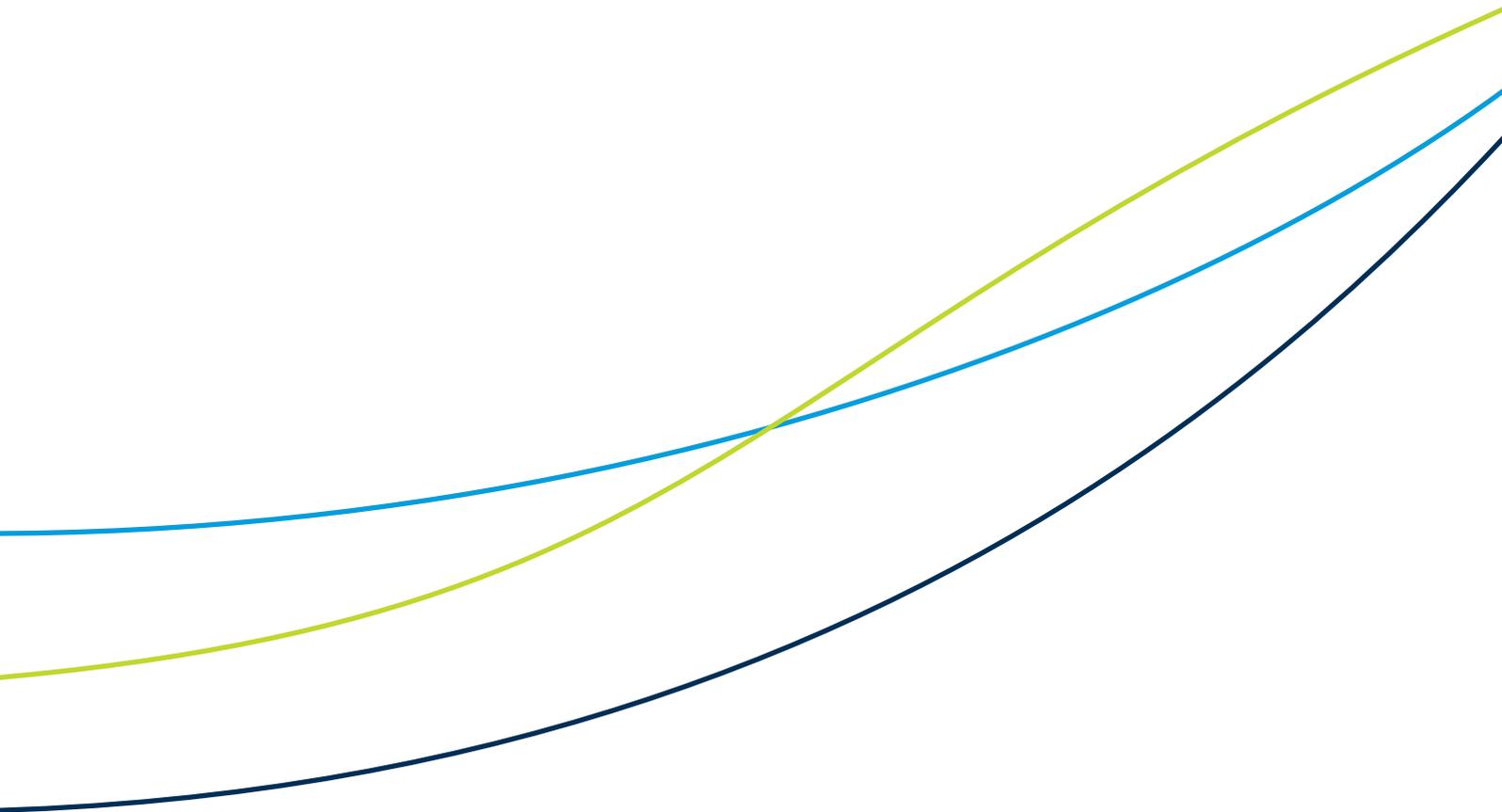


Skjal 2.

The Faroe Plateau Ecosystem. ICES 2015



4.3.2 Cod (*Gadus morhua*) in Subdivision Vb₂ (Faroe Bank)

ICES stock advice

ICES advises that when the precautionary approach is applied, because of the very low stock size, the fishery should be closed. Reopening the fishery should not be considered until both survey indices indicate a biomass at or above the average of the period 1996–2002.

Stock development over time

Survey indices indicate that the stock is severely depleted. Exploitation ratios (proxy for fishing mortality) have remained at very low levels in recent years as a consequence of steep declines in catches.

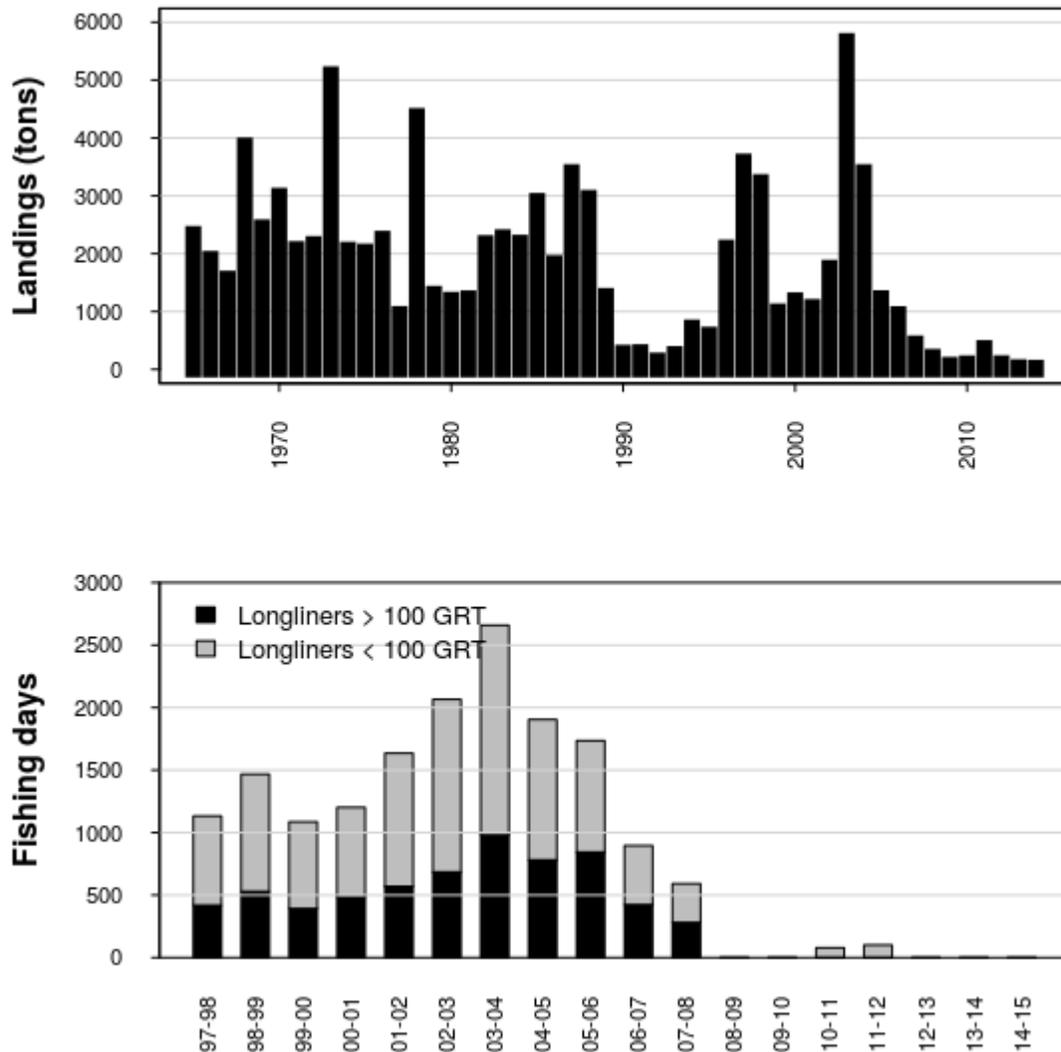


Figure 4.3.2.1 Cod in Subdivision Vb₂ (Faroe Bank). Top panel: Reported landings 1965–2014. Since 1992 only catches from Faroese and Norwegian vessels are considered to be taken on the Faroe Bank. Bottom panel: Fishing days 1997–2015 for longline gear types on the Faroe Bank.

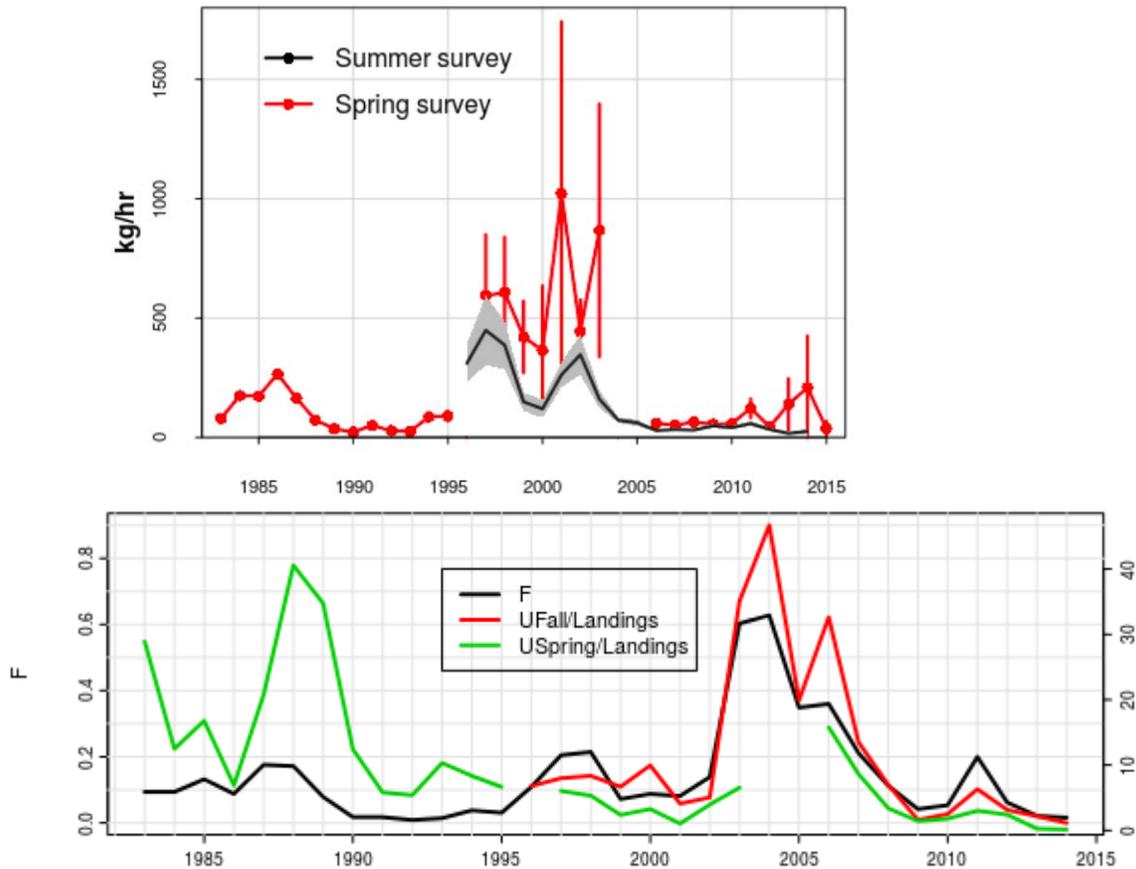


Figure 4.3.2.2 Cod in Subdivision Vb₂ (Faroe Bank). Top panel: Catch per unit of effort in the spring groundfish survey (1983–2015; red line) and summer survey (1996–2014; black line). Vertical bars and shaded areas show the standard error in the estimation of indexes. Bottom panel: estimated fishing mortality from a production model (black line) and exploitation ratio (ratio of landings to survey interpreted as an index of exploitation rate). Red = summer survey, Green = spring survey.

Stock and exploitation status

Table 4.3.2.1 Cod in Subdivision Vb₂. State of the stock and fishery, relative to reference points.

	Fishing pressure				Stock size					
		2012	2013	2014		2013	2014	2015		
Maximum Sustainable Yield	F_{MSY}	?	?	?	Undefined	MSY	?	?	?	Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	?	?	?	Undefined
Management Plan	F_{MGT}	-	-	-	Not applicable	SSB_{MGT}	-	-	-	Not applicable
Qualitative evaluation		→	→	→	Very low		→	→	→	Very low

Catch options

New data on landings and indices from the annual Faroese surveys do not change the perception of the stock since 2008 and do not give reason to change the advice. The advice for the fishery in 2016 is thus the same as the advice given since 2008. Therefore, ICES advises that because of the very low stock size the fishery should be closed. Reopening the fishery should not be considered until both survey indices indicate a biomass at or above the average of the period 1996–2002.

Basis of the advice

Table 4.3.2.2 Cod in Subdivision Vb₂. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	There is no management plan for this stock.

Quality of the assessment

The assessment is based on catch rates in two research surveys, and on exploitation rates derived from landings data and survey indices. The confidence intervals for the spring survey indices are very large, while the summer survey performs better. The recent depletion of the stock is confirmed by both surveys.

The landings estimates for this stock are uncertain as the vessels since 1996 have been allowed to fish both on the Faroe Plateau and on the Faroe Bank during the same trip.

Issues relevant for the advice

If the fishery management agency intends to manage the fisheries of the two stocks (Faroe Plateau cod and Faroe Bank cod) to protect the productive capacity of each individual stock, then it is necessary to identify the catch removed from each stock.

Reference points

No reference points are defined for this stock.

Basis of the assessment

Table 4.3.2.3 Cod in Subdivision Vb₂. The basis of the assessment.

ICES stock data category	3 (ICES, 2015b).
Assessment type	Qualitative based on survey trends.
Input data	Official landings and Faroese groundfish bottom trawl surveys (spring and summer).
Discards and bycatch	Negligible.
Indicators	Research surveys.
Other information	None.
Working group	North-Western Working Group (NWWG).

History of advice, catch, and management

Table 4.3.2.4 Cod in Subdivision Vb₂. History of ICES advice, the agreed TAC, and ICES estimates of landings.

Year	ICES advice	Predicted catch corresponding to advice	Agreed TAC	Official landings
1987	No assessment	-		3.5
1988	No assessment	-		3.1
1989	Addition to Faroe Plateau TAC	~2.0		1.4
1990	Access limitation may be required	-		0.6
1991	Access limitation may be required			0.4
1992	No fishing	0.3		0.3
1993	TAC	0.5		0.4
1994	TAC	0.5		1.0
1995	Precautionary TAC	0.5		1.2
1996	Precautionary TAC	0.5	1.0	2.5
1997	Effort at present levels	0.7	Not applicable	3.9
1998	Effort at present levels	-		3.5
1999	Effort not to exceed that exerted in 1996–1997	-		1.3
2000	Effort not to exceed that of 1996–1998	-		1.2*
2001	Effort not to exceed that of 1996–1999	-		1.8*
2002	Effort not to exceed that of 1996–2000	-		1.9*
2003	Effort not to exceed that of 1996–2001	-		5.7*
2004	Effort not to exceed that of 1996–2002	-		4.3*
2005	Effort not to exceed that of 1996–2002	-		1.0*
2006	Effort not to exceed that of 1996–2002	-		0.95*
2007	Effort not to exceed that of 1996–2002	-		0.45*
2008	No fishing	0		
2009	No fishing	0		
2009	No fishing	0		0.08*
2010	Same advice as last year	0		0.105*
2011	Same advice as last year	0		0.37*
2012	Same advice as last year	0		0.108*
2013	Same advice as last year	0		0.038*
2014	Same advice as last year	0		0.030*
2015	Same advice as last year	0		
2016	Same advice as last year	0		

Weights in thousand tonnes.

* Working group estimates.

History of catch and landings

Table 4.3.2.5 Cod in Subdivision Vb₂. Catch distribution by fleet in 2014 as estimated by ICES.

Total catch (2014)	Commercial landings	Commercial discards	Recreational catch (partially reported)
0.030 kt	0.030 kt	0	0

Table 4.3.2.6 Cod in Subdivision Vb₂ (Faroe Bank). Nominal catches (tonnes) by country 1986–2014 as officially reported to ICES. From 1992 catches by the Faroe Islands and Norway are used in the assessment.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
Faroe Islands	1 836	3 409	2 966	1 270	289	297	122	264	717	561	2 051	3 459	3 092	1 001	
Norway	6	23	94	128	72	38	32	2	8	40	55	135	147	88	
UK (E/W/Ni)	-	-	-	-	2**	1**	74**	186**	56**	43**	126***	61***	27***	-	
UK (Scotland)***	63	47	37	14	205	90	176	118	227	551	382	277	265	51	
Total	1 905	3 479	3 097	1 412	568	426	404	570	1 008	1 195	2 614	3 932	3 531	210	
Used in assessment					289	297	154	266	725	601	2 106	3 594	3 239	1 350	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Faroe Islands		1 094	1 840	5 957	3 607	1 270	1 005	471	231	81	111	393	115	40	32*
Norway	49	51	25	72	18	37	10	7	1	4	1		0		
Greenland	-	-	-	-	-	-	-	-	-	-	5		1		
UK (E/W/Ni)***	18	50	42	15	15	24	1								
UK (Scotland)	245***	288***	218***	254***	244***	1129***	278***	53	32	38	54				270
Total	312	1 483	2 125	6 298	3 884	2 460	1 294	531	264	123	171	393	116	40	302
Correction of Faroese catches in Vb2		-65	-109	-353	-214	-75	-60	-28	-14	-5	-7	-23	-7	-2	-2
Used in assessment	1 194	1 080	1 756	5 676	3 411	1 232	955	450	218	80	105	370	108	38	30

* Preliminary.

**Included in Subdivision Vb₁.

***Reported as Division Vb.

Sources and references

ICES. 2014. Report of the North-Western Working Group (NWWG), 24 April–1 May 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:07. 902 pp.

ICES. 2015a. Report of the North-Western Working Group (NWWG) 28 April–5 May, 2015, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:07.

ICES. 2015b. Advice basis. *In* Report of the ICES Advisory Committee, 2015. ICES Advice 2015, Book 1. In preparation.

4.3.1 Cod (*Gadus morhua*) in Subdivision Vb₁ (Faroe Plateau)

ICES stock advice

ICES advises that when the precautionary approach is applied, catch in 2016 should be at the lowest possible level and a mixed-fishery management plan be developed.

Stock development over time

The spawning-stock biomass (SSB) has remained around B_{lim} since 2005. Fishing mortality (F) decreased from 2010 to 2013, but increased in 2014 and is now above F_{pa} . The 2009–2013 year classes are estimated to be below average.

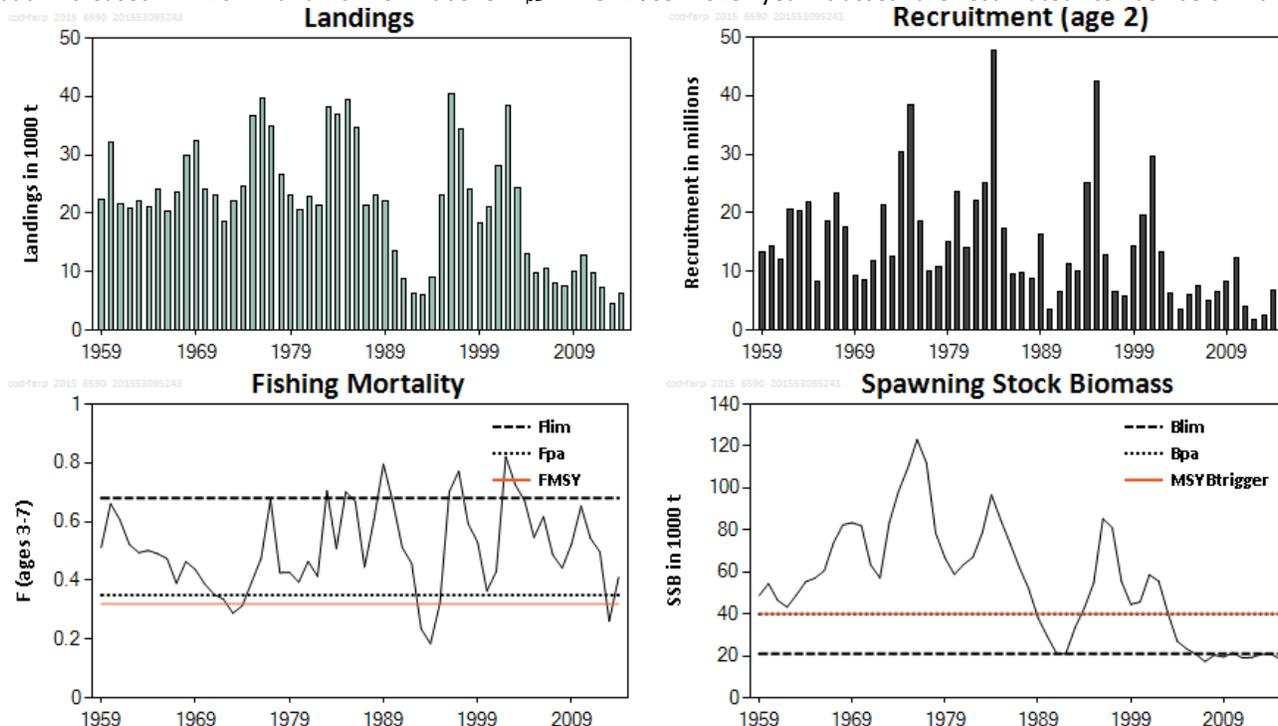


Figure 4.3.1.1 Cod in Subdivision Vb₁. Summary of stock assessment (weights in thousand tonnes).

Stock and exploitation status

Table 4.3.1.1 Cod in Subdivision Vb₁. State of the stock and fishery, relative to reference points.

		Fishing pressure			Stock size		
		2012	2013	2014	2013	2014	2015
Maximum Sustainable Yield	F_{MSY}	✘	✔	✘ Above F_{MSY}	$B_{trigger}$	✘	✘ Below $B_{trigger}$
Precautionary approach	F_{pa} , F_{lim}	⊙	✔	⊙ Increased risk	B_{pa} , B_{lim}	✘	⊙ Below B_{lim}
Management Plan	F_{MGT}	-	-	- Not applicable	SSB_{MGT}	-	- Not applicable

Catch options

Table 4.3.1.2 Cod in Subdivision Vb₁. The basis for the catch options.

Variable	Value	Source	Notes
F ages 3–7 (2015)	0.39	ICES (2015a)	
SSB (2016)	20 kt	ICES (2015a)	
R _{age2} (2016)	3.7 millions	ICES (2015a)	Average of the recruitment in 2012–2014
R _{age2} (2017)	3.7 millions	ICES (2015a)	Average of the recruitment in 2012–2014
Total catch (2015)	6.6 kt	ICES (2015a)	
Commercial landings (2015)	6.6 kt	ICES (2015a)	

Table 4.3.1.3 Cod in Subdivision Vb₁. The catch options.

Rationale	F (2016)	Catch (2016)	Basis	SSB (2017)	%SSB change *
MSY approach	0.16	3.0	$F_{MSY} \times SSB_{2016} / B_{trigger}$	23.5	19
Precautionary approach	0.35	6.0	F_{pa}	20.1	2
Zero catch	0	0	$F = 0$	26.8	36
<i>Status quo</i>	0.39	6.6	F_{sq}	19.5	-1
	0.19	3.6	$F_{sq} \times 0.50$	22.8	16
	0.29	5.1	$F_{sq} \times 0.75$	21.1	7
	0.32	5.6	F_{MSY}	20.6	5
	0.37	6.3	$F_{sq} \times 0.90$	19.8	0
	0.42	7.1	$F_{sq} \times 1.1$	18.9	-4

Weights in thousand tonnes.

* SSB 2017 relative to SSB 2016.

ICES notes that when the MSY approach is applied, effort should be reduced such that fishing mortality in 2016 will be no more than $F = 0.16$, corresponding to a 60% reduction compared to the 2012–2014 fishing mortality and a catch in 2016 of 3000 t.

However, Faroe Plateau cod and Faroe haddock are caught in mixed fishery and it is difficult to target one of them without fishing the other. Given the stock status for haddock, and unless it is possible to fish in such a way that gears only catch cod, ICES recommends cod catches at the lowest possible level (LPL) and the development of a mixed-fishery management plan that avoids catches of haddock.

Basis of the advice

Table 4.3.1.4 Cod in Subdivision Vb₁. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	There is no management plan for this stock.

Quality of the assessment

The landing data are considered accurate. There are no incentives to discard fish under the effort management system. The sampling of the landings is believed to be adequate.

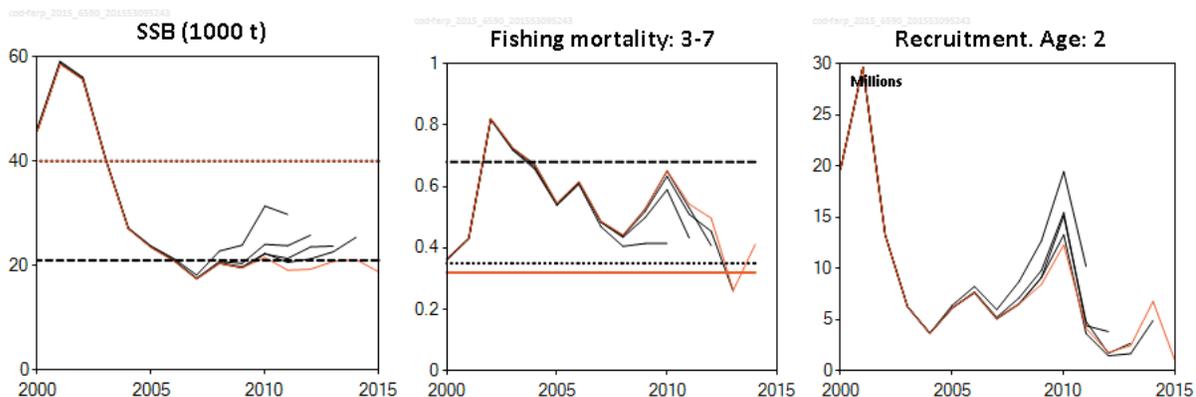


Figure 4.3.1.2 Cod in Subdivision Vb₁. Historical assessment results (final-year recruitment estimates included).

Issues relevant for the advice

There is no management plan for this stock. A preliminary management plan, including a recovery plan, was formulated in 2011, but has not been implemented. An effort management system has been used since 1996. The Faroese Parliament decides the number of allocated fishing days for each new fishing season. The number of used fishing days is, for some of the Faroese fleets, only around half of the allocated days, but requires further reductions. In this situation, with surplus days, effort control is unlikely to be effective.

Reference points

Table 4.3.1.5 Cod in Subdivision Vb₁. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B _{trigger}	40 000 t	B _{pa}	ICES (2011)
	F _{MSY}	0.32	Provisional maximum sustainable yield, FLR stochastic simulations.	ICES (2011)
Precautionary approach	B _{lim}	21 000 t	Lowest observed SSB (1998 assessment).	ICES (1998)
	B _{pa}	40 000 t	B _{lim} e ^{1.645σ} , assuming a σ of about 0.40 to account for the relatively large uncertainties in the assessment.	ICES (1998)
	F _{lim}	0.68	F _{pa} e ^{1.645σ} , assuming a σ of about 0.40 to account for the relatively large uncertainties in the assessment.	ICES (1998)
	F _{pa}	0.35	Close to F _{max} (0.34) and F _{med} (0.38) (1998 assessment).	ICES (1998)
Management plan	SSB _{MGT}	Not defined		
	F _{MGT}	Not defined		

Basis of the assessment

Table 4.3.1.6 Cod in Subdivision Vb₁. The basis of the assessment.

ICES stock data category	1 (ICES, 2015b).
Assessment type	XSA with catch-at-age data and age-disaggregated indices, using catches in the model and in the forecast.
Input data	Commercial catches, ages, and length frequencies from catch sampling; survey indices (FO-GFS-Q1 and FO-GFS-Q3); annual maturity data from FO-GFS-Q1; natural mortalities set at 0.2.
Discards and bycatch	Not included, considered negligible.
Indicators	None.
Other information	The stock assessment was last benchmarked by NWWG in 2005.
Working group	North-Western Working Group (NWWG).

Information from stakeholders

There is no available information.

History of advice, catch, and management

Table 4.3.1.7 Cod in Subdivision Vb₁. History of ICES advice, the agreed TAC, and ICES estimates of landings.

Fishing Year	ICES advice	Predicted catch corresp. to advice	Agreed TAC	ICES landings
1987	No increase in F	< 31		21.4
1988	No increase in F (Revised estimate)	< 29 (23)		23.2
1989	No increase in F	< 19		22.1
1990	No increase in F	< 20		13.5
1991	TAC	< 16		8.8
1992	No increase in F	< 20		6.4
1993	No fishing	0		6.1
1994	No fishing	0	8.5/12.5*,**	9.0
1995	No fishing	0	12.5*	23.0
1996	F at lowest possible level	-	20**	40.4
1997	80% of F(95)	< 24	-	34.3
1998	30% reduction in effort from 1996/97	-	-	24.0
1999	F less than proposed F_{pa} (0.35)	< 19		18.3
2000	F less than proposed F_{pa} (0.35)	< 20		21.0
2001	F less than proposed F_{pa} (0.35)	< 16		28.2
2002	75% of F(2000)	< 22		38.5
2003	75% of F(2001)	< 32		24.5
2004	25% reduction in effort	-		13.2
2005	Rebuilding plan involving large reduction	-		9.9
2006	Rebuilding plan involving large reduction	-		10.5
2007	Rebuilding plan involving large reduction in effort	-		8.0
2008	No fishing. Development of a rebuilding plan.	0		7.5
2009	No fishing. Development of a rebuilding plan.	0		10.0
2010	No fishing. Development of a rebuilding plan.	0		12.8
2011	Reduce F to below F_{pa}	< 16		9.8
2012	MSY framework, reduce F by 30%	< 10		7.2
2013	MSY approach, $F < 0.20$	< 4.8		4.6
2014	MSY approach, reduce F by 69 %	< 3.6		6.3
2015	MSY approach, reduce F by 23 %	< 4.5		
2016	Lowest possible level (LPL) and develop a mixed-fishery management plan	LPL		

Weights in thousand tonnes.

* In the quota year 1 September–31 August the following year.

** The TAC was increased during the quota year.

The fishing year runs from 1 September to 31 August the following year.

History of catch and landings

Table 4.3.1.8 Cod in Subdivision Vb₁. Catch distribution by fleet in 2014 as estimated by ICES.

Total catch (2014)	Commercial landings				Commercial discards	Unaccounted removals
	65% longlines	28% trawlers	6% jigging	0.4% other gear types		
6 kt	6 kt				0 kt	0 kt

Table 4.3.1.9 Cod in Subdivision Vb₁. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery.

	Denmark	Faroe Islands	France	Germany	Iceland	Norway	Greenland	Portugal	UK (E/W/Nl)	UK (Scotland)	United Kingdom	Total
1986	8	34,492	4	8		83	-		-	-	-	34,595
1987	30	21,303	17	12		21	-		8	-	-	21,391
1988	10	22,272	17	5		163	-		-	-	-	22,467
1989	-	20,535	-	7		285	-		-	-	-	20,827
1990	-	12,232	-	24		124	-		-	-	-	12,380
1991	-	8,203	- **	16		89	-		1	-	-	8,309
1992	-	5,938	3 ***	12		39	-		74	-	-	6,066
1993	-	5,744	1 ***	+		57	-		186	-	-	5,988
1994	-	8,724	-	2		36	-		56	-	-	8,818
1995	-	19,079	2 ***	2		38	-		43	-	-	19,164
1996	-	39,406	1 ***	+		507	-		126	-	-	40,040
1997	-	33,556	-	+		410	-		61 ***	-	-	34,027
1998	-	23,308	- *	-		405	-		27 ***	-	-	23,740
1999	-	19,156	-	39		450	-		51	-	-	19,696
2000		0	1	2		374	-		18	-	-	395
2001		29,762	9 ***	9		531	-		50	-	-	30,361
2002		40,602	20	6	5	573			42	-	-	41,248
2003		30,259	14	7		447			15	-	-	30,742
2004		17,540	2	3 ***		414		1	15	-	-	17,975
2005		13,556	-			201			24	-	-	13,781
2006		11,629	7	1 ***		49	5		1	-	-	11,691
2007		9,905	1 ***			71	7		3	358		10,344
2008		9,394	1			40				383		9,818
2009		10,736	1			14	7			300		11,058
2010		13,878	1			10				312		14,201
2011		11,348	-									11,348
2012		8,437	0		28							8,465
2013		5,331	0		20		2					5,333
2014		7,037 *				6				270		7,314

* Preliminary, ** Included in Vb2, *** Reported as Vb.

	Faroese catches:				Catches reported as Vb2:			Foreign catches:				Used in the assessment	
	Officially reported	in Vb1	Corrections in Vb1 **	on Faroe-Iceland ridge	in IIA within Faroee area jurisdiction	UK (E/W/Nl)	UK (Scotland)	UK	French ***	Greenland ***	Russia ***		UK ***
1986	34595												34595
1987	21391												21391
1988	22467				715								23182
1989	20827				1229				12				22068
1990	12380				1090 -		205		17				13692
1991	8309				351 -		90						8750
1992	6066				154 +		176						6396
1993	5988					1	118						6107
1994	8818					1	227						9046
1995	19164	3330 ****			-		551						23045
1996	40040				-		382						40422
1997	34027				-		277						34304
1998	23740				-		265						24005
1999	19696				-1600		210						18306
2000	395	21793 *			-1400		245						21033
2001	30361		-1766		-700		288						28183
2002	41248		-2409		-600		218 -						38457
2003	30742		-1795		-4700		254 -						24501
2004	17975		-1041		-4000		244 -						13178
2005	13781		-804		-4200		1129 -						9906
2006	11691		-690		-800		278						10479
2007	10344		-588		-1800		53			6			8015
2008	9818		-557		-1828		32						7465
2009	11058		-637		-487		38			26	4		10002
2010	14201		-823		-680		54			5			12757
2011	11348		-673		-918					3			9760
2012	8465		-500		-760					5			7210
2013	5333		-316		-387						0.2		4630
2014	7314 *		-417		-547								6349

*) Preliminary, **) In order to be consistent with procedures used previous years, ***) Reported to Faroese Coastal Guard, ****) expected misreporting/discard.

Summary of the assessment

Table 4.3.1.10 Cod in Subdivision Vb₁. Assessment summary (weights in tonnes).

Year	Recruitment Age 2	SSB	Landings	Mean F Ages 3–7
	thousands	tonnes	tonnes	
1959	13 238	48 869	22 415	0.512
1960	14 245	54 447	32 255	0.661
1961	12 019	46 439	21 598	0.606
1962	20 654	43 326	20 967	0.523
1963	20 290	49 054	22 215	0.494
1964	21 834	55 362	21 078	0.502
1965	8 269	57 057	24 212	0.491
1966	18 566	60 629	20 418	0.474
1967	23 451	73 934	23 562	0.39
1968	17 582	82 484	29 930	0.464
1969	9 325	83 487	32 371	0.438
1970	8 608	82 035	24 183	0.388
1971	11 928	63 308	23 010	0.353
1972	21 320	57 180	18 727	0.336
1973	12 573	83 547	22 228	0.289
1974	30 480	98 434	24 581	0.314
1975	38 319	109 566	36 775	0.395
1976	18 575	123 077	39 799	0.475
1977	9 995	112 057	34 927	0.676
1978	10 748	78 497	26 585	0.426
1979	14 998	66 723	23 112	0.427
1980	23 583	58 887	20 513	0.395
1981	14 001	63 562	22 963	0.465
1982	22 128	67 033	21 489	0.414
1983	25 162	78 543	38 133	0.706
1984	47 769	96 774	36 979	0.508
1985	17 323	84 789	39 484	0.701
1986	9 513	73 698	34 595	0.669
1987	9 914	62 249	21 391	0.445
1988	8 726	52 134	23 182	0.607
1989	16 408	38 427	22 068	0.796
1990	3 646	29 450	13 692	0.666
1991	6 662	21 301	8 750	0.512
1992	11 392	21 073	6 396	0.458
1993	10 097	33 502	6 107	0.235
1994	25 156	42 937	9 046	0.185
1995	42 508	54 735	23 045	0.321
1996	12 858	85 457	40 422	0.702
1997	6 454	81 121	34 304	0.772
1998	5 922	55 445	24 005	0.593
1999	14 338	44 611	18 306	0.53
2000	19 710	45 736	21 033	0.364

Year	Recruitment Age 2	SSB	Landings	Mean F Ages 3–7
	thousands	tonnes	tonnes	
2001	29 687	58 652	28 183	0.432
2002	13 258	55 679	38 457	0.822
2003	6 240	40 399	24 501	0.726
2004	3 631	27 059	13 178	0.671
2005	6 095	23 470	9 906	0.546
2006	7 619	20 897	10 479	0.616
2007	5 120	17 387	8 015	0.487
2008	6 506	20 433	7 465	0.442
2009	8 425	19 563	10 002	0.525
2010	12 297	21 525	12 757	0.653
2011	4 145	19 114	9 760	0.543
2012	1 773	19 290	7 210	0.497
2013	2 453	20 785	4 630	0.261
2014	6 772	21 142	6 349	0.412
2015	874	18 781		
Average	14 477	54 827	21 817	0.505

Sources and references

ICES. 1998. Report of the North-Western Working Group (NWWG), 28 April–06 May, 1998, ICES Headquarters, Copenhagen. ICES CM 1998/ACFM:19. 350 pp.

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ICES. 2015a. Report of the North-Western Working Group (NWWG), 28 April–5 May, 2015, ICES Headquarters, Copenhagen, Denmark. ICES CM 2015/ACOM:07.

ICES. 2015b. Advice basis. *In* Report of the ICES Advisory Committee, 2015. ICES Advice 2015, Book 1. In preparation.

4.3.3 Haddock (*Melanogrammus aeglefinus*) in Division Vb (Faroes grounds)

ICES stock advice

ICES advises that when the precautionary approach is applied, there should be no directed fishery on haddock in 2016 and bycatch should be minimized. A recovery plan should be developed and implemented as a prerequisite to reopening the directed fishery.

Stock development over time

The spawning-stock biomass (SSB) has decreased since 2003 and is estimated to have been below B_{lim} since 2010. The fishing mortality (F) has decreased in recent years and is now slightly above F_{MSY} . Recruitment from 2003 onwards has been well below the long-term average.

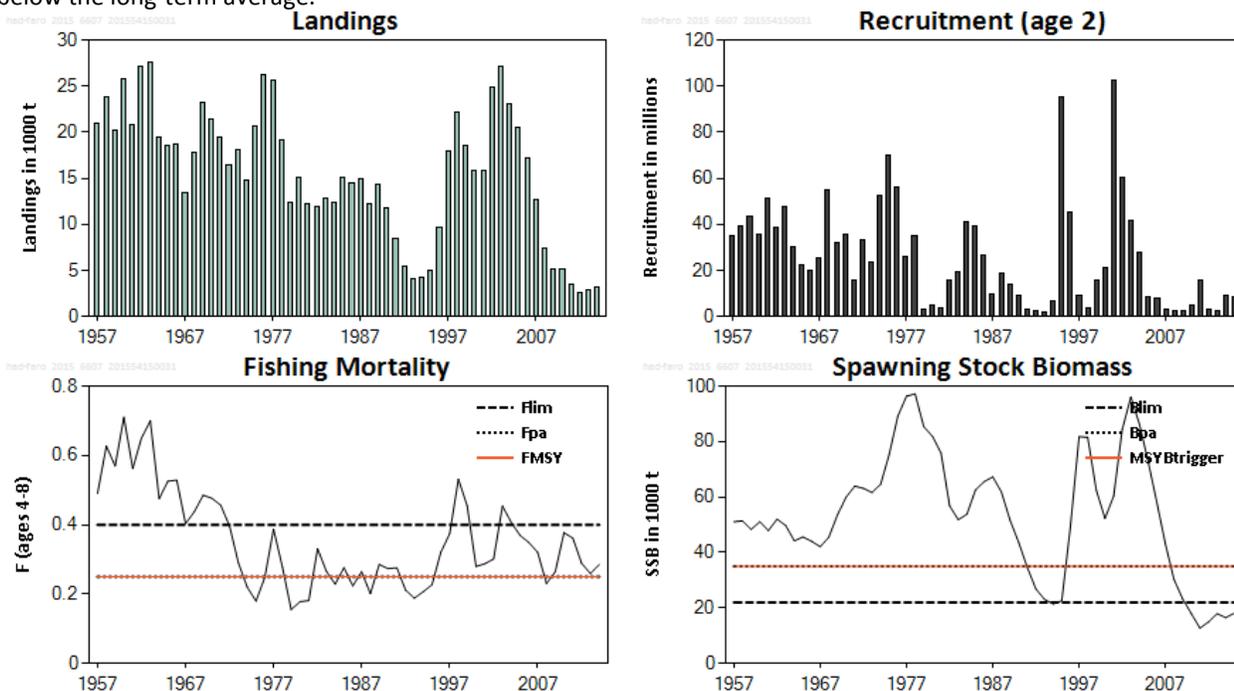


Figure 4.3.3.1 Haddock in Division Vb. Summary of stock assessment (weights in thousand tonnes).

Stock and exploitation status

Table 4.3.3.1 Haddock in Division Vb. State of the stock and fishery, relative to reference points.

	Fishing pressure			Stock size			
		2012	2013	2014	2013	2014	2015
Maximum Sustainable Yield	F_{MSY}	✘	✘	✘ Above F_{MSY}	$B_{trigger}$	✘	✘ Below $B_{trigger}$
Precautionary approach	F_{pa} , F_{lim}	○	○	○ Increased risk	B_{pa} , B_{lim}	✘	✘ Below B_{lim}
Management Plan	F_{MGT}	-	-	- Not applicable	SSB_{MGT}	-	- Not applicable

Catch options

Table 4.3.3.2 Haddock in Division Vb. The basis for the catch options.

Variable	Value	Source	Notes
F ages 4–8 (2015)	0.28	ICES (2015a)	Unscaled averages for 2012–2014.
SSB (2016)	18 912 t	ICES (2015a)	
R _{age2} (2016)	5.078 mill.	ICES (2015a)	Derived from the 2015 assessment.
R _{age2} (2017)	5.089 mill.	ICES (2015a)	Geometric mean since 2005.
Total catch (2015)	3 820 t	ICES (2015a)	

Table 4.3.3.3 Haddock in Division Vb. The catch options.

Rationale	F (2016)	Landings (2016)	Basis	SSB (2017)	%SSB change *
MSY approach	0.14	2.5	$F_{MSY} \times SSB_{2016} / B_{trigger}$	19.7	4
MSY and F _{pa}	0.25	4.2	$F_{sq} \times 0.93$	17.9	-5
Zero catch	0.00	0.0	$F = 0$	22.2	17
<i>Status quo</i>	0.14	2.5	$F_{sq} \times 0.50$	19.7	4
	0.28	4.6	F_{sq}	17.5	-7
	0.34	5.4	$F_{sq} \times 1.20$	16.5	-13

Weights in thousand tonnes.

* SSB 2017 relative to SSB 2016.

Based on the MSY approach, F in 2016 should be no more than 0.14 ($F_{MSY} \times B_{2016} / MSY B_{trigger}$). However, because the current biomass is estimated to be below B_{lim} , ICES recommends no directed fishing on haddock in 2016 and recommends that measures are put in place that will minimize bycatches of haddock in other fisheries. A recovery plan should be developed and implemented as a prerequisite to reopening the directed fishery.

Basis of the advice

Table 4.3.3.4 Haddock in Division Vb. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	There is no management plan for this stock.

Quality of the assessment

The landings data are considered accurate. There are no incentives to discard fish under the effort management system. The sampling of the landings is believed to be adequate. No major problems have been observed with the tuning indices (the two surveys).

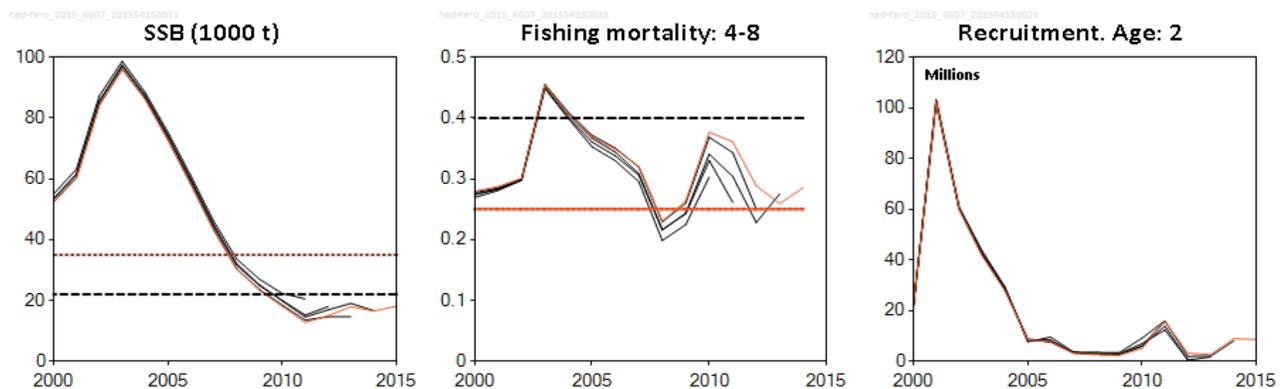


Figure 4.3.3.2 Haddock in Division Vb. Historical assessment results (final-year recruitment estimates included).

Issues relevant for the advice

There is no management plan for this stock. A preliminary management plan, including a recovery plan, was formulated in 2011, but has not been implemented. An effort management system has been used since 1996. The Faroese Parliament decides the number of allocated fishing days for each new fishing season. The number of used fishing days is, for some of the Faroese fleets, only around half of the allocated days.

Reference points

Table 4.3.3.5 Haddock in Division Vb. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	35 000 t	B_{pa}	ICES (2011)
	F_{MSY}	0.25	Stochastic simulations.	ICES (2011)
Precautionary approach	B_{lim}	22 000 t	Lowest observed SSB.	ICES (1998)
	B_{pa}	35 000 t	$B_{lim} e^{1.645\sigma}$, with σ of 0.3.	ICES (1998)
	F_{lim}	0.40	$F_{pa} e^{1.645\sigma}$, with σ of 0.3.	ICES (1998)
	F_{pa}	0.25	$F_{med}(1998) = 0.25$.	ICES (1998)
Management plan	SSB_{MGT}	Not defined		
	F_{MGT}	Not defined		

Basis of the assessment

Table 4.3.3.6 Haddock in Division Vb. The basis of the assessment.

ICES stock data category	1 (ICES, 2015b).
Assessment type	XSA with catch-at-age data and age-disaggregated indices, using catches in the model and in the forecast.
Input data	Commercial catches (mainly Faroese catches, ages and length frequencies from catch sampling); survey indices (FO-GFS-Q1&3); annual maturity data from FO-GFS-Q1; natural mortalities set at 0.2.
Discards and bycatch	Discards are not included and are assumed negligible.
Indicators	None.
Other information	None.
Working group report	North-Western Working Group (NWWG ; ICES, 2015b).

Information from stakeholders

There is no available information.

History of advice, catch, and management

Table 4.3.3.7 Haddock in Division Vb (Faroes grounds). History of ICES advice, the agreed TAC, and ICES estimates of landings.

Fishing year*	ICES advice	Predicted catch corresp. to advice	Agreed TAC	ICES catch
1987	No increase in F	17		14.9
1988	No increase in F	18		12.2
1989	No increase in F	11		14.3
1990	No increase in F	11		11.7
1991	TAC	11		8.4
1992	TAC	13–15		5.5
1993	Reduction in F	8		4.0
1994	No fishing	0	6.2	4.3
1995	No fishing	0	6.2	4.9
1996	TAC	8.3	12.6	9.6
1997	F = F(95)	9.3		17.9
1998	F = F(96)	16		22.2
1999	F < proposed F_{pa} (0.25)	9		18.5
2000	F < proposed F_{pa} (0.25)	22		15.8
2001	F < proposed F_{pa} (0.25)	20		15.9
2002	No fishing	0		24.9
2003	F < proposed F_{pa} (0.25)	12		26.9
2004	F < proposed F_{pa} (0.25)	21		23.1
2005	F < proposed F_{pa} (0.25)	19		20.3
2006	F < proposed F_{pa} (0.25)	18		17.2
2007	F < 0.20	16		12.6
2008	F_{pa}	14		7.3
2009	No fishing and recovery plan	0		5.2
2010	No fishing and recovery plan	0		5.2
2011	No direct fishing; minimize bycatch, implement recovery plan	0		3.5
2012	No direct fishing; minimize bycatch, implement recovery plan	0		2.6
2013	No direct fishing; minimize bycatch, implement recovery plan	0		3.0
2014	No direct fishing; minimize bycatch, implement recovery plan	0		3.2
2015	No direct fishing; minimize bycatch, implement recovery plan	0		
2016	No direct fishing; minimize bycatch, implement recovery plan	0		

Weights in thousand tonnes.

* The fishing year runs from 1 September to 31 August the following year.

History of catch and landings

Table 4.3.3.8 Haddock in Division Vb. Catch distribution by fleet in 2014 as estimated by ICES.

Total catch (2014)	Commercial landings		Commercial discards
	82% longliners	18% trawlers	
3.2 kt	3.2 kt		0 kt

Table 4.3.3.9 Haddock in Division Vb. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery.

Year	Belgium	Denmark	England	Faroe Islands	France	Germany	Island	Netherland	Nnonway	Portugal	Scotland	Spain	Total	Others
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	8	0	0	0	0	8	8
1904	0	0	0	0	0	0	0	6	0	0	1046	0	1052	6
1905	23	0	0	0	0	0	0	66	0	0	851	0	940	89
1906	23	0	9713	0	0	0	0	155	0	0	1118	0	11009	178
1907	11	0	8653	0	0	0	0	279	0	0	1192	0	10135	290
1908	0	0	5494	0	0	0	0	190	0	0	767	0	6451	190
1909	14	0	7397	0	0	0	0	242	0	0	559	0	8212	256
1910	0	0	6697	0	0	0	0	40	0	0	635	0	7372	40
1911	24	0	5990	0	0	0	0	18	0	0	529	0	6561	42
1912	0	0	7500	0	0	0	0	0	0	0	1334	0	8834	0
1913	0	0	7935	0	0	0	0	36	0	0	1675	0	9646	36
1914	0	0	5301	0	0	0	0	2	0	0	2282	0	7585	2
1915	0	0	2359	0	0	0	0	0	0	0	1796	0	4155	0
1916	0	0	0	0	0	0	0	0	0	0	1447	0	1447	0
1917	0	0	0	0	0	0	0	0	0	0	557	0	557	0
1918	0	0	0	0	0	0	0	0	0	0	217	0	217	0
1919	0	0	6040	0	0	0	0	0	0	0	3519	0	9559	0
1920	0	0	2657	0	0	0	0	0	0	0	1010	0	3667	0
1921	0	0	1812	0	0	0	0	0	0	0	380	0	2192	0
1922	0	0	3808	0	0	0	0	6	0	0	1900	0	5714	6
1923	0	0	5688	0	0	37	0	0	0	0	1982	0	7707	37
1924	0	0	7639	0	0	0	0	0	0	0	1547	0	9186	0
1925	0	0	6289	0	0	0	0	0	0	0	1251	0	7540	0
1926	0	0	6567	0	0	0	0	17	0	0	2057	0	8641	17
1927	0	0	7515	0	0	0	0	0	0	0	2025	0	9540	0
1928	1	0	8240	0	4	8	0	17	0	0	1438	0	9708	26
1929	0	0	6662	0	0	3	0	0	0	0	905	0	7570	3
1930	0	3	7294	0	0	0	0	1	0	0	1718	0	9016	4
1931	0	2	9188	3	0	0	0	0	0	0	2382	0	11575	2
1932	0	0	12065	10	0	0	0	86	0	0	2437	0	14598	86
1933	0	15	8595	1	0	0	0	0	0	0	2050	0	10661	15
1934	3	0	8591	2	0	0	0	0	0	0	1938	0	10534	3
1935	0	0	9796	1	0	0	0	0	0	0	2745	0	12542	0
1936	0	0	10422	21	0	0	5	0	0	0	3574	0	14022	5
1937	0	2	9539	81	0	0	0	0	0	0	3495	0	13117	2
1938	0	1	10885	145	0	0	0	0	0	0	3708	0	14739	1
1939	0	0	0	145	0	0	0	0	0	0	1907	0	1952	0
1940	0	0	0	0	0	0	0	0	0	0	3799	0	3799	0
1941	0	0	0	0	0	0	0	0	0	0	2353	0	2353	0
1942	0	0	0	0	0	0	0	0	0	0	3267	0	3267	0
1943	0	0	0	0	0	0	0	0	0	0	5099	0	5099	0
1944	0	0	0	0	0	0	0	0	0	0	3770	0	3770	0
1945	0	0	0	0	0	0	0	0	0	0	2546	0	2546	0
1946	0	0	8533	0	0	0	0	0	0	0	5277	0	13810	0
1947	0	0	6009	0	0	0	0	0	0	0	6522	0	12531	0
1948	0	0	3568	0	0	0	0	0	0	0	6511	0	10079	0
1949	0	0	3126	0	0	0	0	0	0	0	6679	0	9805	0
1950	0	0	3935	0	0	0	0	0	0	0	8048	0	11983	0
1951	0	0	6465	0	0	0	0	0	0	0	7944	0	14409	0
1952	0	0	7535	83	0	0	0	0	0	0	6653	0	14271	0
1953	0	0	5820	2788	0	0	0	0	0	0	6404	0	15012	0
1954	0	0	5925	2654	0	1	0	0	0	0	6832	0	15412	1
1955	0	0	5008	3865	0	33	0	0	0	0	7667	0	16573	33
1956	0	0	5762	4221	0	20	0	0	0	0	7512	0	17515	20
1957	0	0	6902	4453	0	38	0	0	0	0	9602	0	20995	38
1958	0	0	7429	6850	0	19	0	0	0	0	9573	0	23871	19
1959	0	0	5339	5670	0	10	0	0	0	0	9220	0	20239	10
1960	0	0	7006	7772	0	6	0	0	0	0	10943	0	25727	6

1961	0	0	2643	8454	0	22	0	0	0	0	9590	0	20709	22
1962	0	0	3766	7042	166	18	0	0	0	0	16159	0	27151	18
1963	0	0	4655	6336	792	20	0	0	0	0	15766	0	27569	20
1964	0	0	3442	6952	1866	33	0	0	111	0	7087	0	19491	33
1965	0	0	3385	6673	1939	15	0	0	40	0	6355	0	18407	15
1966	0	0	2867	6902	2717	36	0	0	0	0	6240	0	18762	36
1967	0	8	2347	5246	1091	24	0	0	0	0	4656	0	13372	32
1968	0	0	2445	6751	2286	36	0	0	0	0	6339	0	17857	36
1969	0	0	1976	11122	3387	0	0	0	0	0	6815	0	23300	0
1970	0	0	1137	11791	2006	14	0	0	0	0	6421	0	21369	14
1971	0	0	2323	10488	790	19	0	29	0	0	5762	0	19411	48
1972	0	0	3369	8314	2666	25	0	0	844	0	1267	0	16496	25
1973	0	0	2426	6018	3508	46	0	0	0	1190	4788	0	17976	1236
1974	0	0	1617	4811	1451	70	0	0	5	685	6072	52	14773	807
1975	0	0	2426	8757	2298	173	0	383	56	544	6078	0	20715	1100
1976	6	0	2284	12714	2542	22	0	175	20	448	8000	0	26211	651
1977	0	0	709	20079	700	49	0	26	57	5	3928	0	25555	80
1978	0	0	48	18182	71	8	0	0	130	0	761	0	19200	8
1979	0	0	35	11975	50	2	0	0	45	0	317	0	12418	2
1980	0	6	158	14323	31	4	0	0	17	0	477	0	15016	10
1981	0	0	0	11994	113	0	0	0	27	0	99	0	12233	0
1982	0	0	0	11852	2	1	0	0	13	0	48	0	11917	1
1983	0	0	0	12865	2	0	0	0	14	0	13	0	12894	0
1984	0	0	0	12343	20	0	0	0	15	0	0	0	12378	0
1985	0	0	0	15071	23	0	0	0	24	0	25	0	15143	0
1986	0	1	0	14409	8	1	0	0	32	0	26	0	14479	2
1987	0	8	2	14786	22	1	0	0	18	0	45	0	14891	9
1988	0	4	0	12027	14	0	0	0	97	0	15	0	12161	4
1989	0	0	0	14165	0	0	0	0	127	0	30	0	14322	0
1990	0	0	7	11431	0	0	0	0	191	0	0	0	11629	0
1991	0	0	0	8291	0	0	0	0	129	0	0	0	8420	0
1992	0	0	54	4993	164	0	0	0	94	0	149	0	5454	0
1993	0	0	81	3807	0	0	0	0	36	0	102	0	4026	0
1994	0	0	31	4028	0	0	0	0	23	0	170	0	4252	0
1995	0	0	23	4852	0	5	0	0	29	0	39	0	4948	0
1996	0	0	5	9490	0	0	0	0	85	0	62	0	9642	0
1997	0	0	22	17718	0	0	0	0	49	0	135	0	17924	0
1998	0	0	30	21945	2	0	0	0	131	0	102	0	22210	0
1999	0	0	59	17753	0	33	0	0	414	0	193	0	18482	30
2000	0	0	19	15821	6	1	0	0	403	0	185	0	16457	22
2001	0	0	4	15890	8	2	0	0	323	0	148	0	16375	0
2002	0	0	11	24933	2	6	4	0	255	0	177	0	25392	4
2003	0	0	14	27072	4	1	0	0	319	0	185	0	27595	0
2004	0	0	8	23101	1	6	0	0	246	0	186	49	23613	16 Russia
2005	0	0	1	20455	0	0	0	0	257	0	126	0	20839	0 Russia
2006	0	0	1	17154	12	1	0	0	58	0	106	0	17333	1 Greenland
2007	0	0	0	12631	4	0	0	0	69	0	50	0	12767	13 Greenland
2008	0	0	0	7388	3	0	0	0	26	0	65	0	7492	10 Russia
2009	0	0	0	5197	2	0	0	0	8	0	91	0	5305	7 Greenland
2010	0	0	73	5202	1	0	0	0	6	0	0	0	5294	12 Greenland
2011	0	0	0	3540	3	0	0	0	0	0	0	0	3543	0
2012	0	0	0	2613	0	0	3	0	0	0	0	0	2617	1 Greenland
2013	0	0	0	3079	0	0	26	0	0	0	0	0	3105	0
2014	0	0	0	2704	0	0	0	0	1915	0	424	0	5043	0

Faroe Plateau (Sub-division Vb1) HADDOCK. Nominal catches (tonnes) by countries, 2000-2014, as officially reported to ICES.													
	Faroe Islands	France**	Germany	Greenland	Iceland	Norway	Russia	Spain	UK (Engl. and Wales)	UK (Scotland) ^	United Kingdom	Total	Used in the assessment
2000	13,620 ^^	6	1	22 ^^		355			19			14,023	15,821
2001	13,457 ^^	8	2	0 ^^		257 *			4			13,728	15,890
2002	20,776 ^^	2	6	4 ***	4	227			11 ^			21,030	24,933
2003	21,615	4	1			265			14	185		22,084	27,072
2004	18,995	1 ^	6			229	16	49	8	186		19,490	23,101
2005	18,172	+				212			1	126		18,511	20,455
2006	15,600	12 ^	1	1		57			1	106		15,778	17,154
2007	11,689	4 ^		9 ***		61				35		11,798	12,631
2008	6,728	3 ^				26	10			60		6,827	7,388
2009	4,895	2 ^		6 ***		8				64		4,975	5,197
2010	4,932	1		12 ^^		5					73	5,023	5,202
2011	3,350	3		+								3,353	3,540
2012	2,490			1 ***		2						2,493	2,634
2013	2,877				26 ***							2,903	2,950
2014 *	2,704					2					424	3,130	3,194

* Preliminary, ** Including catches from Sub-division Vb2, *** Reported as Division Vb to the Faroese Coastal Guard Service, ^ Reported as Division Vb, ^^ Include Faroese landings reported to the NWWG by FaMRI.

Faroe Plateau (Sub-division Vb2) HADDOCK. Nominal catches (tonnes) by countries, 2000-2014, as officially reported to ICES.							
	Faroe Islands	France	Norway	UK (Engl. and Wales)	UK (Scotland)	Total	
2000	1,565 ^		48	**	185	1,798	
2001	1,948		66	**	148	2,162	
2002	3,698		28	**	177	3,903	
2003	4,934		54	**	***	4,988	
2004	3,594		17	**	**	3,611	
2005	2,444	+	45	**	**	2,489	
2006	1,375		1	***	***	1,376	
2007	810		8		15	833	
2008	556				5	561	
2009	192		3		27	222	
2010	178		1		33	212	
2011	194					194	
2012	141					141	
2013	47					47	
2014 *	63		1			64	

* Preliminary, ** Catches included in Sub-division Vb1, *** Reported as Division Vb, ^ Provided by the NWWG.

Summary of the assessment

Table 4.3.3.10 Haddock in Division Vb. Assessment summary.

Year	Recruitment (age 2)	SSB	Landings	Mean F Ages 4–8
	thousands	tonnes	tonnes	
1957	35 106	51 049	20 995	0.49
1958	39 212	51 409	23 871	0.627
1959	43 417	48 340	20 239	0.57
1960	35 763	51 101	25 727	0.71
1961	51 279	47 901	20 831	0.562
1962	38 537	52 039	27 151	0.651
1963	47 362	49 706	27 571	0.7
1964	30 110	44 185	19 490	0.475
1965	22 644	45 605	18 479	0.526
1966	20 203	44 027	18 766	0.529
1967	25 356	42 086	13 381	0.403
1968	54 851	45 495	17 852	0.438
1969	31 975	53 583	23 272	0.485
1970	35 600	59 957	21 361	0.476
1971	15 457	63 920	19 393	0.456
1972	33 213	63 133	16 485	0.396
1973	23 702	61 620	18 035	0.29
1974	52 333	64 629	14 773	0.221
1975	70 053	75 403	20 715	0.18
1976	55 971	89 217	26 211	0.248
1977	26 192	96 371	25 555	0.387
1978	35 098	97 226	19 200	0.278
1979	2 784	85 393	12 424	0.155

Year	Recruitment (age 2)	SSB	Landings	Mean F Ages 4–8
	thousands	tonnes	tonnes	
1980	4 944	81 895	15 016	0.178
1981	3 491	75 838	12 233	0.181
1982	15 834	56 798	11 937	0.331
1983	19 611	51 804	12 894	0.265
1984	40 751	53 809	12 378	0.229
1985	39 401	62 578	15 143	0.276
1986	26 463	65 566	14 477	0.224
1987	9 426	67 252	14 882	0.265
1988	18 745	61 848	12 178	0.201
1989	14 063	51 674	14 325	0.286
1990	9 366	43 625	11 726	0.273
1991	2 978	34 542	8 429	0.276
1992	2 671	26 845	5 476	0.211
1993	1 825	23 081	4 026	0.188
1994	6 417	21 455	4 252	0.207
1995	95 548	22 596	4 948	0.227
1996	45 021	49 415	9 642	0.32
1997	8 940	81 745	17 924	0.374
1998	3 731	81 550	22 210	0.532
1999	15 464	62 452	18 482	0.455
2000	21 253	52 293	15 821	0.28
2001	102 326	60 300	15 890	0.288
2002	60 025	84 291	24 933	0.301
2003	41 743	96 072	27 072	0.454
2004	27 881	86 212	23 101	0.407
2005	8 484	72 930	20 455	0.369
2006	7 667	58 263	17 154	0.349
2007	3 095	43 113	12 631	0.321
2008	2 587	30 308	7 388	0.23
2009	2 342	23 295	5 197	0.264
2010	5 024	17 988	5 202	0.377
2011	15 688	12 722	3 540	0.361
2012	3 137	14 946	2 634	0.289
2013	2 596	17 931	2 950	0.26
2014	8 872	16 479	3 194	0.285
2015	8 558	18 133		

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4.3.4 Saithe (*Pollachius virens*) in Division Vb (Faroes grounds)

ICES stock advice

ICES advises that when the MSY approach is applied, effort should be reduced such that fishing mortality in 2016 will be no more than $F_{MSY} = 0.30$, and catches in 2016 should be no more than 36 000 t.

Stock development over time

The spawning-stock biomass (SSB) has been above B_{pa} until 2011, slightly below in 2012 and 2013, and then increasing again to its present (2015) estimate well above B_{pa} (around 82 kt). Estimated recruitment in 2014 was well above average (61 million). Fishing mortality (F) has decreased from 2013 to 2014 and is estimated at 0.32; F is therefore slightly above the target fishing mortality.

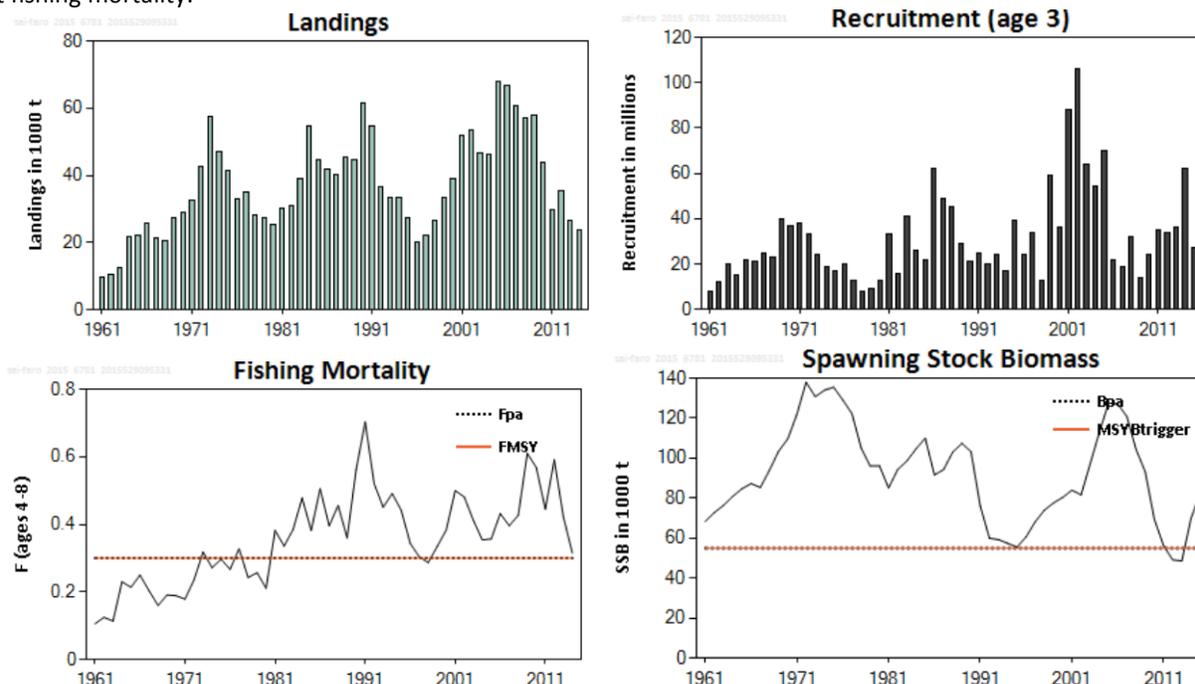


Figure 4.3.4.1 Saithe in Division Vb. Summary of stock assessment (weights in thousand tonnes).

Stock and exploitation status

Table 4.3.4.1 Saithe in Division Vb. State of the stock and fishery, relative to reference points.

		Fishing pressure			Stock size		
		2012	2013	2014	2013	2014	2015
Maximum Sustainable Yield	F_{MSY}	✘	✘	✘ Above F_{MSY}	MSY	✘	✔ Above trigger
Precautionary approach	F_{pa}	?	?	?	$B_{trigger}$	✔	✔ Full reproductive capacity
Management Plan	F_{MGT}	-	-	- Not applicable	B_{pa}	?	✔ Full reproductive capacity
					SSB_{MGT}	-	- Not applicable

Catch options

Table 4.3.4.2 Saithe in Division Vb. The basis for the catch options.

Variable	Value	Source	Notes
F ages 4–8 (2015)	0.31	ICES (2015a)	Average of last three years, scaled to the last year.
SSB (2016)	97 000 t	ICES (2015a)	
R _{age3} (2016)	27 mill.	ICES (2015a)	Geometric mean of last six years, excluding the last year.
R _{age3} (2017)	27 mill.	ICES (2015a)	Same as R _{age3} (2016)
Total catch (2015)	35 000 t	ICES (2015a)	

Table 4.3.4.3 Saithe in Division Vb. The catch options.

Rationale	F (2016)	Catch (2016)	Basis	SSB (2017)	% SSB change *
Zero catch	0	0	F = 0	138 kt	43%
MSY approach	0.30	36 kt	F _{MSY} (= F _{sq} × 0.97)	105 kt	9%
<i>Status quo</i>	0.31	37 kt	F _{sq}	104 kt	8%
	0.16	20 kt	F _{sq} × 0.50	120 kt	24%
	0.23	28 kt	F _{sq} × 0.75	113 kt	17%
	0.27	33 kt	F _{sq} × 0.90	108 kt	12%
	0.33	39 kt	F _{sq} × 1.1	103 kt	6%

Weights in thousand tonnes.

* SSB 2017 relative to SSB 2016.

Basis of the advice

Table 4.3.4.4 Saithe in Division Vb. The basis of the advice.

Advice basis	MSY approach.
Management plan	There is no management plan for this stock.

Quality of the assessment

The landings data are considered accurate. There are no incentives to discard fish under the current effort management system. The sampling of the landings is considered to be adequate. The assessment greatly overestimated the stock around 2010.

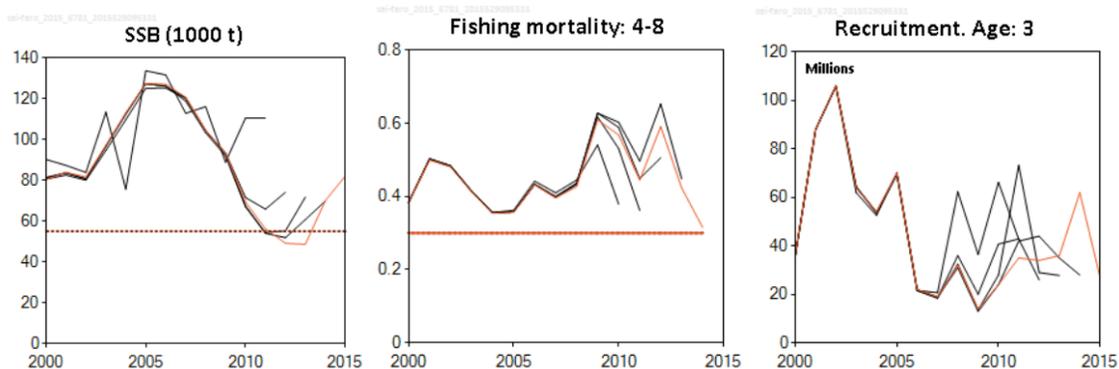


Figure 4.3.4.2 Saithe in Division Vb. Historical assessment results (final-year recruitment estimates included). Left panel: horizontal line shows MSY B_{trigger} = B_{pa} = 55 000 t. Middle panel: horizontal line represents F_{MSY} = 0.30 = F_{PA} = 0.30.

Issues relevant for the advice

An effort management system has been used since 1996. The Faroese Parliament decides the number of allocated fishing days for each new fishing season. In the 2013/2014 fishing year the number of used fishing days for the pair-trawl fleet was only around half or less of the allocated days. In this situation, with surplus days, effort control is unlikely to be effective.

Reference points

Table 4.3.4.5 Saithe in Division Vb. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	55 000 t	Breakpoint in segmented regression.	ICES (2011)
	F_{MSY}	0.30	Stochastic simulations (ICES, 2014c). Consistent with 2014 estimate of $F_{med} = 0.31$.	ICES (2014b, 2014c)
Precautionary approach	B_{lim}	Not defined.		
	B_{pa}	55 000 t	B_{loss} in 2011.	ICES (1998)
	F_{lim}	Not defined.		
Management plan	F_{pa}	0.30	Consistent with 2013 estimate of F_{med} .	ICES (2014d)
	SSB_{MGT}	Not defined.		
	F_{MGT}	Not defined.		

Basis of the assessment

Table 4.3.4.6 Saithe in Division Vb. The basis of the assessment.

ICES stock data category	1 (ICES, 2015b).
Assessment type	XSA with catch-at-age data, using catches in the model and in the forecast.
Input data	Commercial catches (mainly Faroese catches, ages and length frequencies from catch sampling); commercial indices: pair-trawler fleet; annual maturity data from FO-GFS-Q1; survey distribution from FO-GFS-Q1 and FO-GFS-Q3; natural mortalities set at $M = 0.2$.
Discards and bycatch	Discarding is assumed negligible.
Indicators	None.
Other information	A benchmark assessment was performed in 2010.
Working group	North-Western Working Group (NWVG).

Information from stakeholders

There is no available information.

History of advice, catch, and management

Table 4.3.4.7 Saithe in Division Vb. History of ICES advice, the agreed TAC, and ICES estimates of landings.

Year	ICES advice	Predicted catch corresp. to advice	Agreed TAC	ICES landings
1987	No increase in F	< 32		40
1988	No increase in F	< 32		45
1989	Reduction in F	< 40		44
1990	Reduction in F	< 41		62
1991	TAC	< 30		55
1992	Reduction in F	< 27		36
1993	Reduction in F	< 37		34
1994	TAC	< 26	42*	33
1995	TAC	< 22	39*	27
1996	TAC	< 39	-	20
1997	20% reduction in F from 1995 level	< 21	-	22
1998	30% reduction in effort from 1996/97 level	-	-	26
1999	F below F_{pa} (0.28)	< 14		33
2000	F below than F_{pa} (0.28)	< 15		39
2001	Reduce fishing effort to generate F well below F_{pa} (0.28)	< 17		52
2002	Reduce fishing effort to generate F below F_{pa} (0.28)	< 28		54
2003	Reduce fishing effort to generate F below F_{pa} (0.28)	< 47		47
2004	Reduce fishing effort to generate F below F_{pa} (0.28)	< 48		46
2005	Reduce fishing effort to generate F below F_{pa} (0.28)	< 32		68
2006	Reduce fishing effort to generate F below F_{pa} (0.28)	< 24		67
2007	Average catch considerations	40		61
2008	Do not increase effort	-		57
2009	Reduce fishing effort by around 20%	-		58
2010	Reduce fishing effort by around 20%	-		44
2011	Reduce fishing effort to generate F below F_{pa} (0.28)	< 38		29
2012	Reduce fishing effort to generate F below F_{MSY} (0.28)	< 40		35
2013	$F < 0.28$	< 29.1		26
2014	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 29		24
2015	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 26		
2016	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 36		

Weights in thousand tonnes.

* In the quota year 1 September–31 August the following year.

The fishing year runs from 1 September to 31 August the following year.

History of catch and landings

Table 4.3.4.8 Saithe in Division Vb. Catch distribution by fleet in 2014 as estimated by ICES.

Total catch (2014)	Commercial landings			Commercial discards
24 kt	96% pair trawler	1% single trawler	3% jiggers and others	0 kt
	24 kt			

Table 4.3.4.9 Saithe in Division Vb. History of commercial catch and landings; both the official and ICES estimated values are presented for each country participating in the fishery.

Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Denmark	94	-	2	-	-	-	-	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-	-	-	16	-	-	-	-
Faroe Islands	44 402	43 624	59 821	53 321	35 979	32 719	32 406	26 918	19 267	21 721	25 995	32 439		49 676
France ***	313	-	-	-	120	75	19	10	12	9	17	-	273	934
Germany	-	-	-	32	5	2	1	41	3	5	-	100	230	667
German Dem.Rep.	-	9	-	-	-	-	-	-	-	-	-	-	-	-
German Fed. Rep.	74	20	15	-	-	-	-	-	-	-	-	-	-	5
Greenland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Netherlands	-	22	67	65	-	-	-	-	-	-	-	160	72	60
Norway	52	51	46	103	85	32	156	10	16	67	53	-	-	-
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	20	1
UK (Eng. & W.)	-	-	-	5	74	279	151	21	53	-	19	67	32	80
UK (Scotland)	92	9	33	79	98	425	438	200	580	460	337	441	534	708
USSR/Russia **	-	-	30	-	12	-	-	-	18	28	-	-	-	-
Total	45 027	43 735	60 014	53 605	36 373	33 532	33 171	27 200	19 949	22 306	26 065	33 207	1 161	52 131
Working Group estimate ^^^	45 285	44 477	61 628	54 858	36 487	33 543	33 182	27 209	20 029	22 306	26 421	33 207	39 020	51 786
Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*	
Denmark	-	-	-	-	34	-	-	-	-	-	-	-	-	
Estonia	-	-	-	-	-	-	-	-	-	-	-	-	-	
Faroe Islands	55 165	47 933	48 222	71 496	70 696	64 552	61 117	61 889	46 686	32 056	38 175	28 609	25 440	
France	607	370	147	123	315	108	97	68	46	135	40	31	0	
Germany	422	281	186	1	49	3	3	0						
Greenland	125	-			73	239	0	1			1			
Ireland	-	-	-	-	-	-	-	-						
Iceland	-	-	-	-	-	-	-	148	-					
Netherlands	0	0	0	0	0	3	0	0	0					
Norway	77	62	82	82	35	81	38	23	28				165	
Portugal	-	-	5	-	-	-	-	-						
Russia	10	32	71	210	104	159	38	44	3			1		
UK (E/W/NI)	58	89	85	32	88	4	-	-						
UK (Scotland)	540	610	748	4 322	1 011	408	400	685						
United Kingdom	-	-	-	-	-	-	-	-	706	19		1	340	
Total	57 004	49 377	49 546	76 266	72 405	65 557	61 693	62 858	47 469	32 210	38 216	28 642	25 945	
Working Group estimate ^,^^,>>>	53 546	46 555	46 355	67 967	66 902	60 785	57 044	57 949	43 885	29 658	35 314	26 463	23 854	

* Preliminary.

** As from 1991.

*** Quantity unknown 1989–1991.

^ Includes catches from Subdivision Vb₂ and Division IIa in Faroese waters.

^^ Includes French, Greenlandic, and Russian catches from Division Vb, as reported to the Faroese coast guard.

> Includes Faroese, French, and Greenlandic catches from Division Vb, as reported to the Faroese coast guard.

>> The 2001–2008 catches from Faroe Islands, as stated from the Faroese coast guard, have been corrected to be consistent with procedures used in previous years.

Summary of the assessment

Table 4.3.4.10 Saithe in Division Vb. Assessment summary.

Year	Recruitment (age 3)	SSB	Landings	Mean F Ages 4–8
	thousands	tonnes	tonnes	
1961	7 827	68 467	9 592	0.106
1962	12 256	72 862	10 454	0.125
1963	19 837	76 441	12 693	0.114
1964	14 811	80 928	21 893	0.23
1965	22 362	84 690	22 181	0.214
1966	21 229	87 313	25 563	0.25
1967	24 897	85 361	21 319	0.204
1968	22 879	93 938	20 387	0.16
1969	39 798	103 452	27 437	0.191
1970	37 092	109 688	29 110	0.189
1971	38 446	121 969	32 706	0.179
1972	33 424	137 956	42 663	0.236
1973	23 621	130 735	57 431	0.318
1974	19 420	134 009	47 188	0.272
1975	17 327	135 484	41 576	0.297
1976	19 709	129 099	33 065	0.267
1977	13 106	122 227	34 835	0.328
1978	8 332	105 216	28 138	0.243
1979	8 686	96 036	27 246	0.257
1980	13 075	96 216	25 230	0.211
1981	33 145	85 056	30 103	0.382
1982	15 676	94 389	30 964	0.336
1983	40 830	98 639	39 176	0.385
1984	26 075	104 707	54 665	0.478
1985	22332	110 005	44 605	0.382
1986	61 856	91 583	41 716	0.505
1987	48 619	94 297	40 020	0.396
1988	44 854	103 005	45 285	0.456
1989	28 601	107 398	44 477	0.36
1990	20 712	103 216	61 628	0.562
1991	24 971	76 177	54 858	0.703
1992	19 572	59 993	36 487	0.52
1993	23 780	59 260	33 543	0.451
1994	16 877	57 407	33 182	0.491
1995	38 973	55 521	27 209	0.442
1996	24 356	60 584	20 029	0.344
1997	33 517	68 222	22 306	0.304
1998	12 756	74 050	26 421	0.287
1999	58 813	77 635	33 207	0.335
2000	35 840	80 387	39 020	0.383
2001	88 038	83 993	51 786	0.5
2002	105902	81 692	53 546	0.481
2003	64 250	97 221	46 555	0.413
2004	53 951	112 980	46 355	0.354
2005	69 984	127 585	67 967	0.357
2006	22 222	127 123	66 902	0.432
2007	18 880	120 818	60 785	0.396

Year	Recruitment (age 3)	SSB	Landings	Mean F Ages 4–8
	thousands	tonnes	tonnes	
2008	31 507	104 362	57 044	0.427
2009	13 723	93 278	57 949	0.61
2010	24 290	69 401	43 885	0.568
2011	34 720	56 238	29 658	0.445
2012	34 439	49 174	35 314	0.591
2013	35 951	48 637	26 463	0.423
2014	61 619	70 026	23 854	0.315
2015	26 993	82 089		

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