

ECOREGION Widely distributed and migratory stocks
STOCK Tusk (*Brosme brosme*) in Division Va and Subarea XIV

Advice summary for 2015

ICES advises on the basis of the MSY approach that catches should be no more than 3950 t. All catches are assumed to be landed.

Stock status

Fishing pressure			
	2011	2012	2013
MSY (F_{MSY})	✗	✗	✗ Above target
Precautionary approach (F_{pa}, F_{lim})	?	?	?
Stock size			
	2012	2013	2014
MSY ($B_{trigger}$)	?	?	?
Precautionary approach (B_{pa}, B_{lim})	?	?	?
Qualitative evaluation	✓	✓	✓ Above poss. reference points

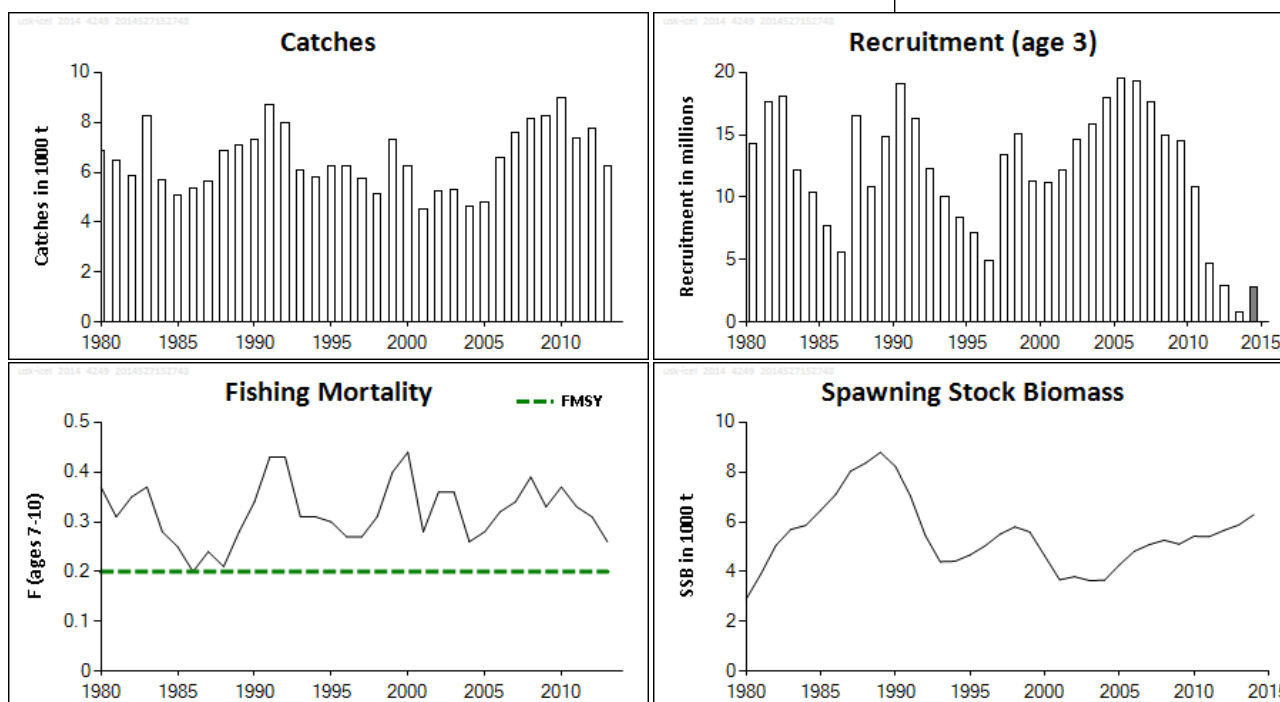
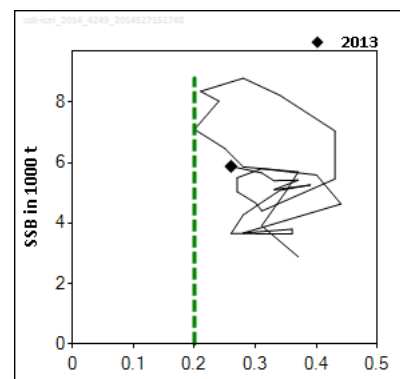


Figure 9.3.29.2.1 Tusk in Division Va and Subarea XIV. Summary of stock assessment (weights in thousand tonnes). Top right: SSB and F over the years. Predicted values are shaded.

Recruitment peaked in 2004 to 2006 but has since declined to a historical low level in 2013. Fishing mortality has declined in recent years and is above the current F_{MSY} estimate. SSB has been increasing in recent years and is likely above candidate MSY $B_{trigger}$.

Management plans

No specific management objectives are known to ICES.

Biology

See Section 9.3.29 for details on biology.

The fisheries

Tusk is largely (98%) caught in a mixed fishery by longline fisheries in Division Va. Tusk is caught both in shelf areas and on the continental slope. In Subarea XIV tusk is caught as a bycatch species in small quantities.

Catch distribution Total catches (2013) were 6283 t (98% longline). Discards are considered negligible.

Quality considerations

Landings in Subarea XIV are not included in the analytical assessment. Since landings from this subarea have been on average less than 1% of the total, the exclusion does not alter the perception of the state of tusk in Division Va. In recent years older otoliths have been aged (2003 to 2010), which moves the recruitment estimates considerably back in time. Fishing mortality is now defined for ages 7 to 10 as these are the main age groups in the fishery, rather than age groups 13 to 16 previously.

Scientific basis

Stock data category	1 (ICES, 2014a).
Assessment type	Analytical length-based assessment (Gadget model).
Input data	March Icelandic groundfish survey and landings in Division Va.
Discards and bycatch	All catches are assumed to be landed.
Indicators	None.
Other information	This stock was benchmarked in 2010 (WKDEEP 2010; ICES, 2010).
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP).

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Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY approach	MSY B_{trigger}	Not defined.	
	F_{MSY}	0.2	Based on stochastic simulations.
Precautionary approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

(Last changed in 2014)

Yield and spawning biomass per Recruit F-reference points:

	Fish Mort Ages 7–10
F_{max}	0.24
$F_{0.1}$	0.15

Outlook for 2015

Basis: F (2014) = TAC constraint (6.3 for the fishing year) = 0.29; SSB (2014) = 6.3; Recruitment (age 3), 2015–2016 = mean for 2012–2014, SSB (2015) = 6.2; catches (2014) = 6.5.

Rationale	Catches (2015)	Basis	F (2015)	SSB (2016)	%SSB change ¹⁾	% TAC change ²⁾
ICES MSY framework	3.950	F_{MSY}	0.20	6.7	8%	–36%
Zero catch	0	Zero catch	0	9.9	40%	–100%

Weights in thousand tonnes.

¹⁾ SSB 2016 relative to SSB 2015.²⁾ Catches 2015 relative to TAC 2014.**MSY approach**

Following the ICES MSY approach implies fishing mortality to be reduced to 0.20. This implies catches of no more than 3950 t in 2015 and a stable spawning-stock biomass in the short term.

Additional considerations*Management considerations*

The overshoot in the set TAC for ling for the Icelandic fleet is a result of the allowance, albeit limited, for exchanging the quota (individual transfer quota, ITQ) of one species for another. The allowance has the objective of limiting discarding and misreporting.

Information from commercial catch data and surveys indicate that tusk in Division Va and Subarea XIV is at present in a good state. This is confirmed in the Gadget model assessment. However, the drop in recruitment since 2005–2006 will result in a decline in fishable biomass and sustainable catches in the coming years.

Closures of known spawning areas and areas of high juvenile abundance should be maintained.

Comparison of the basis of previous assessment and advice

The basis for the assessment has not changed from last year.

Last year's advice (2012) was based on $F_{\text{MAX}} = 0.24$. This year's advice is based on an estimate of $F_{\text{MSY}} = 0.20$.

Sources

- ICES. 2010. Report of the Benchmark Workshop on Deep-water Species (WKDEEP), 17–24 February 2010, Copenhagen, Denmark. ICES CM 2010/ACOM:38. 247 pp.
- ICES. 2014a. Advice basis. *In* Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 1, Section 1.2.
- ICES. 2014b. Report of the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP), 4–11 April 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:17.

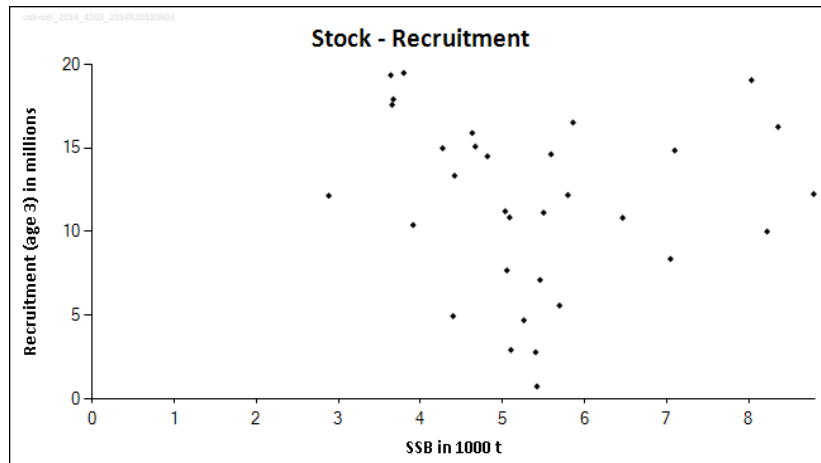


Figure 9.3.29.2.2 Tusk in Division Va and Subarea XIV. Stock–recruitment plot.

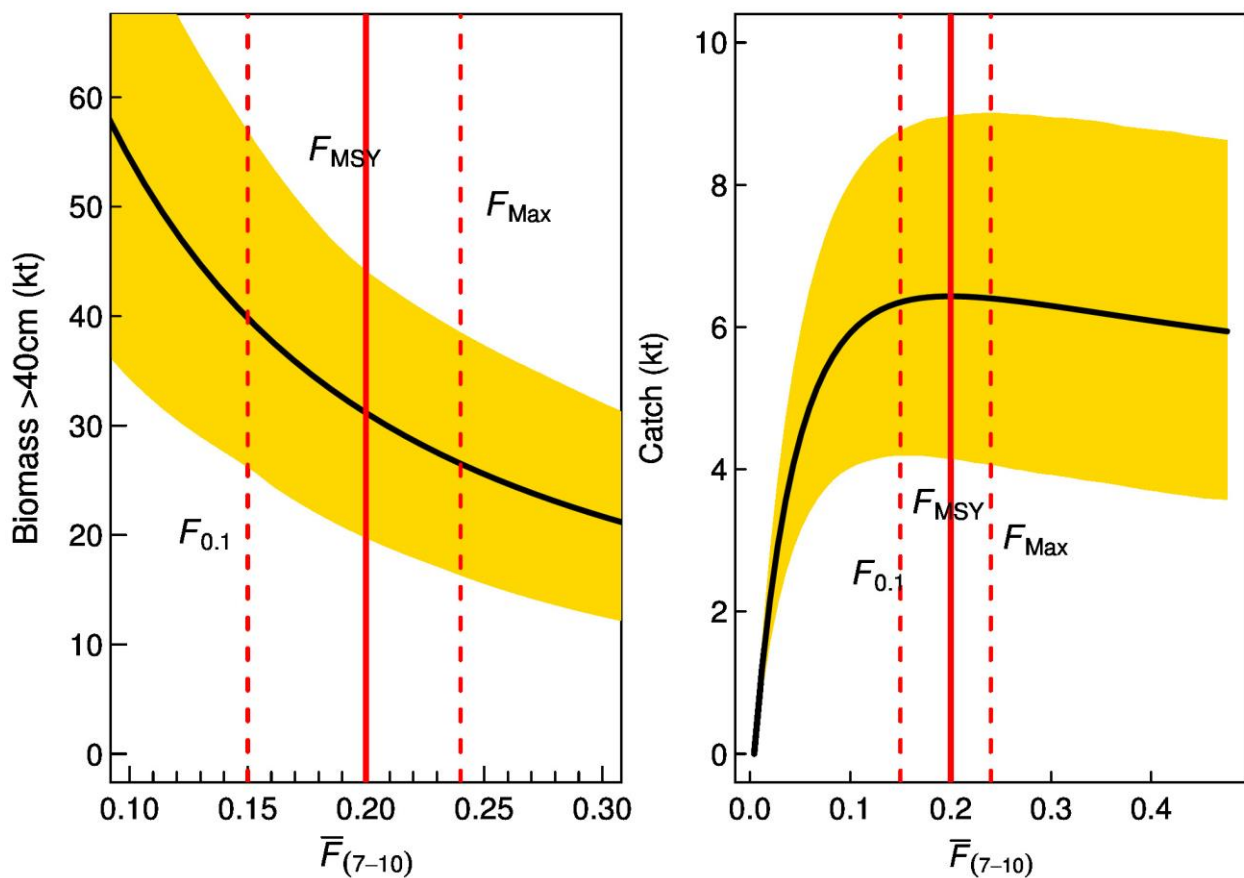


Figure 9.3.29.2.3 Tusk in Division Va and Subarea XIV. Estimates of F reference points from stochastic simulations.

Table 9.3.29.2.1 Tusk in Division Va and Subarea XIV. ICES advice, management, and landings.

Year ¹	ICES Advice ¹	Predicted catch corresp. to advice ²	ICES landings ²	TAC Icelandic Division Va ³	ICES landings Division Va ³
2004/05	⁴		4.9	3.5	4.9
2005/06	⁴		5.1	3.5	5.9
2006/07	⁴		6.7	5.0	7.9
2007/08	⁴		7.6	5.5	7.6
2008/09	Constrain catches to 5000 t	< 5.0	8.2	5.5	8.2
2009/10	Biennial	< 5.0	8.3	5.5	8.4
2010/11	Fishing at $F_{0.1}$	< 6.0	9.0	6.0	7.8
2011/12	Biennial	< 6.0	7.4	7.0	7.4
2012/13	Fishing at F_{MSY} (F_{MAX})	< 6.7	7.8	6.4	6.8
2013/14	No new advice, same as 2013	< 6.7	6.3	5.9	
2014/15	Fishing at F_{MSY}	< 3.95			

Weights in thousand tonnes.

¹ National fishing year ending 31 August.

² Calendar year (refers to first year in fishing year).

³ National fishing year.

⁴ Advice for tusk in Northeast Atlantic, not split in several assessment units (see Table 9.3.29.1).

Table 9.3.29.2.2 Tusk in Division Va. Total international catches (tonnes) by country.

Year	Faroe	Denmark	Germany	Iceland	Norway	UK	Total
1973	3363	0	576	2366	911	391	7607
1974	3172	0	375	1857	893	230	6527
1975	2445	0	384	1673	975	254	5731
1976	2397	0	334	2935	1352	94	7112
1977	2818	0	212	3122	1796	0	7948
1978	2168	0	0	3352	812	0	6332
1979	2050	0	0	3558	845	0	6453
1980	2873	0	0	3089	928	0	6890
1981	2624	0	0	2827	1025	0	6476
1982	2410	0	0	2804	666	0	5880
1983	4046	0	0	3469	772	0	8287
1984	2008	0	0	3430	254	0	5692
1985	1885	0	0	3068	111	0	5064
1986	2811	0	0	2549	21	0	5381
1987	2638	0	0	2984	19	0	5641
1988	3757	0	0	3078	20	0	6855
1989	3908	0	0	3131	10	0	7049
1990	2475	0	0	4813	0	0	7288
1991	2286	0	0	6439	0	0	8725
1992	1567	0	0	6437	0	0	8004
1993	1329	0	0	4746	0	0	6075
1994	1212	0	0	4612	0	0	5824
1995	979	0	1	5245	0	0	6225
1996	872	0	1	5226	3	0	6102
1997	575	0	0	4819	0	0	5394
1998	1052	0	1	4118	0	0	5171
1999	1035	0	2	5794	391	2	7224
2000	1154	0	0	4714	374	2	6244
2001	1125	0	1	3392	285	5	4808
2002	1269	0	0	3840	372	2	5483
2003	1163	0	1	4028	373	2	5567
2004	1478	0	1	3126	214	2	4821
2005	1157	0	3	3539	303	41	5043
2006	1239	0	2	5054	299	2	6596
2007	1250	0	0	5984	300	1	7535
2008	959	0	0	6932	284	0	8175
2009	997	0	0	6955	300	0	8252
2010	1794	0	0	6919	263	0	8976
2011	1347	0	0	5845	198	0	7390
2012	1203	0	0	6341	217	0	7761
2013*	1092	0.12	0	4973	192	0	6257

* Preliminary.

Table 9.3.29.2.3 Tusk in Subarea XIV. Total international catches (tonnes) by country.

Year	Faroe	Denmark	Greenland	Germany	Iceland	Norway	Russia*	Spain	UK	Total
1973	16	0	0	9	0	0	0	0	2	27
1974	259	0	0	2	15	0	0	0	1	277
1975	29	0	0	17	13	138	0	0	0	197
1976	0	0	0	5	89	47	0	0	1	142
1977	167	0	0	16	0	40	0	0	1	224
1978	0	0	0	47	0	38	0	0	0	85
1979	0	0	0	27	0	0	0	0	0	27
1980	0	0	0	13	0	0	0	0	0	13
1981	110	0	0	10	0	0	0	0	0	120
1982	0	0	0	10	0	0	0	0	0	10
1983	74	0	0	11	0	0	0	0	0	85
1984	0	0	0	5	0	58	0	0	0	63
1985	0	0	0	4	0	0	0	0	0	4
1986	33	0	0	2	0	0	0	0	0	35
1987	13	0	0	2	0	0	0	0	0	15
1988	19	0	0	2	0	0	0	0	0	21
1989	13	0	0	1	0	0	0	0	0	14
1990	0	0	0	2	0	7	0	0	0	9
1991	0	0	0	2	0	68	0	0	1	71
1992	0	0	0	0	3	120	0	0	0	123
1993	0	0	0	0	1	39	0	0	0	40
1994	0	0	0	0	0	16	0	0	0	16
1995	0	0	0	0	0	30	0	0	0	30
1996	0	0	0	0	0	157	0	0	0	157
1997	0	0	0	0	10	9	0	0	0	19
1998	0	0	0	0	0	12	0	0	0	12
1999	0	0	0	0	0	8	0	0	0	8
2000	0	0	0	0	11	11	0	3	0	25
2001	3	0	0	0	20	69	0	0	0	92
2002	4	0	0	0	86	30	0	0	0	120
2003	0	0	0	0	2	88	0	0	0	90
2004	0	0	0	0	0	40	0	0	0	40
2005	7	0	0	0	0	41	8	0	0	56
2006	3	0	0	0	0	19	51	0	0	73
2007	0	0	0	0	0	40	6	0	0	46
2008	0	0	33	0	0	7	0	0	0	40
2009	12	0	15	0	0	5	11	0	0	43
2010	7	0	0	0	0	5	0	0	0	12
2011	20	0	0	0	131	24	0	0	0	175
2012	33	0	0	0	174	46	0	0	0	253
2013	1.9	0.3	0	0	0	23.8	0	0	0	26
**										

* Russian catches were taken in Subdivision XIVb₁ (Mid-Atlantic Ridge).

** Preliminary.

Table 9.3.29.2.4 Tusk in Division Va and Subarea XIV. Summary of the assessment. Estimates of biomass, harvestable biomass, spawning-stock biomass (SSB) in thousands of tonnes, and recruitment (millions) and fishing mortality, from Gadget. Projections for 2014 are shown in italics.

Year	Recruitment	Biomass	Harvestable	SSB	Catches	Mean F
	Age 3		biomass			Ages 7–10
	thousands			tonnes	tonnes	
1980	14341	32.426	13.207	2884	6890	0.37
1981	17591	31.595	15.439	3912	6476	0.31
1982	18135	31.574	16.321	5055	5880	0.35
1983	12157	30.503	16.304	5695	8287	0.37
1984	10401	29.243	15.274	5860	5692	0.28
1985	7688	29.669	15.505	6465	5065	0.25
1986	5585	30.164	16.900	7100	5381	0.20
1987	16533	31.041	19.212	8036	5645	0.24
1988	10829	30.461	19.318	8360	6865	0.21
1989	14864	30.988	19.037	8794	7077	0.28
1990	19070	30.301	16.685	8225	7292	0.34
1991	16275	29.199	14.146	7048	8733	0.43
1992	12255	27.485	11.760	5458	8010	0.43
1993	10013	26.312	10.572	4398	6059	0.31
1994	8369	26.817	11.900	4416	5828	0.31
1995	7115	26.353	13.499	4670	6231	0.30
1996	4952	25.455	14.496	5035	6241	0.27
1997	13352	24.911	14.926	5501	5759	0.27
1998	15099	24.373	14.498	5798	5146	0.31
1999	11225	23.533	12.912	5593	7290	0.40
2000	11142	22.087	10.166	4632	6240	0.44
2001	12196	21.269	8.308	3670	4526	0.28
2002	14631	23.238	9.607	3797	5249	0.36
2003	15907	24.030	10.101	3639	5315	0.36
2004	17924	25.257	10.364	3655	4655	0.26
2005	19500	28.383	11.826	4272	4820	0.28
2006	19366	31.115	13.036	4817	6602	0.32
2007	17593	32.802	13.732	5087	7594	0.34
2008	14996	33.917	14.442	5261	8175	0.39
2009	14515	33.221	14.430	5104	8253	0.33
2010	10855	33.099	15.696	5420	8986	0.37
2011	4702	30.874	15.786	5404	7391	0.33
2012	2924	28.541	16.225	5660	7762	0.31
2013	742	25.481	16.242	5877	6258	0.26
2014	2788	22.773	16.470	6288		
Average	12161	28.242	14.238	5454	6520	0.319