

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

ICES stock advice

Please note: The present advice replaces the advice given for this stock in June 2016.

ICES advises that when the MSY approach is applied, catches in 2017 should be no more than 140 653 tonnes.

Since this stock is only partially under the EU landing obligation, ICES is not in a position to advise on landings corresponding to the advised catch.

Stock development over time

Recruitment (R) has fluctuated over time and has generally been below the long-term average since 2008. Fishing mortality (F) has been below F_{MSY} since 2013. Spawning-stock biomass (SSB) has fluctuated without trend, remaining above $MSY B_{trigger}$ since 1997.

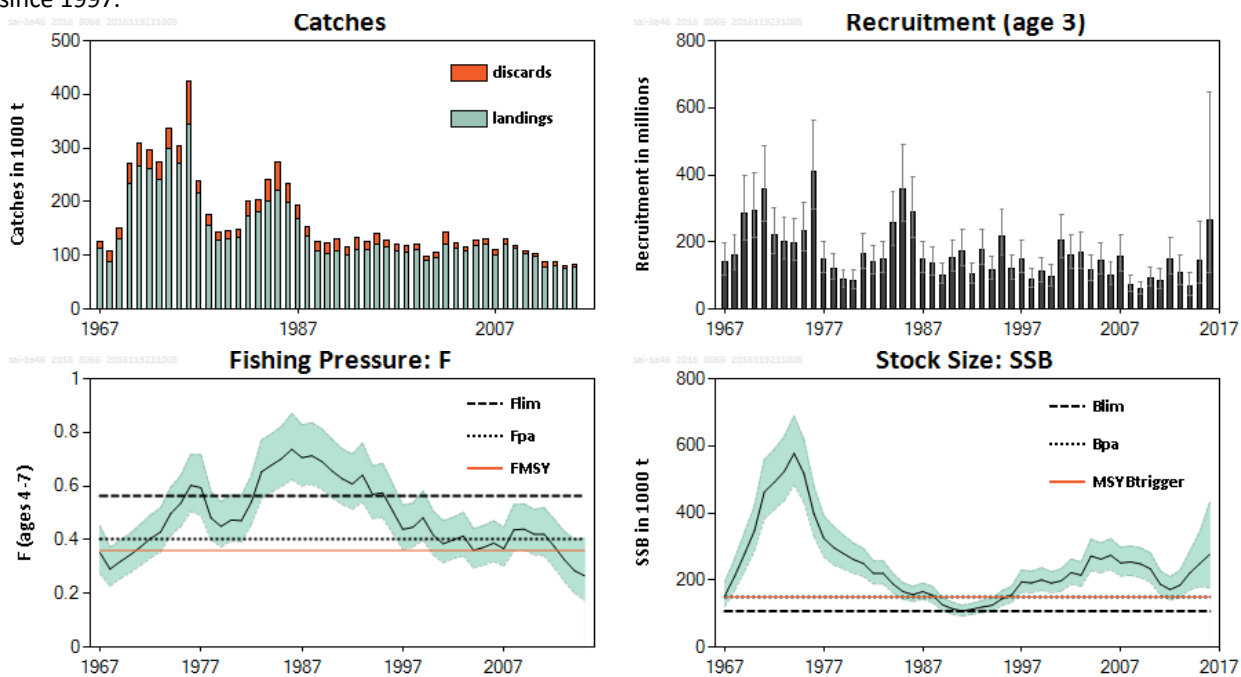


Figure 6.3.38.1 Saithe in subareas 4 and 6 and Division 3.a. Summary of stock assessment.

Stock and exploitation status

Table 6.3.38.1 Saithe in subareas 4 and 6 and Division 3.a. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size				
		2013	2014	2015		2014	2015	2016		
Maximum sustainable yield	F_{MSY}	✓	✓	✓	Appropriate	MSY	✓	✓	✓	Above trigger
Precautionary approach	F_{pa} , F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa} , B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓	Within the range	SSB_{MGT}	✓	✓	✓	Within the range

Catch options

Table 6.3.38.2 Saithe in subareas 4 and 6 and Division 3.a. The basis for the catch options.

Variable	Value	Notes
F ages 4–7 (2016)	$F = 0.20$	TAC constraint (68601 tonnes)*
SSB (2016)	275345 t	SSB in the intermediate year, tonnes
SSB (2017)	337973 t	SSB at the beginning of the TAC year, tonnes
R_{age3} (2016)	109 million	Median recruitment re-sampled from the years 2003–2015
R_{age3} (2017)	109 million	Median recruitment re-sampled from the years 2003–2015
Total catch (2016)	72335 t	Assuming 2015 landings fraction by age, tonnes
Commercial landings (2016)	68601 t	TAC 2015, tonnes
Discards (2016)	3734 t	Assuming 2015 discard fraction by age, tonnes

* 2016 TAC without adjustment.

Table 6.3.38.3 Saithe in subareas 4 and 6 and Division 3.a. The catch options. All weights are in tonnes.

Rationale	Total catch (2017)	Wanted catch* (2017)	Unwanted catch* (2017)	Wanted catch 3.a & 4 (2017) **	Wanted catch 6 (2017) **	Basis	F _{total} (2017)	F _{wanted} (2017)	F _{unwanted} (2017)	SSB (2018)	% SSB change ***	% TAC change wanted catch^
MSY approach	140653	134792	5861	122122	12670	F _{MSY}	0.36	0.34	0.02	333297	-1	96
EU–Norway management strategy	82455	78976	3479	71552	7424	Paragraph 5 of management strategy	0.2	0.19	0.01	390772	16	15
Zero catch	0	0	0	0	0	F = 0	0	0	0	470855	39	-100
Other options	83984	80439	3544	72878	7561	F ₂₀₁₆	0.2	0.19	0.01	389271	15	17
	71912	68601	3311	62153	6448	TAC ₂₀₁₆	0.17	0.16	0.01	400429	18	0
	152927	146546	6381	132771	13775	F _{pa}	0.4	0.38	0.02	321560	-5	114
	201882	193230	8651	175066	18164	F _{lim}	0.56	0.54	0.02	273675	-19	182
	385729	365782	19946	331398	34384	SSB ₂₀₁₈ = B _{lim}	1.58	1.5	0.08	107000	-68	433
	335831	319572	16259	289532	30040	SSB ₂₀₁₈ = B _{pa}	1.2	1.15	0.05	150000	-56	366
335831	319572	16259	289532	30040	SSB ₂₀₁₈ = MSY B _{trigger}	1.2	1.15	0.05	150000	-56	366	
<i>Mixed fisheries options – differences with calculations above can occur because of the different methodology used (ICES, 2016b).^^</i>												
Maximum	173391					A		0.576		228748	-32	
Minimum	60589					B		0.17		335149	-1	
Cod	99696					C		0.29		297816	-12	
SQ effort	120378					D		0.36		278248	-18	
Value	104672					E		0.31		293096	-13	

* “Wanted” and “unwanted” catch are used to describe fish that would be landed and discarded in the absence of the EU landing obligation, based on discard rate estimates for 2015.

** 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.

*** SSB 2018 relative to SSB 2017.

^ Wanted catch 2017 relative to the 2016 wanted catch (without adjustment) TAC.

^^ Mixed-fisheries considerations as part of this advice were included by ICES in November 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 2017 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 scenario: Each fleet stops fishing when its cod stock share is exhausted.
- D. SQ (*status quo*) effort scenario: The effort of each fleet in 2016 and 2017 is the same as in 2015.
- 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.

Basis of the advice

Table 6.3.38.4 Saithe in subareas 4 and 6 and Division 3.a. The basis of the advice.

Advice basis	MSY approach.
Management plan	Changes to the stock assessment and reference points 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.

Quality of the assessment

The saithe assessment went through an ICES benchmark process in 2016 (ICES, 2016c). The scientific survey used in the assessment does not cover the whole stock distribution; however, it is considered generally representative. The number of observations (trawl stations) with saithe is low and the resulting survey index is uncertain.

Commercial catch per unit effort information for French, German, and Norwegian trawlers was combined into a single index of biomass of fishable saithe. There are conflicting signals between the survey and fishable biomass index, which contributes to uncertainty.

The uncertainty for age 3 saithe is large. The fraction of age 3 saithe migrating into the survey area (and the fishery) is low and varying between years with no obvious trend. Observations of saithe at age 3 are not suitable for predicting year-class strength. This means that assumed recruitment values are highly uncertain and a substantial portion (33%) of the advised wanted catch in 2017 is based on the recruitment assumptions for 2016 and 2017.

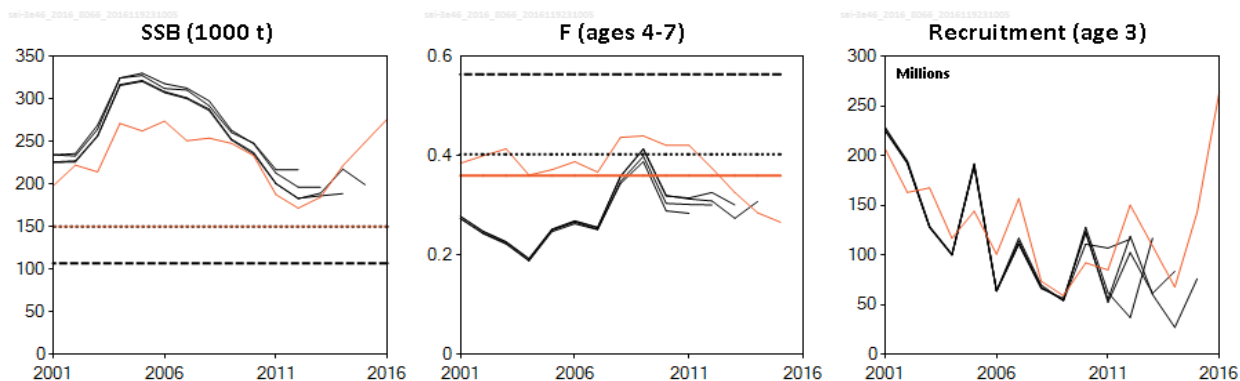


Figure 6.3.38.2 Saithe in subareas 4 and 6 and Division 3.a. Historical assessment results (final-year recruitment estimates included). Latest estimates for F are for ages 4–7; others are for ages 3–6. This assessment (red line) is based on a revised benchmark in 2016 (ICES, 2016c).

Issues relevant for the advice

The assessment was revised for North Sea saithe, incorporating the new survey data for 2016.

In 2012, an EU–Norway request was made to ICES on options to revise the long-term management strategy for saithe (ICES, 2012). Based upon the evaluations, the EU and Norway agreed to keep the existing management strategy. Because the long-term performance was not clear, ICES advised that the strategy should be re-evaluated within four years (i.e. no later than 2016) and revised if necessary.

The catch option for 2017, based on the EU–Norway management strategy, has a lower F than the corresponding F_{MSY} option and is considered precautionary.

The advice based on the MSY approach gives a large increase in TAC compared to the TAC in 2016. This is caused by a combination of improved stock status and changes made to the assessment during the 2016 benchmark process. The assessment methodology has been changed as well as the time-series used for tuning. It should be taken into account that the assessment and associated short-term forecast is uncertain for this stock (see under “Quality of assessment”) when setting the TAC. In addition, recruitment values are highly uncertain and a substantial portion (33%) of the advised wanted catch in 2017 is based on the recruitment assumptions. Therefore, a TAC constraint should be considered by managers.

Results from a North Sea mixed-fisheries analysis are presented in ICES (2016b). For 2017, assuming a strictly implemented discard ban (corresponding to the “Minimum” scenario), haddock would be the most limiting stock (assuming that the full advised catch is taken), constraining 36 out of 41 fleet segments (corresponding to 91% of the kW days of effort in 2015). Cod and eastern Channel sole would be limiting for fleets, corresponding to 5% and 4% of the 2015 effort, respectively. Conversely, in the “Maximum” scenario with *Nephrops* managed by separate TACs for the individual functional units (FUs), *Nephrops* would be considered the least limiting stocks in many FUs. *Nephrops* in FU 33, FU 5, FU 32, FU 7, and FU Others would be the least limiting stocks for fleets in these FUs, representing 32%, 16%, 10%, 4%, and 17% of the 2015 effort, respectively. Eastern Channel plaice and saithe would be least limiting for other fleet segments, representing 12% and 9% of the 2015 effort, respectively.

Results for the saithe stock are also included as additional rows in the catch options table of this advice sheet.

Reference points

Table 6.3.38.5 Saithe in subareas 4 and 6 and Division 3.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	150000 t	B_{pa}	ICES (2016a)
	F_{MSY}	0.36	Stochastic simulation using hockey-stick stock–recruitment	ICES (2016a)
Precautionary approach	B_{lim}	107000 t	B_{loss}	ICES (2016a)
	B_{pa}	150000 t	$B_{pa} = B_{lim} * \exp(1.645 \sigma_B)$; $\sigma_B = 0.20$	ICES (2016a)
	F_{lim}	0.56	F_{lim} gives the 50% probability of falling below B_{lim} in the stochastic EqSim simulations	ICES (2016a)
	F_{pa}	0.40	$F_{pa} = F_{lim} * \exp(-1.645 \sigma_F)$; $\sigma_F = 0.20$	ICES (2016a)
EU–Norway management strategy	SSB trigger	200000 t	Old B_{pa}	ICES (2016a)
	F_{MGT}	0.3	Ages 3–6	

Basis of the assessment

Table 6.3.38.6 Saithe in subareas 4 and 6 and Division 3.a. The basis of the assessment.

ICES stock data category	1 (ICES, 2016d).
Assessment type	Age-based analytical assessment (SAM; ICES, 2016a) that uses catches in the model and in the forecast.
Input data	Commercial catches (international landings and discards, age and length frequencies from catch sampling); survey index (IBTS Q3); combined commercial index scaled to the fishable biomass (French, German, Norwegian trawler fleets). Maturity-at-age and natural mortality are assumed to be constant. Stock weights are catch weights.
Discards and bycatch	Discards included (98% reported, 2% raised), data series from the main fleets (which in 2015 covered 48% of the landings by weight).
Indicators	None.
Other information	Benchmarked in 2016 (ICES, 2016c) with additional review (ICES, 2016a).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) and Working Group on Mixed-Fisheries Advice (WGMIXFISH-ADVICE)

Information from stakeholders

Across individual areas the proportions reporting higher abundances of saithe in 2014 tended to be greater in more northern areas (areas 1, 2, 3, and 8 as shown in Figure 6.3.38.3), while the proportions reporting lower abundances tended to be higher in more southerly areas (areas 4, 6a, and 7 in Figure 6.3.38.3; Napier, 2014). No new information has been provided for 2015.

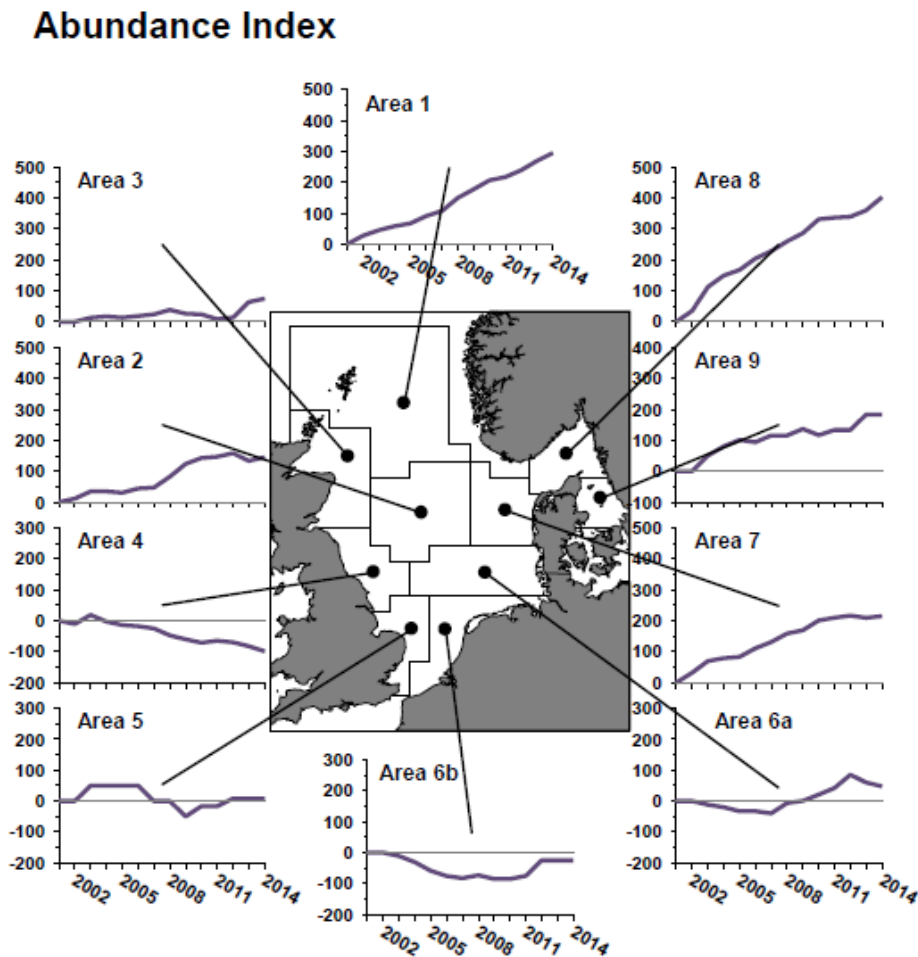


Figure 6.3.38.3 Cumulative time-series of index of perceptions of abundance of saithe by roundfish sampling area from the Fishers' North Sea Stock Survey (Napier, 2014; see page 14 for an explanation of the index).

History of the advice, catch, and management

Table 6.3.38.7 Saithe in subareas 4 and 6 and Division 3.a. History of ICES advice, the agreed TAC, and ICES estimates of landings. All weights are in thousand tonnes.

Subarea 4 and Division 3.a

Year	ICES advice	Predicted landings corresp. to advice	Predicted catches corresp. to advice	Agreed TAC	Official landings	ICES landings	ICES discards
1987	Reduce F	< 198		173	154	149	
1988	60% of F(86); TAC	156		165	113	107	
1989	No increase in F; TAC	170		170	92	92	
1990	No increase in F; TAC	120		120	85	88	
1991	No increase in F; TAC	125		125	93	99	
1992	No increase in F; TAC	102		110	92	92	
1993	70% of F(91) ~ 93 000 t	93		93	99	105	
1994	Reduce F by 30%	72		97	90	102	
1995	No increase in F	107		107	97	113	
1996	No increase in F	111		111	96	110	
1997	No increase in F	113		115	86	103	
1998	Reduce F by 20%	97		97	88	100	
1999	Reduce F to F_{pa}	104		110	108	107	
2000	Reduce F by 30%	75		85	85	87	
2001	Reduce F by 20%	87		87	88	90	
2002	$F < F_{pa}$	< 135		135	115	105.632	18.394
2003	$F < F_{pa}$	< 176		165	107.47	106.257	9.916
2004	$F < F_{pa}^*$	< 211		190	103.61	102.746	7.464
2005	F according to man. plan*	< 137		145	110.58	113.388	6.558
2006	F according to man. plan ($< F_{pa}$)*	< 123		123	109.80	111.845	6.909
2007	F according to man. plan ($< F_{pa}$)*	< 124		123	87.38	92.602	11.828
2008	F according to man. plan ($< F_{pa}$)*	< 137		136	114.52	115.471	6.712
2009	F according to man. plan ($< F_{pa}$)*	< 126		126	100.68	105.973	3.774
2010	F according to man. plan ($< F_{pa}$)*	< 107		107	91.07	96.767	4.071
2011	See scenarios	-		93	89.28	91.528	3.837
2012**	F according to man. plan ($< F_{pa}$)*	< 79.320		79	68.93	70.864	6.396
2013	Management plan (TAC +15%)*	< 91.219		91.220	71.60	71.406	6.392
2014	Management plan (TAC -15%)*	< 77.536		77.536	68.318	69.372	5.824
2015	Management plan	< 66.006	< 72.211	66.006	69.879	69.403	4.603
2016	EU-Norway management strategy	≤ 62.153	≤ 67.995	65.696			
2017	MSY approach	≤ 122.122	≤ 127.432				

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

** The June advice in 2012 was updated in November 2012.

Subarea 6

Year	ICES advice	Predicted landings corresp. to advice	Predicted catches corresp. to advice	Agreed TAC^^	Official landings	ICES landings	ICES discards
1987	F reduced towards F_{max}	19		27.8	32.5	31.4	
1988	80% of F(86); TAC	35		35	32.8	34.2	
1989	F < 0.3; TAC	20		30	22.4	25.6	
1990	80% of F(88); TAC	24		29	18.0	19.9	
1991	Stop SSB decline; TAC	21		22	17.9	17.0	
1992	Avoid further reduction in SSB	< 19		17	10.8	11.8	
1993	F = 0.21	6.3		14	14.5	13.9	
1994	Lowest possible F			14	13.0**	12.8	
1995	Significant reduction in effort	-		16	10.6**	11.8	
1996	No increase in F	10.2*		13	9.4**	9.4	
1997	Significant reduction in F			12	8.6**	9.4	
1998	60% reduction in F	4.8		10.9	7.4**	8.4	
1999	60% reduction in F	4.8		7.5	6.8	7.3	
2000	Reduce F by 30%	6.0		7	6.4	5.9	
2001	Reduce F by 20%	9.0		9	8.7	8.4	
2002	F < F_{pa}	< 13		14	5.6	5.519	3.150
2003	F < F_{pa}	< 17		17.1	5.22	5.789	2.242
2004	F < F_{pa}^{\wedge}	< 21		20	4.81	4.982	0.620
2005	F according to man. plan (< F_{pa}) [^]	< 14		15	8.70	6.456	1.637
2006	F according to man. plan (< F_{pa}) [^]	< 12		13	9.42	9.474	1.675
2007	F according to man. plan (< F_{pa}) [^]	< 12		13	6.69	6.602	0.584
2008	F according to man. plan (< F_{pa}) [^]	< 14		14	6.01	6.712	0.981
2009	F according to man. plan (< F_{pa}) [^]	< 13		13	6.17	6.294	0.521
2010	F according to man. plan (< F_{pa}) [^]	< 11		11	6.22	6.263	0.412
2011	See scenarios	-		10	7.31	6.917	0.502
2012***	F according to man. plan (< F_{pa}) [^]	< 8.230		8	7.56	7.549	2.887
2013	Management plan (TAC +15%) [^]	< 9.464		9.464	8.47	8.653	1.397
2014	Management plan (TAC -15%) [^]	< 8.045		8.045	6.842	7.020	0.512
2015	Management plan	< 6.848	< 7.492	6.848	7.577	7.534	0.405
2016	EU-Norway management strategy	≤ 6.448	≤ 7.054	6.448			
2017	MSY approach	≤ 12.670	≤ 13.221				

* Status quo catch.

** Incomplete data.

*** The June advice in 2012 was updated in November 2012.

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

^{^^} Since 1999, 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.

History of catch and landings

Table 6.3.38.8 Saithe in subareas 4 and 6 and Division 3.a. Catch distribution by fleet in 2015 as estimated by ICES.

Catch (2015)	Landings			Discards
	87% bottom trawl fleets	5% gillnetters	8% other gears	
81945 t	76935 t			5010 t

Table 6.3.38.9 Saithe in subareas 4 and 6 and 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. Weights are in tonnes.

Subarea 4 and Division 3.a

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*
Belgium	22	28	15	18	7	27	15	2	1	3	4	6
Denmark	7991	7498	7470	5443	8066	8802	8018	6331	5171	5691	5056	4508
Faroe Isl.	558	463	60	15	108	841	146	2	8	3	0	0
France	13628	11830	16953	15083	15881	7203	4582*	13856*	14093*	8475	7906	11612
Germany	9589	12401	14397	12791	14140	13410	11193	10234	8052	9687	8562	7954
Greenland	403	1042	924	564	888	927	0	0	0	0	0	0
Ireland	1	0	0	0	0	1	0	0	0	0	0	0
Lithuania	0	149	0	0	0	0	0	0	0	0	0	0
Netherlands	3	40	28	5	3	16	3	24	34	168	0	64
Norway	62783	68122	61318	45396	61464	57708	52712	46809	33288	35701	37463	35691
Poland	0	1100	1084	1384	1407	988	654	584	0	0	0	0
Russia	0	35	2	5	5	13	0	0	0	0	0	0
Sweden	2249	2132	1745	1381	1639	1363	1545	1335	1306	1401	1272	1157
UK (E/W/Ni)	457	960									687	
UK (Scotland)	5924	6170	9128**	9625**	11804**	12584**	11887**	10250**	7287**	10379**	7686	8888**
Total reported	103608	111970	113124	91710	115412	103883	90755	89427	69240	71508	68318	69879
Unallocated	862	-1418	1279	-892	-59	-2090	-6012	-2101	-1624	102	-1054	476
ICES estimate	102746	113388	111845	92602	115471	105973	96767	91528	70864	71406	69372	69403
TAC	190000	145000	123250	135900	135900	125934	107000	93600	79320	91220	77536	66006

*Preliminary.

**Scotland+E/W/Ni combined.

Subarea 6

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*
Denmark	0	0	0	0	0	0	0	0	0	0	20	0
Faroe Islands	34	25	76	32	23	60	24	5	6	25	0	3
France	3053	3954	6092	4327	4170	2102	2008	2357	2612	3814	2904	3484
Germany	4	373	532	580	148	298	257	0	9	0	0	0
Ireland	95	168	267	322	288	407	520	359	364	313	128	105
Netherlands	0	0	3	36	1	0	0	0	0	0	0	6
Norway	16	20	28	377	78	68	121	240	5	715	442	677
Russia	6	25	7	2	50	4	2	0	0	0	0	1
Spain	2	3	6	3	4	8	18	31	13	21	0	15
UK (E/W/Ni)	37	133									97	
UK (Scotland)	1563	2922	2748**	1424**	2955**	3491**	3168**	4500**	4549**	3646**	3191	3286**
Total reported	4810	7623	9759	7103	7717	6438	6118	7492	7558	8534	6842	7577
Unallocated	-172	1167	285	501	1005	144	-145	575	9	-119	-178	43
ICES estimate	4982	6456	9474	6602	6712	6294	6263	6917	7549	8653	7020	7534
TAC	20000	15044	12787	14100	14100	13066	11000	9570	8230	9464	8045	6848

*Preliminary.

**Scotland+E/W/Ni combined.

Summary of the assessment

Table 6.3.38.10 Saithe in subareas 4 and 6 and Division 3.a. Assessment summary. Weights are in tonnes.

Year	Recruitment Age 3	High	Low	Stock size (SSB)	High	Low	Landings	Discards	Fishing pressure (F) Ages 4–7 Year–1	High	Low
	thousands			tonnes			tonnes	tonnes			
1967	141236	198600	100441	153048	193538	121029	113751	12992	0.352	0.452	0.274
1968	160632	222615	115907	211445	263489	169682	88326	20818	0.291	0.372	0.228
1969	286285	397018	206436	278191	342145	226192	130588	19713	0.319	0.398	0.256
1970	293712	405054	212975	347552	420609	287184	234962	35817	0.344	0.424	0.278
1971	356492	486445	261256	462902	558572	383618	265381	43821	0.373	0.457	0.305
1972	223364	302723	164810	491380	589235	409776	261877	34567	0.405	0.492	0.333
1973	200752	271954	148191	523227	627377	436367	242499	32651	0.429	0.519	0.355
1974	198882	269900	146550	577735	689057	484397	298351	38674	0.497	0.595	0.416
1975	234353	316185	173700	517101	618047	432643	271584	33035	0.536	0.639	0.45
1976	410052	562596	298869	398783	479436	331698	343967	79449	0.603	0.718	0.505
1977	148871	202432	109482	324896	391201	269830	216395	23520	0.594	0.716	0.492
1978	120467	163299	88870	297156	359412	245683	155141	21727	0.481	0.579	0.4
1979	87300	118717	64197	279004	333649	233310	128360	14295	0.45	0.542	0.374
1980	85182	115809	62655	261281	310098	220149	131908	13392	0.474	0.567	0.396
1981	164050	224837	119697	249654	294874	211368	132278	15971	0.471	0.564	0.393
1982	140815	190685	103988	220401	256729	189213	174351	27775	0.541	0.639	0.458
1983	147953	200572	109139	220123	257058	188495	180044	22978	0.653	0.771	0.554
1984	256002	348080	188282	188409	219154	161978	200834	39723	0.678	0.795	0.578
1985	357822	492071	260200	165835	191925	143292	220869	52802	0.703	0.823	0.6
1986	291043	395414	214221	156674	180967	135643	198596	34190	0.737	0.871	0.624
1987	148507	201511	109445	165388	191043	143177	167514	24877	0.706	0.828	0.601
1988	138160	186712	102234	154741	180677	132529	135172	19076	0.713	0.836	0.607
1989	101945	137932	75348	126388	147065	108618	108877	15707	0.691	0.812	0.588
1990	151399	205303	111649	114521	133560	98197	103800	20619	0.656	0.773	0.557
1991	175157	236754	129586	107564	124759	92739	108048	22902	0.627	0.738	0.532
1992	102904	138133	76660	113170	130505	98138	99742	15792	0.608	0.719	0.514
1993	176835	237831	131482	119686	138866	103156	111491	21119	0.641	0.76	0.541
1994	117015	157157	87127	124845	144787	107650	109622	17138	0.569	0.674	0.48
1995	217518	296202	159736	144007	167846	123555	121810	19395	0.575	0.685	0.483
1996	119064	161583	87733	156136	181652	134204	114997	13928	0.507	0.607	0.424
1997	150189	205645	109688	194605	230257	164473	107327	12755	0.439	0.529	0.364
1998	87361	119345	63948	191395	225645	162343	106123	11096	0.447	0.537	0.373
1999	111667	153295	81342	200576	237063	169705	110716	8936	0.482	0.582	0.399
2000	96563	131852	70719	190981	224940	162148	91322	8014	0.418	0.507	0.344
2001	207152	283572	151326	197819	233931	167281	95042	11118	0.385	0.471	0.315
2002	163049	222783	119331	222344	262676	188205	122036	21544	0.4	0.484	0.33
2003	167628	229065	122669	214343	253243	181418	112383	11438	0.414	0.502	0.341
2004	116865	159136	85822	271423	321663	229030	107384	8088	0.361	0.441	0.295
2005	144115	197465	105179	262460	310068	222162	118873	8196	0.372	0.453	0.306
2006	100868	140720	72302	274035	323680	232005	121650	8585	0.388	0.471	0.32
2007	156865	220455	111618	250989	297634	211654	99470	12413	0.367	0.446	0.302
2008	73683	100477	54034	254061	301185	214311	121848	8359	0.437	0.531	0.36
2009	58999	80455	43265	247988	296023	207748	113756	4296	0.44	0.534	0.362
2010	92045	126472	66990	233517	281175	193937	103004	4484	0.421	0.513	0.345
2011	84876	119436	60316	187715	226828	155347	97598	4362	0.421	0.52	0.341
2012	150330	214393	105410	171772	209575	140787	77865	9278	0.375	0.476	0.296
2013	109072	161963	73453	184761	229709	148608	80447	7777	0.326	0.431	0.246
2014	67670	109115	41967	221606	286323	171516	75493	6337	0.285	0.401	0.202
2015	143109	263454	77737	249285	344040	180627	78307	5003	0.266	0.405	0.175
2016	264905	645277	108751	276772	431435	177553					
Average	166016	234570	118935	242994	292889	202087	145138	20011	0.483	0.584	0.4

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