

Black-bellied anglerfish (*Lophius budegassa*) in Subarea 7 and divisions 8.a–b and 8.d (Celtic Seas, Bay of Biscay)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in 2020 should be no more than 12 959 tonnes.

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

Stock development over time

Catches have gradually increased since 2006. Discard data are only available since 2003. The stock size index shows a large increase in recent years. Fishing pressure has been decreasing since 2005 and is now below F_{MSY} . Recruitment has varied without trend throughout the time-series, with high interannual variability.

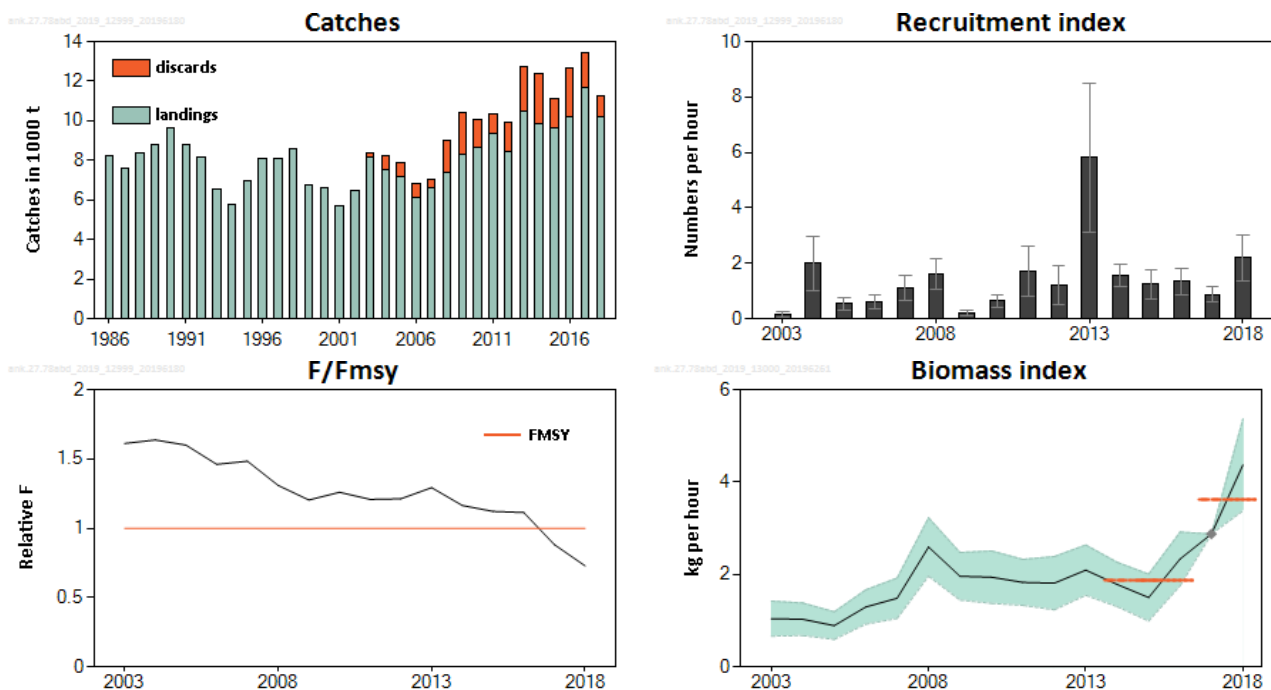


Figure 1 Black-bellied anglerfish in divisions 7.b-k, 8.a–b, and 8.d. Summary of the stock assessment. The biomass and recruitment indices from the combined surveys are displayed with confidence intervals (95%). The 2017 point in the biomass index is imputed, and its confidence interval is not provided owing to the differing method. The short orange horizontal lines represent the mean biomass index in the most recent 2 years and the preceding 3 years.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} . No reference points for stock size have been defined for this stock.*

* Version 2: The text has been updated to reflect that there are no defined reference points for stock size.

Table 1 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. State of the stock and fishery relative to proxy reference points.[†]

		Fishing pressure			Stock size				
		2016	2017	2018	2016	2017	2018		
Maximum sustainable yield	F_{MSY} proxy	✘	✔	✔ Below proxy	$B_{trigger}$?	?	?	Undefined
Precautionary approach	F_{pa} , F_{lim}	?	✔	✔ Below possible reference points	B_{pa} , B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	✘	✔	✔ *Below F_{MSY} proxy	B_{MGT}	?	?	?	Undefined
Qualitative evaluation	-	-	-	- Not applicable	-	↗	↗	↗	Increasing

* F ranges are not available for this stock.

Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The combined IE-IGFS-WIBTS-Q4 and FR-EVHOE-WIBTS-Q4 biomass index 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 increased by more than 20%, so the uncertainty cap was applied.

The fishing mortality is below the MSY reference points, and the stock size is increasing by more than 50%, therefore, no additional precautionary buffer was applied.

Table 2 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. The basis for the catch scenarios. *

Index A (2017–2018)		3.6 kg/hr
Index B (2014–2016)		1.87 kg/hr
Index ratio (A/B)		1.93
Uncertainty cap	Applied	1.20
Advised catches in 2018		10 799 tonnes
Unwanted catch rate		14% (average of the last three years)
Precautionary buffer	Not applied	-
Catch advice **		12 959 tonnes
% Advice change ^		+20%

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

** [Advice for 2019 × uncertainty cap].

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

Basis of the advice

Table 3 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. The basis of the advice.

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

[†] Version 2: Table 1 has been updated to reflect the fishing pressure stock status for the precautionary approach and qualitative evaluation.

Quality of the assessment

The stock was benchmarked in 2018 (ICES 2018b) but it did not result in any change in assessment methodology and the stock remains as category 3.

The combined IE-IGFS-WIBTS-Q4 and FR-EVHOE-WIBTS-Q4 surveys cover a large part of the stock distribution and most of the depth range of the stock (< 500 m). Catch rates are low, however, leading to some uncertainties around the index. The IE-IGFS-WIBTS-Q4 and FR-EVHOE-WIBTS-Q4 surveys cover different spatial extents, and have displayed differing signals; the combined index provides a more robust basis for the advice than the individual indices.

The FR-EVHOE-WIBTS-Q4 survey was not completed in 2017 because of a vessel breakdown; the working group applied a spatial model (VAST) to estimate the 2017 biomass value. The VAST model provided a robust biomass value for 2017, as the full modelled survey index was in line with the original combined survey index.

Issues relevant for the advice

The two anglerfish species (*L. piscatorius* and *L. budegassa*) are not completely 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.

Discards are nearly all undersized fish.

Reference points

Table 4 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. Reference points, values, and their technical basis. No reference points are defined for this stock in terms of absolute values.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{\text{trigger proxy}}$			
	$F_{\text{MSY proxy}}$	1.00	Relative value (F/F_{MSY}) from YPR and mean length-based Z.	ICES (2018c)
Precautionary approach	B_{lim}			
	B_{pa}			
	F_{lim}			
	F_{pa}			
Management plan	SSB_{mgt}			
	F_{mgt}			
	MAP MSY B_{trigger}			
	MAP B_{lim}			
	MAP F_{MSY}			
	MAP range F_{lower}			
	MAP range F_{upper}			

Basis of the assessment

Table 5 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. The basis of the assessment.

ICES stock data category	3 (ICES, 2018a).
Assessment type	Survey trends-based assessment (ICES, 2019). Relative F_{MSY} calculated with mean-length Z approach.
Input data	Combined survey index (IE-IGFS-WIBTS-Q4 and FR-EVHOE-WIBTS-Q4).
Discards and bycatch	Discarding is in the order of 14%.
Indicators	Effort and LPUE trends for some of the main fleets in the fishery.
Other information	Last benchmark in 2018 (ICES, 2018b).
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 6 Black-bellied anglerfish in Subarea 7 and 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 ***, #	Catch/landings corresponding to advice ***, #	Landings advice (both <i>Lophius</i> species) ***, ^	Agreed TAC *, **	ICES landings (both <i>Lophius</i> species) ***	Landings <i>L. budegassa</i>	Catches <i>L. budegassa</i>
1986	Not assessed	-	-		33200	8217	
1987	Not assessed	-	-	39080	30710	7618	
1988	Not assessed	-	-	42990	29696	8381	
1989	Not assessed	-	-	42990	32835	8821	
1990	Not assessed	-	-	42990	30613	9631	
1991	No advice	-	-	42990	25543	8779	
1992	No advice	-	-	42990	21793	8176	
1993	Concern about <i>L. pisc.</i> SSB decrease	-	-	25100	21462	6567	
1994	SSB ↓ still inside safe biological limits	-	-	23900	22946	5745	
1995	No increase in F	-	20000	23200	27987	6954	
1996	No increase in F	-	30300	30400	31425	8093	
1997	No increase in F	-	34300	34300	31099	8116	
1998	No increase in F	-	33000	34300	29074	8598	
1999	No increase in F	-	32900	34300	25529	6738	
2000	At least 20% decrease in F	-	< 22300	29600	21089	6644	
2001	Reduce F below Fpa	-	< 27600	27600	23019	5728	
2002	Reduce F below Fpa	-	< 19900	23700	28588	6505	
2003	At least 30% decrease in F	-	< 16400	21000	36105	8171	8351
2004	At least 10% decrease in F	-	< 26700	26700	36565	7537	8213
2005	Maintain F below Fpa	-	< 37800	31200	35056	7187	7914
2006	Maintain F below Fpa	-	< 33900	34000	33783	6131	6835
2007	Maintain F below Fpa	-	< 36000	36000	37821	6608	7021
2008	Less than average landings	-	< 33000	36000	34452	7399	8985
2009	Same advice as last year	-	< 33000	36000	30122	8287	10400
2010	No increase in effort	-	-	41400	30841	8626	10062
2011	No increase in effort	-	-	40900	34006	9348	10319
2012	Reduce catch	-	-	38900	36618	8429	9888
2013	Reduce catch by the rate of biomass decr.	< 6900		36953	41086	10475	12760
2014	Increase land. by the rate of biomass incr.	< 10757		42496	38306	9832	12402
2015	Same landings advice as in 2014	< 10757		42496	37508	9649	11109
2016	Precautionary approach; same advice as '14	≤ 10757		42496	39630	10220	12660
2017	Precautionary approach; same advice as '16	≤ 10757		42496	37325	11690	13460
2018	Precautionary approach; same advice as '16	≤ 10757		42496	32545	10174	11283
2019	Precautionary approach (catch advice)	≤ 10799		41370			
2020	Precautionary approach (catch advice)	≤ 12959					

* Applies to the combined species.

** Includes Division 8.e.

*** Includes Division 7.a since the 2018 benchmark (ICES, 2018b)

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

^ Since 2013, ICES advice has been on a single species basis.

History of catch and landings

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

Total catch (2018)	Landings					Discards
11 283 tonnes	77%	2.9%	6.6%	5.8%	7.2%	1109 tonnes
	Otter trawl demersal fish	Otter trawl <i>Nephrops</i>	Beam trawl	Gillnets	others	
10 174 tonnes						

Table 8 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. History of the ICES estimates of the catch and landings by area and for recent years by country. All weights are in tonnes.

Year	ICES estimated landings			Discards	ICES estimated landings					ICES estimated discards				
	Subarea 7	Divisions 8.a–b, d	Total	Subarea 7 and Divisions 8.a–b, d	Spain	France	UK	Ireland	Other	Spain	France	UK	Ireland	Other
1986	6443	1774	8217											
1987	5115	2503	7618											
1988	6346	2035	8381											
1989	6434	2387	8821											
1990	7060	2571	9631											
1991	6254	2525	8779											
1992	6008	2168	8176											
1993	4648	1919	6567											
1994	3949	1796	5745											
1995	5204	1750	6954											
1996	5979	2114	8093											
1997	6187	1929	8116											
1998	6509	2089	8598											
1999	5068	1670	6738											
2000	5219	1425	6644											
2001	4478	1250	5728											
2002	4734	1771	6505		2914	3019	146	309	119					
2003	6256	1916	8171	179	3995	3695	181	180	119	81	80	14	2	3
2004	5358	2178	7537	676	3346	3553	256	224	157	278	262	40	80	17
2005	5214	1974	7187	727	3317	3089	248	365	167	214	344	20	133	16
2006	4675	1456	6131	704	3020	2707	133	200	71	355	306	5	30	9
2007	4857	1751	6608	413	2767	3180	151	348	162	275	35	5	80	17
2008	6039	1360	7399	1585	3282	3125	280	508	205	1214	276	12	27	56
2009	6478	1809	8287	2113	3790	3150	306	797	244	1158	570	21	293	70
2010	6812	1815	8626	1436	3183	3669	477	981	316	810	441	20	109	56
2011	7416	1933	9348	971	4314	3285	425	941	382	540	298	4	90	39
2012	5959	2471	8429	1459	3580	3644	376	621	209	951	194	11	278	25
2013	7274	3200	10475	2285	4687	4242	494	615	436	1463	504	14	237	66
2014	6114	3718	9832	2570	2575	5355	878	720	304	1058	961	51	425	75
2015	6284	3365	9649	1460	2134	5425	1055	839	197	52	1045	58	252	52
2016	6127	4093	10220	2441	2036	5850	1076	970	288	453	1165	54	680	88
2017	7518	4172	11690	1770	2228	7255	1198	793	216	250	1121	22	338	39
2018	6863	3312	10174	1109	1656	6349	903	1110	157	110	791	40	145	22

Summary of the assessment

Table 9 Black-bellied anglerfish in Subarea 7 and divisions 8.a–b and 8.d. Assessment summary: Recruitment and biomass (with 95% confidence intervals) indices from the combined IE-IGFS-WIBTS-Q4 and FR-EVHOE-WIBTS-Q4 surveys. F/F_{MSY} was estimated using the mean-length Z approach.

Year	Recruitment index in Numbers/hr	High	Low	Biomass index in Kg/hr	High	Low	Landings in tonnes	Discards in tonnes	F/F_{MSY}
1986							8217		
1987							7618		
1988							8381		
1989							8821		
1990							9631		
1991							8779		
1992							8176		
1993							6567		
1994							5745		
1995							6954		
1996							8093		
1997							8116		
1998							8598		
1999							6738		
2000							6644		
2001							5728		
2002							6505		
2003	0.16	0.25	0.07	1.04	1.42	0.66	8171	179	1.61
2004	2	2.97	1.02	1.03	1.38	0.68	7537	676	1.64
2005	0.53	0.75	0.32	0.89	1.19	0.59	7187	727	1.60
2006	0.61	0.88	0.34	1.3	1.67	0.92	6131	704	1.46
2007	1.12	1.56	0.68	1.49	1.92	1.05	6608	413	1.48
2008	1.61	2.16	1.05	2.6	3.23	1.96	7399	1585	1.31
2009	0.2	0.3	0.11	1.96	2.48	1.45	8287	2113	1.20
2010	0.64	0.87	0.42	1.94	2.51	1.38	8626	1436	1.26
2011	1.71	2.61	0.81	1.83	2.33	1.33	9348	971	1.21
2012	1.23	1.94	0.52	1.81	2.39	1.24	8429	1459	1.21
2013	5.8	8.48	3.13	2.09	2.64	1.55	10475	2285	1.29
2014	1.57	1.97	1.18	1.78	2.26	1.3	9832	2570	1.16
2015	1.26	1.78	0.73	1.5	2.01	0.99	9649	1460	1.12
2016	1.35	1.83	0.88	2.34	2.92	1.76	10220	2441	1.11
2017	0.84	1.17	0.6	2.88	n/a	n/a	11690	1770	0.88
2018	2.2	3.02	1.37	4.37	5.36	3.38	10174	1109	0.73

n/a = not applicable.

Sources and references

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