ICES Advice on fishing opportunities, catch, and effort
Bay of Biscay and the Iberian Coast Ecoregion
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Black-bellied anglerfish (*Lophius budegassa*) in divisions 8.c and 9.a (Cantabrian Sea, Atlantic Iberian waters)

ICES advice on fishing opportunities

This advice for 2019 replaces the advice provided in June 2018.

ICES advises that when the precautionary approach is applied, catches in 2019 should be no more than 2212* tonnes.

Management 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 assessment is indicative of trends only. The stock biomass (B) increased from 2005 to 2016 and has since decreased. Fishing mortality (F) has decreased since 1994.
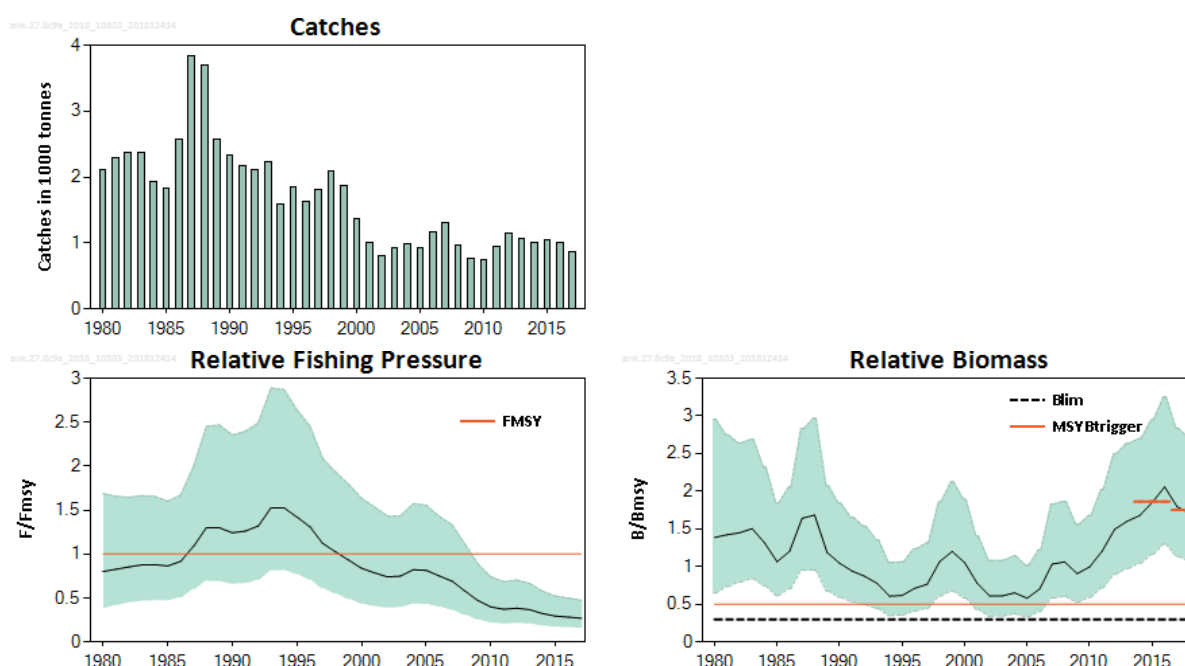

Figure 1‡   Black-bellied anglerfish in divisions 8.c and 9.a. Summary of the stock assessment: Catches (top left), relative fishing pressure (bottom left), and relative biomass (bottom right) with 95% confidence intervals (shaded area). Fishing pressure and biomass are relative to the average of the time-series.

Stock and exploitation status

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

Table 1*   Black-bellied anglerfish in divisions 8.c and 9.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 $B_{trigger}$	✅	✅	✅ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✅	✅	✅	Below potential reference points	B_{pa}, B_{lim}	✅	✅	✅ Full reproductive capacity
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—	— Not applicable

‡Version 2: Advice value, figure 1 and table 1 updated

Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The relative biomass estimates from the SPicT analysis 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 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 fishing mortality is below and the stock size above proxies of the MSY proxy reference points; therefore, no additional precautionary buffer was applied.

Discarding is considered negligible.

Table 2[§]   Black-bellied anglerfish in divisions 8.c and 9.a. The catch scenario table.*

Index A (2017–2018)		1.76
Index B (2014–2016)		1.86
Index ratio (A/B)		0.94
Uncertainty cap	Not applied	-
Advised catch for 2018 issued in 2017		2349 tonnes
Unwanted catch rate		Negligible
Precautionary buffer	Not applied	-
Catch advice**		2212
% advice change^		-6.0%

*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.
** [Advice for 2018] × [index ratio].
^ Advice value 2019 relative to the advice value 2018 (2349 tonnes).

The advice is reduced by 6.0% compared to the advice for 2018 because the results of the assessment, considered in relative terms, indicates a decline in the last two years.

Basis of the advice

Table 3   Black-bellied anglerfish in divisions 8.c and 9.a. The basis of the advice.

Advice basis	Precautionary approach
Management plan	ICES is not aware of any currently agreed precautionary management plans for anglerfish in this area. The European Commission has proposed a multiannual management plan (MAP) for the Western Waters, which is not yet finalized (EU, 2018).

Quality of the assessment

This stock was benchmarked in 2018 (ICES, 2018a) and, thus, the present assessment is not fully comparable with previous years' assessments. However, while following the benchmarked approach gave comparable trends, the estimates of stock biomass were notably higher, and fishing mortality lower compared with the previous assessment method. This has led to uncertainties regarding the absolute levels of biomass and fishing pressure. Therefore, the assessment was considered to be indicative of trends only.

The SPicT diagnostics show some autocorrelation for PT-TRC9A (the Portuguese trawl series), but this was not considered a matter of concern. Some retrospective patterns were observed, suggesting some past underestimation of fishing mortality and overestimation of biomass; however, each retrospective iteration is within the 95% confidence intervals of the assessment.
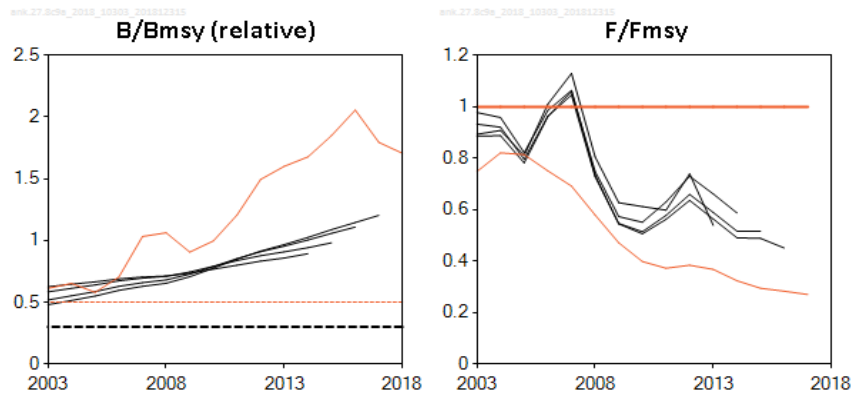

[§] Version 2: Table 2 updated

Figure 2[**]   Black-bellied anglerfish in divisions 8.c and 9.a. Relative historical assessment results. This stock was benchmarked in 2018. Fishing pressure and biomass are relative to the average of the time-series.

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 species and species-specific landings are estimated by ICES (ICES, 2018b). ICES considers that management of the two anglerfish species under a combined TAC prevents effective control of the single-species exploitation rates and could lead to overexploitation of either species.

A mixed-fisheries analysis covering the stocks in Iberian waters of hake, megrim, four-spot megrim, and white anglerfish is provided in ICES (2018c). The black-bellied anglerfish is not included in that analysis, owing to technical limitations of the model.

Reference points

Table 4   Black-bellied anglerfish in divisions 8.c and 9.a. Reference points, values, and their technical basis.

Framework	Reference point	Relative value	Technical basis	Source
MSY approach	MSY $B_{trigger\ proxy}$	$0.5 \times B_{MSY\ proxy} = 0.25 \times K*$	Relative value. B_{MSY} proxy is estimated directly from the assessment model and changes when the assessment is updated.	ICES (2018a)
	$F_{MSY\ proxy}$	$r/2*$	Relative value. The F_{MSY} proxy is estimated directly from the assessment model and changes when the assessment is updated.	ICES (2018a)
Precautionary approach	$B_{lim\ proxy}$	$0.3 \times B_{MSY\ proxy}*$	Relative value (equilibrium yield at this biomass is 50% of the MSY proxy).	ICES (2018a)
	B_{pa}	Not defined		
	$F_{lim\ proxy}$	$1.7 \times F_{MSY\ proxy}*$	Relative value (the F that drives the stock to the proxy of B_{lim}).	ICES (2018a)
	F_{pa}	Not defined		
Management plan	SSB_{mgt}	Not applicable		
	F_{mgt}	Not applicable		
	MAP MSY $B_{trigger}$	$0.5 \times B_{MSY\ proxy} = 0.25 \times K*$	MSY $B_{trigger\ proxy}$	
	MAP B_{lim}	$0.3 \times B_{MSY\ proxy}*$	$B_{lim\ proxy}$	
	MAP F_{MSY}	$r/2*$	$F_{MSY\ proxy}$	
	MAP range F_{lower}	$0.78\ F_{MSY\ proxy}$	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with the MSY (ICES, 2016a).	
	MAP range F_{upper}	$F_{MSY\ proxy}$ ($F_{2018} \times 3.631$)	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with the MSY (ICES, 2016a).	

* Fishing mortality is estimated only in relation to the $F_{MSY\ proxy}$ and total stock biomass is estimated only in relation to the $B_{MSY\ proxy}$. K is the carrying capacity and r is the intrinsic biomass growth rate.

[**] Version 2: Figure 2 updated

Basis of the assessment

Table 5 Black-bellied anglerfish in divisions 8.c and 9.a. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2016b).
Assessment type	Relative results of surplus production model (SPiCT; ICES, 2018a, 2018b) that uses landings in the model and in the forecast.
Input data	Commercial catches (international landings); three commercial indices (SPCORTR8c 1982–2012, PT.crust.tr 1989–2017, and PT.fish.tr 1989–2017).
Discards and bycatch	Discarding is assumed to be negligible.
Indicators	None.
Other information	This stock was benchmarked in 2018 (ICES, 2018a).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE)

Information from stakeholders

There is no additional information available.

History of the advice, catch, and management

Table 6 Black-bellied anglerfish in divisions 8.c and 9.a. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Landings corresponding to advice for combined *Lophius* species	Landings corresponding to advice for *L. budegassa*	Agreed TAC*	ICES landings for combined *Lophius* species	ICES landings *L. budegassa*[††]
1987	Not dealt with	-		12000	8973	3832
1988	Not dealt with	-		12000	10021	3700
1989	Not dealt with	-		12000	7574	2578
1990	Not dealt with	-		12000	6124	2334
1991	No advice	-		12000	5802	2162
1992	No advice	-		12000	5493	2111
1993	No long-term gain in increasing F	-		13000	4556	2227
1994	No advice	-		13000	3587	1580
1995	If required a precautionary TAC	-		13000	3677	1843
1996	If required a precautionary TAC	-		13000	4584	1629
1997	If required a precautionary TAC	-		13000	5527	1813
1998	Restrict catch to < 80% recent levels			10000	5070	2089
1999	Reduce F to F_{pa}	4200		8500	3811	1879
2000	60% reduction in F	1600		6800	2628	1369
2001	50% reduction in F	2800		6000	1801	1013
2002	30% reduction in F	3500		4800	1900	810
2003	5% reduction in F	3200		4000	3258	934
2004	F = 0 or recovery plan**	0**		2300	4250	993
2005	F = 0 or recovery plan	0		2000	4757	933
2006	F = 0 or recovery plan	0		2000	4158	1161
2007	F = 0 or recovery plan	0		2000	3684	1306
2008	F = 0 or recovery plan	0		2000	3328	957
2009	Same advice as last year	0		1800	3080	774
2010	F = 0 or management plan	0		1500	2372	754
2011	MSY framework	1500	480	1571	2179	948
2012	MSY framework	3300	1100	3300	2645	1141
2013	MSY transition	2090	740	2475	2710	1071
2014	MSY approach	2629	1153	2629	3130	998
2015	MSY approach	2987	1050	2987	2970	1047
2016	MSY approach^	≤ 2413	≤ 1070	2569	2948	1014
2017	MSY approach^		≤ 2122	3955	2307	861
2018	MSY approach^		≤ 2349	3955		
2019	Precautionary approach^		≤ 2212[††]			

* For *Lophius piscatorius* and *L. budegassa* combined. For Division 8.c and subareas 9 and 10; EU waters of CECAF 34.1.1.
** Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries, protecting stocks outside safe biological limits.
^ Advice is for catch.

History of the catch and landings

Table 7 Black-bellied anglerfish in divisions 8.c and 9.a. Catch distribution by fleet in 2017 as estimated by ICES. All weights are in tonnes.

Catch (2017)	Landings					Discards
861	Bottom trawl 40%	Artisanal 35%	Gillnet 25%	Unallocated 0%	Others 0%	Discarding is negligible
	861					

[††] Version 2: Values updated

Table 8[‡‡]   Black-bellied anglerfish in divisions 8.c and 9.a. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

| Year | Division 8.c | | | | | | | Division 9.a | | | | | | Divisions 8.c and 9.a | | |
| | SPAIN | | | FRANCE | | | | SPAIN | | | PORTUGAL | | | | | |
	Trawl	Gillnet	Others	Trawl	Gillnet	Others	TOTAL	Trawl	Gillnet	Others	Trawl	Artisanal	TOTAL	SUBTOTAL	Unallocated / non-reported	TOTAL
1978	n/a	n/a					n/a	248			n/a	107	355	355		355
1979	n/a	n/a					n/a	306			n/a	210	516	516		516
1980	1203	207					1409	385			n/a	315	700	2110		2110
1981	1159	309					1468	505			n/a	327	832	2300		2300
1982	827	413					1240	841			n/a	288	1129	2369		2369
1983	1064	188					1252	699			n/a	428	1127	2379		2379
1984	514	176					690	558			223	458	1239	1929		1929
1985	366	123					489	437			254	653	1344	1833		1833
1986	553	585					1138	379			200	847	1425	2563		2563
1987	1094	888					1982	813			232	804	1849	3832		3832
1988	1058	1010					2068	684			188	760	1632	3700		3700
1989	648	351					999	764			272	542	1579	2578		2578
1990	491	142					633	689			387	625	1701	2334		2334
1991	503	76					579	559			309	716	1584	2162		2162
1992	451	57					508	485			287	832	1603	2111		2111
1993	516	292					809	627			196	596	1418	2227		2227
1994	542	201					743	475			79	283	837	1580		1580
1995	924	104					1029	615			68	131	814	1843		1843
1996	840	105					945	342			133	210	684	1629		1629
1997	800	198					998	524			81	210	815	1813		1813
1998	748	148					896	681			181	332	1194	2089		2089
1999	565	127					692	671			110	406	1187	1879		1879
2000	441	73					514	377			142	336	855	1369		1369
2001	383	69					452	190			101	269	560	1013		1013
2002	202	74		10	1	0	288	234	0	0	75	213	522	810		810
2003	279	49		9	0	0	338	305	0	0	68	224	597	934		934
2004	251	120		14	5	0	391	285	0	0	50	267	603	993		993
2005	273	97		26	9	0	405	283	0	0	31	214	527	933		933
2006	323	124		12	1	0	460	541	0	0	39	121	701	1161		1161
2007	372	68		4	1	0	444	684	0	0	66	111	861	1306		1306
2008	386	70		5	1	0	462	336	0	0	40	119	495	957		957
2009	301	148		3	1	0	454	172	0	0	34	114	320	774		774
2010	319	81		2	1	0	403	197	0	0	70	84	351	754		754
2011	214	115	32	3	0	0	364	157	60	98	75	119	510	874	74	948
2012	161	83	22	2	0	0	268	109	40	90	156	370	765	1033	109	1141
2013	221	135	14	4	1	0	375	95	55	90	100	258	598	973	98	1071
2014	187	126	7	5	2	0	326	120	47	4	116	286	572	898	100	998
2015	233	141	1	2	2	0	380	103	62	2	126	222	515	895	152	1047
2016	203	118	5	2	2	0	330	103	79	2	120	257	560	889	125	1014
2017	163	153	0	1	3	0	319	109	62	1	68	302	542	861		861

[‡‡] Version 2: Values for 2011–2016 revised

Summary of the assessment

Table 9§§   Black-bellied anglerfish in divisions 8.c and 9.a. Assessment summary. Weights are in tonnes. High and low refer to 95% confidence intervals. All weights are in tonnes.

Year	B/Bmsy*	High	Low	Landings	F/Fmsy*	High	Low
1980	1.39	2.95	0.65	2110	0.80	1.69	0.38
1981	1.42	2.75	0.74	2300	0.83	1.66	0.41
1982	1.45	2.64	0.8	2369	0.85	1.65	0.44
1983	1.5	2.69	0.84	2379	0.88	1.66	0.46
1984	1.31	2.32	0.75	1929	0.88	1.65	0.47
1985	1.06	1.84	0.62	1833	0.86	1.60	0.47
1986	1.2	2.05	0.71	2563	0.92	1.67	0.50
1987	1.64	2.83	0.95	3832	1.09	1.99	0.59
1988	1.68	2.97	0.95	3700	1.30	2.5	0.69
1989	1.19	2.07	0.68	2578	1.30	2.5	0.68
1990	1.05	1.84	0.59	2334	1.24	2.4	0.66
1991	0.94	1.65	0.54	2162	1.26	2.4	0.66
1992	0.87	1.54	0.5	2111	1.32	2.5	0.70
1993	0.78	1.36	0.44	2227	1.53	2.9	0.81
1994	0.61	1.06	0.35	1580	1.53	2.9	0.81
1995	0.62	1.06	0.36	1843	1.42	2.6	0.76
1996	0.71	1.24	0.41	1629	1.31	2.5	0.70
1997	0.77	1.31	0.45	1813	1.12	2.1	0.60
1998	1.07	1.86	0.61	2089	1.02	1.93	0.54
1999	1.2	2.13	0.68	1879	0.93	1.79	0.48
2000	1.05	1.89	0.59	1369	0.84	1.63	0.43
2001	0.78	1.4	0.43	1013	0.79	1.54	0.40
2002	0.61	1.08	0.34	810	0.74	1.43	0.38
2003	0.61	1.08	0.35	934	0.75	1.43	0.39
2004	0.65	1.14	0.37	993	0.82	1.57	0.43
2005	0.58	1.01	0.33	933	0.81	1.55	0.43
2006	0.7	1.22	0.4	1161	0.75	1.43	0.39
2007	1.03	1.83	0.58	1306	0.69	1.33	0.36
2008	1.06	1.87	0.6	957	0.58	1.11	0.30
2009	0.91	1.56	0.53	774	0.47	0.89	0.25
2010	1	1.68	0.59	754	0.40	0.74	0.21
2011	1.21	2.03	0.72	948	0.37	0.69	0.20
2012	1.49	2.49	0.9	1141	0.38	0.70	0.21
2013	1.6	2.63	0.97	1071	0.37	0.67	0.20
2014	1.68	2.7	1.04	998	0.32	0.58	0.181
2015	1.85	2.95	1.16	1047	0.29	0.52	0.166
2016	2.06	3.26	1.3	1014	0.28	0.50	0.161
2017	1.8	2.84	1.14	861	0.27	0.47	0.154
2018	1.71	2.71	1.08				

* F/Fmsy and B/Bmsy are relative values.

Sources and references

EU. 2018. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a multiannual plan for fish stocks in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulation (EU) 2016/1139 establishing a multiannual plan for the Baltic Sea, and repealing Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) 509/2007 and (EC) 1300/2008. COM/2018/0149 final. 30 pp. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018PC0149&from=EN.

ICES. 2012. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM:68. 42 pp.

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§§ Version 2: Table 9 updated

ICES. 2016a. Report of the Working Group for the Bay of Biscay and the Iberian waters Ecoregion (WGBIE), 13–19 May 2016, ICES Headquarters, Copenhagen, Denmark. ICES CM 2016/ACOM:12. 513 pp.

ICES. 2016b. Advice basis. *In* Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.

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. In preparation
http://ices.dk/community/groups/Pages/WKAngler.aspx.

ICES. 2018b. Report of the Working Group on Mixed-Fisheries Advice (WGMIXFISH-ADVICE), 21–25 May 2018, ICES Headquarters, Copenhagen, Denmark. ICES CM 2018/ACOM:18. In preparation.

ICES. 2018c. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 3 –10 May 2018, ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:12. 642 pp.