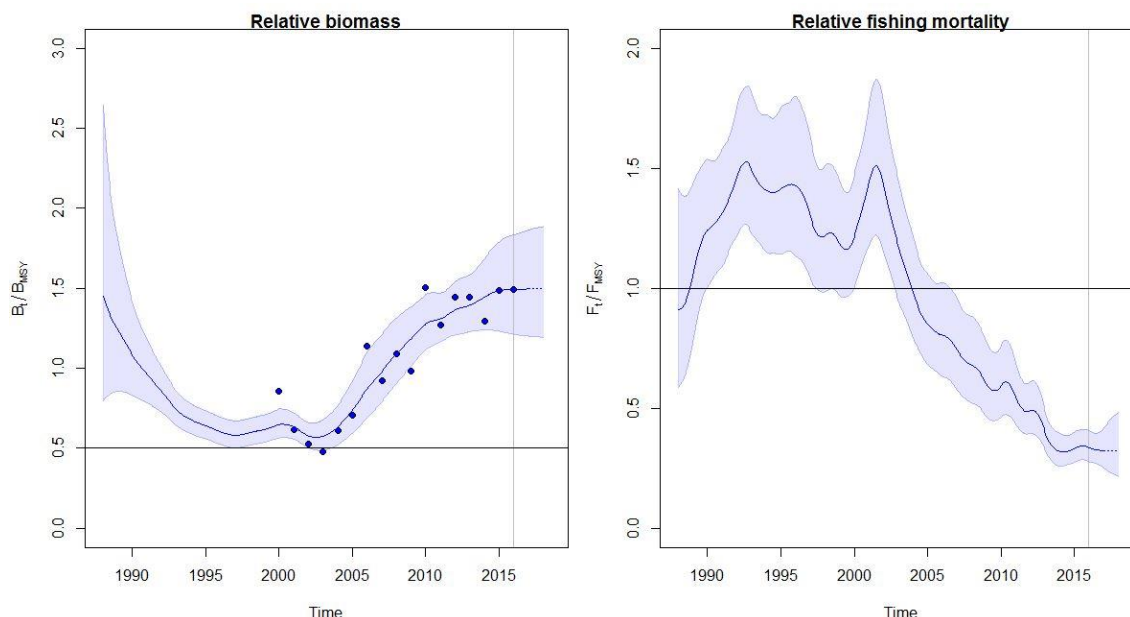|		Fishing pressure				Stock size		
		2014	2015	2016		2014	2015	2016
Maximum sustainable yield	F_{MSY} proxy	✅	✅	✅ Below	MSY $B_{trigger}$ proxy	✅	✅	✅ Above
Precautionary approach	F_{pa}, F_{lim}	✅	✅	✅ Harvested sustainably	B_{pa}, B_{lim}	✅	✅	✅ Full reproductive capacity
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}	—	—	— Not applicable
Qualitative evaluation	-	—	—	— Not applicable	-	—	—	— Not applicable

Figure 1 Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. SPiCT model results used for the evaluation of the stock and exploitation status.

Catch options

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 (2016–2017) 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. Discarding is considered negligible (< 5%). The fishing mortality is below and the stock size above proxies of the MSY reference points; therefore, no additional precautionary buffer was applied.

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

Index A (2015–2016)		143
Index B (2012–2014)		134
Index ratio (A/B)		1.07
Uncertainty cap	Not applied	
Advised catch for (2016–2017)		8415 tonnes
Discard rate		Negligible
Precautionary buffer	Not applied	-
Catch advice*		8984 tonnes

* [advised catch (2016–2017)] × [index ratio].

Note: 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.

Basis of the advice

Table 3 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	Precautionary approach.
Management plan	ICES is not aware of any agreed precautionary management plan for 2017 in this area.

Quality of the assessment

The advice is based on a combined standardized cpue series from the Norwegian longline fishery which covers the main areas of the stock (Helle *et al.*, 2015). Cpue series from the three main areas (Figures 2 and 3) show similar trends.
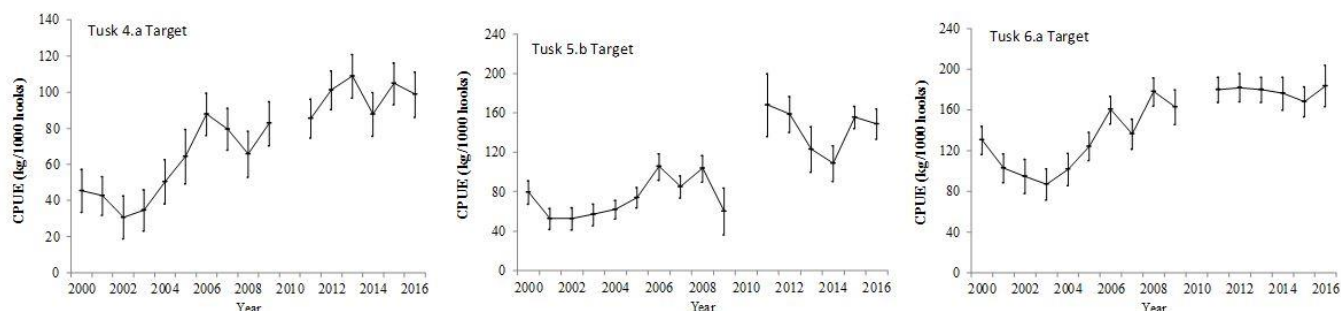

Figure 2   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 7.b. A standardized cpue series for tusk for the period 2000–2016, based on data when tusk appeared to be targeted (>30% of total catch) by area. The bars denote the 95% confidence intervals.
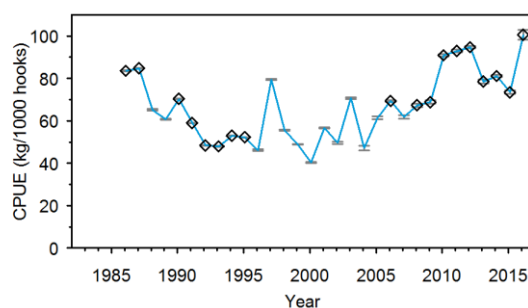

Figure 3   Tusk in Division 5.b. Standardized cpue for longliners (< 110 GRT) fishing in Faroese waters. The points show where more than 100 longline sets are used to calculate the cpue.

Issues relevant for the advice

There is no information to present for this stock.

Reference points

Table 4   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. 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 (2017)
	$F_{MSY_{proxy}}$	$\frac{F}{F_{MSY}} = 1$ *	Relative value from SPiCT model. F_{MSY} is estimated directly from the SPiCT assessment model and changes when the assessment is updated.	ICES (2017)
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 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Basis of assessment and advice.

ICES stock data category	3 (ICES, 2016).
Assessment type	Cpue trends-based assessment (ICES, 2017).
Input data	Total catches and cpue data from the Norwegian longline fishery.
Discards and bycatch	Discarding is considered 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 available information.

History of the advice, catch, and management

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

Year	ICES advice	Predicted catch corresp. 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	-	6510	
2004	Biennial*		-	40	370	710	-	6140	
2005	Effort should be reduced by 30% of 1998 effort*		-	40	317	604	-	6700	
2006	Biennial*		-	40	317	604	-	7260	
2007	Constrain catches to 5 000 t**	5000	28	231	170	435	3350	7119
2008	Biennial**	5000	28	231	170	435	3350	7466
2009	Constrain catches to 5 000 t	5000	28	231	170		3785	6849
2010	Biennial	5000	24	196	0	283	2938	8136
2011	Less than 6 900 t, and a reduction from recent levels catches should be considered	6900	24	196			283	2938	6361
2012	No new advice, same as 2011	6900	24	196	0	294	2923	6848
2013	No more than a 20% increase in catches	8500	24	235	170	353	2923	4673
2014	No new advice, same as 2013	8500	29	235	170	535	2923	4585
2015	No new advice, same as 2013	8500	29	235	170	937	2923	5155
2016	Precautionary	8415	29	235	170	937	2923	4820
2017	Biennial	8415	29	235	170	937	2923	
2018	Precautionary approach	≤ 8984						
2019	Precautionary (same catch value as in 2018)	≤ 8984						

* Advice for tusk in the Northeast Atlantic.
** Advice for this stock included the Mid-Atlantic Ridge and Division 7.b (Rockall).

History of the catch and landings

There are no reported catches in the NEAFC regulatory area.

Table 7   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Catch distribution by fleet in 2016 as estimated by ICES.

Catch (2016)	Landings			Discards
4973 tonnes	Longliners 90%	Trawlers 5%	Gillnet 5%	153 tonnes
	4820 tonnes			

Table 8   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	4429		4059	1606	2120		17	5	1	12298
1989	93	6418	4	3722	1400	2297	2	108	86		14130
1990	60	4254	5	5202	979	2256	4	155	33		12948
1991	84	4537	2	5170	1096	1543	2	52	14		12500
1992	85	4932	12	4399	992	1682	3	218	47		12370
1993	79	5141	14	2862	577	1223		120	32		10048
1994	51	3375	7	3407	909	1262		94	31		9136
1995	42	3348	15	3347	631	1435	1	48	37		8904
1996	44	3369	33	2728	582	1391		58	29		8234
1997	31	2272	38	2742	577	1261	1	75	19		7016
1998	21	3387	66	2073	637	1281	1	33	10	1	7510
1999	29	2435	34	3517	447	539		147	8	0	7156
2000	36	3260	116	2367	333	2011		164	13		8300
2001	57	3095	11	3526	469	1767	1	263	14		9203
2002	50	2961	71	2722	281	1124		66	5		7280
2003	51	1997	8	2733	559	1128		21	3		6500
2004	45	1666	23	3536	107	726		21	1		6125
2005	44	1826	7	3272	360	1019		23	2		6553
2006	29	2159	32	3560	317	1059		90	3		7249
2007	21	2180	15	3468	344	1077		13	1		7119
2008	46	2139	71	3798	61	1347		4	0		7466
2009	19	2268	17	3135	164	1242		4	0		6849
2010	21	1861	15	4889	127	1216		3	0	4	8136
2011	17	1623	96	3287	0	1337		5	0	0	6361
2012	20	1749	47	3793	0	1174		63	2		6848
2013	22	1510	31	1500	12	1594		4	0		4673
2014	9	1463	11	2310	129	662		1			4585
2015	9	1530	18	2081	324	1193		0			5155
2016	14	1650	9	2261	42	844		0			4820

Summary of the assessment

Table 9   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Assessment summary. Combined area standardized cpue series from the Norwegian longline fishery (kg per 1000 hooks).

Year	Cpue	Cpue 97.5 percentile	Cpue 2.5 percentile
2000	82.44	89.62	75.26
2001	59.15	65.45	52.86
2002	50.36	57.36	43.35
2003	46.16	52.78	39.54
2004	58.85	65.31	52.38
2005	68.04	75.14	60.95
2006	109.3	116.4	102.1
2007	88.8	95.58	82.03
2008	104.8	112	97.62
2009	94.46	103.2	85.73
2010*	-	--	-
2011	122.1	129	115.2
2012	138.6	145.6	131.6
2013	138.4	145.9	131
2014	124.4	132.7	116.2
2015	142.6	149.7	135.6
2016	143.1	151.7	134.4

* There was no survey in 2010

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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