

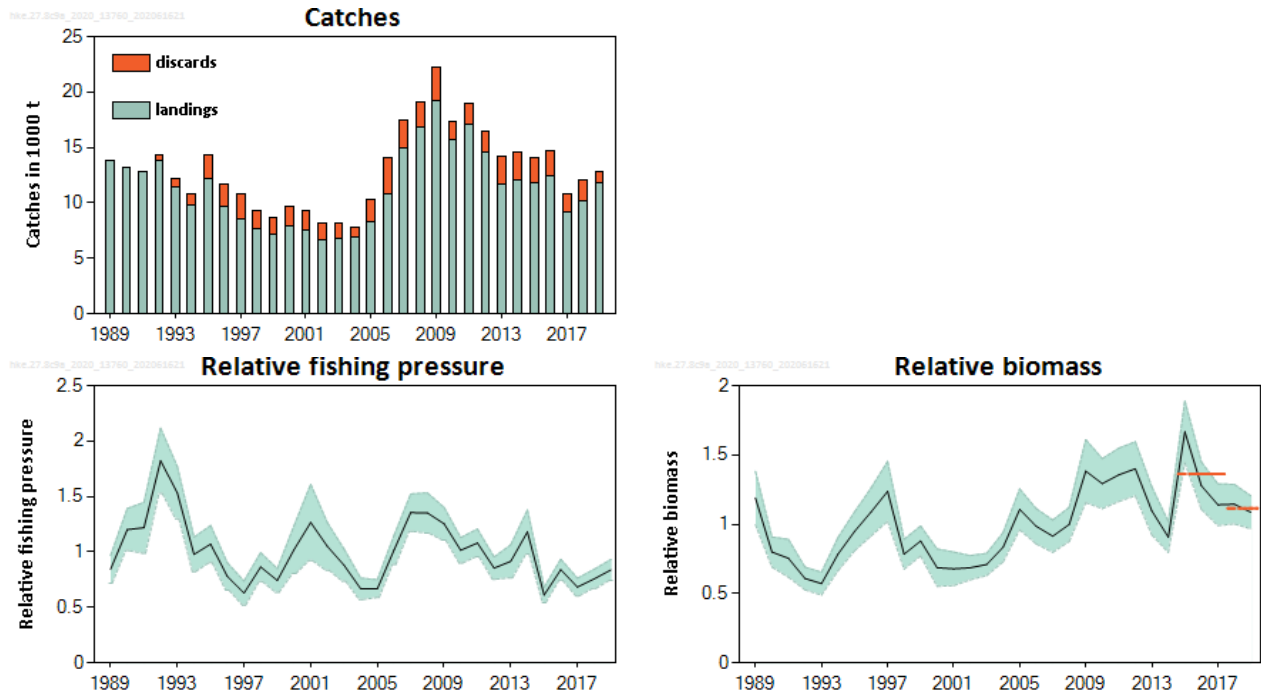
## Hake (*Merluccius merluccius*) in divisions 8.c and 9.a, Southern stock (Cantabrian Sea and Atlantic Iberian waters)

### ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in 2021 should be no more than 7825 tonnes.

### Stock development over time

The stock-size indicator is variable, although it shows a historical upward trend. It has decreased slightly in recent years.



**Figure 1** Hake in divisions 8.c and 9.a, Southern stock. Summary of the stock assessment. Catches (top left), relative fishing pressure (bottom left), and relative biomass (bottom right) are indicated with 95% confidence intervals (shaded area). Fishing pressure and biomass are relative to the average of the time-series. The dashed orange lines indicate the average of the relative biomass for 2015 to 2017, and for 2018 to 2019.

### Stock and exploitation status

ICES cannot assess the stock and exploitation status relative to maximum sustainable yield (MSY) and precautionary approach (PA) reference points because the reference points are undefined.

**Table 1** Hake in divisions 8.c and 9.a, Southern stock. State of the stock and the fishery relative to reference points.

		Fishing pressure			Stock size					
		2017	2018	2019	2017	2018	2019			
Maximum sustainable yield	$F_{MSY}$	?	?	?	Undefined	$MSY B_{trigger}$	?	?	?	Undefined
Precautionary approach	$F_{pa}, F_{lim}$	?	?	?	Undefined	$B_{pa}, B_{lim}$	?	?	?	Undefined
Management plan	$F_{MGT}$	?	?	?	Undefined	$B_{MGT}$	?	?	?	Undefined
Qualitative evaluation	-	↘	↗	↗	Increasing	-	↘	↔	↘	Decreasing

## Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The mean of the standardized indices (SP-NSGFS-WIBTS-Q4 and PT-TR) was used as the index of stock development. The advice is based on the ratio of the mean of the last two index values (Index A) and the mean of the three preceding values (Index B), multiplied by the recent ICES estimated catch (mean of the last three years).

The index is estimated to have decreased by less than 20%; thus, the uncertainty cap was not applied.

The stock status relative to candidate reference points is unknown; therefore, the precautionary buffer was applied to the advice.

The discard rate is 13% of the total catch.

**Table 2** Hake in divisions 8.c and 9.a, Southern stock. The catch scenarios table.\*

Index A (2019, 2018)		1.12
Index B (2015, 2016, 2017)		1.36
Index ratio (A/B)		0.82
Uncertainty cap	Not applied	-
Recent ICES estimated catch (2017–2019)		11944
Discard rate (mean 2017, 2018, 2019)		0.131
Precautionary buffer	Applied	-20%
Catch advice **		7825
Projected landings corresponding to advice ***		6803
% change in advice ^		18.3%

\* The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.

\*\* [Recent average catch (11 944 tonnes) × index ratio × precautionary buffer].

\*\*\* [Recent average catch (11 944 tonnes) × index ratio × precautionary buffer × (1 – discard rate)].

^ Advice 2021 (7825 tonnes) relative to advice 2020 (6615 tonnes).

The advice has changed because it is now assessed as a category 3 stock, using the ICES precautionary approach. ICES has previously provided advice based on a category 1 assessment.

## Basis of the advice

**Table 3** Hake in divisions 8.c and 9.a, Southern stock. The basis of the advice.

Advice basis	Precautionary approach
Management plan	The EU multiannual plan (MAP; EU, 2019) for stocks in the Western Waters and adjacent waters applies to this stock. The MAP stipulates that when the $F_{MSY}$ ranges are not available, fishing opportunities should be based on the best available scientific advice.

## Quality of the assessment

The basis for the advice has changed this year, from category 1 to category 3 (ICES, 2012), because of a strong retrospective pattern in the GADGET length-based model.

## Issues relevant for advice

Southern hake is caught in a mixed demersal fishery together with megrims, anglerfish, and other species, where hake has been acting as a choke species in recent years.

## Reference points

No reference points are defined for this category 3 assessment.

## Basis of the assessment

**Table 4** Hake in divisions 8.c and 9.a, Southern stock. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2019).
Assessment type	Biomass index (survey and CPUE) trends.
Input data	Commercial catches (international landings, discards); one survey index (SP-NSGFS-WIBTS-Q4 [1989 to 2019]) and an LPUE index based on a commercial trawl fleet (standardized Portuguese trawl fleet [1989 to 2019])
Discards and bycatch	Included in the assessment since 1992 and considered negligible before. Data series from the main fleets raised to the effort.
Indicators	Fishing pressure indicator.
Other information	None.
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE).

## Information from stakeholders

There is no additional information available.

## History of the advice, catch, and management

**Table 5** Hake in divisions 8.c and 9.a, Southern stock. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Catch/landings corresponding to advice **	Agreed TAC ***	ICES estimated landings	ICES estimated discards	ICES estimated catch
1987	Precautionary TAC; juvenile protection	15000	25000	16185	-	-
1988	TAC; juvenile protection	15000	25000	16653	-	-
1989	TAC; juvenile protection	15000	20000	13786	-	-
1990	TAC; juvenile protection	15000	20000	13190	-	-
1991	Precautionary TAC	10000	18000	12827	-	-
1992	Precautionary TAC	10300	16000	13798	473	14271
1993	F = 10% of F <sub>91</sub>	1000	12000	11489	683	12172
1994	F lowest possible, at least reduced by 80%	2000	11500	9865	994	10859
1995	F lowest possible	-	8500	12239	2102	14341
1996	F lowest possible	-	9000	9730	1910	11640
1997	F lowest possible	-	9000	8499	2270	10769
1998	60% reduction in F	4000	8200	7683	1681	9364
1999	Reduce F below F <sub>pa</sub>	9500	9000	7171	1519	8690
2000	20% reduction from 1994–1998 average landings	<7700	8500	7902	1835	9737
2001	Reduce F below F <sub>pa</sub> ; no increase in landings	8500	8900	7581	1662	9243
2002	F below F <sub>pa</sub>	< 8000	8000	6697	1492	8189
2003	Lowest possible catch/ rebuilding plan	0	7000	6745	1461	8206
2004	Zero catch	0	5950	6940	913	7854
2005	Zero catch	0	5968	8302	1978	10280
2006	Zero catch	0	6661	10799	3262	14061
2007	Zero catch	0	6128	14934	2504	17438
2008	Zero catch	0	7047	16773	2311	19084
2009	Zero catch	0	8104	19242	2935	22177
2010	Reach B <sub>pa</sub> in 2011	4900	9300	15736	1580	17316
2011	See scenarios	< 9900	10695	17072	1948	19020
2012	MSY transition	< 14323	12299	14573	1822	16395
2013	MSY transition	< 10552	14144	11661	2549	14209

Year	ICES advice	Catch/landings corresponding to advice **	Agreed TAC ***	ICES estimated landings	ICES estimated discards	ICES estimated catch
2014	MSY transition	< 13123 *	16266	12011	2602	14614
2015	MSY approach	< 8417 *	13826	11786	2292	14077
2016	MSY approach	≤ 6078	10674	12443	2313	14756
2017	MSY approach	≤ 8049	10520	9171	1676	10847
2018	MSY approach	≤ 8561	9258	10183	1942	12125
2019	MSY approach	≤ 8281	9258	11800	1061	12861
2020	Management plan	6615 (range 4694–8991) #	8752			
2021	Precautionary approach	≤ 7825				

\*This value refers to total catch, including discards.

\*\* From 2016 this refers to total catch, including unwanted catch.

\*\*\* Applies to ICES Division 8.c and subareas 9 and 10; EU waters of CECAF 34.1.1.

# Catches corresponding to  $F_{MSY}$ , EU MAP range in brackets (EU, 2019).

### History of catch and landings

**Table 6** Hake in divisions 8.c and 9.a, Southern stock. Catch distribution by fleet in 2019 as estimated by ICES.

Catch (2019)	Landings			Discards
	39% trawlers	39% other fleets	22% unallocated	
12861 tonnes	11800 tonnes			1061 tonnes

**Table 7** Hake in divisions 8.c and 9.a, Southern stock. History of commercial catch and landings; both the official and ICES estimated values are presented by country for each country participating in the fishery. All weights are in tonnes. Cd-Trw – Cadiz trawl; Pr-Bk TRW – Pair-Baka trawl; Pa-Trw – Pair-trawl; Ba-Trw – Baka-trawl.

Year	Spain									Portugal				France*	Unallocated**	Total		
	Artisanal	Gillnet	Longline	Cd-Trw	Pr-Bk TRW	Pa-Trw	Ba-Trw	Discards	Landings	Artisanal	Trawl	Discards	Landings	Total		Discards	Landings	Catch
1972					10200				17300	4700	4100		8800	0		26100	26100	
1973					12300				20800	6500	7300		13800	200		34800	34800	
1974			2200		8300				14100	5100	3500		8600	100		22800	22800	
1975			3000		11200				19000	6100	4300		10400	100		29500	29500	
1976			2600		10000				16900	6000	3100		9100	100		26100	26100	
1977			1300		5800				9200	4500	1600		6100	200		15500	15500	
1978			2100		4900				8500	3400	1400		4800	100		13400	13400	
1979			2100		7200				11200	3900	1900		5800			17000	17000	
1980			5000		5300				12700	4500	2300		6800			19500	19500	
1981			4600		4100				10500	4100	1900		6000			16500	16500	
1982			4177	485	3923				10098	5009	2485		7494			17592	17592	
1983			6568	574	5293				14906	5185	2859		8044			22950	22950	
1984			7521	694	5844				16664	4296	1219		5515			22179	22179	
1985			4420	789	5334				13121	3768	2052		5820			18941	18941	
1986			3464	976	4861				12207	3159	1788		4947	7		17161	17161	
1987			4409	952	3501				11362	3470	1328		4798	25		16185	16185	
1988			2967	986	3977				10612	4303	1714		6017	24		16653	16653	
1989			1950	899	3920				9187	2736	1847		4583	16		13786	13786	
1990			2128	1196	4131				9765	2261	1138		3399	26		13190	13190	
1991	417	1406	2201	1210	3632				8866	2710	1245		3955	6		12827	12827	
1992	404	7100		975	3788			143	8700	3773	1325	329	5098		473	13798	14271	
1993	367	8500		541	2671			242	7577	3042	870	441	3912		683	11489	12172	
1994	374	1000	2600	325		820	1898	286	6778	2298	789	709	3087		994	9865	10859	
1995	365	1300	3500	457		2337	2937	927	8648	2565	1026	1175	3591		2102	12239	14341	
1996	227	1200	3100	976		1462	2174	915	6966	2007	758	995	2765		1910	9730	11640	
1997	304	600	1500	879		1317	1778	1070	6084	1519	897	1199	2415		2270	8499	10769	
1998	318	100	1400	525		878	1953	571	5045	1668	970	1110	2638		1681	7683	9364	
1999	335	200	1700	570		867	1588	353	3961	2120	1090	1166	3210		1519	7171	8690	
2000	260	200	2200	584		827	1980	622	4651	2092	1158	1213	3251		1835	7902	9737	
2001	317	300	1500	1203		1055	1124	370	4359	2023	1198	1292	3222		1662	7581	9243	

Year	Spain									Portugal				France*	Unallocated**	Total		
	Artisanal	Gillnet	Longline	Cd-Trw	Pr-Bk TRW	Pa-Trw	Ba-Trw	Discards	Landings	Artisanal	Trawl	Discards	Landings	Total		Discards	Landings	Catch
2002	221	265	1249	883		1372	748	379	3923	1808	965	1112	2774			1492	6697	8189
2003	373	374	2097	1251		1363	1065	411	4653	1129	962	1050	2092			1461	6745	8206
2004	476	333	2272	1062		1657	1131	222	4875	1266	799	691	2065			913	6940	7854
2005	717	768	1810	885		2769	1143	379	6241	1096	965	1599	2061			1978	8302	10280
2006	479	833	2073	634		4699	1808	2654	8673	1218	908	608	2126			3262	10799	14061
2007	827	533	1967	505		6709	2069	1192	12802	1408	724	1312	2132			2504	14934	17438
2008	1115	697	1985	529		6325	2436	1455	14563	1274	936	856	2210			2311	16773	19084
2009	1412	555	1863	551		7370	2537	976	16889	1390	964	1959	2353			2935	19242	22177
2010	724	587	1723	680		6332	1711	1004	13033	1614	727	575	2341	362		1580	15736	17316
2011	419	1091	761	527		2184	1479	1209	6462	1721	493	739	2214		8396	1948	17072	19020
2012	340	851	1079	500		1644	1416	1352	5831	1793	814	470	2607		6136	1822	14573	16395
2013	641	1751	1110	624		1863	1165	2219	7154	1933	812	330	2744	308	1455	2549	11661	14209
2014	754	1458	1604	540		1716	1184	2020	7256	1713	661	582	2374	136	2246	2602	12011	14614
2015	902	1115	1234	359		2014	1134	2061	6758	1238	763	231	2000	238	2789	2292	11786	14077
2016	909	1641	1305	419		2279	1509	2149	8063	1221	752	164	1973	233	2174	2313	12443	14756
2017	687	1514	1714	267		1599	1075	1432	6857	909	575	244	1484	67	763	1676	9171	10847
2018	765	1642	995	395		1543	1101	1765	6441	792	697	177	1489	60	2193	1942	10183	12125
2019***	776	1646	1121	425		1807	1493	754	7267	1114	801	307	1915	5	2612	1061	11800	12861

\* French catches were not considered in the category 1 assessment model in previous years.

\*\* Unallocated landings have been estimated and included since 2011.

\*\*\* Preliminary.

## Summary of the assessment

**Table 8** Hake in divisions 8.c and 9.a, Southern stock. Assessment summary\*. All weights are in tonnes.

Year	Relative biomass	High	Low	Landings	Discards	Relative fishing pressure	High	Low
1989	1.19	1.38	1.00	13786	0	0.84	0.97	0.72
1990	0.8	0.91	0.69	13190	0	1.20	1.39	1.01
1991	0.75	0.89	0.62	12827	0	1.22	1.45	0.99
1992	0.61	0.69	0.53	13798	473	1.82	2.1	1.53
1993	0.57	0.65	0.49	11489	683	1.53	1.77	1.30
1994	0.79	0.91	0.67	9865	994	0.98	1.13	0.82
1995	0.95	1.09	0.81	12239	2102	1.07	1.24	0.90
1996	1.09	1.26	0.92	9730	1910	0.78	0.90	0.66
1997	1.24	1.45	1.02	8499	2270	0.63	0.74	0.52
1998	0.78	0.89	0.68	7683	1681	0.86	0.99	0.73
1999	0.88	0.99	0.77	7171	1519	0.74	0.85	0.64
2000	0.69	0.82	0.55	7902	1835	1.02	1.24	0.80
2001	0.68	0.8	0.56	7581	1662	1.27	1.61	0.92
2002	0.69	0.77	0.60	6697	1492	1.05	1.26	0.84
2003	0.71	0.79	0.63	6745	1461	0.88	1.03	0.74
2004	0.84	0.94	0.73	6940	913	0.67	0.76	0.57
2005	1.11	1.25	0.96	8302	1978	0.67	0.75	0.59
2006	0.99	1.11	0.86	10799	3262	1.02	1.15	0.89
2007	0.91	1.03	0.80	14934	2504	1.35	1.52	1.19
2008	1.00	1.12	0.88	16773	2311	1.35	1.53	1.17
2009	1.38	1.61	1.16	19242	2935	1.25	1.40	1.11
2010	1.29	1.47	1.11	15736	1580	1.02	1.13	0.90
2011	1.36	1.55	1.16	17072	1948	1.08	1.21	0.96
2012	1.4	1.60	1.21	14573	1822	0.85	0.95	0.75
2013	1.10	1.27	0.92	11661	2549	0.92	1.06	0.77
2014	0.91	1.02	0.80	12011	2602	1.18	1.38	0.98
2015	1.67	1.89	1.44	11786	2292	0.61	0.68	0.54
2016	1.28	1.45	1.12	12443	2313	0.84	0.94	0.75
2017	1.14	1.29	0.99	9171	1676	0.68	0.76	0.60
2018	1.15	1.29	1.00	10183	1942	0.76	0.84	0.67
2019	1.09	1.21	0.97	11800	1061	0.84	0.93	0.74

\* French catches were considered in the category 3 assessment.

## Sources and references

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