

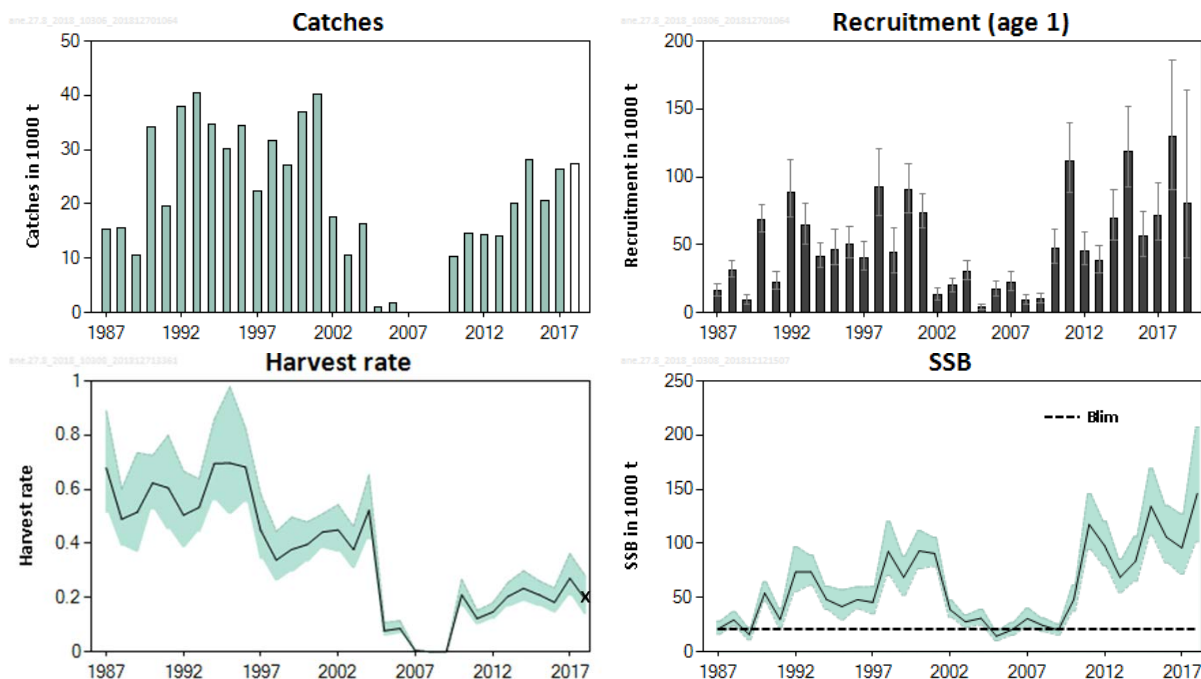
## Anchovy (*Engraulis encrasicolus*) in Subarea 8 (Bay of Biscay)

### ICES advice on fishing opportunities

ICES advises that when the management strategy is applied, catches in 2019 should be no more than 33 000 tonnes.

### Stock development over time

The spawning-stock biomass (SSB) has been above  $B_{lim}$  since 2010 and is assessed as the highest in the historical series in 2018. Recruitment has been well above the historical average in recent years. The incoming recruitment (age 1) in 2019 is above the average of 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 rate (catch/SSB; 2018 (denoted by x) preliminary), and spawning-stock biomass (mid-May)\*. 90% confidence limits are indicated for recruitment, harvest rate, and SSB.

### Stock and exploitation status

ICES assesses that the spawning-stock size is above  $B_{lim}$ .  $B_{pa}$  and  $MSY B_{trigger}$  have not been defined for this stock. In addition, no reference points have been defined for fishing pressure.

**Table 1** Anchovy in Subarea 8. State of the stock and fishery relative to reference points. For fishing pressure, 2018 is not shown because the value for harvest rate is preliminary.

		Fishing pressure			Stock size					
		2015	2016	2017	2016	2017	2018			
Maximum sustainable yield	$F_{MSY}$	?	?	?	Undefined	$MSY B_{trigger}$	?	?	?	Undefined
Precautionary approach	$F_{pa}$ , $F_{lim}$	?	?	?	Undefined	$B_{lim}$	✓	✓	✓	Above $B_{lim}$
Management plan	$F_{MGT}$	—	—	—	Not applicable	$B_{MGT}$	✓	✓	✓	Above upper trigger

\* Version 2: unit added to the SSB plot.

### Catch scenarios

**Table 2** Anchovy in Subarea 8. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
Catch (2018)	27 475 tonnes	Preliminary value, used as input in the stock assessment. The November and December catches were assumed to be 3.3% of the annual catches (average percentage in 2010–2017).
Discards (2018)	Negligible	Discarding is considered negligible.
SSB (2018)	146 175 tonnes	SSB (mid-May) estimate from the stock assessment.
HR (2018)	0.194	Harvest rate estimate from the stock assessment.
R <sub>age1</sub> (2019)	80 687 tonnes	Recruitment estimate from the stock assessment (at 1st of January, in mass).

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

Basis	Total catch (2019)	Probability SSB < B <sub>lim</sub> * (2019)	Median SSB * (2019)	HR ** (2019)	% SSB change***	% TAC change^	% Advice change
ICES advice basis							
Harvest control rule in the management strategy^^	33000	< 0.001	135155	0.24	-7.5	0	0
Other scenarios							
HR (2019) = 0	0	< 0.001	148743	0	1.76	-100	-100
	10000	< 0.001	144668	0.069	-1.03	-70	-70
	20000	< 0.001	140557	0.142	-3.8	-39	-39
HR(2019) = HR(2018)	26774	< 0.001	137745	0.194	-5.8	-19	-19
	30000	< 0.001	136404	0.22	-6.7	-9.1	-9.1
	40000	< 0.001	132230	0.30	-9.5	21	21
	50000	< 0.001	128030	0.39	-12.4	52	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).

\*\*\* SSB (2019) relative to SSB (2018).

^ Catch (2019) relative to the 2018 TAC (33 000 t).

^^ Because SSB (2019) is projected to be above 89 000 t, the management strategy option is based on the upper bound for the TAC (33 000 t).

Advised catch for 2019 is the same as the advised catch for 2018.

### 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 these 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 <math>\widehat{SSB}_y</math> is the expected spawning-stock biomass in year <math>y</math>.</p>

### Quality of the assessment

The current assessment results align well with the observed trend in the surveys (SSB and the proportion of age 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 2018, both spring surveys show similar biomass and proportion of age 1 estimates, consistent with the JUVENA pre-recruitment index in 2017.

The catch data for 2018 are preliminary. Preliminary catch statistics were available from January to October. The catches in November and December were assumed to be 3.3% of the total annual catch (based on the average proportion observed since the reopening of the fishery, 2010–2017). Age-structured catches in the first semester were also preliminary. Therefore, the harvest rate estimate for 2018 is also preliminary.

Some French catches are usually taken in Subarea 7 near the border to Subarea 8 (ICES rectangles 25E4 and 25E5) and are considered to belong to the same stock and fishery. These catches have, therefore, been included in the assessment and typically represent around 1% of the total stock catches. In 2017, the French catches represented 2% of the total catches, while no catches were reported in 2018 from these two rectangles.

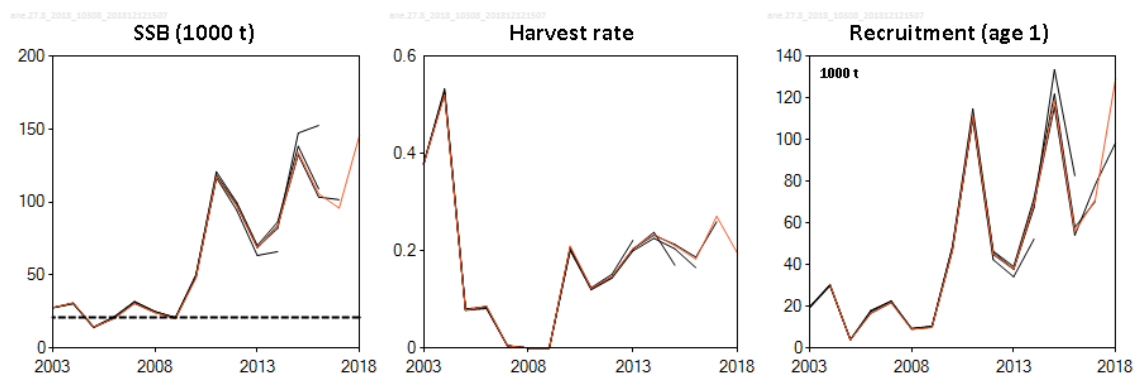


Figure 2† Anchovy in Subarea 8. Historical assessment results.

### 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	$B_{lim}$ : mean of SSB estimates in the two 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 33000 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		

† Version 2: unit corrected in Recruitment plot.

## Basis of the assessment

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

ICES stock data category	1 (ICES, 2018a).
Assessment type	Two-stage Bayesian biomass dynamic model (CBBM) assessment that uses catches in the model and in the forecast (ICES, 2018b).
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. Official catches (shown with a "-") have not been derived for the management year.

Year	ICES advice	Catch corresponding to advice	Agreed TAC	Official catch	ICES catch <sup>##</sup>
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 <sup>^</sup>	See scenarios	-	15600	-	15120
2011/2012 <sup>^</sup>	Risk of SSB falling below Blim < 5%	< 47000	29700	-	12217
2012/2013 <sup>^</sup>	Risk of SSB falling below Blim < 5%	< 28000	20700	-	16737
2013/2014 <sup>^</sup>	Risk of SSB falling below Blim < 5%	< 18000	17100	-	17551
2014/2015 <sup>^</sup>	Risk of SSB falling below Blim < 5%	< 23000	20100	-	5832^^

Year	ICES advice	Catch corresponding to advice	Agreed TAC	Official catch	ICES catch <sup>##</sup>
2015	Management plan	< 25000	25000	27562	28258
2016	Management plan	≤ 25000	33000 <sup>#</sup>	20225	20670
2017	Management strategy	≤ 33000	33000	-	26450
2018	Management strategy	≤ 33000	33000		27475 <sup>^^</sup>
2019	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 the following year.

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

^^^ Provisional catch in 2018.

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

## Includes catches from the ICES rectangles 25E4 and 25E5 in Subarea 7, starting in 2010.

### History of the catch and landings

**Table 8** Anchovy in Subarea 8. Catch distribution by fleet in 2017 as estimated by ICES.

Catch (2017)	Landings		Discards
	Purse seiner 97%*	Pelagic trawler 3%	
26450 tonnes	26273 tonnes		Negligible (< 1%)

\* Including 332 tonnes not landed, but used as live bait by the tuna fishing fleet.

**Table 9** Anchovy in Subarea 8. History of commercial catch and landings; both the official and ICES estimated values are presented. All weights are in tonnes.

Year	Official catch	ICES catch <sup>***</sup>
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

Year	Official catch	ICES catch***
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
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	10665	10317
2011	14369	14530
2012	16636	14402
2013	14366	14192
2014	20611	20126
2015	27562	28258
2016	20225	20670
2017	NA	26450
2018	NA	27475*

\* Preliminary estimate.

\*\* Experimental fisheries.

\*\*\* Includes catches from the ICES rectangles 25E4 and 25E5 in Subarea 7, starting in 2010.

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), tonnes	High	Low	SSB, tonnes	High	Low	Total catch, tonnes	Harvest rate	High	Low
1987	16021	21618	12053	21226	28150	16178	15308	0.68	0.89	0.51
1988	31379	38624	25967	29414	37000	23993	15581	0.49	0.60	0.39
1989	9239	13160	6580	15986	22373	11211	10614	0.52	0.73	0.37
1990	68009	79276	59294	54145	64539	46532	34272	0.62	0.72	0.52
1991	22677	30336	17179	29914	40235	22671	19634	0.61	0.80	0.45
1992	88721	112895	70087	73682	96807	55836	37885	0.51	0.67	0.38
1993	64173	80390	49965	73811	89362	61608	40393	0.53	0.64	0.44
1994	41281	51798	33176	48365	60471	39141	34631	0.70	0.86	0.56
1995	46201	61311	35067	41788	57351	29761	30115	0.70	0.98	0.51
1996	50680	63203	40505	48203	59832	39744	34373	0.68	0.83	0.55
1997	39869	52170	30906	45715	60156	35219	22337	0.45	0.58	0.34
1998	92272	120418	71082	92589	120249	70727	31617	0.34	0.44	0.26
1999	43930	62294	29662	68797	88621	52333	27259	0.38	0.50	0.29
2000	90675	109610	73665	93166	111643	76964	36994	0.40	0.48	0.33
2001	73832	87810	62171	90768	105700	78825	40149	0.44	0.51	0.38
2002	13020	18015	9380	38904	47590	32198	17507	0.45	0.54	0.37
2003	19776	24867	15657	27745	34207	22677	10595	0.38	0.46	0.31
2004	30424	37945	24566	31039	39164	24774	16361	0.52	0.65	0.41
2005	3958	5793	2602	14446	19649	10497	1128	0.078	0.107	0.057

Year	Recruitment (Age 1), tonnes	High	Low	SSB, tonnes	High	Low	Total catch, tonnes	Harvest rate	High	Low
2006	16793	23004	12317	20369	26986	15235	1753	0.086	0.115	0.065
2007	21930	29756	16181	30704	40025	23464	0	0.0046	0.0060	0.0035
2008	8991	12754	6257	24321	31036	18815	0	0.00	0.00	0.00
2009	9850	13815	7002	20085	25568	15663	0	0.00	0.00	0.00
2010	46974	61067	36284	48102	61549	37579	10317	0.21	0.27	0.164
2011	111252	140141	88192	117617	145882	94882	14530	0.123	0.153	0.099
2012	45191	58998	34812	97820	120477	79643	14402	0.147	0.180	0.119
2013	37963	49211	29007	68732	85578	54986	14192	0.20	0.26	0.164
2014	69263	90323	52917	83576	106360	65318	20126	0.23	0.30	0.184
2015	118682	151467	92988	134135	169118	107692	28258	0.21	0.26	0.167
2016	55883	74394	41635	105822	135034	82267	20670	0.183	0.24	0.143
2017	71350	95285	53103	95971	127305	71685	26450	0.27	0.36	0.20
2018	129480	185497	90107	146175	207255	101502	27475*	0.194*	0.280*	0.137*
2019	80687	164178	39830							

\*Preliminary.

### Sources and references

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