

Saithe (*Pollachius virens*) in subareas 4 and 6, and in Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2020 should be no more than 88 093 tonnes.

Stock development over time

Spawning-stock biomass (SSB) has fluctuated without trend and has been above MSY $B_{trigger}$ since 1996. Fishing mortality (F) has decreased and stabilized at or below F_{MSY} since 2014. Recruitment (R) has shown an overall decreasing trend over time with lowest levels in the past 10 years.

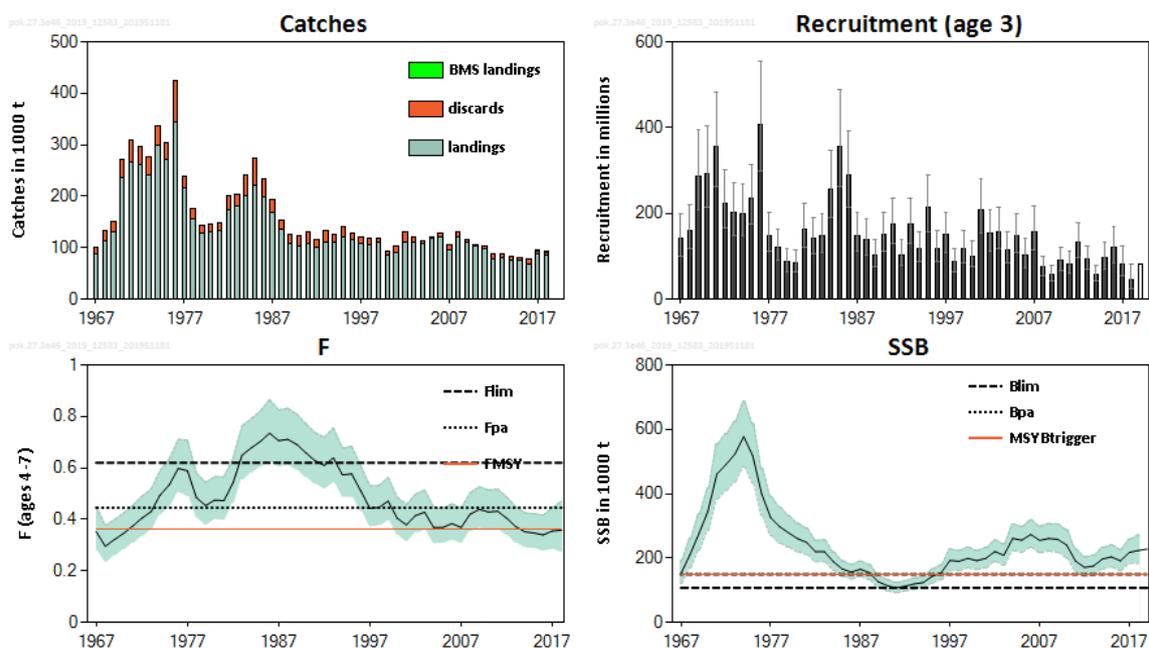


Figure 1 Saithe in subareas 4 and 6, and in Division 3.a. Summary of the stock assessment. Predicted recruitment values are not shaded. Shaded areas (F, SSB) and error bars (R) indicate 95% confidence intervals. Landings and discards are for ages 3-10+ only, as used in the assessment. The unshaded recruitment is the median recruitment re-sampled from the years 2009-2018.

Stock and exploitation status

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

Table 1 Saithe in subareas 4 and 6, and in Division 3.a. State of the stock and fishery relative to reference points.

	Fishing pressure			Stock size						
	2016	2017	2018	2017	2018	2019				
Maximum sustainable yield	F_{MSY}	✓	✓	✓	At F_{MSY}	MSY $B_{trigger}$	✓	✓	✓	Above trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—	—	Not applicable

Catch scenarios

Table 2 Saithe in subareas 4 and 6, and in Division 3.a. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{\text{ages 4-7}}$ (2019)	0.36	Average exploitation pattern (2016–2018), scaled to F_{4-7} in 2018.
SSB (2020)	217 356	SSB at the beginning of the TAC year; in tonnes.
$R_{\text{age 3}}$ (2019, 2020)	83 040	Median recruitment re-sampled from the years 2009–2018; in thousands.
Total catch (2019)	88 709	Short-term forecast; in tonnes.
Wanted catch (2019)	81 897	Assuming average of 2016–2018 wanted catch fraction by age; in tonnes.
Unwanted catch (2019)	6 812	Assuming average of 2016–2018 unwanted catch fraction by age; in tonnes.

Table 3 Saithe in subareas 4 and 6, and in Division 3.a. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2020)	Wanted catch* (2020)	Unwanted catch* (2020)	Wanted catch*# 3a4	Wanted catch*# 6	F_{total} (ages 4–7) (2020)	F_{wanted} (ages 4–7) (2020)	F_{unwanted} (ages 4–7) (2020)	SSB (2021)	% SSB change **	% TAC change ***	% advice change ^
ICES advice basis												
MSY approach: F_{MSY}	88093	80676	7417	73092	7584	0.363	0.33	0.032	213159	-1.93	-14.7	-14.7
Other scenarios												
$F = \text{MAP}^{\wedge\wedge}$ $F_{\text{MSY lower}}$	54430	49936	4494	45242	4694	0.210	0.191	0.0190	245209	12.8	-47	-47
$F = \text{MAP}^{\wedge\wedge}$ $F_{\text{MSY upper}}$	121041	110641	10400	100241	10400	0.536	0.49	0.048	182110	-16.2	17.1	17.1
$F = 0$	0	0	0	0	0	0	0	0	298215	37	-100	-100
F_{pa}	104446	95642	8804	86652	8990	0.446	0.41	0.040	197699	-9.0	1.08	1.08
F_{lim}	135413	123673	11740	112048	11625	0.620	0.56	0.055	168963	-22	31	31
$\text{SSB}_{2021} = B_{\text{lim}}$	203255	184872	18383	167494	17378	1.13	1.03	0.100	107297	-51	97	97
$\text{SSB}_{2021} = B_{\text{pa}}$	157456	143563	13893	130068	13495	0.76	0.70	0.068	149098	-31	52	52
$\text{SSB}_{2021} = \text{MSY } B_{\text{trigger}}$	157456	143563	13893	130068	13495	0.76	0.70	0.068	149098	-31	52	52
$F = F_{2019}$	86995	79683	7312	72193	7490	0.36	0.33	0.032	214145	-1.48	-15.8	-15.8
TAC_{2019}	103328	94616	8712	85722	8894	0.44	0.40	0.039	198740	-8.6	0	0
$\text{TAC}_{2019} -15\%$	87828	80436	7392	72875	7561	0.36	0.33	0.032	213398	-1.82	-15.0	-15.0
$\text{TAC}_{2019} +15\%$	118826	108650	10176	98437	10213	0.52	0.48	0.047	184174	-15.3	15.0	15.0
$\text{TAC}_{2019} -20\%$	82662	75723	6939	68605	7118	0.34	0.31	0.030	218216	0.40	-20.0	-20.0
$\text{TAC}_{2019} +25\%$	129159	117952	11207	106865	11087	0.58	0.53	0.052	174816	-19.6	25	25

* “Wanted” and “unwanted” catch are used to describe fish that would be landed and discarded in the absence of the EU landing obligation.

** SSB_{2021} relative to SSB_{2020} .

*** Total catch in 2020 relative to the TAC in 2019 (103 327 tonnes).

Wanted catch split according to the average in 1993–1998, i.e. 90.6% in Subarea 4 and Subdivision 3.a.20 and 9.4% in Subarea 6.

^ Total catch 2020 relative to the advice value 2019 (103 327 tonnes).

^^ EU multiannual plan (MAP) for the North Sea (EU, 2018).

The change in advice (-14.7%) is due mainly to a downward revision in stock size and low incoming recruitment.

Basis of the advice

Table 4 Saithe in subareas 4 and 6, and in Division 3.a. The basis of the advice.

Advice basis	MSY approach.
Management plan	An EU multiannual management plan (MAP) has been agreed by the EU for this stock (EU, 2018). This plan is not adopted by Norway; thus, it was not used as the basis of the advice for this shared stock. ICES was requested by the EC to provide advice based on the MSY approach and to include the MAP as a catch option. EU–Norway have requested an evaluation of multiple management strategies that are currently under consideration (ICES, 2019a).

Quality of the assessment

Commercial catch per unit of effort (CPUE) information for French, German, and Norwegian trawlers was combined into a single index of biomass of saithe. Factors such as vessel experience and fishing behaviour likely contribute to the variability in CPUE for all fleets, but these are not accounted for in the CPUE standardization. Conflicting signals between the survey and CPUE index contributes to the assessment uncertainty.

The survey index is uncertain because it is influenced by occasional large catches and does not cover the whole stock distribution; however, it is considered generally representative of the stock.

Recruitment values are highly uncertain. Estimates of recruitment for a given year class tend to be revised considerably with successive assessments (Figure 2); therefore, the associated short-term forecast is uncertain for this stock. There has recently been a tendency to overestimate spawning-stock biomass (SSB) and underestimate fishing mortality (F), although this was partly caused by an error in the assessment code impacting assessments prior to 2018.

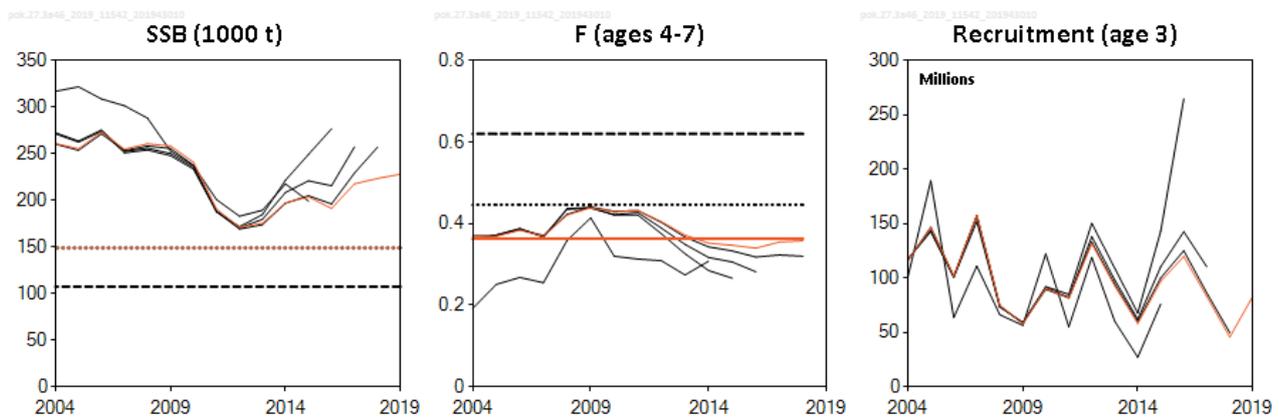


Figure 2 Saithe in subareas 4 and 6, and in Division 3.a. Historical assessment results.

Issues relevant for the advice

Below minimum size (BMS) landings reported to ICES in 2016–2018 were low. In 2018, saithe catches in all EU fleets of Subarea 4 and Division 3.a were subject to the EU landing obligation, with a *de minimis* exemption for saithe caught in crustacean fisheries. In Subarea 6, saithe was subject to the landing obligation in fisheries targeting saithe. Substantial discarding still continues in Subarea 4, based on observations from sampling programmes (estimated unwanted catch for 2018 is 7649 tonnes in Subarea 4 and Division 3.a, i.e. 8.7% of the total catch).

Reference points

Table 5 Saithe in subareas 4 and 6, and in Division 3.a. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	149 098	B_{pa}	ICES (2019b)
	F_{MSY}	0.363	EQsim analysis based on the recruitment period 1998–2017.	ICES (2019b)
Precautionary approach	B_{lim}	107 297	B_{loss}	ICES (2019b)
	B_{pa}	149 098	$B_{lim} \times \exp(1.645 \times 0.2) \approx 1.4 \times B_{lim}$	ICES (2019b)
	F_{lim}	0.620	EQsim analysis based on the recruitment period 1998–2017.	ICES (2019b)
	F_{pa}	0.446	$F_{lim} \times \exp(-1.645 \times 0.2) \approx F_{lim} / 1.4$	ICES (2019b)
Management plan (MAP) *	MAP MSY $B_{trigger}$	149 098	MSY $B_{trigger}$	ICES (2019b)
	MAP B_{lim}	107 297	B_{lim}	ICES (2019b)
	MAP F_{MSY}	0.363	F_{MSY}	ICES (2019b)
	MAP range F_{lower}	0.210–0.363	Consistent with ranges provided by ICES, resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2019b)
	MAP range F_{upper}	0.363–0.536	Consistent with ranges provided by ICES, resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2019b)

* EU multiannual plan (MAP) for the North Sea (EU, 2018).

Basis of the assessment

Table 6 Saithe in subareas 4 and 6, and in Division 3.a. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018).
Assessment type	Age-based analytical assessment SAM (ICES, 2019c) that uses catches in the model and in the forecast.
Input data	Commercial catches (international landings, BMS landings, and discards, age frequencies from catch sampling); survey index (IBTS Q3, ages 3–8); combined commercial index scaled to the exploitable biomass (French, German, and Norwegian trawler fleets). Maturity-at-age and natural mortality are assumed to be constant. Stock weights are catch weights.
Discards, BMS landings, and bycatch	Discards were included and 46% of the landings had associated discarding information; 85% of the discards were observed and 15% were raised. Of the imported discards, 99% had been sampled for age information. BMS landings for Norway are included with landings in the assessment since 2016; all other BMS landings are included with the discards. Logbook-registered discards were 0 kg.
Indicators	None.
Other information	Benchmarked in 2016 (ICES, 2016a) with additional review (ICES, 2016b). An interbenchmark was conducted in 2019 (ICES, 2019a).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

Information from stakeholders

There is no additional available information for this stock.

History of the advice, catch, and management

Table 7 Saithe in subareas 4 and 6, and in Division 3.a. ICES advice, TAC, official landings, and ICES catch estimates. All weights are in tonnes. Values of official and ICES landings for the period 1987 to 2001 are presented to the nearest thousand tonnes in Subarea 4 and Division 3.a, and to the nearest hundred tonnes in Subarea 6. TAC values are presented to the nearest thousand tonnes. Note that before 2000, the advice was given for two separate areas: Subarea 4 and Division 3.a, and Subarea 6.

Stock				Subarea 4 (North Sea) and Division 3.a (Skagerrak and Kattegat)					
Year	ICES advice	Total catch corresponding to advice	Wanted catch corresponding to advice	Catch in Subarea 4 and Division 3.a calculated from the advice**	Wanted catch in Subarea 4 and Division 3.a calculated from the advice**	Agreed TAC	Official landings	ICES landings#	ICES discards##
1987	Reduce F		< 198000			173000	154000	149000	
1988	60% of F(86); TAC		156000			165000	113000	107000	
1989	No increase in F; TAC		170000			170000	92000	92000	
1990	No increase in F; TAC		120000			120000	85000	88000	
1991	No increase in F; TAC		125000			125000	93000	99000	
1992	No increase in F; TAC		102000			110000	92000	92000	
1993	70% of F(91) ~ 93000 t		93000			93000	99000	105000	
1994	Reduce F by 30%		72000			97000	90000	102000	
1995	No increase in F		107000			107000	97000	113000	
1996	No increase in F		111000			111000	96000	110000	
1997	No increase in F		113000			115000	86000	103000	
1998	Reduce F by 20%		97000			97000	88000	100000	
1999	Reduce F to F_{pa}		104000			110000	108000	107000	
2000	Reduce F by 30%		81000		75000	85000	85000	87000	
2001	Reduce F by 20%		96000		87000	87000	88000	90000	
2002	$F < F_{pa}$		< 148000		< 135000	135000	115000	105632	18394
2003	$F < F_{pa}$		< 193000		< 175600	165000	107470	106257	9916
2004	$F < F_{pa}^*$		< 234000		< 211120	190000	103608	102746	7464
2005	F according to man. plan*		< 150000		< 137000	145000	111970	113388	6558
2006	F according to man. plan (< F_{pa})*		< 135900		< 123300	123000	113354	111845	6909
2007	F according to man. plan (< F_{pa})*		< 136000		< 123800	123000	91778	92602	11828
2008	F according to man. plan (< F_{pa})*		< 150000		< 136500	136000	115414	115471	7378
2009	F according to man. plan (< F_{pa})*		< 139000		≤ 125900	126000	103883	105973	3774
2010	F according to man. plan (< F_{pa})*		< 118000		< 107100	107000	90755	96767	4071

Stock				Subarea 4 (North Sea) and Division 3.a (Skagerrak and Kattegat)					
Year	ICES advice	Total catch corresponding to advice	Wanted catch corresponding to advice	Catch in Subarea 4 and Division 3.a calculated from the advice**	Wanted catch in Subarea 4 and Division 3.a calculated from the advice**	Agreed TAC	Official landings	ICES landings#	ICES discards##
2011	See scenarios				-	93000	89427	91528	3837
2012^	F according to man. plan ($< F_{pa}$)*		< 87550		< 79320	79000	68241	70864	6396
2013	Management plan (TAC +15%)*		< 100684		< 91219	91220	71516	71406	6392
2014	Management plan (TAC-15%)*		< 85581		< 77536	77536	68695	69372	5824
2015	Management plan	< 80097		< 72211	< 66006	66006	69796	69403	4603
2016	EU-Norway management strategy	≤ 75049		≤ 67995	≤ 62153	65696	62658	62504	10693
2017^	MSY approach	≤ 140653		≤ 127432	≤ 122122	100287 †	82203	81570	6339
2018	MSY approach	≤ 118460		≤ 107325	≤ 93980	105793 ‡	80704	80070#	7649
2019^^	MSY approach	≤ 103327		≤ 93614	≤ 87178	93614			
2020	MSY approach	≤ 88093		≤ 79812	≤ 73092				

* Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries.

** Split between areas according to the average in 1993–1998, i.e. 90.6% in Subarea 4 and Subdivision 3.a.20 and 9.4% in Subarea 6.

† Includes top-up of 4.1%.

‡ Includes top-up of 12.57%.

Since 2016, landings correspond to wanted catch, which includes the Norwegian component of BMS landings.

Since 2016, discards correspond to unwanted catch, including all BMS landings except the Norwegian component.

^ The June advice was updated in November.

^^ Values corrected in February 2019.

Table 7 (cont') Saithe in subareas 4 and 6, and in Division 3.a. ICES advice, TAC, official landings, and ICES catch estimates. All weights are in tonnes. Values of official and ICES landings for the period 1987 to 2001 are presented to the nearest thousand tonnes in Subarea 4 and Division 3.a, and to the nearest hundred tonnes in Subarea 6. TAC values are presented to the nearest thousand tonnes. Note that before 2000, the advice was given for two separate areas: Subarea 4 and Division 3.a, and Subarea 6.

Stock				Subarea 6 (Rockall and West of Scotland)					
Year	ICES advice	Total catch corresponding to advice	Wanted catch corresponding to advice	Catch in Subarea 6 calculated from the advice**	Wanted catch in Subarea 6 calculated from the advice**	Agreed TAC	Official landings	ICES landings#	ICES discards##
1987	Reduce F		19000			27800	32500	31400	
1988	60% of F(86); TAC		35000			35000	32800	34200	
1989	No increase in F; TAC		20000			30000	22400	25600	
1990	No increase in F; TAC		24000			29000	18000	19900	
1991	No increase in F; TAC		21000			22000	17900	17000	
1992	No increase in F; TAC		< 19000			17000	10800	11800	
1993	70% of F(91) ~ 93000 t		6300			14000	14500	13900	
1994	Reduce F by 30%					14000	13000 [§]	12800	
1995	No increase in F		-			16000	10600 [§]	11800	
1996	No increase in F		10200~			13000	9400 [§]	9400	
1997	No increase in F					12000	8600 [§]	9400	
1998	Reduce F by 20%		4800			10900	7400 [§]	8400	
1999	Reduce F to F_{pa}		4800			7500	6800	7300	
2000	Reduce F by 30%		81000		6000	7000	6400	5900	
2001	Reduce F by 20%		96000		9000	9000	8700	8400	
2002	$F < F_{pa}$		< 148000		< 13000	14000	5600	5519	3150
2003	$F < F_{pa}$		< 193000		< 17400	17100	5220	5789	2242
2004	$F < F_{pa}^*$		< 234000		< 20880	20000	4810	4982	620
2005	F according to man. plan*		< 150000		< 14000	15000	8700	6456	1637
2006	F according to man. plan (< F_{pa})*		< 135900		< 12200	13000	9420	9474	1675
2007	F according to man. plan (< F_{pa})*		< 136000		< 12200	13000	6690	6602	584
2008	F according to man. plan (< F_{pa})*		< 150000		< 13500	14000	6010	6712	981
2009	F according to man. plan (< F_{pa})*		< 139000		< 13100	13000	6170	6294	521
2010	F according to man. plan (< F_{pa})*		< 118000		< 11100	11000	6220	6263	412
2011	See scenarios				-	10000	7310	6917	502
2012 [^]	F according to man. plan (< F_{pa})*		< 87550		< 8230	8000	7560	7549	2887

Stock				Subarea 6 (Rockall and West of Scotland)					
Year	ICES advice	Total catch corresponding to advice	Wanted catch corresponding to advice	Catch in Subarea 6 calculated from the advice**	Wanted catch in Subarea 6 calculated from the advice**	Agreed TAC	Official landings	ICES landings [#]	ICES discards ^{##}
2013	Management plan (TAC +15%)*		< 100684		< 9464	9464	8470	8653	1397
2014	Management plan (TAC-15%)*		< 85581		< 8045	8045	6829	7020	512
2015	Management plan	< 80097		< 7492	< 6848	6848	7577	7534	405
2016	EU-Norway management strategy	≤ 75049		≤ 7054	≤ 6448	6816	5852	5573	181
2017 [^]	MSY approach	≤ 140653		≤ 13221	≤ 12670	10404 †	7391	7116	139
2018	MSY approach	≤ 118460		≤ 11135	≤ 9751	10215 ‡	7595	6754	359
2019 ^{^^}	MSY approach	≤ 103327		≤ 9713	≤ 9045	9713			
2020	MSY approach	≤ 88093		≤ 8281					

* Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries.

** Split between areas according to the average in 1993–1998, i.e. 90.6% in Subarea 4 and Subdivision 3.a.20 and 9.4% in Subarea 6.

~ *Status quo* catch.

§ Incomplete data.

Since 2016, landings correspond to wanted catch, which includes the Norwegian component of BMS landings.

Since 2016, discards correspond to unwanted catch, including all BMS landings except the Norwegian component.

† Includes top-up of 4.1%.

‡ Includes top-up of 4.76%.

[^] The June advice was updated in November.

^{^^} Values corrected in February 2019.

History of the catch and landings

Table 8 Saithe in subareas 4 and 6, and in Division 3.a. Catch distribution by fleet in 2018 as estimated by ICES for ages 3–10+ only, as used in the assessment.

Catch (2018)	Wanted catch			Unwanted catch
	Bottom trawl 90%	Gillnet 4.8%	Other 5.2%	
94832 tonnes	86824 tonnes			8008 tonnes

Table 9 Saithe in subareas 4 and 6, and in Division 3.a. History of commercial landings; both the official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes and over all age groups.

Subarea 4 and Division 3.a

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*	2018*
Belgium	22	28	15	18	7	27	15	2	2	3	5	6	16	15	14
Denmark	7991	7498	7471	5443	8068	8802	8018	6331	5171	5695	4913	4512	4084	5689	7016
Faroe Isl.	558	463	60	15	108	841	146	2	8	3	1	0	18	16	4
France	13628	11830	16953	15083	15881	7203	4582*	13856*	14093*	8475	7910	11574	10794	10334	12598
Germany	9589	12401	14397	12791	14140	13410	11193	10234	8052	9690	8602	7954	6279	6629	7944
Greenland	403	1042	924	564	888	927	0	0	0	0	0	0	0	0	0
Ireland	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Lithuania	0	149	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	3	40	28	5	3	16	3	24	34	168	43	75	112	190	264
Norway	62783	68122	61318	45396	61464	57708	52712	46809	33288	35701	37519	35631	31596	49580	39133
Poland	0	1100	1084	1384	1407	988	654	584	0	0	0	0	0	0	0
Portugal			228	68											
Russia	0	35	2	5	5	13	0	0	0	0	0	0	0	0	0
Sweden	2249	2132	1746	1381	1639	1363	1545	1335	1306	1402	1329	1156	1198	1177	1316
UK (E/W/Nl)	457	960	9128**	9625**	11804**	12584**	11887**	10250**	7287**	10379**	687	8888**	8561**	8573**	12415**
UK (Scotland)	5924	6170									7686				
Total reported	103608	111970	113354	91778	115414	103883	90755	89427	69241	71516	68695	69796	62658	82203	80704
Unallocated	-862	1418	-1509	824	57	2090	6012	2101	1623	-110	677	-393	-152	-633	-634
BMS landings														< 1	11
ICES estimate	102746	113388	111845	92602	115471	105973	96767	91528	70864	71406	69372	69403	62506#	81570#	80070#
TAC	190000	145000	123250	135900	135900	125934	107000	93600	79320	91220	77536	66006	65696	100287#	105793#

* Official values are preliminary.

** Scotland+E/W/Nl combined.

Includes top-up (4.1% in 2017, 12.57% in 2018).

Since 2016, landings correspond to wanted catch, which includes the Norwegian component of BMS landings.

Subarea 6

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*	2018*
Denmark	0	0	0	0	0	0	0	0	0	0	20	0	0	5	1
Faroe Islands	34	25	76	32	23	60	24	5	6	25	29	3	7	13	21
France	3053	3954	6092	4327	4170	2102	2008	2357	2612	3814	2904	3484	2299	3968	3626
Germany	4	373	532	580	148	298	257	0	9	0	0	0	9	<1	<1
Ireland	95	168	267	322	288	407	520	359	364	313	128	105	185	124	231
Netherlands	0	0	3	36	1	0	0	0	0	0	0	6	12	3	70
Norway	16	20	28	377	78	68	121	240	5	715	442	677	555	631	955
Russia	6	25	7	2	50	4	2	0	0	0	9	1	0	2	0
Spain	2	3	6	3	4	8	18	31	13	21	9	15	15	4	7
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UK (E/W/Ni)	37	133	2748**	1424**	2955**	3491**	3168**	4500**	4549**	3646**	97	3286**	2770**	2641**	2684**
UK (Scotland)	1563	2922									3191				
Total reported	4810	7623	9759	7103	7717	6438	6118	7492	7558	8534	6829	7577	5852	7391	7595
Unallocated	172	-1167	-1191	-501	-1005	-144	145	-575	-9	119	191	-43	-279	-275	-841
BMS landings														0	31
ICES estimate	4982	6456	8568	6602	6712	6294	6263	6917	7549	8653	7020	7534	5573 †	7116 †	6754 †
TAC	20000	15044	12787	14100	14100	13066	11000	9570	8230	9464	8045	6848	6816	10404 ‡	10215 ‡

*Official values are preliminary.

**Scotland+E/W/Ni combined.

† Does not include BMS landings.

‡ Includes top-up (4.1% in 2017, 4.76% in 2018).

Subareas 4 and 6 and Division 3.a

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ICES estimate	107728	119844	121320	99204	122184	112267	103030	98446	78414	80059	76392	76936	68709 #	88686 #	86824 #
TAC	210000	160044	136037	150000	150000	139000	118000	103170	87550	100684	85581	72854	72512	110691 ‡	116008 ‡

‡ Agreed upon TAC including landings top-up.

Since 2016, landings correspond to wanted catch, which includes Norwegian component of BMS landings.

Summary of the assessment

Table 10 Saithe in subareas 4 and 6, and in Division 3.a. Assessment summary. Recruitment in thousands. Weights are in tonnes. "High" and "Low" indicate 95% confidence intervals.

Year	Recruitment			SSB			Landings [^]	Discards [^]	Official BMS Landings	F		
	Age 3	High	Low	SSB	High	Low				Ages 4–7	High	Low
1967	141494	198062	101082	152179	191621	120855	88339	12992		0.35	0.45	0.28
1968	160626	221340	116566	210140	260771	169339	113741	20818		0.30	0.38	0.23
1969	285536	393742	207066	276167	338468	225333	130580	19713		0.32	0.40	0.26
1970	293885	402801	214420	345470	416722	286401	235012	35817		0.35	0.43	0.28
1971	355289	482335	261706	460888	554512	383072	265356	43821		0.37	0.46	0.31
1972	223760	301708	165950	489956	585832	409772	261914	34567		0.41	0.49	0.33
1973	200829	270557	149071	522340	624484	436902	242513	32651		0.43	0.52	0.36
1974	199146	268668	147614	577409	687054	485262	298347	38674		0.50	0.59	0.42
1975	234629	314939	174799	517619	617259	434064	271610	33035		0.53	0.63	0.45
1976	406509	554761	297875	399536	479219	333103	343898	79449		0.60	0.71	0.50
1977	149305	201820	110455	325613	391157	271051	216393	23520		0.59	0.71	0.49
1978	120267	162085	89239	297541	358782	246753	155124	21727		0.48	0.58	0.40
1979	87312	118110	64545	278406	331971	233484	128352	14295		0.45	0.54	0.38
1980	85442	115585	63160	260341	308074	220005	131897	13392		0.48	0.57	0.40
1981	163244	222487	119776	248847	293028	211327	132273	15971		0.47	0.56	0.40
1982	140924	189861	104600	219732	255341	189090	174336	27775		0.54	0.64	0.46
1983	148454	200146	110112	219760	256096	188580	180040	22978		0.65	0.76	0.55
1984	255728	345608	189223	188629	218875	162563	200843	39723		0.68	0.79	0.58
1985	356651	486871	261261	165846	191491	143635	220870	52802		0.70	0.82	0.60
1986	290211	391958	214876	156491	180356	135784	198605	34190		0.74	0.87	0.62
1987	148978	201026	110405	165328	190573	143427	167503	24877		0.71	0.83	0.60
1988	138223	185852	102799	154642	180143	132752	135176	19076		0.71	0.83	0.61
1989	102269	137687	75961	126330	146635	108837	108892	15707		0.69	0.81	0.59
1990	150675	203232	111710	114429	133104	98374	103831	20619		0.66	0.77	0.56
1991	175072	235328	130244	107236	124057	92695	108071	22902		0.63	0.74	0.54
1992	103616	138535	77498	112743	129693	98009	99745	15792		0.61	0.72	0.52
1993	175855	235807	131145	119462	138496	103043	111499	21119		0.64	0.76	0.54
1994	118210	158072	88400	123897	143399	107047	109621	17138		0.57	0.68	0.49
1995	213155	288825	157310	143022	166404	122926	121795	19395		0.58	0.69	0.49
1996	118789	160681	87819	154300	179119	132920	114968	13928		0.51	0.61	0.43
1997	149544	203637	109820	192734	227932	162971	107348	12755		0.44	0.53	0.37
1998	87766	119285	64576	190223	223546	161867	106126	11096		0.45	0.53	0.38
1999	116546	158601	85642	199093	234058	169351	110531	8936		0.47	0.56	0.39
2000	101190	137244	74608	191818	223430	164679	85781	8014		0.41	0.49	0.34
2001	206864	279866	152904	199131	232606	170473	91741	11118		0.38	0.46	0.31
2002	152635	207133	112475	220406	256208	189607	110911	18936		0.42	0.50	0.35
2003	158359	215478	116381	208324	243589	178165	110282	11374		0.43	0.52	0.36
2004	115926	156279	85993	261048	305836	222818	107356	6436		0.37	0.45	0.31
2005	146568	199075	107909	255341	298187	218652	118625	2592		0.37	0.44	0.31
2006	101835	140440	73842	273112	319375	233550	120414	8297		0.38	0.46	0.32
2007	157857	217143	114758	254900	299487	216950	94958	11375		0.37	0.45	0.31
2008	74781	101054	55339	260792	307154	221428	121618	8269		0.42	0.50	0.35
2009	57946	78165	42957	258473	305816	218460	110972	3548		0.44	0.53	0.37
2010	90504	122342	66952	240921	287975	201556	102128	2595		0.43	0.51	0.36
2011	81377	110994	59662	190672	228353	159208	98034	3972		0.43	0.52	0.36
2012	131577	177402	97589	171139	203888	143650	78144	8905		0.41	0.49	0.34
2013	92659	125298	68523	175410	208467	147594	79859	7412		0.37	0.45	0.31
2014	57989	79296	42407	197237	233313	166740	76057	6115		0.35	0.43	0.29
2015	97033	133381	70590	203685	240629	172413	76748	4697		0.35	0.42	0.29
2016	119787	168254	85281	191273	226994	161174	67620*	10052**	0	0.34	0.42	0.28
2017	83040	124105	55564	217740	258756	183226	88010*	6571**	0.5	0.36	0.45	0.28
2018	45672	80422	25938	223515	271665	183899	86540*	7752**	42	0.36	0.47	0.27
2019	83040***			228110								

[^] ICES estimates; landings, and discards for ages 3–10+ only, as used in the assessment.

* Since 2016, landings correspond to wanted catch, which includes the Norwegian component of BMS landings.

** Since 2016, discards correspond to unwanted catch minus BMS landings from EU fleets officially reported in logbooks.

*** Recruitment in 2019 is the median of re-sampled assessment recruitment estimates from 2009–2018, required for stochastic projections.

Sources and references

- EU. 2018. Regulation (EU) 2018/973 of the European Parliament and of the Council of 4 July 2018 establishing a multiannual plan for demersal stocks in the North Sea and the fisheries exploiting those stocks, specifying details of the implementation of the landing obligation in the North Sea and repealing Council Regulations (EC) No 676/2007 and (EC) No 1342/2008. Official Journal of the European Union, L. 179. 13 pp. <http://data.europa.eu/eli/reg/2018/973/oj>.
- ICES. 2016a. Report of the Benchmark Workshop on North Sea Stocks (WKNSEA), 14–18 March 2016, Copenhagen, Denmark. ICES CM 2016/ACOM:37. 698 pp.
- ICES. 2016b. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 26 April–5 May 2016, Hamburg, Germany. ICES CM 2016/ACOM:14. 1023 pp.
- ICES. 2018. Advice basis. *In* Report of the ICES Advisory Committee, 2018. ICES Advice 2018, Book 1, Section 1.2. <https://doi.org/10.17895/ices.pub.4503>.
- ICES. 2019a. EU and Norway request concerning the long-term management strategy of cod, saithe, and whiting, and of North Sea autumn-spawning herring. *In* Report of the ICES Advisory Committee, 2019. ICES Advice 2019, sr.2019.06, <https://doi.org/10.17895/ices.advice.4895>.
- ICES. 2019b. Report of the Interbenchmark Protocol on North Sea Saithe (IBPNSsaithe). ICES Scientific Reports. VOL 1:ISS 1. 65 pp. <https://doi.org/10.17895/ices.pub.4890>.
- ICES. 2019. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports. 1:7. <http://doi.org/10.17895/ices.pub.5402>

Recommended citation: ICES. 2019. Saithe (*Pollachius virens*) in subareas 4 and 6, and in Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat). *In* Report of the ICES Advisory Committee, 2019. ICES Advice 2019, pok.27.3a46, <https://doi.org/10.17895/ices.advice.4872>