

Whiting (*Merlangius merlangus*) in divisions 7.b–c and 7.e–k (southern Celtic Seas and western English Channel)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2023 should be no more than 1715 tonnes.

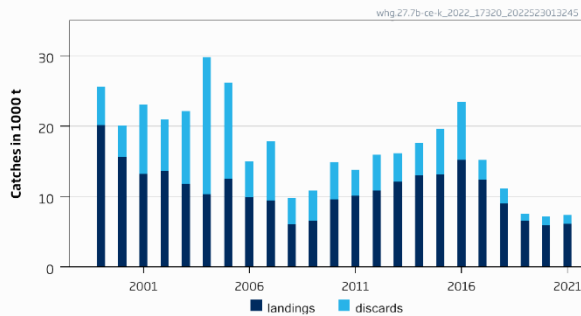
ICES notes the existence of a precautionary management plan, developed and adopted by one of the relevant management authorities for this stock.

Management should be implemented at the stock level.

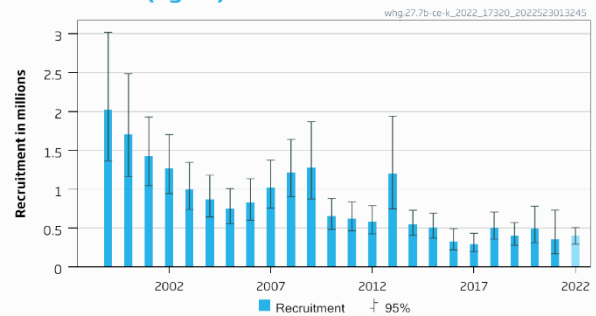
Stock development over time

Fishing pressure on the stock is above F_{MSY} and between F_{pa} and F_{lim} , and spawning-stock size is below MSY $B_{trigger}$, B_{pa} , and B_{lim} .

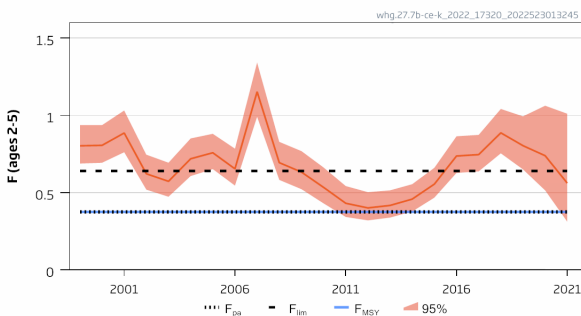
Catches



Recruitment (age 0)



F



SSB

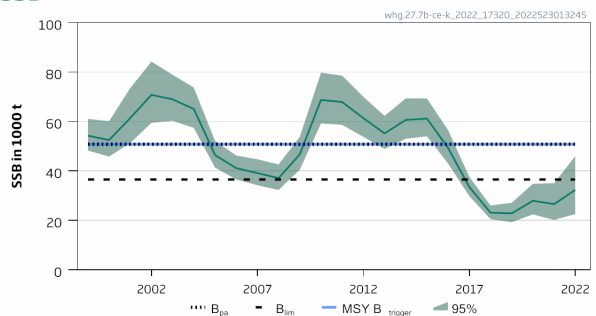


Figure 1 Whiting in divisions 7.b–c and 7.e–k. Summary of the stock assessment. The assumed recruitment value for 2022 is shaded in a lighter colour.

Catch scenarios

Table 1 Whiting in divisions 7.b–c and 7.e–k. The basis for the catch scenarios.

Variable	Value	Notes
$F_{ages\ 2-5}$ (2022)	0.701	$F_{sq} = F_{average}$ (2019–2021), unscaled
SSB (2023)	30 343	Short-term forecast; in tonnes.
Recruitment age 0 (2022–2023)	400 108	Median resampled (2015–2021); in thousands
Catch (2022)	10 741	Short-term forecast; in tonnes.
Projected landings (2022)	9228	Short-term forecast assuming average 2019–2021 landings pattern; in tonnes
Projected discards (2022)	1513	Short-term forecast assuming average 2019–2021 discard pattern; in tonnes

Table 2 Whiting in divisions 7.b–c and 7.e–k. Annual catch scenarios. All weights are in tonnes. No information on % TAC change can be shown because the TAC area differs from the stock area.

Basis	Total catch (2023)	Projected landings (2023)	Projected discards (2023)	F_{total} (2023)	$F_{projected}$ landings (2023)	$F_{projected}$ discards (2023)	SSB (2024)	% SSB change *	% advice change **	% probability of being below B_{lim} in 2024
ICES advice basis										
$SSB_{2024} = B_{lim}$	1715	1512	203	0.090	0.079	0.011	36571	21	–61	50
Other options										
MSY and precautionary considerations: $F = 0$	0	0	0	0.000	0.000	0.000	38109	26	–100	40
MSY approach: $F_{MSY} \times SSB_{2023} / MSY\ B_{trigger}$	4030	3542	488	0.224	0.199	0.025	34568	14	–9.5	62
EU MAP^^: $F_{MSY} \times SSB_{2023} / MSY\ B_{trigger}$	4030	3542	488	0.224	0.199	0.025	34568	14	–9.5	62
EU MAP^^: $F_{MSY\ lower} \times SSB_{2023} / MSY\ B_{trigger}$	3441	3026	415	0.188	0.167	0.021	35065	16	–23	59
$F = F_{MSY} = F_{pa}$	6322	5532	790	0.375	0.333	0.042	32641	8	42	72
$SSB_{2024} = B_{pa} = B_{trigger}^{\wedge}$										
$F = F_{2022}$	10376	9013	1363	0.701	0.622	0.079	29323	–3	133	86
$SSB_{2024} = SSB_{2023}$	9108	7939	1169	0.590	0.523	0.067	30343	0	105	82

* SSB 2024 relative to SSB 2023.

** Advice value for 2023 relative to the advice value for 2022 (4452 tonnes).

^ The B_{pa} and MSY $B_{trigger}$ options were left blank because neither can be achieved in 2024, even with zero catches.

^^ EU multiannual plan (MAP) for the Western Waters and adjacent waters (EU, 2019).

The advice for 2023 is 61% lower than last year because the stock remains below B_{lim} , incoming recruitment remains low, and a larger reduction in fishing mortality is needed to bring the stock above B_{lim} with 50% probability in 2024

Basis of the advice

Table 3 Whiting in divisions 7.b–c and 7.e–k. The basis of the advice.

Advice basis	MSY approach
Management plan	ICES is aware of the multiannual management plan (MAP) which has been adopted by the EU for this stock (EU, 2019) and which ICES considers to be precautionary. There is no agreed shared management plan with UK for this stock, and ICES provides advice according to ICES MSY approach. Catch scenarios consistent with the MAP F_{MSY} ranges are provided.

Quality of the assessment

This year's assessment shows an increasing retrospective pattern. There is a tendency for the assessment to result in overestimates of biomass and underestimates of fishing mortality, which may indicate model or data issues. If this pattern continues, the forecast will be overly optimistic in terms of SSB and the probabilities of the stock remaining below B_{lim} will be higher.

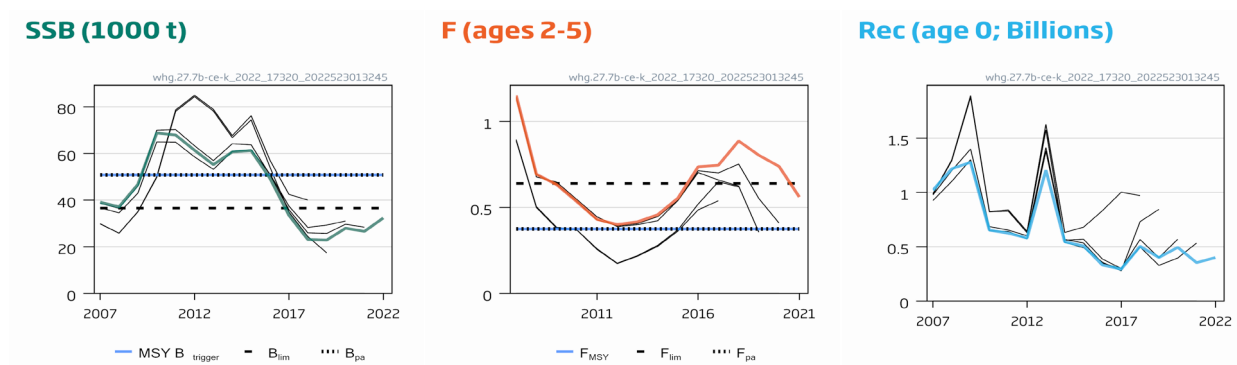


Figure 2 Whiting in divisions 7.b–c and 7.e–k. Historical assessment results (final-year SSB estimate and recruitment assumptions included). The stock was benchmarked in 2020 (ICES, 2020) and an interbenchmark completed in 2021 (ICES, 2021a). The reference points were revised in 2020 (following a benchmark), and only assessment results from the last three years should be compared to the reference points indicated.

Issues relevant for the advice

Distinct changes in recruitment are apparent for this stock, therefore intermediate year assumptions for recruitment were truncated to the recent seven years. The assumed recruitment in 2022 and 2023 used in the forecast constitutes a significant part (56.3%) of the projected SSB in 2024.

The forecast is also highly dependent on the assumption on F (or catch) for the intermediate year (2022). Using the catch assumptions derived from mixed-fishery analysis, under the haddock scenario (as done in 2021), was not considered to be appropriate this year. An average of the last three years' F is more appropriate to account for the tendency to underestimate recent F.

The assessment and advice are for divisions 7.b–c and 7.e–k, including reallocations from rectangles 33E2 and 33E3 of 59 t in Division 7.a.

Whiting in divisions 7.b–c and 7.e–k is fished under a common TAC with whiting in Division 7.d. By mixing the biological and TAC areas for different whiting stocks, it will be difficult to achieve the objective of fishing at maximum sustainable yield (MSY) for both stock areas. Hence, ICES recommends that the TAC area corresponds to the assessment area.

Mixed-fisheries considerations

Whiting in divisions 7.b–c and 7.e–k is caught as part of a mixed fishery. Most whiting are caught by otter trawls targeting fish; these trawls also catch haddock and varying amounts of other benthic and gadoid species (ICES, 2021b).

Reference points

Table 5 Whiting in divisions 7.b–c and 7.e–k. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	50818	B_{pa} ; in tonnes	ICES (2021a)
	F_{MSY}	0.375	From EqSim with segmented regression and fixed breakpoint (B_{lim}) capped to F_{P05} .	ICES (2021a)
Precautionary approach	B_{lim}	36571	B_{loss} ; lowest observed SSB (2008) from which stock recovery was observed; in tonnes	ICES (2021a)
	B_{pa}	50818	B_{lim} combined with the assessment error; $B_{lim} \times \exp(1.645 \times \sigma)$; $\sigma = 0.20$ (default setting); in tonnes	ICES (2021a)
	F_{lim}	0.64	F with 50% probability of SSB less than B_{lim}	ICES (2021a)
	F_{pa}	0.375	F_{P05} ; the F that leads to SSB $\geq B_{lim}$ with 95% probability	ICES (2021a)
Management plan	MAP MSY $B_{trigger}$	50818	MSY $B_{trigger}$; in tonnes	EU (2019), ICES (2021a)
	MAP B_{lim}	36571	B_{lim} ; in tonnes	EU (2019), ICES (2021a)
	MAP F_{MSY}	0.375	F_{MSY} .	EU (2019), ICES (2021a)
	MAP range F_{lower}	0.315	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY	EU (2019), ICES (2021a)
	MAP range F_{upper}	0.375	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY capped to F_{P05} .	EU (2019), ICES (2021a)

Basis of the assessment

Table 6 Whiting in divisions 7.b–c and 7.e–k. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2022a).
Assessment type	Analytical age-based assessment (State-space fish stock assessment model; SAM) that uses catches in the model and the forecast (ICES, 2022b).
Input data	Commercial catches (age composition of landings and discards); vector autoregressive spatiotemporal (VAST) standardized survey index (combined IGFS-WIBTS-Q4 [G7212] and EVHOE-WIBTS-Q4 [G9527]); maturity data (surveys and observer data; constant for all years); age-dependent natural mortalities (Lorenzen, 1996)
Discards and bycatch	Included in the assessment for the full time-series. Full observer-based estimates from 2003, partial observer-based estimates from 1999 to 2002.
Indicators	None.
Other information	This stock was benchmarked in 2020 (ICES, 2020) and interbenchmarked in 2021 (ICES, 2021a).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE).

History of the advice, catch, and management

Table 7 Whiting in divisions 7.b–c and 7.e–k. ICES advice and landings, as used in the assessment. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Landings corresponding to advice	Agreed TAC ^a	ICES landings	ICES discards
1987	Status quo F; TAC	-	7100*	18500	13720	
1988	Precautionary TAC	-	7000*	18500	15822	
1989	Precautionary TAC	-	7900*	19300	24276	
1990	No increase in F; TAC	-	8400*	24000	24099	
1991	Precautionary TAC	-	8000*	24000	14402	
1992	If required, precautionary TAC	-	8000*	22000	14419	
1993	Within safe biological limits	-	6600*	22000	17904	
1994	Within safe biological limits	-	< 9400*	29000	21659	
1995	20% reduction in F	-	8200**	31000	23559	
1996	20% reduction in F	-	600**	28000	19539	
1997	At least 20% reduction in F	-	< 7300***	27000	21067	
1998	At least 20% reduction in F	-	< 8200***	27000	19710	

Year	ICES advice	Catch corresponding to advice	Landings corresponding to advice	Agreed TAC [^]	ICES landings	ICES discards
1999	No increase in F	-	12400***	25000	24260	5420
2000	17% reduction in F	-	< 13100***	22200	16030	4400
2001	No increase in F	-	13500***	21000	13832	9877
2002	No increase in F	-	27700***	31700	14295	7336
2003	No increase in F	-	20200***	27000	11788	10337
2004	No increase in F	-	14000***	27000	10321	19522
2005	No increase in F	-	10600***	21600	12575	13598
2006	No increase in F	-	10800***	19940	9908	5098
2007	No increase in F	-	-	19940	9424	8439
2008	Reduction in F	-	-	19940	6080	3760
2009	Same advice as last year	-	-	16949	6574	4281
2010	Same advice as last year	-	-	14407	9570	5346
2011	See scenarios	-	-	16658	10084	3750
2012	No increase catch and improved gear selection	-	-	19053	10834	5116
2013	MSY approach	-	< 17500***	24500	12131	4026
2014	MSY approach	-	< 15562***	19162	12983	4672
2015	MSY approach	< 18501	< 14230	17742	13110	6528
2016	MSY approach	≤ 19076	≤ 15395	22778	15201	8259
2017	MSY approach	≤ 25125	≤ 19825	27500	12377	2791
2018	MSY approach	≤ 19429	≤ 13759	22213	9007	2139
2019	MSY approach	≤ 15841		19184	6588 [†]	970
2020	Management plan	6481 (range 4157–6481)		10863	5931	1266
2021	Management plan	5261 (range 4458–5261)		10259	6153	1224
2022	MSY approach	≤ 4452		8352		
2023	MSY approach	≤ 1715				

[^] TAC covers Subarea 7 (except Division 7.a).

* For the divisions 7.f and 7.g stock component.

** For the divisions 7.f–h stock component.

*** For the divisions 7.e–k stock component.

[†] Incomplete/missing as a result of part of the data being unavailable under data confidentiality clauses.

History of the catch and landings

Table 8 Whiting in divisions 7.b–c and 7.e–k. Catch distribution by fleet in 2021, as estimated by ICES.

Catch	Landings					Discards				
7377 tonnes	Otter trawls 76%	Seine nets 18%	Beam trawls 3%	Gillnets 1%	Other gears 2%	Otter trawls 83%	Seine nets 5%	Beam trawls 10%	Gillnets 1%	Other gears 2%
	6153 tonnes					1224 tonnes				

Table 9 Whiting in divisions 7.b–c and 7.e–k. History of commercial landings; the official landings by country and landings in rectangles 33E2 and 33E3. All weights are in tonnes.

Year	Belgium	France	Ireland	UK England and Wales	Others	Rectangles 33E2 and 33E3 **	Total
1998	479	6322	5549	1755	179		19710
1999	448	5119	6013	1354	27		24260
2000	194	5961	5358	1255	39		16032
2001	171	4731	5365	948	31		13832
2002	149	3596	5718	847	35		14297
2003	129	2871	4634	757	75		11788
2004	180	2776	4406	567	49		10321
2005	217	3402	5826	471	101		12575
2006	128	4287	4594	384	72		9908
2007	126	3866	5048	574	80		9424
2008	121	3986	2451	602	36		6080
2009	87	4928	2862	811	38		6574
2010	103	5623	4424	745	896		9570
2011	99	6281	4826	691	181		10084
2012	171	5290	5884	723	191	32	10834
2013	226	3625	6916	741	261	34	12131
2014	222	3221	6929	742	161	49	12983
2015	152	2697	6477	601	257	32	13110
2016	186	6322	7782	801	151	40	15201
2017	102	5119	6338	592	54	20	12377
2018	103	5961	4650	588	40	18	9007
2019	73	3203	2599†	487	125	24	6488†
2020	80	2697	2669	337	147	14	5931
2021*	81	2681	2973	354	65	59	6153

* Preliminary.

** Included in Irish landings. Landings in the southern part of Division 7.a (rectangles 33E2 and 33E3) are included in the assessment and are considered to be part of the stock.

† Incomplete/missing as a result of part of the data being unavailable under data confidentiality clauses.

Summary of the assessment

Table 10 Whiting in divisions 7.b–c and 7.e–k. Assessment summary. All weights are in tonnes and recruitment in thousands. ‘Low’ and ‘High’ refer to 95% confidence intervals.

Year	Recruitment age 0			SSB			Landings	Discards	Ages 2–5		
	Low	Value	High	Low	Value	High			Low	Value	High
1999	1362089	2027897	3019160	48260	54302	61100	20180	5420	0.69	0.80	0.94
2000	1163986	1701339	2486760	45815	52501	60164	15644	4400	0.69	0.81	0.94
2001	1046908	1421549	1930257	51288	61432	73583	13196	9877	0.76	0.89	1.03
2002	943722	1267864	1703340	59469	70799	84286	13640	7336	0.52	0.62	0.75
2003	739785	998197	1346874	60286	68985	78939	11788	10337	0.47	0.57	0.69
2004	643630	871785	1180819	57440	65094	73768	10321	19522	0.61	0.72	0.85
2005	557406	749519	1007845	41340	46453	52199	12575	13598	0.65	0.76	0.88
2006	601247	826353	1135740	36574	41147	46292	9908	5098	0.55	0.65	0.79
2007	757667	1020649	1374910	34226	39139	44757	9424	8439	0.99	1.15	1.34
2008	904652	1218297	1640683	32306	37123	42658	6080	3760	0.58	0.69	0.83
2009	873636	1278262	1870293	40539	46729	53865	6574	4281	0.52	0.63	0.77
2010	483184	652585	881377	59205	68742	79815	9570	5346	0.43	0.53	0.66
2011	466120	624387	836391	58664	67898	78585	10084	3750	0.34	0.43	0.54
2012	426262	579921	788972	53784	61381	70051	10834	5116	0.32	0.40	0.50
2013	749170	1205680	1940367	48902	55194	62296	12131	4026	0.34	0.42	0.52
2014	406667	545184	730884	53033	60670	69406	12983	4672	0.38	0.46	0.56
2015	371843	507319	692155	53992	61195	69360	13110	6528	0.47	0.56	0.66
2016	221522	330789	493952	42957	49278	56528	15201	8259	0.63	0.74	0.87

Year	Recruitment age 0			SSB			Landings	Discards	Ages 2–5		
	Low	Value	High	Low	Value	High			Low	Value	High
2017	197994	293206	434204	29806	33504	37662	12377	2791	0.64	0.75	0.87
2018	358994	504093	707837	20529	23130	26061	9007	2139	0.75	0.89	1.04
2019	279923	400108	571894	19251	22862	27150	6588	970	0.65	0.80	0.99
2020	312172	494034	781842	22428	27954	34842	5931	1266	0.51	0.74	1.06
2021	170388	353025	731427	20180	26600	35064	6153	1224	0.31	0.56	1.01
2022	293206	400108*	507319	22581	32346	46048					

* Median resampled (2010–2021).

Sources and references

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