

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Horse mackerel (*Trachurus trachurus*) in Division IXa (Southern stock)

Advice for 2013

ICES advises on the basis of precautionary considerations that landings in 2013 should be no more than 26 000 tonnes.

Stock status

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	?	?	?
Precautionary approach (F_{pa}, F_{lim})	?	?	?
Qualitative evaluation	✓	✓	?
SSB (Spawning Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	?	?	?
Precautionary approach (B_{pa}, B_{lim})	?	?	?
Qualitative evaluation	→	→	?

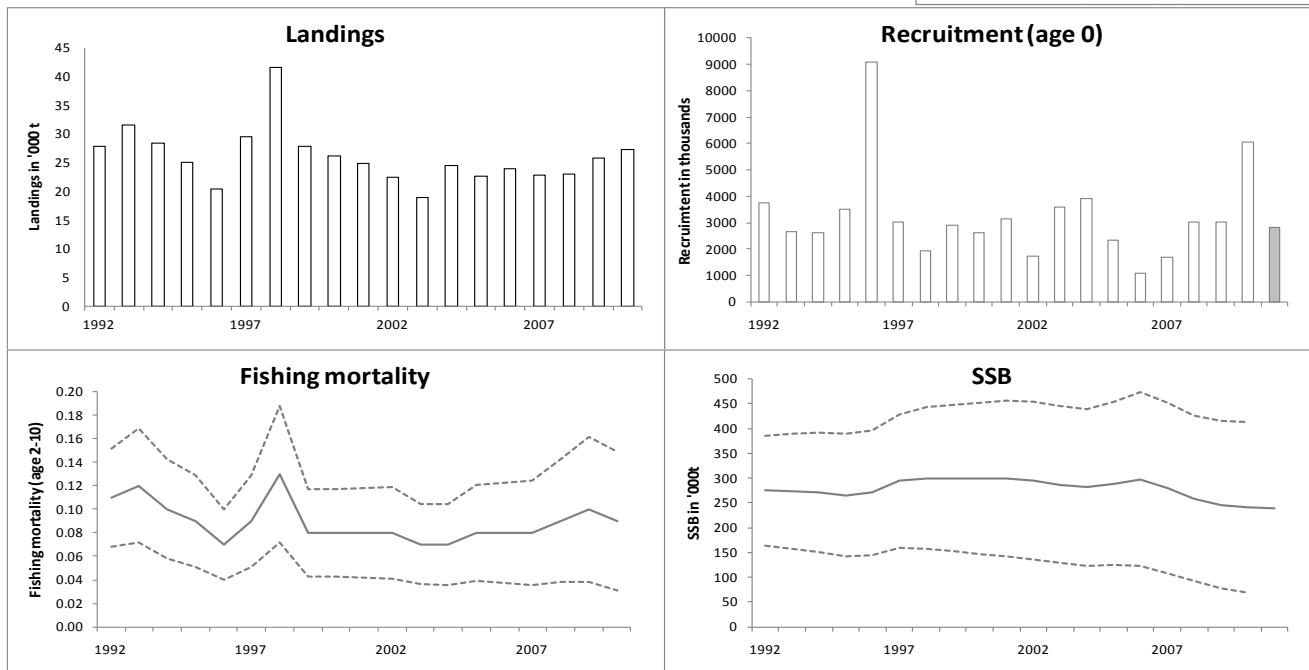
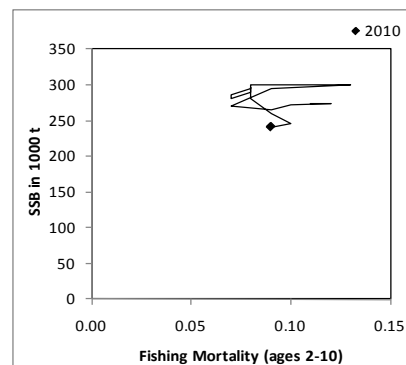


Figure 7.4.6.1 Horse mackerel in Division IXa. Summary of stock assessment 2011 (weights in '000 tonnes) with 95% confidence intervals included for F and SSB. Top right: SSB and F over the time-series used in the assessment. Estimates are shaded.

No assessment has been carried out in 2012. The stock status is based on last year's assessment. Catches and fishing mortality have been relatively stable since 1999. Biomass has been stable during the assessment period. Recruitment is variable with occasional large peaks.

Management plans

No specific management objectives are known to ICES.

Biology

The distribution pattern of southern horse mackerel is linked to the size of the fish. Most of the older fish are found in the waters off Galicia and northern Portugal, while the distribution of juveniles extends further south.

Environmental influence on the stock

This stock shows a relatively stable recruitment with occasional large peaks which may be driven by environmental factors.

The fisheries

Horse mackerel is caught in mixed fisheries. Changes in the availability of other species caught in the same fisheries could affect the targeting of horse mackerel. Traditionally, horse mackerel catches show a large proportion of juveniles. Recently the importance of the Spanish bottom trawl fleet, targeting mainly adult fish, is increasing.

Other species of horse mackerel are caught together with *T. trachurus* in Division IXa, in particular *T. picturatus* of which 300–800 t have been caught annually in the past. The advice for Southern horse mackerel applies to the Southern stock of *Trachurus trachurus* only.

Catch distribution	Catches reported in 2011 were not considered reliable for assessment. Total catch (2010) = 27 kt (19% PT trawl; 8% PT purse-seine; 15% PT-artisanal; 40% SP-trawl; 17% SP-purse-seine; 1% SP-artisanal).
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Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011. This implies that assumptions on mean recruitment were made for 2010-2013 and on fishing mortality for two intermediate years (2011 and 2012) instead of one (2012). This has resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2010–2013) is 45%. Confidence intervals for the assessment estimates are very wide, indicating a high uncertainty in F, SSB, and recruitment in the most recent years.

Scientific basis

Assessment type	Analytical assessment (AMISH model), with data up to 2010 (not updated this year).
Input data	One survey index (combined PT and SP-IBTS-Q4). No commercial indices.
Discards and bycatch	Not included in the assessment, and are believed to be low.
Indicators	None.
Other information	This stock was benchmarked in 2011 (WKBENCH).
Working group report	WGHANSA

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Reference points

No MSY and precautionary reference points have been defined for this stock. Historical fishing mortalities have on average (0.09) been below any candidate reference points (e.g. $F_{0.1}=0.14$)

Yield and spawning biomass per Recruit F-reference points 2011:

	Fish Mort Ages 2–10	Yield/R	SSB/R
Average last 3 years	0.09	0.01	0.08
$F_{0.1}$	0.14	0.01	0.06
$F_{35\%SPR}$	0.11	0.01	0.07
F_{med}	0.16	0.01	0.05

Outlook for 2013

Basis: $F(2012) = F(2011) = F(2010) = 0.09$; $SSB(2012) = 233$; Landings (2011) = 26.1; $SSB(2013) = 242$; Landings (2012) = 26.4; $R(2010–13) = \text{Geom. Mean}(1992–2009) = 2806$ millions.

Rationale	Landings (2013)	Basis	F (2013)	SSB (2014)	%SSB change ¹⁾	% TAC change ²⁾
Precautionary considerations	26	F_{2012}	0.09	240	2 %	-17 %
Zero catch	0.0	0	0	270	13 %	-100 %
Other options	5.3	$F_{2012} * 0.2$	0.02	260	10 %	-83 %
	11	$F_{2012} * 0.4$	0.04	260	8 %	-66 %
	16	$F_{2012} * 0.6$	0.05	250	6 %	-49 %
	21	$F_{2012} * 0.8$	0.07	250	4 %	-33 %
	30	$F_{2012} * 1.2$ (TAC 2012)	0.11	240	0 %	-2 %
	35	$F_{2012} * 1.4$	0.12	230	-2 %	14 %
	40	$F_{2012} * 1.6$	0.14	230	-4 %	29 %
	44	$F_{2012} * 1.8$	0.16	230	-6 %	43 %
49	$F_{2012} * 2$	0.18	220	-7 %	58 %	

Weights in thousand tonnes.

¹⁾ SSB 2014 relative to SSB 2011 (last assessment).

²⁾ Landings 2013 relative to TAC 2012.

Precautionary considerations

In absence of precautionary reference points the stock status cannot be evaluated in reference to those. The current fishing mortality does not seem to be detrimental to the stock.

The wide confidence intervals indicate high uncertainty in the assessment estimates and particularly in the current trends of the stock. Therefore, based on precautionary considerations, ICES recommends that fishing mortality should not be allowed to increase from the present level. This would imply landings of less than 26 000 t.

Additional considerations

The traditional fishery across fleets has for a long time targeted juvenile age classes. This exploitation pattern combined with at a moderate exploitation rate does not seem to have been detrimental to the dynamics of the stock.

Comparison with previous assessment and advice

No assessment has been carried out in 2012. The advice this year is based on last year's assessment (ICES, 2011). Short-term forecasts with two intermediate years, based on F status-quo (F_{2010}) were performed, based on the assessment performed in 2011. Given that recent catches have been below the TAC, and catches in 2011 are unreliable, this

option seemed more adequate than catch constrained forecasts. The advice is based on precautionary considerations, as before.

Assessment and management area

Since 2010 the management area and advice area have been identical.

Source

ICES. 2011. Report of the Working Group on Anchovy and Sardine (WGANSA), 24–28 June 2011, Vigo, Spain. ICES CM 2011/ACOM:16.

ICES. 2012. Report of the Working Group on Anchovy, Sardine and Horse Mackerel Assessments (WGHANSA), 22–28 June 2012, Horta, Azores, Portugal. ICES CM 2012/ACOM:16

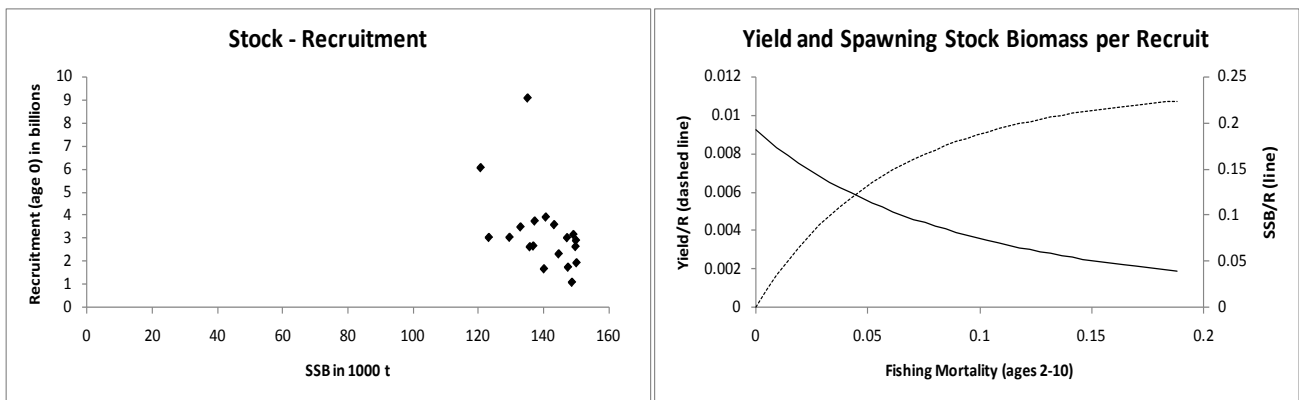


Figure 7.4.6.2 Horse mackerel in Division IXa. 2011 Stock–recruitment plot and yield-per-recruit analysis.

Table 7.4.6.1 Horse mackerel in Division IXa. ICES advice, management, and landings.

Year	ICES Advice	Predicted catch corresp. to advice ²	Agreed TAC ¹	ICES landings ^{2,7}
1987	Not assessed	-	72.5 ³	55 ⁴
1988	Mesh size increase	-	82.0 ³	56 ⁴
1989	No increase in F; TAC	72.5	73.0 ³	56 ⁴
1990	F at F _{0.1} ; TAC	38	55.0 ⁴	49 ⁴
1991	Precautionary TAC	61	73.0 ⁴	22
1992	If required, precautionary TAC	61	73.0 ⁴	26
1993	No advice	-	73.0 ⁴	32
1994	<i>Status quo</i> prediction	55 ⁵	73.0 ⁴	26
1995	No long-term gains in increasing F	63 ⁵	73.0 ⁴	25
1996	No long-term gains in increasing F	60 ⁵	73.0 ⁴	23
1997	No advice	-	73.0 ⁴	28
1998	F should not exceed the F(94–96)	59	73.0 ⁴	42
1999	No increase in F	58	73.0 ⁴	28
2000	F < F _{pa}	<59	68.0 ⁴	27
2001	F < F _{pa}	<54	68.0 ⁴	25
2002	F < 0.113	<34	57.5 ⁴	24
2003	Average of last 3 years	<49	55.2 ⁴	20
2004	Should not exceed the recent average (2000–2002) ⁶	<47	55.0 ⁴	24
2005	Should not exceed the recent average (2000–2002)	<25 ⁷	55.0 ⁴	23
2006	Should not exceed the recent average (2000–2004, excluding 2003) ⁶	<25	55.0 ⁴	24
2007	Should not exceed the recent average (2000–2004, excluding 2003) ⁶	<25	55.0 ⁴	23
2008	Should not exceed the recent average (2000–2004, excluding 2003)	<25	57.8 ⁴	22
2009	Should not exceed the recent average (2000–2004, excluding 2003)	<25	57.8 ⁴	26
2010	Should not exceed the recent average (2000–2004, excluding 2003)	<25	31.1 ⁸	27
2011	Should not exceed 25 000 (average 2000–2004, excluding 2003)	<25	29.585 ⁸	*
2012	No increase in F	<30.8	30.800 ⁸	
2013	No increase in F	< 26		

Weights in thousand tonnes.t.

¹ Includes all *Trachurus* spp.

² Includes only *Trachurus trachurus* L.

³ Division VIIIc, Subareas IX and X, and CECAF Division 34.1.1 (EC waters only).

⁴ Division VIIIc and Subarea IX.

⁵ Catch at *status quo* F.

⁶ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

⁷ Figures for Division IXa only from 1991 onwards, following the revision of stock boundaries in 2004.

⁸ Subarea IX.

* Catches for 2011 were considered inconsistent with those from previous years.

Table 7.4.6.2 Horse mackerel in Division IXa. ICES estimated landings and official catch statistics (tonnes).

Year	Official Catch	Estimated Catch
1991	17 497	21 772
1992	22 654	28 411 ¹
1993	25 747	31 945
1994	19 061	28 441 ¹
1995	17 698	25 147
1996	14 053	20 400 ¹
1997	16 736	27 642
1998	21 334	41 564
1999	14 420	27 733
2000	15 348	27 160
2001	13 760	24 910
2002	14 270	22 506 // (23 663)*
2003	11 242	18 887 // (19 566)*
2004	11 875	23 252 // (23 577)*
2005	13 307	22 695 // (23 111)*
2006	19 426	23 902 // (24 558)*
2007	10 381	22 790 // (23 424)*
2008	9 290	22 993 // (23 593)*
2009	10 841	25 727 // (24 967)*
2010	11 726	27 216 // (26 556)*
2011	18 130	**

(*) In parenthesis: the Spanish catches from Subdivision IXa South are also included. These catches have only been available since 2002 and they will not be considered in the assessment data until the rest of the time-series is complete.

(**) Due to inconsistencies in the Spanish official landings, catch data in 2011 were not considered suitable for advice.

(1) These figures have been revised in 2008.

Table 7.4.6.3 Horse mackerel in Division IXa. Summary of the 2011 stock assessment. 95% Confidence intervals included around SSB and F (± 2 standard deviations).

Year	Recruits('000)	SSB - 2SD	SSB (tonnes)	SSB +2SD	F-2SD	mean F(2-10)	F+2SD	Landings
1992	3749400	163612	274520	385428	0.068	0.11	0.152	27858
1993	2667100	157364	273680	389996	0.071	0.12	0.169	31521
1994	2633700	150884	271540	392196	0.058	0.10	0.142	28450
1995	3492900	143100	265840	388580	0.051	0.09	0.129	25132
1996	9075200	144960	270180	395400	0.040	0.07	0.100	20360
1997	3027600	160216	294400	428584	0.051	0.09	0.129	29491
1998	1941100	157128	300180	443232	0.072	0.13	0.188	41661
1999	2907900	152452	299860	447268	0.043	0.08	0.117	27768
2000	2641600	146752	299580	452408	0.043	0.08	0.117	26160
2001	3163500	141184	298260	455336	0.042	0.08	0.118	24911
2002	1750800	135612	294960	454308	0.041	0.08	0.119	22506
2003	3591500	128536	286480	444424	0.036	0.07	0.104	18887
2004	3921200	123408	281340	439272	0.035	0.07	0.105	24485
2005	2326400	124864	289240	453616	0.039	0.08	0.121	22689
2006	1097500	122416	297380	472344	0.037	0.08	0.123	23895
2007	1678400	108048	280220	452392	0.036	0.08	0.124	22787
2008	3043400	91772	259100	426428	0.038	0.09	0.142	22993
2009	3037400	78592	246420	414248	0.038	0.10	0.162	25726
2010	6057700	69240	241400	413560	0.031	0.09	0.149	27217
2011	2806204*		238339					

* Geometric Mean recruitment over all years except 2010.