

Anchovy (*Engraulis encrasicolus*) in Division 9.a (Atlantic Iberian waters)

ICES advice on fishing opportunities

Please note: This advice was updated in June 2019 (ICES, 2019)

ICES advises that when the precautionary approach is applied, catches from the **western component** should be no more than 13 308 tonnes and catches from the **southern component** should be no more than 3760 tonnes. The advice is for the period 1 July 2018 to 30 June 2019.

Stock development over time

ICES considers that there are two components of the anchovy stock in the area: the western and southern components. These components show different dynamics and therefore are assessed separately.

The **western component** biomass size indicator shows a sharp increasing trend in the most recent years, reaching its maximum in 2018. The harvest rate in 2017 was below the average of the historical time-series.

For the **southern component**, the assessment is indicative of trends only. The spawning stock biomass (SSB) of the **southern component** has been fluctuating without a trend over the time-series. Most of the values are above B_{pa} . Fishing mortality (F) has been fluctuating with no clear trend.

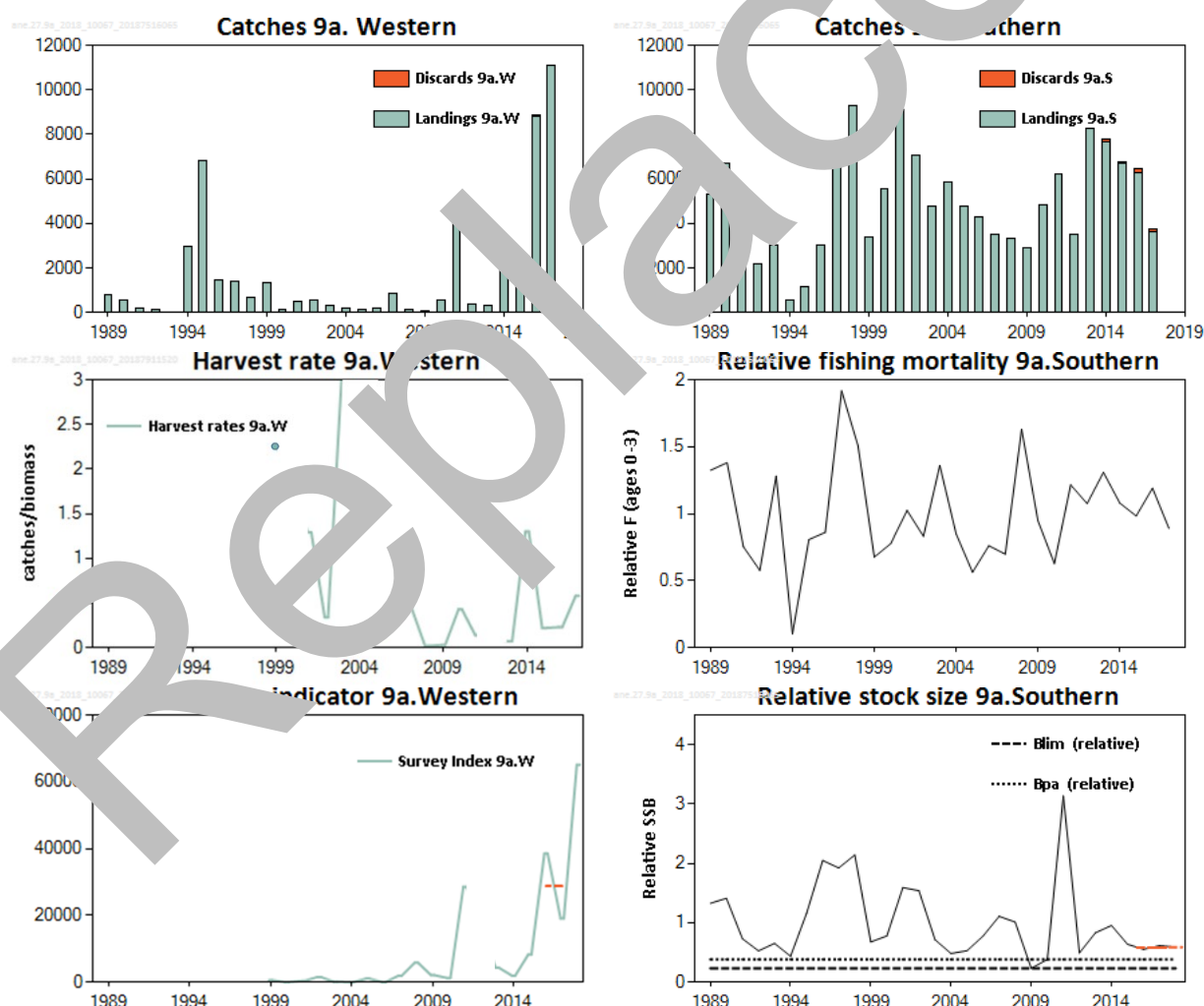


Figure 1 Anchovy in Division 9.a. Summary of the stock assessments (left column; **western component**, right column; **southern component**). Catches (in thousand tonnes). Discard estimates are included since 2014. Stock biomass survey indices and harvest rates are presented for the **western component**. SSB and F for the **southern component**

are expressed as relative to the average of the time series (years correspond to the beginning of the management period, i.e. 1989 corresponds to the beginning of the period 1 July 1989 to 30 June 1990). The dashed lines in the stock size indicator and SSB plots indicate the average values of the respective years.

Stock and exploitation status

For the **western component** of the stock, ICES cannot assess the stock and exploitation status relative to MSY and precautionary approach (PA) reference points because the reference points are undefined.

For the **southern component** of the stock, ICES assesses that the spawning-stock size is above B_{pa} and B_{lim} . ICES does not use F reference points to determine exploitation status for short-lived species (ICES, 2017), therefore reference points for fishing pressure have been defined for this stock.

Table 1.1 Anchovy in Division 9.a. State of the **western component** and fishery relative to reference points. Fishing pressure for a year corresponds to F in the management period, i.e. 2015 corresponds to the period 1 July 2015 to 30 June 2016.

		Fishing pressure				Stock size		
		2015	2016	2017		2015	2016	2017
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?	?
Precautionary approach	F_{pa} F_{lim}	?	?	?	Undefined	$B_{trigger}$?	?
Management plan	F_{MGT}	-	-	-	Not applicable	B_{pa}	?	?
Qualitative evaluation	-	↓	→	↑	Increasing	B_{MGT}	-	-
						-	↑	↓
							↑	↑

Table 1.2 Anchovy in Division 9.a. State of the **southern component** and fishery relative to reference points. Fishing pressure for a year corresponds to F in the management period, i.e. 2015 corresponds to the period 1 July 2015 to 30 June 2016.

		Fishing pressure				Stock size		
		2015	2016	2017		2016	2017	2018
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?	?
Precautionary approach	F_{pa} F_{lim}	?	?	?	Undefined	$B_{trigger}$?	?
Management plan	F_{MGT}	-	-	-	Not applicable	B_{pa} B_{lim}	✓	✓
Qualitative evaluation	-	↓	→	↑	Decreasing	B_{MGT}	-	-
						-	-	-

Catch scenarios

From this year onwards, ICES provides catch options separately for the two identified stock components of anchovy in 9.a: the **western component** (distributed in anchovy areas 9.a North, Central-North, and Central-South), and the **southern component** (distributed in anchovy area 9.a South). In addition, the advice now refers to the period 1 July 2018 to 30 June 2019.

Western component

The ICES framework for category 3 stocks was applied (ICES, 2012). The combined PELACUS and PELAGO acoustic biomass estimate was used as the index of stock development. The advice is based on the ratio between the last index value (index A) and the average of the two preceding values (index B), and the recent catch (1 July 2017 to 30 June 2018). The index is estimated to have increased by more than 20% and thus the uncertainty cap was applied.

The **western component** of the stock has increased significantly, as the application of the “1 versus 2” advice rule gave an indicator ratio far above > 1.5 (2.26). For this reason, no precautionary buffer was applied.

It was not possible to estimate a total discard rate for the period 1 July 2017 to 30 June 2018 because no data for 2018 are available at present. However, discards are generally negligible in this area (mean 0.02% of total catch). For the last semester of 2017 it was 0%.

Table 2.1 Anchovy in Division 9.a. **Western component.** The basis for the catch scenarios.

Index A (2018)		65097
Index B (2016–2017)		28777
Index ratio (A/B)		2.3
Uncertainty cap	Applied	1.2
Total catch last year (1 July 2017 to 30 June 2018)		11090 tonnes
Discard rate		0
Precautionary buffer	Not applied	-
Catch advice*		11090 tonnes
% advice change		advice provided in 2017

*total catch × uncertainty cap.

Southern component

The ICES framework for category 3 stocks was applied (ICES, 2012). The SSB estimated by the assessment model was used as the index of stock size development. The advice is based on the ratio between the last index value (index A) and the average of the two preceding values (index B), multiplied by the recent catch (1 July 2017 to 30 June 2018). The index is estimated to have increased by less than 20% and thus the uncertainty cap was not applied.

Stock size has been above B_{pa} for the last nine years and with an upward trend. This was considered as sufficient evidence to not apply a precautionary buffer.

It was not possible to estimate a total discard rate for the period 1 July 2017 to 30 June 2018 because no data for 2018 are available at present. Discards only occur in the Spanish gawl fishery, which has no anchovy quota. There are no landings from this fleet. For the last semester of 2017 the ratio of discards from this fleet relative to catch from all gears is 3.39%.

Table 2.2 Anchovy in Division 9.a. **Southern component.** The basis for the catch scenarios.*

Index A (2018)		0.59
Index B (2016–2017)		0.58
Index ratio (A/B)		1.01
Uncertainty cap	Not applied	-
Total catch last year (1 July 2017 to 30 June 2018)		3730 tonnes
Discard rate (average 2015–2017)		0.025
Precautionary buffer	Not applied	-
Catch advice**		3760 tonnes
% advice change		No advice provided in 2017

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

**total catch × index ratio.

In 2017, ICES was not able to provide advice for anchovy in Division 9.a for 2018. Following a benchmark, advice is now provided for the first time for the western and southern stock components separately.

Basis of the advice

Table 3.1 Anchovy in Division 9.a. **Western component.** The basis of the advice.

Advice basis	Precautionary approach
Management plan	ICES is not aware of any agreed precautionary management plan for anchovy in this area

Table 3.2 Anchovy in Division 9.a. **Southern component.** The basis of the advice.

Advice basis	Precautionary approach
Management plan	ICES is not aware of any agreed precautionary management plan for anchovy in this area

Quality of the assessment

A benchmark assessment was conducted in 2018 (ICES, 2018a). New information indicated that the advice should be given separately for two components of the anchovy stock in the area, the **western and southern components**. These components show different dynamics and therefore are assessed separately.

The advice for the **southern component** is based on biomass estimated by an assessment model. The assessment model is not considered to provide reliable absolute estimates and therefore ICES considers the **southern component** a category 3 “stock” (ICES, 2018b).

Issues relevant for the advice

From this year on, ICES provides catch options separately for the two identified stock components of anchovy in 9.a: the **western component** (distributed in anchovy areas 9.a North, Central-North, and Central-South), and the **southern component** (distributed in anchovy area 9.a South). If the management wishes to set a TAC for the whole of Division 9.a, then both advised catches for the two components could be summed, but there should be a provision to protect the smaller component from overexploitation, such as the fixing of a sub-TAC for the catch period 2018–2019, the sum of the advised catches is 17 068 t, of which not more than 3760 t should be taken from the anchovy area 9.a South.

With consent of the management authority, ICES now provides management advice for the period 1 July to 30 June in the following year instead of for a calendar year. This is a measure to provide in-year TAC advice following the spring surveys.

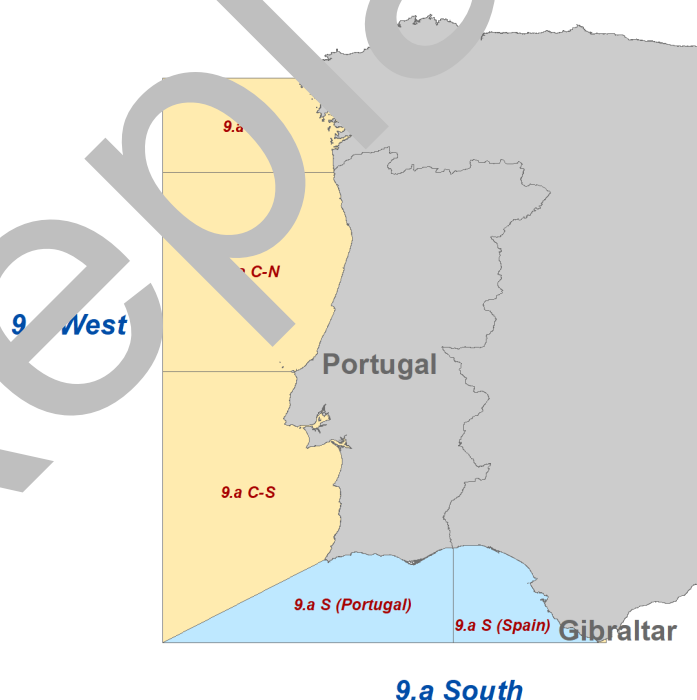


Figure 2 Anchovy in Division 9.a. ICES divisions and anchovy areas in the SW of the Iberian Peninsula. The terminology “9.a West” refers to the geographical area including anchovy areas 9.a North, 9.a Central-North, and 9.a Central-South, whereas “9.a South” refers to anchovy areas 9.a South-Portugal and 9a-South-Spain.

Reference points

No reference points are defined for the **western component** of the stock.

The reference points for the **southern component** are in relative terms.

Table 4 Anchovy in Division 9a. **Southern component**. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
Precautionary approach	B_{lim}	0.23	B_{loss} in 2009	(ICES, 2018b)
	B_{pa}	0.38	$B_{pa}=B_{lim}*1.64$	(ICES, 2018b)
	F_{lim}	Not defined		
	F_{pa}	Not defined		

Basis of the assessment

Table 5.1 Anchovy in the Division 9.a. **Western component**. Basis of assessment and advice.

ICES stock data category	3 (ICES, 2016)
Assessment type	Survey trends-based assessment (ICES, 2018b)
Input data	PELACUS (anchovy area 9.a North) and PELAGO (anchovy area 9.a Central-North Central-South) acoustic spring survey indices
Discards and bycatch	Discard estimates are available for some fisheries since 2014 and are considered negligible
Indicators	None
Other information	A recruitment index from an autumn survey (JUVESAR) under development. The stock was benchmarked in 2018 (ICES, 2018a)
Working group	Working Group on Southern Horse mackerel, Anchovy and Sardine (WGHANSA)

Table 5.2 Anchovy in the Division 9.a. **Southern component**. Basis of assessment and advice.

ICES stock data category	3 (ICES, 2016)
Assessment type	Model trend-based assessment, B_{lim} (ICES, 2016) that uses catches in the model and in the forecast.
Input data	Commercial landings, ages and length frequencies from landing and survey sampling. Survey indices for 9.a South: PELAGO and BOCA
Discards and bycatch	Discard estimates are available for some fisheries since 2014. Discards from purse seiners are negligible, most of the discards are reported for Spanish bottom trawlers.
Indicators	None
Other information	A recruitment index from an autumn survey (ECOCADIZ-RECLUTAS) and a SSB index from a DEPM survey (BOCA-DEVA) under development. The stock was benchmarked in 2018 (ICES, 2018a).
Working group	Working Group on Southern Horse mackerel, Anchovy and Sardine (WGHANSA)

Information taken into account

There is no additional information available.

History of the advice, catch, and management

Table 6 Anchovy in Division 9.a. ICES advice, the agreed TAC and official landings. All weights are in tonnes.

Year	ICES advice	Catch/landings corresponding to advice	Agreed TAC*	Official landings	ICES catches**
1987	Not assessed	-	4600	5516	n/a
1988	Not assessed	-	6000	4173	4721
1989	Not assessed	-	6000	5259	5944
1990	Not assessed	-	9000	2889	6487
1991	Not assessed	-	9000	3753	5922
1992	Not assessed	-	12000	2351	3166
1993	If required, precautionary TAC	-	12000	1130	1984

Year	ICES advice	Catch/landings corresponding to advice	Agreed TAC*	Official landings	ICES catches**
1994	If required, precautionary TAC	-	12000	1619	3388
1995	If required, precautionary TAC	-	12000	10106	12956
1996	If required, precautionary TAC	-	12000	6256	4595
1997	If required, TAC at pre-95 catch level	-	12000	4011	5295
1998	No advice		12000	8717	10962
1999	If required, TAC at pre-95 catch level	4600	13000	7100	7409
2000	Fishery less than pre-95 level and develop and implement management plan	4600	10000	1017	2502
2001	Average catch excl. 95 and 98	4900	10000	5907	9098
2002	Average catch excl. 95 and 98	4900	8000	5000	8806
2003	Average catch excl. 95, 98, and 01	4700	8000	6146	5269
2004	Average catch excl. 95, 98, 01, and 02	4700	8000	6644	5844
2005	Average catch excl. 95, 98, 01, and 02	4700	8000	4596	4515
2006	Average catch excl. 95, 98, 01, and 02	4700	8000	4131	4491
2007	Average catch 1988–2005 excl. 95, 98, 01, 02	4800	8000	6282	6454
2008	Average catch 1988–2006 excl. 95, 98, 01, 02	4800	8000	3244	3508
2009	Same advice as last year	4800	8000	2349	3013
2010	Same advice as last year	4800	8000	3291	3210
2011	See scenarios	-	7600	10134	10076
2012	Reduce catches	-	8600	5589	5589
2013	Historical level, 1995–1998, sustainable	-	8800	5632	5632
2014	Historical fishery, 1995–1998, sustainable	-	8800	7739	10332
2015	No catch advice	-	9700	9420	9597
2016	5-year-advice	≤ 15000	15000	13583	13740
2017	No catch advice	-	12500	13277	14705
2018	No catch advice	-	12500		
2018–2019*	Precautionary approach	Western component ≤ 13308; Southern component ≤ 3760			

* TAC for subareas 9 and 10 and CECF 34.1.1.

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

*** Catch advice given for the western and **southern component** from 1 July 2018 to 30 June 2019.

History of the catch and landings

Table 7.1 Anchovy in the Division 9.a. **Western component.** Catch distribution by fleet in 2017 as estimated by ICES.

Catch (2017)	Landings		Discards*
10094 tonnes	99% purse-seiners	1% other gear types	7 tonnes
	10088 tonnes		

Table 7.2 Anchovy in the Division 9.a. **Southern component.** Catch distribution by fleet in 2017 as estimated by ICES.

Catch (2017)	Landings		Discards*
4611 tonnes	95% purse-seiners	5% other gear types	215 tonnes
	4396 tonnes		

* Discards from purse-seiners are negligible, most of the discards are reported for Spanish bottom trawlers.

Replaced

Table 8 Anchovy in Division 9.a. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

Year	Official landings			ICES catch									
	Portugal	Spain	Total	Portugal*				Spain**			Total	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	West	South	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	118	118	-	-	-		-	-
1965	7610	44581	52191	7	0	4452	4459	-	-	-		-	-
1966	4461	41226	45687	3	35	4402	4460	-	-	-		-	-
1967	3824	36754	40578	15	34	363	3818	-	-	-		-	-
1968	1161	14078	15239	518	5	4	977	-	-	-		-	-
1969	1364	12636	14000	782	1	58	665	-	-	-		-	-
1970	1193	23127	24320	112	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	314	686	8	24	340	372	-	-	-		-	-
1976	88	703	791	38	18	18	88	-	-	-		-	-
1977	3261	1306	4567	3027	1	233	3261	-	-	-		-	-
1978	1022	9027	10045	640	17	354	1011	-	-	-		-	-
1979	790	21669	22459	194	8	453	655	-	-	-		-	-
1980	94	10	104	21	24	935	980	-	-	-		-	-
1981	70	1370	1440	426	117	435	978	-	-	-		-	-
1982	600	715	1414	48	96	512	656	-	-	-		-	-
1983	1015	1115	2130	283	58	332	673	-	-	-		-	-
1984	461	463	924	214	94	84	392	-	-	-		-	-
1985	2435	2487	4922	1893	146	83	2122	-	-	-		-	-
1986	2152	3223	5375	1828	229	96	2153	-	-	-		-	-
1987	521	3895	5516	1126	81	414	1621	-	-	-		-	-
1988	892	3281	4173	383	139	222	744	-	4263	4263		4306	4721
1989	824	4435	5259	646	141	36	823	118	5330	5448	905	5352	5944
1990	644	2245	2889	431	4	110	545	220	5726	5946	655	5750	6487
1991	222	3531	3753	187	3	22	212	15	5697	5712	205	5717	5922
1992	138	2213	2351	136	1	2	139	33	2995	3028	170	2995	3166
1993	28	1102	1130	22	1	0	23	1	1960	1961	24	1960	1984
1994	236	1383	1619	236	8	0	244	117	3035	3152	361	3035	3388
1995	2530	7576	10106	2521	9	0	2530	5329	571	5900	7859	571	12956
1996	2775	3481	6256	2711	13	51	2775	44	1780	1824	2768	1831	4595

Year	Official landings			ICES catch									
	Portugal	Spain	Total	Portugal*				Spain**			Total	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	West	South	9.a
1997	632	3982	4614	610	8	14	632	63	4600	4664	681	4613	5295
1998	1613	7104	8717	894	153	610	1657	371	8977	9349	1418	9587	11005
1999	1374	6112	7486	957	96	355	1408	413	5587	6000	1466	5942	7409
2000	265	2452	2717	71	61	178	310	10	2182	2191	142	2360	2502
2001	748	5159	5907	397	19	439	855	27	8216	8244	443	8655	9098
2002	916	4720	5636	433	90	393	915	21	7870	7891	544	8262	8806
2003	519	5627	6146	211	67	200	478	23	4768	4791	301	4968	5269
2004	663	5981	6644	83	139	434	657	4	5183	5187	226	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	844	5500	6454
2008	335	2909	3244	211	87	37	335	5	3168	3173	303	3266	3508
2009	72	2277	2349	35	5	32	72	19	2922	2941	59	2951	3013
2010	130	3161	3291	100	2	28	130	179	2901	3080	281	2971	3210
2011	3318	6816	10134	3239	1	78	3318	541	6273	6814	1004	5810	10076
2012	796	4793	5589	521	220	56	796	39	4754	4793	780	4810	5589
2013	391	5241	5632	192	131	67	391	69	4772	5241	392	5240	5632
2014	818	6921	7739	678	21	118	818	581	6340	6921	1280	9051	10332
2015	2546	6874	9420	2533	10	2	2546	600	7051	7651	2716	6880	9597
2016	6937	6647	13583	6908	10	19	6937	222	6581	7140	7140	6599	13740
2017	9051	4226	13277	8854	170	26	9051	1069	4185	5654	10094	4611	14705
2017–2018***	10171	4363	14534	9738	406	27	10171	947	3108	4649	11090	3730	14820

(-) Not available.

(0) Less than 1 tonne.

*Discards considered negligible.

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

*** Catches from 1 July to 30 June in the following year to match the annualised percentage catch estimates of the first semester of 2018 are provisional.

Summary of the assessment

Table 9.a Anchovy in Division 9.a. **Western component.** Summary of the stock assessment. Weights are in tonnes. Years correspond to the management period, i.e. the period from 1 July to 30 June in the following year.

Year	Survey Index 9a.W	Harvest rates 9a.W	Landings 9a.W	Discards 9a.W
1989			803	
1990			531	
1991			208	
1992			143	
1993			14	
1994			2956	
1995			6803	
1996			1456	
1997			1420	
1998			696	
1999	596	2.23	1331	
2000	0		111	
2001	368	1.29	47	
2002	1542	0.34	52	
2003	112	2.98	13	
2004	0		173	
2005	1062	0.11	113	
2006	0			
2007	1945	0.44	862	
2008	5811	0.02	142	
2009	2115	0.02	66	
2010	1230	0.02	529	
2011	28558	0.14	4097	
2012			356	
2013	4284	0.02	311	
2014	1947	0.03	2538	
2015	8237	0.02	1774	0.2
2016	38507	0.23	8874	6.5
2017	19077	0.58	11090	0
2018	6097			

Table 9.b Anchovy in Division 9.a. **Southern component.** Summary of the stock assessment. Weights are in tonnes. Years correspond to the management period, i.e. the period from 1 July to 30 June in the following year.

Year	Relative stock size 9a.S	Relative fishing mortality 9a.S (ages 0–3)	Landings 9a.S	Discards 9a.S
1989	1.33	1.32	5319	
1990	1.41	1.38	6690	
1991	0.73	0.75	3469	
1992	0.53	0.58	2191	
1993	0.65	1.28	3017	
1994	0.44	0.104	556	
1995	1.16	0.81	1154	
1996	2.0	0.86	3001	
1997	1.92	1.92	6552	
1998	2.1	1.51	9259	
1999	0.68	0.68	3387	
2000	0.78	0.78	5546	
2001	1.59	1.02	9094	
2002	1.54	0.83	7121	
2003	0.71	1.36	4744	
2004	0.48	0.85	4744	
2005	0.53	0.56	4267	
2006	0.78	0.76		
2007	1.11	0.70		
2008	1.01	1.63	3300	
2009	0.23	0.95	2917	
2010	0.38	0.63	4821	
2011	3.1		6215	
2012	0.49	1.08	3518	
2013	0.83	1.5	8267	
2014	0.96	0.8	7634	167
2015	0.64	0.98	6674	93
2016	0.55	0.19	6294	182
2017	0.62	0.6	3608	122
2018	0.59			

Sources and references

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