

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

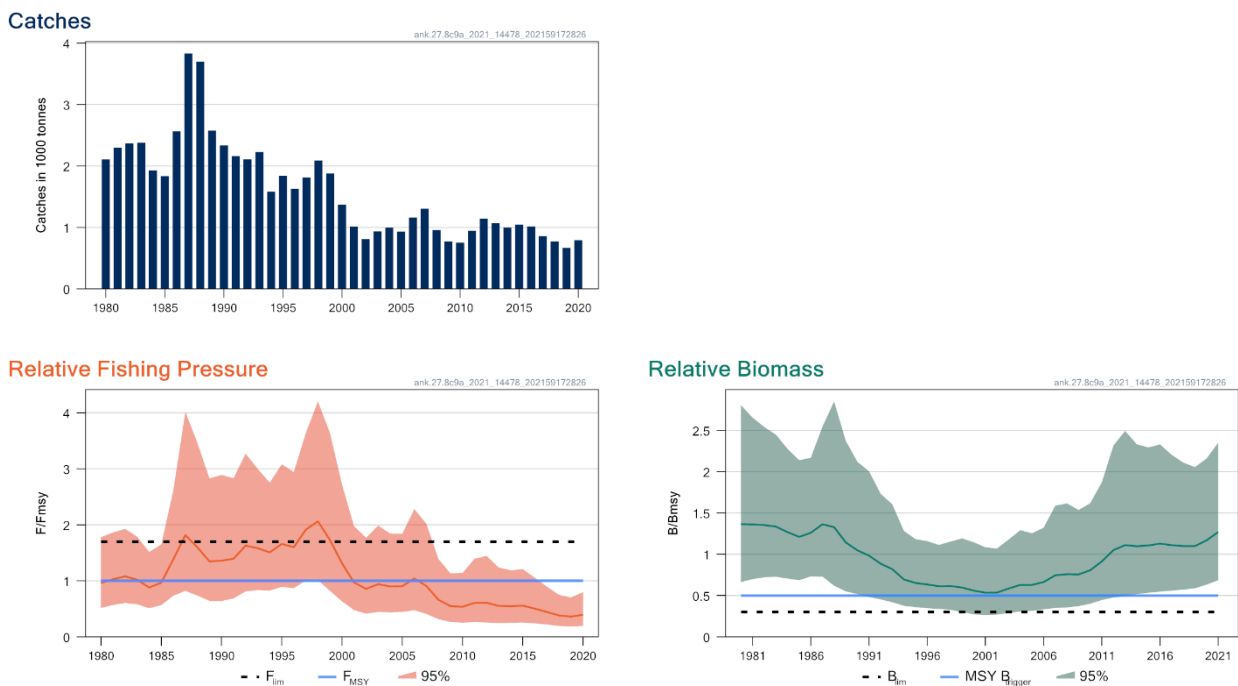
### ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2022 should be no more than 1969 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

Fishing pressure on the stock is below  $F_{MSY}$  and biomass is above MSY  $B_{trigger}$  and  $B_{lim}$ .



**Figure 1** Black-bellied anglerfish in divisions 8.c and 9.a. Summary of the stock assessment.

### Catch scenarios

**Table 1** Black-bellied anglerfish in divisions 8.c and 9.a. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
F (2021)/ $F_{MSY}$	0.39	Status quo F/ $F_{MSY}$
B (2022)/ $B_{MSY}$	1.27	Short term forecast (STF) with status quo F/ $F_{MSY}$
Catch (2021)	793	STF of catch under status quo F/ $F_{MSY}$ ; tonnes

**Table 2** Black-bellied anglerfish in divisions 8.c and 9.a. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2022)	F <sub>2022</sub> /F <sub>MSY</sub>	B <sub>2023</sub> /B <sub>MSY</sub>	% B change <sup>^</sup>	% advice change <sup>^^</sup>
ICES advice basis					
MSY approach (35 <sup>th</sup> percentile of predicted catch distribution under F = F <sub>MSY</sub> )	1969	0.90	1.29	1.57	9.4
Other scenarios					
F = F <sub>msy</sub>	2179	1.00	1.27	0	21
F = F <sub>2020</sub> = F <sub>sq</sub>	888	0.39	1.36	7.1	-51
F = 0	0	0.0	1.42	11.8	-100

<sup>^</sup> Biomass 2023 relative to Biomass 2022.

<sup>^^</sup> Advice value for 2022 relative to the advice value for 2021 (1800 tonnes).

The stock was benchmarked in 2021 (ICES, 2021c) and a new model (SPiCT) was accepted for this stock. Changes in the advice are relative to the results from the previous model.

### Basis of the advice

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

Advice basis	MSY 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 <sub>MSY</sub> ranges are not available, fishing opportunities should be based on the best available scientific advice.

### Quality of the assessment

This stock was benchmarked in 2021 (ICES, 2021c).

The assessment is dependent on commercial catches per unit effort (cpue) series only. Stock status estimates are considered to be robust in relation to reference points.

The collection of data from the commercial fishery during 2020 was impacted by COVID-19 restrictions to a varying degree across member states. For this stock, the diagnostics for the assessment were deemed acceptable and the impact on the perception of the stock status and advice is considered minimal.

### 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.

## Reference points

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

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	0.5 *	Relative value ( $B/B_{MSY}$ ) from the SPiCT assessment model. $B_{MSY}$ is estimated directly from the SPiCT model and changes when the assessment is updated.	ICES (2021c)
	$F_{MSY}$	1 *	Relative value ( $F/F_{MSY}$ ) from the SPiCT assessment model. $F_{MSY}$ is estimated directly from the SPiCT model and changes when the assessment is updated.	ICES (2021c)
Precautionary approach	$B_{lim}$	$0.3 \times B_{MSY}$	Relative value (equilibrium yield at this biomass is 50% of MSY).	ICES (2021c)
	$B_{pa}$	Not defined		
	$F_{lim}$	$1.7 \times F_{MSY}$	Relative value (the F that drives the stock to $B_{lim}$ ).	ICES (2021c)
	$F_{pa}$	Not defined		
Management plan	$SSB_{mgt}$	Not defined		
	$F_{mgt}$	Not defined		

\*No reference points are defined for this stock in terms of absolute values. The SPiCT-estimated values of the ratios  $F/F_{MSY}$  and  $B/B_{MSY}$  are used to estimate stock status relative to the MSY reference points.

## 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	2 ( <a href="#">ICES, 2021a</a> ).
Assessment type	Surplus Production Model in Continuous Time (SPiCT) (ICES, 2021b).
Input data	Commercial catches (international landings); one commercial index (PT.fish.tr 1989–2020).
Discards and bycatch	Discarding is assumed to be negligible.
Indicators	LPUE trends from SP-CORTR8C (1982–2012) and PT.crust.tr (1990–2020); survey index from the Spanish Gulf of Cadiz Bottom Trawl Survey (G4309).
Other information	Last benchmarked in 2021 (ICES, 2021c).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion ( <a href="#">WGBIE</a> ).

## History of the advice, catch, and management

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

Year	ICES advice	Catches corresponding to advice for combined <i>Lophius</i> species	Catches corresponding to advice for <i>L. budegassa</i>	Agreed TAC *	ICES catches (combined <i>Lophius</i> species)	ICES catches for <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	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

Year	ICES advice	Catches corresponding to advice for combined <i>Lophius</i> species	Catches corresponding to advice for <i>L. budegassa</i>	Agreed TAC *	ICES catches (combined <i>Lophius</i> species)	ICES catches for <i>L. budegassa</i>
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	-		2000	4757	933
2006	F = 0 or recovery plan	-		2000	4158	1161
2007	F = 0 or recovery plan	-		2000	3684	1306
2008	F = 0 or recovery plan	-		2000	3328	957
2009	Same advice as last year	-		1800	3080	774
2010	F = 0 or management plan	-		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	1916	773
2019	Precautionary approach ***		≤ 2212	4166	1577	669
2020	Precautionary approach ***		≤ 2050	4023	1515^	793^
2021	Precautionary approach ***		≤ 1800	3672		
2022	MSY approach***		≤ 1969			

\* 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.

^ Preliminary.

## History of catch and landings

**Table 7** Black-bellied anglerfish in divisions 8.c and 9.a. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings				Discards
793 tonnes	50% Bottom trawl	40% Artisanal	9% Gillnet	< 1% Others	Negligible
	793 tonnes				

**Table 8** Black-bellied anglerfish in divisions 8.c and 9.a. History of commercial catch; 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	653	1344	1833		1833
1986	553	585					1138	379			200	847	1425	2563		2563

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				
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
2018	186	156	1	7	9	0	359	126	37	1	52	185	402	752	11	773
2019	137	117	0	1	2	0	259	109	49	1	43	135	337	595	73	669
2020	126	65	0	4	2	0	198	138	5	3	128	321	596	793		793

**Summary of the assessment**

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

Year	Relative biomass			Catches	Relative fishing pressure		
	Relative B	High	Low		Relative F	High	Low
1980	1.36	2.81	0.66	2110	0.96	1.78	0.52
1981	1.36	2.65	0.70	2300	1.03	1.86	0.57
1982	1.35	2.54	0.72	2369	1.08	1.93	0.61
1983	1.34	2.45	0.73	2379	1.02	1.79	0.58
1984	1.27	2.28	0.71	1929	0.88	1.52	0.51
1985	1.21	2.14	0.69	1833	0.97	1.65	0.57
1986	1.26	2.17	0.73	2563	1.39	2.61	0.73
1987	1.36	2.55	0.73	3832	1.82	4.02	0.82
1988	1.33	2.85	0.62	3700	1.60	3.46	0.74
1989	1.14	2.37	0.55	2578	1.35	2.83	0.64
1990	1.05	2.12	0.52	2334	1.36	2.89	0.64
1991	0.98	2.01	0.48	2162	1.39	2.83	0.69
1992	0.89	1.73	0.45	2111	1.63	3.27	0.81
1993	0.82	1.60	0.42	2227	1.58	3.00	0.84
1994	0.69	1.28	0.38	1580	1.51	2.75	0.83
1995	0.65	1.18	0.36	1843	1.66	3.08	0.89
1996	0.63	1.16	0.35	1629	1.60	2.94	0.87
1997	0.61	1.11	0.34	1813	1.91	3.64	1.01
1998	0.62	1.15	0.33	2089	2.06	4.20	1.01
1999	0.60	1.19	0.30	1879	1.73	3.64	0.82
2000	0.56	1.15	0.27	1369	1.31	2.72	0.63
2001	0.54	1.08	0.26	1013	0.97	1.98	0.48
2002	0.54	1.07	0.27	810	0.86	1.77	0.42
2003	0.59	1.18	0.29	934	0.94	1.99	0.44
2004	0.63	1.29	0.31	993	0.90	1.84	0.44
2005	0.63	1.25	0.32	933	0.90	1.84	0.44
2006	0.66	1.32	0.33	1161	1.04	2.28	0.48
2007	0.75	1.59	0.35	1306	0.91	2.02	0.41
2008	0.76	1.62	0.36	957	0.66	1.39	0.32
2009	0.76	1.54	0.37	774	0.55	1.13	0.26
2010	0.81	1.62	0.40	754	0.54	1.14	0.25
2011	0.91	1.87	0.45	948	0.61	1.40	0.26
2012	1.05	2.32	0.48	1141	0.61	1.45	0.26
2013	1.11	2.49	0.49	1071	0.55	1.24	0.25
2014	1.10	2.33	0.52	998	0.55	1.19	0.25
2015	1.11	2.29	0.53	1047	0.56	1.21	0.26
2016	1.13	2.33	0.55	1014	0.50	1.06	0.24
2017	1.11	2.20	0.56	861	0.44	0.90	0.22
2018	1.10	2.11	0.57	773	0.38	0.75	0.195
2019	1.10	2.06	0.59	669	0.36	0.70	0.186
2020	1.17	2.16	0.63	793	0.39	0.80	0.195
2021	1.27	2.35	0.69				

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