

Black-bellied anglerfish (*Lophius budegassa*) in divisions 8.c and 9.a (Cantabrian Sea, Atlantic Iberian waters)

ICES advice on fishing opportunities

Please note: This advice was updated in December 2018 ([ICES, 2018](#))

ICES advises that when the precautionary approach is applied, catches in 2019 should be no more than 2062 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.

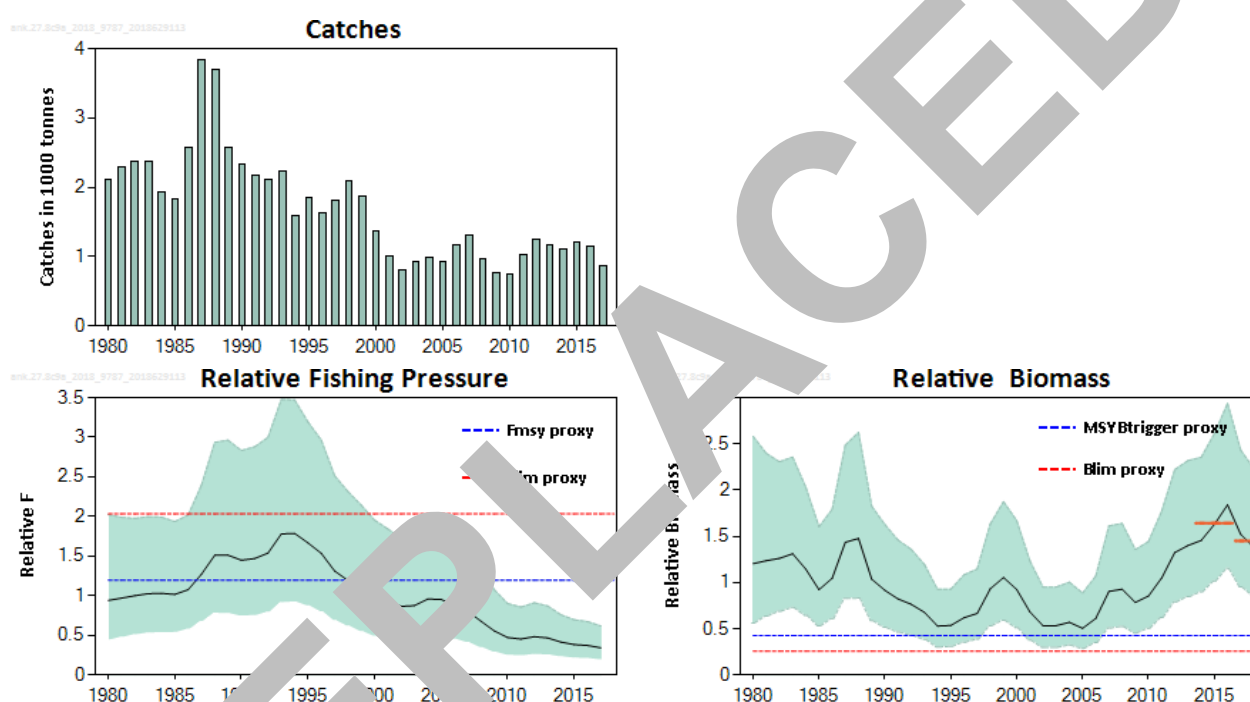


Figure 1 Black-bellied anglerfish in divisions 8.c and 9.a. Summary of the stock assessment: Catches (top left), relative fishing pressure (bottom left) and relative biomass (bottom right) with 95% confidence intervals (shaded area). Fishing pressure and biomass are relative to the average of the time-series.

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	FMSY proxy	✓	✓	✓ Appropriate	MSY Btrigger proxy	✓	✓ Above trigger
Precautionary approach	Flim proxy	✓	✓	✓ Harvested sustainably	Blim proxy	✓	✓ Full reproductive capacity
Management plan	FMGT	—	—	— Not applicable	BMGT	—	— Not applicable

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)		1.70
Index B (2014–2016)		1.94
Index ratio (A/B)		0.88
Uncertainty cap	Not applied	-
Advised catch for 2018 issued in 2017		2349 tonnes
Unwanted catch rate		Negligible
Precautionary buffer	Not applied	-
Catch advice**		2062
% advice change^		-12.2%

*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 2019] × [index ratio].

^ Advice value 2019 relative to the advice value 2018 (2349 tonnes).

The advice is reduced by 12.2% 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 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 assessment is benchmarked against ICES (2018a) and, thus, the present assessment is not fully comparable with previous years' assessment. However, while following the benchmarked approach gave comparable trends, the estimates of stock biomass, fishing mortality, 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.

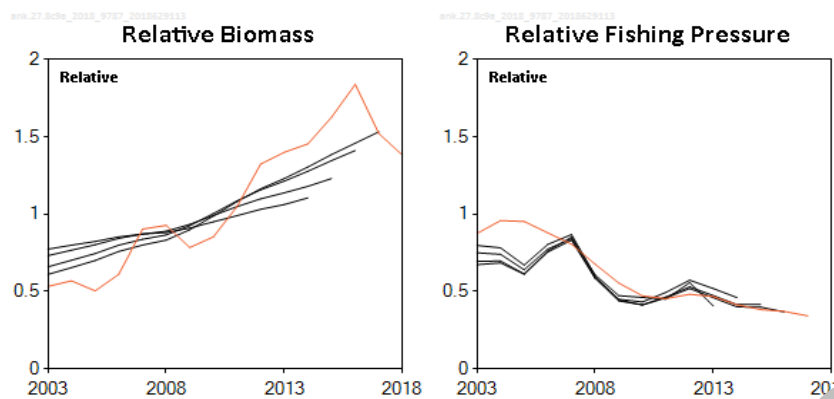


Figure 2 Black-bellied anglerfish in divisions 8.c and 9.a. Relative historical assessment results for stock and fishing pressure benchmarked in 2018. Fishing pressure and biomass are relative to the average of the time-series.

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 haddock, megrim, fourspot 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)
	$B_{trigger proxy}$	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)
	$F_{trigger proxy}$	Not defined		
Management plan	SSB_{lim}	Not applicable		
	F_{mgt}	Not applicable		
	MAP $B_{MSY B_{trigger}}$	$0.5 \times B_{MSY proxy} = 0.25 \times K^*$	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.

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 (SPCORT8c 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 <i>Lophius</i> species	Landings corresponding to advice for <i>L. budegassa</i>	Agreed TAC*	ICES landings for combined <i>Lophius</i> species	ICES landings <i>L. budegassa</i>
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	5002	2162
1992	No advice	-		12000	5000	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	3500	1629
1997	If required a precautionary TAC	-		13000	3500	1813
1998	Restrict catch to < 80% recent levels			13000	5070	2089
1999	Reduce F to F_{pa}	4200		8000	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		6800	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	1022
2012	MSY framework	1500	1100	3300	2645	1250
2013	MSY transition	2090	740	2475	2710	1169
2014	MSY approach	2629	1153	2629	3130	1098
2015	MSY approach	2987	1050	2987	2970	1199
2016	MSY approach	≤ 2413	≤ 1070	2569	2948	1139
2017	MSY approach^		≤ 2122	3955	2307	861
2018	MSY approach		≤ 2349	3955		
2019	Precautionary approach		≤ 2062			

* For *Lophius* species 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 single stock boundary.

^ Advice is in transition.

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.

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

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			TOTAL	SPAIN			PORTUGAL		TOTAL	SUBTOTAL	Unallocated / non-reported	TOTAL
	Trawl	Gillnet	Others	Trawl	Gillnet	Others		Trawl	Gillnet	Others	Trawl	Artisanal				
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	553	1444	1833		1833
1986	553	585					1138	379			200	647	1446	2563		2563
1987	1094	888					1982	813			237	804	1849	3832		3832
1988	1058	1010					2068	684			79	700	1632	3700		3700
1989	648	351					999	764			21	512	1577	2578		2578
1990	491	142					633	689			387	525	1214	2334		2334
1991	503	76					579	559			309	584	1143	2162		2162
1992	451	57					508	485			287	83	1603	2111		2111
1993	516	292					809	627			19	596	1418	2227		2227
1994	542	201					743	475			79	283	837	1580		1580
1995	924	104					1029	615			5	131	814	1843		1843
1996	840	105					945	520			53	210	684	1629		1629
1997	800	198					998	524			81	210	815	1813		1813
1998	748	148					896	531			181	332	1194	2089		2089
1999	565	127					692	511			110	406	1187	1879		1879
2000	441	73					514	511			142	336	855	1369		1369
2001	383	69					452	199			101	269	560	1013		1013
2002	202	74		10	1		288	234	0	0	75	213	522	810		810
2003	279	49		9	0		338	255	0	0	68	224	597	934		934
2004	251	120				0	371	285	0	0	50	267	603	993		993
2005	273	97		16		0	386	283	0	0	31	214	527	933		933
2006	323	124		12		0	460	541	0	0	39	121	701	1161		1161
2007	372	68			1	0	444	684	0	0	66	111	861	1306		1306
2008	386	70			1	0	462	336	0	0	40	119	495	957		957
2009	301			3		0	454	172	0	0	34	114	320	774		774
2010	319	81		2		0	403	197	0	0	70	84	351	754		754
2011	261		32	3	0	0	411	185	60	98	75	119	538	948	74	1022
2012		8	22		0	0	346	140	40	90	156	370	796	1141	109	1250
2013	280	143			4	1	442	126	55	90	100	258	629	1071	98	1169
2014	285	126		5	2	0	425	120	47	4	116	286	573	998	100	1098
2015	320		1	2	2	0	516	119	62	2	126	222	531	1047	152	1199
2016	300	142		5	2	0	431	126	79	2	120	257	583	1014	125	1139
2017	283	153	0	1	3	0	319	109	62	1	68	302	542	861	0	861

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	Relative biomass*	High	Low	Landings	Relative fishing pressure*	High	Low
1980	1.20	2.6	0.56	2100	0.94	2.0	0.44
1981	1.23	2.4	0.64	2300	0.97	1.99	0.47
1982	1.26	2.3	0.69	2400	1.00	1.97	0.51
1983	1.31	2.4	0.73	2400	1.02	2.00	0.53
1984	1.14	2.0	0.65	1930	1.03	1.99	0.53
1985	0.92	1.60	0.53	1830	1.02	2.04	0.53
1986	1.04	1.79	0.61	2600	1.08	2.1	0.57
1987	1.44	2.5	0.83	3800	1.27	2.4	0.67
1988	1.48	2.6	0.83	3700	1.51	2.9	0.78
1989	1.03	1.83	0.59	2600	1.31	3.0	0.77
1990	0.92	1.63	0.52	2300	1.45	3.1	0.74
1991	0.82	1.46	0.46	2200	1.4	3.1	0.75
1992	0.76	1.36	0.43	2100	1.4	3.0	0.79
1993	0.68	1.20	0.38	2200	1.78	3.5	0.91
1994	0.53	0.93	0.30	1100	1.7	3.5	0.92
1995	0.54	0.93	0.31	1140	1.6	3.2	0.87
1996	0.62	1.08	0.35	1130	1.54	3.0	0.80
1997	0.67	1.15	0.39	1100	1.31	2.5	0.68
1998	0.93	1.63	0.53	2100	1.19	2.3	0.62
1999	1.05	1.88	0.55	1880	1.08	2.1	0.55
2000	0.92	1.67	0.51	1770	0.97	1.95	0.49
2001	0.68	1.23	0.38	1000	0.92	1.84	0.46
2002	0.53	0.95	0.30	810	0.86	1.72	0.43
2003	0.53	0.95	0.30	930	0.87	1.73	0.44
2004	0.57	1.00	0.32	990	0.96	1.89	0.49
2005	0.50	0.89	0.29	930	0.95	1.88	0.48
2006	0.61	1.00	0.35	1160	0.88	1.72	0.45
2007	0.90	1.6	0.5	1310	0.81	1.60	0.41
2008	0.93	1.6	0.53	960	0.68	1.34	0.34
2009	0.78	1.5	0.45	770	0.55	1.07	0.29
2010	0.75	1.44	0.50	750	0.47	0.90	0.25
2011	1.05	1.8	0.62	1020	0.45	0.86	0.24
2012	1.35	2.1	0.79	1250	0.48	0.91	0.26
2013	1.2	2.3	0.85	1170	0.47	0.87	0.25
2014	1.16	2.4	0.90	1100	0.41	0.76	0.23
2015	1.1	2.6	1.02	1200	0.38	0.70	0.21
2016	1.84	2.9	1.15	1140	0.37	0.67	0.21
2017	1.2	2.4	0.95	860	0.34	0.62	0.189
2018	1.38	2.2	0.86				

* pressure and biomass are relative to the average of the time-series.

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