

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 2022 should be no more than 4452 tonnes.

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

Stock development over time

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

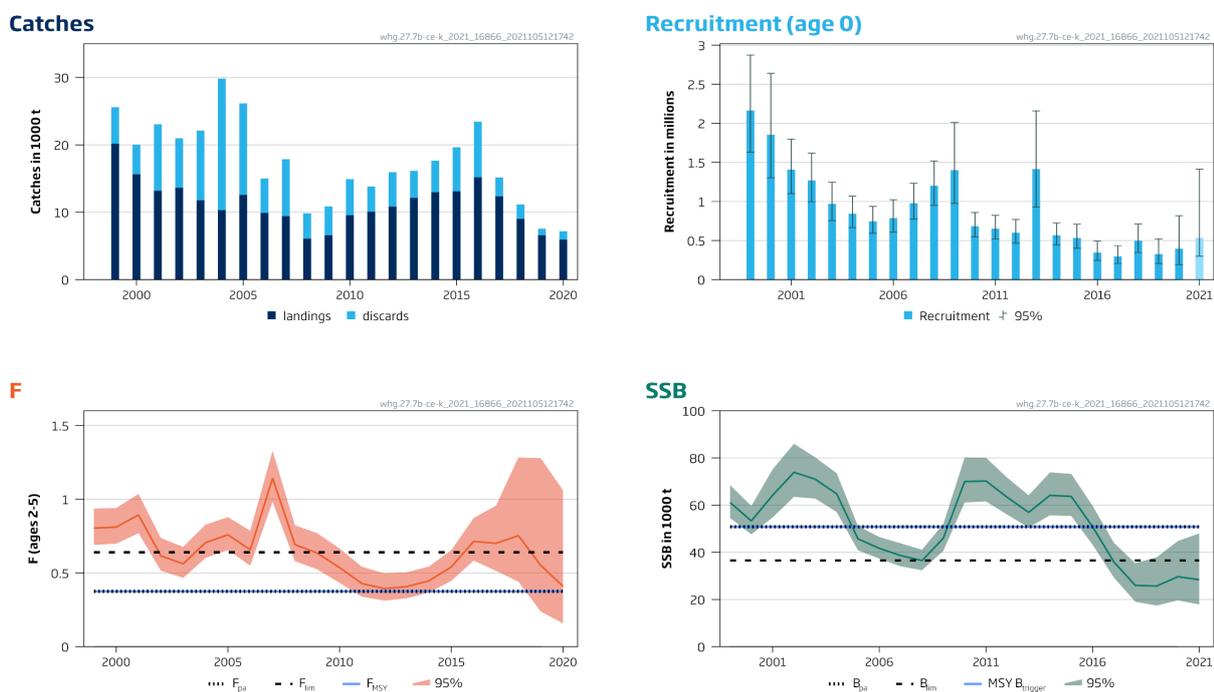


Figure 1 Whiting in divisions 7.b–c and 7.e–k. Summary of the stock assessment. The assumed recruitment value for 2021 is shaded in a lighter colour. Discard estimates are available since 2003; prior to 2003, discards have been reconstructed from incomplete sampling data.

Catch scenarios

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

Variable	Value	Notes
$F_{ages\ 2-5}$ (2021)	0.492	F based on catch of 8678 tonnes for 2021
SSB (2022)	30856	Short-term forecast fishing at $F = 0.492$; in tonnes
Recruitment age 0 (2021–2022)	533781	Median resampled (2010–2020); in thousands
Catch (2021)	8678	Catch based on mixed fisheries considerations (ICES, 2020a) when haddock is fished in 2021 at $F = 0.353$; in tonnes
Projected landings (2021)	7036	Short-term forecast assuming average 2018–2020 landings pattern; in tonnes
Projected discards (2021)	1642	Short-term forecast assuming average 2018–2020 discard pattern; in tonne.

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 (2022)	Projected landings (2022)	Projected discards (2022)	F _{total} (2022)	F _{projected landings} (2022)	F _{projected discards} (2022)	SSB (2023)	% SSB change*	% advice change**	% Probability of falling below B _{lim} in 2023
ICES advice basis										
MSY approach: F _{MSY} × SSB ₂₀₂₂ /MSY B _{trigger}	4452	3539	913	0.228	0.189	0.039	37372	21	-15.4	47
Other scenarios										
EU MAP^^: F _{MSY} × SSB ₂₀₂₂ /MSY B _{trigger}	4452	3539	913	0.228	0.189	0.039	37372	21	-15.4	47
EU MAP^^: F _{MSY lower} × SSB ₂₀₂₂ /MSY B _{trigger}	3801	3028	773	0.191	0.158	0.033	37930	23	-28	44
F = 0	0	0	0	0.000	0.000	0.000	41192	33	-100	29
F = F _{MSY} = F _{pa}	6883	5440	1443	0.375	0.310	0.065	35338	15	31	55
SSB ₂₀₂₃ = B _{lim}	5414	4296	1118	0.284	0.235	0.049	36571	19	3	50
SSB ₂₀₂₃ = B _{pa} = B _{trigger} ^										
F = F ₂₀₂₁	7803	6060	1743	0.492	0.407	0.085	33115	7	48	63
SSB ₂₀₂₃ = SSB ₂₀₂₂	11274	8706	2568	0.756	0.625	0.131	30856	0	114	70

* SSB 2023 relative to SSB 2022.

** Advice value for 2022 relative to the advice value for 2021 (5261 tonnes).

† Numbers presented are approximations of the reference point values.

^ The B_{pa} and MSY B_{trigger} options were left blank, because B_{pa} and MSY B_{trigger} cannot be achieved in 2023, even with zero catches.

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

The advice for 2022 (4452 t) has decreased compared to advice for 2021 because of revised reference points and a lower SSB used in the forecast.

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

An interbenchmark was carried out for this stock in 2021 (ICES, 2021a). The model input data were updated with additional discard data, re-estimated weights-at-age, and a revision to the allocation of sampling across catch. Reference points were revised accordingly.

The stock shows an increase in retrospective patterns compared to the previous year's assessment, but the consistency of estimated SSB remains within acceptable limits.

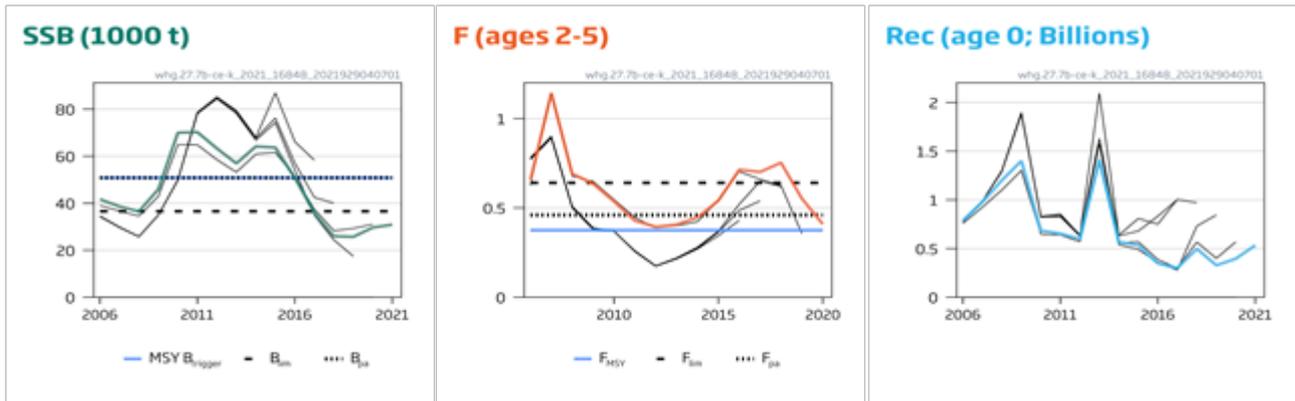


Figure 2 Whiting in divisions 7.b–c and 7.e–k. Historical assessment results (final-year SSB estimate and recruitment assumptions included). The stock was benchmarked in 2020 (ICES, 2020) and an interbenchmark completed in 2021 (ICES, 2021a).

Issues relevant for the advice

The assessment and the advice are for divisions 7.b–c and 7.e–k, including reallocations from rectangles 33E2 and 33E3 in Division 7.a. There was a significant amount of discarding in the past, but this has decreased.

Because the SSB is currently below B_{lim} , ICES has provided the probability of SSB being below B_{lim} in 2023 for each of the scenarios presented in Table 2. Given the advised catch of 4452 tonnes, the probability of SSB being below B_{lim} in 2023 is 47%. In comparison, the scenario with zero catches in 2022 has a 29% probability of SSB being below B_{lim} in 2023.

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 with haddock and cod. Mixed-fisheries advice will be provided as part of the Celtic Seas fisheries overview later in the year.

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 (2021)
	F_{MSY}	0.375	From EqSim with segmented regression and fixed breakpoint (B_{lim}) capped to F_{P05} .	ICES (2021)
Precautionary approach	B_{lim}	36571	B_{loss} ; lowest observed SSB (2008) from which stock recovery was observed; in tonnes	ICES (2021)
	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 (2021)
	F_{lim}	0.64	F with 50% probability of SSB less than B_{lim}	ICES (2021)
	F_{pa}	0.375	F_{P05} ; the F that leads to SSB $\geq B_{lim}$ with 95% probability	ICES (2021)
Management plan	MAP MSY $B_{trigger}$	50818	MSY $B_{trigger}$; in tonnes	EU (2019), ICES (2021)
	MAP B_{lim}	36571	B_{lim} ; in tonnes	EU (2019), ICES (2021)
	MAP F_{MSY}	0.375	F_{MSY} .	EU (2019), ICES (2021)
	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 (2021)
	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 $F_{p0.5}$.	EU (2019), ICES (2021)

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, 2021b).
Assessment type	Analytical age-based assessment (State-space fish stock assessment model; SAM) that uses catches in the model and the forecast (ICES, 2021c).
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 [^]	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		
2022	MSY approach	≤ 4452				

[^] 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.

History of the catch and landings

Table 8 Whiting in divisions 7.b–c and 7.e–k. Catch distribution by fleet in 2020, as estimated by ICES.

Catch	Landings					Discards				
	Otter trawls	Seine nets	Beam trawls	Gill Nets	Other gears	Otter trawls	Seine nets	Beam trawls	Gill Nets	Other gears
7197 tonnes	79%	15%	2%	1%	3%	81%	1%	14%	2%	2%
	5931 tonnes					1266 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

Year	Belgium	France	Ireland	UK England and Wales	Others	Rectangles 33E2 and 33E3 **	Total
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	4731	2672	486	136	24	6588
2020*	80	3596	2669	329	154	14	5931

* 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.

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	F ages 2–5		
	Value	Low	High	Value	Low	High			Value	Low	High
1999	2164746	1630362	2874285	61155	54562	68545	20180	5420	0.804	0.69	0.937
2000	1854498	1302778	2639869	53303	47616	59669	15644	4400	0.811	0.698	0.941
2001	1406546	1100727	1797332	64208	54794	75239	13196	9877	0.893	0.77	1.036
2002	1270409	996812	1619099	73921	63504	86047	13640	7336	0.616	0.515	0.737
2003	969463	754657	1245413	70959	62752	80239	11788	10337	0.562	0.466	0.677
2004	843915	665849	1069600	64785	57046	73574	10321	19522	0.706	0.602	0.828
2005	746124	594158	936959	45709	40839	51161	12575	13598	0.759	0.655	0.879
2006	788980	608365	1023217	41667	37324	46515	9908	5098	0.657	0.549	0.787
2007	977045	773793	1233686	38626	34034	43838	9424	8439	1.143	0.982	1.329
2008	1201563	950051	1519659	36493	32390	41117	6080	3760	0.692	0.58	0.824
2009	1400384	975170	2011010	45959	40621	51999	6574	4281	0.635	0.524	0.769
2010	685700	547050	859492	69991	61094	80182	9570	5346	0.536	0.432	0.666
2011	653475	519382	822188	70233	61565	80121	10084	3750	0.428	0.338	0.542
2012	600632	468107	770676	63302	55938	71636	10834	5116	0.394	0.312	0.498
2013	1414790	927480	2158141	56931	50490	64194	12131	4026	0.407	0.328	0.505
2014	567204	443861	724824	64149	55692	73892	12983	4672	0.447	0.367	0.544
2015	533781	401170	710229	63702	55396	73253	13110	6528	0.541	0.446	0.656
2016	348159	245858	493028	50810	43212	59744	15201	8259	0.714	0.584	0.873
2017	299364	206517	433954	35894	29262	44029	12377	2791	0.701	0.514	0.957
2018	497185	346494	713413	25981	19060	35415	9007	2139	0.753	0.441	1.284
2019	328106	206650	520948	25705	17431	37904	6588	970	0.552	0.238	1.279
2020	395701	191470	817776	29668	19636	44824	5931	1266	0.409	0.158	1.06
2021	533781*	299364	1414790	28381	17873	48042					

* Median resampled (2010–2020).

Sources and references

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[Download the stock assessment data and figures.](#)

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