

Anchovy (*Engraulis encrasicolus*) in Subarea 8 (Bay of Biscay)

ICES stock advice

ICES advises that when the management strategy is applied, catches in 2018 should be no more than 33 000 tonnes.

Stock development over time

The spawning-stock biomass (SSB) has been above B_{lim} since 2010. Recruitment and SSB have been well above the historical average in recent years. The incoming recruitment (age 1) in 2018 is the third highest in the historical series. Harvest rates since the reopening of the fishery in 2010 have been below average.

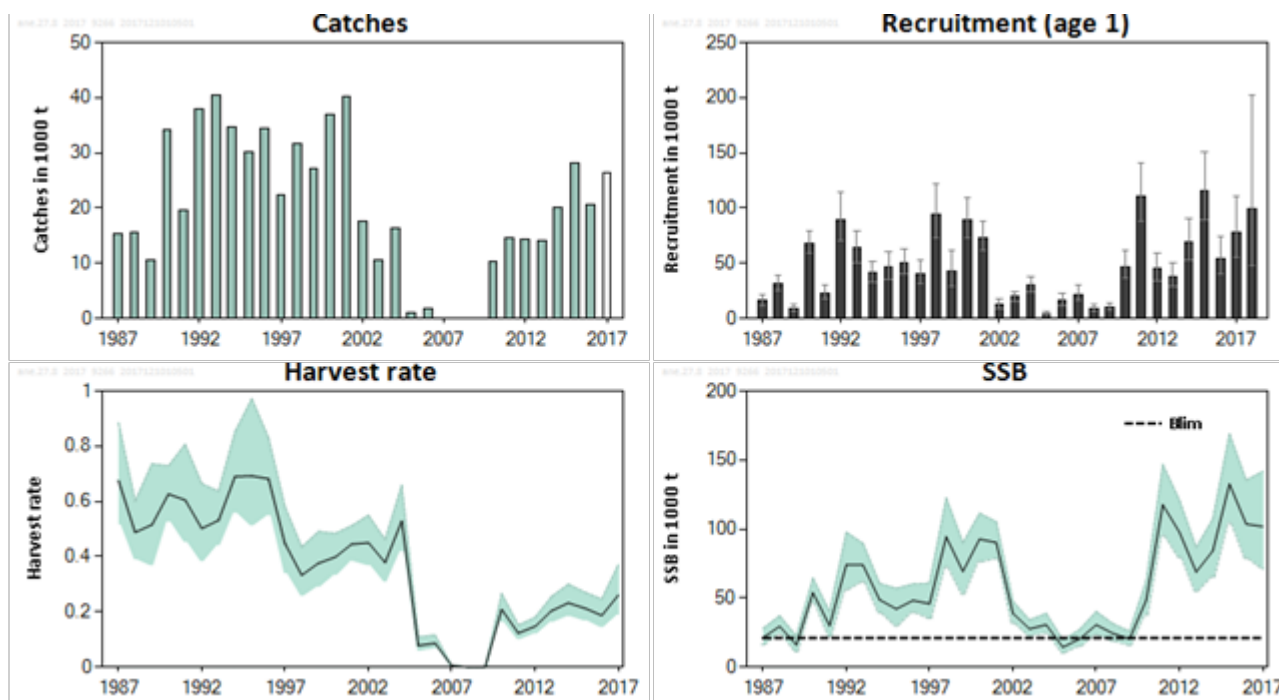


Figure 1 Anchovy in Subarea 8. Summary of the stock assessment. Trends in catch (preliminary value not shaded), recruitment (age 1 biomass, January 1), harvest rates (catch/SSB) and spawning-stock biomass (mid-May). 90% confidence limits are indicated for recruitment, harvest rate, and SSB.

Stock and exploitation status

Table 1 Anchovy in Subarea 8. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size			
		2015	2016	2017		2015	2016	2017	
Maximum Sustainable Yield	F_{MSY}	?	?	?	Undefined	$MSY B_{Trigger}$?	?	?
Precautionary Approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	✓	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	?	?	?	Undefined	B_{MGT}	✓	✓	✓ Above upper trigger

Catch options

Table 2 Anchovy in Subarea 8. The basis for the catch options.

Variable	Value	Source	Notes
Catch (2017)	26505 t	ICES (2017a)	Preliminary value, used as input in the stock assessment. The November and December catches were assumed to be the 3.6% of the annual catches (average percentage in 2010-2016)
Discards (2017)	Negligible	ICES (2017a)	Discarding considered to be negligible
SSB (2017)	101786 t	ICES (2017a)	SSB (mid-May) estimate from the stock assessment
HR (2017)	0.26	ICES (2017a)	Harvest rate estimate from the stock assessment
Rage1 (2018)	98670 t	ICES (2017a)	Recruitment estimate from the stock assessment (January 1 st in mass)

Table 3 Anchovy in Subarea 8. Annual catch options. All weights are in tonnes.

Basis	Total catch (2018)	Probability SSB (2018) < B _{lim} *	Median SSB (2018) *	HR (2018) **	% TAC change ***
ICES advice basis					
Harvest control rule in the management strategy [^]	33000	< 0.001	125771	0.262	0%
Other options					
HR (2018)=0	0	< 0.001	139741	0	-100%
	10000	< 0.001	135544	0.074	-70%
	20000	< 0.001	131324	0.152	-39%
	30000	< 0.001	127048	0.24	-9.1%
HR(2018)=HR(2017)	32775	< 0.001	125868	0.26	-0.68%
	40000	< 0.001	122770	0.33	21%
	50000	< 0.001	118460	0.42	52%

* The SSB corresponds to mid-May, with 60% of the catch assumed to be taken in the first semester.

** Harvest rate (HR) is calculated as Catch/(Median SSB).

*** Catch (2018) relative to the 2017 TAC (33 000 t).

[^] Because SSB (2018) is above 89 000 t, the management strategy option is based on the upper bound for the TAC (33 000 t).

Basis of the advice

Table 4 Anchovy in Subarea 8. The basis of the advice.

Advice basis	Management strategy
Management plan	<p>A set of harvest control rules for a management calendar from January to December was evaluated by STECF (2013, 2014). The European Commission requested ICES to provide its advice in 2015 according to one of the rules, and according to a different one since 2016. ICES has reviewed the harvest control rule selected in 2016 and concluded that it is precautionary (Annex 9 in ICES, 2016a). The harvest control rule upon which the current advice is based sets the TAC from January to December as:</p> $TAC_{y+1} = \begin{cases} 0 & \text{if } \widehat{SSB}_{y+1} \leq 24000 \\ -2600 + 0.40 \cdot \widehat{SSB}_{y+1} & \text{if } 24000 < \widehat{SSB}_{y+1} \leq 89000 \\ 33000 & \text{if } \widehat{SSB}_{y+1} > 89000 \end{cases}$ <p>where SSB_y is the expected spawning-stock biomass in year y.</p>

Quality of the assessment

The current assessment results align well with the observed trend in the surveys (SSB and proportion of 1-group in the biomass from the spring surveys and the index of incoming (age 1) recruitment from the autumn acoustic surveys at age 0). The two spring surveys, BIOMAN and PELGAS, usually follow similar trends, with a few exceptions (e.g. in 2012). In 2017 both spring surveys show a similar proportion of age 1, in agreement with the JUVENA recruitment index 2016. In 2017 PELGAS gives higher biomass than BIOMAN (as in most years).

The catch data for 2017 are preliminary. Preliminary catch statistics were available from January to October. The catches in November and December were assumed to be 3.6% of the total annual catch (based on the average proportion observed since the fishery reopening, 2010–2016). Age-structured catches in the first semester were also preliminary. Therefore, the harvest rate estimate for 2017 is also preliminary.

Some French catches taken in Subarea 7 near the border with Subarea 8 (ICES rectangles 25E4 and 25E5) are considered to belong to the same stock and fishery and have, therefore, been included in the assessment. These catches typically represent around 1% of the total stock catches.

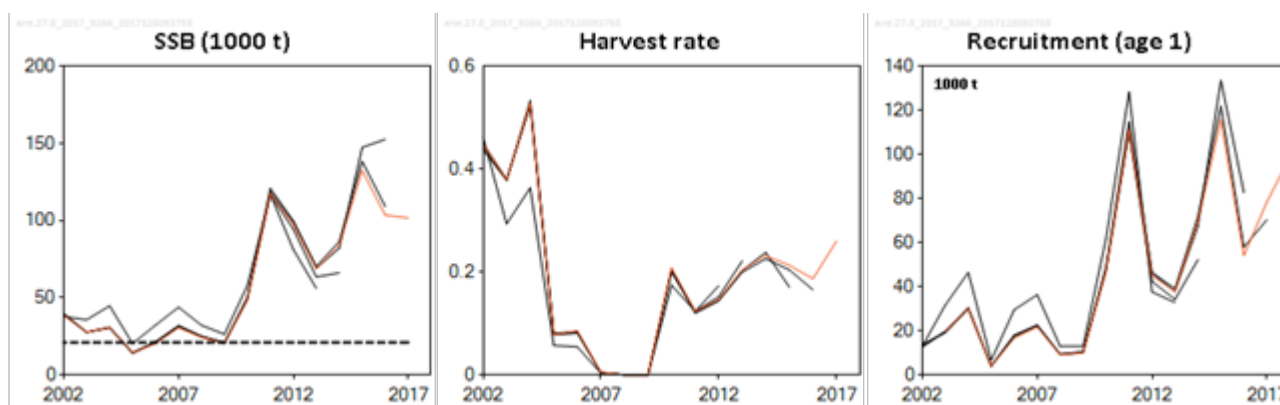


Figure 2 Anchovy in Subarea 8. Historical assessment results.

Issues relevant for the advice

There is no information to present for this stock.

Reference points

Table 5 Anchovy in Subarea 8. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	Not defined		
	F_{MSY}	Not defined		
Precautionary approach	B_{lim}	21000 t	B_{lim} : median of SSB estimates in the years 1987 and 2009, the minimum estimated biomass that produced substantial recruitment (Annex 8 in ICES, 2013)	ICES (2013)
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	SSB_{mgt}	24000 t (lower trigger) 89000 t (upper trigger)	TAC set to zero if SSB below the lower trigger, and to 33 000 t if SSB is above the upper trigger. The harvest control rule results in 5% probability of $SSB < B_{lim}$ in the long term.	STECF (2014)
	F_{mgt}	Not defined		

Basis of the assessment

Table 6 Anchovy in Subarea 8. Basis of assessment and advice.

ICES stock data category	1 (ICES, 2016b)
Assessment type	Two-stage Bayesian biomass dynamic model (CBBM) assessment that uses catches in the model and in the forecast (ICES, 2017a)
Input data	Commercial catches (international landings, ages and length frequencies from catch sampling), three surveys (BIOMAN, PELGAS, JUVENA); annual maturity data from DEPM survey (BIOMAN) and natural mortalities from past models fitted to spring surveys.
Discards and bycatch	Discarding and bycatch are considered negligible.
Indicators	None
Other information	The assessment was benchmarked in 2013 (WKPELA; ICES, 2013).
Working group	Working Group on Southern Horse Mackerel, Anchovy and Sardine (WGHANSA)

Information from stakeholders

There is no available information.

History of the advice, catch, and management

Table 7 Anchovy in Subarea 8. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Predicted catch corresp. to advice	Agreed TAC	Official catch	ICES catch
1987	Not assessed	-	32000	14188	15308
1988	Not assessed	-	32000	14045	15581
1989	Increase SSB; TAC	10000*	32000	5898	10614
1990	Precautionary TAC	12300	30000	22053	34272
1991	Precautionary TAC	14000	30000	11581	19634
1992	No advice	-	30000	25370	37885
1993	Reduced F on juveniles; closed area	-	30000	29266	40393
1994	Reduced F on juveniles; closed area	-	30000	28474	34631
1995	Reduced F on juveniles; closed area	-	33000	28626	30115
1996	Reduced F on juveniles; closed area	-	33000	25452	34373
1997	Reduced F on juveniles; closed area	-	33000	18179	22337
1998	Reduced F on juveniles; closed area	-	33000	27026	31617
1999	Reduced F on juveniles; closed area	-	33000	15757	27259
2000	Closure of the fishery	0	33000	34567	36994
2001	Preliminary TAC at recent exploitation	18000	33000	37086	40149
2002	Preliminary TAC at recent exploitation	33000	33000	19118	17507
2003	Preliminary TAC at recent exploitation	12500	33000	9964	10595
2004	Preliminary TAC at recent exploitation	11000	33000	15528	16361
2005	Rebuilding SSB	5000	30000	1086	1128
2006	Closure of the fishery	0	5000	1807	1753
2007	Closure of the fishery	0	0	141	141**
2008	Closure of the fishery	0	0	0	0
2009	Closure of the fishery	0	0	190	0
2010	Closure of the fishery	0	7	-	6111***
2010/2011^	See scenarios	-	15600	-	15120
2011/2012^	Risk of SSB falling below $B_{lim} < 5\%$	< 47000	29700	-	12217
2012/2013^	Risk of SSB falling below $B_{lim} < 5\%$	< 28000	20700	-	16737
2013/2014^	Risk of SSB falling below $B_{lim} < 5\%$	< 18000	17100	-	17551
2014/2015^	Risk of SSB falling below $B_{lim} < 5\%$	< 23000	20100	-	5832^^
2015	Management plan	< 25000	25000	27562	28258
2016	Management plan	≤ 25000	33000^^^	-	20670
2017	Management strategy	≤ 33000	33000	-	26505^^^
2018	Management strategy	≤ 33000			

* Mean catch in 1985–1987.

** Experimental fisheries.

*** Catch from January 2010 to June 2010.

^ From 2011 to 2014 the advice, TAC, and landings are valid from 1 July to 30 June.

^^ Catch restricted to the second semester 2014 due to a change in the management calendar.

^^^ Provisional catch in 2017.

^^^^ The initial TAC was set to 25 000 t; in June 2016 it was raised to 33 000 t.

History of the catch and landings

Table 8 Anchovy in Subarea 8. Catch distribution by fleet in 2016 as estimated by ICES.

Catch (2016)	Landings		Discards
20670 tonnes	Purse seiner 92%	Pelagic trawler 8%	Negligible (0.2%)
	20628 tonnes		

Table 9 Anchovy in Subarea 8. 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 catch	ICES catch
1960	80947	58085
1961	89969	75494
1962	65295	59123
1963	51956	48652
1964	80381	76973
1965	85296	83615
1966	48909	48358
1967	41460	41175
1968	38429	39619
1969	33098	36083
1970	23637	23485
1971	29086	28612
1972	32927	33067
1973	28196	28009
1974	31312	31117
1975	26426	26302
1976	36166	37261
1977	48319	48191
1978	45367	45219
1979	22673	26349
1980	22256	22102
1981	10876	10815
1982	4712	4991
1983	15699	14153
1984	28423	35179
1985	10816	11486
1986	7698	7923
1987	14188	15308
1988	14045	15581
1989	5898	10614
1990	22053	34272
1991	11581	19634
1992	25370	37885
1993	29266	40393
1994	28474	34631
1995	28626	30115
1996	25452	34373
1997	18179	22337
1998	27026	31617
1999	15757	27259
2000	34567	36994
2001	37086	40149

Year	Official catch	ICES catch
2002	19118	17507
2003	9964	10595
2004	15528	16361
2005	1086	1128
2006	1807	1753
2007**	141	0
2008	0	0
2009	190	0
2010	10664	10317
2011	14369	14530
2012	16636	14402
2013	14366	14192
2014	20611	20126
2015	27562	28258
2016	20244*	20670
2017	NA	26505*

* Preliminary estimate.

** Experimental fisheries.

NA: Not available.

Summary of the assessment

Table 10 Anchovy in Subarea 8. Assessment summary. Weights are in tonnes. High and low refer to 90% confidence limits.

Year	Recruitment (age 1), January 1st	High	Low	Stock size: SSB, mid-May	High	Low	Total catch	Harvest rate Ages 1+	High	Low
	tonnes			tonnes			tonnes			
1987	15954	21526	12048	21323	27993	16262	15308	0.675	0.885	0.51
1988	31327	38665	25759	29503	37147	23978	15581	0.49	0.60	0.39
1989	9210	13019	6546	16009	22500	11200	10614	0.515	0.74	0.37
1990	67698	79236	59045	53860	64402	46266	34272	0.63	0.73	0.52
1991	22665	30337	17108	29950	40131	22453	19634	0.605	0.81	0.45
1992	89195	113974	70791	74129	97651	56066	37885	0.50	0.66	0.38
1993	63656	79614	49736	73971	89605	61686	40393	0.53	0.64	0.44
1994	41520	51619	33284	48731	60446	39417	34631	0.69	0.85	0.56
1995	46381	60576	35015	42071	57005	29954	30115	0.69	0.97	0.51
1996	50566	62564	40205	48210	60133	39589	34373	0.68	0.83	0.55
1997	40013	52410	31001	45889	60762	35325	22337	0.45	0.58	0.34
1998	94282	121976	72376	94311	122455	72224	31617	0.33	0.435	0.26
1999	43329	61881	28973	69174	90055	52965	27259	0.38	0.49	0.29
2000	89726	109228	72871	92637	111368	76202	36994	0.40	0.48	0.33
2001	73387	87723	61898	90201	105266	78445	40149	0.445	0.51	0.38
2002	12941	18087	9288	38873	47715	31785	17507	0.45	0.55	0.37
2003	19641	24547	15585	27635	34118	22666	10595	0.38	0.46	0.31
2004	30078	37595	24457	30671	38852	24587	16361	0.53	0.66	0.42
2005	3994	5903	2618	14381	19619	10341	1128	0.078	0.109	0.057
2006	16655	22963	12051	20302	27115	15062	1753	0.086	0.116	0.065
2007	21779	29921	15891	30570	40155	23225	0	0.005	0.006	0.004
2008	9084	12786	6242	24355	31422	18810	0	0	0	0
2009	9998	14011	7084	20340	25905	15852	0	0	0	0
2010	46944	61564	36249	48495	62319	37831	10317	0.21	0.27	0.162
2011	110955	140449	87926	117509	146590	95138	14530	0.123	0.152	0.099
2012	44890	59058	34369	97605	120779	79591	14402	0.147	0.18	0.119
2013	37843	49786	28804	68881	86609	55012	14192	0.20	0.26	0.162

Year	Recruitment (age 1), January 1st	High	Low	Stock size: SSB, mid-May	High	Low	Total catch	Harvest rate Ages 1+	High	Low
	tonnes			tonnes			tonnes			
2014	69521	90454	52810	84158	107292	65246	20126	0.23	0.3	0.182
2015	115878	150862	89627	132564	168884	104208	28258	0.21	0.27	0.167
2016	54170	74611	39837	103546	135333	78747	20670	0.187	0.25	0.143
2017	78528	111180	55042	101786	141714	71394	26505*	0.26	0.37	0.187
2018	98670	202431	47951							
Average	48765	65330	36953	57795	73592	45533	20242	0.36	0.46	0.28

*Preliminary.

Sources and references

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