

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 EU multiannual plan (MAP) for the Western Waters and adjacent waters is applied, catches in 2020 that correspond to the F ranges in the MAP are between 4157 tonnes and 6481 tonnes.

Management should be implemented at the stock level.

Stock development over time

The spawning-stock biomass (SSB) has decreased since 2012 and is estimated at below $MSY B_{trigger}$ since 2017 and below B_{lim} since 2018. Fishing mortality (F) was below F_{MSY} between 2008 and 2016, but has increased above F_{MSY} since. Recruitment (R) has been below average since 2014.



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

Stock and exploitation status

ICES assesses that fishing pressure on the stock is above F_{MSY} , but below F_{pa} and F_{lim} ; the spawning-stock size is below $MSY B_{trigger}$, B_{pa} , and B_{lim} .

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			
		2016	2017	2018	2017	2018	2019
Maximum sustainable yield	F_{MSY}	✓	✗	✗ Above	$MSY B_{trigger}$	✗	✗ Below trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa}, B_{lim}	○	✗ Reduced reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Within the range	B_{MGT}	✗	✗ Below trigger

Catch scenarios

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

Variable	Value	Notes
$F_{\text{ages 2-5}}$ (2019)	0.62	$F_{\text{sq}} = F_{\text{average}}$ (2016–2018), rescaled to 2018.
SSB_{2020}	23 615	Fishing at <i>status quo</i> F (F_{sq}); in tonnes.
Recruitment age 0 (2019–2020)	844 529	$GM_{1999-2017}$; in thousands.
Catch (2019)	9 183	Fishing at F_{sq} ; in tonnes.
Wanted catch (2019)	6 061	Average discard ratio (2016–2018); in tonnes.
Unwanted catch (2019)	3 122	Average discard ratio (2016–2018); in tonnes.

Table 3 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 distribution area.

Basis	Total catch (2020)	Wanted catch* (2020)	Unwanted catch* (2020)	F_{total} (2020)	F_{wanted} (2020)	F_{unwanted} (2020)	SSB (2021)	% SSB change **	% Advice change ***
ICES advice basis									
EU MAP [^] : $F_{\text{MSY}} \times$ $SSB_{2020}/MSY B_{\text{trigger}}$	6481	3885	2597	0.35	0.25	0.10	33720	43	-59
EU MAP [^] : $F_{\text{MSY lower}} \times$ $SSB_{2020}/MSY B_{\text{trigger}}$	4157	2513	1644	0.22	0.15	0.06	35680	51	-74
Other scenarios									
$F_{\text{MSY upper}} \times$ $SSB_{2020}/MSY B_{\text{trigger}}$	8104	4826	3277	0.45	0.32	0.13	32365	37	-49
$F = 0$	0	0	0	0	0	0	39236	66	-100
$F = F_{\text{pa}}$	13006	7586	5420	0.80	0.56	0.24	28347	20	-18.3
$F = F_{\text{lim}}$	16762	9603	7159	1.12	0.79	0.33	25356	7.4	5.3
$SSB_{2021} = B_{\text{lim}}$	17216	9841	7376	1.16	0.82	0.34	25000	5.9	8.2
$SSB_{2021} = B_{\text{pa}} = B_{\text{trigger}}$	4960	2990	1970	0.26	0.18	0.08	35000	48	-69
$F = F_{2019}$	10641	6271	4370	0.62	0.44	0.18	30270	28	-33

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

** SSB 2021 relative to SSB 2020.

*** Advice value for 2020 relative to the advice value for 2019 (15 841 tonnes).

[^]EU multiannual plan (MAP) for the Western Waters (EU, 2019).

This year’s advised catch is lower than last year’s because of a downward revision of SSB and an estimated continued reduction in SSB.

Basis of the advice

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

Advice basis	Management plan
Management plan	<p>The EU multiannual plan (MAP) for stocks in in the Western Waters and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities, depending on stock status and making use of the F_{MSY} range for the stock.</p> <p>In accordance with the MAP, catches higher than those corresponding to F_{MSY} can only be taken providing SSB is greater than $MSY B_{trigger}$, and one of the following conditions is met:</p> <ul style="list-style-type: none"> a) if it is necessary for the achievement of objectives of mixed fisheries; b) if is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics; c) in order to limit variations in fishing opportunities between consecutive years to not more than 20%. <p>ICES considers that the F_{MSY} range for this stock used in the MAP is precautionary.</p> <p>Full details of the plan are described in EU (2019).</p>

Quality of the assessment

The assessment shows a significant downward revision in SSB. The reduced estimates of the recent year classes are likely to have contributed substantially to the SSB revision. These lower estimates for recruitment compared to previous assessments are due to the low survey catches of ages 1–3 in 2018. The estimates of the 2015 to 2018 year classes are therefore considered to be particularly uncertain. The long-term average recruitment has been assumed in the forecast, but it is noted that this value is higher than recent estimates of recruitment.

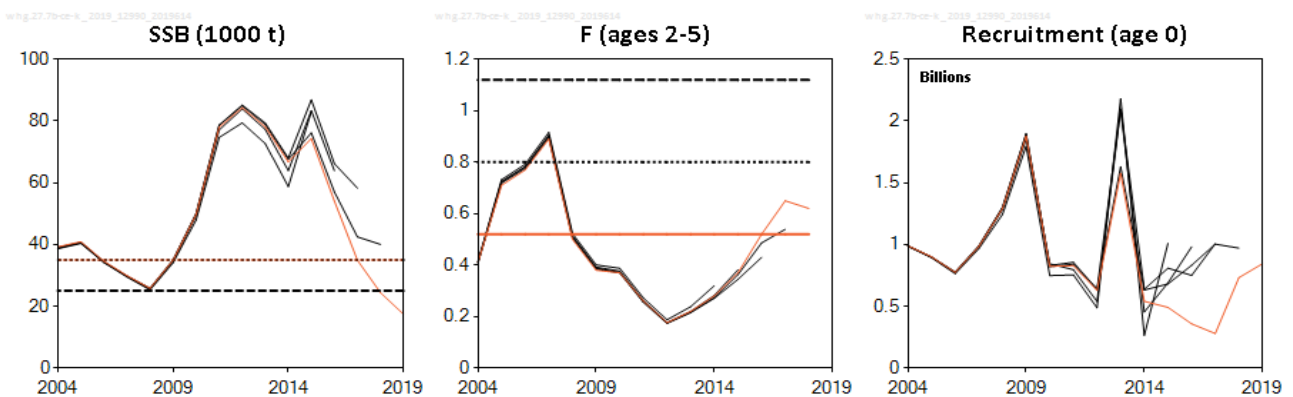


Figure 2 Whiting in divisions 7.b, 7.c, and 7.e–k. Historical assessment results (final-year recruitment assumptions included).

Issues relevant for the advice

The present advice is highly dependent on the recruitment assumption for 2019.

The assessment and the advice are for divisions 7.b–c and 7.e–k, including the rectangles 33E2 and 33E3 in the Irish Sea (Division 7.a).

A significant amount of discarding still occurs, but discards were reduced in 2018.

Whiting in divisions 7.b, 7.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 stocks. ICES therefore recommends that the TAC area corresponds to the assessment area.

Mixed fish 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 in 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 $B_{trigger}$	35000	B_{pa} ; in tonnes.	ICES (2016)
	F_{MSY}	0.52	Segmented regression with B_{loss} , the lowest observed spawning-stock biomass (EqSim).	ICES (2016)
Precautionary approach	B_{lim}	25000	Lowest observed SSB (2008), rounded value; in tonnes.	ICES (2017)
	B_{pa}	35000	$B_{lim} \times 1.4$; in tonnes.	ICES (2017)
	F_{lim}	1.12	Based on a segmented regression with B_{lim} as breakpoint.	ICES (2017)
Management plan	F_{pa}	0.80	$F_{lim} \cdot 1.4^{-1}$	ICES (2017)
	MAP MSY $B_{trigger}$	35000	MSY $B_{trigger}$; in tonnes.	ICES (2016), EU (2019)
	MAP B_{pa}	35000	B_{pa} ; in tonnes.	ICES (2017), EU (2019)
	MAP B_{lim}	25000	B_{lim} ; in tonnes.	ICES (2017), EU (2019)
	MAP F_{MSY}	0.52	F_{MSY}	ICES (2016), EU (2019)
	MAP range F_{lower}	0.32	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2016), EU (2019)
MAP range F_{upper}	0.67	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2016), EU (2019)	

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, 2018).
Assessment type	Age-based analytical assessment (XSA) that uses catches in the model and in the forecast (ICES, 2019).
Input data	Commercial landings, estimated discards, age composition of catches and one survey index (EVHOE-WIBTS-Q4 & IGFS-WIBTS-Q4 combined: IGFSEVHOE); maturity 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.
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.

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	<i>Status quo</i> 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 selection	-	-	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	11693	4505
2018	MSY approach	≤ 19429	≤ 13759	22213	8773	1495
2019	MSY approach	≤ 15841	9882	19184		
2020	Management plan	6481 (range 4157–6481)				

*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 2018 as estimated by ICES.

Catch	Landings					Discards				
	Otter trawls	Seine nets	Beam trawls	Mid-water	Other gears	Otter trawls	Seine nets	Beam trawls	Mid-water	Other gears
10 268 t	78%	15%	2%	< 1%	5%	65%	< 1%	33%	< 1%	2%
	8773 t					1495 t				

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

Year	Belgium	France	Ireland	UK England & Wales	Others	Rectangles 33E2 & 33E3**	Total
1998	479	11748	5549	1755	179		19710
1999	448	16418	6013	1354	27		24260
2000	194	9186	5358	1255	39		16032
2001	171	7317	5365	948	31		13832
2002	149	7548	5718	847	35		14297
2003	129	5989	4516	763	21		11418
2004	180	4874	4350	587	132		10123
2005	218	5913	5774	482	136		12523
2006	128	4710	4570	413	129		9951
2007	127	3574	4864	576	86		9226
2008	121	3072	2406	620	35		6255
2009	87	2814	2798	827	25		6551
2010	102	3463	4330	798	85		8779
2011	100	4312	4752	740	174		10077
2012	170	3710	5841	764	141	32	10627
2013	226	4006	6888	907	92	34	12119
2014	222	4928	6874	1062	35	49	13121
2015	152	5634	6437	828	97	32	13149
2016	186	6294	7700	892	39	40	15110
2017*	102	5256	6296	607	32	20	12293
2018*	103	3666	4628	590	33	18	9019
2019							

*Preliminary.

**Included in Ireland landing estimates. 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.

Year	Recruitment at age 0	SSB	Landings	Discards	F at ages 2–5
1999	2305731	50358	20180	5420	0.72
2000	1365080	42448	15644	4400	0.70
2001	626150	50757	13196	9877	0.78
2002	719054	57627	13640	7336	0.58
2003	972995	45333	11098	3559	0.42
2004	990224	39250	10188	6481	0.41
2005	899817	40891	12207	6700	0.71
2006	774876	34549	9660	12031	0.77
2007	983016	29891	9086	8456	0.89
2008	1291906	25827	5859	2880	0.50
2009	1877546	34946	6572	4101	0.38
2010	823287	49749	8514	3008	0.37
2011	827878	78031	9498	1954	0.26
2012	628396	84341	9812	2449	0.176
2013	1577179	78155	12402	2512	0.22
2014	539974	66763	12847	3977	0.28
2015	490588	74356	13174	6101	0.37
2016	356770	54055	15179	7278	0.52
2017	278325	34901	11693	4505	0.65
2018	731014	24379	8773	1495	0.62
2019	844529*	17423			

* Geometric mean recruitment 1999–2017.

Sources and references

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