

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa

Advice for 2014

ICES advises on the basis of the MSY approach that landings should be no more than 1153 t in 2014. Combined landings of *Lophius piscatorius* and *Lophius budegassa* should be no more than 2629 t in 2014. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

Stock status

F (Fishing Mortality)				
	2010	2011	2012	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined
Biomass				
	2011	2012	2013	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Undefined

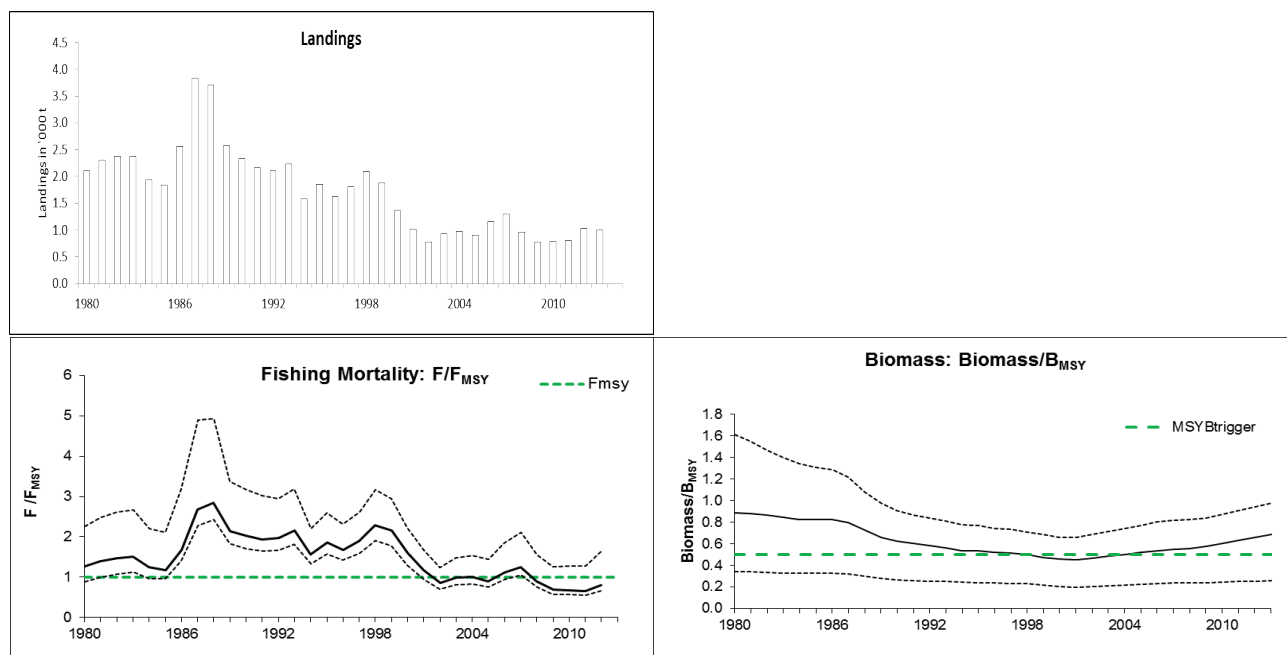
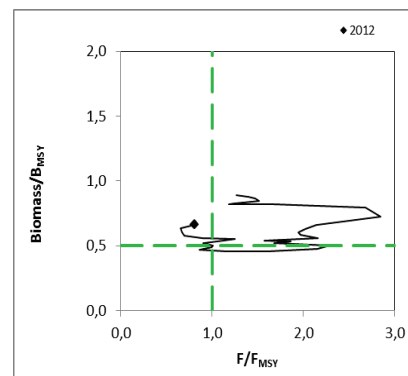


Figure 7.4.3.1 Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Summary of stock assessment: Landings (top left), F/F_{MSY} (bottom left), and B/B_{MSY} (bottom right) with 80% confidence intervals (dotted black lines). Top right: SSB/B_{MSY} and F/F_{MSY} for the time-series used in the assessment.

Biomass at the beginning of 2013 is estimated to be above MSY $B_{trigger}$. Fishing mortality has decreased since 1999 and in 2012 it was estimated to be below F_{MSY} .

Management plans

No specific management objectives are known to ICES.

Biology

Growth rates for *L. budegassa* are under revision. In the absence of accurate ageing, a growth model is needed; this will require tagging experiments.

The fisheries

Anglerfish species, *Lophius piscatorius* and *L. budegassa*, are caught together in bottom trawl and gillnet fisheries. Anglerfish, hake, *Nephrops*, and megrim are partly caught in the same mixed fisheries. Spanish trawl discards are considered negligible except in occasional years when they can be high. There is no minimum landing size for anglerfish, but a minimum selling weight of 500 g was fixed in 1996 to ensure marketing standards.

Catch distribution Total landings (2012) = 1.024 kt (72% bottom otter trawl, 10% Spanish gillnet, and 18% Portuguese artisanal gear types). Discarding is known to occur but cannot be quantified.

Quality considerations

The lack of a validated age-reading criterion precludes the use of assessment models based on age data.

The assessment results are considered uncertain, as reflected by the large confidence intervals. In addition the overall dynamics in relation to B_{trigger} and F_{MSY} are relatively unstable as reflected in shifts in stock trends relative to these values in consecutive years. The advice is, however, relatively robust to these uncertainties.

Due to the broad size range of the species, length sampling should be increased to ensure adequate data for future development of improved assessment methods.

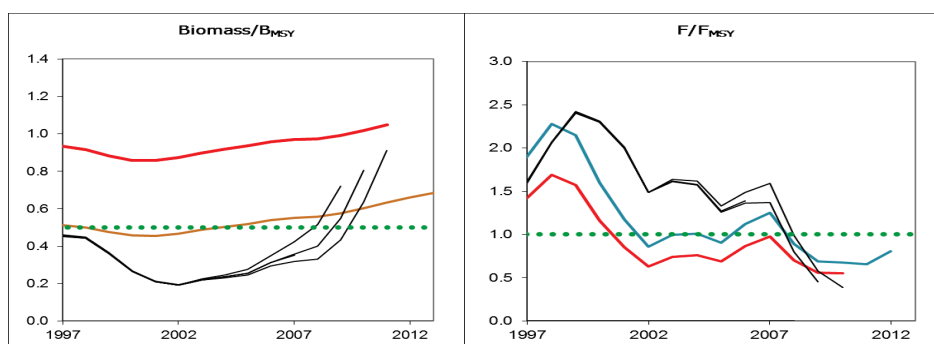


Figure 7.4.3.2 Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Historical assessment results. The stock was benchmarked in 2012.

Scientific basis

Assessment type	Surplus production model (ASPIC).
Stock data category	Category 1.
Input data	Commercial catches (international landings); three commercial indices (SPCORTR8c, PT.crust.tr, and PT.fish.tr).
Discards and bycatch	Discarding occurs but cannot be quantified and is not included in the assessment.
Indicators	None.
Other information	This stock was benchmarked in 2012 (WKFLAT ; ICES, 2012). This stock is caught together with <i>L. piscatorius</i> (Section 7.4.4); therefore, the fisheries advice combines both stocks.
Working group report	WGHMM (ICES, 2013).

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Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	50% B_{MSY}	B_{MSY} is implicitly estimated from surplus production model (ICES, 2012).
Approach	F_{MSY}	Relative value.	Implicit, estimated from surplus production model (ICES, 2012). Fishing mortality values expressed relative to F_{MSY} .
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

(unchanged since: 2012)

Outlook for 2014

Basis: $F_{\text{sq}}/F_{\text{MSY}} = F(2013)/F_{\text{MSY}} = \text{mean } F(2010-2012)/F_{\text{MSY}} = 0.712$; $B(2014)/B_{\text{MSY}} = 0.71$; Landings (2013) = 0.934.

Rationale	<i>L. bud.</i>	Combined species	Basis	<i>L. budegassa</i>			Combined species	
	Landings (2014)	Landings (2014)		F(2014) / F_{MSY}	B(2015) / B_{MSY}	%B change ¹⁾	%TAC change ²⁾	%Landings change ³⁾
MSY approach	1.153	2.629	$F_{\text{sq}} \times 1.055$ ⁴⁾	0.85	0.73	3%	6%	16%
Zero catch	0.00	0.00	$F = 0$	0.00	0.77	8%	-100%	-100%
Other options	0.915	2.105	-15% TAC ($F_{\text{sq}} \times 0.833$)	0.67	0.74	4%	-15%	-7%
	1.083	2.476	Equal TAC ($F_{\text{sq}} \times 0.99$)	0.80	0.73	3%	0%	9%
	1.253	2.847	+15% TAC ($F_{\text{sq}} \times 1.15$)	0.93	0.73	2%	15%	26%
	0.969	2.375	$F_{\text{sq}} \times 1$	0.71	0.74	4%	-4%	5%
	1.349	-	$F_{\text{sq}} \times 1.241$ ⁵⁾	1.00	0.72	2%	-	-

Weights in thousand tonnes.

¹⁾ Biomass 2015 relative to biomass 2014.

²⁾ Landings of combined anglerfish species in 2014 relative to TAC 2013 (2475 t).

³⁾ Landings 2014 relative to landings 2013 (both species combined).

⁴⁾ As both species of anglerfish (*L. piscatorius* and *L. budegassa*) are caught in the same fisheries and are subject to a combined TAC, the same multiplicative factor is applied to the current fishing mortality (F_{sq}) for both species. This year the *L. piscatorius* multiplier is used.

⁵⁾ Single-species F_{MSY} value.

MSY approach

Because the two anglerfish species are not separated in the landings, the advice of the two stocks is linked. This stock is below F_{MSY} and above MSY B_{trigger} . To maintain fishing mortality for both stocks at or below F_{MSY} , the F multiplier of *L. piscatorius* is applied to both stocks, resulting in landings of *L. budegassa* of no more than 1153 t in 2014. This is expected to lead to a 3% biomass increase in 2015. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

Additional considerations

As anglerfish are taken in mixed trawl fisheries, this stock is also affected by the southern hake and *Nephrops* recovery plan (Council Regulation (EC) No. 2166/2005) effort limitation.

The fisheries for the two anglerfish species are managed under a common TAC. They are usually caught and recorded together in the landing statistics. It is impossible to adequately manage each species separately under a common TAC.

Uncertainties in the assessment and forecast

The assessment has improved with the inclusion of the Spanish “A Coruña” series, which corresponds to a fuller coverage of the fishery distribution.

The assessment results are considered uncertain, as reflected by the large confidence intervals. In addition the overall dynamics in relation to B_{trigger} and F_{MSY} are relatively unstable as reflected in shifts in stock trends relative to these values in consecutive years. The advice is, however, relatively robust to these uncertainties. The current estimates of the overall stock dynamics relative to reference points are in the same order as those estimated in 2012.

Comparison with previous assessment and advice

The method used this year is the same as that used last year. The basis for this year’s advice is the MSY approach. Last year the advice was based on the MSY transition.

Sources

- ICES. 2012. Report of the Benchmark Workshop on the Flatfish Species and Anglerfish (WKFLAT), 1–8 March 2012, Bilbao, Spain. ICES CM 2012/ACOM:46.
- ICES. 2013. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2013, ICES Headquarters, Copenhagen. ICES CM 2013/ACOM:11A.
- Landa, J., Duarte, R., and Quincoces, I. 2008. Growth of white anglerfish (*Lophius piscatorius*) tagged in the Northeast Atlantic and a review of age studies on anglerfish. ICES Journal of Marine Science, 65: 72–80.

Table 7.4.3.1 Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. ICES advice, management, and landings.

Year	ICES Advice ¹	Predicted landings corresp. to advice for combined species	Predicted landings corresp. to advice for <i>L. budegassa</i>	Agreed TAC ^{1,2}	ICES landings for combined species	ICES landings <i>L. budegassa</i>
1987	Not dealt with	-		12.0	8.9	3.8
1988	Not dealt with	-		12.0	10.0	3.7
1989	Not dealt with	-		12.0	7.6	2.6
1990	Not dealt with	-		12.0	6.1	2.3
1991	No advice	-		12.0	5.8	2.2
1992	No advice	-		12.0	4.2	2.1
1993	No long-term gain in increasing F	-		13.0	4.5	2.2
1994	No advice	-		13.0	3.6	1.6
1995	If required a precautionary TAC	-		13.0	3.6	1.8
1996	If required a precautionary TAC	-		13.0	4.6	1.6
1997	If required a precautionary TAC	-		13.0	5.5	1.8
1998	Restrict catch to < 80% recent levels			10.0	5.1	2.1
1999	Reduce F to F _{pa}	4.2		8.5	3.8	1.9
2000	60% reduction in F	1.6		6.8	2.6	1.4
2001	50% reduction in F	2.8		6.0	1.8	1.0
2002	30% reduction in F	3.5		4.8	1.8	0.8
2003	5% reduction in F	3.2		4.0	3.2	0.9
2004	F = 0 or recovery plan ³	0 ³		2.3	4.1	1.0
2005	F = 0 or recovery plan	0		2.0	4.5	0.9
2006	F = 0 or recovery plan	0		2.0	4.1	1.1
2007	F = 0 or recovery plan	0		2.0	3.6	1.3
2008	F = 0 or recovery plan	0		2.0	3.3	1.0
2009	Same advice as last year	0		1.8	3.0	0.8
2010	F = 0 or management plan	0		1.5	2.3	0.8
2011	MSY framework	1.5	0.48	1.6	1.8	0.8
2012	MSY framework	3.3	1.1	3.3	2.3	1.0
2013	MSY transition	2.09	0.74	2.5		
2014	MSY approach	2.629	1.153			

Weights in thousand tonnes.

¹⁾ For *Lophius piscatorius* and *L. budegassa* combined.

²⁾ For Division VIIIc and Subareas IX and X; EU waters of CECAF 34.1.1.

³⁾ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries, protecting stocks outside safe biological limits.

Table 7.4.3.2

Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Landings (in tonnes) by country and main fishing fleets, as estimated by ICES.

Year	Div. VIIIc			Div. IXa				Div. VIIIc+IXa
	SPAIN			SPAIN	PORTUGAL		TOTAL	
	Trawl	Gillnet	TOTAL		Trawl	Artisanal		
1978	n/a	n/a	n/a	248	n/a	107	355	355
1979	n/a	n/a	n/a	306	n/a	210	516	516
1980	1203	207	1409	385	n/a	315	700	2110
1981	1159	309	1468	505	n/a	327	832	2300
1982	827	413	1240	841	n/a	288	1129	2369
1983	1064	188	1252	699	n/a	428	1127	2379
1984	514	176	690	558	223	458	1239	1929
1985	366	123	489	437	254	653	1344	1833
1986	553	585	1138	379	200	847	1425	2563
1987	1094	888	1982	813	232	804	1849	3832
1988	1058	1010	2068	684	188	760	1632	3700
1989	648	351	999	764	272	542	1579	2578
1990	491	142	633	689	387	625	1701	2334
1991	503	76	579	559	309	716	1584	2162
1992	451	57	508	485	287	832	1603	2111
1993	516	292	809	627	196	596	1418	2227
1994	542	201	743	475	79	283	837	1580
1995	924	104	1029	615	68	131	814	1843
1996	840	105	945	342	133	210	684	1629
1997	800	198	998	524	81	210	815	1813
1998	748	148	896	681	181	332	1194	2089
1999	565	127	692	671	110	406	1187	1879
2000	441	73	514	377	142	336	855	1369
2001	383	69	452	190	101	269	560	1013
2002	173	74	248	234	75	213	522	770
2003	279	49	329	305	68	224	597	926
2004	250	120	370	285	50	267	603	973
2005	273	97	370	283	31	214	527	897
2006	323	124	447	541	39	121	701	1148
2007	372	68	440	684	66	111	861	1301
2008	386	70	456	336	40	119	495	951
2009	301	148	449	172	34	114	320	769
2010	352	81	432	197	70	84	351	784
2011	256	68	324	279	75	119	474	798
2012	207	61	267	231	156	370	757	1024

n/a: not available

Table 7.4.3.3Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Summary of the assessment.

Year	F/F_{msy}	Landings tonnes	B/B_{msy}
1980	1.27	2110	0.89
1981	1.40	2300	0.88
1982	1.47	2369	0.86
1983	1.51	2379	0.85
1984	1.24	1929	0.83
1985	1.18	1833	0.82
1986	1.68	2563	0.82
1987	2.68	3832	0.80
1988	2.84	3700	0.73
1989	2.14	2578	0.66
1990	2.02	2334	0.63
1991	1.94	2162	0.60
1992	1.97	2111	0.58
1993	2.16	2227	0.56
1994	1.57	1580	0.54
1995	1.86	1843	0.53
1996	1.68	1629	0.52
1997	1.90	1813	0.51
1998	2.28	2089	0.50
1999	2.15	1879	0.48
2000	1.60	1369	0.46
2001	1.17	1013	0.46
2002	0.86	770	0.47
2003	0.99	926	0.49
2004	1.01	973	0.50
2005	0.90	897	0.52
2006	1.12	1148	0.54
2007	1.25	1301	0.55
2008	0.89	951	0.56
2009	0.69	769	0.58
2010	0.67	784	0.60
2011	0.66	798	0.63
2012	0.81	1024	0.66
2013			0.68