

7.4.1 EU request to ICES on in-year advice for anchovy (*Engraulis encrasicolus*) in Division 9.a (Atlantic Iberian waters)

Advice Summary

Please note: The present advice replaces the advice given for this stock in July 2015.

ICES advises that catches of 15 000 tonnes in 2016 can be considered sustainable.

ICES is not in a position to advise on a catch level in 2016 that is deemed to be sustainable in accordance with ICES precautionary approach for category 3 stocks for short-lived species.

Request

The present advice is in response to the following request from the European Commission:

In view of the current high biomass level ICES is requested to advise on:

- a) *whether catches of 15,000t in 2016 are deemed sustainable, in accordance with ICES precautionary approach for data-limited (category 3) stocks.*
- b) *the catch level in 2016 that is deemed sustainable, in accordance with ICES precautionary approach for data-limited (category 3) stocks.*

Background information included in the request: In its advice for anchovy in Division IXa (Atlantic Iberian waters) of 14 July 2016 ICES indicates historical high levels of biomass. In 2016 the anchovy TAC in area IX, X and Union waters of CECAF 34.1.1 is set at 10,622t.

Stock development over time

The biomass stock size indicator in the southern part of Division 9.a (where the most part of the catch is historically taken) is highly variable and, since 2013, has been increasing and above historically high levels; the 2016 value is a historical high. The stock biomass is variable because it is largely composed of one-year-old fish. The observed harvest rates (HR) for anchovy in Division 9.a South (10–49%) are considered low, since these result in 50–90% of the potential spawning biomass being allowed to spawn (ICES, 2016a). There is no information on the recruitment that will form the bulk of the catches and spawning stock biomass in 2017.

In the central and northern parts of Division 9a the anchovy abundance is generally low showing occasional outburst of biomasses, as in 2011, 2015 and 2016, being the latest the highest in the series.

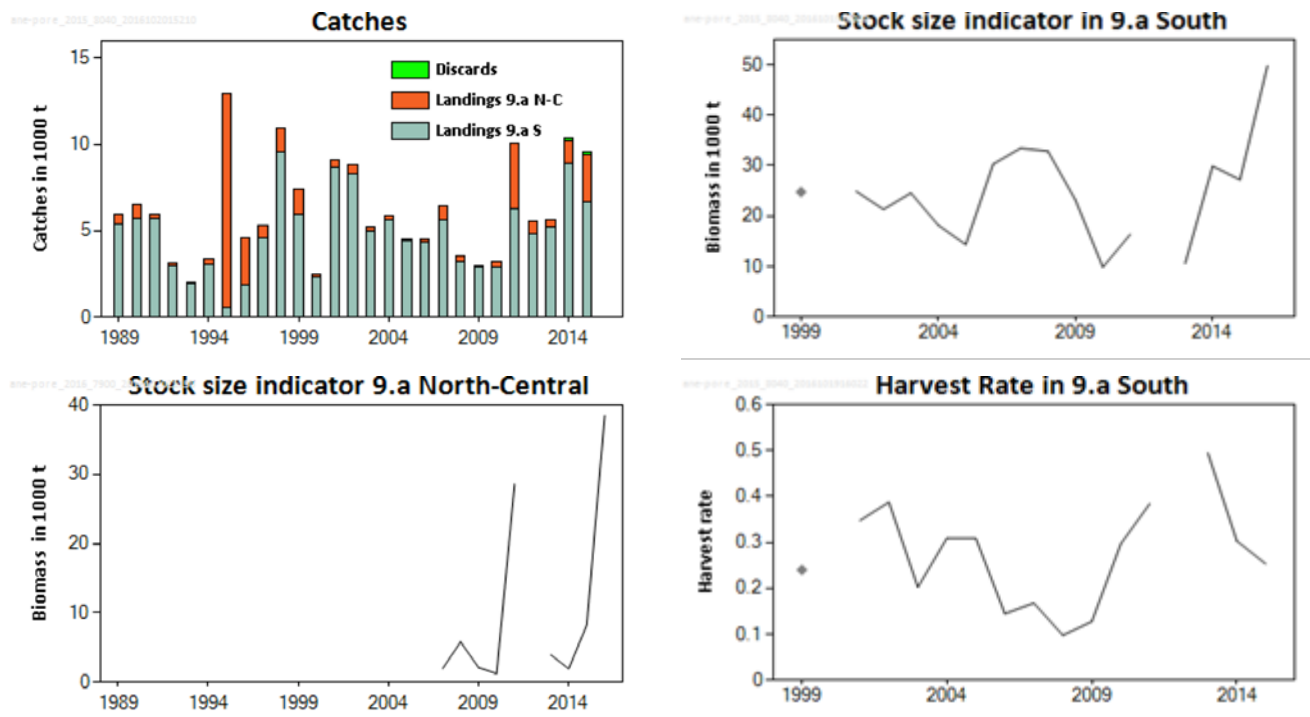


Figure 7.4.1.1 Anchovy in Division 9.a. Upper left panel: catches in Division 9.a (in thousand tonnes) differentiated between Northern and Central, and Southern areas. Discard estimates are included from 2014 onwards. Upper right panel: average survey biomass estimates, used as the stock size indicator, in southern part of Division 9.a from the PELAGO, ECOCADIZ (acoustic), and BOCADEVA (DEPM, Daily Egg Production Model) surveys. Lower left panel: sum of the survey biomass estimates in the northern and central parts of Division 9.a from the PELACUS and PELAGO (acoustic) surveys. Lower right panel: average yearly harvest rates in southern part of Division 9.a based on average survey biomass estimates in the area, with the assumption of catchability equal to one for all surveys.

Stock and exploitation status

Table 7.4.1.1 Anchovy in Division 9.a. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size					
		2013	2014	2015	2014	2015	2016			
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?	?	?	Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	-	-	-	Not applicable	SSB_{MGT}	-	-	-	Not applicable
Qualitative evaluation	-	✓	✓	✓	Below possible reference points	-	↗	→	↗	Increasing

Elaboration on Advice

Most of the fishery for this anchovy stock takes place in the southern part of Division 9.a (Figure 7.4.1.2). The fleets in the northern and central parts of Division 9.a (targeting sardine) occasionally target anchovy when abundant. This occurred in 1995, 2011, 2014, 2015 and 2016. Biomass stock size indicators in 2016 for the northern and central parts of Division 9.a, and for the southern part of Division 9.a are the highest ones within their respective historical series.

In the advice for anchovy in Division 9.a released in July 2016 it was noted that: “The sensitivity analysis on the anchovy harvest rate in Division 9.a South over a range of potential survey catchabilities (0.6 to 1.6) suggests that the current harvest rate leads to spawning per recruit (SPR) levels above 50%, which is considered a sustainable level of exploitation”.

The harvest rates for anchovy in the southern part of Division 9.a using the biomass indicator and observed catches have fluctuated between 0.10 and 0.49 from 1999 to 2015, with a mean of 0.27 (Table 7.4.1.2). The harvest rate in the southern part of Division 9.a associated with a catch of 15 000 tonnes in 2016 is 0.30. This is within the historical observed harvest rates. Taking into account that anchovy is also found in the northern and central parts of Division 9.a and that the biomass indices for these areas are at record highs in 2016, the harvest rate for anchovy in the entire Division 9.a associated with a catch of 15 000 tonnes in 2016 would be less than the 0.30. ICES therefore considers a catch of 15 000 tonnes of anchovy in Division 9.a in 2016 to be sustainable. ICES emphasizes that this advice is only valid for 2016 and does not reflect any evaluation of medium- or long-term consequences of annual catches of 15 000 tonnes.

The ICES framework for category 3 stocks (ICES, 2012) is based on a comparison of the two latest abundance index values with the three preceding values to advise a year ahead. The framework is considered insufficiently responsive to the dynamic nature of changes in this stock, i.e. short-lived species with high variability in recruitment. There is a need to further develop the category 3 framework for short-lived species before it can be used as basis for in-year advice for anchovy in Division 9.a. on catch levels deemed sustainable. ICES is therefore not in position to provide the advice as stated in point b in the Request section above.

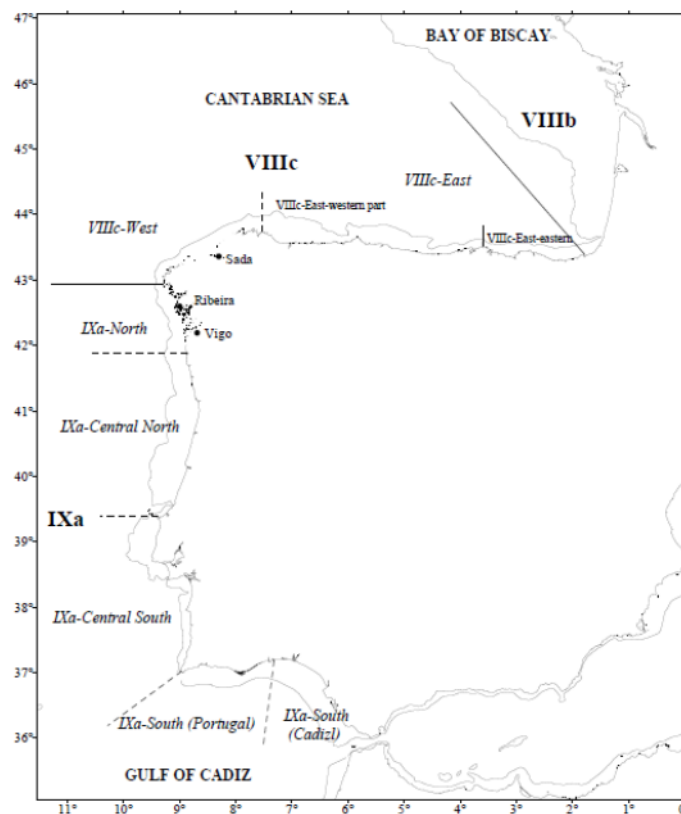


Figure 7.4.1.2 Anchovy in Division 9.a. ICES divisions in southern Europe. Note that 9.a South (which includes the European waters of the Gulf of Cadiz) is also differentiated between Portuguese and Spanish waters.

Table 7.4.1.2 Anchovy in Division 9.a. Harvest rates (HR) for anchovy. Catchability assumed equal to 1 for all surveys. Stock sizes are calculated as the average of the PELAGO, ECOCADIZ, and BOCADEVA survey values, shown in Table 7.4.1.7.

Year	Southern component		
	Division 9.a South		
	Catches	Stock size	Harvest rate
1999	5942	24763	0.24
2000	2360		
2001	8655	24913	0.35
2002	8262	21335	0.39
2003	4968	24565	0.20
2004	5617	18177	0.31
2005	4423	14339	0.31
2006	4381	30301	0.14
2007	5610	33451	0.17
2008	3204	32845	0.10
2009	2954	23163	0.13
2010	2929	9867	0.30
2011	6294	16379	0.38
2012	4810		
2013	5240	10593	0.49
2014	9051	29902	0.30
2015	6880	27203	0.25
2016		49823	
Average (1999-2015/16)	5387	24476	0.27

Basis of the assessment

Table 7.4.1.3 Anchovy in Division 9.a. The basis of the assessment.

ICES stock data category	3 (ICES, 2016b)
Assessment type	Survey and catch based assessment
Input data	Commercial landings, ages and length frequencies from landing sampling. Survey indices: SAR Q2/PELAGO (9.a South), ECOCÁDIZ (9.a South), triennial DEPM survey BOCADEVA (9.a South)
Discards and bycatch	Discard estimates are available for some fisheries since 2014 onwards and are considered negligible.
Indicators	Survey indices: acoustic spring surveys PELACUS (9.a North), SAR Q2/PELAGO (9.a Central–North, Central–South)
Other information	ECOCADIZ-RECLUTAS survey has a three year-long time-series at the moment. This survey aims at obtaining recruitment indicators potentially useful for advice in the future.
Working group	Working Group on Southern Horse mackerel, Anchovy and Sardine (WGHANSA)

History of advice, catch and management

Table 7.4.1.4 Anchovy in Division 9.a. History of ICES advice, the agreed TAC, and ICES estimates of landings. Weights in thousand tonnes.

Year	ICES advice	Predicted catch/landings corresp. to advice	Agreed TAC*	Official landings	ICES landings
1987	Not assessed	-	4.6	3.9	n/a
1988	Not assessed	-	6	3.3	4.7
1989	Not assessed	-	6	4.4	6.0
1990	Not assessed	-	9	2.2	6.5
1991	Not assessed	-	9	3.5	5.9
1992	Not assessed	-	12	2.2	3.2
1993	If required, precautionary TAC	-	12	1.1	2.0
1994	If required, precautionary TAC	-	12	1.4	3.4
1995	If required, precautionary TAC	-	12	7.6	13.0
1996	If required, precautionary TAC	-	12	3.5	4.6
1997	If required, TAC at pre-95 catch level	-	12	4.0	5.3
1998	No advice		12	7.1	11.0
1999	If required, TAC at pre-95 catch level	4.6	13	6.1	7.4
2000	Fishery less than pre-95 level and develop and implement management plan	4.6	10	2.5	2.5
2001	Average catch excl. 95 and 98	4.9	10	5.2	9.1
2002	Average catch excl. 95 and 98	4.9	8	4.7	8.8
2003	Average catch excl. 95, 98, and 01	4.7	8	5.6	5.3
2004	Average catch excl. 95, 98, 01, and 02	4.7	8	6.0	5.8
2005	Average catch excl. 95, 98, 01, and 02	4.7	8	4.5	4.5
2006	Average catch excl. 95, 98, 01, and 02	4.7	8	4.0	4.5
2007	Average catch 1988–2005 excl. 95, 98, 01, 02	4.8	8	5.4	6.5
2008	Average catch 1988–2006 excl. 95, 98, 01, 02	4.8	8	2.9	3.5
2009	Same advice as last year	4.8	8	2.3	3.0
2010	Same advice as last year	4.8	8	3.2	3.2
2011	See scenarios	-	7.6	9.7	10.1
2012	Reduce catches	-	8.6	5.6	5.6
2013	Historical fishery appears sustainable	-	8.8	5.6	5.6
2014	Historical fishery appears sustainable	-	8.8	7.7	10.3**
2015	No catch advice	-	9.7	9.4	9.6**
2016	in-year-advice	≤ 15	10.6		
2017	No catch advice***	-			

*TAC for subareas 9 and 10 and CECAF 34.1.1.

**Catch estimates available for 2014 and 2015. In previous years discards are considered negligible and landings are assumed equal to catch.

*** ICES, 2016a

History of catch and landings

Table 7.4.1.5 Anchovy in Division 9.a. Catch distribution by fleet in 2015 as estimated by ICES.

Total catch	ICES estimated landings	Official landings		Discards
9.6 kt	9.4 kt	99.4 % purse-seiners	0.6 % other gear types	0.2 kt
		9.4 kt		

Table 7.4.1.6 Anchovy in Division 9.a. History of commercial catch and landings, both official and ICES estimated values are presented by area for each country participating in the fishery. Weights in tonnes.

Year	Official landings			ICES catch								
	Portugal	Spain	TOTAL	Portugal*				Spain**			Total	TOTAL
	Total 9.a	Total 9.a	9.a	9.a C-N	9.a C-S	9.a S	Total	9.a N	9.a S	Total	9.a S	9.a
1943	-	-	-	7121	355	2499	9975	-	-	-	-	-
1944	-	-	-	1220	55	5376	6651	-	-	-	-	-
1945	-	-	-	781	15	7983	8779	-	-	-	-	-
1946	-	-	-	0	335	5515	5850	-	-	-	-	-
1947	-	-	-	0	79	3313	3392	-	-	-	-	-
1948	-	-	-	0	75	4863	4938	-	-	-	-	-
1949	-	-	-	0	34	2684	2718	-	-	-	-	-
1950	4145	11645	15790	31	30	3316	3377	-	-	-	-	-
1951	4145	13784	17929	21	6	3567	3594	-	-	-	-	-
1952	3619	13243	16862	1537	1	2877	4415	-	-	-	-	-
1953	4656	17103	21759	1627	15	2710	4352	-	-	-	-	-
1954	1550	16959	18509	328	18	3573	3919	-	-	-	-	-
1955	5031	27290	32321	83	53	4387	4523	-	-	-	-	-
1956	5574	23699	29273	12	164	7722	7898	-	-	-	-	-
1957	7810	23921	31731	96	13	12501	12610	-	-	-	-	-
1958	13562	28807	42369	1858	63	1109	3030	-	-	-	-	-
1959	3132	22808	25940	12	1	3775	3788	-	-	-	-	-
1960	6815	32992	39807	990	129	8384	9503	-	-	-	-	-
1961	9890	30098	39988	1351	81	1060	2492	-	-	-	-	-
1962	3557	37718	41275	542	137	3767	4446	-	-	-	-	-
1963	4638	22493	27131	140	9	5565	5714	-	-	-	-	-
1964	5714	27337	33051	0	0	4118	4118	-	-	-	-	-
1965	7610	44581	52191	7	0	4452	4460	-	-	-	-	-
1966	4461	41226	45687	23	35	4402	4460	-	-	-	-	-
1967	3824	36754	40578	153	34	3631	3818	-	-	-	-	-
1968	1161	14078	15239	518	5	447	970	-	-	-	-	-
1969	1364	12636	14000	782	10	582	1375	-	-	-	-	-
1970	1193	23127	24320	323	0	839	1162	-	-	-	-	-
1971	0	91	91	257	2	67	326	-	-	-	-	-
1972	0	1563	1563	-	-	-	-	-	-	-	-	-
1973	126	2458	2584	6	0	120	126	-	-	-	-	-
1974	437	2845	3282	113	1	124	238	-	-	-	-	-
1975	372	3114	3486	8	24	340	372	-	-	-	-	-
1976	88	8703	8791	32	38	18	88	-	-	-	-	-
1977	3261	11306	14567	3027	1	233	3261	-	-	-	-	-
1978	1022	9023	10045	640	17	354	1011	-	-	-	-	-
1979	790	20879	21669	194	8	453	655	-	-	-	-	-
1980	994	994	1988	21	24	935	980	-	-	-	-	-
1981	1370	1370	2740	426	117	435	978	-	-	-	-	-
1982	699	715	1414	48	96	512	656	-	-	-	-	-
1983	1015	1115	2130	283	58	332	673	-	-	-	-	-
1984	461	463	924	214	94	84	392	-	-	-	-	-

Year	Official landings			ICES catch								
	Portugal	Spain	TOTAL	Portugal*				Spain**			Total	TOTAL
	Total 9.a	Total 9.a	9.a	9.a C-N	9.a C-S	9.a S	Total	9.a N	9.a S	Total	9.a S	9.a
1985	2435	2487	4922	1893	146	83	2122	-	-	-	-	-
1986	2152	3223	5375	1892	194	95	2181	-	-	-	-	-
1987	1621	3895	5516	84	17	11	112	-	-	-	-	-
1988	892	3281	4173	338	77	43	458	-	4263	4263	4306	4721
1989	824	4435	5259	389	85	22	496	118	5330	5448	5352	5944
1990	644	2245	2889	424	93	24	541	220	5726	5946	5750	6487
1991	222	3531	3753	187	3	20	210	15	5697	5712	5717	5922
1992	138	2213	2351	92	46	0	138	33	2995	3028	2995	3166
1993	28	1102	1130	20	3	0	23	1	1960	1961	1960	1984
1994	236	1383	1619	231	5	0	236	117	3035	3152	3035	3388
1995	2530	7576	10106	6724	332	0	7056	5329	571	5900	571	12956
1996	2775	3481	6256	2707	13	51	2771	44	1780	1824	1831	4595
1997	632	3982	4614	610	8	13	632	63	4600	4664	4613	5295
1998	1613	7104	8717	894	153	566	1613	371	8977	9349	9543	10962
1999	1374	6112	7486	957	96	355	1408	413	5587	6000	5942	7409
2000	265	2452	2717	71	61	178	310	10	2182	2191	2360	2502
2001	748	5159	5907	397	19	439	855	27	8216	8244	8655	9098
2002	916	4720	5636	433	90	393	915	21	7870	7891	8262	8806
2003	519	5627	6146	211	67	200	478	23	4768	4791	4968	5269
2004	663	5981	6644	83	139	434	657	4	5183	5187	5617	5844
2005	129	4467	4596	82	6	38	126	4	4385	4389	4423	4515
2006	111	4020	4131	79	15	14	108	15	4368	4383	4381	4491
2007	871	5411	6282	833	7	34	874	4	5576	5580	5610	6454
2008	335	2909	3244	211	87	37	335	5	3168	3173	3204	3508
2009	72	2277	2349	35	5	32	72	19	2922	2941	2954	3013
2010	130	3161	3291	100	2	28	130	179	2901	3080	2929	3210
2011	3318	6816	10134	3239	1	78	3318	541	6216	6758	6294	10076
2012	796	4793	5589	521	220	56	796	39	4754	4793	4810	5589
2013	391	5241	5632	192	131	67	391	69	5172	5241	5240	5632
2014	818	6921	7739	678	21	118	818	581	8933	9515	9051	10332
2015	2546	6874	9420	2533	10	2	2546	173	6878	7051	6880	9597

(-) Not available

(0) Less than 1 tonne

*Discards considered negligible.

**Catch estimates available for 2014 and 2015. In previous years discards are considered negligible and landings are assumed equal to catch.

Summary of the assessment

Table 7.4.1.7 Anchovy in Division 9.a. Biomass estimates (in tonnes) from each survey series on a regional basis.

Year	Acoustic survey biomass estimates							DEPM
	Spring				Summer	Autumn		Summer
	Sp. survey 9.a N	Port. survey 9.a C-N to 9.a C-S	Sp.+Port. Surveys 9.a N to 9.a C-S	Port. survey 9.a S	Sp. survey 9.a S	Port. survey 9.a S	Sp. survey 9.a S	Sp. survey 9.a S
	PELACUS	PELAGO	PELACUS+ PELAGO	PELAGO	ECOCADIZ	SAR-NOV	ECOCADIZ RECLUTAS	BOCADEVA
Months	March– April	March–April	March–April	March– April	July	Oct–Nov	Oct–Nov	June–July
1998						30695		
1999		596		24763				
2000						33909		
2001		368		24913		25578		
2002		1542		21335				
2003		112		24565				
2004					18177			
2005		1062		14041				14637
2006		0		24082	36521			
2007	0	1945	1945	38020	28882	23723		
2008	306	5505	5811	34162				31527
2009	26	2089	2115	24745	21580			
2010	42	1188	1230	7395	12339			
2011	1508	27050	28558	0				32757
2012	45						13680	
2013	0	3955	3955	12700	8487			
2014	0	1947	1947	28917	29219		8113	31569*
2015	0	8237	8237	33100	21305		30827	
2016	205	38302	38507	65345	34301			

*Preliminary estimate.

N: North, C: Central, S: South

Sources and references

ICES. 2012. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM 68. 42 pp.

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