ICES International Council for the Exploration of the Sea
CIEM Conseil International pour l'Exploration de la Mer

Saithe (*Pollachius virens*) in Division 5.b (Faroes grounds)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2022 should be no more than 37 444 tonnes. ICES is not in a position to advise on the corresponding level of fishing effort.

Stock development over time

ICES assesses that fishing pressure on the stock is above F_{MSY} and F_{pa} and below F_{lim}, while spawning-stock size is above MSY $B_{trigger}$, B_{pa}, and B_{lim}.
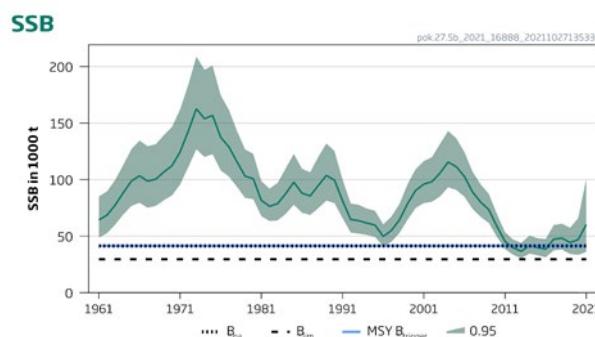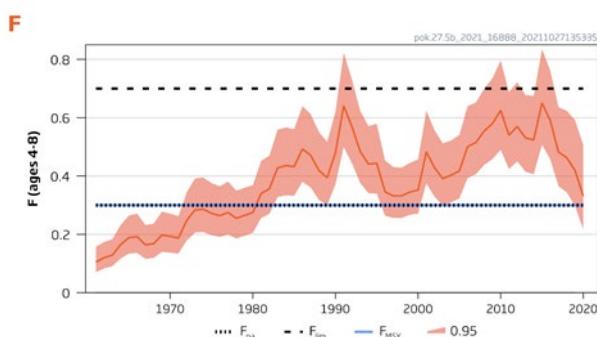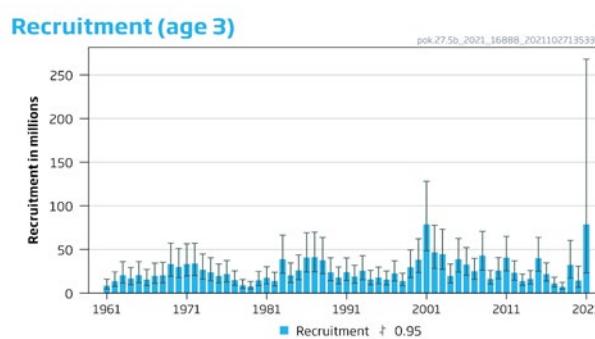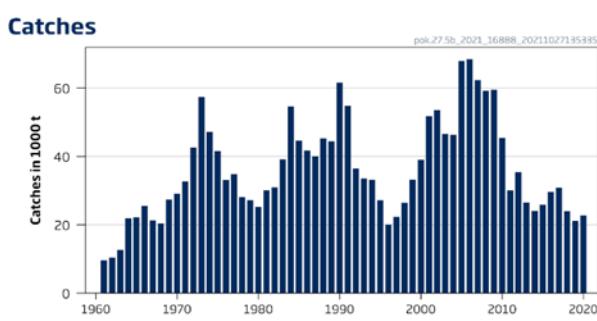

Figure 1 Saithe in Division 5.b (Faroes grounds). Summary of the stock assessment. Catches, recruitment, fishing mortality (F), and spawning-stock biomass (SSB).

Catch scenarios

Table 1 Saithe in Division 5.b (Faroes grounds). Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{ages\ 4–8}$ (2021)	0.20	Based on catch estimate of 15663 tonnes in 2021
SSB (2022)	89084	Based on F = 0.20; tonnes
$R_{age\ 3}$ (2022 and 2023)	14498	Median of resampled estimates 2016–2020; thousands
Landings (2021)	15663	Catch estimate for 2021 based on catch statistics to the end of September extrapolated to the entire year; tonnes
Discards (2021)	0	Discard is considered negligible; tonnes

Table 2   Saithe in Division 5.b (Faroes grounds). Annual catch scenarios. All weights are in tonnes.

Basis	Catch (2022)	F_{4-8} (2022)	SSB 2023	% SSB change*	% advice change**
ICES advice basis					
MSY approach: F_{MSY} = 0.30	37444	0.30	110756	24%	37%
Other scenarios					
F = 0	0	0	140946	58%	-100%
F = F_{2021}	26037	0.20	119854	35%	-4.9%
F = F_{pa}	37444	0.30	110756	24%	37%
F = F_{lim}	74675	0.70	80522	−10%	173%

* SSB (2023) relative to SSB (2022) (89 084 tonnes).
** Advice value for 2022 relative to the advice value for 2021 as issued in 2020 (27 368 tonnes).

The catch advice for 2022 is higher compared to the advice for 2021 due to the higher estimate of biomass.

Basis of the advice

**Table 3**   Saithe in Division 5.b (Faroes grounds). The basis of the advice.

| Advice basis	MSY approach
Management plan	A management plan (Anon., 2019) was implemented in 2021, but ICES has not been requested to evaluate it

Quality of the assessment

There is a tendency for the assessment to result in overestimates of biomass and underestimates of fishing mortality which may indicate model or data issues. The estimate of F in 2019 has been revised upwards in the 2021 assessment compared to the assessment conducted in 2020.

The estimate of recruitment in 2021 is the second highest in the time-series, and it is associated with very large confidence intervals.
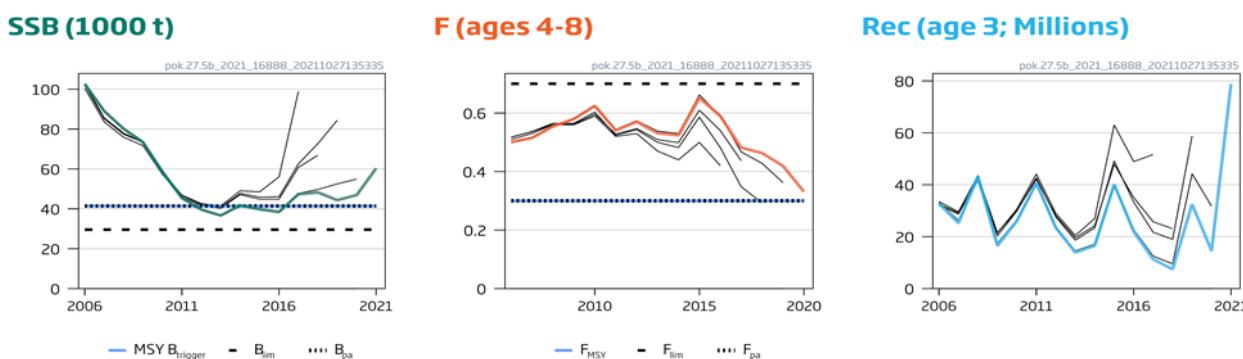
Figure 2   Saithe in Division 5.b (Faroes grounds). Historical assessment results. Results of the last five assessments are plotted, with the solid coloured line representing the current assessment.

Issues relevant for the advice

In 2021 the Faroese authorities implemented a management plan (Anon., 2019) with a control rule that regulates the number of fishing days for cod, haddock, and saithe in the Faroe Plateau fishery. The management plan has not been evaluated by ICES and therefore ICES bases its advice on the MSY approach.

ICES cannot quantify the relationship between effort and F for this stock.

Reference points

Table 4   Saithe in Division 5.b (Faroes grounds). Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	41400	B_{loss} (SSB in 2013).	ICES (2017)
	F_{MSY}	0.30	Stochastic simulations, capped by F_{P05}	ICES (2017)
Precautionary approach	B_{lim}	29571	B_{pa}/1.4	ICES (2017)
	B_{pa}	41400	B_{loss}	ICES (2017)
	F_{lim}	0.70	Stochastic simulations; the F that gives a 50% probability of SSB > B_{lim}.	ICES (2017)
	F_{pa}	0.30	F_{P05}, stochastic simulations (ICES, 2017): the F that leads to SSB ≥ B_{lim} with 95% probability	ICES (2017, 2020)*
Management plan	SSB_{mgt}	Not applicable		
	F_{mgt}	Not applicable		

* In 2020 both the technical basis and the value of F_{pa} were revised.

Basis of the assessment

Table 5   Saithe in Division 5.b (Faroes grounds). Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2021a)
Assessment type	State-space model (SAM) using catches in the model and in the forecast (ICES, 2021b)
Input data	Commercial catches (mainly Faroese catches, ages and length frequencies from catch sampling); Faroese bottom-trawl surveys FO-GFS-Q1 (G1264) and FO-GFS-Q3 (G3284); annual maturity data from FO-GFS-Q1 (G1264); natural mortality set at M = 0.2
Discards and bycatch	Discarding is considered negligible
Indicators	None
Other information	A benchmark assessment was performed in 2017 (WKFAROE; ICES, 2018)
Working group	North-Western Working Group (NWWG)

History of the advice, catch, and management

Table 6   Saithe in Division 5.b (Faroes grounds). ICES advice, TACs, and catch. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Agreed TAC*	ICES catch
1987	No increase in F	< 32000		40020
1988	No increase in F	< 32000		45285
1989	Reduction in F	< 40000		44477
1990	Reduction in F	< 41000		61628
1991	TAC	< 30000		54858
1992	Reduction in F	< 27000		36487
1993	Reduction in F	< 37000		33543
1994	TAC	< 26000	42000 **	33182
1995	TAC	< 22000	39000 **	27209
1996	TAC	< 39000	-	20029
1997	20% reduction in F from 1995 level	< 21000	-	22306
1998	30% reduction in effort from 1996/1997 level	-	-	26421
1999	F below F_{pa} (0.28)	< 14000		33207
2000	F below than F_{pa} (0.28)	< 15000		39020
2001	Reduce fishing effort to generate F well below F_{pa} (0.28)	< 17000		51786
2002	Reduce fishing effort to generate F below F_{pa} (0.28)	< 28000		53546
2003	Reduce fishing effort to generate F below F_{pa} (0.28)	< 47000		46555
2004	Reduce fishing effort to generate F below F_{pa} (0.28)	< 48000		46355

Year	ICES advice	Catch corresponding to advice	Agreed TAC*	ICES catch
2005	Reduce fishing effort to generate F below F_{pa} (0.28)	< 32000		67967
2006	Reduce fishing effort to generate F below F_{pa} (0.28)	< 24000		68465
2007	Average catch considerations	40000		62351
2008	Do not increase effort	-		57044
2009	Reduce fishing effort by around 20%	-		59558
2010	Reduce fishing effort by around 20%	-		45441
2011	Reduce fishing effort to generate F below F_{pa} (0.28)	< 38000		30084
2012	Reduce fishing effort to generate F below F_{MSY} (0.28)	< 40000		35448
2013	F < 0.28	< 29100		26539
2014	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 29000		24103
2015	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 26000		25900
2016	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 36000		29671
2017	MSY approach (F ≤ 0.30)	≤ 46000		30853
2018	MSY approach (F ≤ 0.30)	≤ 35003		24019
2019	MSY approach	≤ 23967		21109
2020	MSY approach	≤ 35636		22773
2021	MSY approach	≤ 27368		
2022	MSY approach	≤ 37444		

* Not applicable since 1997.
** 1 September in the quota year to 31 August the following year.

History of the catch and landings

Table 7   Saithe in Division 5.b (Faroes grounds). Catch distribution by fleet as estimated by ICES. All weights are in tonnes.

Catch (2020)	Landings		Discards
22773	Pair trawls 95%	Other gears 5%	Negligible
	22773		

Table 8 Saithe in Division 5.b. History of commercial catch and landings; official catches by country and ICES estimated catches are presented. All weights are in tonnes.

Year	Denmark	Estonia	Faroe Islands	France	Germany##	Greenland	Ireland	Netherlands	Norway	Portugal	UK	USSR/Russian Fed. ***	Greenland	Iceland	Total	ICES estimate ^,^^,^^^,#
1989			43624	**	29			22	51		9				43735	44477
1990	2		59821	**	15			67	46		33		30		60014	61628
1991			53321	**	32			65	103		84				53605	54858
1992			35979	120	5				85		172	12			36373	36487
1993			32719	75	2				32		704				33532	33543
1994			32406	19	1				156		589				33171	33182
1995			26918	10	41				10		221				27200	27209
1996			19267	12	3				16		633		18		19949	20029
1997		16	21721	9	5				67		460		28		22306	22306
1998			25995	17					53		356				26065	26421
1999			32439		100		0	160			508				33207	33207
2000			*	273	230		0	72		20	566				1161	39020
2001			49676	934	672		0	60		1	788				52131	51786
2002			55165	607	547		0	77		10	598				57004	53546
2003			47933	370	281		0	62		32	699				49377	46555
2004			48222	147	186			0	82	5	833	71			49546	46355
2005			71496	123	1			0	82		4354	210			76266	67967
2006	34		72169	315	49	73		0	35		1099	104	73		73878	68465
2007			66319	108	3	239		3	81		412	160	239		67325	62351
2008			63424	97	3	0		0	38		400	38	0		64000	59243
2009			63339	68	0	1		0	23		685	44	1	148	64308	59558
2010			48279	46				0	28		706	3			49062	45441
2011			32357	135							19				32511	30084
2012			38278	40		1								1	38319	35448
2013			28655	31							1	1			28688	26539
2014			25655	28					4		340				26027	24103
2015			27496	122					40		304				27962	25900

Year	Denmark	Estonia	Faroe Islands	France	Germany##	Greenland	Ireland	Netherlands	Norway	Portugal	UK	USSR/Russian Fed. ***	Greenland	Iceland	Total	ICES estimate ^, ^^, ^^^, #
2016			30849	336				1	198		601				31985	29671
2017			32966	40					27		292				33325	30853
2018			25823	0		1			15		217			1	26056	24119
2019			22698						38		73			2	22811	21109
2020			24217						35		337				24589	22773

* No official catches reported.
** Quantity unknown 1989–1991.
*** Catches up to 1990 are from USSR and from the Russian Federation since 1991.
^ The 2001–2008 catches from Faroe Islands, as stated by the Faroese coast guard, have been corrected to be consistent with procedures used in previous years.
^^ Includes catches from Subdivision 5.b.2 and Division 2.a in Faroese waters.
^^^ Includes French, Greenlandic, and Russian catches from Division 5.b, as reported to the Faroese coast guard.
# Includes Faroese, French, and Greenlandic catches from Division 5.b, as reported to the Faroese coast guard.
Catches from Germany in 1989 and 1990 are sum of cathes from the German Democratic Republic and the German Federal Republic

Summary of the assessment

Table 9   Saithe in Division 5.b (Faroes grounds). Assessment summary. Weights are in tonnes, recruitment in thousands.

Year	Recruitment			SSB			Catches	F		
	Age 3	97.5 percentile	2.5 percentile	SSB	97.5 percentile	2.5 percentile		Mean F (ages 4–8)	97.5 percentile	2.5 percentile
1961	8643	16030	4661	64278	84991	48613	9592	0.105	0.158	0.070
1962	13775	24447	7762	68566	89588	52477	10454	0.120	0.174	0.083
1963	20527	36150	11655	77425	99647	60158	12693	0.129	0.184	0.091
1964	16837	29423	9635	88327	112968	69061	21893	0.165	0.23	0.117
1965	20715	36181	11860	98654	126956	76662	22181	0.189	0.27	0.134
1966	15505	27176	8846	103409	134517	79495	25563	0.192	0.27	0.136
1967	19788	34527	11341	98651	129565	75114	21319	0.164	0.23	0.116
1968	20388	35304	11774	100367	131308	76717	20387	0.168	0.24	0.119
1969	33304	57270	19367	106736	139310	81779	27437	0.198	0.28	0.140
1970	30123	51304	17687	112261	146586	85974	29110	0.193	0.27	0.137
1971	33503	56610	19828	124526	162177	95616	32706	0.188	0.26	0.134
1972	34041	57182	20264	142683	183766	110784	42663	0.25	0.34	0.179
1973	26788	44904	15980	162637	208747	126713	57431	0.28	0.39	0.21
1974	24011	40534	14223	153868	197254	120025	47188	0.29	0.40	0.21
1975	19773	33423	11697	156771	200821	122383	41576	0.27	0.38	0.197
1976	21990	37379	12937	137380	174618	108083	33065	0.26	0.37	0.191
1977	15070	25559	8885	128961	161892	102729	34835	0.28	0.38	0.199
1978	9219	15612	5444	115725	143175	93538	28138	0.26	0.35	0.186
1979	7886	13386	4646	103021	126707	83763	27246	0.27	0.36	0.195
1980	14817	25043	8767	100796	122837	82710	25230	0.28	0.37	0.21
1981	17848	30294	10516	81676	98705	67584	30103	0.34	0.45	0.26
1982	14064	23875	8284	76353	92045	63336	30964	0.36	0.47	0.27
1983	38943	66445	22824	78741	97037	63895	39176	0.43	0.56	0.33
1984	20487	34655	12111	87601	110067	69720	54665	0.44	0.57	0.33
1985	26063	43833	15497	97713	122785	77760	44605	0.43	0.56	0.33
1986	40912	69202	24188	88049	109663	70696	41716	0.49	0.64	0.38
1987	41413	69925	24526	85551	106550	68690	40020	0.47	0.61	0.36
1988	37757	63828	22334	94659	119986	74678	45285	0.42	0.55	0.32
1989	24080	40574	14291	103672	132029	81406	44477	0.39	0.52	0.30
1990	17874	30043	10634	99641	125335	79214	61628	0.48	0.62	0.37
1991	24166	40355	14472	81219	100250	65801	54858	0.64	0.82	0.50
1992	19128	31906	11468	64738	78902	53117	36487	0.57	0.73	0.44
1993	25634	42882	15323	63658	77659	52182	33543	0.48	0.62	0.38
1994	15852	26194	9593	61567	74393	50952	33182	0.44	0.57	0.34
1995	17972	29891	10805	59737	72452	49254	27209	0.44	0.58	0.34
1996	15484	25399	9439	49742	60471	40918	20029	0.35	0.45	0.26
1997	22729	37048	13944	54950	67303	44865	22306	0.33	0.43	0.26
1998	14021	22908	8582	64367	78552	52743	26421	0.33	0.43	0.26
1999	29761	49576	17865	78723	96083	64500	33207	0.35	0.45	0.27
2000	38328	62327	23570	90452	109286	74865	39020	0.35	0.46	0.27
2001	78929	128159	48609	96009	116392	79197	51786	0.48	0.62	0.38
2002	46907	77732	28306	98139	119878	80342	53546	0.43	0.56	0.33
2003	44712	73217	27304	105892	131679	85154	46555	0.39	0.51	0.30
2004	19715	33410	11634	115508	143106	93232	46355	0.40	0.52	0.31
2005	38919	62683	24164	111374	136540	90846	67967	0.42	0.54	0.32
2006	32742	52251	20517	102718	124362	84841	68465	0.50	0.64	0.39
2007	25217	39810	15973	89012	107099	73980	62351	0.52	0.65	0.41
2008	43191	70744	26369	80132	95778	67041	59243	0.55	0.70	0.44
2009	16460	26089	10385	73427	87497	61619	59558	0.58	0.74	0.46
2010	25965	40852	16503	58594	69646	49296	45441	0.63	0.80	0.49
2011	40754	65023	25543	45371	53447	38516	30084	0.54	0.69	0.42

| Year | Recruitment | | | SSB | | | Catches | F | | |
	Age 3	97.5 percentile	2.5 percentile	SSB	97.5 percentile	2.5 percentile		Mean F (ages 4–8)	97.5 percentile	2.5 percentile
2012	23475	37020	14885	39614	47003	33386	35448	0.57	0.72	0.45
2013	13905	21902	8828	36675	44180	30445	26539	0.53	0.68	0.42
2014	16480	26058	10422	41739	50520	34484	24103	0.52	0.68	0.41
2015	40185	63907	25269	39882	48168	33022	25900	0.65	0.84	0.51
2016	21912	34800	13797	38492	47449	31226	29671	0.59	0.76	0.46
2017	11286	18254	6977	47312	59839	37408	30853	0.48	0.64	0.37
2018	7446	12440	4457	48242	61072	38107	24019	0.46	0.62	0.34
2019	32492	60435	17469	44350	57396	34269	21109	0.42	0.59	0.30
2020	14498	30851	6814	46920	65964	33374	22773*	0.33	0.51	0.22
2021	78889	268097	23213	60300	100848	36056				

* Preliminary.

Sources and references

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