

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

Please note: the present advice replaces the advice given in June 2022.

ICES advises that when the MSY approach is applied, catches in 2023 should be no more than 23 596 tonnes.

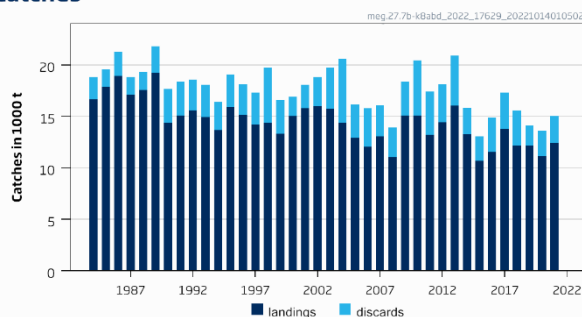
ICES notes the existence of a precautionary management plan, developed and adopted by one of the relevant management authorities for this stock.

Management of catches of the two megrim species—megrim (*Lepidorhombus whiffiagonis*) and four-spot megrim (*Lepidorhombus boschii*)—under a combined species TAC prevents effective control of the single-species exploitation rates and could lead to the overexploitation of either species.

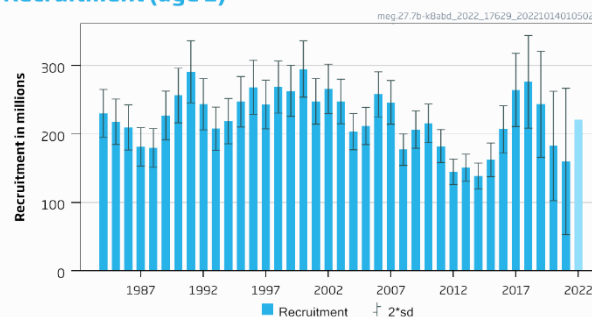
Stock development over time

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

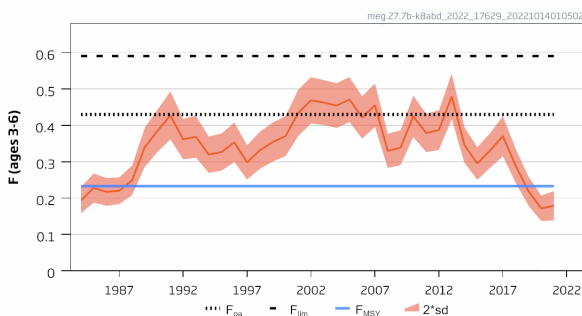
Catches



Recruitment (age 1)



F



SSB

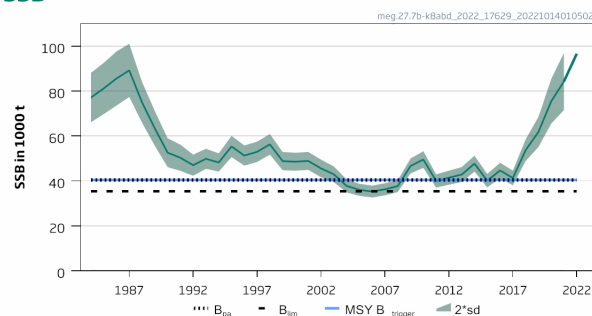


Figure 1 Megrim in divisions 7.b–k, 8.a–b, and 8.d. Summary of the stock assessment. The assumed recruitment value for 2022 is shaded in a lighter colour. The 2022 SSB value is a model forecast.

Catch scenarios

Table 1 Megrim in divisions 7.b–k, 8.a–b, and 8.d. The basis of the catch scenarios.

Variable	Value	Notes
$F_{ages\ 3-6}(2022)$	0.190	Average F (2019–2021).
SSB (2023)	96184	Short-term forecast (STF); in tonnes.
$R_{age\ 1}$ (2022–2023)	221058	Geometric mean of recruitment (1984–2019); in thousands.
Catch (2022)	19412	STF; in tonnes.
Projected landings (2022)	16612	STF; average (2019–2021) landings ratio at age; in tonnes.

Variable	Value	Notes
Projected discards (2022)	2800	STF; average (2019–2021) discards ratio at age; in 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 megrim species combined.

Basis	Total catch (2023)	Projected landings* (2023)	Projected discards** (2023)	F _{ages 3–6} Total (2023)	SSB (2024)	% SSB change***	% advice change^
ICES advice basis							
MSY approach: F _{MSY}	23596	20264	3332	0.23	90976	–5.4	2.8
Other scenarios							
EU MAP^^ = F _{MSY}	23596	20264	3332	0.23	90976	–5.4	2.8
F = MAP^^ F _{MSY lower}	15101	12982	2119	0.14	99893	3.9	–34
F = MAP^^ F _{MSY upper}	38191	32733	5457	0.41	75788	–21	66
F = 0	0	0	0	0	115855	20	–100
F _{pa}	39638	33966	5672	0.43	74293	–23	73
F _{lim}	50197	42939	7258	0.591	63458	–34	119
SSB (2024) = B _{lim}	78477	66677	11800	1.241	35398	–63	242
SSB (2024) = B _{pa}	73241	62327	10914	1.084	40444	–58	219
SSB (2024) = MSY B _{trigger}	73241	62327	10914	1.084	40444	–58	220
SSB (2024) = SSB (2023)	18629	16008	2621	0.176	96184	0	–18.9
F = F ₂₀₂₂	19945	17136	2809	0.19	94803	–1.44	–13.1

* Marketable landings, assuming recent discard rate.

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

*** SSB 2024 relative to SSB 2023.

^ Advice value for 2023 relative to advice value for 2022 (22 964 tonnes).

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

The advice for 2023 is higher than the advice for 2022 because of a re-estimation of F_{MSY}.

Basis of the advice

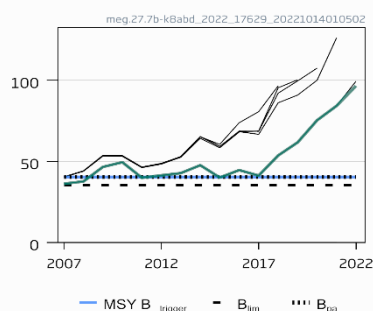
Table 3 Megrim in divisions 7.b–k, 8.a–b, and 8.d. The basis of the advice.

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 UK for this stock, and ICES provides advice according to ICES MSY approach. Catch scenarios consistent with the MAP F _{MSY} ranges are provided.

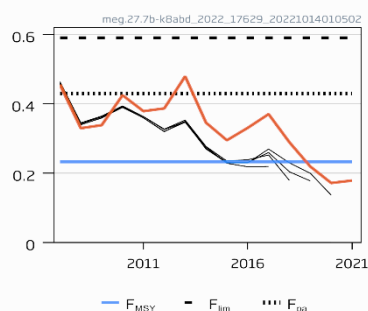
Quality of the assessment

This stock was benchmarked in 2022 and this resulted in a different assessment model and data revisions, including the removal of all commercial abundance indices and revision and raising of discard estimates (ICES, 2022a). These changes triggered the calculation of new reference points. Such changes have led to a different picture of the historical assessment results in comparison with previous years' assessments. However, the perception of stock status, in relation to reference points, does not change in comparison to previous years' assessments.

SSB (1000 t)



F (ages 3-6)



Rec (age 1; Millions)

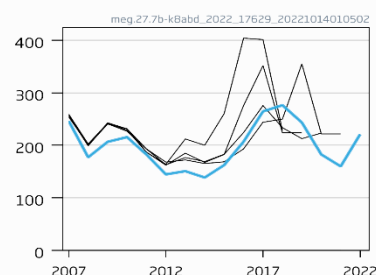


Figure 2 Megrim in divisions 7.b–k, 8.a–b, and 8.d. Historical assessment results (final-year recruitment assumptions included for each line). The reference points were revised in 2022 following a benchmark, and only the last assessment results should be compared to the reference points indicated.

Issues relevant for the advice

The two megrim species are not separated in the landings statistics. The TACs are set separately for subarea 7 and divisions 8.a–b,d,e with each TAC covering catches of both species. Species specific landings are estimated by ICES. ICES considers that management of the catches of these two species under a combined TAC prevents effective control of single-species exploitation rates and could lead to 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.

Framework	Reference point	Value	Technical basis	Source
MSY Approach	MSY $B_{trigger}$	40444	B_{pa} ; in tonnes.	ICES (2022a)
	F_{MSY}	0.233	F giving maximum yield at equilibrium. Median EqSim estimate for landings.	ICES (2022a)
EU Management plan (MAP); EU (2019)	MAP MSY $B_{trigger}$	40444	MSY $B_{trigger}$; in tonnes.	ICES (2022a)
	MAP F_{MSY}	0.233	F_{MSY}	ICES (2022a)
	MAP range F_{lower}	0.140	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2022a)
	MAP range F_{upper}	0.414	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2022a)
Precautionary Approach	B_{lim}	35398	B_{loss} , which is the lowest biomass observed; in tonnes.	ICES (2022a)
	B_{pa}	40444	$B_{lim} * \exp(1.645 * \sigma)$, with $\sigma = 0.081$; in tonnes.	ICES (2022a)
	F_{lim}	0.591	The F that gives 50% probability of SSB being above B_{lim} .	ICES (2022a)
	F_{pa}	0.430	F_{P05} with Advice Rule (AR) (F that gives 5% probability of SSB below B_{lim}).	ICES (2022a)

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, 2022b).
Assessment type	A4a statistical catch at age (ICES, 2022a, 2022c) using catches in the model and forecast.
Input data	Commercial catches (international landings, ages, and length frequencies from catch sampling). Three survey indices: Spanish Porcupine Bottom Trawl Survey [G5768], IE-IGFS [G7212] and EVHOE [G9527]; the latter two surveys are combined into a single index. Natural mortality, a fixed value of 0.2 is used for all age groups and all years, and histologically derived maturity ogives are described in ICES (2022a).
Discards and bycatch	Discards are included in the assessment.
Indicators	None.
Other information	Last benchmarked in 2022 (ICES, 2022a).
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 F_{pa}	14600	20000	13305	3297	16601
2000	Reduce F below F_{pa}	< 14200	20000	15031	1870	16750
2001	Reduce F below F_{pa}	< 14100	16800	15778	2262	18040
2002	Reduce F below F_{pa}	< 13000	14900	15987	2813	18800
2003	Reduce F below F_{pa}	< 16100	16000	15711	4008	19719
2004	Reduce F below F_{pa}	< 20200	20200	14358	6243	20602
2005	Reduce F below F_{pa}	< 22600	21500	12888	3275	16163
2006	Reduce F below F_{pa}	<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
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) **	20181^	12417	2603	15020
2022	MSY approach	≤ 22964	20786			
2023	MSY approach	≤ 23596				

* 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 starting in 2017.

^ EU (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 2021 as estimated by ICES. All weights are in tonnes.

Catch	Landings		Discards
15020	98% trawl	2% other gears	2603
	12417		

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	UK (England & Wales)	UK (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
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	2393**	13962
2016	3141	2672	2694	145	2593		302	1	11548	3315**	14863
2017	5101	3178	2512	176	2458		360		13784	3518**	17303
2018	4680	2276	2337	112	2128	6	347	261	12147	3415**	15562
2019	4332	2617	2150	129	2454	1	481		12164	1966**	14130
2020	4387	2420	1883	5	1797	1	649		11141	2485**	13626
2021	4380	2896	2199	144	2075	5	718		12417	2603	15020

**Updated including imported and raised discards (ICES, 2022a).

Summary of the assessment

Table 9 Megrim in divisions 7.b–k, 8.a–b, and 8.d. Assessment summary. ‘High’ and ‘Low’ refer to two standard deviations (sd) confidence intervals

Year	Recruitment (age 1)			Spawning-stock biomass			Landings	Discards	Fishing pressure (ages 3–6)		
	R	High	Low	SSB	High	Low			F	High	Low
	thousands			tonnes							
1984	230209	265242	195175	77102	88124	66080	16659	2169	0.194	0.23	0.158
1985	218022	251314	184730	81159	92574	69743	17865	1732	0.23	0.27	0.187
1986	209635	242605	176665	85603	97663	73543	18927	2321	0.22	0.26	0.179
1987	181309	209443	153175	89217	101067	77367	17114	1705	0.22	0.26	0.184
1988	179649	207940	151357	74999	84090	65908	17577	1725	0.25	0.29	0.21
1989	227252	262902	191602	63394	71172	55616	19233	2582	0.34	0.39	0.29
1990	256378	296286	216469	52602	59042	46162	14370	3284	0.39	0.44	0.33
1991	290949	336422	245475	50325	56172	44477	15094	3282	0.43	0.49	0.36
1992	243615	281171	206060	47032	51751	42313	15600	2988	0.36	0.42	0.31
1993	207721	239400	176041	49875	54361	45390	14929	3108	0.37	0.43	0.31
1994	218801	251945	185658	48238	52317	44160	13684	2700	0.32	0.37	0.27
1995	247262	284147	210376	55356	60110	50601	15862	3206	0.33	0.38	0.28
1996	268341	307884	228797	51311	55809	46813	15109	3026	0.35	0.41	0.30
1997	243209	278827	207590	52984	57523	48445	14230	3066	0.30	0.35	0.25
1998	268759	306946	230572	56305	60912	51698	14345	5371	0.33	0.38	0.28
1999	263151	300474	225827	48825	52897	44753	13305	3297	0.35	0.41	0.30
2000	295083	336301	253865	48578	52588	44569	15031	1870	0.37	0.43	0.32
2001	247844	281141	214546	48929	52933	44924	15778	2262	0.43	0.50	0.37
2002	266020	302166	229874	45578	49530	41626	15987	2813	0.47	0.53	0.41
2003	247611	280197	215025	42966	46478	39453	15711	4008	0.46	0.52	0.40
2004	203492	230060	176925	37800	40694	34906	14358	6243	0.45	0.52	0.39
2005	211827	239074	184579	36054	38755	33352	12888	3275	0.47	0.53	0.41
2006	257924	290979	224868	35289	37947	32632	12037	3751	0.42	0.48	0.36
2007	246254	278248	214260	36299	39009	33590	13060	3033	0.46	0.52	0.40
2008	177204	200255	154153	37711	40365	35056	11048	2860	0.33	0.38	0.28
2009	206609	233900	179318	46675	50012	43338	15064	3278	0.34	0.39	0.29
2010	215687	243973	187402	49553	53284	45821	15101	5343	0.43	0.48	0.37
2011	182433	206464	158401	39998	42973	37024	13226	4187	0.38	0.43	0.33
2012	144699	163308	126091	41474	44617	38330	14433	3704	0.39	0.44	0.33
2013	150806	170656	130955	42850	46187	39512	16025	4885	0.48	0.54	0.42
2014	138656	157627	119685	47716	51282	44150	13277	2569	0.35	0.40	0.30
2015	162385	186943	137826	40129	43137	37121	10682	2393	0.30	0.34	0.25
2016	206961	241614	172308	44679	48131	41228	11548	3315	0.33	0.38	0.28
2017	264621	318140	211103	41330	44631	38029	13784	3518	0.37	0.43	0.32
2018	276376	344190	208563	53716	58558	48873	12147	3415	0.29	0.34	0.24
2019	243439	320924	165954	61793	68522	55065	12164	1966	0.22	0.26	0.179
2020	182574	262595	102554	75432	85413	65450	11141	2485	0.172	0.21	0.137
2021	159912	266826	52998	84327	97067	71587	12418	2603	0.179	0.22	0.139
2022	221058*			96645							

* Geometric mean (1984–2019).

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