

Anglerfish (*Lophius budegassa*, *Lophius piscatorius*) 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 precautionary approach is applied, catches in 2020 should be no more than 22 056 tonnes.

Stock development over time

The stock size indicator increased from 2011 to a high value in 2017, and has been decreasing since then. The harvest rate has increased since 2015.

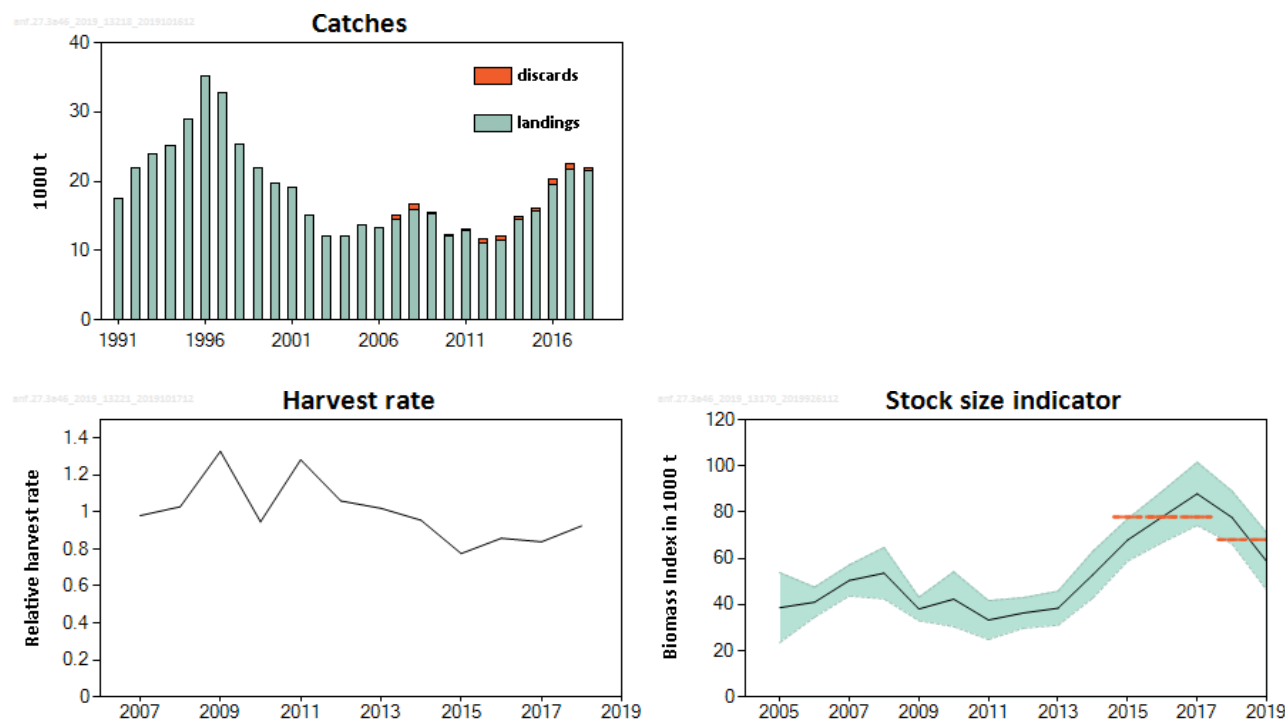


Figure 1 Anglerfish in subareas 4 and 6 and in Division 3.a. Summary of the stock assessment. Top: ICES landings and discards in thousand tonnes (estimates available since 2007). Bottom left: Relative harvest rate (total catch/stock size indicator; normalized to the average harvest rate). Bottom right: Stock bio (thousands tonnes) from the SIAMISS-Q2 survey. 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				
		2016	2017	2018		2017	2018	2019		
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	$MSY B_{trigger}$	?	?	?	Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—	—	Not applicable
Qualitative evaluation	-	↗	→	↗	Increasing	-	↗	↘	↘	Decreasing

Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The Scottish–Irish Anglerfish and Megrim Industry–Science Survey in Subarea 6 and Division 4.a (SIAMISS-Q2) was used as the index of stock development. The advice is based on the ratio of the mean of the last two index values (Index A) and the mean of the three preceding values (Index B), multiplied by the recent advised catch.

The index is estimated to have decreased by less than 20% and thus the uncertainty cap was not applied. The precautionary buffer has not previously been applied for this stock. However, as the stock size indicator has declined in recent years and the stock status relative to reference points is unknown, the precautionary buffer was applied in this assessment. The discard rate in 2018 was 1.5% of the total catch.

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

Index A (2018, 2019)		68118 t
Index B (2015, 2016, 2017)		77919 t
Index ratio (A/B)		0.87
Uncertainty cap	Not applied	-
Advised catch for 2019		31690 t
Precautionary buffer	Applied	0.8
Catch advice **		22056 t
% Advice change ^		-30%

* 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 2019] × [index ratio] × [precautionary buffer].

^ Advice value for 2020 relative to the advice value for 2019.

The advised catch for 2020 is lower than the 2019 advice, due to the decrease in the stock size indicator and the application of the precautionary buffer.

Basis of the advice

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

Advice basis	Precautionary approach.
Management plan	The EU multiannual plan (MAP) for stocks in Western Waters and adjacent waters (EU, 2019) applies to this stock complex in Eu waters. The MAP stipulates that when the F_{MSY} ranges are not available, fishing opportunities should be based on the best available scientific advice.

Quality of the assessment

The SIAMISS-Q2 survey does not cover divisions 3.a, 4.b, or 4.c, which collectively account for 8% 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 17% of the landings in 2018. It is not clear how these two issues may affect the estimate of the harvest rate.

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. There is no TAC for the Norwegian fishery in Subarea 4.

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 a dedicated Scottish–Irish Anglerfish and Megrim Industry–Science Survey in Subarea 6 and Division 4.a (SIAMISS–Q2).
Discards and bycatch	Discard estimates are available from 2009 onwards for most of the fleets (83% of the landings).
Indicators	Length distribution from the SIAMISS–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 in 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 ##
		Division 3.a and Subarea 4	Subarea 6					
1990	Not assessed	-	-	-	8600	17 605	-	-
1991	Not assessed	-	-	-	8600	18 369	17 441	-
1992	Not assessed	-	-	-	8600	20 807	21 872	-
1993	No long-term gain in increased F**	-	-	-	8600	22 596	23 971	-
1994	No long-term gain in increased F**	-	-	-	8600	25 155	25 057	-
1995	A precautionary TAC not exceeding recent catch levels**	-	-	-	8600	29 055	28 913	-
1996	A precautionary TAC not exceeding recent catch levels**	-	-	-	8600	35 039	35 100	-
1997	Reduction in fishing effort**	-	-	-	8600	32 853	32 728	-
1998	Reduction in fishing effort**	-	-	-	30 700	25 471	25 293	-
1999	Reduce fishing effort, effective implementation of the TAC**	-	-	-	30 700	21 230	21 854	-
2000	40% reduction in catches	< 9700	< 7400	-	25 700	18 973	19 682	-
2001	2/3 of the catches in 1973–1990	5700	4300	-	20 500	19 304	19 157	-
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	12 008	-
2004	Reduce F below F _{pa}	-	-	< 8800	10 200	13 496	11 976	-
2005	No effort increase	-	-	-	15 000	13 557	13 728	-
2006	No effort increase	-	-	-	15 000	15 152	13 292	-
2007	No effort increase	-	-	-	16 500	16 430	14 564	490
2008	No effort increase	-	-	-	16 500	16 918	15 878	903
2009	Same advice as last year	-	-	-	16 900	16 008	15 372	38
2010	No effort increase	-	-	-	16 900	13 833	12 136	69
2011	Decrease effort	-	-	-	15 100^	13 679	12 902	95
2012	Reduce catch	-	-	-	14 344^	12 266	11 143	590
2013	Decrease catches by 20%	-	-	-	13 627^	12 141	11 375	687
2014	Decrease catches by 20%	-	-	10 231	12 265^	13 286	14 406	448
2015	Increase landings by 20%	-	-	14 702	16 203^	16 182	15 663	395
2016	Precautionary approach (increase recent advised catch by no more than 20%)	≤ 18 435		17 642	19 142^	19 553^^	19 412	981
2017	Precautionary approach	≤ 22 007		21 171	21 171^	22 023^^	21 719	756

Year	ICES advice	Catch corresponding to advice		Landings corresponding to advice	Agreed TAC *	Official landings	ICES landings #	ICES discards ##
		Division 3.a and Subarea 4	Subarea 6					
2018	Precautionary approach	≤ 26 408		≤ 25 563	25 405^^	21 350^^^	21 572	326
2019	Precautionary approach	≤ 31 690			31 690^^			
2020	Precautionary approach	≤ 22 056						

* 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 to include Division 3.a official landings when ICES estimates are not available (ICES, 2019).

Estimation now carried out in InterCatch (ICES, 2019).

History of the catch and landings

Table 6 Anglerfish in subareas 4 and 6 and in Division 3.a. Catch distribution by fleet in 2018 as estimated by ICES.

Catch	Landings								Discards
	Division 3.a and Subarea 4				Subarea 6				
21 898 t	Demersal trawls 70%	Gillnets 17%	<i>Nephrops</i> trawls 5%	Other 8%	Demersal trawls 71%	Gillnets 16%	<i>Nephrops</i> trawls 1%	Other 12%	326 t
	21 572 t								

Table 7 Anglerfish in subareas 4 and 6 and in 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, and 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	-	-

Year	3.a	4.a	4.b	4.c	6.a	6.b	4	6	Total (3.a, 4, and 6)	ICES landings **	ICES discards #
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	17 441	-
1992	938	10 209	3 053	39	5 479	1 089	13 301	6 568	20 807	21 872	-
1993	843	12 309	3 143	66	5 553	681	15 519	6 234	22 596	23 971	-
1994	811	14 505	3 445	210	5 273	909	18 162	6 182	25 155	25 057	-
1995	823	17 891	2 627	402	6 354	958	20 920	7 312	29 055	28 913	-
1996	702	25 176	1 847	304	6 408	602	27 327	7 010	35 039	35 100	-
1997	776	23 425	2 172	160	5 330	990	25 757	6 320	32 853	32 728	-
1998	626	16 859	2 088	78	4 506	1 313	19 026	5 819	25 471	25 293	-
1999	660	13 344	1 517	24	4 284	1 401	14 885	5 685	21 230	21 854	-
2000	602	12 338	1 617	31	3 311	1 074	13 986	4 385	18 973	19 682	-
2001	621	12 861	1 832	21	2 660	1 309	14 714	3 969	19 304	19 157	-
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	12 008	-
2004	519	8 987	851	15	2 453	671	9 853	3 124	13 496	11 976	-
2005	458	8 424	688	5	3 019	958	9 117	3 982	13 557	13 728	-
2006	426	10 340	683	3	2 785	915	11 026	3 700	15 152	13 292	-
2007	433	10 632	749	4	3 353	1 261	11 384	4 613	16 430	14 564	490
2008	486	11 038	769	5	3 373	1 246	11 813	4 619	16 918	15 878	903
2009	478	10 067	651	8	2 984	1 820	10 726	4 804	16 008	15 372	38
2010	433	8 190	615	11	3 040	1 606	8 815	4 645	13 833	12 136	69
2011	405	7 760	764	8	2 871	1 871	8 532	4 742	13 679	12 902	95
2012	423	6 459	714	5	2 835	1 831	7 177	4 666	12 266	11 143	590
2013	407	6 393	546	5	2 667	2 123	6 944	4 790	12 141	11 375	687
2014	440	7 633	820	27	2 610	1 754	8 481	4 365	13 286	14 406	448
2015	478	9 690	985	16	3 290	1 723	10 691	5 013	16 182	15 663	395
2016	586	11 690	1 196	11	4 638	1 423	12 887	6 080	19 553	19 412	981
2017 *	742	13 620	1 107	7	5 024	1 504	14 753	6 528	22 023	21 719	756
2018 *	914	13 391	823	11	4292	1918	14 225	6 210	21 350	21 572	326

* Preliminary.

** Revised values to include Division 3.a official landings when ICES estimates are not available (ICES, 2019).

Estimation now carried out in InterCatch (ICES, 2019).

Table 8 Anglerfish in subareas 4 and 6 and in Division 3.a. Official landings in Subarea 6. All weights are in tonnes.

Year	Belgium	Denmark	Faroe Is.	France	Germany	Ireland	Netherlands	Norway	Portugal	Russia	Spain	UK (E,W&NI)	UK (Scotland)	UK (total)	Total	Unallocated	As used by the WG
1991	3	1	-	1910	1	522	-	24	-	-	340	369	2814	-	5984	296	6280
1992	2	3	2	2308	2	820	-	24	-	-	274	524	2609	-	6568	2638	9206
1993	9	4	-	2496	163	524	-	25	-	-	186	299	2528	-	6234	3816	10050
1994	6	5	-	2382	140	438	-	30	132	-	215	420	2414	-	6182	2634	8816
1995	5	10	-	2648	160	853	-	18	128	-	333	425	2732	-	7312	4984	12296
1996	-	4	15	2899	113	807	-	15	-	-	229	345	2583	-	7010	11148	18158
1997	5	1	4	2059	249	764	27	5	91	-	234	403	2478	-	6320	7415	13735
1998	2	2	2	1635	269	879	1	9	413	-	338	307	1962	-	5819	4821	10640
1999	-	1	2	1814	194	692	-	6	429	-	344	171	2032	-	5685	3790	9475
2000	-	+	-	1180	158	596	-	14	20	-	231	316	1870	-	4385	3131	7516
2001	+	+	1	1135	78	609	-	7	18	1	397	237	1486	-	3969	1890	5859
2002	+	-	-	782	38	355	-	4	8	-	229	165	1417	-	2998	22	2976
2003	-	+	-	1403	91	348	-	6	4	-	255	164	865	-	3136	68	3068
2004	+	+	2	1366	105	232	-	5	19	2	153	84	1156	-	3124	6	3130
2005	-	-	2	1689^	116	391	-	5	63	4	117^	113	1482	-	3982	235	3747
2006	-	-	3	1537	73	445	-	7	-	1	112	70	1451	-	3700	209	3491
2007	-	-	2	2090	222	540	-	8	-	1	15	188	1546	-	4613	137	4476
2008	-	-	2	2073	146	371	-	7	-	35	259	6	1720	-	4619	228	4847
2009	-	-	6	1852	211	419	-	9	-	-	242	60	2005	-	4804	388	5192
2010	-	-	12	1374	166	617	-	14	-	-	229	-	-	2234	4645	733	3912
2011	-	-	1	1676	149	596	-	7	-	-	167	-	-	2145	4742	49	4693
2012	-	-	5	1622	142	581	-	6	-	-	105	132	2073	2205	4666	294	4372
2013	-	-	-	1777	136	572	-	10	-	-	123	401	1770	2171	4790	63	4727
2014	-	-	1	1246	151	572	-	4	-	1	81	-	-	2310	4365	1515	5880
2015	-	-	+	1326	201	602	-	8	-	2	149	-	-	2724	5013	5	5008
2016	-	-	1	1734	258	741	-	12	-	-	234	-	-	3080	6060	94	5966
2017	-	-	+	1882	246	793	-	5	-	2	290	-	-	3310	6528	68	6460
2018*	-	-	-	1287	394	878	-	4	-	-	261	-	-	3387	6211	-145	6356

+ Indicates less than 0.5 tonnes landed

^ indicates landings assigned to subarea 6 but not to a division.

* Preliminary.

Table 9 Anglerfish in subareas 4 and 6 and in Division 3.a. Official landings in Division 4.f. All weights are in tonnes.

Year	Belgium	Denmark	Faroes	France	Germany	Ireland	Netherlands	Norway	Sweden	UK(E&W&NI)	UK (Scotland)	UK (Total)	Total	Unallocated	WG estimate
1991	372	1599^	1	124	75	-	313	604	14	804	7884	-	11790	-1224	10566
1992	559	1686	-	152	70	-	410	639	7	1158	8620	-	13301	-1573	11728
1993	595	1293^	12	69	113	-	559	1227	7	1463	10181	-	15519	-2441	13078
1994	753	1509^	18	30	99	-	568	1329	10	1582	12264	-	18162	-2732	15430
1995	607	1027	20	18	623	-	363	672	4	1456	16130	-	20920	-5126	15794
1996	323	1464	-	7	301	-	201	850	2	1357	22822	-	27327	11087	16240
1997	357	1489	15	7	619	-	260	678	5	2969	19358	-	25757	-7540	18217
1998	389	1456	10	13	892	-	238	967	11	1307	13743	-	19026	-4999	14027
1999	286	1496	6	18	463	-	166	1236	12	1148	10054	-	14885	-3166	11719
2000	476	1347	-	8	196	-	168	1191	81	642	9877	-	13986	-2422	11564
2001	594	1540	2	9	104	-	132	1227	46	658	10402	-	14714	-2037	12677
2002	459	1563	10	8	112	-	75	938	65	334	8749	-	12313	600	11713
2003	190	1714	3	8	76	1	52	781	10	281	6274	-	9390	676	8714
2004	265	1812	11	8	31	-	63	1021	7	206	6429	-	9853	1330	8523
2005	211	1616	22	4	93	-	45	896	9	130	6091	-	9117	-579	9696
2006	141	1587	2	7	187	-	47	1018	10	207	7820	-	11026	1462	9564
2007	181	1134	-	14	198	-	76	855	26	425	8476	-	11384	1561	9823
2008	185	1308	-	13	367	-	71	875	76	118	8800	-	11813	1081	10732
2009	140	1382	4	23	233	-	41	881	-	406	7617	-	10726	945	9781
2010	131	1337	-	30	145	-	56	802	-	460	5855	-	8815	915	7900
2011	116	1127	-	24	63	-	59	505	-	-	-	6638	8532	612	7920
2012	133	1122	-	15	275	-	67	496	-	333	4736	5069	7177	765	6412
2013	137	1046	-	15	284	-	42	572	-	621	4226	4847	6944	638	6306
2014	217	1135	-	30	339	-	108	533	-	-	-	6120	8481	316	8165
2015	200	1331	-	26	309	-	98	415	10	-	-	8303	10691	448	10243
2016	253	2090	-	36	226	-	148	626	11	-	-	9498	12887	33	12854
2017	169	2567	-	91	537	-	199	881	18	-	-	10270	14733	225	14508
2018*	156	2201	-	142	536	-	187	1267	25	-	-	9711	14225	-55	14280

+ Indicates less than 0.5 tonnes landed.

^ indicates landings assigned to subarea 6 but not to a division.

* Preliminary.

Table 10 Anglerfish in subareas 4 and 6 and in Division 3.a. Official landings in Division 3.a. All weights are in tonnes.

Year	Belgium	Denmark	France	Germany	Netherlands	Norway	Sweden	UK (Total)	Total	Unallocated	As used by the WG
1991	15	493	-	-	-	64	23	-	595	-	-
1992	48	658	-	-	-	170	62	-	938	-	-
1993	34	565	-	1	-	154	89	-	843	-	-
1994	21	459	-	+	-	263	68	-	811	-	-
1995	35	312	-	-	-	440	36	-	823	-	-
1996	-	367	-	1	-	309	25	-	702	-	-
1997	-	550	-	1	-	186	39	-	776	-	-
1998	-	415	-	1	-	177	33	-	626	-	-
1999	-	362	-	2	-	260	36	-	660	-	-
2000	-	377	-	1	-	197	27	-	602	-	-
2001	-	375	-	-	-	200	46	-	621	-	-
2002	-	369	-	1	-	242	55	-	667	288	379
2003	-	215	-	-	3	189	71	-	478	252	226
2004	-	311	-	1	4	130	73	-	519	197	322
2005	-	274	-	1	4	100	79	-	458	174	284
2006	-	227	-	2	3	139	54	-	426	189	237
2007	-	255	-	1	1	132	44	-	433	168	265
2008	-	287	-	1	3	144	51	-	486	187	299
2009	-	344	-	1	-	134	-	-	478	79	399
2010	-	270	-	1	5	158	-	-	433	109	324
2011	-	251	-	2	-	153	-	-	405	116	289
2012	-	307	+	1	-	115	-	-	423	63	360
2013	-	298	+	1	-	108	-	-	407	65	342
2014	-	309	-	-	4	127	-	-	440	78	362
2015	-	336	-	1	9	90	42	-	478	66	412
2016	-	389	+	2	17	124	53	+	586	-5	591
2017	-	526	1	1	16	118	81	-	742	-9	751
2018*	-	597	-	2	16	204	95	-	914	-22	936

+ Indicates less than 0.5 tonnes landed.

^ indicates landings assigned to subarea 6 but not to a division.

* Preliminary.

Summary of the assessment

Table 11 Anglerfish in subareas 4 and 6 and in Division 3.a. Assessment summary. Weights are in tonnes.

Year	Stock size indicator	Stock size indicator, High	Stock size indicator, Low	ICES landings *	ICES discards **	Harvest rate ***
1991				17 441		
1992				21 872		
1993				23 971		
1994				25 057		
1995				28 913		
1996				35 100		
1997				32 728		
1998				25 293		
1999				21 854		
2000				19 682		
2001				19 157		
2002				15 067		
2003				12 008		
2004				11 976		
2005	39	54	23	13 728		
2006	41	47	34	13 292		
2007	50	57	44	14 564	490	0.98
2008	54	65	42	15 878	903	1.03
2009	38	43	33	15 372	38	1.33
2010	42	54	30	12 136	69	0.95
2011	33	42	25	12 902	95	1.28
2012	36	43	30	11 143	590	1.06
2013	38	46	31	11 375	687	1.02
2014	53	63	43	14 406	448	0.96
2015	68	77	59	15 663	395	0.78
2016	78	89	67	19 412	981	0.86
2017	88	102	74	21 719	756	0.84
2018	78	89	66	21 572	326	0.93
2019	59	71	46			

* Revised values to include Division 3.a official landings when ICES estimates are not available (ICES, 2019).

** Estimation now carried out in InterCatch (ICES, 2019).

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

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