

## White anglerfish (*Lophius piscatorius*) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)

### ICES advice on fishing opportunities

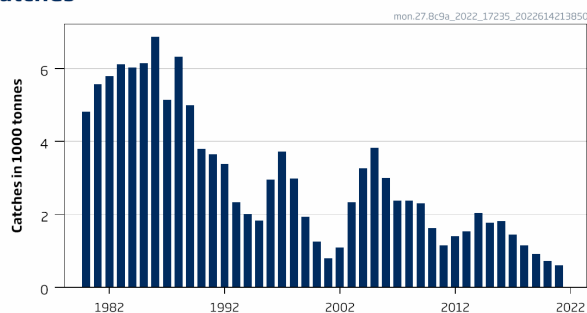
ICES advises that when the EU multiannual plan (MAP) for Western waters and adjacent waters is applied, catches in 2023 that correspond to the F ranges in the plan are between 1613 tonnes and 2986 tonnes. According to the MAP, catches higher than those corresponding to  $F_{MSY}$  (2271 tonnes) can only 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—black-bellied anglerfish (*Lophius budegassa*) and white anglerfish (*Lophius piscatorius*)—under a combined species TAC prevents effective control of the single-species exploitation rates and could lead to the overexploitation of either species.

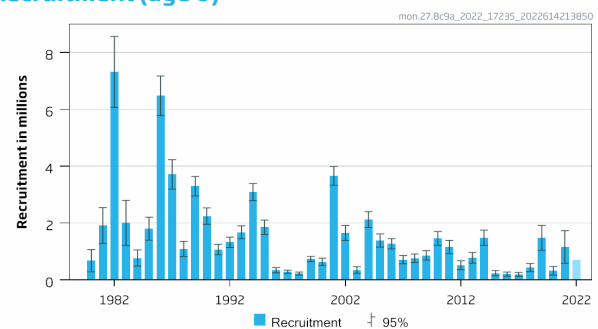
### Stock development over time

Fishing pressure on the stock is below  $F_{MSY}$ , and spawning-stock size is above  $MSY B_{trigger}$ ,  $B_{pa}$ , and  $B_{lim}$ .

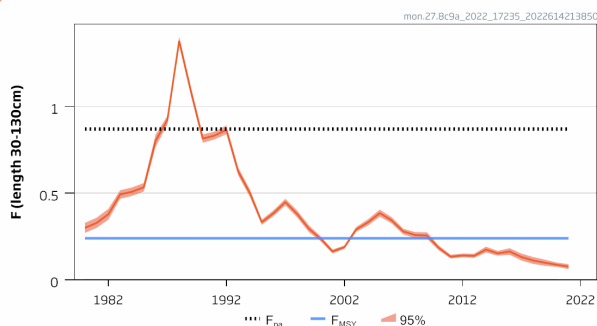
#### Catches



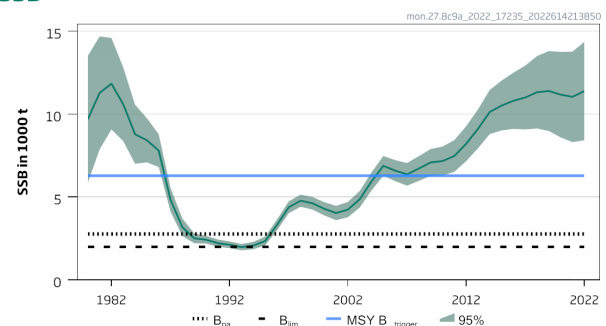
#### Recruitment (age 0)



#### F



#### SSB



**Figure 1** White anglerfish in divisions 8.c and 9.a. Summary of the stock assessment. The assumed recruitment value for 2022 is shaded in a lighter colour.

### Catch scenarios

**Table 1** White anglerfish in divisions 8.c and 9.a. The basis of the catch scenarios.

Variable	Value	Notes
$F_{30-130 \text{ cm}} (2022)$	0.088	$F_{sq} = F_{\text{average}} (2019-2021)$ .
SSB (2023)	11 943	Short-term forecast (STF); in tonnes.
$R_{\text{age } 0} (2022, 2023)$	706	Geometric mean of recruitment (GM, 2003–2021); in thousands.
Total catch (2022)	792	STF. Discarding assumed to be negligible; in tonnes.
Projected landings (2022)	792	STF; in tonnes.
Projected discards (2022)		Discarding is assumed to be negligible.

**Table 2** White anglerfish in divisions 8.c and 9.a. Annual catch scenarios. All weights are in tonnes. The % change in TAC is not computed because the TAC is for the two species (*L. piscatorius* and *L. budegassa*) combined.

Basis	Total catch (2023)	F <sub>30-130 cm</sub> Total (2023)	SSB (2024)	% SSB change**	% advice change^
ICES advice basis					
EU MAP*: F <sub>MSY</sub>	2271	0.24	11163	-6.5	19.6
F = MAP* F <sub>MSY lower</sub>	1613	0.164	11858	-0.71	19.9^^
F = MAP* F <sub>MSY upper</sub>	2986	0.33	10404	-12.9	19.1^^
Other options					
F = 0	0	0	13549	13.4	-100
F <sub>pa</sub>	6140	0.87	6985	-42	223
SSB (2024) = B <sub>lim</sub>	10347	3.02	1993	-83	445
SSB (2024) = B <sub>pa</sub>	9753	2.4	2769	-77	414
SSB (2024) = MSY <sub>Btrigger</sub>	6770	1.02	6283	-47	257
SSB <sub>2024</sub> = SSB <sub>2023</sub>	1532	0.155	11943	0	-19.3
F = F <sub>2022</sub>	898	0.088	12610	5.6	-53

\* The EU multiannual plan (MAP; EU, 2019).

\*\* SSB 2024 relative to SSB 2023 (11 943 tonnes).

^ Advice value for 2023 relative to advice value for 2022 (1899 tonnes).

^^ Advice value for 2023 relative to the advice value for 2022 for the MAP F<sub>MSY lower</sub> (1345 tonnes) and MAP F<sub>MSY upper</sub> (2507 tonnes).

The advice for 2023 is about 20% higher than the advice for 2022 because of an upward revision of recruitment in recent years.

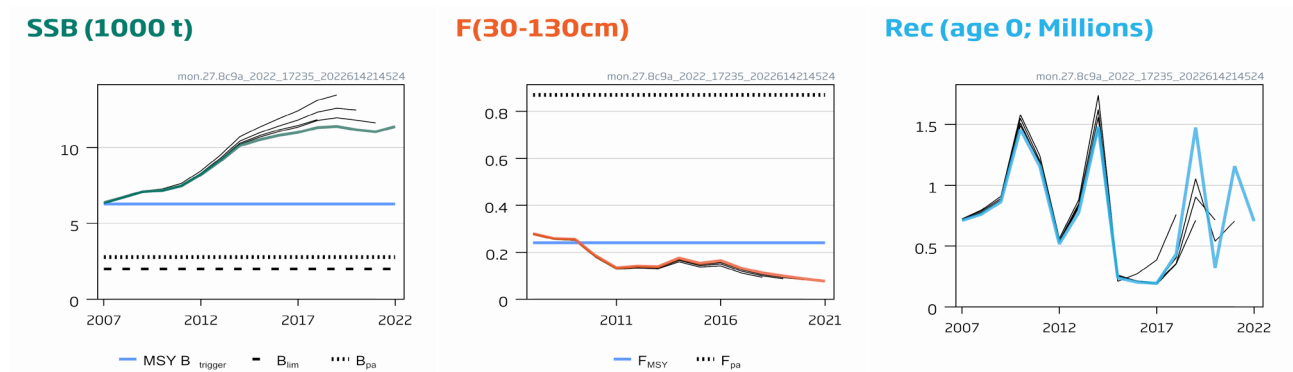
### Basis of the advice

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

Advice basis	Management plan approach
Management plan	The EU multiannual plan (MAP) for stocks 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 F <sub>MSY</sub> range for the stock.
	In accordance with the MAP, “provided that the stock is above MSY <sub>Btrigger</sub> :
	(a) if, on the basis of scientific advice or evidence, it is necessary for the achievement of the objectives laid down in Article 3 in the case of mixed fisheries;
	(b) if, on the basis of scientific advice or evidence, it is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics; or
	(c) in order to limit variations in fishing opportunities between consecutive years to not more than 20%.”
	ICES considers that the F <sub>MSY</sub> range for this stock used in the MAP is precautionary.
	Full details of the plan are described in Regulation 2019/472 (EU, 2019).

### Quality of the assessment

Results of the assessment rely on assumptions regarding the exploitation pattern on older fish, for which no abundance index is available, and the estimates of their biomass are thus uncertain. To improve the quality of the assessment, fishery-independent information on large fish would be required.



**Figure 2** White anglerfish in divisions 8.c and 9.a. Historical assessment results (final-year recruitment assumptions included).

### Issues relevant for the advice

The two anglerfish species are not separated in the landings statistics. A single TAC covers both species, with species-specific landings being estimated by ICES (ICES, 2018). 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 the overexploitation of either species.

### Reference points

**Table 4** White 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 $B_{trigger}$	6283	5th percentile of the SSB when fishing at $F_{MSY}$ ; in tonnes.	ICES (2018)
	$F_{MSY}$	0.24	Stochastic simulations based on a segmented regression.	ICES (2018)
Precautionary approach	$B_{lim}$	1993	$B_{loss}$ (lowest observed SSB value); in tonnes.	ICES (2018)
	$B_{pa}$	2769	$B_{lim} \times \exp(\sigma \times 1.645)$ , where $\sigma = 0.2$ ; in tonnes.	ICES (2018)
	$F_{lim}$	Undefined	$F_{lim}$ (0.56) is no longer considered appropriate given the estimate of $F_{pa}$ .	ICES (2021)
	$F_{pa}$	0.87	$F_{P05}$ with advice rule: the $F$ that provides a 95% probability for SSB to be above $B_{lim}$ .	ICES (2021)
Management plan	MAP MSY $B_{trigger}$	6283	MSY $B_{trigger}$ ; in tonnes.	ICES (2018), EU (2019)
	MAP $B_{lim}$	1993	$B_{lim}$ ; in tonnes.	ICES (2018), EU (2019)
	MAP $F_{MSY}$	0.24	$F_{MSY}$	ICES (2018), EU (2019)
	MAP range $F_{lower}$	0.164	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2018), EU (2019)
	MAP range $F_{upper}$	0.33	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2018), EU (2019)

## Basis of the assessment

**Table 5** White anglerfish in divisions 8.c and 9.a. Basis of the assessment and advice.

ICES stock data category	1 ( <a href="#">ICES,2022a</a> ).
Assessment type	Length-based analytical assessment model (Stock Synthesis) that uses landings in the model and in the forecast (ICES, 2022b).
Input data	Commercial landings, one index from the Spanish North Coast Bottom Trawl Survey (SP-NSGFS-Q4 [G2784]) between 1983 and 2021 and two commercial indices (LPUE series from SP-CORUTR8c 1982–2012 and SP-CEDGNS8c 1999–2011); assumed constant natural mortality.
Discards and bycatch	Discarding is not quantified, assumed to be negligible.
Indicators	None.
Other information	The most recent benchmark was in 2018 (ICES, 2018).
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** White 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. piscatorius</i>	Agreed TAC*	ICES catches for combined <i>Lophius</i> species	ICES catches for <i>L. piscatorius</i>
1987	Not assessed	-		12000	8973	5141
1988	Not assessed	-		12000	10021	6321
1989	Not assessed	-		12000	7574	4996
1990	Not assessed	-		12000	6124	3790
1991	No advice	-		12000	5802	3640
1992	No advice	-		12000	5493	3382
1993	No long-term gain in increasing F	-		13000	4556	2329
1994	No advice	-		13000	3587	2007
1995	If required a precautionary TAC	-		13000	3677	1834
1996	If required a precautionary TAC	-		13000	4584	2955
1997	If required a precautionary TAC	-		13000	5527	3714
1998	Restrict catch to < 80% recent levels			10000	5070	2981
1999	Reduce F to F <sub>pa</sub>	4200		8500	3817	1938
2000	60% reduction in F	1600		6800	2628	1259
2001	50% reduction in F	2800		6000	1801	788
2002	30% reduction in F	3500		4800	1900	1090
2003	5% reduction in F	3200		4000	3258	2324
2004	F = 0 or recovery plan**	0**		2300	4250	3257
2005	F = 0 or recovery plan	0		2000	4757	3824
2006	F = 0 or recovery plan	0		2000	4158	2997
2007	F = 0 or recovery plan	0		2000	3684	2378
2008	F = 0 or recovery plan	0		2000	3328	2371
2009	Same advice as last year	0		1800	3080	2306
2010	F = 0 or management plan	0		1500	2372	1618
2011	MSY framework	1500	1000	1571	2179	1157
2012	MSY framework	3300	2200	3300	2645	1395
2013	MSY transition	2090	1350	2475	2710	1541
2014	MSY approach	2629	1476	2629	3130	2032
2015	MSY approach	2987	1937	2987	2970	1771
2016	MSY approach^	≤ 2413	≤ 1343	2569	2948	1809
2017	MSY approach^		≤ 2253	3955	2307	1446
2018	MSY approach^		≤ 2197	3955	1916	1144
2019	MSY approach^		≤ 2153	4166	1577	909
2020	Management plan##		2146 (range 1519–2813)#	4023	1515	722
2021	Management plan##		1872 (range 1295–2472)#	3672	1326	608

Year	ICES advice	Catches corresponding to advice for combined <i>Lophius</i> species	Catches corresponding to advice for <i>L. piscatorius</i>	Agreed TAC*	ICES catches for combined <i>Lophius</i> species	ICES catches for <i>L. piscatorius</i>
2022	Management plan <sup>##</sup>		1899 (range 1345–2507) <sup>#</sup>	3868		
2023	Management plan <sup>##</sup>		2271 (range 1613–2986) <sup>#</sup>			

\* Combined TAC for *Lophius piscatorius* and *L. budegassa*. For Division 8.c and subareas 9 and 10; EU waters of CECF 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.

# Catches corresponding to  $F_{MSY}$ , EU MAP range in brackets (EU, 2019).

## EU multiannual plan (MAP) for the Western Waters (EU, 2019).

## History of catch and landings

**Table 7** White anglerfish in divisions 8.c and 9.a. Catch distribution by fleet in 2021 as estimated by ICES. All weights are in tonnes.

Catch	Landings				Discards
608	39% gillnet	47% trawl	13% artisanal	1% others	Negligible
	608				

**Table 8** White anglerfish in divisions 8.c and 9.a. History of commercial landings; the 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						Sub- total	ICES estimated totals	
	Spain			France		Total	Spain			Portugal		Total		Unallo- cated	Total landings
	Trawl	Gillnet	Other	Trawl	Gillnet		Trawl	Gillnet	Other	Trawl	Artisanal				
1980	2806	1270				4076	401				339	740	4816	0	4816
1981	2750	1931				4681	535				352	887	5568	0	5568
1982	1915	2682				4597	875				310	1185	5782	0	5782
1983	3205	1723				4928	726				460	1186	6114	0	6114
1984	3086	1690				4776	578			186	492	1256	6032	0	6032
1985	2313	2372				4685	540			212	702	1454	6139	0	6139
1986	2499	2624				5123	670			167	910	1747	6870	0	6870
1987	2080	1683				3763	320			194	864	1378	5141	0	5141
1988	2525	2253				4778	570			157	817	1543	6321	0	6321
1989	1643	2147				3790	347			259	600	1206	4996	0	4996
1990	1439	985				2424	435			326	606	1366	3790	0	3790
1991	1490	778				2268	319			224	829	1372	3640	0	3640
1992	1217	1011				2228	301			76	778	1154	3382	0	3382
1993	844	666				1510	72			111	636	819	2329	0	2329
1994	690	827				1517	154			70	266	490	2007	0	2007
1995	830	572				1403	199			66	166	431	1834	0	1834
1996	1306	745				2050	407			133	365	905	2955	0	2955
1997	1449	1191				2640	315			110	650	1075	3714	0	3714
1998	912	1359				2271	184			28	497	710	2981	0	2981
1999	545	1013				1558	79			9	285	374	1932	0	1932
2000	269	538				808	107			4	340	451	1259	0	1259
2001	231	294				525	57			16	190	263	788	0	788
2002	385	341		51	7	784	110			29	168	307	1090	0	1090
2003	911	722		46	0	1679	312			29	305	645	2324	0	2324
2004	1262	1269		73	27	2631	264			27	335	626	3257	0	3257
2005	1378	1622		134	46	3180	371			29	244	643	3824	0	3824
2006	1166	1247		60	5	2478	260			29	230	519	2997	0	2997
2007	955	1009		22	6	1992	181			13	192	386	2378	0	2378
2008	894	1168		26	8	2096	138			11	127	275	2371	0	2371
2009	850	1058		17	9	1935	213			10	148	371	2306	0	2306
2010	370	955		12	2	1339	158			2	119	279	1618	0	1618
2011	243	483	73	15	2	816	59	28	48	46	80	260	1077	80	1157

Year	Division 8.c						Division 9.a						Sub-total	ICES estimated totals	
	Spain			France		Total	Spain			Portugal		Total		Unallo-cated	Total landings
	Trawl	Gillnet	Other	Trawl	Gillnet		Trawl	Gillnet	Other	Trawl	Artisanal				
2012	271	527	67	12	2	880	54	20	42	6	163	285	1165	230	1395
2013	274	718	38	19	6	1054	47	30	50	15	154	296	1350	190	1541
2014	358	947	28	25	9	1368	91	47	4	27	122	291	1659	374	2032
2015	324	802	4	11	12	1152	86	53	2	34	200	375	1527	244	1771
2016	376	846	3	10	8	1243	76	67	1	8	120	273	1516	294	1809
2017	248	726	1	3	8	986	106	66	1	30	138	341	1327	119	1446
2018	227	614	34	5	6	886	117	35	1	6	94	253	1139	4	1144
2019	161	435	0	0	0	597	74	33	1	22	104	233	830	78	909
2020	175	256	1	8	3	443	84	40	2	28	125	279	722	0	722
2021	178	233	1	3	0	415	88	7	2	16	80	193	608	0	608

## Summary of the assessment

**Table 9** White anglerfish in divisions 8.c and 9.a. Assessment summary. ‘High’ and ‘Low’ refer to 95% confidence intervals. All weights are in tonnes and recruitment is in thousands.

Year	Recruitment			Stock size			Catch	Fishing pressure		
	R (age 0)	High	Low	SSB	High	Low		F <sub>30–130 cm</sub>	High	Low
1980	676	1068	283	9688	13518	5858	4817	0.30	0.33	0.27
1981	1910	2539	1281	11276	14688	7865	5566	0.33	0.36	0.30
1982	7313	8562	6065	11840	14601	9078	5782	0.38	0.41	0.35
1983	2004	2798	1211	10595	12824	8366	6113	0.49	0.52	0.47
1984	768	1052	484	8786	10570	7003	6031	0.51	0.53	0.48
1985	1800	2204	1396	8424	9761	7088	6139	0.53	0.56	0.51
1986	6473	7170	5775	7800	8792	6808	6870	0.80	0.84	0.77
1987	3709	4226	3192	4835	5553	4117	5139	0.92	0.95	0.90
1988	1090	1357	823	3179	3711	2647	6321	1.38	1.40	1.35
1989	3294	3635	2953	2511	2810	2212	4995	1.09	1.11	1.06
1990	2242	2531	1953	2425	2660	2190	3790	0.82	0.84	0.79
1991	1066	1252	880	2219	2443	1995	3640	0.83	0.86	0.81
1992	1319	1502	1137	2120	2324	1917	3382	0.87	0.89	0.84
1993	1676	1903	1449	1978	2170	1786	2329	0.63	0.65	0.60
1994	3086	3387	2786	2072	2295	1848	2007	0.50	0.52	0.48
1995	1852	2106	1598	2345	2615	2075	1835	0.33	0.35	0.32
1996	340	432	248	3312	3642	2982	2956	0.39	0.40	0.37
1997	282	341	222	4384	4746	4021	3715	0.45	0.47	0.43
1998	222	277	166	4778	5146	4410	2981	0.38	0.40	0.36
1999	735	829	642	4625	5006	4244	1933	0.30	0.31	0.27
2000	635	764	507	4292	4695	3888	1256	0.24	0.25	0.22
2001	3657	3989	3326	4036	4468	3604	788	0.164	0.176	0.152
2002	1652	1914	1391	4241	4706	3776	1093	0.189	0.199	0.179
2003	349	465	233	4865	5368	4362	2326	0.29	0.31	0.28
2004	2120	2397	1842	5941	6489	5394	3258	0.33	0.35	0.31
2005	1384	1617	1151	6882	7480	6283	3827	0.39	0.41	0.36
2006	1270	1452	1089	6593	7228	5958	2998	0.34	0.36	0.33
2007	710	856	564	6369	7054	5683	2377	0.28	0.30	0.26
2008	761	912	610	6718	7469	5968	2372	0.26	0.28	0.24
2009	863	1029	697	7086	7897	6275	2307	0.26	0.28	0.24
2010	1459	1702	1215	7169	8044	6293	1620	0.185	0.199	0.171
2011	1154	1390	919	7473	8432	6515	1156	0.134	0.145	0.124
2012	516	673	358	8212	9269	7156	1396	0.141	0.152	0.130
2013	777	965	590	9110	10287	7934	1540	0.139	0.152	0.127
2014	1482	1749	1214	10129	11460	8797	2033	0.175	0.192	0.158
2015	238	331	144	10517	12021	9014	1771	0.153	0.167	0.139
2016	203	275	130	10804	12500	9109	1809	0.164	0.183	0.144
2017	194	263	125	11002	12927	9076	1447	0.132	0.152	0.112

Year	Recruitment			Stock size			Catch	Fishing pressure		
	R (age 0)	High	Low	SSB	High	Low		F <sub>30-130 cm</sub>	High	Low
2018	434	579	289	11320	13506	9134	1144	0.112	0.132	0.092
2019	1476	1914	1038	11394	13807	8982	908	0.099	0.117	0.081
2020	321	470	172	11174	13755	8593	720	0.087	0.100	0.075
2021	1157	1731	582	11043	13775	8310	608	0.077	0.091	0.062
2022	706*			11388	14356	8421				

\* Geometric mean 2003–2021.

## Sources and references

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[Download the stock assessment data and figures.](#)

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