

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

Please note: This advice was updated in February 2019 ([ICES, 2019](#))

ICES advises that when the MSY approach is applied, catches in 2019 should be no more than 135 035 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 been decreasing and has been below F_{MSY} since 2013. Recruitment (R) has fluctuated over time and has been below the long-term average since 2003.

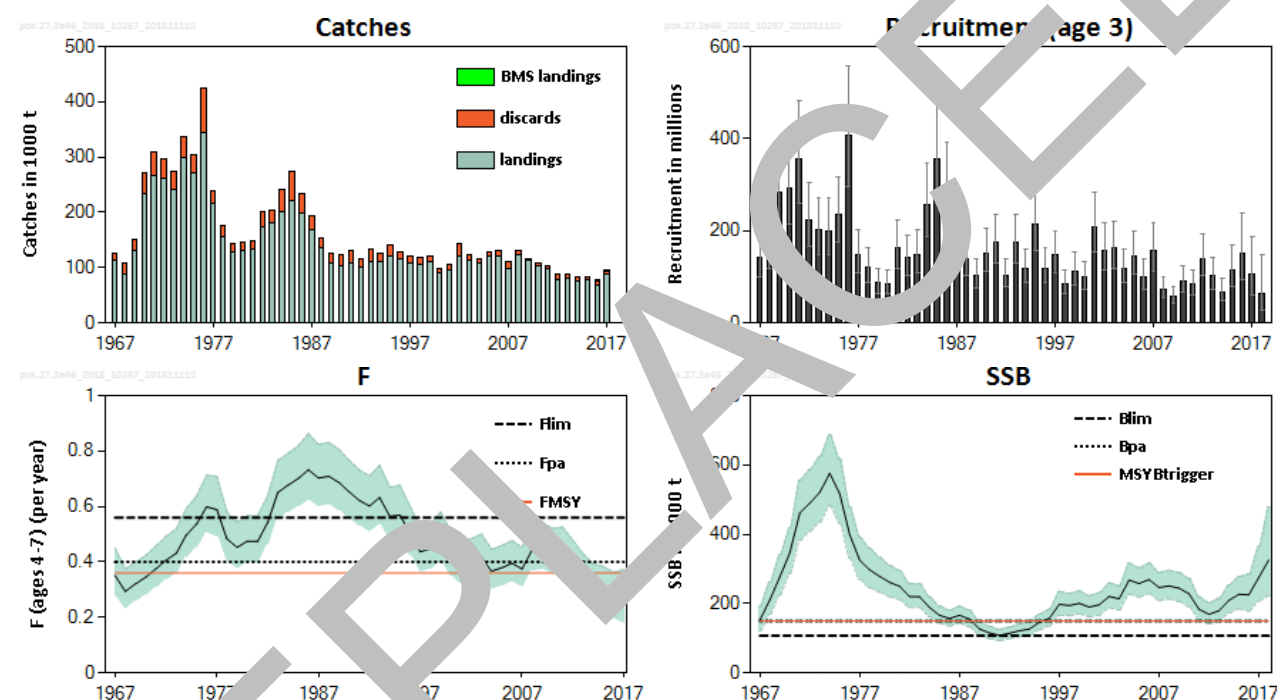


Figure 1 Saithe in subareas 4 and 6, and in Division 3.a. Summary of the stock assessment. Predicted recruitment values are shown with error bars. Shaded areas (F, SSB) and error bars (R) indicate 95% confidence intervals.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} , 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		
		2015	2016	2017		2016	2017	2018
Maximum Sustainable Yield	F_{MSY}	✓	✓	✓	Below	MSY $B_{Trigger}$	✓	✓
Precautionary Approach	F_{pa} , F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa} , B_{lim}	✓	✓
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—
								Above trigger
								Full reproductive capacity
								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
$F_{\text{ages 4-7}} (2018)$	0.258	Average exploitation pattern (2015-2017) scaled to F_{4-7} in 2017
SSB (2019)	344 673 tonnes	SSB at the beginning of the TAC year
$R_{\text{age 3}} (2018)$	61 461 thousands	Median recruitment estimate in 2018
$R_{\text{age 3}} (2019)$	105 825 thousands	Median recruitment re-sampled from the years 2003–2018
Total catch (2018)	100 640 tonnes	Short-term forecast
Wanted catch (2018)	93 947 tonnes	Assuming 2017 wanted catch fraction by age
Unwanted catch (2018)	6 693 tonnes	Assuming 2017 wanted catch fraction by age

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

Basis	Total catch (2019)	Wanted catch* (2019)	Unwanted catch* (2019)	Wanted catch*# 3a4	Wanted catch*# 6	F_{total} (2019)	F_{wanted} (2019)	F_{unwanted} (2019)	SSB (2020)	SSB change* %	% TAC change* ^	% advice change ^
ICES advice basis												
MSY approach: F_{MSY}	135035	127619	7416	115623	11996	0.36	0.33	0.02	319880	1.2	16.4	14.0
Other scenarios												
$F = \text{MAP}^{\wedge\wedge}$ $F_{\text{MSY lower}}$	85912	81291	4621	73649	7641	0.25	0.198	0.015	370401	7.5	-26	-27
$F = \text{MAP}$ $F_{\text{MSY upper}}$	174789	164980	9809	149472	15508	0.49	0.46	0.03	280051	-18.7	51	48
$F = 0$	0	0	0	0	0	0	0	0	459630	33	-100	-100
F_{pa}	148973	140725	8248	127497	13248	0.38	0.38	0.028	305711	-11.3	28	26
F_{lim}	194139	183090	11049	165880	17211	0.43	0.43	0.039	260516	-24	67	64
$\text{SSB}_{2020} = B_{\text{lim}} = B_{\text{lim}}$	355855	332849	23006	301562	31288	1.49	1.39	0.103	107000	-69	207	200
$\text{SSB}_{2020} = B_{\text{pa}} = B_{\text{pa}}$	308299	289180	18119	261061	27183	1.13	1.05	0.078	150000	-56	166	160
$\text{SSB}_{2020} = B_{\text{trigger}} = \text{MSY } B_{\text{trigger}}$	319476	299432	20044	271285	28147	1.21	1.12	0.083	139672	-59	175	170
$F = F_{2018}$	101908	96386	5522	87326	9060	0.26	0.24	0.018	353949	2.7	-12.2	-14.0
TAC_{2018}	116008	109608	6334	99364	10309	0.30	0.28	0.021	339375	-1.5	0.0	-2.1
Mixed-fisheries scenarios												
A: Max.	174252					0.525			253216	-27	50	47
B: Min.	9895					0.152			367813	6.7	-48	-49
C: C ₀	368					0.156			366314	6.3	-47	-48
D: Q	4802					0.252			332443	-3.5	-18	-20
E: value						0.299			317128	-8.0	-5.2	-7.1
F: Ratio	81766					0.212			349517	1.4	-30	-31

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

** SSB 2020 relative to SSB 2019.

*** Total catch in 2019 relative to the TAC in 2018 (116 008 t).

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 2019 relative to the advice value 2018 (118 460 t).

^^ Proposed EU multiannual plan (MAP) for the North Sea (EU, 2016).

Mixed-fisheries assumptions (note: "fleet's stock share" is used to describe the share of the fishing opportunities for each particular fleet, which has been calculated based on the single-stock advice for 2018 and the historical proportion of the stock landings taken by the fleet):

- A. Maximum scenario: Each fleet stops fishing when its last stock share is exhausted.
- B. Minimum scenario: Each fleet stops fishing when its first stock share is exhausted.
- C. COD: Each fleet stops fishing when its individual cod share is exhausted.
- D. SQ (*status quo*) effort scenario: The effort of each fleet in 2017 and 2018 is as in 2016.
- E. Value scenario: The effort of each fleet is equal to the weighted average of the efforts required to catch the fleet's quota share of each of the stocks, where the weights are the relative catch values of each stock in the fleet's portfolio.
- F. Range scenario: The potential for TAC mismatches in 2018 are minimized within the F_{MSY} range, for the demersal fish stocks for which such a range is available (cod.27.47d20; had.27.46a20; pok.27.3a46; ple.27.420; ple.27.7d; sol.27.4; sol.27.7d).

The change in advice (+14.0%) is due mainly to the increase in stock size.

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	Changes to the stock assessment and reference points at the benchmark in 2016 imply a need to re-evaluate the EU–Norway management strategy. Until such an evaluation is conducted, the ICES advice is based on the MSY approach.
	An EU multiannual management plan (MAP) has been proposed for this stock (EU, 2016). This plan is not adopted by Norway and is thus 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.

Quality of the assessment

The saithe assessment went through an ICES benchmark process in 2016 (ICES, 2016a). 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.

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 different fleets, but these are not accounted for in the CPUE standardization. Conflicting signals between the survey and CPUE index contribute to the assessment uncertainty. The survey tends to estimate a larger stock size than the CPUE index.

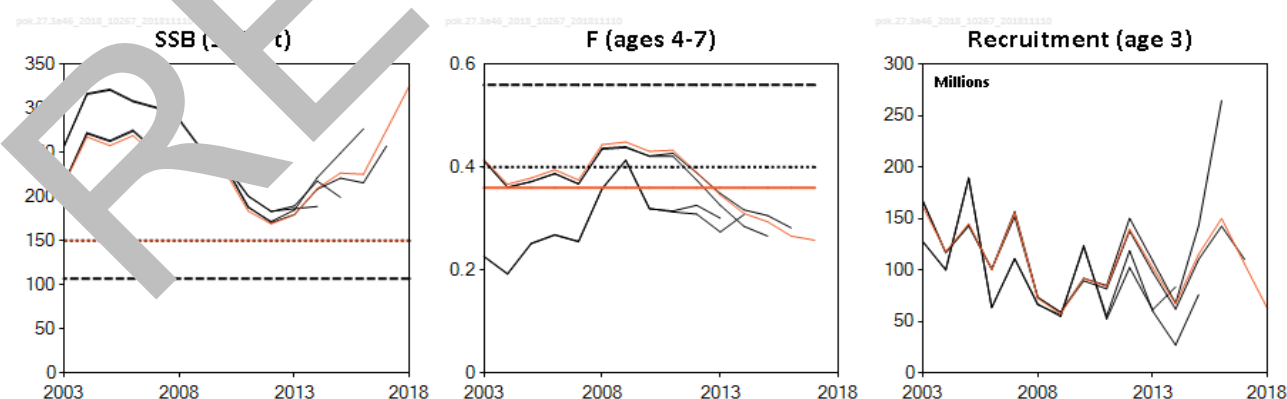


Figure 2 Saithe in subareas 4 and 6, and in Division 3.a. Historical assessment results.

Issues relevant for the advice

Based on the survey information (IBTS Q3) that became available in summer 2018, the assessment and advice has been updated from that released in June 2018.

Only the targeted saithe fisheries were under the landing obligation in 2017. BMS landings reported to ICES are currently much lower than the estimates of unwanted catches from observer programmes, which are 7% of the total catch for 2017.

Mixed-fisheries considerations

Results from a North Sea mixed-fisheries analysis are presented in the ICES mixed-fisheries advice (ICES, 2018a). The analysis has been updated, taking into account latest changes made to the assessments and forecasts for stocks with reopened advice.

After years of positive development, North Sea cod is again estimated to be the most limiting stock in the Greater North Sea mixed-fisheries model. For 2019, assuming a strictly implemented landing obligation (corresponding to the “Minimum” scenario), cod is estimated to constrain 24 out of 40 fleet segments. Saithe is the second most limiting stock, constraining twelve fleet segments. Conversely, in the “Maximum” scenario, saithe and northern plaice stocks (North Sea and eastern English Channel) would be the least limiting for 17, 9, and 3 fleet segments, respectively. Finally, if Norway lobster were managed by separate TACs, Norway lobster in FU 7 would be the most limiting for seven fleet segments (ICES, 2018b).

For those demersal fish stocks for which the F_{MSY} range is available, a “range” scenario is presented that minimizes the potential for TAC mismatches in 2019 within the F_{MSY} range. This scenario is a fishing mortality by stock which, if used for setting single-stock fishing opportunities for 2019, may reduce the gap between the most and the least restrictive TACs, thus reducing the potential for quota over- and under-allocations. This “range” scenario suggests that the potential for mixed-fisheries mismatch would be lowered with 2019 TAC in the lower part of the F_{MSY} range for North Sea plaice and North Sea saithe, and at the highest possible value for cod in accordance with the MSY approach and the MAP (EU multiannual plan).

Reference points

Table 5 Saithe in subareas 4 and 6, and in Division 1a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	150 000 t	B_{pa}	ICES (2016b)
	F_{lower}	0.358	EQsim analysis based on the recruitment period 2003–2015	ICES (2016b)
Precautionary approach	B_{lim}	107 000 t	B_{loss}	ICES (2016b)
		150 000 t	$B_{lim} \times \exp(1.645 \times 0.2) \approx 1.4 \times B_{lim}$	ICES (2016b)
	F_{lim}	0.564	EQsim analysis based on the recruitment period 2003–2015	ICES (2016b)
	F_{pa}	0.403	$F_{lim} \times \exp(-1.645 \times 0.2) \approx F_{lim} / 1.4$	ICES (2016b)
Management plan*	MAP MSY $B_{trigger}$	150 000 t	MSY $B_{trigger}$	ICES (2016b)
		107 000 t	B_{lim}	ICES (2016b)
	MAP F_{MSY}	0.358	F_{MSY}	ICES (2016b)
	MAP range F_{lower}	0.210	Consistent with ranges provided by ICES, resulting in no more than 5% reduction in long-term yield compared with MSY	ICES (2016b)
	MAP range F_{upper}	0.492	Consistent with ranges provided by ICES, resulting in no more than 5% reduction in long-term yield compared with MSY	ICES (2016b)

* Proposed EU multiannual plan (MAP) for the North Sea (EU, 2016).

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, 2018c).
Assessment type	Age-based analytical assessment SAM (ICES, 2018d) 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, 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 41% of the landings had associated discarding information: 94% of the discards were observed and 6% were raised. Of the imported discards, 98% had been included for age information. BMS landings for Norway are included with landings in the assessment from 2011; 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, 2018b).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSS)

Information from stakeholders

No additional information is available 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, and 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.

Subarea 4 and Division 3.a

Year	ICES advice	Predicted landings corresponding to advice	Predicted catches corresponding to 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	90000	88000	
1991	No increase in F; TAC	125000		125000	93000	90000	
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	103000	
1996	No increase in F	111000		111000	90000	110000	
1997	No increase in F	113000		115000	80000	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%	75000		85000	85000	87000	
2001	Reduce F by 20%	87000		87000	88000	90000	
2002	$F < F_{pa}$	< 135000		115000	115000	105632	18394
2003	$F < F_{pa}$	< 176000		165000	107470	106257	9916
2004	$F < F_{pa}^*$	< 211000		190000	103608	102746	7464
2005	F according to man. plan*	< 137000		145000	111970	113388	6558
2006	F according to man. plan ($< F_{pa}$) *	< 123000		123000	113354	111845	6909
2007	F according to man. plan ($< F_{pa}$) *	< 124000		123000	91778	92602	11828
2008	F according to man. plan ($< F_{pa}$) *	< 137000		136000	115414	115471	7378
2009	F according to man. plan ($< F_{pa}$) *	< 126000		126000	103883	105973	3774
2010	F according to man. plan ($< F_{pa}$) *	< 100000		107000	90755	96767	4071
2011	See scenarios			93000	89427	91528	3837
2012**	F according to man. plan ($< F_{pa}$) *	< 79320		79000	68241	70864	6396
2013	Management plan (TAC-15%) *	< 91219		91220	71516	71406	6392
2014	Management plan (TAC-15%) *	< 77536		77536	68695	69372	5824
2015	Management plan	< 66006	< 72211	66006	69796	69403	4603
2016	EU-Norway management strategy	≤ 62153	≤ 67995	65696	62528	62504#	10693##
2017**	MSY approach	≤ 122122	≤ 127432	100287 ‡	82203	81570#	6339##
2018	MSY approach	≤ 93980	≤ 107325	105793 ‡			
2019	MSY approach		≤ 122342				

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

† The June advice was updated in November.

‡ 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.

Subarea 6

Year	ICES advice	Predicted landings corresponding to advice	Predicted catches corresponding to advice	Agreed TAC ^{^^}	Official landings	ICES landings	ICES discards
1987	F reduced towards F_{max}	19000		27800	32500	31400	
1988	80% of $F(86)$; TAC	35000		35000	32800	34200	
1989	$F < 0.3$; TAC	20000		30000	22400	25600	
1990	80% of $F(88)$; TAC	24000		29000	18000	19900	
1991	Stop SSB decline; TAC	21000		22000	17900	17000	
1992	Avoid further reduction in SSB	< 19000		17000	10800		
1993	$F = 0.21$	6300		14000	14500	13900	
1994	Lowest possible F			14000	13000**	12800	
1995	Significant reduction in effort	-		16000	10600**	11800	
1996	No increase in F	10200*		13000	10000**	9400	
1997	Significant reduction in F			12000	8600**	8400	
1998	60% reduction in F	4800		10900	7400**	7300	
1999	60% reduction in F	4800		7500	6800	7300	
2000	Reduce F by 30%	6000		7000	6400	5900	
2001	Reduce F by 20%	9000		9000	8700	8400	
2002	$F < F_{pa}$	< 13000		11000	7600	5519	3150
2003	$F < F_{pa}$	< 17000		17100	15000	5789	2242
2004	$F < F_{pa}^{\wedge}$	< 21000		20000	4810	4982	620
2005	F according to man. plan ($< F_{pa}$) [^]	< 14000		15000	8700	6456	1637
2006	F according to man. plan ($< F_{pa}$) [^]	< 12000		13000	9420	9474	1675
2007	F according to man. plan ($< F_{pa}$) [^]	< 12000		13000	6690	6602	584
2008	F according to man. plan ($< F_{pa}$) [^]	< 14000			6010	6712	981
2009	F according to man. plan ($< F_{pa}$) [^]	< 13000		13000	6170	6294	521
2010	F according to man. plan ($< F_{pa}$) [^]	< 11000		11000	6220	6263	412
2011	See scenarios	-		10000	7310	6917	502
2012***	F according to man. plan ($< F_{pa}$) [^]	< 8230		8000	7560	7549	2887
2013	Management plan (TAC +15%) [^]	< 9464		9464	8470	8653	1397
2014	Management plan (TAC -15%) [^]	< 8045		8045	6829	7020	512
2015	Management plan	6848	< 7492	6848	7577	7534	405
2016	EU-Norway management strategy	≤ 7058	≤ 7054	6816	5849	5573 #	181 ##
2017***	MSY approach	≤ 12670	≤ 13221	10404 †	7391	7116 #	139 ##
2018	MSY approach	≤ 9751	≤ 11135	10215 ††			
2019	MSY approach		≤ 12693				

* Status quo catch.

** Incomplete data.

*** The June advice was updated in November.

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

^{^^} Since 2002, this area has been assessed together with the North Sea/Skagerrak. The TACs for each area are derived from a split based on historical landings.

† Includes top-up of 4.1%.

†† Includes top-up of 4.76%.

June 2017 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.

History of catch and landings

Table 8 Saithe in subareas 4 and 6, and in Division 3.a. Catch distribution by fleet in 2017 as estimated by ICES.

Catch (2017)	Wanted catch			Unwanted catch
95165 tonnes	Bottom trawl 90%	Gillnet 4.8%	Other 5.2%	6478 tonnes
	88686 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.

Subarea 4 and Division 3.a

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*	2017*
Belgium	22	28	15	18	7	27	15	2	2	3	5	6	16	15
Denmark	7991	7498	7471	5443	8068	8802	8018	6331	5171	5695	4913	4512	4067	5689
Faroe Isl.	558	463	60	15	108	841	146	2	8	3	1	0	18	16
France	13628	11830	16953	15083	15881	7203	4582*	13856*	1115	847	7910	11574	10794	10334
Germany	9589	12401	14397	12791	14140	13410	11193	10000	8000	7000	8602	7954	6279	6629
Greenland	403	1042	924	564	888	927	0	0	0	0	0	0	0	0
Ireland	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Lithuania	0	149	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
Norway	62783	68122	61318	45396	61464	57708	52712	46809	288	35701	37519	35631	31470	49580
Poland	0	1100	1084	1384	1407	988	654	0	0	0	0	0	0	0
Portugal			228	68										
Russia	0	35	2	5	5	13	15	0	0	0	0	0	0	0
Sweden	2249	2132	1746	1381	1639	1363	1245	1335	1306	1402	1329	1156	1226	1177
UK (E/W/Ni)	457	960	9128**	9625**	11804**	12584**	10387**	10250**	7287**	10379**	687	8888**	8546**	8573**
UK (Scotland)	5924	6170									7686			
Total reported	103608	111970	113354	91778	115411	103883	91555	89427	69241	71516	68695	69796	62528	82203
Unallocated	-862	1418	-1509	824	57	2090	6012	2101	1623	-110	677	-393	1849	-633
BMS landings														< 1
ICES estimate	102746	113388	111845	92602	115411	103883	96767	91528	70864	71406	69372	69403	62506#	81570#
TAC	190000	145000	123250	120000	135000	125000	107000	93600	79320	91220	77536	66006	65696	100287#

* Official values are preliminary.

** Scotland+E/W/Ni combined.

Includes top-up of 4.1%.

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*
Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Faroe Islands	34	25	76	32	23	60	24	5		25		3	7	13
France	3053	3954	6092	4327	4170	2102	2008	2357	12	38	204	3484	2299	3968
Germany	4	373	532	580	148	298	257	0	9	0	0	0	9	< 1
Ireland	95	168	267	322	288	407	520	359	364	313	128	105	185	124
Netherlands	0	0	3	36	1	0	0	0	0	0	0	6	12	3
Norway	16	20	28	377	78	68	121	240	5	7	442	677	555	631
Russia	6	25	7	2	50	4	2	0		0	9	1	0	2
Spain	2	3	6	3	4	8	18	31	15	21	9	15	15	4
Sweden	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**	45**	3646**	97	3286**	2767**	2641**
UK (Scotland)	1563	2922									3191			
Total reported	4810	7623	9759	7103	7717	6438	6118	4492	558	8534	6829	7577	5849	7391
Unallocated	172	-1167	-1191	-501	-1005	-144	145		-9	119	191	-43	-1932	-275
BMS landings														0
ICES estimate	4982	6456	8568	6602	6712	6294	6263	417	7549	8653	7020	7534	5573 †	7116 †
TAC	20000	15044	12787	14100	14100	13066	10000	9570	8230	9464	8045	6848	6816	10404 ‡

*Official values are preliminary.

**Scotland+E/W/Ni combined.

† Does not include BMS landings.

‡ Includes top-up of 4.1%.

Subareas 4 and 6 and Division 3.a

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ICES estimate	107728	119844	121320	10704	22184	112267	103030	98446	78414	80059	76392	76936	68709 #	88686 #
TAC	210000	160044	136037	150000	150000	139000	118000	103170	87550	100684	85581	72854	72512	110691 ‡

‡ 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. Weights are in tonnes. “High” and “Low” indicate 95% confidence intervals.

Year	Recruitment age 3	High	Low	SSB	High	Low	Wanted catch	Unwanted catch	Fishing pressure (F) ages 4–7	High	Low
	thousands			tonnes			tonnes				
1967	141056	198318	100327	152800	193208	120843	113751	12992	0.35	0.45	0.27
1968	160983	222779	116328	210690	262398	169172	88326	20818	0.29	0.38	0.23
1969	284268	393425	205397	277050	340591	225364	130588	19713	0.32	0.40	0.26
1970	293109	403286	213032	346182	418723	286208	234962	35817	0.35	0.42	0.28
1971	354289	482895	259934	461139	556186	382334	265381	43821	0.38	0.45	0.31
1972	224044	303348	165472	489407	586415	408447	261877	34567	0.41	0.48	0.34
1973	201260	272293	148757	521094	624121	435073	242499	32651	0.43	0.52	0.36
1974	199605	270400	147345	575927	686446	483202	298351	38674	0.50	0.59	0.42
1975	234934	316607	174329	516325	616961	432104	271584	33035	0.54	0.64	0.45
1976	405658	556156	295885	398570	479063	331602	343967	79446	0.61	0.71	0.50
1977	149400	202790	110066	325117	391560	269949	216395	23177	0.59	0.68	0.49
1978	120498	163090	89028	297258	359511	245784	155141	17127	0.48	0.58	0.40
1979	87392	118703	64340	278732	333381	233041	128360	15105	0.45	0.54	0.38
1980	85515	116173	62947	261143	310041	219957	131908	13517	0.41	0.57	0.40
1981	162621	222453	118882	249735	295092	211349	132277	15971	0.47	0.57	0.40
1982	140888	190579	104154	220226	256621	188991	171011	27775	0.54	0.64	0.46
1983	148360	200839	109594	219984	256961	188328	110044	22978	0.65	0.77	0.55
1984	255854	347211	188534	188526	219288	162080	108834	39721	0.68	0.79	0.58
1985	356814	489268	260217	165920	192040	143353	218869	52802	0.70	0.82	0.60
1986	289441	392327	213536	156899	181306	135777	151006	34196	0.73	0.86	0.62
1987	148943	201788	109938	165897	191740	143537	167500	24897	0.70	0.82	0.60
1988	138223	186581	102399	155360	181531	125022	135172	15076	0.71	0.83	0.61
1989	102529	138603	75843	126973	147868	109031	108877	15707	0.69	0.81	0.59
1990	151018	204526	111508	115215	134465	93722	100000	20619	0.65	0.77	0.56
1991	175187	236420	129813	108297	125709	92097	108048	22902	0.62	0.73	0.53
1992	104011	139543	77527	114207	131777	90000	99742	15792	0.60	0.71	0.51
1993	175886	236560	130774	121596	141383	104000	111491	21119	0.63	0.75	0.53
1994	118300	158728	88168	110008	146819	108600	109622	17138	0.56	0.67	0.48
1995	214714	292128	157814	145000	169927	124776	121810	19395	0.57	0.68	0.48
1996	119314	161973	87800	157447	183266	135000	114997	13928	0.50	0.60	0.42
1997	146935	200566	100045	100025	125006	80050	107327	12755	0.44	0.53	0.36
1998	85299	116035	62704	100021	125000	80050	106123	11096	0.45	0.54	0.37
1999	112741	154277	82390	100050	125000	80050	110716	8936	0.48	0.58	0.40
2000	98327	134032	72133	89762	122559	80000	91322	8014	0.42	0.51	0.35
2001	208241	272244	135000	196270	231198	166619	95042	11118	0.39	0.47	0.32
2002	158272	215727	116000	220827	259246	188101	122036	21544	0.40	0.48	0.33
2003	161900	221635	118400	213826	251615	181712	112383	11438	0.42	0.50	0.34
2004	100000	160200	86740	100000	125000	80000	107728	8085	0.37	0.45	0.30
2005	140000	190000	106095	257875	303583	219048	119844	8195	0.38	0.46	0.31
2006	100200	133334	72100	269251	316469	229078	121320	8585	0.40	0.48	0.33
2007	155660	216161	110000	246261	290278	208920	99204	12413	0.38	0.45	0.31
2008	12421	170076	83260	250785	295305	212978	122184	8359	0.44	0.54	0.37
2009	17477	78000	42309	244356	289566	206206	112267	4295	0.45	0.54	0.37
2010	191916	125319	67417	228317	272519	191284	103030	4483	0.43	0.52	0.36
2011	83000	10761	60780	183594	219343	153672	98446	4339	0.43	0.53	0.36
2012	139812	192394	101601	169050	202239	141307	78414	9282	0.39	0.48	0.32
2013	102359	142143	73710	179261	215222	149308	80059	7789	0.35	0.43	0.28
2014	67226	95782	47184	209290	253029	173112	76392	6336	0.31	0.39	0.25
2015	15408	170271	78222	226743	278244	184775	76936	5009	0.29	0.38	0.23
2016	150155	236886	95179	225328	284818	178264	67902 #	10874 ##	0.27	0.36	0.194
2017	105825	187983	59575	275454	364917	207924	88468 #	6478 ##	0.26	0.37	0.179
2018	62179###	147931	26135	325942	478842	221865					

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

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

Recruitment in 2018 is the assessment estimate. The value given in Table 2 is the median from a normal distribution of the assessment estimate required for stochastic projections.

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