ICES International Council for
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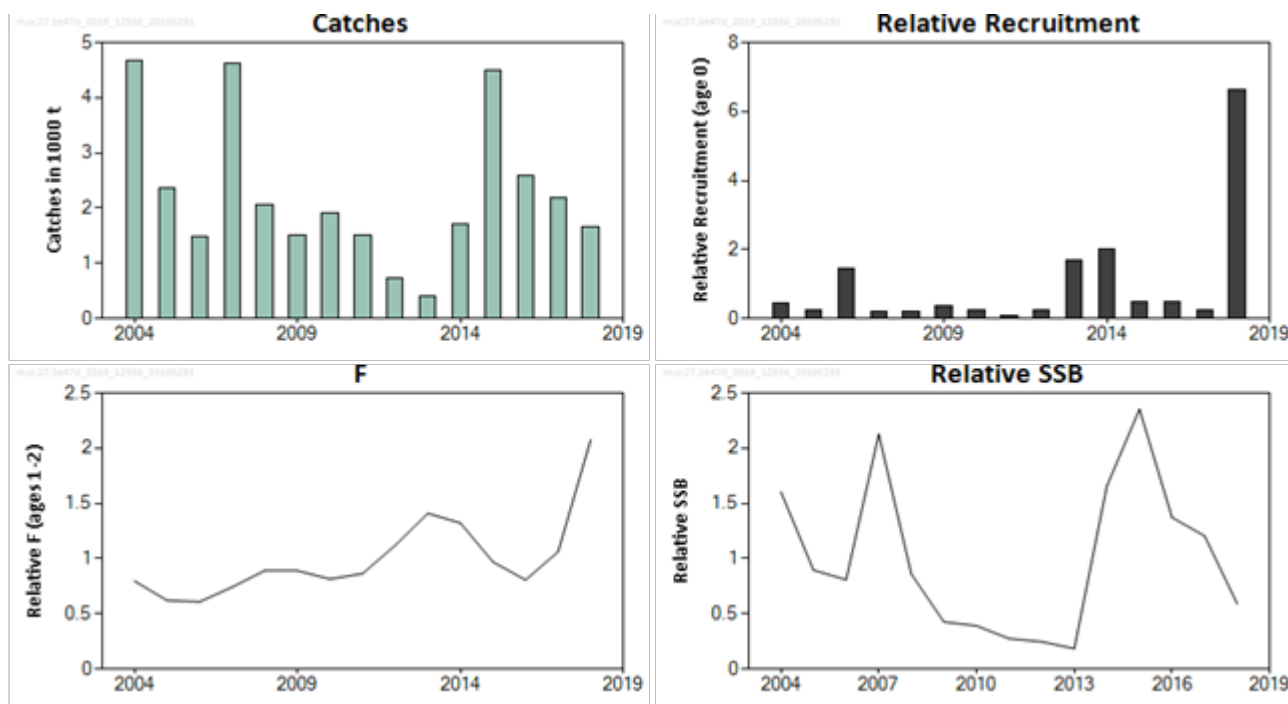l'Exploration de la Mer

Striped red mullet (*Mullus surmuletus*) in Subarea 4 and divisions 7.d and 3.a (North Sea, eastern English Channel, Skagerrak and Kattegat)

ICES advice on fishing opportunities

ICES has not been requested to provide advice on fishing opportunities for this stock.

Stock development over time

The assessment is indicative of trends only. Spawning-stock biomass has decreased since 2015, as a consequence of poor recruitment and an increase in F. Recruitment in 2018 is estimated to be large.

Figure 1   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. Summary of the stock assessment.

Stock and exploitation status

ICES cannot assess the stock and exploitation status relative to MSY and precautionary approach (PA) reference points because the reference points are undefined

Table 1   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. State of the stock and fishery relative to reference points. The fishing pressure indicators are based on the length-based analyses shown in Figure 2.

		Fishing pressure					Stock size			
		2016	2017	2018			2016	2017	2018	
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY $B_{trigger}$	?	?	?	Undefined
Precautionary approach	F_{pa},F_{lim}	?	?	?	Undefined	B_{pa},B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	—	—	—		B_{MGT}	—	—	—	
Qualitative evaluation	-	↘	↗	↗	Increasing	-	↘	↘	↘	Decreasing

ICES advice, as adopted by its advisory committee (ACOM), is developed upon request
by ICES clients (European Union, NASCO, NEAFC, and Norway).

Catch scenarios

ICES has not been requested to provide advice on fishing opportunities for this stock.

Basis of the advice

ICES has not been requested to provide advice on fishing opportunities for this stock.

Table 2   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	The EU multiannual plan (MAP) for stocks in the North Sea (EU, 2018) and adjacent waters applies to by-catches of this stock. The MAP stipulates that when the FMSY ranges are not available, fishing opportunities should be based on the best available scientific advice.

Quality of the assessment

The assessment relies on information collected in the eastern English Channel, on age-structured data provided by France, and on length data provided by both France and the UK. The percentage of landings covered by length and age sampling is 26%. Additional length and age samples from the main fleets, including other areas and nations, are needed to improve the quality of the assessment.

Issues relevant for the advice

Landings are assumed to be catches, because there is no minimum landing size and there is a market for small fish.

The age structure is truncated, and recent catches of this stock mainly consist of age 0 and age 1 fish. There is evidence of a strong incoming recruitment in 2018. The fishery for striped red mullet would benefit from improved technical measures such as sorting grids, increased mesh size, and spatial and temporal closures. These measures could reduce the catches of small fish and contribute to more stable yields.

Reference points

Table 3   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B$_{trigger\,proxy}$	Not defined		
	F$_{MSY\,proxy}$	Not defined		
Precautionary approach	B$_{lim}$	Not defined		
	B$_{pa}$	Not defined		
	F$_{lim}$	Not defined		
	F$_{pa}$	Not defined		
Management plan	SSB$_{MGT}$	Not defined		
	F$_{MGT}$	Not defined		

* No reference points are defined for this stock in terms of absolute values. The LBI-estimated values of the ratio $L_{mean}/L_{F=M}$ is used to estimate exploitation status relative to the proxy MSY reference point.

Basis of the assessment

Available data and approaches for the assessment are described below; ICES has not, however, been requested to provide advice on fishing opportunities for this stock in 2019.

Table 4   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2018).
Assessment type	Age-based assessment (a4a; Jardim *et al.*, 2015) indicative of trends (ICES, 2019).
Input data	Commercial landings (age frequencies from landings sampling in Division 7.d), survey index (CGFS). Natural mortality and maturity-at-age are assumed constant.
Discards and bycatch	Not included, are considered negligible.
Additional indicators	
Other information	Benchmarked in 2015 (ICES, 2015).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

Information from stakeholders

There is no additional available information.

History of the advice, catch, and management

Table 5   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Official landings	ICES estimates
2006		-	1724	1483
2007		-	5328	4610
2008		-	5365	2066
2009		-	2026	1518
2010		-	2166	1920
2011		-	1817	1512
2012	No increase in catch	-	893	726
2013	No increase in catches (average 2009–2010)	< 1700	461	409
2014	Reduce catches by 36% compared to 2012	< 460	2002	1718
2015	No new advice, same as for 2014	< 460	4161	4487
2016	Precautionary approach (increase catches by no more than 20%)	< 552	2609	2579
2017	Precautionary approach (same advised catch value as given for 2016)	< 552	2160	2195
2018	Precautionary approach	≤ 465	1650	1648
2019	Precautionary approach	≤ 465		
2020	No catch advice requested			
2021	No catch advice requested			

History of the catch and landings

Table 6   Striped red mullet in Subarea 4 and divisions 7.d and 3.a. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Landings			Discards
1648 tonnes	Danish seine 69 %	Otter trawl 25 %	Others 6 %	Negligible
	1648 tonnes			

Table 7 Striped red mullet in Subarea 4 and divisions 7.d and 3.a. History of commercial 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	Belgium	France	Netherlands	UK	Total official landings	Total landings (ICES estimates)
2004	31	4137	1148	129	5445	4674
2005	29	1918	914	136	2997	2350
2006	16	1145	466	97	1724	1483
2007	16	3982	1147	183	5328	4610
2008	19	3723	1270	353	5365	2066
2009	17	827	889	293	2026	1518
2010	80	947	802	337	2166	1920
2011	97	705	771	244	1817	1512
2012	52	170	525	146	893	726
2013	40	121	260	40	461	409
2014	79	765	912	242	2002	1718
2015	211	1598	1996	356	4161	4487
2016	147	556	1421	485	2609	2579
2017	93	784	973	310	2160	2195
2018	77	593	826	154	1650	1648

Summary of the assessment

Table 8 Striped red mullet in Subarea 4 and divisions 7.d and 3.a. Assessment summary. Weights are in tonnes.

Year	Relative Recruitment	Relative SSB	Catches	Relative F (ages 1–2)
2004	0.436	1.604	4674	0.80
2005	0.239	0.895	2350	0.62
2006	1.452	0.809	1483	0.61
2007	0.193	2.127	4610	0.74
2008	0.203	0.861	2066	0.89
2009	0.357	0.427	1518	0.89
2010	0.252	0.392	1920	0.82
2011	0.075	0.276	1512	0.86
2012	0.244	0.247	726	1.12
2013	1.706	0.186	409	1.41
2014	2.006	1.656	1718	1.32
2015	0.471	2.353	4487	0.97
2016	0.503	1.372	2579	0.81
2017	0.241	1.205	2195	1.06
2018	6.622	0.591	1648	2.1

Sources and references

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