

6.3.19 Horse mackerel (*Trachurus trachurus*) in divisions 3.a, 4.b–c, and 7.d (Skagerrak and Kattegat, southern and central North Sea, eastern English Channel)

ICES stock advice

ICES advises that when the precautionary approach is applied, catches in 2017 should be no more than 18 247 tonnes.

Stock development over time

The stock appears to be overall stable at a low level. The survey indices show contrasting trends: The French Channel Groundfish Survey (CGFS) Q4 abundance index from Division 7.d, where most of the catches have been taken during the last years, indicates an increase in the fishable biomass of North Sea horse mackerel (+20 cm). This is due to stronger-than-average recruitment (< 20 cm) in 2013 and, particularly, in 2014. However, the International Bottom Trawl Survey (IBTS) in Q3 does not show such a clear increase; here the index is at the level of 2012 and 2013. Catches have been declining since 2009.

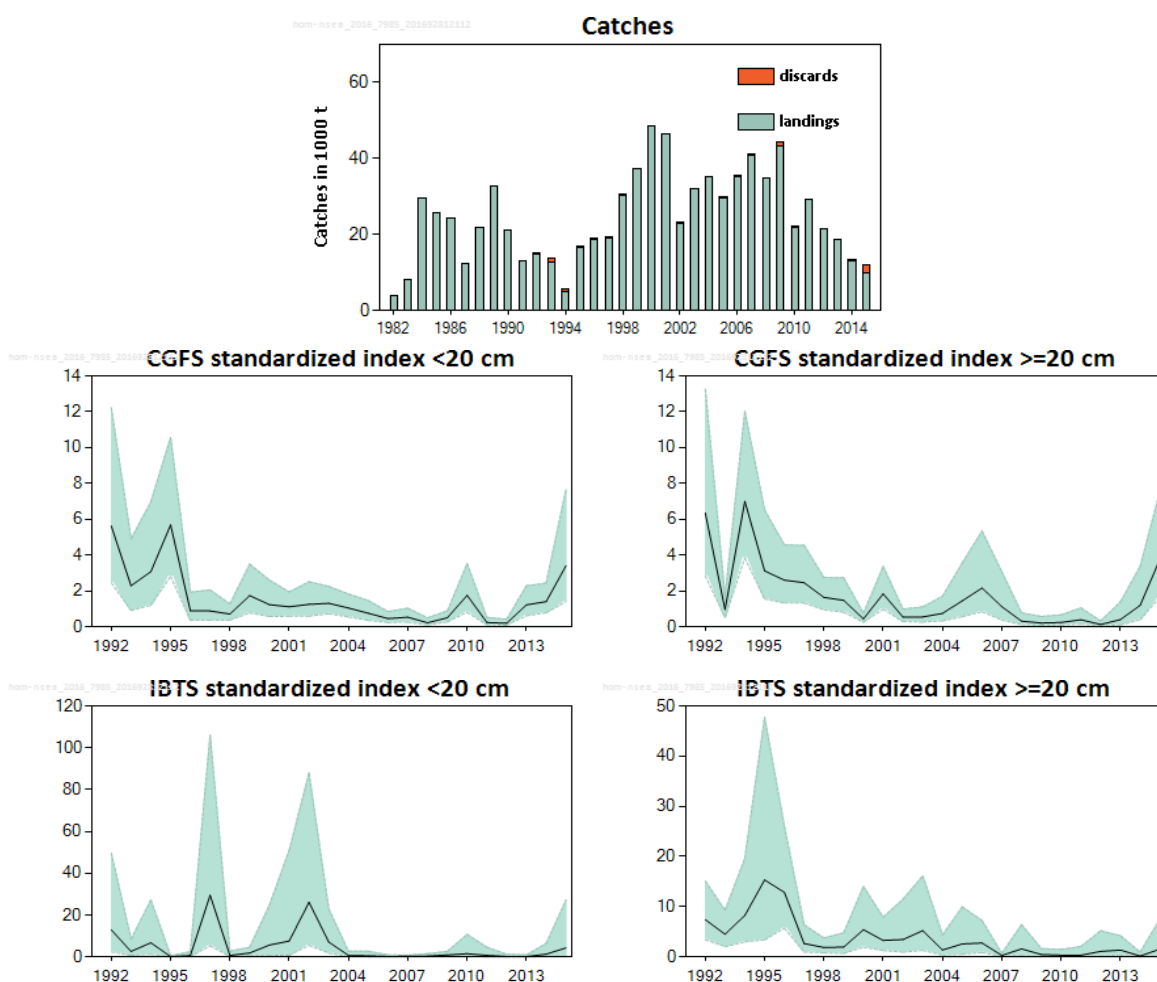


Figure 6.3.19.1 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. Top panel: Catches in quarters 1 and 2 from divisions 3.a and 4.a, and in all quarters from divisions 4.b–c and 7.d. Complete discard estimates are only available for some years. Middle and bottom panels: Indices derived from the IBTS (bottom) and CGFS (middle) surveys in the North Sea (divisions 4.b–c) and eastern English Channel (Division 7.d) for the portion of the stock that is either smaller than or larger than 20 cm (left and right panels, respectively). The abundance index values are standardized to the 2006–2015 mean. Confidence intervals (95%) are included in the IBTS and CGFS standardized indices.

Stock and exploitation status

Table 6.3.19.1 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size			
		2013	2014	2015		2013	2014	2015	
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	-	?	?	?	Unknown	SSB_{MGT}	-	-	-
						-	→	→	↗
									Increasing

Catch options

The CGFS index shows a considerable increase over the last three years, though there is a high amount of uncertainty in this trend. There is no increase in the IBTS index. Considering the uncertainties involved in the survey indices, the new information available this year does not change the perception of the stock. Advice in previous years was for total catch under the assumption that discarding was negligible. New information available for 2015 indicates non-negligible discarding in non-directed fisheries. This new information is taken into account in the catch advice for 2017.

Table 6.3.19.2 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. For stocks in ICES data categories 3–6, one catch option is provided.

Recent advised catch for 2016	15 200 t
Discard rate**	16.7%
Precautionary buffer	Not applied
Catch advice*	18 247 t
Wanted catch corresponding to the catch advice	15 200 t

*Recent advised catch/(1 – discard rate).

** The majority of discards come from non-directed, demersal fisheries.

Basis of the advice

Table 6.3.19.3 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	There is no management plan for horse mackerel in this area. ICES evaluated a proposed harvest control rule for a multi-annual plan for horse mackerel in the North Sea (ICES, 2014). None of the options were considered as being in accordance with the precautionary approach.

Quality of the assessment

Until 2014 only the IBTS Q3 survey was used as indicator of stock abundance. In 2015 an additional survey index was provided (the French CGFS survey in Division 7.d) which takes place in the main fishing area and season for this stock (Division 7.d, Q4). Indices from both surveys are very uncertain and individual years are not indicative of trends.

Since 2015, the RV “Gwen Drez” has been replaced by the RV “Thalassa” to carry out the CGFS survey. Because of differences in vessel size and gear characteristics a calibration process was conducted to quantify the differences in catchability by species. The abundance data by length have been transformed with the obtained conversion factors in order to preserve the consistency in the GCFS time-series. This calibration study is presently being reviewed by ICES.

Issues relevant for the advice

Since 2013 signals of better recruitment have been observed. The main focus of the fisheries in this area in 2015 has been on the smaller fish; this is expected to continue in 2016 and 2017. With this pattern of exploitation, mostly immature individuals are caught, which might hinder the recovery of the stock by removing an important portion of the recent year classes before they can enter the spawning stock.

Discarding in the target pelagic fisheries is considered negligible. New information in 2015 from bottom-trawl fisheries not directed at horse mackerel indicated an overall discard rate of 16.7% for the stock as a whole. Complete discard information for earlier years has not been submitted to ICES. However, information from national discard reports for the non-directed bottom-trawl fisheries indicates a similar level of discarding in earlier years. Discard data will be requested for the upcoming benchmark of North Sea horse mackerel.

Reference points

No reference points are defined for this stock.

Basis of the assessment

Table 6.3.19.4 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. The basis of the assessment.

ICES stock data category	5 (ICES, 2016a).
Assessment type	No assessment.
Input data	Commercial catch.
Discards and bycatch	Included in the advice (16.7% of the total catch in 2015).
Indicators	Survey indices from Subarea 4 (IBTS Q3) and Division 7.d (CGFS Q4).
Other information	This stock has not been benchmarked. A benchmark is planned for 2017.
Working group	Working Group on Widely Distributed Stocks (WGWIDE).

Information from stakeholders

On behalf of the Pelagic Advisory Council and the EAPO Northern Pelagic Working Group, a research project on horse mackerel was initiated in 2015 with IMARES (the Netherlands) and University College Dublin (Ireland). Genetic and chemical analysis relevant for the separation between North Sea and western horse mackerel has been carried out but is not conclusive yet. More analyses are being carried out. Work is also ongoing to evaluate the feasibility of using historical catch rates of pelagic freezer-trawlers, based on skippers' diaries as indicators of abundance. This information will be presented to the upcoming benchmark.

History of advice, catch, and management

Table 6.3.19.5 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. History of ICES advice, the agreed TAC, and ICES estimates of catch.

Year	ICES advice	Predicted catch corresp. to advice	Agreed TAC *	ICES catch **
1987	Not assessed	-	30	12
1988	No advice	-	50	24
1989	No advice	-	45	33
1990	No advice	-	40	19
1991	No advice	-	45	12
1992	No advice	-	55	15
1993	No advice	-	60	14
1994	No advice	-	60	6
1995	No advice	-	60	17
1996	No advice	-	60	19
1997	No advice	-	60	20
1998	Develop and implement management plan	-	60	31
1999	Develop and implement management plan	-	60	37
2000	Develop and implement management plan	-	51	48
2001	No increase in catch	-	51	46
2002	No increase in catch from 1982–1997 average	< 18	58	23
2003	No increase in catch from 1982–1997 average	< 18	50	32
2004	No increase in catch from 1982–1997	< 18	42	35
2005	No increase in catch from 1982–1997	< 18	43	29
2006	No increase in catch from 1982–1997	< 18	43	36
2007	No increase in catch from 1982–1997	< 18	43	41
2008	No increase in catch from 1982–1997	< 18	39	36
2009	Same advice as last year	< 18	39	45
2010	Same advice as last year	< 18	47	24
2011	No advice	-	40	29
2012	Reduce catches	-	44	23
2013	Reduce catches by 20%	< 25.5	38	19
2014	Same advice as last year	< 25.5	32	13
2015	Significant reduction in catches	< 15.2	15.2	12
2016	Same advice value as in 2015	≤ 15.2	15.2	
2017	Precautionary approach	≤ 18.247***		

Weights in thousand tonnes.

* Until 2010 the TAC is for Division 2.a and Subarea 4 (EU waters only). From 2010 onwards the TAC is for divisions 4.b–c and 7.d (EU waters only).

** Catch includes catch from Divisions 4.a and 3.a (quarters 1–2 only).

*** Total catch advice takes into account new information on discarding from non-directed bottom-trawl fisheries.

History of catch and landings

Table 6.3.19.6 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. Catch distribution by fleet in 2015 as estimated by ICES.

Total catch	Landings			Discards
12 002 t	Pelagic trawl	Undefined gears	Otter trawl	Otter trawl
	33%	58%	9%	~100%
	9 998 t			2 004 t

Table 6.3.19.7 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. History of commercial catch and landings; ICES estimated values are presented by area. Weights in tonnes.

Year	Division 3.a	Division 4.a	Divisions 4.b–c	Division 7.d	Discards	Total
1982	2788*		-	1247		4035
1983	4420*		-	3600		8020
1984	25893*		-	3585		29478
1985	-		22897	2715		26750
1986	-		19496	4756		24648
1987	1138		9477	1721		11634
1988	396		18290	3120		23671
1989	436		25830	6522		33265
1990	2261		17437	1325		18762
1991	913		11400	600		12000
1992			13955	688	400	15043
1993			3895	8792	930	13617
1994			2496	2503	630	5689
1995	112		7948	8666	30	16756
1996	1657		7558	9416	212	18843
1997			14078	5452	10	19540
1998	3693		10530	16194	83	30500
1999			9335	27889		37224
2000			25954	22471		48425
2001	85	69	8157	38114		46356
2002			12636	10723	20	23379
2003	48	623	10309	21098		32078
2004	351		18348	16455		35154
2005	357		13892	15460	62	29711
2006	1099	2661	7998	23790	78	35626
2007	63	2056	9118	29788	139	41164
2008	27	1003	2330	31389		34749
2009	38	72	18711	24366	1036	44223
2010	< 1	100	1965	20188	2	22255
2011	0		10458	18886		29344
2012	1	4056	2596	14722		21375
2013	< 1	17	1477	17202		18696
2014	2	2	2596	10773	8	13388
2015	3.4	644	769.6	8581	2004	12002

* Divisions 3.a and 4.b–c combined.

Summary of the assessment

Table 6.3.19.8 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. Relative index of abundance derived from the French Channel Groundfish Survey in Q4 (CGFS, Division 7.d). The index is derived as the product of the CPUE in the positive (non-zero) hauls and the proportion of positive hauls, and is standardized to the 2006–2015 mean. The High and Low columns represent the confidence intervals (95%) of the indices.

Year	CGFS standardized index < 20 cm				CGFS standardized index ≥20 cm			
	index	High	Low	P(non-zero) hauls	index	High	Low	P(non-zero) hauls
1992	5.635	12.227	2.458	0.764	6.358	13.260	2.843	0.764
1993	2.295	4.913	0.919	0.752	0.972	1.726	0.527	0.752
1994	3.083	6.977	1.204	0.759	7.001	12.014	3.842	0.759
1995	5.684	10.567	2.821	0.612	3.124	6.525	1.560	0.612
1996	0.903	1.936	0.374	0.729	2.609	4.570	1.330	0.729
1997	0.888	2.063	0.378	0.682	2.465	4.553	1.329	0.682
1998	0.720	1.281	0.376	0.723	1.644	2.753	0.955	0.723
1999	1.745	3.500	0.779	0.609	1.482	2.735	0.820	0.609
2000	1.242	2.610	0.575	0.603	0.444	0.759	0.256	0.603
2001	1.121	1.949	0.593	0.57	1.841	3.370	0.984	0.57
2002	1.258	2.516	0.598	0.596	0.546	0.992	0.296	0.596
2003	1.316	2.257	0.733	0.598	0.557	1.117	0.269	0.598
2004	1.050	1.832	0.555	0.611	0.755	1.709	0.334	0.611
2005	0.760	1.471	0.364	0.496	1.456	3.574	0.571	0.496
2006	0.464	0.855	0.245	0.492	2.168	5.344	0.843	0.492
2007	0.541	1.043	0.265	0.437	1.128	3.076	0.382	0.437
2008	0.231	0.505	0.105	0.347	0.319	0.786	0.121	0.347
2009	0.509	0.892	0.278	0.4	0.216	0.580	0.081	0.4
2010	1.760	3.529	0.818	0.446	0.249	0.671	0.101	0.446
2011	0.245	0.528	0.109	0.343	0.396	1.060	0.152	0.343
2012	0.205	0.429	0.094	0.303	0.135	0.334	0.055	0.303
2013	1.228	2.291	0.619	0.27	0.405	1.394	0.108	0.27
2014	1.407	2.445	0.786	0.337	1.202	3.385	0.402	0.337
2015	3.410	7.655	1.412	0.348	3.782	7.571	1.670	0.348

Table 6.3.19.9 Horse mackerel in divisions 3.a, 4.b–c, and 7.d. Relative index of abundance derived from the IBTS Q3 (North Sea only) in Q4. The index is derived as the product of the CPUE in the positive (non-zero) hauls and the proportion of positive hauls standardized to the 2006–2015 mean. The High and Low columns represent the confidence intervals (95%) of the indices.

Year	IBTS standardized index < 20 cm				IBTS standardized index ≥ 20 cm			
	index	High	Low	P(non-zero) hauls	index	High	Low	P(non-zero) hauls
1992	12.915	49.662	2.365	0.764	7.427	15.119	3.429	0.764
1993	2.631	8.467	0.642	0.752	4.502	9.301	2.032	0.752
1994	6.743	27.241	1.235	0.759	8.260	19.630	2.999	0.759
1995	0.130	0.602	0.020	0.612	15.332	47.698	3.396	0.612
1996	0.614	2.472	0.119	0.729	12.848	26.042	5.714	0.729
1997	29.469	105.950	5.331	0.682	2.659	6.398	0.955	0.682
1998	0.685	2.715	0.154	0.723	1.873	3.779	0.807	0.723
1999	1.857	4.634	0.619	0.609	1.956	4.784	0.674	0.609
2000	5.657	24.756	0.660	0.603	5.425	14.035	1.935	0.603
2001	7.586	50.927	0.735	0.57	3.285	7.912	1.265	0.57
2002	26.090	87.880	5.527	0.596	3.463	11.487	0.939	0.596
2003	7.099	22.980	1.798	0.598	5.233	16.153	1.279	0.598
2004	0.703	2.640	0.150	0.611	1.375	4.400	0.368	0.611
2005	0.518	2.676	0.075	0.496	2.574	9.978	0.547	0.496
2006	0.216	0.982	0.036	0.492	2.769	7.245	0.867	0.492
2007	0.274	0.743	0.071	0.437	0.294	0.731	0.102	0.437
2008	0.389	1.528	0.079	0.347	1.596	6.433	0.244	0.347
2009	0.903	2.682	0.203	0.4	0.480	1.667	0.103	0.4
2010	1.518	10.776	0.115	0.446	0.343	1.473	0.070	0.446
2011	0.737	4.612	0.068	0.343	0.343	2.081	0.049	0.343
2012	0.201	1.263	0.006	0.303	1.085	5.211	0.182	0.303
2013	0.166	0.967	0.015	0.27	1.360	4.224	0.259	0.27
2014	1.280	6.422	0.172	0.337	0.181	0.959	0.026	0.337
2015	4.315	27.174	0.296	0.348	1.549	7.529	0.241	0.348

Sources and references

ICES. 2014. The Netherlands request for evaluation of the proposal for a multi-annual plan for horse mackerel in the North Sea. *In* Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 6, Section 6.2.3.3.

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