ICES Advice on fishing opportunities, catch, and effort
Celtic Seas and Oceanic Northeast Atlantic ecoregions
lez.27.6b

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Megrim (*Lepidorhombus ssp.*) in Division 6.b (Rockall)

ICES stock advice

ICES advises that when the precautionary approach is applied, catches in 2018 should be no more than 443 tonnes.

Stock development over time

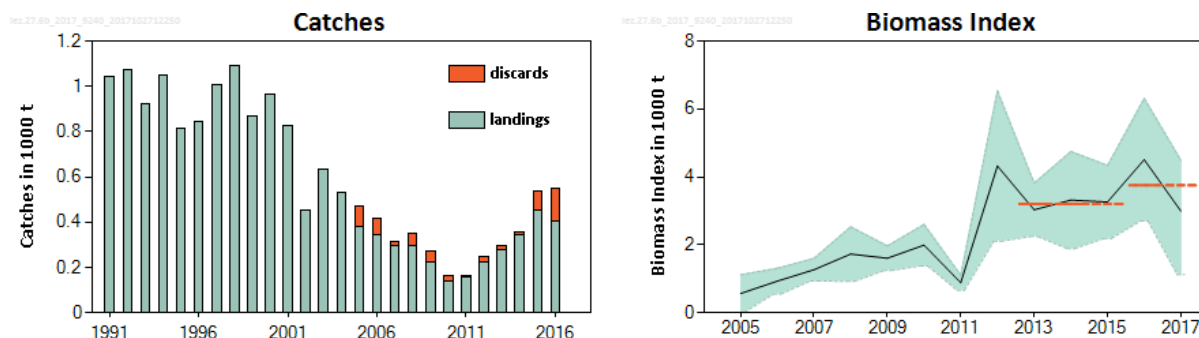Overall, the biomass has increased in the last decade.

Figure 1   Megrim in Division 6.b. Summary of the stock assessment. Catches and stock size indicator (biomass from survey SCO-IV-VI-AMISS-Q2 in thousand tonnes) with 95% confidence intervals. The dashed horizontal lines indicate the average of the respective year range.

Stock and exploitation status

Table 1   Megrim in Division 6.b. State of the stock and fishery relative to reference points.

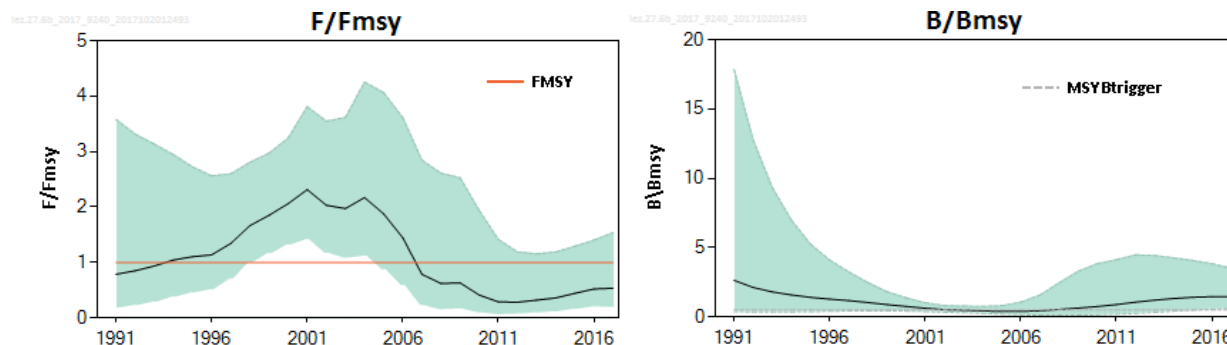|		Fishing pressure				Stock size			
		2014	2015	2016			2015	2016	2017
Maximum sustainable yield	F_{MSY}	✅	✅	✅ Below	MSY $B_{trigger}$		✅	✅	✅ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✅	✅	✅ Below potential reference points	B_{pa}, B_{lim}		✅	✅	✅ Above potential reference points
Management plan	F_{MGT}	–	–	– Not applicable	B_{MGT}		–	–	– Not applicable
Qualitative evaluation	-	–	–	– Not applicable	-		➡	↗	↘ Decreasing

Figure 2   Megrim in Division 6.b. SPiCT analysis showing exploitable biomass relative to B_{MSY} and fishing mortality relative to F_{MSY}. The shaded areas in both plots indicate 95% confidence intervals. The horizontal lines indicate F_{MSY} and MSY $B_{trigger}$ proxies.

Catch options

The ICES framework for category 3 stocks was applied (ICES, 2012). The SCO-IV-VI-AMISS-Q2 survey biomass index was used as an indicator of stock development. The advice is based on a comparison of the two latest index values (index A) with the three preceding values (index B), multiplied by the recent advised catch.

The Surplus Production In Continuous Time (SPiCT; Pedersen and Berg, 2017) analysis suggests that fishing mortality is below, and stock size above, proxies of the F_{MSY} reference points (Figure 2); therefore, no additional precautionary buffer was applied. The discard rate is 15.5% of total catch.

Table 2   Megrim in Division 6.b. The basis for the catch options.*

Index A (2016–2017)		3750 t
Index B (2013–2015)		3203 t
Index ratio (A/B)		1.17
Uncertainty cap	Not applied	-
Advised catch for 2017		379 tonnes
Discard rate (average 2014–2016)		15.5%
Precautionary buffer	Not applied	-
Catch advice**		443 tonnes
Wanted catch corresponding to the catch advice***		375 tonnes

* The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.

** Advice for 2017 × index ratio.

*** "Wanted" catch is used to describe fish that would be landed in the absence of the EU landing obligation; calculated as catch advice × (1- discard rate).

Basis of the advice

Table 3   Megrim in Division 6.b. The basis of the advice.

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

Quality of the assessment

The advice is based on the industry-science survey catch per unit of effort (CPUE) (SCO-IV-VI-AMISS-Q2), used as an indicator of stock size. The index has large uncertainties associated with it and has large interannual variability.

Discard estaimates are available from 2005, but discard rates are poorly estimated with few samples each year.

The estimates of fishing mortality are well below F_{MSY} but associated with large uncertainties.

Issues relevant for the advice

ICES provides catch advice this year as vessels targeting gadoids at Rockall have been subject to the landings obligation for megrim since 2017 (EC, 2016).

Reference points

Table 4   Megrim in Division 6.b. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger_{proxy}}$	B/BMSY=0.5*	Estimated by SPiCT biomass dynamic model parameters; 0.5 × B_{MSY}; 1991–2017	ICES (2017)
	$F_{MSY_{proxy}}$	F/FMSY=1*	Estimated by SPiCT biomass dynamic model parameters; 1991–2017	ICES (2017)
Precautionary approach	B_{lim}			
	B_{pa}			
	F_{lim}			
	F_{pa}			
Management plan	SSB_{mgt}			
	F_{mgt}			

* No reference points are defined for this stock in terms of absolute values. The SPiCT-estimated values of the ratios F/F_{MSY} and B/B_{MSY} are used to estimate stock status relative to the proxy MSY reference points.

Basis of the assessment

Table 5   Megrim in Division 6.b. Basis of assessment and advice.

ICES stock data category	3 (ICES, 2016)
Assessment type	Survey trends-based assessment
Input data	Commercial landings; one dedicated industry-science survey index (SCO-IV-VI-AMISS-Q2).
Discards and bycatch	Discard estimates are available from 2005 onwards.
Indicators	SPiCT (Petersen & Berg, 2017)
Other information	Last benchmarked in 2011 (WKFLAT; ICES, 2011).
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 6   Megrim in Division 6.b. ICES advice, official landings and ICES estimated discards. All weights are in tonnes.

Year	ICES advice *	Predicted catches corresp. to advice	Predicted landings corresp. to advice	Agreed TAC 5.b(EC) 6, 12, 14	Official landings 6.b	ICES discards**
1990	Not assessed		-	4840	804	
1991	No advice		-	4840	1045	
1992	No advice		-	4840	1073	
1993	No long-term gain in increased F		-	4840	925	
1994	No long-term gain in increased F		-	4840	1046	
1995	No advice		-	4840	816	
1996	No advice		-	4840	843	
1997	No advice		-	4840	1009	
1998	Adequate catch controls		-	4840	1091	
1999	Maintain current TAC		4840	4840	866	
2000	Maintain current TAC		4840	4840	964	
2001	Maintain current TAC		4840	4360	824	
2002	Maintain current TAC		4360	4360	455	
2003	Maintain current TAC		4360	4360	632	
2004	Reduce TAC to recent landings		3600	3600	528	
2005	Reduce TAC to recent landings		2300	2880	382	87
2006	Reduce TAC to recent landings		2300	2880	344	75
2007	Reduce TAC to recent landings		2100	2880	106	22
2008	Reduce TAC to recent landings		1400	2592	294	59
2009	Same advice as last year		1400	2799	226	44
2010	No increase in effort		-	3079	139	26
2011	No increase in catches		-	3387	155	7
2012	No increase in catches		-	3387	224	21
2013	Catch decrease by 7%		< 160	3387	278	15
2014	Landings increase of no more than 20%		< 207	4074	343	15
2015	Landings increase of no more than 20%		< 262	4129	453	85
2016	Precautionary approach (no more than 20% increase of recent advised landings)		≤ 314	5214	405^	145^
2017	Precautionary approach	≤ 379	≤ 342	5682		
2018	Precautionary approach	≤ 443				

* Prior to 2011 advice was given for megrim in Divisions 4.a, 6.a, and 6.b combined.

** Discard data are only available from 2005 onwards.

^ Preliminary.

History of the catch and landings

Table 7   Megrim in Division 6.b. Catch distribution by fleet in 2016 as estimated by ICES.

Catch (2016)	Landings	Discards
550 tonnes	Otter trawls almost 100 %	145 tonnes
	405 tonnes	

Table 8   Megrim in Division 6.b. History of catch and landings; both the official and ICES estimated values are presented for each country. All weights are in tonnes.

Year	France	Ireland	Spain	UK – Eng+Wales+N.Irl.	UK – England & Wales	UK – Scotland	UK	Official landings	ICES catch
1990		196	363	19		226		804	
1991		240	587	14		204		1045	
1992		139	683	53		198		1073	
1993		128	594	56		147		925	
1994		176	574	38		258		1046	
1995		117	520	27		152		816	
1996		124	515	92		112		843	
1997		141	628	76		164		1009	
1998		218	549	116		208		1091	
1999		127	404	57		278		866	
2000	4	167	427	57		309		964	
2001	< 0.5	176	370	42		236		824	
2002	< 0.5	87	120	41		207		455	
2003		83	93	74		382		632	
2004		43	71	42		372		528	
2005		68	88	19		207		382	469
2006		95	59	9		181		344	419
2007		87	19			188		294	316
2008		68	84		1	141		294	353
2009		48	0			178		226	270
2010		47	0				92	139	165
2011		72	17				66	155	162
2012		120	15				89	224	245
2013		181	39				58	278	293
2014		230	18				95	343	358
2015		256	67				130	453	538
2016*		272	27				106	405	550

* Preliminary.

Summary of the assessment

Table 9   Megrim in Division 6.b. Assessment summary. High and low referes to 95% confidence intervals.

Year	Biomassindex	High	Low
	tonnes		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005	566	1118	14
2006	929	1308	551
2007	1267	1601	934
2008	1728	2531	925
2009	1605	1968	1241
2010	1991	2602	1380
2011	885	1107	663
2012	4320	6533	2107
2013	3030	3816	2244
2014	3318	4748	1888
2015	3262	4336	2187
2016	4507	6311	2704
2017	2992	4489	1121

Sources and references

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