

Whiting (*Merlangius merlangus*) in Division 6.a (West of Scotland)

ICES advice on fishing opportunities

Please note: The present advice replaces the advice given in June 2020 for catches in 2022.

ICES advises that when the MSY approach is applied, catches in 2022 should be no more than 4114 tonnes.

Stock development over time

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

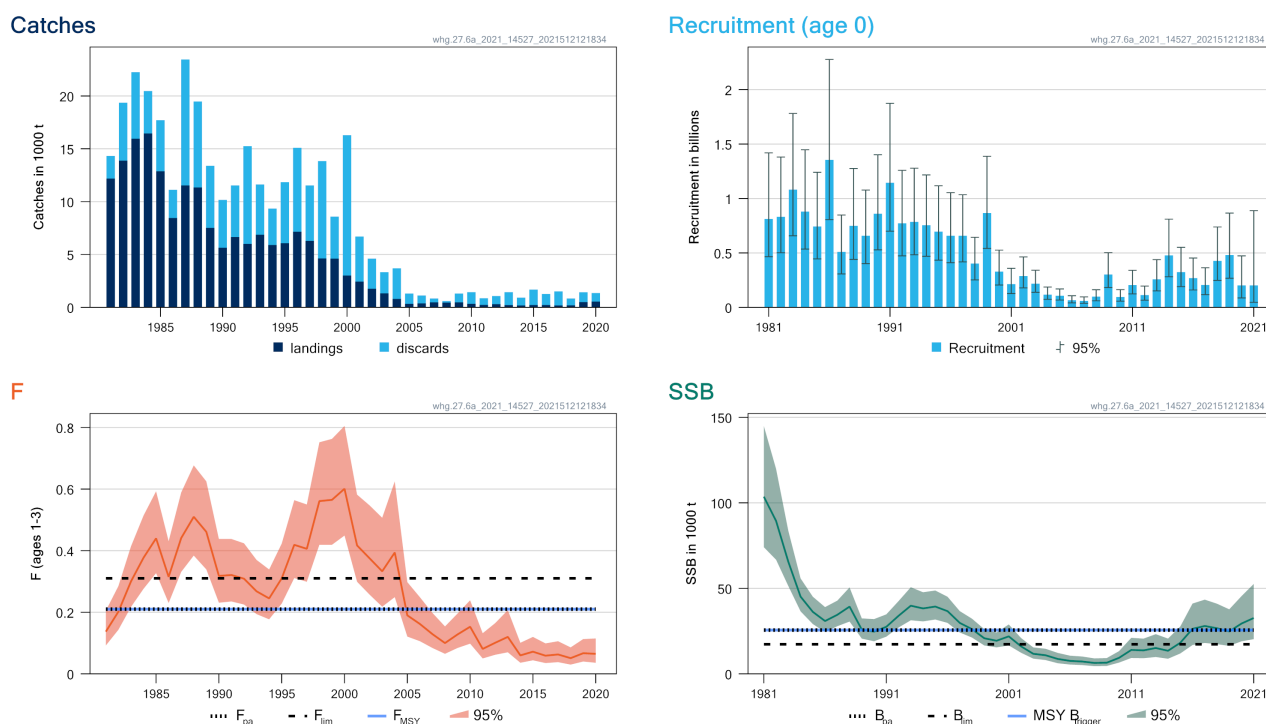


Figure 1 Whiting in Division 6.a. Summary of the stock assessment.

Catch scenarios

Table 1 Whiting in Division 6.a. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
F _{ages 1–3} (2021)	0.065	$F = F_{average} (2016–2020)$ rescaled to F_{2020}
SSB (2022)	31 548	Short-term forecast; tonnes
R _{age 0} (2021)	202 757	Assessment estimate in 2021; thousands
R _{age 0} (2022)	268 962	Median recruitment, resampled from the years 2012–2021; thousands
Catch (2021)	1245	Short-term forecast; tonnes
Projected landings (2021)	552	Short-term forecast; assuming average landings ratio by age 2019–2020; tonnes
Projected discards (2021)	693	Short-term forecast; assuming average discard ratio by age 2019–2020; tonnes

Table 2 Whiting in Division 6.a. Annual catch scenarios. All weights are in tonnes.

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^
ICES advice basis									
MSY approach: MSY	4114	2142	1972	0.21	0.038	0.172	26 294	-16.70	
Other scenarios									
F = 0	0	0	0	0	0	0	31 193	-1.13	
F _{MSY lower}	3433	1784	1649	0.173	0.031	0.142	27 062	-14.20	
F _{MSY upper}	4114	2142	1972	0.21	0.038	0.172	26 294	-16.70	
F _{pa}	4114	2142	1972	0.21	0.038	0.172	26 294	-16.70	
F _{lim}	5870	3074	2796	0.31	0.056	0.25	24 383	-23	
SSB (2023) = B _{lim}	13 196	7039	6157	0.82	0.148	0.67	17 286	-45	
SSB (2023) = B _{pa} = MSY B _{trigger}	4750	2479	2271	0.25	0.044	0.2	25 597	-18.90	
SSB (2023) = SSB (2022)^									
F = F ₂₀₂₁	1332	688	644	0.065	0.0117	0.053	29 530	-6.40	

* Marketable landings, assuming recent discard rate.

** Including BMS landings (EU stocks), assuming recent discard rate.

*** SSB 2023 relative to SSB 2022.

^ This is not provided because the advice for 2021 was zero.

^^ The SSB (2023) = SSB (2022) option was left blank because this cannot be achieved in 2023, even with zero catch in 2022.

Last year's advice was zero. Following the benchmark, the advice for 2022 is 4114 tonnes.

Basis of the advice

Table 3 Whiting in Division 6.a. The basis of the advice.

Advice basis	MSY approach
Management plan	The EU multiannual plan (MAP) for stocks in Western Waters and adjacent waters (EU, 2019) takes into account bycatch of this species. There is no agreed shared management plan with UK for this stock, and ICES provides advice according to ICES MSY approach.

Quality of the assessment

This stock assessment was benchmarked in 2021 (ICES, 2021a) and, as a result, the stock was changed from category 5 to category 1. The assessment, which is now based on SAM, includes revised catch and survey data and updated biological parameters and also accounts for changes in fishery selectivity. Reference points were also revised. These changes have resulted in a more reliable assessment and a change in the stock status.

The majority of catches have been discarded in recent years. Reduced sampling because of the COVID-19 disruption means that discard estimates are based on incomplete sampling of the fisheries in 2020. However, this is considered to have had minimal impact on the perception of the stock status.

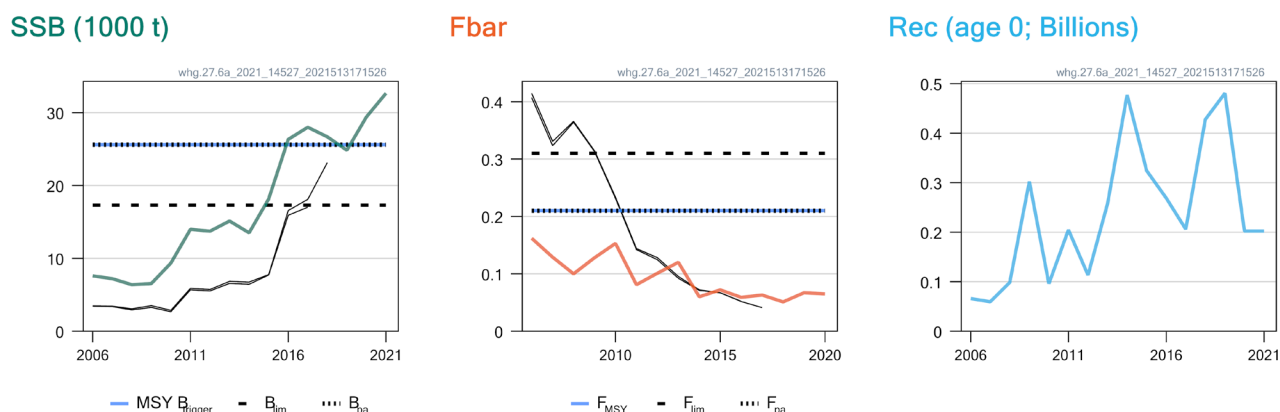


Figure 2 Whiting in Division 6.a. Historical assessment results (final-year SSB and recruitment estimates included). This stock was benchmarked in 2021 at which point F_{bar} was changed from F_{2-4} to F_{1-3} , and recruitment age was changed from age 1 to age 0. The reference points were revised in 2021 following a benchmark, and only the last assessment results should be compared to the reference points indicated.

Issues relevant for the advice

The advice for many years has been zero. The benchmark has led to a change in the perception of the stock because of a combination of increase and level in biomass and a revision of the reference points. As a consequence, the advice for 2022, based on the MSY approach, is 4114 tonnes.

The TAC is for ICES Subarea 6 and European Union and international waters of Division 5.b and subareas 12 and 14, and includes Division 6.a, for which the advice is given separately.

The increase in mesh size from 100 mm to 120 mm, established under the emergency measures since 2010, and the introduction of large square mesh panels in the *Nephrops* fishery, are likely to have contributed to the observed reductions in fishing mortality.

In 2019 and 2020, there was a significant decrease in the proportion of discards because of an increase in TAC compared to recent years. The partition of catch into projected landings and discards in the forecast is based on the assumption that the discard pattern by age seen in 2019 and 2020 will continue in 2021 and 2022.

Reference points

Table 4 Whiting in Division 6.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	25 597	B_{pa} , in tonnes	ICES (2021a)
	F_{MSY}	0.21	Stochastic simulations (EqSim)	ICES (2021a)
Precautionary approach	B_{lim}	17 286	Lowest SSB (1999) within period of high recruitment (pre- 2000); in tonnes	ICES (2021a)
	B_{pa}	25 597	$B_{lim} \times \exp(1.645 \times \sigma)$; $\sigma = 0.239$ (CV on estimate of SSB 2020); in tonnes	ICES (2021a)
	F_{lim}	0.31	F giving 50% probability of $SSB < B_{lim}$ in stochastic simulation (EqSim) uses segmented regression recruitment with breakpoint = B_{lim} (S-R pairs from 1985 onwards)	ICES (2021a)
	F_{pa}	0.21	$F_{p.05}$; the F that leads to $SSB \geq B_{lim}$ with 95% probability	ICES (2021a)
Management plan	SSB_{mgt}	Not applicable		
	F_{mgt}	Not applicable		

Basis of the assessment

Table 5 Whiting in Division 6.a. The basis of the assessment.

ICES stock data category	1 (ICES, 2021b)
Assessment type	Age-based analytic assessment (SAM; ICES, 2021c) that uses catches in the model and in the forecast
Input data	Commercial landings, estimated discards, age composition of catches. Three survey indices: ScoGFS-WIBTS-Q1 (G1179); UK-SCOWCGFS-Q1 (G4748); and a modelled Q4 index estimated using ScoGFS-WIBTS-Q4 (G4299), IGFS-WIBTS-Q4 (G7212) and UK-SCOWCGFS-Q4 (G4815). A fixed maturity ogive; natural mortalities-at-age (Lorenzen, 1996); stock weights-at-age from survey and catch data.
Discards and bycatch	Included in the assessment (ages 0+), dataserie from the main fleets (covering 95% of the landings)
Indicators	SURBAR analysis
Other information	The stock was benchmarked in 2021 (WKNSEA; ICES, 2021a)
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

History of the advice, catch and management

Table 6 Whiting in Division 6.a. History of ICES advice, the agreed TAC, ICES estimates of landings and discards. Weights in tonnes.

Year	ICES advice/ single-stock exploitation boundaries since 2004	Catch corresponding to advice	Agreed TAC*	Official landings	ICES landings	ICES Discards [^]	ICES catch
1987	No increase in F	15 000	16 400	12 399	11 544	11 918	23 462
1988	No increase in F; TAC	15 000	16 400	11 879	11 352	8 132	19 458
1989	No increase in F; TAC	13 000	16 400	7 669	7 531	5 876	13 407
1990	No increase in F; TAC	11 000	11 000	6 026	5 643	4 530	10 173
1991	70% of effort (89)	-	9 000	6 908	6 660	4 883	11 543
1992	70% of effort (89)	-	7 500	6 010	6 004	9 249	15 253
1993	70% of effort (89)	-	8 700	6 751	6 872	4 759	11 631
1994	30% reduction in effort	-	6 800	5 786	5 901	3 455	9 356
1995	Significant reduction in effort	-	6 800	6 277	6 076	5 771	11 847
1996	Significant reduction in effort	-	10 000	6 642	7 156	7 940	15 096
1997	Significant reduction in effort	-	13 000	6 178	6 285	5 251	11 536
1998	No increase in F	6 500	9 000	4 657	4 631	216	13 847
1999	Reduce F below F_{pa}	4 300	6 300	4 677	4 613	3 975	8 588
2000	Reduce F below F_{pa}	< 4 300	4 300	3 203	3 010	13 285	16 295
2001	Reduce F below F_{pa}	< 4 200	4 000	2 543	2 438	4 263	6 701
2002	SSB > B_{pa} in the short term	< 2 000	3 500	1 735	1 709	2 851	4 560
2003	No cod catches	-	2 000	1 365	1 331	1 984	3 316
2004	SSB > B_{pa} in the short term	< 2 100**	1 600	819	798	2 887	3 686
2005	Exploitation not allowed to increase	< 1 600	1 600	289	335	972	1 307
2006	Lowest possible level	0	1 360	383	378	746	1 124
2007	Lowest possible level	0	1 020	488	481	366	847
2008	Lowest possible level	0	765	440	441	156	598
2009	Same advice as last year	0	574	482	480	826	1 305
2010	Same advice as last year	0	431	349	345	1 091	1 436
2011	See scenarios	-	323	230	231	630	861
2012	Reduce catches	-	307	301	300	742	1 042
2013	Lowest possible catch, improve selectivity	0	292	214	215	1 172	1 387
2014	Lowest possible catch, improve selectivity	0	292	181	181	745	926
2015	Lowest possible catch	0	263	221	221	1 458	1 679
2016	Precautionary approach (minimize all catches)	0	213	232	227	1 040	1 266
2017	MSY approach	0	213	169	168	1 331	1 498
2018	MSY approach	0	213	180	189	666	855
2019	Precautionary approach	0	1 112	485^^	484	960	1 444
2020	Precautionary approach	0	937	537^^	541	834	1 375
2021	Precautionary approach	0	937				
2022	MSY approach	≤4 114					

* Subarea 6; EC waters of Division 5.b; and international waters of subareas 12 and 14.

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

[^] Pre-2003 discards are estimated for ages 1+ only.

^{^^} Preliminary official landings.

History of the catch and landings

Table 7 Whiting in Division 6.a. Catch distribution by fleet in 2020 as estimated by ICES.

Catch	Landings			Discards		
1 375 tonnes	Finfish directed otter trawl	<i>Nephrops</i> directed otter trawl	Other gear	Finfish directed otter trawl	<i>Nephrops</i> directed otter trawl	Other gear
	96%	< 1%	4%	8%	92%	< 1%
	541 tonnes			834 tonnes		

Table 8 Whiting in Division 6.a. History of official landings by country, and BMS (below minimum size) landings (tonnes).

Year	Belgium	Denmark	Faroe Islands	France	Germany	Ireland	Netherlands	Norway	Spain	UK (E W & NI)	UK (Scot.)	UK (total)	Official BMS landings	Total official landings
1989	1	1	-	199	< 0.5	1 315	-	-	-	44	6 109			7 669
1990	-	< 0.5	-	180	-	977	-	-	-	50	4 819			6 026
1991	-	3	-	352	< 0.5	1 200	-	-	-	218	5 135			6 908
1992	-	1	-	105	1	1 377	-	-	-	196	4 330			6 010
1993	-	1	-	149	1	1 192	-	-	-	184	5 224			6 751
1994	-	< 0.5	-	191	< 0.5	1 213	-	-	-	233	4 149			5 786
1995	-	< 0.5	-	362	-	1 448	-	-	1	204	4 263			6 277
1996	-	< 0.5	-	202	-	1 182	-	-	-	237	5 021			6 642
1997	1	< 0.5	-	108	-	977	-	-	1	453	4 638			6 178
1998	1	-	-	82	-	952	-	-	2	251	3 369			4 657
1999	< 0.5	-	-	300	-	1 121	-	-	< 0.5	210	3 046			4 677
2000	-	-	-	48	-	793	-	-	-	104	2 258			3 203
2001	-	-	-	52	-	764	-	-	2	71	1 654			2 543
2002	-	-	-	21	-	577	-	-	-	73	1 064			1 735
2003	-	< 0.5	-	11	-	568	-	-	-	35	751			1 365
2004	< 0.5	< 0.5	-	6	-	356	-	-	-	13	444			819
2005	-	-	-	9	-	172	-	-	-	5	103			289
2006	-	-	-	7	-	196	-	-	-	2	178			383
2007	-	-	-	6	1	56	-	-	-	20	405			488
2008	-	-	-	1	-	69	-	-	-	2	368			440
2009	-	-	< 0.5	1	-	125	-	2	-	-	354			482
2010	-	-	-	3	-	99	-	-	-	2	245			349
2011	-	-	1	-	-	149	-	-	-	-	-	80		230
2012	-	-	1	-	-	96	-	-	-	-	-	204		301
2013	-	-	-	1	-	97	-	-	-	-	-	116		214
2014	-	-	-	1	-	97	-	-	-	-	-	83		181
2015	-	-	-	< 0.5	-	88	11	-	-	-	-	122		221
2016	-	-	-	-	-	77	52	-	-	-	-	98		232
2017	-	-	-	3	-	53	19	-	-	-	-	94		169
2018	-	2	-	2	-	72	2	< 0.5	-	-	-	101	2	187
2019*	-	56	-	6	-	160	23	-	< 0.5	-	-	240	< 0.5	486
2020*	-	10	-	10	-	126	4	-	-	-	-	387	11	548

* Preliminary.

Summary of the assessment

Table 9 Whiting in Division 6.a. Assessment summary with weights in tonnes and recruitment in thousands. 'High' and 'Low' refer to 95% confidence intervals.

Year	Recruitment age 0			SSB			Landings*	Discards*	Fishing mortality ages 1–3		
	Low	Value	High	Low	Value	High			Low	Value	High
1981	465 262	812 632	1 419 351	74 077	103 635	144 988	12 194	2 132	0.092	0.137	0.21
1982	501 677	832 298	1 380 808	66 723	89 433	119 873	13 880	5 485	0.143	0.20	0.28
1983	657 335	1 082 047	1 781 169	51 338	65 543	83 679	15 962	6 294	0.22	0.30	0.41
1984	535 282	880 298	1 447 695	36 533	45 164	55 834	16 459	4 017	0.28	0.38	0.51
1985	445 080	743 245	1 241 153	29 124	36 258	45 139	12 879	4 840	0.33	0.44	0.59
1986	805 575	1 354 517	2 277 523	24 445	30 897	39 051	8 458	2 669	0.23	0.32	0.43
1987	306 843	510 155	848 182	27 854	34 540	42 830	11 542	11 918	0.33	0.44	0.59
1988	440 604	749 690	1 275 601	30 585	39 326	50 565	11 349	8 132	0.38	0.51	0.68
1989	400 876	657 216	1 077 470	20 587	25 845	32 445	7 523	5 876	0.34	0.46	0.63
1990	527 857	860 236	1 401 908	19 065	24 713	32 034	5 642	4 530	0.23	0.32	0.44
1991	699 569	1 145 112	1 874 414	21 738	27 507	34 806	6 657	4 883	0.24	0.32	0.44
1992	473 316	771 780	1 258 450	27 081	33 953	42 570	6 004	9 249	0.23	0.31	0.42
1993	483 253	785 939	1 278 212	31 336	39 854	50 688	6 871	4 759	0.194	0.27	0.37
1994	469 025	755 366	1 216 520	30 672	38 262	47 730	5 900	3 455	0.177	0.25	0.34
1995	433 842	696 054	1 116 743	31 775	39 359	48 754	6 078	5 771	0.23	0.31	0.42
1996	410 330	657 609	1 053 908	29 801	36 665	45 110	7 158	7 940	0.31	0.42	0.56
1997	417 443	657 222	1 034 728	24 193	29 797	36 700	6 291	5 251	0.30	0.41	0.55
1998	252 031	402 613	643 164	21 186	26 139	32 251	4 628	9 216	0.42	0.56	0.75
1999	540 952	866 442	1 387 781	16 587	20 824	26 144	4 613	3 975	0.42	0.56	0.76
2000	205 250	328 494	525 742	15 476	19 360	24 218	3 011	13 285	0.45	0.60	0.81
2001	126 774	213 390	359 184	16 617	21 924	28 925	2 439	4 263	0.30	0.42	0.58
2002	178 714	287 758	463 337	12 338	16 093	20 990	1 768	2 851	0.26	0.38	0.55
2003	138 394	217 260	341 069	8 886	11 725	15 472	1 331	1 987	0.22	0.33	0.51
2004	73 390	117 059	186 712	8 068	10 887	14 691	799	2 889	0.25	0.39	0.63
2005	66 983	106 349	168 850	6 193	8 716	12 266	335	971	0.121	0.190	0.30
2006	40 679	65 960	106 951	5 427	7 594	10 625	378	748	0.106	0.162	0.25
2007	36 687	59 396	96 160	5 116	7 207	10 152	481	367	0.084	0.129	0.198
2008	60 072	98 577	161 761	4 496	6 381	9 054	441	156	0.065	0.100	0.154
2009	182 003	302 352	502 283	4 620	6 540	9 259	480	826	0.084	0.128	0.196
2010	56 583	96 013	162 923	6 574	9 349	13 295	338	1 094	0.098	0.153	0.24
2011	123 313	204 747	339 959	9 270	13 982	21 088	229	631	0.050	0.081	0.132
2012	65 608	113 307	195 684	9 143	13 726	20 606	304	772	0.062	0.101	0.165
2013	151 416	257 644	438 396	9 845	15 121	23 223	216	1 225	0.070	0.120	0.21
2014	281 295	477 394	810 199	8 832	13 503	20 643	181	748	0.036	0.060	0.101
2015	190 603	324 234	551 552	11 906	18 159	27 698	223	1 457	0.044	0.072	0.120
2016	159 543	268 962	453 425	16 856	26 328	41 122	226	1 038	0.035	0.059	0.099
2017	116 683	206 089	364 003	18 052	27 995	43 413	178	1 326	0.038	0.063	0.106
2018	247 842	427 777	738 345	17 347	26 677	41 027	190	648	0.030	0.051	0.086
2019	266 965	480 698	865 547	16 342	24 840	37 756	502	925	0.040	0.067	0.113
2020	86 502	202 293	473 082	19 032	29 416	45 466	544	826	0.036	0.065	0.115
2021	46 062	202 293	888 426	20 282	32 659	52 590					

* Calculated using sum of products from the catch numbers-at-age and mean weights-at-age. Pre-2003 discards are estimated for ages 1+ only.

Sources and references

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

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