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

Advice summary for 2013 and 2014

ICES advises that, based on the MSY approach, catches should be no more than 6700 t.

Stock status

F (Fishing Mortality)		
	2011	
MSY (F_{MSY})	✓	Close to target
Precautionary approach (F_{pa},F_{lim})	?	Unknown

SSB (Spawning Stock Biomass)		
	2012	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa},B_{lim})	?	Unknown
Qualitative evaluation	✓	Above poss. reference points

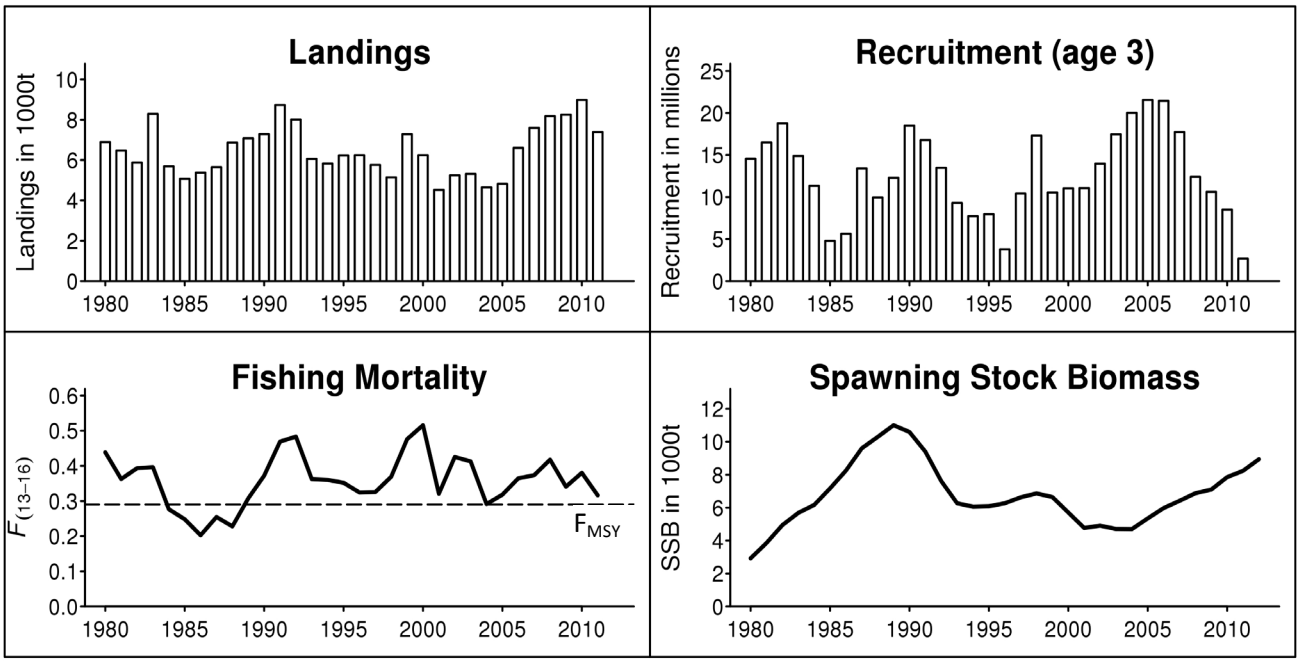

Figure 9.4.12.2.1 Tusk in Division Va and Subarea XIV. Landings (thousand tonnes), recruitment in millions (age 3), fishing mortality, and spawning-stock biomass (thousand tonnes).

Recruitment peaked in 2004 to 2006 but has declined since then to a low level in 2011. There are indications that fishing mortality may have declined in recent years and is close to the proxy for F_{MSY}. 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.

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 landings (2011) were 7.4 kt (98% longline).

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 alter the perception of the state of tusk in DivisionVa.

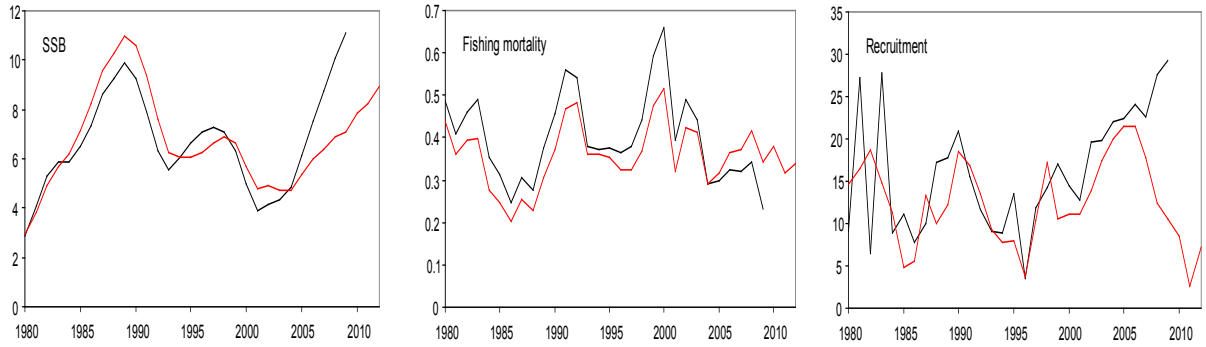

Figure 9.4.12.2.2 Tusk in Division Va and Subarea XIV. Historical assessment results.

Scientific basis

Assessment type	Analytical length-based assessment (Gadget model).
Input data	March Icelandic groundfish survey and landings in Division Va.
Discards and bycatch	Not included in the assessment.
Other information	This stock was benchmarked in 2010 (WKDEEP 2010).
Working group report	WGDEEP

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

Reference points

	Type	*Value*	*Technical basis*
MSY Approach	MSY $B_{trigger}$	Not defined.	
	F_{MSY}	0.29	F_{max} as proxy for F_{MSY}
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

(unchanged since 2012)

Yield and spawning biomass per Recruit F-reference points (2010):

	Fish Mort Ages 13–16	**Yield/R**	**SSB/R**
Average last 3 years	0.35	0.53	2.6
F_{max}	0.29	0.58	3

F_{max}, derived from a well-defined maximum of a yield-per-recruit curve estimated within the Gadget model (Figure 9.4.12.2.2), is used as a proxy for F_{MSY}.

Outlook for 2013 and 2014

Basis: F(2012) = 0.34; TAC constraint = 7; landings (2012) = 7.4 (same as 2011); SSB(2012) = 8.94; Recruitment (age 3) = mean for 2009–2011.

Rationale	**Landings (2013)**	**Basis**	**F (2013)**	**SSB (2013)**	**%SSB change [1)]**	**% TAC change [2)]**
ICES–MSY framework	6.7	F_{MSY}	0.29	9.15	2%	−4%
	3.9	$F_{0.1}$	0.16	9.46	6%	−56%

Weights in thousand tonnes.
[1)] SSB 2014 relative to SSB 2013.
[2)] Landings 2013 relative to TAC 2012.

MSY approach

A decrease in catches to 6700 t or less will result in a fishing mortality close to F_{max} in 2013 and a stable spawning-stock biomass.

Additional considerations

The permission, albeit limited, to switch the individual transferable quota (ITQ) from one species to another has led to the overshoot in the set TAC for tusk for the native fleet. Although this permission limits discarding and misreporting, it may in the long term result in serious overfishing of relatively small stocks with a small TAC.

Closed areas off the southern and southeastern coast of Iceland have been implemented in 2003 to prevent the fishing on juveniles in Division Va.

All the signs 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 and expanded if needed.

The assumption of natural mortality (M) was changed from 0.15 in the 2010 assessment to 0.2 in the 2012 assessment because of a re-evaluation of the longevity of the species and because it resulted in improved diagnostics. The F_{max} is now more clearly defined. The SSB and recruitment estimates in recent years have been revised downwards.

Comparison with previous assessment and advice

The basis for the assessment has not changed. SSB and recruitment estimates for 2009 are much lower than 2 years ago. The basis for the advice in 2010 was $F_{0.1}$; the basis for the current advice is F_{max} defined as a proxy for F_{MSY}.

Source

ICES. 2012. Report of the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP), 29 March–5 April 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:17.

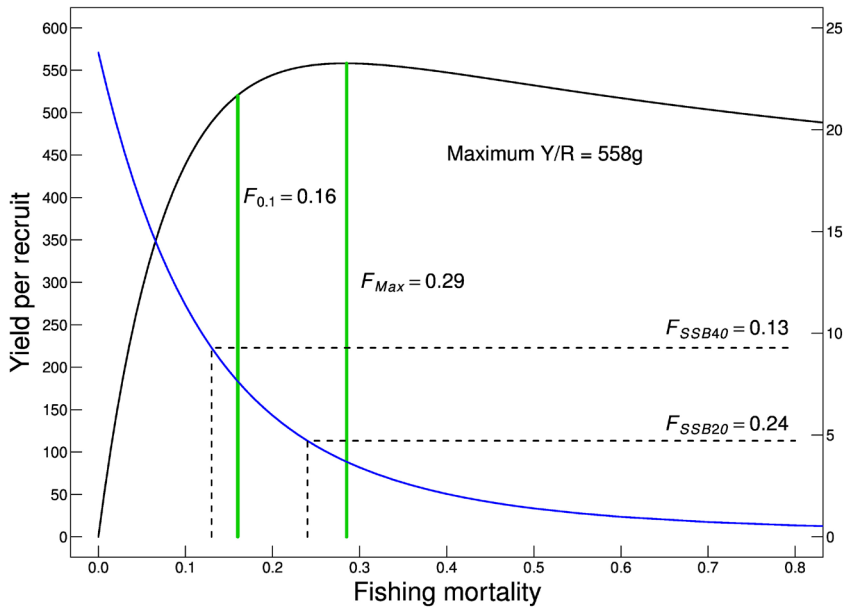

Figure 9.4.12.2.3 Tusk in Division Va and Subarea XIV. Yield-per-recruit analysis.

Table 9.4.12.2.1 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	
2012/13	Fishing at F_{MSY}	< 6.7			
2013/14	No new advice, same as 2013	< 6.7			

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 9.4.12.1).

Table 9.4.12.2.2 Tusk in Division Va. Total international landings (tonnes) by country.

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

Table 9.4.12.2.3 Tusk in Subarea XIV. Total international landings (tonnes) by country.

YEAR	FAROE	GERMANY	ICELAND	NORWAY	RUSSIA*	SPAIN	UK	TOTAL
1973	16	9	0	0	0	0	2	27
1974	259	2	15	0	0	0	1	277
1975	29	17	13	138	0	0	0	197
1976	0	5	89	47	0	0	1	142
1977	167	16	0	40	0	0	1	224
1978	0	47	0	38	0	0	0	85
1979	0	27	0	0	0	0	0	27
1980	0	13	0	0	0	0	0	13
1981	110	10	0	0	0	0	0	120
1982	0	10	0	0	0	0	0	10
1983	74	11	0	0	0	0	0	85
1984	0	5	0	58	0	0	0	63
1985	0	4	0	0	0	0	0	4
1986	33	2	0	0	0	0	0	35
1987	13	2	0	0	0	0	0	15
1988	19	2	0	0	0	0	0	21
1989	13	1	0	0	0	0	0	14
1990	0	2	0	7	0	0	0	9
1991	0	2	0	68	0	0	1	71
1992	0	0	3	120	0	0	0	123
1993	0	0	1	39	0	0	0	40
1994	0	0	0	16	0	0	0	16
1995	0	0	0	30	0	0	0	30
1996	0	0	0	157	0	0	0	157
1997	0	0	10	9	0	0	0	19
1998	0	0	0	12	0	0	0	12
1999	0	0	0	8	0	0	0	8
2000	0	0	11	11	0	3	0	25
2001	3	0	20	69	0	0	0	92
2002	4	0	86	30	0	0	0	120
2003	0	0	2	88	0	0	0	90
2004	0	0	0	40	0	0	0	40
2005	7	0	0	41	8	0	0	56
2006	3	0	0	19	51	0	0	73
2007	0	0	0	40	6	0	0	46
2008	0.2	0	0	7	0	0	0	7.2
2009	0	0	0	5	11	0	0	16
2010	7	0	0	5	0	0	0	12
2011	0	0	0	24	0	0	0	24

* Russian catches were taken in Subdivision $XIVb_1$ (Mid-Atlantic Ridge).