

## Megrim (*Lepidorhombus whiffiagonis*) in divisions 7.b–k, 8.a–b, and 8.d (west and southwest of Ireland, Bay of Biscay)

### ICES advice on fishing opportunities

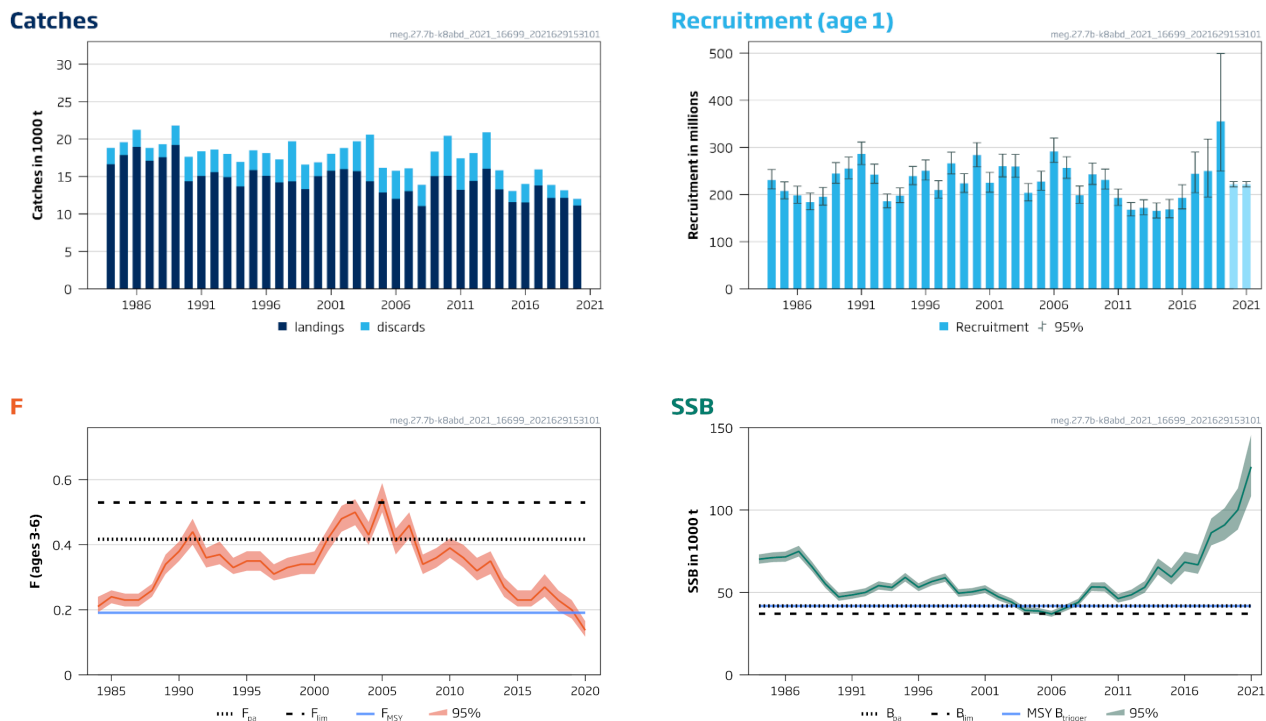
ICES advises that when the MSY approach is applied, catches in 2022 should be no more than 22 964 tonnes.

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

Management of catches of the two megrim species, *L. whiffiagonis* and *L. boschii*, under a combined species TAC prevents effective control of the single-species exploitation rates, and could lead to the overexploitation of either species.

### Stock development over time

ICES assesses that fishing pressure on the stock is below FMSY and spawning-stock size is above MSY Btrigger, Bpa, and Blim.



**Figure 1** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Summary of the stock assessment. The assumed recruitment values for 2021 and 2022 are shaded in a lighter colour.

### Catch scenarios

**Table 1** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{\text{ages 3-6}}(2021)$	0.19	Average F (2018–2020).
SSB (2022)	136377	Short-term forecast; tonnes.
$R_{\text{age1}}(2021-2022)$	221690	Geometric mean of recruitment (1984–2018); thousands.
Catch (2021)	20682	Short-term forecast based on F (2021); tonnes.
Projected landings (2021)	17822	Short-term forecast; Average landing rate of 2018–2020; tonnes.
Projected discards (2021)	2860	Short-term forecast; Average discard rate of 2018–2020; tonnes.

**Table 2** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Annual catch scenarios. All weights are in tonnes. Note: The % change in TAC is not computed because the TAC is for the two species (*Lepidorhombus whiffiagonis* and *L. boscii*) combined.

Basis	Total catch (2022)	Projected landings* (2022)	Projected discards** (2022)	F <sub>total</sub> (2022)	SSB (2023)	% SSB change***	% Advice change ^
ICES advice basis							
MSY approach: F <sub>MSY</sub>	22964	20152	2812	0.191	138512	2	20
Other scenarios							
EU MAP <sup>^^^</sup> = F <sub>MSY</sub>	22964	20152	2812	0.191	138512	2	20
F = MAP <sup>^^^</sup> F <sub>MSY lower</sub>	15205	13357	1848	0.122	146818	8	26 <sup>^^</sup>
F = MAP <sup>^^^</sup> F <sub>MSY upper</sub>	33269	29156	4113	0.29	127599	-6	20 <sup>^^</sup>
F = 0	0	0	0	0	162887	19	-100
F <sub>pa</sub>	45238	39579	5659	0.42	115164	-16	136
F <sub>lim</sub>	54973	48018	6955	0.53	105181	-23	187
SSB (2023) = B <sub>lim</sub>	123120	105281	17839	2.2	37100	-73	542
SSB (2023) = B <sub>pa</sub>	118180	101350	16830	1.94	41800	-69	516
SSB (2023) = MSY B <sub>trigger</sub>	118180	101350	16830	1.94	41800	-69	516
SSB (2023) = SSB (2022)	24968	21903	3065	0.21	136377	0	30
F = F <sub>2021</sub>	22861	20062	2799	0.190	138621	2	19

\* Marketable landings, assuming recent discard rate.

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

\*\*\* SSB 2023 relative to SSB 2022.

^ Advice value for 2022 relative to advice value for 2021 (19 184 tonnes).

^^ Advice value this year relative to the advice value for last year for the MAP F<sub>MSY lower</sub> (12 076 tonnes) and MAP F<sub>MSY upper</sub> (27 748 tonnes).

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

The advice for 2022 is higher than the advice for 2021 because the biomass has increased.

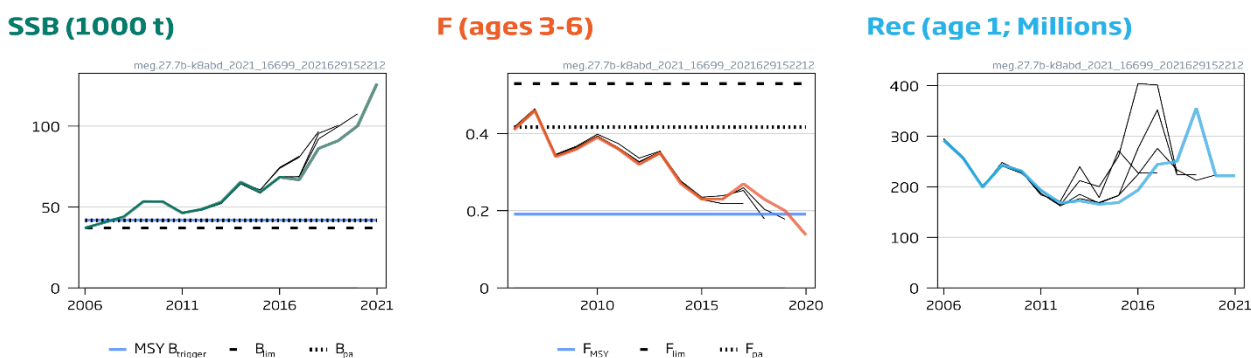
### Basis of the advice

**Table 3** Megrim in divisions 7.b–k, 8.a–b, and 8.d. 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 the UK for this stock and ICES provides advice according to the ICES MSY approach. Catch scenarios consistent with the MAP F <sub>MSY</sub> ranges are provided.

### Quality of the assessment

The collection of data from the commercial fishery and research surveys during 2020 was impacted by COVID-19 restrictions to a varying degree across member states. For this stock, the diagnostics for the assessment were deemed acceptable and sensitivity analyses conducted indicated that the impact on the perception of the stock status and advice was minimal.



**Figure 2** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Historical assessment results (final-year recruitment assumptions included for each line). The reference points were revised in 2016 following a benchmark and only the last 4 assessment results should be compared to the reference points indicated.

### Issues relevant for the advice

The ICES advice is for *L. whiffiagonis*, whereas the TAC is for *L. whiffiagonis* and *L. boscii* combined.

The two megrim species (*L. whiffiagonis* and *L. boscii*) are not totally separated in the landings. A single TAC covers both species and species-specific landings are estimated by ICES (ICES, 2018). ICES considers that management of the two megrim species under a combined TAC prevents effective control of the single-species exploitation rates and could lead to the overexploitation of either species.

### Reference points

**Table 4** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	41800	$B_{pa}$	ICES (2016b)
	$F_{MSY}$	0.191	Stochastic simulations based on a segmented regression, with the breakpoint fixed at the lowest observed biomass.	ICES (2016b)
Precautionary approach	$B_{lim}$	37100	$B_{loss}$ , which is the lowest biomass observed, corresponding to year 2006.	ICES (2016b)
	$B_{pa}$	41800	$B_{lim}e^{1.645 \sigma}$ ; $\sigma_B = 0.07$	ICES (2016b)
	$F_{lim}$	0.53	The $F$ that gives 50% probability of SSB being above $B_{lim}$ .	ICES (2016b)
	$F_{pa}$	0.417	$F_{p,05}$ with AR: The $F$ that provides a 95% probability for SSB to be above $B_{lim}$ .	ICES (2021b)
Management plan	MAP MSY $B_{trigger}$	41800	MSY $B_{trigger}$	ICES (2016b), EU (2019)
	MAP $B_{lim}$	37100	$B_{lim}$	ICES (2016b), EU (2019)
	MAP $F_{MSY}$	0.191	$F_{MSY}$	ICES (2016b), EU (2019)
	MAP range $F_{lower}$	0.122	Consistent with ranges provided by ICES (2016b), resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2016b), EU (2019)
	MAP range $F_{upper}$	0.29	Consistent with ranges provided by ICES (2016b) resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2016b), EU (2019)

## Basis of the assessment

**Table 5** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2021a).
Assessment type	Bayesian statistical catch at age (ICES, 2018) using catches in the model and forecast.
Input data	Commercial catches (international landings, ages, and length frequencies from catch sampling). Survey indices: French Southern Atlantic Bottom Trawl Survey (EVHOE-WIBTS-Q4 [G9527]) and the Spanish Porcupine Bottom Trawl Survey (SpPGFS-WIBTS-Q3 [G5768]). Commercial indices: SP-VIGOTR7 (VIGO84, VIGO99), and IRTBB. Maturity ogive from Anon. (1998). Natural mortality: a fixed value of 0.2 is used for all age groups and all years.
Discards and bycatch	Discards are included in the assessment.
Indicators	None.
Other information	Last benchmarked in 2016 (ICES, 2016a).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE).

## History of the advice, catch, and management

**Table 6.** Megrim in divisions 7.b–k, 8.a–b, and 8.d. ICES advice and landings. All weights are in tonnes.

Year	ICES advice	Catch / landings corresponding to advice	Agreed TAC*	ICES landings	Discards	ICES catch
1987	Not assessed	-	16460	17114	1705	18819
1988	Not assessed	-	18100	17577	1725	19302
1989	Not assessed	-	18100	19233	2582	21815
1990	Not assessed	-	18100	14370	3284	17654
1991	No advice	-	18100	15094	3282	18376
1992	No advice	-	18100	15600	2988	18588
1993	Within safe biological limits	-	21460	14929	3108	18037
1994	Within safe biological limits	-	20330	13684	2700	16384
1995	No particular concern	-	22590	15862	3206	19068
1996	No long-term gain in increased F	16600	21200	15109	3026	18135
1997	No advice	14300	25000	14230	3066	17296
1998	No increase in F	15200	25000	14345	5371	19716
1999	Reduce F below Fpa	14600	20000	13305	3297	16601
2000	Reduce F below Fpa	< 14200	20000	15031	1870	16750
2001	Reduce F below Fpa	< 14100	16800	15778	2262	18040
2002	Reduce F below Fpa	< 13000	14900	15987	2813	18800
2003	Reduce F below Fpa	< 16100	16000	15711	4008	19719
2004	Reduce F below Fpa	< 20200	20200	14358	6243	20602
2005	Reduce F below Fpa	< 22600	21500	12888	3275	16163
2006	Reduce F below Fpa	<13600	20425	12037	3751	15788
2007	Less than average landings 2003–2005	< 14200	20425	13060	3033	16092
2008	Less than average landings 2004–2006	< 13000	20425	11048	2860	13908
2009	Same advice as last year	< 13000	20425	15064	3278	18342
2010	No increase in effort	< 13000	20425	15101	5343	20444
2011	See scenarios	-	20106	13226	4187	17413
2012	Catch and effort reduction	-	19101	14433	3704	18137
2013	Decrease landings by 4% (20% increase, followed by 20% PA reduction)	< 12000	19101	16025	4885	20910
2014	Same advice as 2013	< 12000	19101	13277	2569	15846
2015	Increase landings by no more than 13%	< 15180	19101	11569	1507	13076

Year	ICES advice	Catch / landings corresponding to advice	Agreed TAC*	ICES landings	Discards	ICES catch
2016	Precautionary approach (increase recent advised landings by no more than 20%)	≤ 18216	20056	11548	2445	13992
2017	MSY approach (catch advice)	≤ 16021***	15043	13784	2173	15957
2018	MSY approach (catch advice)	≤ 15720***	13528	12147	1738	13528
2019	MSY approach (catch advice)	≤ 18976***	19836	12164	989	13153
2020	Management plan	19982 (range 13218–28838) **, ***	20526	11141	885	12026
2021	Management plan	19184 (range 12706–27748) **, ***	18365^			
2022	MSY approach	≤ 22964***				

\* Includes *L. boscii* and divisions 7.a and 8.e.

\*\* Catches corresponding to F, EU MAP range in brackets (EU, 2019).

\*\*\* Advice is for catches.

^ DEFRA (2021).

### History of catch and landings

**Table 7** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Catch distribution by fleet in 2020 as estimated by ICES. All weights are in tonnes.

Catch (2020)	Landings		Discards
12 026 tonnes	Trawl 98%	Other gears 2%	885 tonnes
	11 141 tonnes		

**Table 8** Megrim in divisions 7.b–k, 8.a–b, and 8.d. History of commercial catch and landings; ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

Year	France	Spain	U.K. (England & Wales)	U.K. (Scotland)	Ireland	Northern Ireland	Belgium	Unallocated	ICES estimated landings	ICES estimated discards	ICES estimated catch
1984									16659	2169	18828
1985									17865	1732	19597
1986	4896	10242	2048		1563		178		18927	2321	21248
1987	5056	8772	1600		1561		125		17114	1705	18819
1988	5206	9247	1956		995		173		17577	1725	19302
1989	5452	9482	1451		2548		300		19233	2582	21815
1990	4336	7127	1380		1381		147		14370	3284	17654
1991	3709	7780	1617		1956		32		15094	3282	18376
1992	4104	7349	1982		2113		52		15600	2988	18588
1993	3640	6526	2131		2592		40		14929	3108	18037
1994	3214	5624	2309		2420		117		13684	3284	16968
1995	3945	6129	2658		2927		203		15862	2652	18514
1996	4146	5572	2493		2699		199		15109	3026	18135
1997	4333	5472	2875		1420		130		14230	3066	17296
1998	4232	4870	2492		2621		129		14345	5371	19716
1999	3751	4615	2193		2597		149		13305	3297	16601
2000	4173	6047	2185		2512		115		15031	1870	16901
2001	3645	7575	1710		2767		80		15778	2262	18040
2002	2929	8797	1787		2413		62		15987	2813	18800
2003	3227	8340	1732		2249		163		15711	4008	19719
2004	2817	7526	1622		2288		106		14358	6243	20602
2005	2972	5841	1764		2155		156		12888	3275	16163
2006	2763	5916	1509		1751		99		12037	3751	15788

Year	France	Spain	U.K. (England & Wales)	U.K. (Scotland)	Ireland	Northern Ireland	Belgium	Unallocated	ICES estimated landings	ICES estimated discards	ICES estimated catch
2007	2745	6895	1462		1763		195		13060	3033	16092
2008	2578	5402	1387		1514		167		11048	2860	13908
2009	3032	8062	1840		1918	2	209		15064	3278	18342
2010	3651	7095	1805		2283	5	261		15101	5343	20444
2011	3235	3500	1845		2227		330	2089	13226	4187	17413
2012	4012	4055	1744		3047		609	966	14433	3704	18137
2013	4549	4982	2918		3038		538		16025	4885	20910
2014	4311	3318	2753	176	2391		179	150	13277	2569	15846
2015	3073	2863	2804	147	2436		246	1	11569	1507	13076
2016	3141	2672	2694	145	2593		302	1	11548	2445	13992
2017	5101	3178	2512	176	2458		360		13784	2173	15957
2018	4680	2276	2337	112	2128	6	347	261	12147	1738	13885
2019	4332	2617	2150	129	2454	1	481		12164	989	13153
2020*	4387	2420	1883	5	1797	1	649		11141	885	12026

\*Preliminary

### Summary of the assessment

**Table 9** Megrim in divisions 7.b–k, 8.a–b, and 8.d. Assessment summary. Highs and lows refer to confidence intervals (95%). All weights are in tonnes and recruitment is in thousands.

Year	Recruitment (Age 1)	High	Low	SSB	High	Low	Landings	Discards	F <sub>Ages 3–6</sub>	High	Low
1984	231059	253215	211897	70187	73105	67430	16659	2169	0.21	0.24	0.192
1985	207848	226931	191065	71120	74311	68390	17865	1732	0.24	0.26	0.22
1986	198246	217909	181666	71593	74851	68639	18927	2321	0.23	0.25	0.21
1987	183587	203252	167756	74944	78325	71792	17114	1705	0.23	0.25	0.21
1988	195229	215111	177820	65531	68616	62735	17577	1725	0.26	0.28	0.24
1989	244696	267729	224019	55195	57971	52679	19233	2582	0.34	0.37	0.31
1990	255240	279616	233579	47296	49802	44941	14370	3284	0.38	0.41	0.35
1991	286582	311481	263645	48493	51050	46154	15094	3282	0.44	0.48	0.40
1992	242634	264471	223924	50020	52608	47700	15600	2988	0.36	0.39	0.33
1993	186001	201196	171991	54170	56787	51735	14929	3108	0.37	0.41	0.34
1994	197735	214214	182809	53069	55434	50752	13684	3284	0.33	0.36	0.31
1995	239356	259843	221239	59147	61856	56568	15862	2652	0.35	0.38	0.32
1996	250722	273255	230669	53124	55608	50770	15109	3026	0.35	0.38	0.32
1997	209956	229260	192613	56627	59207	54210	14230	3066	0.31	0.34	0.29
1998	266229	289862	243771	58894	61582	56394	14345	5371	0.33	0.36	0.30
1999	223925	244392	204509	49568	52013	47315	13305	3297	0.34	0.37	0.31
2000	283863	310174	258835	50364	52663	48076	15031	1870	0.34	0.38	0.31
2001	224802	247142	204954	51982	54430	49659	15778	2262	0.42	0.45	0.38
2002	259986	285812	237683	47340	49649	45156	15987	2813	0.48	0.52	0.44
2003	259629	285207	236506	44182	46363	42256	15711	4008	0.50	0.54	0.46
2004	203598	223491	186534	39114	41080	37304	14358	6243	0.43	0.47	0.40
2005	227670	249576	209131	38779	40591	37006	12888	3275	0.54	0.59	0.50
2006	291747	319819	268344	36987	38899	35255	12037	3751	0.41	0.45	0.37
2007	256741	280340	234330	40426	42372	38565	13060	3033	0.46	0.50	0.42
2008	198938	218102	181467	43962	46174	41927	11048	2860	0.34	0.37	0.31
2009	243017	266725	221399	53360	56110	50845	15064	3278	0.36	0.39	0.33

Year	Recruitment (Age 1)	High	Low	SSB	High	Low	Landings	Discards	F <sub>Ages 3–6</sub>	High	Low
2010	231345	254296	211645	53191	56178	50517	15101	5343	0.39	0.42	0.36
2011	193178	211834	176788	46274	49120	43838	13226	4187	0.36	0.40	0.33
2012	168049	183007	154480	48592	51762	45761	14433	3704	0.32	0.36	0.29
2013	172164	189152	157199	53149	56898	49840	16025	4885	0.35	0.38	0.31
2014	165400	182291	150324	65446	70656	60786	13277	2569	0.27	0.30	0.24
2015	168637	189702	150608	59350	64710	54712	11569	1507	0.23	0.26	0.21
2016	193255	220996	169495	68380	74778	62874	11548	2445	0.23	0.26	0.21
2017	244072	290188	204114	66776	73075	61306	13784	2173	0.27	0.31	0.24
2018	249882	317614	194749	86206	94920	78537	12147	1738	0.23	0.26	0.196
2019	355298	499357	249793	90958	101189	81868	12164	989	0.20	0.23	0.173
2020	221690*	227698	216068	100112	113233	88194	11141	885	0.137	0.165	0.117
2021	221690*	227698	216068	126311	145747	108523					

\* Geometric mean (1984–2018).

## Sources and references

Department for Environment, Food & Rural Affairs (DEFRA). 2021. Written record of fisheries consultations between the United Kingdom and the European Union for 2021. Policy paper, International Fisheries Management collection. London, UK. 44 pp. <https://www.gov.uk/government/publications/fisheries-consultations-between-the-uk-and-the-eu-in-2021>. Last accessed 24 June 2021.

EU. 2019. Regulation (EU) 2019/472 of the European Parliament and of the Council of 19 March 2019 establishing a multiannual plan for stocks fished in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulations (EU) 2016/1139 and (EU) 2018/973, and repealing Council Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007 and (EC) No 1300/2008. Official Journal of the European Union, L 83. 17 pp. <http://data.europa.eu/eli/reg/2019/472/oj>.

ICES. 2016a. Inter-Benchmark Protocol Workshop Megrim (*Lepidorhombuswhiffiagonis*) in divisions 7.b–k and 8.a, 8.b, and 8.d (West and Southwest of Ireland, Bay of Biscay) (IBP Megrim 2016), July 2015–March 2016, by correspondence. ICES CM 2016/ACOM:32. 124 pp. <https://doi.org/10.17895/ices.pub.5352>.

ICES. 2016b. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 13–19 May 2016, ICES Headquarters, Copenhagen, Denmark. ICES CM 2016/ACOM:12. 513 pp. <https://doi.org/10.17895/ices.pub.7644>.

ICES. 2018. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 3–10 May 2018, ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:12. 569 pp. <https://doi.org/10.17895/ices.pub.5343>.

ICES. 2021a. Advice on fishing opportunities. In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. <https://doi.org/10.17895/ices.advice.7720>.

ICES. 2021b. Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE). ICES Scientific Reports. 3:48. <https://doi.org/10.17895/ices.pub.8212>.

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