

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

ICES stock advice

ICES advises that when the MSY approach is applied, catches in 2018 should be no more than 19 429 tonnes.

Stock development over time

The spawning–stock biomass (SSB) has remained well above $MSY B_{trigger}$ since 2009. Fishing mortality (F) has been below F_{MSY} since 2008, and has increased in recent years. Recruitment has been below average since 2010 with the exception of the 2013 year class, which is estimated to be the second highest in the series.



Figure 1 Whiting in divisions 7.b–c and 7.e–k. Summary of the stock assessment. The assumed recruitment values are not shaded.

Stock and exploitation status

Table 1 Whiting in divisions 7.b–c and 7.e–k. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size		
		2014	2015	2016	2015	2016	2017
Maximum Sustainable Yield	F_{MSY}	✓	✓	✓ Below	$MSY B_{Trigger}$	✓	✓ Above trigger
Precautionary Approach	F_{pa} F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa} B_{lim}	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}	—	— Not applicable

[†] Version 2: Stock area corrected

Catch options

Table 2 Whiting in divisions 7.b–c and 7.e–k. The basis for the catch options.

Variable	Value	Source	Notes
F ages 2–5 (2017)	0.43	ICES (2017a)	$F_{sq} = F_{average}$ (2014–2016) scaled to F_{2016}
SSB (2018)	48 763 tonnes	ICES (2017a)	Fishing at F_{sq}
Recruitment age 0 (2017–2018)	1 005 961 thousands	ICES (2017a)	$GM_{1999-2015}$
Total catch (2017)	20 788 tonnes	ICES (2017a)	Fishing at F_{sq}
Landings (2017)	15 801 tonnes	ICES (2017a)	Average discard pattern (2014–2016)
Discards (2017)	5 097 tonnes	ICES (2017a)	Average discard pattern (2014–2016)

Table 3 Whiting in divisions 7.b–c and 7.e–k. Annual catch options. All weights are in tonnes. No information on % TAC change can be shown because TAC area differs from the stock distribution area.

Basis	Total catch (2018)	Wanted catch* (2018)	Unwanted catch* (2018)	F_{total} (2018)	F_{wanted} (2018)	$F_{unwanted}$ (2018)	SSB (2019)	% SSB change **
ICES advice basis								
MSY approach: F_{MSY}	19429	13759	5670	0.52	0.36	0.162	46685	-4.3
Other options								
$F = 0$	0	0	0	0	0	0	63499	30
F_{pa}	26923	18784	8139	0.80	0.55	0.25	40416	-17
F_{lim}	33753	23165	10589	1.12	0.77	0.35	34852	-28
SSB (2019) = B_{lim}	46510	30624	15886	2.00	1.38	0.625	25000	-49
SSB (2019) = B_{pa}	33569	23050	10520	1.11	0.77	0.35	35000	-28
SSB (2019) = MSY $B_{trigger}$	33569	23050	10520	1.11	0.77	0.35	35000	-28
$F = F_{2017}$	16640	11842	4798	0.43	0.30	0.134	49055	0.60
Mixed fisheries options								
A: Max.	19595	-	-	0.52	-	-	46544	-4.6
B: Min.	10064	-	-	0.24	-	-	54705	12
C: Stock	19548	-	-	0.52	-	-	46584	-4.5
D: SQ effort	16640	-	-	0.43	-	-	49055	0.60
E: Value	16174	-	-	0.42	-	-	49452	1.4
F: Range	13348	-	-	0.33	-	-	51873	6.4

* “Wanted” and “unwanted” catch are used to describe fish that would be landed and discarded in the absence of the EU landing obligation.

** SSB 2019 relative to SSB 2018.

Mixed-fisheries assumptions (note: “fleet’s stock share” is used to describe the share of the fishing opportunities for each particular fleet, which has been calculated based on the single-stock advice for 2018 and the historical proportion of the stock landings taken by the fleet):

- A. Maximum scenario: Each fleet stops fishing when its last stock share is exhausted.
- B. Minimum scenario: Each fleet stops fishing when its first stock share is exhausted.
- C. Stock scenario: Each fleet stops fishing when its individual stock share is exhausted.
- D. SQ (*status quo*) effort scenario: The effort of each fleet in 2017 and 2018 is as in 2016.
- E. Value scenario: The effort of each fleet is equal to the weighted average of the efforts required to catch the fleet’s quota share of each of the stocks, where the weights are the relative catch values of each stock in the fleet’s portfolio.
- F. Range scenario: where the potential for TAC mismatch in 2018 is minimised within the F_{MSY} range, for the demersal fish stocks for which such a range is available (Cod.27.7e–k; Had.27.7b–k; Whg.27.7b–ce–k)

Basis of the advice

Table 4 Whiting in divisions 7.b–c and 7.e–k. The basis of the advice.

Advice basis	MSY approach
Management plan	ICES is not aware of any agreed precautionary management plan for whiting in this area.

Quality of the assessment

This year’s assessment is consistent with last year’s. Sampling of landings and discards are considered to be sufficient to support the current assessment approach.

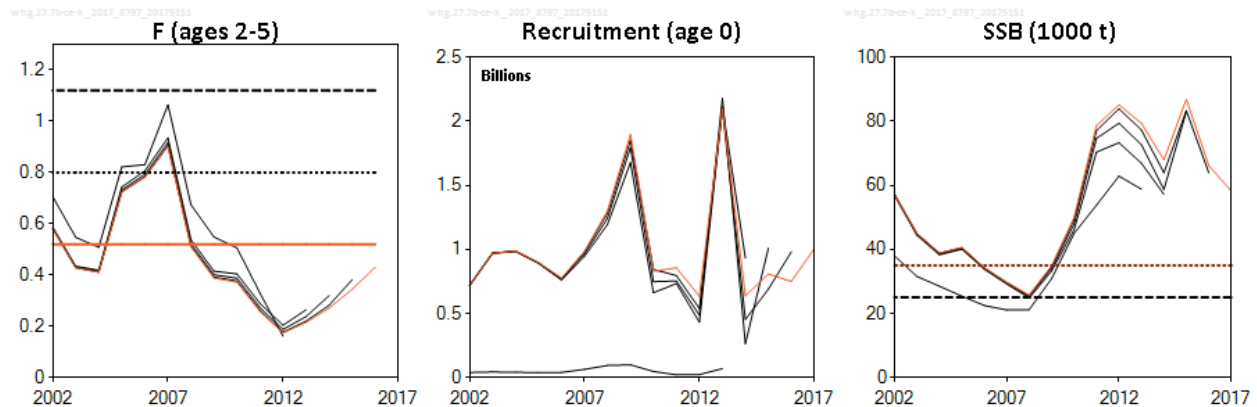


Figure 2 Whiting in divisions 7.b, 7.c, and 7.e–k. Historical assessment results (final-year recruitment estimates included). The 2014 benchmark led to a rescaling of the assessment outputs, particularly recruitment.

Issues relevant for the advice

Despite the introduction of square mesh panels during 2012 the volume of discards has remained high and there is not yet evidence of improvements in selectivity in the fishery. The majority of discards occur above the minimum landing size.

Vessels targeting whiting have been subject to the landings obligation since 2016. Other demersal fleets, in which whiting is a bycatch species, are not currently under the landings obligation (EC, 2016/2375). There were significant reported landings of whiting from midwater gear targeting herring during 2016 as a consequence of the landings obligation.

Whiting are caught in mixed fisheries with cod and haddock, and this should be taken into account. The single-stock advice allows for a large increase in F to achieve F_{MSY} in 2018. The mixed-fisheries analysis carried out by ICES shows that haddock will be the limiting species for over half of the fleets (64%) in 2018 (Section 5.2.2.1). Whiting is fished at or below F_{MSY} in 2018 under all mixed-fisheries scenarios, reflecting that it is the least limiting stock for most fleets.

This year, a “range” scenario is presented. This scenario searches for the minimum sum of differences between potential catches by stock under the “min” and the “max” scenarios within the F_{MSY} ranges. The outcomes of this scenario are largely driven by the restrictive nature of haddock this year, needing to bring the stocks fishing mortality to within the F_{MSY} range, which imply that many mixed fisheries should reduce their effort to avoid over-catching this stock.

There is a mismatch between the assessment area and the TAC area because Division 7.d is not considered part of this stock and is assessed separately with Area 4 whiting. ICES recommends that the TAC area correspond to the assessment area.

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 $B_{trigger}$	35 000 t	B_{pa}	ICES(2016a)
	F_{MSY}	0.52	Segmented regression with B_{loss} , the lowest observed	ICES(2016a)
Precautionary approach	B_{lim}	25 000 t	Lowest observed SSB (2008), rounded value	ICES(2016b)
	B_{pa}	35 000 t	$B_{lim} \times 1.4$	ICES(2016b)
	F_{lim}	1.12	Based on segmented regression with B_{lim} as breakpoint	ICES(2016b)
Management plan	F_{pa}	0.80	$F_{lim}/1.4$	ICES(2016b)
	SSB_{mgt}	Not applicable		
	F_{mgt}	Not applicable		

Basis of the assessment

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

ICES stock data category	1 (ICES, 2016c)
Assessment type	Age-based analytical assessment (XSA) that uses catches in the model and in the forecast
Input data	Commercial landings, estimated discards, age composition of catches and one survey index (EVHOE-WIBTS-Q4 & IGFS-WIBTS-Q4 combined: IGFSEVHOE); maturity-based knife-edge at age 2; Lorenzen-based M (Lorenzen, 1996) derived from the mean weight-at-age.
Discards and bycatch	Included in the assessment for the full time-series. Sampling from the majority of the fleets.
Indicators	None
Other information	This stock was benchmarked in 2014 (WKCELT; ICES, 2014).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

There is no additional available information for this stock.

History of the advice, catch, and management

Table 7 Whiting in divisions 7.b–c and 7.e–k. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Predicted catch corresp. to advice	Predicted landings corresp. 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	
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	11418	3559
2004	No increase in F	-	14000 ^{###}	27000	10119	6481
2005	No increase in F	-	10600 ^{###}	21600	12496	6700
2006	No increase in F	-	10800 ^{###}	19940	9951	12031
2007	No increase in F	-	-	19940	9228	8456
2008	Reduction in F	-	-	19940	6254	2880
2009	Same advice as last year	-	-	16949	6553	4101
2010	Same advice as last year	-	-	14407	8781	3008
2011	See scenarios	-	-	16658	10076	1954
2012	No increase catch and improved gear	-	-	19053	10626	2449
2013	MSY approach	-	< 17500 ^{###}	24500	12118	2512
2014	MSY approach	-	< 15562 ^{###}	19162	13117	3977
2015	MSY approach	< 18501	< 14230	17742	13145	6101
2016	MSY approach	≤ 19076	≤ 15395	22778	15179	7278
2017	MSY approach	≤ 25125	≤ 19825	27500		
2018	MSY approach	≤ 19429	≤ 13759			

* 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 2016 as estimated by ICES.

Catch (2016)	Landings					Discards				
	otter trawls	seine nets	beam trawls	Mid water trawls	other gears	otter trawls	seine nets	beam trawls	Mid water trawls	other gears
22 457 t	76%	15%	2.0%	5.1%	2.5%	74%	11%	12%	0.2%	2.3%
	15 179 t					7 278 t				

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

Year	Belgium	France	Ireland	UK: Eng. + W.	Others	Rectangles 33E2 & 33E3**	Total
1998	479	11 748	5549	1755	179		19 710
1999	448	16 418	6013	1354	27		24 260
2000	194	9186	5358	1255	39		16 032
2001	171	7317	5365	948	31		13 832
2002	149	7548	5718	847	35		14 297
2003	129	5989	4516	763	21		11 418
2004	180	4874	4350	587	132		10 123
2005	218	5913	5774	482	136		12 523
2006	128	4711	4570	413	129		9951
2007	127	3575	4864	575	86		9227
2008	122	3072	2406	618	35		6253
2009	87	2815	2798	828	25		6553
2010	101	3464	4331	792	86		8774
2011	100	4311	4752	739	174		10 076
2012	170	3709	5842	750	141	32	10 644
2013	226	4007	6887	906	92	34	12 152
2014	222	4927	6873	1057	38	49	13166
2015*	152	5640	6437	819	97	32	13177
2016*	186	6294	7644	890	39	40	15093

*Preliminary.

** Landings in the south of Division 7.a (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. Weights are in tonnes.

Year	Recruitment age 0 thousands	SSB	Landings	Discards	F Ages 2-5
1999	2295542	50345	20180	5420	0.72
2000	1357759	42405	15644	4400	0.70
2001	623570	50581	13196	9877	0.78
2002	717424	57285	13640	7336	0.58
2003	971252	44974	11098	3559	0.43
2004	988436	38920	10188	6481	0.41
2005	897849	40600	12207	6700	0.72
2006	775656	34313	9660	12031	0.78
2007	986692	29709	9086	8456	0.90
2008	1301691	25724	5859	2880	0.51
2009	1897256	34918	6572	4101	0.39
2010	829944	49971	8514	3008	0.37
2011	855666	78700	9498	1954	0.26
2012	634499	85208	9812	2449	0.17
2013	2097669	79409	12402	2512	0.22
2014	637380	68013	12847	3977	0.27
2015	808397	86891	13174	6101	0.34
2016	749497	66195	15179	7278	0.43
2017	1005961*	58288			

*GM recruitment 1999–2015.

Sources and references

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