

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

ICES stock advice

ICES advises that when the MSY approach is applied, catches in 2017 should be no more than 16 021 tonnes. If discard rates do not change from the average of the last three years (2013–2015), this implies landings of no more than 13 709 tonnes.

Stock development over time

The spawning-stock biomass (SSB) has been above $MSY B_{trigger}$ since 2008. The fishing mortality (F) is above F_{MSY} . Recruitment (R) has been relatively stable throughout the time-series, and the 2015 recruitment is below average.

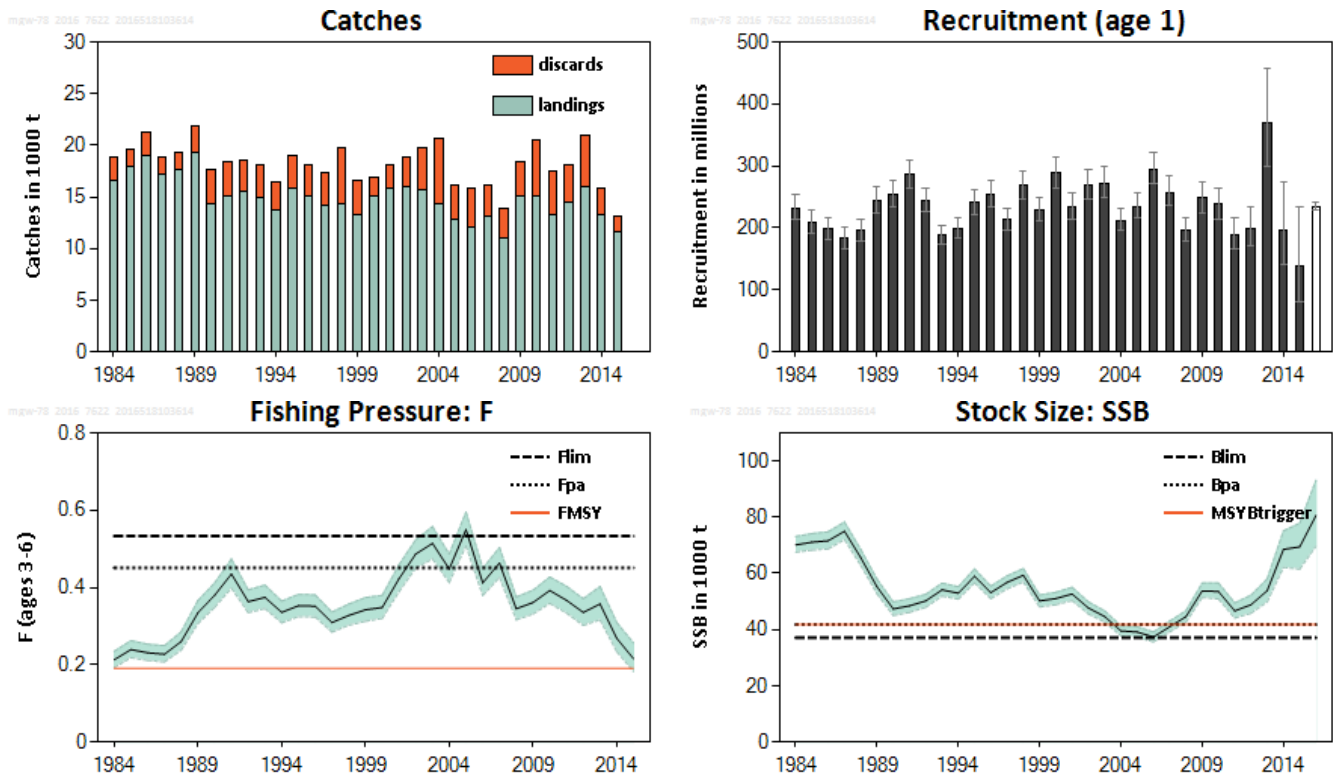


Figure 5.3.36.1 Megrim in divisions 7.b–k, 8.a–b, and 8.d. Summary of the stock assessment with confidence intervals of 90%. Assumed recruitment values are unshaded.

Stock and exploitation status

Table 5.3.36.1 Megrim in divisions 7.b–k, 8.a–b, and 8.d. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size		
		2013	2014	2015	2014	2015	2016
Maximum sustainable yield	F_{MSY}	✗	✗	✗ Above	$MSY B_{trigger}$	✓	✓ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa}, B_{lim}	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	-	-	- Not applicable	SSB_{MGT}	-	- Not applicable

Catch options

Table 5.3.36.2 Megrim in divisions 7.b–k, 8.a–b, and 8.d. The basis for the catch options.

Variable	Value	Source	Notes
F ₂₀₁₆	0.22	ICES (2016a)	F ₂₀₁₅
SSB (2017)	86360 t	ICES (2016a)	
R (2016)	234864 thousand	ICES (2016a)	Geometric mean of recruitment (1984–2013)
R (2017)	234864 thousand	ICES (2016a)	Geometric mean of recruitment (1984–2013)
Catch (2016)	15951 t	ICES (2016a)	Based on F(2016)
Landings (2016)	13649 t	ICES (2016a)	Using average discard rate of 2013–2015
Discards (2016)	2302 t	ICES (2016a)	Using average discard rate of 2013–2015

Table 5.3.36.3 Megrim in divisions 7.b–k, 8.a–b, and 8.d. The catch options.

Rationale	Total catch (2017)	Landings 2017	Discards 2017	Basis	F total (2017)	SSB (2018)	%SSB change *	%TAC change **
MSY approach	16021	13709	2312	F _{MSY}	0.191	90801	5	-32
Precautionary approach	32607	27902	4705	F _{pa}	0.45	71182	-18	38
Other options	0	0	0	F = 0	0.00	109941	27	-100
	17540	15009	2531	F ₂₀₁₆	0.22	89011	3	-25
	36722	31423	5299	F _{lim}	0.53	66414	-23	57
	62293	53304	8989	SSB ₂₀₁₈ = B _{lim}	1.24	37100	-57	166
	58131	49743	8388	SSB ₂₀₁₈ = B _{pa} = MSY B _{trigger}	1.09	41800	-52	148
	19923	17048	2875	TAC ₂₀₁₆ × -1.15	0.25	86207	0	-15
	23438	20056	3382	TAC ₂₀₁₆	0.30	82047	-5	0
26953	23064	3889	TAC ₂₀₁₆ × 1.15	0.36	77857	-10	15	

* SSB 2018 relative to SSB 2017.

** Landings 2017 relative to TAC 2016.

Basis of the advice

Table 5.3.36.4 Megrim in divisions 7.b–k, 8.a–b, and 8.d. The basis of the advice.

Advice basis	MSY approach
Management plan	There is no management plan for megrim in this area.

Quality of the assessment

This is the first time since 2006 that ICES has provided advice based on an analytical assessment of this stock. Previously, the advice was based on a category 3 assessment (ICES, 2012, 2015). Discard issues noted in previous advice have been resolved in the recent benchmark (ICES, 2016b).

Issues relevant for the advice

Discards are included in the assessment and now ICES is able to provide catch advice for this stock.

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

Reference points

Table 5.3.36.5 Megrin 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 $B_{trigger}$	41800 t	B_{pa}	ICES (2016a, 2016b)
	F_{MSY}	0.191	Stochastic simulations based on segmented regression, with the breakpoint fixed at the lowest observed biomass	ICES (2016a, 2016b)
Precautionary approach	B_{lim}	37100 t	B_{loss} , which is the lowest biomass observed corresponding to year 2006	ICES (2016a, 2016b)
	B_{pa}	41800 t	$B_{lim}e^{1.645 \sigma}$; $\sigma_B = 0.07$	ICES (2016a, 2016b)
	F_{lim}	0.53	F that gives 50% probability of SSB being above B_{lim}	ICES (2016a, 2016b)
	F_{pa}	0.45	$F_{lim}e^{-1.645 \sigma}$; $\sigma_F = 0.102$	ICES (2016a, 2016b)
Management plan	SSB_{MGT}	Not defined		
	F_{MGT}	Not defined		

Basis of the assessment

Table 5.3.36.6 Megrin in divisions 7.b–k, 8.a–b, and 8.d. The basis of the assessment.

ICES stock data category	1 (ICES, 2016c)
Assessment type	Statistical catch at age (ICES, 2016a) using catches in the model and forecast.
Input data	Commercial catches (international landings, ages and length frequencies from catch sampling). Survey indices: EVHOE-WIBTS-Q4 and SP-PGFS-WIBTS-Q4. Commercial indices: SP-VIGOTR7 (VIGO84, VIGO99), and IRTBB. Annual maturity ogive from BIOSDEF (1998). Natural mortalities: 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	The stock was benchmarked in 2016 (IBP Megrin; ICES, 2016b).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE)

Information from stakeholders

There is no available information.

History of the advice, catch, and management

Table 5.3.36.7 Megrim in divisions 7.b–k, 8.a–b, and 8.d. History of ICES advice, the agreed TAC, and ICES estimates of catches. All weights are in thousand tonnes.

Year	ICES advice	Predicted catch / landings corresponding to advice	Agreed TAC*	ICES landings ^	Discards ^	ICES catch ^
1987	Not assessed	-	16.46	17.1	1.705	18.8
1988	Not assessed	-	18.1	17.6	1.725	19.3
1989	Not assessed	-	18.1	19.2	2.582	21.8
1990	Not assessed	-	18.1	14.4	3.284	17.7
1991	No advice	-	18.1	15.1	3.382	18.4
1992	No advice	-	18.1	15.6	2.988	18.6
1993	Within safe biological limits	-	21.46	14.9	3.108	18.0
1994	Within safe biological limits	-	20.33	13.7	2.700	16.4
1995	No particular concern	-	22.59	15.9	3.206	19.1
1996	No long-term gain in increased F	16.6	21.20	15.1	3.026	18.1
1997	No advice	14.3	25.0	14.2	3.108	17.3
1998	No increase in F	15.2	25.0	14.3	5.371	19.7
1999	Reduce F below F_{pa}	14.6	25.0	13.3	3.297	16.6
2000	Reduce F below F_{pa}	< 14.2	20.0	15.0	1.870	16.9
2001	Reduce F below F_{pa}	< 14.1	16.8	15.8	2.262	18.0
2002	Reduce F below F_{pa}	< 13.0	14.9	16.0	2.813	18.8
2003	Reduce F below F_{pa}	< 16.1	16.0	15.711	4.008	19.7
2004	Reduce F below F_{pa}	< 20.2	20.2	14.358	6.243	20.6
2005	Reduce F below F_{pa}	< 22.6	21.5	12.888	3.275	16.2
2006	Reduce F below F_{pa}	< 13.6	20.4	12.037	3.751	15.8
2007	Less than average landings 2003–05	< 14.2	20.4	13.06	3.033	16.1
2008	Less than average landings 2004–06	< 13.0	20.4	11.048	2.860	13.9
2009	Same advice as last year	< 13.0	20.4	15.064	3.278	18.3
2010	No increase in effort	< 13.0	20.4	15.1	5.343	20.4
2011	See scenarios	-	20.1	13.559	4.187	17.4
2012	Catch and effort reduction	-	19.101	14.489	3.704	18.1
2013	Decrease landings by 4% (20% increase, followed by 20% PA reduction)	< 12.0	19.101	15.869	4.885	20.9
2014	Same advice as 2013	< 12.0	19.101	13.277	2.569	15.8
2015	Increase landings by no more than 13%	< 15.180	19.101	11.6	1.5	13.1
2016	Precautionary approach (increase recent advised landings by no more than 20%)	≤ 18.216	20.056			
2017	MSY approach (catch advice)	≤ 16.021				

^ In 2016 catch data were updated from 2004 to 2015 and discards for the period 2003–2015.

* Includes *L. boschii* and divisions 7.a and 8.e.

History of catch and landings

Table 5.3.36.8 Megrim in divisions 7.b–k, 8.a–b, and 8.d. Catch distribution by fleet in 2015 as estimated by ICES.

Total catch (2015)	Landings		Discards
13076 tonnes	98 % trawl	2% other gears	1507 tonnes
	11569 tonnes		

Table 5.3.36.9 Megrim in divisions 7.b–k, 8.a–b, and 8.d. History of commercial catch and landings; both the official and 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	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	2700	16384
1995	3945	6129	2658		2927	203		15862	3206	19068
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	16750
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	209		15064	3278	18342
2010	3651	7095	1805		2283	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	2864	2804	147	2436	246	2089	11569	1507	13076

* In 2016 catch data were updated from 2004 to 2015 and discards for the period 2003–2015.

Summary of the assessment

Table 5.3.36.10 Megrim in divisions 7.b–k, 8.a–b, and 8.d. Assessment summary.

Year	R 5%	R	R 95%	SSB 5%	SSB	SSB 95%	F 5%	F	F 95%	Catches	Landings	Discards
1984	213860	231919	252913	67564	70151	73129	0.193	0.213	0.235	18828	16659	2169
1985	191589	208999	227754	68308	71116	74166	0.218	0.239	0.262	19597	17865	1732
1986	181461	198363	217068	68719	71637	74806	0.211	0.231	0.253	21248	18927	2321
1987	166097	183030	201296	72042	75027	78297	0.207	0.227	0.249	18819	17114	1705
1988	179495	196603	214425	62833	65633	68505	0.238	0.260	0.285	19302	17577	1725
1989	223311	244080	265946	52776	55281	57974	0.306	0.335	0.366	21815	19233	2582
1990	234927	254780	277121	45030	47369	49865	0.349	0.380	0.412	17654	14370	3284
1991	262654	285200	310068	46158	48469	51003	0.398	0.435	0.473	18376	15094	3282
1992	225375	243070	263611	47945	50214	52548	0.335	0.363	0.394	18588	15600	2988

Year	R 5%	R	R 95%	SSB 5%	SSB	SSB 95%	F 5%	F	F 95%	Catches	Landings	Discards
1993	173993	188708	203854	51920	54149	56538	0.346	0.374	0.406	18037	14929	3108
1994	184625	199593	216353	50857	52940	55266	0.309	0.336	0.365	16384	13684	2700
1995	222405	241294	260812	56645	58993	61609	0.325	0.353	0.382	19068	15862	3206
1996	233324	253785	275691	51018	53163	55479	0.324	0.352	0.381	18135	15109	3026
1997	195566	212548	231262	54512	56822	59111	0.284	0.309	0.336	17296	14230	3066
1998	246371	268872	291660	56965	59350	61720	0.302	0.328	0.357	19716	14345	5371
1999	210379	229321	249770	48051	50237	52316	0.313	0.342	0.374	16601	13305	3297
2000	264083	288839	314897	48866	51068	53259	0.320	0.348	0.379	16750	15031	1870
2001	213322	233545	257433	50334	52666	55045	0.389	0.422	0.459	18040	15778	2262
2002	245042	268374	294713	45588	47713	49877	0.450	0.487	0.524	18800	15987	2813
2003	247665	271218	299420	42719	44658	46692	0.474	0.514	0.557	19719	15711	4008
2004	195041	212085	231365	37810	39563	41407	0.413	0.448	0.486	20602	14358	6243
2005	215051	234228	255348	37359	39142	41061	0.508	0.549	0.595	16163	12888	3275
2006	271722	294394	321152	35647	37375	39151	0.379	0.412	0.449	15788	12037	3751
2007	235502	256907	283067	39193	41013	43032	0.426	0.463	0.503	16092	13060	3033
2008	178758	195886	215959	42620	44607	46719	0.316	0.345	0.375	13908	11048	2860
2009	224114	248036	273126	51418	53773	56559	0.331	0.361	0.393	18342	15064	3278
2010	213312	237509	264226	50933	53580	56608	0.359	0.392	0.427	20444	15101	5343
2011	166701	189526	215595	44119	46670	49510	0.334	0.367	0.403	17413	13226	4187
2012	170451	198935	233996	45832	48855	52239	0.302	0.335	0.371	18137	14433	3704
2013	298336	368181	455937	49855	53837	58057	0.316	0.357	0.402	20910	16025	4885
2014	140250	195899	273898	62178	68542	75125	0.234	0.269	0.309	15846	13277	2569
2015	80202	137901	233602	61537	69448	77889	0.182	0.216	0.256	13076	11569	1507
2016	228861*	234864*	241193*	69669	80624	93141						

* Geometric mean.

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