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Norway lobster (*Nephrops norvegicus*) in divisions 8.a and 8.b, functional units 23–24 (northern and central Bay of Biscay)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, and assuming that discard rates and fishery selection patterns do not change from the average of 2015–2017, catches in 2019 should be no more than 6221 tonnes.

Stock development over time

An abundance estimate from an underwater TV (UWTV) survey has been available since 2016. Stock abundance decreased between 2016 and 2017 then increased in 2018. The harvest rate is now estimated to be above F_{MSY}.

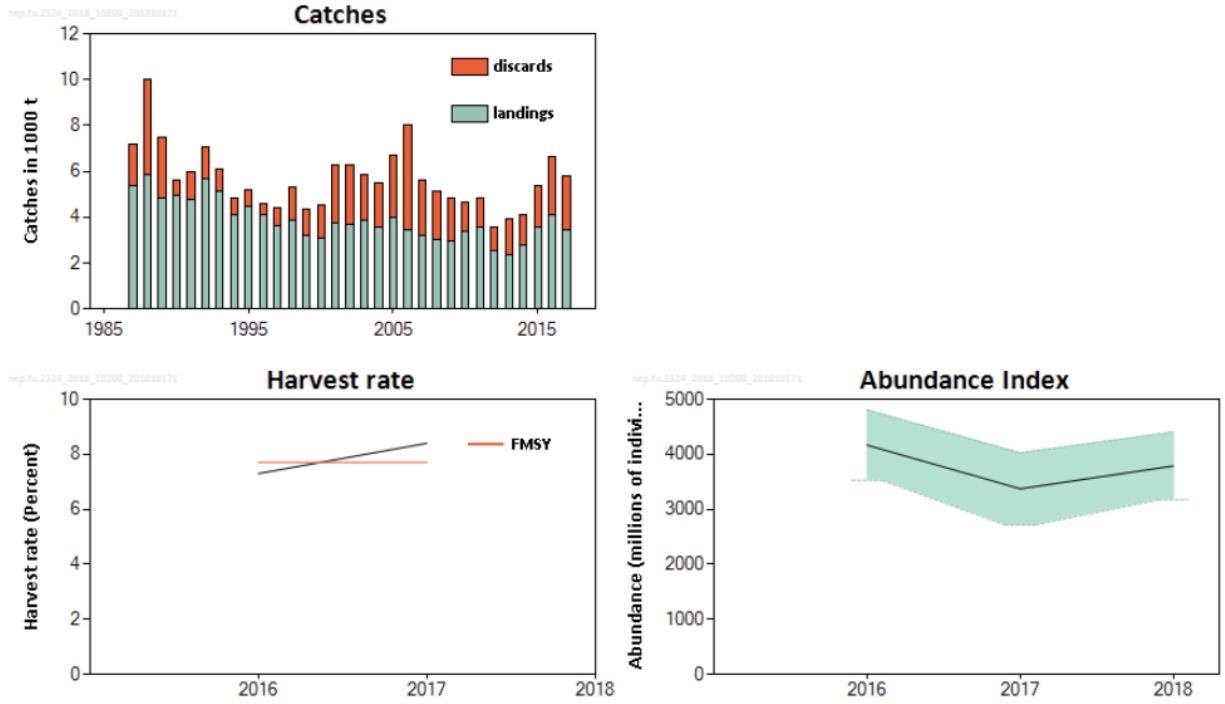

Figure 1 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by total abundance), stock abundance form the survey (Underwater TV survey, millions; SSB proxy; 95% confidence intervals). The orange line represents the F_{MSY} harvest rate.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is above F_{MSY}; no reference points for stock size have been defined for this stock.

Table 1 Norway lobster in divisions 8.a and 8.b, functional units 23–24. State of the stock and fishery relative to reference points.

	Fishing pressure					Stock size				
		2015	2016	2017			2016	2017	2018	
Maximum sustainable yield	F_{MSY}	✓	✓	✗	Above	MSY $B_{trigger}$	?	?	?	Undefined
Precautionary approach	F_{pa},F_{lim}	✓	✓	?	Undefined	B_{pa},B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	–	–	–	Not applicable	B_{MGT}	–	–	–	Not applicable
Qualitative evaluation	-	–	–	–	Not applicable	-	?	↘	↗	Increasing

Catch scenarios

Table 2 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2019)	3788 million	UWTV survey 2018 (number of individuals)
Mean weight in wanted catch	24.94 g	Average 2015–2017
Mean weight in unwanted catch	12.05 g	Average 2015–2017
Unwanted catch	55.6%	Average 2015–2017 (proportion by number)
Discards survival	30%	Proportion by number
Dead unwanted catch	46.7%	Average 2015–2017 (proportion by number)

Table 3 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Catch options for 2019 assuming discarding continues at the recent average rate. All weights are in tonnes.

Basis	Total catch	Dead removals	Wanted catch	Dead unwanted catch	Surviving unwanted catch	Harvest rate*	% Advice change**
						%	
	WC+DUC+SUC	WC+DUC	WC	DUC	SUC	For WC+DUC	
ICES advice basis							
MSY approach; F_{MSY}	6221	5518	3878	1641	703	7.70%	12.5
Other options							
F_{2017}	6802	6033	4240	1794	769	8.40%	23

* By number
** Advice value for 2019 relative to the advice value for 2018.

The advice for 2019 has increased 12.5% due to an increase in stock abundance.

Basis of the advice

Table 4 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis of the advice.

Advice basis	ICES MSY approach
Management plan	ICES is not aware of any agreed precautionary management plan for Norway lobster in this area.

Quality of the assessment

Underwater TV (UWTV) surveys have been carried out for this stock since 2014; the first two survey years were considered to be exploratory and showed the feasibility of the method for this stock. In October 2016, ICES benchmarked this assessment using the 2016 UWTV survey, which provides an abundance estimate for functional units (FUs) 23–24 with acceptable precision.

Poor fits in the length–frequency models normally used for calculating F_{MSY} for category 1 *Nephrops* stocks meant that F_{MSY} values could not be estimated for FUs 23–24 using this method. The reasons for this require further investigation. The F_{MSY} reference point (harvest rate of 7.7%) is rather based on the average realized harvest rates of functional units with an observed history of sustainable exploitation, while also taking into account the low harvest rates applied to the FUs 23–24 stock in the recent past.

The level of catch sampling is good for this stock.

Issues relevant for the advice

From 2016, fisheries catching *Nephrops* in Subarea 8 are covered by the EU landings obligation (EU, 2015). However, an exemption for high survival has been granted for this fishery since 2016.

The assessment and advice for this stock were carried out by applying a discard survival rate of 30% based on historical experiments (Charuau *et al.*, 1982). However, Méhault *et al.* (2016) found that the discard survival rate (55%) is higher than the historical reference. Further experiments (Mérillet *et al.*, 2018) estimated the rate at 51% when using the quick chute system for discarding *Nephrops*, which is mandatory since the 1st January 2017. This updated estimate was considered reliable enough to confirm the existing exemption (STECF, 2017). The updated discard survival rate will be considered both when the revision of the reference points is carried out and in future assessments.

An improved selection pattern would reduce discarding and result in a higher yield in the long term.

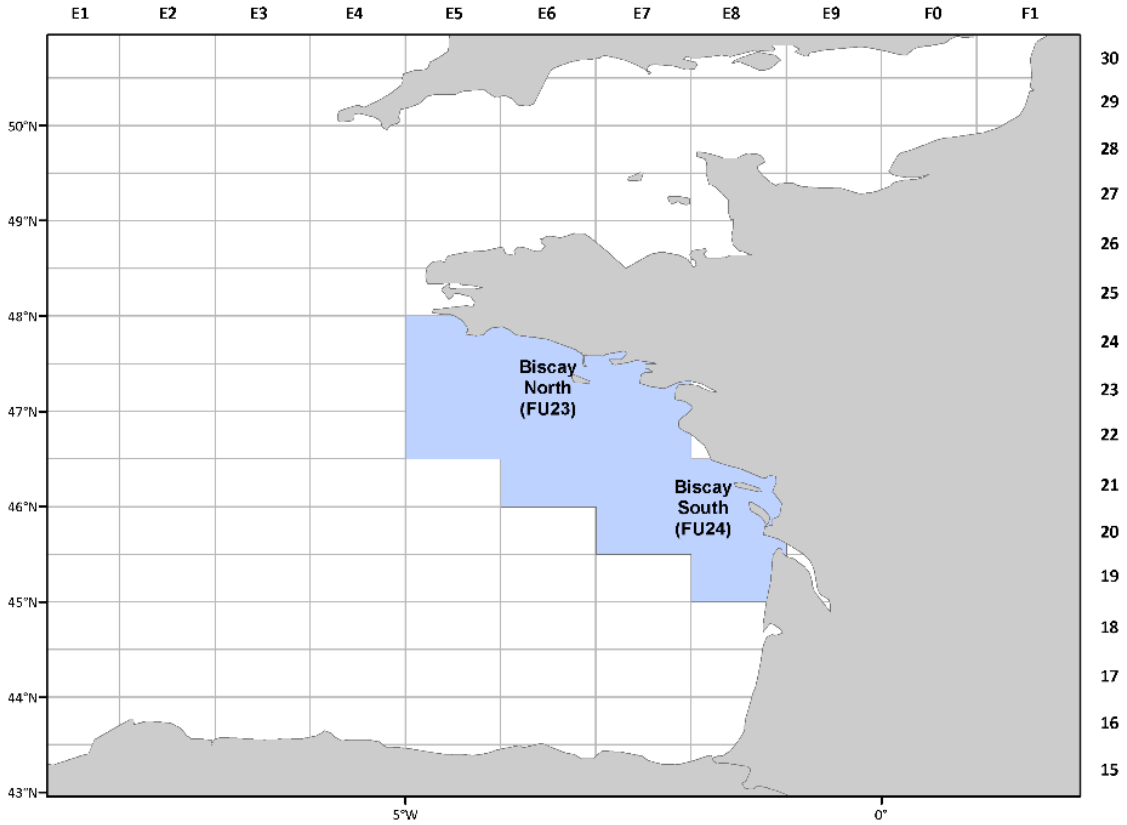

Figure 2 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The functional units (FUs) 23 and 24 constitute a single stock of *Nephrops*.

Reference points

Table 5 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	Not defined		
	F_{MSY}	7.7% harvest rate	F_{MSY} based on the average realized harvest rates of functional units with an observed history of sustainable exploitation, while also taking into account the low harvest rates applied to the FUs 23–24 stock in the recent past.	ICES (2016)
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		

Basis of the assessment

Table 6 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis of the assessment.

ICES stock data category	1 (ICES, 2018a)
Assessment type	Underwater TV survey (ICES, 2018b).
Input data	One survey index (UWTV-FU23-24); commercial catches (international landings, length frequencies from sampling); fixed maturity parameters from sampling onboard; fixed natural mortalities. Discard survival rate of 30% (Charuau *et al.*, 1982).
Discards and bycatch	Included in the assessment for the entire time-series (>50% of catches in number).
Indicators	Length–frequency distributions by sex.
Other information	The latest benchmark (based on the UWTV survey) was performed in October 2016 (ICES, 2016).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE)

Information from stakeholders

In 2017, as in 2016, yields were high from the beginning of the year until mid-August; however, in 2016 yields remained high for the remainder of the year. Producer Organizations limitations per trip and per vessel were put in place earlier in 2017 than in 2016. These limitations have led to changes in on-board sorting practices (discarding of individuals equal to or greater than the national minimum size of 9 cm) in 2016, and to a lesser extent in 2017. Fishers have observed significant proportions of undersized *Nephrops* in the catches.

Since 2017, devices are used to improve survival of unwanted catches.

History of the advice, catch, and management

Table 7 Norway lobster in divisions 8.a and 8.b, functional units 23–24. History of ICES advice, the agreed TAC, and ICES estimates of landings. All weights are in tonnes.

Year	ICES advice	Landings corresponding to the advice	Catch advice	Agreed TAC	ICES estimated landings	ICES estimated total discards*
2003	50% reduction of current exploitation rate	2200		3000	3886	1977
2004	20% reduction of current exploitation rate	3300		3150	3571	1932
2005	20% reduction of current exploitation rate	3100		3100	3991	2698
2006	Maintain recent catch	3500		4000	3447	4544
2007	Maintain recent catch	3600		4320	3176	2411
2008	Maintain recent catch	3600		4320	3030	2123
2009	Maintain recent landings (average 2005–2007)	3400		4100	2987	1833
2010	No new advice, same as for 2009	3400		3900	3398	1275
2011	See scenarios			3900	3559	1263
2012	Reduce catch			3900	2520	1013
2013	Decrease landings by 5% (19% increase, followed by 20% PA reduction)	< 3200		3900	2380	1521
2014	Same advice as 2013	< 3200		3900	2807	1326
2015	Increase landings by no more than 14%	< 3214		3900	3569	1822
2016	Same advice as 2015	< 3214		3900	4091	2531
2017	MSY approach	≤ 4160**	≤ 6376**	4160	3412	2387
2018	MSY approach		≤ 5531**	3600		
2019	MSY approach		≤ 6221**			

* Dead + surviving discards.
** Assuming recent discard rates.

History of the catch and landings

Table 8 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Official catch distribution by fleet in 2017 as estimated by ICES. Discards split into dead and alive, assuming 30% discard survival. All weights are in tonnes.

Total catch		Landings	Total discards*	
12.3% surviving	87.7% dead	~100% bottom trawl	70% dead	30% surviving
5799		3412	2387	

* Dead + surviving discards.

Table 9 Norway lobster in divisions 8.a and 8.b, functional units 23–24. ICES estimates of removals, landings, and discards. Only the French fleet is fishing in these FUs. All weights are in tonnes.

Year	Removals*	Landings	Total discards
1987	6634	5397	1767
1988	8772	5875	4138
1989	6940	4835	3007
1990	5423	4972	644
1991	5603	4754	1213
1992	6532	5681	1217
1993	5791	5109	974
1994	4594	4092	717
1995	4933	4452	687
1996	4460	4118	487
1997	4249	3610	914
1998	4882	3865	1453
1999	3974	3209	1092
2000	4005	3069	1337
2001	5569	3730	2628
2002	5454	3679	2535
2003	5270	3886	1977
2004	4923	3571	1932
2005	5880	3991	2698
2006	6627	3447	4544
2007	4864	3176	2411
2008	4517	3030	2123
2009	4270	2987	1833
2010	4290	3398	1275
2011	4443	3559	1263
2012	3229	2520	1013
2013	3444	2380	1521
2014	3735	2807	1326
2015	4845	3569	1822
2016	5863	4091	2531
2017	5083	3412	2387

* Removals are calculated as landings plus dead discards, assuming 30% survival rate of discards.

Summary of the assessment

Table 10 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Assessment summary.

Year	Landings in number	Total discards in number	Removals* in number	UWTV abundance estimates	95% Confidence interval	Harvest rate (by number)	Mean weight in landings	Mean weight in discards	Discard proportion (by number)	Dead discard proportion (by number)	Landings	Discards
	millions					%	grammes		%		tonnes	
2014	121.6	117.9	204.1				23.1	11.2	49	40	2807	1326
2015	138.9	156.4	248.4				25.7	11.7	53	44	3569	1822
2016	161.4	201	302.1	4168	640	7.2	25.4	12.6	55	47	4091	2531
2017	143.5	200.6	283.9	3373	653	8.4	23.8	11.9	58	49	3412	2387
2018				3788	616							

* Removals are calculated as landings plus dead discards, assuming 30% survival rate of discards.

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