

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

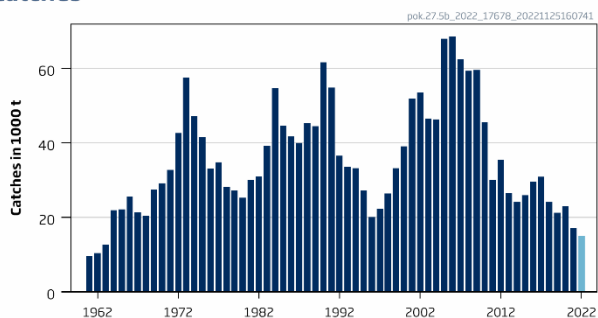
ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2023 should be no more than 17 843 tonnes. ICES is not in a position to advise on the corresponding level of fishing effort.

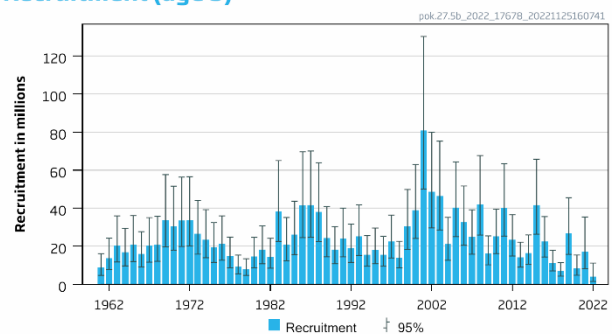
Stock development over time

Fishing pressure on the stock is below F_{MSY} and spawning-stocksize is above MSY $B_{trigger}$, B_{pa} , and B_{lim} .

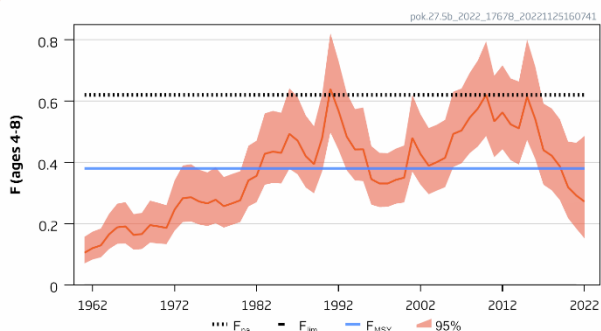
Catches



Recruitment (age 3)



F



SSB

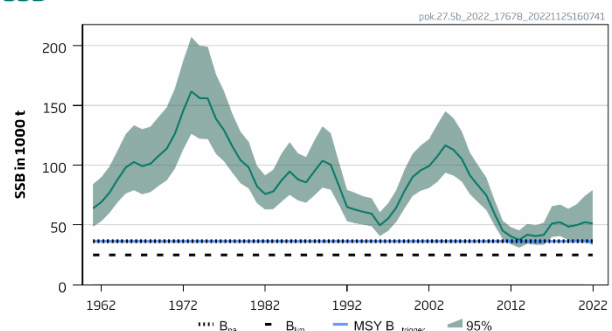


Figure 1 Saithe in Division 5.b (Faroes grounds). Summary of the stock assessment. The assessment produces an estimate of F in 2022. Catches in 2022 are assumed.

Catch scenarios

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

Variable	Value	Notes
$F_{ages\ 4-8}$ (2022)	0.27	Based on catch at age estimate of 14 173 tonnes in 2022
SSB (2023)	54411	Based on $F = 0.28$; in tonnes
$R_{age\ 3}$ (2023 and 2024)	11232	Median of resampled estimates 2017–2021; in thousands
Landings (2022)	14173	Catch estimate for 2022 based on catch statistics to the end of September extrapolated to the entire year; in tonnes
Discards (2022)	0	Discarding is considered negligible; in tonnes

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

Basis	Catch (2023)	F_{4-8} (2023)	SSB 2024	% SSB change*	% advice change**
ICES advice basis					
MSY approach: $F_{MSY} = 0.38$	17843	0.38	53319	-2.0	-52
Other scenarios					
$F = 0$	0	0	70241	29	-100
$F = F_{2022}$	13653	0.28	57111	5.0	-64
$F = F_{pa}$	26368	0.62	45148	-17.0	-30
$F = F_{lim}$	35988	0.98	35844	-34	-3.9

* SSB (2024) relative to SSB (2023) (54 411 tonnes).

** Advice value for 2023 relative to the advice value for 2022 as issued in 2021 (37 444 tonnes).

The catch advice for 2023 is lower compared to the advice for 2022 due to the lower 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.

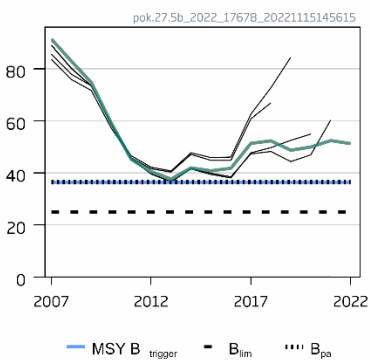
Quality of the assessment

There is a tendency for the assessment to result in overestimates of biomass and recruitment which may indicate model or data issues.

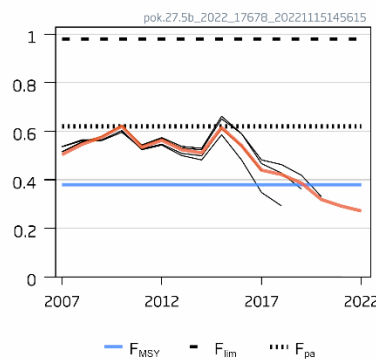
The estimate of recruitment in 2022 is the lowest in the time-series.

The plot does not show the line for fishing mortality that ends in 2021 because this year's assessment estimated fishing mortality in the current year (year y) while the last year in previous assessments was the last full calendar year (year y-1) (Figure 2).

SSB (1000 t)



F (ages 4-8)



Rec (age 3; Millions)

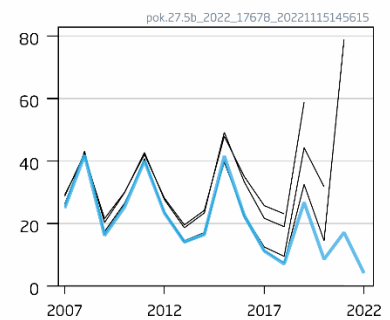


Figure 2 Saithe in Division 5.b (Faroes grounds). Historical assessment results. Results of the last five assessments are plotted, with the solid coloured line representing the current assessment.

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.

There have been a number of lower recruitments in the past 10 years.

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 $B_{trigger}$	36412	B_{loss} (SSB in 2013).	ICES (2022c)
	F_{MSY}	0.38	Stochastic simulations, capped by F_{P05}	ICES (2022c)
Precautionary approach	B_{lim}	24990	$B_{pa}/\exp(1.645 \times \sigma)$, where $\sigma = 0.228829$	ICES (2022c)
	B_{pa}	36412	B_{loss}	ICES (2022c)
	F_{lim}	0.98	Stochastic simulations; the F that gives a 50% probability of $SSB > B_{lim}$.	ICES (2022c)
	F_{pa}	0.62	F_{P05} , stochastic simulations (ICES, 2022): the F that leads to $SSB \geq B_{lim}$ with 95% probability	ICES (2022c)
Management plan	SSB_{mgt}	Not applicable		

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, 2022a)
Assessment type	State-space model (SAM) using catches in the model and in the forecast (ICES, 2022b)
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	An interbenchmark assessment was performed in 2022 (ICES, 2022c)
Working group	North-Western Working Group (NWVG)

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

Year	ICES advice	Catch corresponding to advice	Agreed TAC*	ICES catch
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
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		25899
2016	Reduce fishing effort to generate F below F_{MSY} (0.30)	< 36000		29672
2017	MSY approach ($F \leq 0.30$)	≤ 46000		30852
2018	MSY approach ($F \leq 0.30$)	≤ 35003		24046
2019 ***	MSY approach	≤ 23967		21179
2020	MSY approach	≤ 35636		22920
2021	MSY approach	≤ 27368		17038
2022	MSY approach	≤ 37444		
2023	MSY approach	≤ 17843		

* Not applicable since 1997.

** 1 September in the quota year to 31 August the following year.

*** Since 2019 fishing year equals to calendar year.

History of the catch and landings

Table 7 Saithe in Division 5.b (Faroes grounds). Catch distribution by fleet in 2021 as estimated by ICES.

Catch	Landings		Discards
	Pair trawls	Other gears	
17 038 tonnes	95%	5%	Negligible
	17 038 tonnes		

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 ##	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		0	35		1099	104	73		73878	68465
2007			66319	108	3		3	81		412	160	239		67325	62351
2008			63424	97	3		0	38		400	38	0		64000	59243
2009			63339	68	0		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		38319	35448
2013			28655	31						1	1			28688	26539
2014			25655	28				4		340				26027	24103
2015			27496	122				40		304				27961	25899

Year	Denmark	Estonia	Faroe Islands	France	Germany #	Ireland	Netherlands	Norway	Portugal	UK	USSR/Russian Fed. ***	Greenland	Iceland	Total	ICES estimate ^, #
2016			30849	336			1	198		601				31986	29672
2017			32966	40				27		291				33325	30852
2018			25692	27				40		214		1		25973	24046
2019			22764	5				40		71			0	22877	21179
2020			24334	20				38		352				24745	22920
2021			18045					10					3	18418	17038

* No official catches reported.

** Quantity unknown 1989–1991.

*** Catches up to 1990 are from USSR and from the Russian Federation since 1991.

^ Includes catches from Subdivision 5.b.2 and Division 2.a in Faroese waters, as reported to the Faroese Coast Guard.

Catches from Germany in 1989 and 1990 are sum of catches 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%	2.5%	Mean	97.5%	2.5%		Mean F ₄₋₈	97.5%	2.5%
1961	8713	16072	4724	63990	84260	48596	9592	0.105	0.157	0.070
1962	13775	24308	7806	69108	89932	53106	10454	0.120	0.174	0.083
1963	20537	35968	11726	76995	98800	60002	12693	0.129	0.184	0.090
1964	16905	29397	9722	88074	112321	69062	21893	0.165	0.23	0.117
1965	20820	36187	11978	98171	126093	76433	22181	0.188	0.27	0.134
1966	15869	27655	9105	102756	133506	79088	25563	0.191	0.27	0.135
1967	20186	35025	11634	99328	130181	75788	21319	0.163	0.23	0.115
1968	20780	35796	12063	101242	132257	77500	20387	0.166	0.24	0.117
1969	33665	57614	19671	107803	140462	82737	27437	0.195	0.28	0.138
1970	30435	51622	17944	113934	148496	87417	29110	0.191	0.27	0.135
1971	33483	56347	19897	126476	164365	97321	32706	0.186	0.26	0.133
1972	33815	56555	20219	145450	187109	113066	42663	0.25	0.34	0.177
1973	26475	44144	15878	161788	207309	126263	57431	0.28	0.39	0.21
1974	23427	39241	13987	156288	199992	122135	47188	0.29	0.39	0.21
1975	19343	32429	11537	155835	199164	121932	41576	0.27	0.38	0.197
1976	21361	35971	12685	138908	176160	109534	33065	0.27	0.37	0.192
1977	14742	24817	8757	129160	161719	103156	34835	0.28	0.38	0.20
1978	9153	15419	5433	115851	143143	93762	28138	0.26	0.35	0.187
1979	7949	13433	4704	104303	128059	84954	27246	0.27	0.36	0.196
1980	14695	24733	8730	98236	119707	80616	25230	0.28	0.37	0.21
1981	18182	30710	10765	82449	99600	68251	30103	0.34	0.45	0.26
1982	14340	24232	8486	75953	91594	62983	30964	0.36	0.47	0.27
1983	38299	65030	22556	78120	96259	63399	39176	0.43	0.56	0.33
1984	20856	35106	12390	87378	109834	69513	54665	0.44	0.57	0.33
1985	26092	43735	15566	94829	119356	75342	44605	0.43	0.56	0.33
1986	41356	69665	24550	88190	110068	70661	41716	0.49	0.64	0.38
1987	41650	70079	24754	85704	106903	68709	40020	0.47	0.61	0.36
1988	37932	63889	22520	94929	120590	74729	45285	0.42	0.55	0.32
1989	24351	40876	14506	103850	132604	81332	44477	0.39	0.52	0.30
1990	18121	30330	10826	100512	126887	79620	61628	0.48	0.62	0.37
1991	24074	40045	14472	82922	102773	66906	54858	0.64	0.82	0.50
1992	19110	31727	11510	65057	79511	53230	36487	0.57	0.73	0.44
1993	25097	41695	15106	62873	76870	51424	33543	0.48	0.63	0.37
1994	15613	25651	9503	61035	74025	50325	33182	0.44	0.57	0.34
1995	17910	29603	10835	59498	72444	48865	27209	0.44	0.58	0.34
1996	15480	25238	9494	49774	60715	40804	20029	0.35	0.45	0.26
1997	22413	36344	13822	55408	68103	45079	22306	0.33	0.43	0.25
1998	13910	22583	8567	64602	79264	52653	26421	0.33	0.43	0.26
1999	30259	49868	18360	78384	96201	63868	33207	0.34	0.45	0.27
2000	38981	62952	24137	90280	109623	74350	39020	0.35	0.46	0.27
2001	80739	130253	50047	95889	116717	78778	51786	0.48	0.62	0.37
2002	48695	79956	29657	99324	121872	80948	53546	0.43	0.56	0.33
2003	46349	75213	28562	107388	134020	86049	46555	0.39	0.51	0.30
2004	21098	35211	12642	116685	145262	93729	46355	0.40	0.52	0.31
2005	40197	64404	25089	112834	139343	91369	67967	0.42	0.54	0.32
2006	32538	51684	20485	105229	128254	86337	68465	0.49	0.63	0.39
2007	24911	39194	15834	91449	110474	75701	62352	0.50	0.64	0.40
2008	41837	67671	25866	82974	99805	68982	59243	0.55	0.69	0.43
2009	16167	25497	10252	74783	89617	62404	59557	0.58	0.73	0.45
2010	25235	39476	16132	59259	70799	49600	45441	0.62	0.80	0.49

Year	Recruitment			SSB			Catches	F		
	Age 3	97.5%	2.5%	Mean	97.5%	2.5%		Mean F ₄₋₈	97.5%	2.5%
2011	40021	63306	25300	45243	53549	38226	30083	0.53	0.68	0.42
2012	23359	36637	14894	40470	48221	33966	35448	0.56	0.72	0.44
2013	14100	22126	8986	37628	45563	31076	26539	0.52	0.67	0.41
2014	16493	25977	10471	41940	51097	34424	24103	0.51	0.66	0.39
2015	41595	65782	26302	40799	49735	33469	25899	0.62	0.80	0.47
2016	22574	35609	14311	41789	52045	33554	29672	0.54	0.71	0.41
2017	11232	17896	7050	51343	65737	40100	30852	0.44	0.59	0.33
2018	7051	11453	4341	52319	67153	40762	24046	0.42	0.58	0.31
2019	26764	45532	15732	48713	63581	37322	21179	0.39	0.54	0.28
2020	8594	15434	4785	49934	67351	37021	22920	0.32	0.47	0.22
2021	17110	35397	8270	52421	74353	36958	17038	0.29	0.46	0.184
2022	4111	11150	1515	51258	79463	33064	14945*	0.27	0.49	0.152

* Catch estimate based on catch statistics to the end of September extrapolated to the entire year.

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