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 advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 8627 tonnes in each of the years 2020 and 2021.

Stock development over time

Catches have generally declined in all subareas. The Norwegian longline CPUE series, based on catches when tusk is targeted, shows a positive trend from 2004 to 2011 and has been stable since.
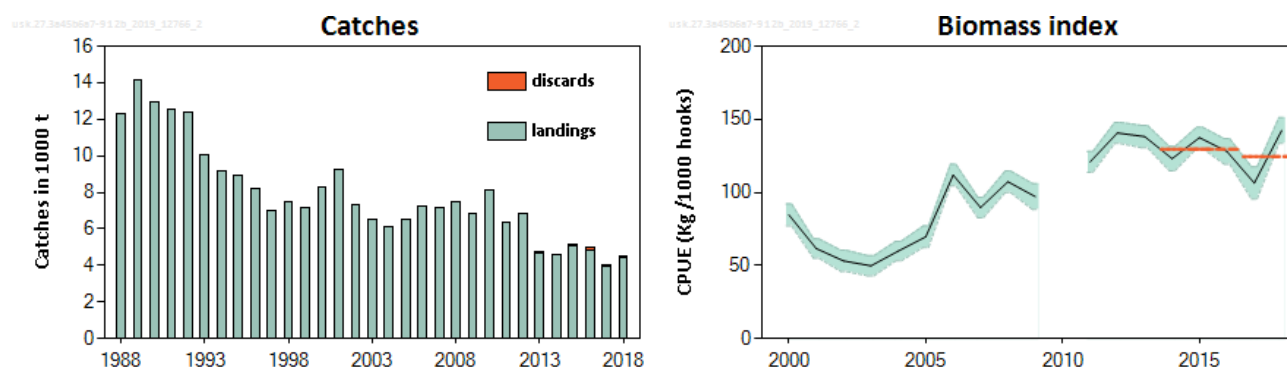

Figure 1   Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Summary of the stock assessment. Landings and discards (in thousand tonnes), discard data are only available from 2013 on. CPUE (kg per 1000 hooks) from the Norwegian longline fleet (median and 95% confidence interval). The dashed horizontal lines indicate the average stock size index of the respective year range used to calculate the advice.

Stock and exploitation status

ICES assesses the relative fishing pressure on the stock to be below $F_{MSY\ proxy}$ and the relative spawning stock size to be above MSY $B_{trigger\ proxy}$ (Figure 2).

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 proxies for F_{MSY} and MSY $B_{trigger}$, using the SPiCT model (ICES, 2019).

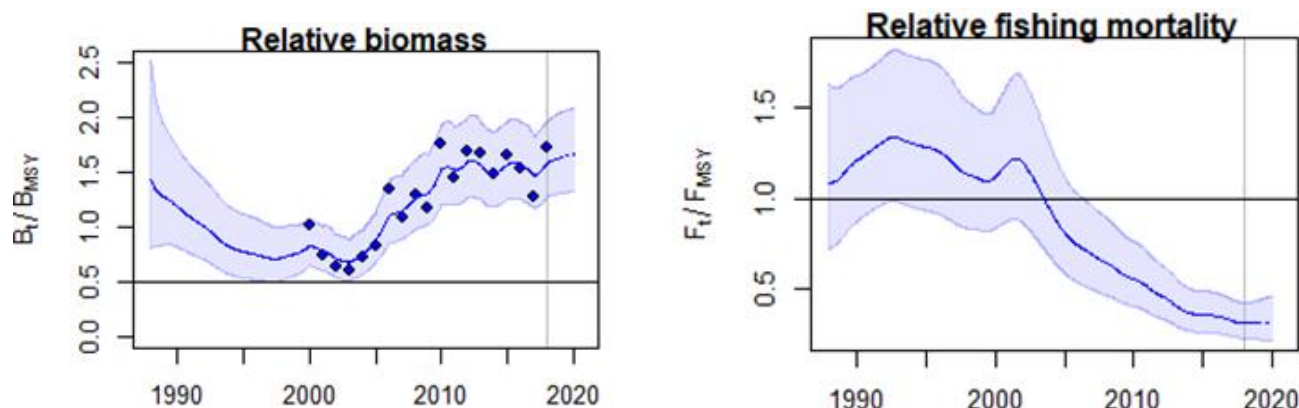|		Fishing pressure				Stock size			
		2016	2017	2018			2016	2017	2018
Maximum sustainable yield	F_{MSY} proxy	✓	✓	✓ Below	MSY $B_{trigger}$ proxy		✓	✓	✓ Above
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Below possible reference points	B_{pa}, B_{lim}		✓	✓	✓ Above possible reference points
Management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

Figure 2 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. 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 (2018–2019) 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 (< 5%).

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 scenarios.

Index A (2017–2018)		124
Index B (2014–2016)		130
Index ratio (A/B)		0.96
Uncertainty cap	Not applied	-
Advised catch for (2018–2019)		8 984 tonnes
Discard rate		Negligible
Precautionary buffer	Not applied	-
Catch advice *		8 627 tonnes
% Advice change **		-4%

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

The catch advice has decreased because of a decrease in the index ratio.

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 tusk in this area.

Quality of the assessment

Within the standardized CPUE series from the Norwegian longline fishery there are consistent trends within the main areas of the stock (subareas 4.a, 5.b, and 6.a). This is further corroborated by the CPUE trends observed for Faroese longliners (ICES 2019).

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 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 the 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 the 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 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, 2018).
Assessment type	CPUE trends-based assessment (ICES, 2019).
Input data	Total catches and CPUE data from the Norwegian longline fishery.
Discards and bycatch	Discarding is considered negligible.
Indicators	SPiCT model.
Other information	Faroese longline CPUE series.
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP)

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

Information from stakeholders

There is no additional 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, 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	-	6510	6500
2004	Biennial*	-	40	370	710	-	6140	6125
2005	Effort should be reduced by 30% of 1998 effort*	-	40	317	604	-	6700	6553
2006	Biennial*	-	40	317	604	-	7260	7249
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		3350	6849
2010	Biennial	5000	24	196	170	283	2923	8132
2011	Less than 6 900 t, and a reduction from recent levels catches should be considered	6900	24	196	170	283	2938	6365
2012	No new advice, same as 2011	6900	24	196	170	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	3916
2018	Precautionary approach	≤ 8984	31	251	170	1207	2923	4411
2019	Precautionary (same catch value as in 2018)	≤ 8984	31	251	170	1207	2923	
2020	Precautionary approach	≤ 8627						
2021	Precautionary approach (same catch value as in 2020)	≤ 8627						

* Advice for tusk in the Northeast Atlantic.

** Advice for this stock included the Mid-Atlantic Ridge and Division 6.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 2018 as estimated by ICES.

Catch (2018)	Landings				Discards
4507 tonnes	Longline 84%	Trawl 13%	Gillnet 2%	Others 1%	96 tonnes
	4411 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
2017	10	1206	18	2035	135	511		1			3916
2018	8	1439	17	1983	21	940		3			4411

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). High and low refer to the 95% confidence bounds.

Year	Biomass index	High	Low	Landings	Discards
				tonnes	
1988				12298	
1989				14130	
1990				12948	
1991				12500	
1992				12370	
1993				10048	
1994				9136	
1995				8904	
1996				8234	
1997				7016	
1998				7510	
1999				7156	
2000	84.59	92.054	77.125	8300	
2001	61.575	68.201	54.948	9248	
2002	53.133	60.396	45.87	7280	
2003	49.757	56.645	42.869	6500	
2004	59.882	66.622	53.142	6125	
2005	69.642	76.981	62.303	6553	
2006	111.847	119.205	104.489	7249	
2007	89.658	96.724	82.592	7119	
2008	107.264	114.626	99.902	7466	
2009	97.119	105.994	88.244	6849	
2010*				8136	
2011	120.83	127.966	113.695	6361	
2012	140.674	147.871	133.478	6848	
2013	138.125	145.813	130.437	4673	52
2014	123.089	131.411	114.766	4585	0
2015	137.427	144.685	130.169	5155	18
2016	128.035	136.737	119.333	4820	153
2017	106.392	117.414	95.371	3916	143
2018	142.344	151.157	133.532	4411	96

* There was no survey in 2010.

Sources and references

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