

Anglerfish (*Lophius budegassa*, *Lophius piscatorius*) in subareas 4 and 6 and Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in 2019 should be no more than 31 690 tonnes.

Stock development over time

The stock size indicator increased between 2011–2017 and decreased in 2018 from the historical high. The harvest rate has been relatively stable since 2014.

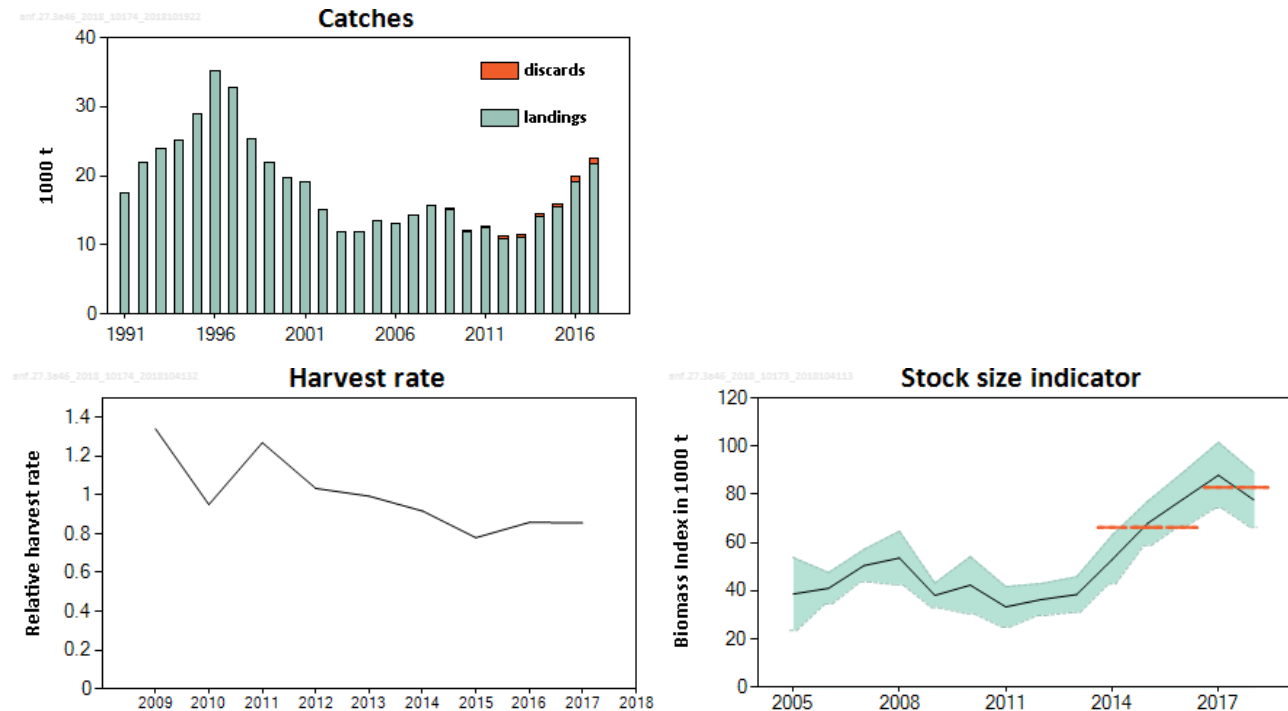


Figure 1 Anglerfish in subareas 4 and 6 and Division 3.a. Summary of the stock assessment. Top: ICES landings and discards (thousand tonnes). Bottom left: Relative harvest rate (total catch/stock size indicator; normalized to the average harvest rate). Bottom right: Stock biomass (thousands tonnes) from SCO-IV-VI-AMISS-Q2. The dashed horizontal lines indicate the average of the most recent two years and the previous three years. The shaded area represents the 95% confidence interval.

Stock and exploitation status

ICES cannot assess the stock and exploitation status relative to the maximum sustainable yield (MSY) and precautionary approach (PA) reference points because the reference points are undefined.

Table 1 Anglerfish in subareas 4 and 6 and 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}	?	?	?	MSY $B_{trigger}$?	?
Precautionary approach	F_{pa}, F_{lim}	?	?	?	B_{pa}, B_{lim}	?	?
Management plan	F_{MGT}	—	—	—	B_{MGT}	—	—
Qualitative evaluation	-	↘	↗	→	-	↗	↘
				Stable			Decreasing

Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The SCO-IV-VI-AMISS-Q2 survey was used as the index of stock development. The advice is based on a comparison of the two latest index values (index A) with the three preceeding values (index B), multiplied by the recent advised catch.

The index is estimated to have increased by more than 20% and thus the uncertainty cap was applied. The stock status relative to candidate reference points is unknown. The precautionary buffer has not previously been applied for this stock, and with the increasing trend in the stock size indicator since 2011, the precautionary buffer was not applied this year either. Discard rate in 2017 was 3.4% of the total catch.

Table 2 Anglerfish in subareas 4 and 6 and Division 3.a. The basis for the catch scenarios.*

Index A (2017, 2018)		82 779 t
Index B (2014, 2015, 2016)		66 246 t
Index ratio (A/B)		1.25
Uncertainty cap	Applied	1.2
Advised catch for 2018		26 408 t
Precautionary buffer	Not applied	-
Catch advice**		31 690 t
% Advice change^		+20%

*The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.

**[Advised catch for 2018] × [uncertainty cap].

^Advice value for 2019 relative to the advice value for 2018.

The advised catch for 2019 is higher than the 2018 advice due to the increase in the stock size indicator.

Basis of the advice

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

Advice basis	Precautionary approach.
Management plan	ICES is not aware of any agreed precautionary management plan for anglerfish in this area.

Quality of the assessment

The SCO-AMISS-IV-VI-Q2 survey does not cover divisions 3.a, 4.b, and 4.c, which collectively account for 9% of the landings. It is uncertain to what extent the lack of coverage of these areas affects the quality of the assessment. Discard data are available for most of the fleets except the gillnet fishery, which is not adequately sampled and which accounted for 14% of the landings in 2017. It is not clear how this affects the harvest rate.

This stock was benchmarked at WKANGLER (ICES, 2018a). ICES estimates of catch were updated for the period 2002–2016 along with the estimation of discards for the period 2009–2016. No appropriate analytical assessment was agreed. Methods for setting proxy reference points, according to the ICES technical guidelines for stocks in categories 3 and 4, remain unsuitable for this stock owing to its life history characteristics and uncertainties surrounding the historical catch data.

Issues relevant for the advice

The two TACs in this area do not match the stock unit. One TAC area covers Subarea 4 and Division 2.a (EC); the second covers Division 5.b (EC) and subareas 6, 12, and 14. There is no TAC for Division 3.a. As a result of this mismatch, there is a potential for catches to exceed advice.

Discard levels were higher in 2013, 2016, and in 2017 owing to incoming high recruitment in these years. In addition, 2017 quota restrictions in both the demersal whitefish and the *Nephrops* fisheries have also resulted in discarding of marketable anglerfish.

Reference points

No reference points are defined for this stock. MSY proxies were examined (ICES, 2016; 2018a), but no reliable proxy could be identified for this stock.

Basis of the assessment

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

ICES stock data category	3 (ICES, 2018b).
Assessment type	Survey trends.
Input data	International catch information and dedicated industry-science anglerfish surveys in Subarea 6 and Division 4.a (SCO-IV-VI-AMISS-Q2).
Discards and bycatch	Discard estimates are available from 2009 onwards for most of the fleets.
Indicators	Length distribution from SCO-IV-VI-AMISS-Q2 survey.
Other information	Last benchmarked in 2018 (WKANGLER; ICES, 2018a), which did not result in a revision of the assessment method.
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE).

Information from stakeholders

No additional information is available for this stock.

History of the advice, catch, and management

Table 5 Anglerfish in subareas 4 and 6 and Division 3.a. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice		Landings corresponding to advice	Agreed TAC*	Official landings	ICES landings [#]	ICES discards [#]
		Div. 3.a & Subarea 4	Subarea 6					
1990	Not assessed	-	-	-	8600	17 605	-	-
1991	Not assessed	-	-	-	8600	18 369	16 846	-
1992	Not assessed	-	-	-	8600	20 807	20 934	-
1993	No long-term gain in increased F**	-	-	-	8600	22 596	23 128	-
1994	No long-term gain in increased F**	-	-	-	8600	25 155	24 246	-
1995	A precautionary TAC not exceeding recent catch levels**	-	-	-	8600	29 055	28 090	-
1996	A precautionary TAC not exceeding recent catch levels**	-	-	-	8600	35 039	34 398	-
1997	Reduction in fishing effort**	-	-	-	8600	32 853	31 952	-
1998	Reduction in fishing effort**	-	-	-	30 700	25 471	24 667	-
1999	Reduce fishing effort, effective implementation of the TAC**	-	-	-	30 700	21 230	21 194	-
2000	40% reduction in catches	< 9700	< 7400	-	25 700	18 973	19 080	-
2001	2/3 of the catches in 1973–1990	5700	4300	-	20 500	19 304	18 536	-
2002	2/3 of the catches in 1973–1990	5700	4300	-	15 300	15 978	15 067	-
2003	Reduce F below F _{pa}	-	-	< 6700***	10 200	13 004	11 847	-
2004	Reduce F below F _{pa}	-	-	< 8800	10 200	13 496	11 857	-
2005	No effort increase	-	-	-	15 000	13 557	13 540	-
2006	No effort increase	-	-	-	15 000	15 151	13 071	-
2007	No effort increase	-	-	-	16 500	16 430	14 288	-
2008	No effort increase	-	-	-	16 500	16 918	15 739	-
2009	Same advice as last year	-	-	-	16 900	16 012	15 158	88
2010	No effort increase	-	-	-	16 900	13 839	11 819	185
2011	Decrease effort	-	-	-	15 100 [^]	13 679	12 532	76
2012	Reduce catch	-	-	-	14 344 [^]	12 265	10 849	367
2013	Decrease catches by 20%	-	-	-	13 627 [^]	12 139	11 056	343
2014	Decrease catches by 20%	-	-	10 231	12 265 [^]	13 287	14 078	410
2015	Increase landings by 20%			14 702	16 203 [^]	16 043	15 450	367
2016	Precautionary approach (increase recent advised catch by no more than 20%)	≤ 18 435		17 642	19 142 [^]	19 505	19 118	873
2017	Precautionary approach	≤ 22 007		21 171	21 171 [^]	21 082 ^{^^^}	21 719	756

Year	ICES advice	Catch corresponding to advice		Landings corresponding to advice	Agreed TAC*	Official landings	ICES landings [#]	ICES discards [#]
		Div. 3.a & Subarea 4	Subarea 6					
2018	Precautionary approach	≤ 26 408		≤ 25 563	25 405 ^{^^}			
2019	Precautionary approach	≤ 31 690						

* TAC for Subarea 4 and Division 2.a (EC) plus TAC for Division 5.b (EC) and subareas 6, 12, and 14. Prior to 1998 TAC covered only Division 5.b (EC) and subareas 6, 12, and 14.

** For Subarea 6.

*** Advice for Division 3.a, Subarea 4, and Division 6.a.

^ An additional quota of 1500 tonnes is also available for EU vessels fishing in the Norwegian zone of Subarea 4.

^^ An additional quota of 1700 tonnes is also available for EU vessels fishing in the Norwegian zone of Subarea 4.

^^^ Preliminary.

Revised values since 2002 (ICES, 2018a).

History of the catch and landings

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

Anglenish in subareas 4 and 6 and Division 3.a: catch distribution by fleet in 2017 as estimated by IES.									
Catch	Landings								Discards
	Division 3.a and Subarea 4				Subarea 6				
22 475 t	Demersal trawls 75%	Gillnets 15%	<i>Nephrops</i> trawls 5%	Other 5%	Demersal trawls 78%	Gillnets 12%	<i>Nephrops</i> trawls 1%	Other 9%	756 t
	21 719 t								

Table 7 Anglerfish in subareas 4 and 6 and Division 3.a. Official landings by ICES area and ICES estimates of landings and discards. All weights are in tonnes.

Year	3.a	4.a	4.b	4.c	6.a	6.b	4	6	Total (3.a, 4, 6)	ICES Landings**	ICES Discards**
1973	140	2 085	575	41	9 221	127	2 701	9 348	12 189	-	-
1974	202	2 737	1 171	39	3 217	435	3 947	3 652	7 801	-	-
1975	291	2 887	1 864	59	3 122	76	4 810	3 198	8 299	-	-
1976	641	3 624	1 252	49	3 383	72	4 925	3 455	9 021	-	-
1977	643	3 264	1 278	54	3 457	78	4 596	3 535	8 774	-	-
1978	509	3 111	1 260	72	3 117	103	4 443	3 220	8 172	-	-
1979	687	2 972	1 578	112	2 745	29	4 662	2 774	8 123	-	-
1980	652	3 450	1 374	175	2 634	200	4 999	2 834	8 485	-	-
1981	549	2 472	752	132	1 387	331	3 356	1 718	5 623	-	-
1982	529	2 214	654	99	3 154	454	2 967	3 608	7 104	-	-
1983	506	2 465	1 540	181	3 417	433	4 186	3 850	8 542	-	-
1984	568	3 874	1 803	188	3 935	707	5 865	4 642	11 075	-	-
1985	578	4 569	1 798	77	4 043	1 013	6 444	5 056	12 078	-	-
1986	524	5 594	1 762	47	3 090	1 326	7 403	4 416	12 343	-	-
1987	589	7 705	1 768	66	3 955	1 294	9 539	5 249	15 377	-	-
1988	347	7 737	2 061	95	6 003	1 730	9 893	7 733	17 973	-	-
1989	334	7 868	2 121	86	5 729	313	10 075	6 042	16 451	-	-
1990	570	8 387	2 177	34	5 615	822	10 598	6 437	17 605	-	-
1991	595	9 235	2 522	26	5 061	923	11 790	5 984	18 369	16 846	-
1992	938	10 209	3 053	39	5 479	1 089	13 301	6 568	20 807	20 934	-
1993	843	12 309	3 143	66	5 553	681	15 519	6 234	22 596	23 128	-
1994	811	14 505	3 445	210	5 273	909	18 162	6 182	25 155	24 246	-
1995	823	17 891	2 627	402	6 354	958	20 920	7 312	29 055	28 090	-
1996	702	25 176	1 847	304	6 408	602	27 327	7 010	35 039	34 398	-
1997	776	23 425	2 172	160	5 330	990	25 757	6 320	32 853	31 952	-
1998	626	16 859	2 088	78	4 506	1 313	19 026	5 819	25 471	24 667	-
1999	660	13 344	1 517	24	4 284	1 401	14 885	5 685	21 230	21 194	-
2000	602	12 338	1 617	31	3 311	1 074	13 986	4 385	18 973	19 080	-
2001	621	12 861	1 832	21	2 660	1 309	14 714	3 969	19 304	18 536	-
2002	667	11 048	1 244	21	2 280	718	12 313	2 998	15 978	15 067	-
2003	478	8 523	847	20	2 493	643	9 390	3 136	13 004	11 847	-
2004	519	8 987	851	15	2 453	671	9 853	3 124	13 496	11 857	-
2005	458	8 424	688	5	3 019	958	9 117	3 982	13 557	13 540	-
2006	425	10 339	683	3	2 785	915	11 026	3 700	15 151	13 071	-
2007	433	10 632	749	4	3 353	1 260	11 384	4 613	16 430	14 288	-
2008	486	11 038	769	5	3 373	1 247	11 812	4 620	16 918	15 739	-
2009	479	10 067	652	9	2 983	1 821	10 729	4 804	16 012	15 158	88

Year	3.a	4.a	4.b	4.c	6.a	6.b	4	6	Total (3.a, 4, 6)	ICES Landings**	ICES Discards**
2010	434	8 134	614	11	3 040	1 606	8 759	4 646	13 839	11 819	185
2011	406	7 759	764	9	2 871	1 871	8 532	4 741	13 679	12 532	76
2012	422	6 460	714	3	2 835	1 831	7 177	4 666	12 265	10 849	367
2013	407	6 392	546	4	2 666	2 124	6 943	4 789	12 139	11 056	343
2014	439	7 629	823	27	2 610	1 755	8 482	4 366	13 287	14 078	410
2015	480	9 668	961	9	3 365	1 559	10 639	4 924	16 043	15 450	367
2016	586	11 671	1 194	12	4 676	1 368	12 877	6 042	19 505	19 118	873
2017*	740	12 950	1 087	7	5 051	1 249	14 043	6 299	21 082	21 719	756

* Preliminary.

** Revised values since 2002 (ICES, 2018a).

Summary of the assessment

Table 8 Anglerfish in subareas 4 and 6, and in Division 3.a. Assessment summary. Weights are in tonnes.

Year	Official landings	ICES landings***	ICES discards ***	Total catch	Survey index	Survey index, high	Survey index, low	Relative harvest rate*
1973	12 189	-	-	-	-	-	-	-
1974	7 801	-	-	-	-	-	-	-
1975	8 299	-	-	-	-	-	-	-
1976	9 021	-	-	-	-	-	-	-
1977	8 774	-	-	-	-	-	-	-
1978	8 172	-	-	-	-	-	-	-
1979	8 123	-	-	-	-	-	-	-
1980	8 485	-	-	-	-	-	-	-
1981	5 623	-	-	-	-	-	-	-
1982	7 104	-	-	-	-	-	-	-
1983	8 542	-	-	-	-	-	-	-
1984	11 075	-	-	-	-	-	-	-
1985	12 078	-	-	-	-	-	-	-
1986	12 343	-	-	-	-	-	-	-
1987	15 377	-	-	-	-	-	-	-
1988	17 973	-	-	-	-	-	-	-
1989	16 451	-	-	-	-	-	-	-
1990	17 605	-	-	-	-	-	-	-
1991	18 369	16 846	-	-	-	-	-	-
1992	20 807	20 934	-	-	-	-	-	-
1993	22 596	23 128	-	-	-	-	-	-
1994	25 155	24 246	-	-	-	-	-	-
1995	29 055	28 090	-	-	-	-	-	-
1996	35 039	34 398	-	-	-	-	-	-
1997	32 853	31 952	-	-	-	-	-	-
1998	25 471	24 667	-	-	-	-	-	-
1999	21 230	21 194	-	-	-	-	-	-
2000	18 973	19 080	-	-	-	-	-	-
2001	19 304	18 536	-	-	-	-	-	-
2002	15 978	15 067	-	-	-	-	-	-
2003	13 004	11 847	-	-	-	-	-	-
2004	13 496	11 857	-	-	-	-	-	-
2005	13 557	13 540	-	-	38 617	53 755	23 479	-
2006	15 151	13 071	-	-	40 985	47 492	34 478	-
2007	16 430	14 288	-	-	50 392	57 108	43 676	-
2008	16 918	15 739	-	-	53 546	64 671	42 421	-
2009	16 012	15 158	88	15 246	38 060	43 133	32 987	1.34
2010	13 839	11 819	185	12 004	42 279	54 129	30 429	0.95
2011	13 679	12 532	76	12 608	33 254	41 662	24 846	1.27
2012	12 265	10 849	367	11 216	36 325	42 946	29 704	1.03

Year	Official landings	ICES landings***	ICES discards ***	Total catch	Survey index	Survey index, high	Survey index, low	Relative harvest rate*
2013	12 139	11 056	343	11 399	38 395	45 770	31 020	0.99
2014	13 287	14 078	410	14 488	52 884	62 999	42 769	0.92
2015	16 043	15 450	367	15 817	67 915	77 047	58 782	0.78
2016	19 505	19 118	873	19 118	77 946	89 060	66 831	0.86
2017	21 082**	21 719	756	22 475	87 896	101 569	74 222	0.86
2018	-	-	-	-	77 661	89 064	66 258	-

* Calculated as total catch divided by survey index; normalized to the average harvest rate.

** Preliminary.

*** Revised values since 2002 (ICES, 2018a).

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