

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

ICES advice on fishing opportunities

ICES advises that when the EU management plan is applied, catches in 2022 should be no more than 33 000 tonnes.

Stock development over time

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

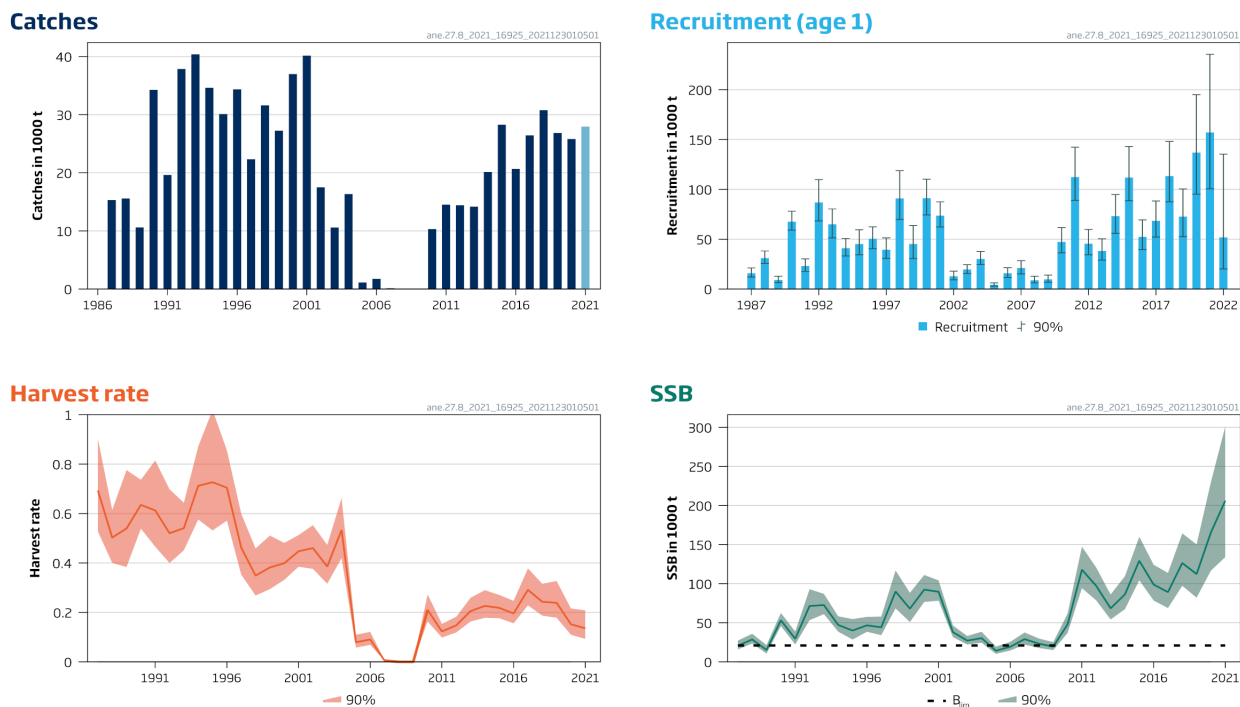


Figure 1 Anchovy in Subarea 8. Summary of the stock assessment. Trends in catch (the 2021 lighter blue bar is a preliminary estimation), recruitment (age 1 biomass, estimated on January 1), harvest rate (catch/SSB), and spawning-stock biomass (estimated in mid-May).

Catch scenarios

Table 1 Anchovy in Subarea 8. Basis for the catch scenarios.

Variable	Value	Notes
HR (2021)	0.136	Harvest rate estimate from the stock assessment.
SSB (2021)	206215	SSB estimate (in mid-May) from the stock assessment (tonnes).
R_{age1} (2022)	51817	Recruitment estimate (on 1 January, from the stock assessment, in tonnes of biomass).
Catch (2021)	27951	Catches to the end of October (27947 tonnes) plus assumed catches for France for November and December, based on the average percentage in 2010–2020 (6.3%), (fishery in Spain was closed from mid August). Preliminary value, used as input in the stock assessment (in tonnes).
Discards (2021)	Negligible	Discarding is considered negligible.

Table 2 Anchovy in Subarea 8. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2022)	Probability of SSB * < B _{lim} based on stochastic short-term forecast (2022)	SSB * (2022)	HR ** (2022)	% SSB change ***	% TAC change ^	% advice change ^^
ICES advice basis							
Harvest control rule in the management plan	33000	< 0.001	135124	0.24	-34	0.00	0.00
Other scenarios							
HR (2022) = 0	0	< 0.001	148521	0.000	-28	-100	-100
HR (2022) = HR (2021)	19086	< 0.001	140812	0.136	-32	-42	-42
Catch (2022) = 10000	10000	< 0.001	144496	0.069	-30	-70	-70
Catch (2022) = 20000	20000	< 0.001	140441	0.142	-32	-39	-39
Catch (2022) = 30000	30000	< 0.001	136355	0.22	-34	-9	-9
Catch (2022) = 40000	40000	< 0.001	132237	0.30	-36	21	21
Catch (2022) = 50000	50000	< 0.001	128087	0.39	-38	52	52

* SSB corresponds to mid-May estimate, with 60% of the catch assumed to be taken in the first six months of the year.

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

*** SSB (2022) relative to SSB (2021).

^ Catch (2022) relative to the 2021 TAC (33 000 tonnes).

^^ Advice for 2022 relative to advice for 2021 (33 000 tonnes).

The advice for 2022 is unchanged from the advice for 2021 since this is the maximum allowable catch under the management plan (previously referred to as a 'Management Strategy') harvest control rule.

Basis of the advice

Table 3 Anchovy in Subarea 8. The basis of the advice.

Advice basis	Management plan
Management plan	<p>A set of harvest control rules for a management calendar year from January to December was evaluated by STECF (2013, 2014). The European Commission requested that ICES 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, 2016). 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 \widehat{SSB}_{y+1} is the expected spawning-stock biomass in mid-May year y+1.</p>

Quality of the assessment

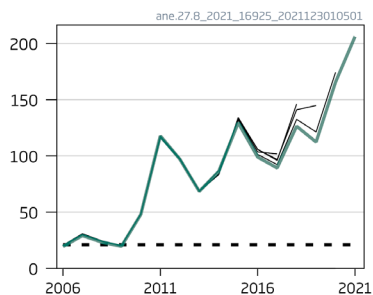
The collection of data from the commercial fishery during 2020 has been affected by COVID-19 restrictions. This has had an impact on the catch-at-age and catch-at-length data used in the assessment (ICES, 2021a). Length sampling for 2020 was not available for 91% of the Spanish catches, and the age structure for those catches was based on sales notes by commercial size category. However, this procedure has been used previously for preliminary estimates in the assessment year and it is considered to be reliable. All the research surveys (PELGAS, BIOMAN, and JUVENA) were conducted in 2021.

Concerning French catches in 2020, no length sampling was available due to the low total landings (138 t) and age structure from Spanish catches was used for the catch-at-age calculation.

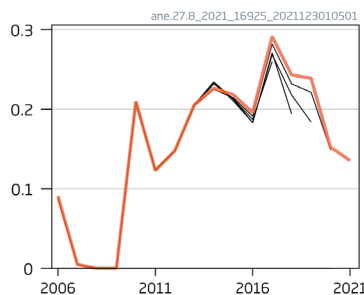
The current assessment has resulted in an upwards revision of the 2021 recruitment (age 1) estimate (Figure 2). In 2019 and 2020 the JUVENA survey could not cover the whole distribution, and the recruitment index for 2020 and 2021 was considered underestimated. The 2021 biomass estimate from the PELGAS acoustic survey is the highest of the time-series.

The Daily Egg Production Method (DEPM) biomass estimate has decreased from last year, but it is still among the highest of the time series.

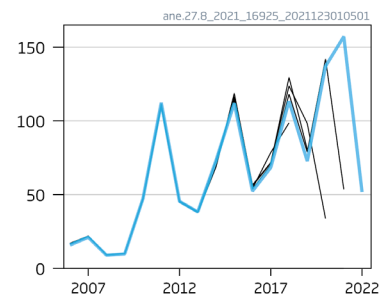
SSB (1000 t)



Harvest rate



Rec (age 1; 1000 t)



- B_{lim}

Figure 2 Anchovy in Subarea 8. Historical assessment results.

Issues relevant for the advice

The advised catch for 2022 is the same as the advised catch for 2021 because it corresponds to the maximum TAC level allowed in the management plan.

The advice is based on the management plan agreed for this stock and evaluated as precautionary by ICES (ICES, 2016). MSY advice for short-lived species is usually based on the escapement strategy. No MSY reference points have been defined for this stock and, therefore, no MSY advice is provided.

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 typically represent less than 2% of the total stock catches and should be taken into consideration in managing the fishery.

Reference points

Table 4 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	Mean of SSB estimates in the two years 1987 and 2009, the minimum estimated biomass that produced substantial recruitment.	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		

Basis of the assessment

Table 5 Anchovy in Subarea 8. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2021b).
Assessment type	Two-stage Bayesian biomass dynamic model (CBBM) assessment that uses catches in the model and in the forecast (ICES, 2021a).
Input data	Commercial catches (international landings, ages and length frequencies from catch sampling), three surveys (BIOMAN [I9143] (1987–2021), PELGAS [A4150] (1989–2021), JUVENA [A6767] (2003–2021)); annual maturity data from DEPM survey (BIOMAN [I9143]) and natural mortalities derived from 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)

History of the advice, catch, and management

Table 6 Anchovy in Subarea 8. ICES advice and official landings. All weights are in tonnes. Official catches for the management year (1 July to 30 June of the following year) are not available for 2010–2015.

Year	ICES advice	Catch corresponding 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	7000	-	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	\leq 25000	33000 #	20225	20670
2017	Management strategy	\leq 33000	33000	25470	26450
2018	Management strategy	\leq 33000	33000	30756	30773

Year	ICES advice	Catch corresponding to advice	Agreed TAC	Official catch	ICES catch ##
2019	Management strategy	≤ 33000	33000	26820	26857
2020	Management strategy	≤ 31892	31892	25600 ^{^^}	25823
2021	Management strategy	≤ 33000	33000		27951 ^{^^^}
2022	Management plan ^{&&}	≤ 33000			

* Mean catch 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 last six months of the year of 2014, due to a change in the management calendar.

^{^^^} Preliminary.

^{^^^} Provisional catch estimate for 2021.

[#] Initial TAC was set to 25 000 tonnes; in June 2016 it was raised to 33 000 tonnes.

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

^{&&} Previously referred to as a 'Management Strategy'.

History of the catch and landings

Table 7 Anchovy in Subarea 8. Catch distribution by fleet in 2020 as estimated by ICES.

Catch	Landings		Discards
	Purse-seiner 99.9%*	Pelagic trawler 0.1%	
25823 tonnes	25680 tonnes		143 tonnes

* Including 24 tonnes not landed, but used as live bait by the tuna fishing fleet.

Table 8 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 ***
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

Year	Official catch	ICES catch ***
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
2002	19118	17507
2003	9964	10595
2004	15528	16361
2005	1086	1128
2006	1807	1753
2007 **	141	141
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	25470	26450
2018	30756	30773
2019	26820	26857
2020	25600 *	25823
2021		27951 *

* Preliminary estimate.

** Experimental fisheries.

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

Summary of the assessment

Table 9 Anchovy in Subarea 8. Assessment summary. Recruitment, SSB, and catches are in tonnes. High and low refer to 90% confidence limits.

Year	Recruitment			SSB			Total catches	Harvest rate		
	R (age 1)	High	Low	SSB	High	Low		(Age 1+)	High	Low
1987	15761	21086	12038	20730	27268	15942	15308	0.69	0.90	0.53
1988	31012	38165	25720	28653	35991	23439	15581	0.50	0.61	0.40
1989	9047	12821	6424	15261	21485	10618	10614	0.54	0.78	0.38
1990	67630	78178	59083	53110	62559	45780	34272	0.64	0.74	0.54
1991	23070	30235	17572	29562	38884	22227	19634	0.61	0.81	0.47
1992	86937	109828	68286	71491	93042	53315	37885	0.52	0.70	0.40
1993	65068	80391	51284	72653	87067	61042	40393	0.54	0.64	0.45
1994	40971	50805	33146	47201	58364	38592	34631	0.71	0.87	0.58
1995	45148	59519	34303	40047	54761	28541	30115	0.73	1.02	0.53
1996	50483	62357	40448	46690	57572	38438	34373	0.70	0.86	0.57
1997	39427	51237	30653	44229	57992	34114	22337	0.46	0.60	0.35
1998	90945	118817	69770	90022	117010	68387	31617	0.35	0.46	0.27
1999	45254	63739	30537	68069	88405	50891	27259	0.38	0.51	0.29
2000	91152	110121	74344	92434	111165	76633	36994	0.40	0.48	0.33
2001	73563	87436	62255	89702	104326	78234	40149	0.45	0.51	0.38
2002	12897	17848	9193	38014	46507	31628	17507	0.46	0.55	0.38
2003	19639	24424	15560	27177	33154	22148	10595	0.39	0.47	0.32

Year	Recruitment			SSB			Total catches	Harvest rate		
	R (age 1)	High	Low	SSB	High	Low		(Age 1+)	High	Low
2004	30203	37679	24477	30343	38576	24411	16361	0.53	0.66	0.42
2005	4223	6219	2762	14242	19544	10257	1128	0.079	0.110	0.058
2006	15772	21434	11620	19323	25625	14476	1753	0.091	0.121	0.068
2007	21048	28438	15163	29095	37676	21993	141	0.0048	0.0064	0.0037
2008	8900	12811	6108	23217	29863	17737	0	0.00	0.00	0.00
2009	9766	14023	6819	19523	25264	14981	0	0.00	0.00	0.00
2010	47334	61640	36246	48023	61816	36925	10317	0.21	0.27	0.163
2011	112283	142401	88946	117909	147524	94257	14530	0.123	0.154	0.098
2012	45436	59752	34271	97147	120574	78545	14402	0.148	0.183	0.119
2013	38220	50318	28956	68460	86209	54213	14192	0.21	0.26	0.163
2014	73123	94841	55794	86353	109701	67372	20126	0.23	0.29	0.178
2015	111902	143051	88534	129399	160140	104390	28258	0.22	0.27	0.176
2016	52398	69410	39525	98931	124360	78441	20670	0.196	0.25	0.156
2017	68384	88291	52129	89268	113780	68798	26450	0.29	0.38	0.23
2018	113331	148088	87474	126427	164426	97291	30773	0.24	0.32	0.187
2019	72651	100401	52438	112353	150355	82053	26857	0.24	0.33	0.179
2020	136984	195019	95204	165720	230357	116758	25823	0.152	0.22	0.109
2021	157198	235560	100510	206215	301184	134023	27951 *	0.136	0.21	0.093
2022	51817	135371	20165							

* Preliminary estimate.

Sources and references

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