

## White anglerfish (*Lophius piscatorius*) in Subarea 7 and in divisions 8.a–b and 8.d (southern Celtic Seas, Bay of Biscay)

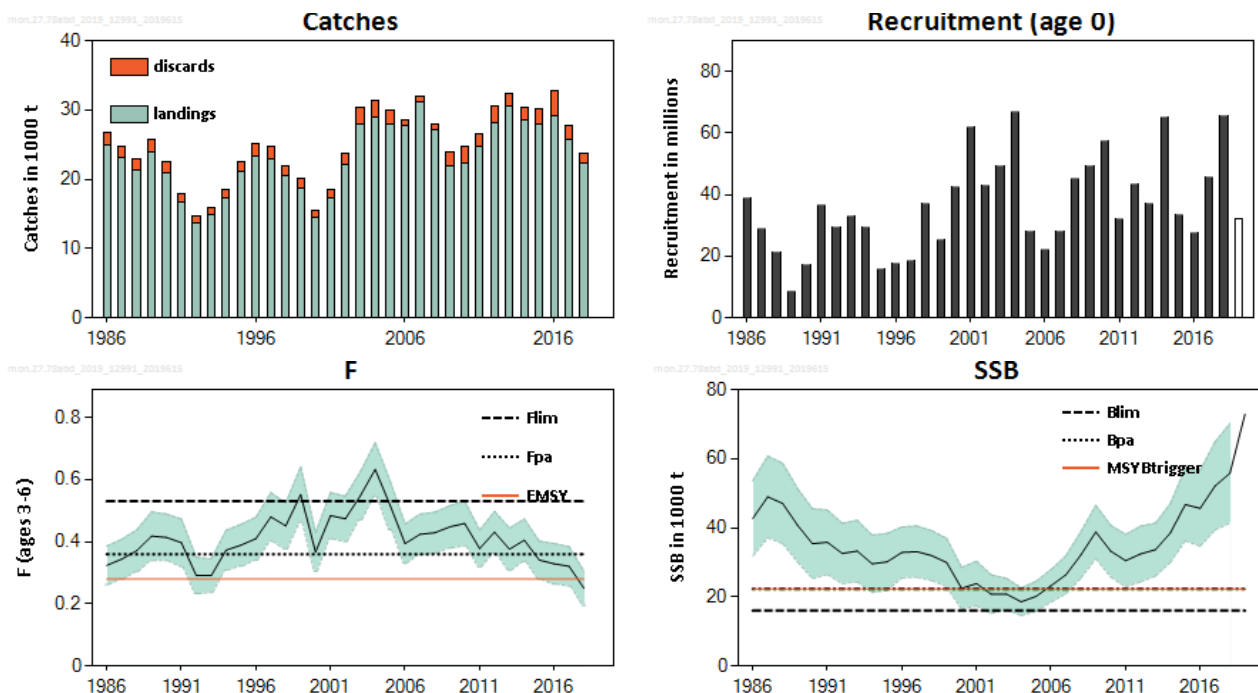
### ICES stock advice

ICES advises that when the EU multiannual plan (MAP) for Western waters and adjacent waters is applied, catches in 2020 that correspond to the F ranges in the MAP are between 21 428 tonnes and 42 331 tonnes. According to the MAP, catches higher than those corresponding to  $F_{MSY}$  (31 798 tonnes) can only be taken under conditions specified in the MAP, while the entire range is considered precautionary when applying the ICES advice rule.

Management of catches of the two anglerfish species, *Lophius budegassa* and *L. piscatorius*, under a combined species TAC prevents effective control of the single-species exploitation rates and could lead to the overexploitation of either species.

### Stock development over time

The spawning-stock biomass (SSB) has been increasing since 2005 and is estimated to be the highest in the time-series in 2019. Fishing mortality (F) has been above  $F_{MSY}$  but has trended downwards since the mid-2000s and is now lower than  $F_{MSY}$ . Recruitment (R) has been variable over the time-series.



**Figure 1** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. Summary of the stock assessment (weights in thousand tonnes). Discard observations are available only since 2003. The plots for recruitment, F, and SSB show the 95% confidence limits. Assumed recruitment values are unshaded.

### Stock and exploitation status

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

**Table 1** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. State of the stock and fishery relative to reference points.

	Fishing pressure			Stock size						
	2016	2017	2018	2017	2018	2019				
Maximum sustainable yield	$F_{MSY}$	✘	✘	✔	Below	MSY $B_{trigger}$	✔	✔	✔	Above trigger
Precautionary approach	$F_{pa}, F_{lim}$	✔	✔	✔	Harvested sustainably	$B_{pa}, B_{lim}$	✔	✔	✔	Full reproductive capacity
Management plan	$F_{MGT}$	✔	✔	✔	Within the range	$B_{MGT}$	✔	✔	✔	Above trigger

### Catch scenarios

**Table 2** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. Assumptions made for the interim year and in the forecast. All weights are in tonnes, recruitment in thousands.

Variable	Value	Notes
$F_{ages\ 3-6}$ (2019)	0.25	$F_{ages\ 3-6}$ , average selection pattern (2016–2018) scaled to F of 2018
SSB (2020)	74923	Short-term forecast; in tonnes.
$R_{age\ 0}$ (2019–2020)	32059	Geometric mean of full time-series, excluding the last 2 years; in thousands.
Catch (2019)	27787	Short-term forecast; in tonnes.
Wanted catch (2019)	25169	Mean wanted catch proportion-at-age, last 3 years; in tonnes.
Unwanted catch (2019)	2618	Mean unwanted catch proportion-at-age, last 3 years; in tonnes.

**Table 3** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. Annual catch scenarios. All weights are in tonnes. Note: The % change in TAC is not computed because the TAC is for both species of anglerfish.

Basis	Total catch (2020)	Wanted catch (2020)	Unwanted catch* (2020)	$F_{total}$ (2020)	$F_{wanted}$ (2020)	$F_{unwanted}$ (2020)	SSB (2021)	% SSB change **	% Advice change ***
ICES advice basis									
EU MAP <sup>^</sup> : $F_{MSY}$	31798	29510	2288	0.28	0.27	0.0087	74595	-0.44	3.0
F = MAP $F_{MSY\ lower}$	21428	19894	1534	0.181	0.175	0.0056	81095	8.2	-31
F = MAP $F_{MSY\ upper}$	42331	39268	3063	0.39	0.37	0.0121	68045	-9.2	37
Other scenarios									
MSY approach = $F_{MSY}$	31798	29510	2288	0.28	0.27	0.0087	74595	-0.44	3.0
F = 0	0	0	0	-	-	-	94679	26	-100
$F_{pa}$	39556	36698	2858	0.36	0.34	0.0112	69765	-6.9	28
$F_{lim}$	54386	50426	3961	0.53	0.51	0.0164	60618	-19.1	76
SSB (2021) = $B_{lim}$	124127	114623	9504	2.0	1.93	0.062	19523	-74	300
SSB (2021) = $B_{pa}$ = MSY $B_{trigger}$	119217	110131	9086	1.81	1.76	0.056	22278	-70	290
F = $F_{2019}$	28773	26706	2067	0.25	0.24	0.0077	76486	2.1	-6.8

\* "Wanted catch" is the predicted landed catch above the minimum conservation reference size. "Unwanted catch" refers to landings below the minimum conservation reference size and discards.

\*\*SSB 2021 relative to SSB 2020.

\*\*\* Advice value 2020 relative to the advice value 2019.

<sup>^</sup> The EU multiannual plan (MAP; EU, 2019).

The advice has increased by 3% because of the increase in the stock biomass.

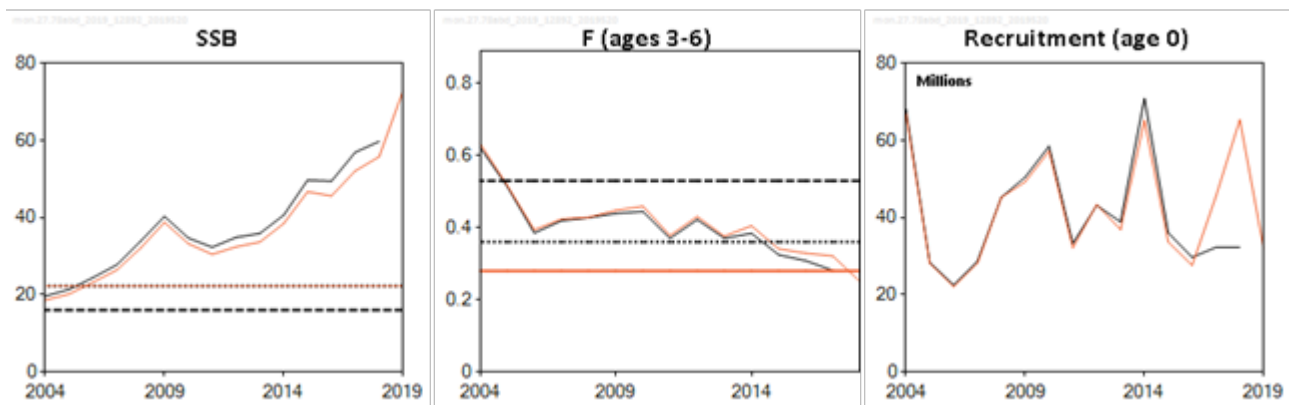
**Basis of the advice**

**Table 4** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. The basis of the advice.

Advice basis	Management plan approach
Management plan	<p>The EU multiannual plan (MAP) for stocks in in the Western Waters and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities, depending on stock status and making use of the <math>F_{MSY}</math> range for the stock.</p> <p>In accordance with the MAP, catches higher than those corresponding to <math>F_{MSY}</math> can only be taken providing SSB is greater than <math>MSY B_{trigger}</math>, and one of the following conditions is met:</p> <ul style="list-style-type: none"> <li>a) if it is necessary for the achievement of objectives of mixed fisheries;</li> <li>b) if it is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics;</li> <li>c) in order to limit variations in fishing opportunities between consecutive years to not more than 20%.</li> </ul> <p>ICES considers that the <math>F_{MSY}</math> range for this stock used in the MAP is precautionary.</p> <p>Full details of the plan are described in EU (2019).</p>

**Quality of the assessment**

With the addition of new data, the assessment has a tendency to downgrade stock size; however, the stock is still well above current biological reference points. The reference points have been evaluated to be robust to this change.



**Figure 2** White anglerfish in Subarea 7 and divisions 8.a–b and 8.d. Historical assessment results (year 2018 recruitment estimate included).

**Issues relevant for the advice**

The two anglerfish species (*L. piscatorius* and *L. budegassa*) are not totally separated in the landings. A single TAC covers both, and species-specific landings are estimated by ICES (ICES, 2019). ICES considers that management of the catches of the two anglerfish species under a combined TAC prevents effective control of single-species exploitation rates and could lead to overexploitation of either species.

## Reference points

**Table 5** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	22278	$B_{pa}$	ICES (2018a)
	$F_{MSY}$	0.28	Median EQsim estimate for landings	ICES (2018a)
Precautionary approach	$B_{lim}$	16032	$B_{loss}$	ICES (2018a)
	$B_{pa}$	22278	$B_{lim} \times \exp(1.645 \times 0.2)$	ICES (2018a)
	$F_{lim}$	0.53	F with 5% probability of $SSB < B_{lim}$	ICES (2018a)
	$F_{pa}$	0.36	$F_{lim} \times \exp(-1.645 \times 0.233)$	ICES (2018a)
Management plan	MAP MSY $B_{trigger}$	22278	MSY $B_{trigger}$	EU (2019)
	MAP $B_{lim}$	16032	$B_{lim}$	EU (2019)
	MAP $F_{MSY}$	0.28	$F_{MSY}$	EU (2019)
	MAP range $F_{lower}$	0.181	Consistent with ranges provided by ICES (2018a), resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2018a) and EU (2019)
	MAP range $F_{upper}$	0.39	Consistent with ranges provided by ICES (2018a), resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2018a) and EU (2019)

## Basis of the assessment

**Table 6** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. The basis of the assessment.

ICES stock data category	1 (ICES, 2018b).
Assessment type	Age-based analytical assessment that uses catches in the model and in the forecast (a4a; ICES, 2018b).
Input data	Commercial landings and discards; three survey indices (combined FR-EVHOE-WIBTS-Q4 / IE-IGFS-WIBTS-Q4 index, SP-PORC-WIBTS-Q3 and Irish Monkfish Survey); weights- and numbers-at-age derived from catch and survey length-frequency distribution.
Discards and bycatch	Discards are available from 2003 and are included in the assessment and forecast.
Indicators	LPUE and effort of the main fleets in the fisheries.
Other information	Most recent benchmark was in 2018 (ICES, 2018a).
Working group report	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE).

## Information from stakeholders

There is no additional available information.

## History of the advice, catch, and management

**Table 7** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. History of ICES advice, the agreed TAC, and ICES estimates of landings. All weights are in tonnes.

Year	ICES advice <sup>***, #</sup>	Catch corresponding to advice <sup>***, #</sup>	Landings corresponding to advice (both <i>Lophius</i> species) <sup>***, #</sup>	Agreed TAC <sup>*, **</sup>	ICES landings (both <i>Lophius</i> species) <sup>***</sup>	Landings <i>L. piscatorius</i>	Catches <i>L. piscatorius</i>
1987	Not assessed	-	< 27600	39080	30709	23091	-
1988	Not assessed	-	< 19900	42990	29695	21314	-
1989	Not assessed	-	< 16400	42990	32836	24015	-
1990	Not assessed	-	< 26700	42990	30613	20982	-
1991	No advice	-	< 37800	42990	25542	16763	-
1992	No advice	-	< 33900	42990	21793	13617	-
1993	Concern about <i>L. pisc.</i> SSB decrease	-	< 36000	25100	21462	14895	-

Year	ICES advice***, #	Catch corresponding to advice***, #	Landings corresponding to advice (both <i>Lophius</i> species)***, #	Agreed TAC*, **	ICES landings (both <i>Lophius</i> species)***	Landings <i>L. piscatorius</i>	Catches <i>L. piscatorius</i>
1994	SSB decreasing, still inside safe biological limits	-	< 33000	23900	22946	17201	-
1995	No increase in F	-	< 33000	23200	27987	21033	-
1996	No increase in F	-	-	30400	31426	23333	-
1997	No increase in F	-	-	34300	31099	22983	-
1998	No increase in F	-	-	34300	29072	20474	-
1999	No increase in F	-	< 24800	34300	25530	18792	-
2000	At least 20% decrease in F	-	< 37448	29600	21095	14451	-
2001	Reduce F below $F_{pa}$	-	< 37448	27600	23022	17294	-
2002	Reduce F below $F_{pa}$	-	< 37448	23700	28588	22083	-
2003	At least 30% decrease in F	-	< 37448	21000	36104	27933	30415
2004	At least 10% decrease in F	-	< 37448	26700	36565	29028	31366
2005	Maintain F below $F_{pa}$	-	< 27600	31200	35056	27869	29931
2006	Maintain F below $F_{pa}$	-	< 19900	34000	33783	27652	28533
2007	Maintain F below $F_{pa}$	-	< 16400	36000	37821	31213	32014
2008	Less than average landings	-	< 26700	36000	34452	27053	28024
2009	Same advice as last year	-	< 37800	36000	30122	21835	23862
2010	No increase in effort	-	< 33900	41400	30841	22215	24799
2011	No increase in effort	-	< 36000	40900	34005	24657	26434
2012	Reduce catch	-	< 33000	38900	36617	28188	30522
2013	Reduce catch by the rate of biomass decrease (14% for <i>L. piscatorius</i> and 20% for <i>L. budegassa</i> )	17900		36953	41086	30611	32293
2014	Increase landings by the rate of biomass increase (20% for <i>L. piscatorius</i> and 20% for <i>L. budegassa</i> )	< 26691		42496	38306	28474	30328
2015	Same landings advice for <i>L. piscatorius</i> as in 2014	< 26691		42496	37508	27859	30173
2016	Precautionary approach (same landings value as advised for 2014)	≤ 26691		42496	39303	29083	32664
2017	Precautionary approach (same landings value as advised for 2016)	≤ 26691		42496	37324	25634	27836
2018	Precautionary approach (same landings value as advised for 2016)	≤ 26691		42496	35051	22371	23768
2019	MSY approach	≤ 31042		41370			
2020	Management plan	31798 (range 21248 – 42331) ##					

\* Applies to the combined *Lophius* species.

\*\* Includes Division 8.e.

\*\*\* Includes Division 7.a since 2018 (ICES, 2018a).

# Advice refers to landings up to 2017 and to catches since 2018.

## Catches corresponding to  $F_{MSY}$ , EU MAP range in brackets.

## History of catch and landings

**Table 8** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. Catch distribution by fleet in 2018 as estimated by ICES.

Total catch (2018)	Landings					Discards
23767 tonnes	65% Otter trawl demersal fish	2.8% Otter trawl <i>Nephrops</i>	10.1% Beam trawl	15.1% Gillnet	7.2% Other	1396 tonnes
	22371 tonnes					

**Table 9a** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. History of commercial catch and landings; ICES estimated values are presented for Subarea 7 for each country participating in the fishery. All weights are in tonnes.

Year	France	Ireland	Spain	UK	Others	Unallocated	Total landings in Subarea 7	Total discards in Subarea 7
1986	9797	1014	6223	3356	467	0	20858	-
1987	8549	928	5407	3382	96	0	18362	-
1988	8257	654	4615	3673	168	0	17366	-
1989	9536	1716	4926	4339	609	0	21126	-
1990	8773	1474	4284	2845	227	0	17602	-
1991	7228	1056	3707	2559	54	0	14604	-
1992	5595	1127	2669	2762	102	0	12255	-
1993	6290	1286	2851	2630	250	0	13307	-
1994	7358	2036	2856	2280	627	0	15156	-
1995	9563	1661	3240	2561	896	0	17921	-
1996	9832	1372	4097	3192	852	0	19345	-
1997	9557	1994	3548	3377	589	0	19065	-
1998	8484	1998	3586	3214	406	0	17687	-
1999	7870	3176	3050	2903	321	0	17319	-
2000	6411	1726	2274	2676	334	0	13420	-
2001	8096	1598	2493	3021	462	0	15670	-
2002	10496	1836	3480	3489	530	0	19832	-
2003	12080	1456	4662	2850	1569	0	22617	2063
2004	12281	1646	4507	2906	1743	0	23083	1917
2005	11137	2071	4663	3032	1469	0	22372	1743
2006	10607	2656	4589	3137	1375	0	22364	668
2007	12253	2902	5065	4036	1596	0	25852	610
2008	10871	2419	4107	2928	1062	0	21387	729
2009	8691	2048	2754	3013	857	0	17363	1477
2010	8188	2523	2353	3675	993	0	17732	1976
2011	9546	2304	2232	4287	1174	0	19542	1403
2012	12224	2648	1252	4028	1836	1313	23301	1841
2013	12767	2555	3313	4626	1624	1166	26052	1406
2014	11410	2707	1080	6129	1055	1148	23529	1443
2015	11722	2582	1770	5644	1284	337	23339	1793
2016	12667	2761	1692	6052	1578	414	25164	3058
2017	11473	2543	1394	5222	1498	351	22481	1939
2018*	9898	2148	1810	4156	770	84	18866	1286

\*Preliminary.

**Table 9b** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. History of commercial catch and landings. For divisions 8.a, 8.b, and 8.d both the official and ICES estimated values are presented by country participating in the fishery. The final column shows the total for divisions 8.a–b and 8.d. All weights are in tonnes.

Year	France	Spain	Others	Unallocated	Total landings divisions 8.a–b and 8.d	Total discards divisions 8.a–b and 8.d
1986	3265	858	0	0	4123	-
1987	3955	774	0	0	4729	-
1988	3129	819	0	0	3948	-
1989	2264	625	0	0	2889	-
1990	2580	800	0	0	3380	-
1991	1657	502	0	0	2159	-
1992	1066	296	0	0	1362	-
1993	1314	274	0	0	1588	-
1994	1564	481	0	0	2045	-
1995	2402	482	0	228	3112	-
1996	2216	834	0	938	3988	-
1997	2143	707	0	1068	3918	-
1998	1534	711	0	542	2787	-
1999	924	549	0	0	1473	-
2000	690	341	0	0	1031	-
2001	1240	384	0	0	1624	-
2002	1737	514	0	0	2251	-
2003	4806	508	0	0	5314	419
2004	5227	718	0	0	5945	421
2005	4927	571	0	0	5498	318
2006	4819	420	48	0	5287	213
2007	4935	401	25	0	5361	190
2008	5132	527	7	0	5666	242
2009	4065	374	33	0	4472	550
2010	4043	367	73	0	4483	608
2011	4569	422	93	30	5114	373
2012	4221	430	194	41	4886	492
2013	4105	318	137	0	4560	276
2014	4279	408	174	84	4945	411
2015	4153	293	65	10	4521	521
2016	3561	283	69	5	3918	522
2017	2886	203	66	0	3155	263
2018*	3332	156	15	1	3505	110

\*Preliminary.

### Summary of the assessment

**Table 10** White anglerfish in Subarea 7 and in divisions 8.a–b and 8.d. Assessment summary. Weights are in tonnes and recruitment in thousands. High and low refers to 95% confidence intervals.

Year	Recruitment (Age 0)	High	Low	SSB	High	Low	Landings	Discards	F (Ages 3–6)	High	Low
1986	39063	39069	39058	42716	53596	31836	24981	1833	0.32	0.39	0.26
1987	28872	28876	28868	48955	60775	37135	23091	1694	0.34	0.41	0.28
1988	21420	21423	21417	47044	58670	35418	21314	1564	0.37	0.44	0.30
1989	8734	8735	8733	40730	51337	30123	24015	1762	0.42	0.50	0.34
1990	17123	17125	17120	35407	45516	25298	20982	1539	0.41	0.49	0.34
1991	36740	36745	36735	35811	45124	26498	16763	1230	0.40	0.47	0.32
1992	29314	29318	29310	32562	41278	23846	13617	999	0.29	0.35	0.23
1993	33186	33191	33182	33258	42165	24351	14895	1093	0.29	0.35	0.24
1994	29281	29285	29277	29573	37875	21271	17201	1262	0.37	0.44	0.31
1995	15905	15907	15903	30118	38352	21884	21033	1543	0.39	0.46	0.32
1996	17702	17705	17700	32872	40242	25502	23333	1712	0.41	0.48	0.34
1997	18675	18678	18672	33097	40518	25676	22983	1686	0.48	0.56	0.40

Year	Recruitment (Age 0)	High	Low	SSB	High	Low	Landings	Discards	F (Ages 3–6)	High	Low
1998	37108	37113	37102	31941	39141	24741	20474	1502	0.45	0.53	0.38
1999	25176	25180	25173	29924	36909	22939	18792	1379	0.55	0.64	0.46
2000	42606	42612	42600	22476	28495	16457	14451	1060	0.37	0.43	0.31
2001	62044	62053	62036	23853	30327	17379	17294	1269	0.48	0.56	0.41
2002	42934	42940	42929	20754	26316	15192	22083	1620	0.47	0.55	0.40
2003	49221	49226	49216	20853	25368	16338	27933	2482	0.55	0.63	0.47
2004	66909	66916	66902	18590	22606	14574	29028	2338	0.63	0.72	0.55
2005	28136	28138	28133	20171	24510	15832	27869	2062	0.52	0.60	0.44
2006	22059	22061	22057	23219	27903	18535	27652	881	0.39	0.46	0.33
2007	28154	28157	28151	26406	31907	20905	31213	801	0.42	0.49	0.36
2008	45243	45248	45239	32129	38816	25442	27053	971	0.43	0.50	0.36
2009	49263	49268	49258	38790	46488	31092	21835	2027	0.45	0.52	0.38
2010	57232	57238	57227	33235	40715	25755	22215	2584	0.46	0.53	0.39
2011	32170	32173	32167	30476	38065	22887	24657	1777	0.38	0.44	0.32
2012	43370	43374	43366	32414	40466	24362	28188	2334	0.43	0.50	0.36
2013	36899	36903	36895	33666	41317	26015	30611	1682	0.38	0.44	0.31
2014	65226	65233	65218	38479	46994	29964	28474	1854	0.41	0.47	0.34
2015	33700	33704	33696	46718	57198	36238	27859	2314	0.34	0.40	0.28
2016	27621	27625	27617	45627	56590	34664	29083	3581	0.33	0.39	0.26
2017	45518	45527	45509	52119	64863	39375	25634	2202	0.32	0.38	0.26
2018	65381	65399	65362	55785	70203	41367	22371	1396	0.25	0.31	0.195
2019	32059*			72848							

\* Geometric mean 2003–2017.

## Sources and references

EU. 2019. Regulation (EU) 2019/472 of the European Parliament and of the Council of 19 March 2019 establishing a multiannual plan for stocks fished in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulations (EU) 2016/1139 and (EU) 2018/973, and repealing Council Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007 and (EC) No 1300/2008. Official Journal of the European Union, L 83: 1–17. <http://data.europa.eu/eli/reg/2019/472/oj>.

ICES. 2018a. Report of the Benchmark Workshop on Anglerfish Stocks in the ICES Area (WKANGLER), 12–16 February 2018, Copenhagen, Denmark. ICES CM 2018/ACOM:31. 177 pp.

ICES. 2018b. 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. 2019. Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE). ICES Scientific Reports. 1:31. 692 pp. <http://doi.org/10.17895/ices.pub.5299>

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