

Norway lobster (*Nephrops norvegicus*) in divisions 7.g and 7.f, Functional Unit 22 (Celtic Sea, Bristol Channel)

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 2084 tonnes.

To ensure that the stock in Functional Unit 22 is exploited sustainably, management should be implemented at the functional unit level.

Stock development over time

The harvest rate has fluctuated over the time-series and it is now just below F_{MSY} . The stock abundance has been above $MSY B_{trigger}$, except for 2016 and 2018.

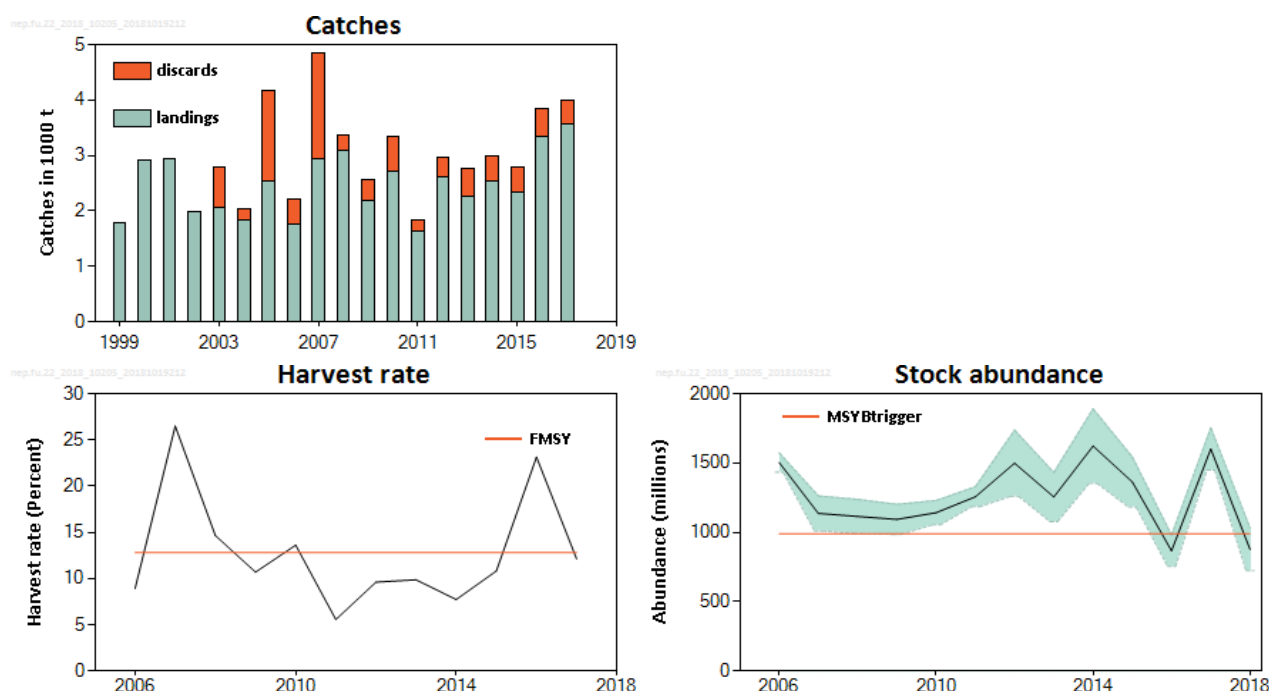


Figure 1 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. Summary of the stock assessment. Catches (discard data only available from 2003), harvest rate (sum of landings and dead discards in numbers, divided by total abundance), survey abundance (Underwater TV, millions; SSB proxy; 95% confidence intervals). Orange lines represent $MSY B_{trigger}$ and the F_{MSY} harvest rate.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} and stock size is below $MSY B_{trigger}$.

Table 1 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. 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}	✓	✗	✓ Below	$MSY B_{trigger}$	✗	✗ Below trigger
Precautionary approach	F_{pa}, F_{lim}	✓	?	✓ Below potential reference points	B_{pa}, B_{lim}	?	? Undefined
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}	—	— Not applicable

Catch scenarios

The latest estimate of stock abundance is below the MSY B_{trigger} (990 million). The ICES maximum sustainable yield (MSY) approach states that under such conditions the F_{MSY} harvest rate (12.8%) for Functional Unit (FU) 22 should be reduced by multiplying it by the ratio of current abundance to MSY B_{trigger} . This corresponds to a harvest rate of $[12.8 \times (876/990)] = 11.3\%$ for the advice in 2019.

Table 2 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. The basis for the catch advice and scenarios.

Variable	Value	Notes
Stock abundance (2019)	876 million	UWTV survey 2018 (number of individuals).
Mean weight in wanted catch	22.2 g	Average 2003–2017.
Mean weight in unwanted catch	11.9 g	Average 2003–2017.
Unwanted catch	24.1%	Average 2015–2017(proportion by number).
Discards survival	25%	Proportion by number.
Dead unwanted catch	19.3%	Average 2015–2017(proportion by number).

Table 3 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. Annual catch advice and scenarios; discarding is assumed to continue at the recent average. 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; $F = F_{\text{MSY}} \times (\text{Stock Abundance 2019})/\text{MSY } B_{\text{trigger}}$	2084	2008	1780	228	76	11.3	-51.8
Other options							
F_{MSY}	2355	2269	2011	258	86	12.8	-45.5
$F_{\text{MSY lower}}$	1876	1808	1603	205	68	10.2	-56.6
$F_{\text{MSY lower}} \times (\text{Stock Abundance 2019})/\text{MSY } B_{\text{trigger}}$	1656	1595	1414	181	60	9	-61.7
$F_{\text{MSY upper}}$	2355	2269	2011	258	86	12.8	-45.5
$F_{\text{MSY upper}} \times (\text{Stock Abundance 2019})/\text{MSY } B_{\text{trigger}}$	2084	2008	1780	228	76	11.3	-51.8
F_{2017}	2227	2146	1903	244	81	12.1	-48.5

* By number.

** Advice value for 2019 relative to advice value for 2018.

The reduction in total catch advice is the result of the decrease in observed stock abundance in 2018 and the lower harvest rate to be applied because stock abundance is below MSY B_{trigger} .

Basis of the advice

Table 4 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. The basis of the advice.

Advice basis	MSY approach.
Management plan	The EU has proposed a multiannual management plan for the Western Waters, which is not yet finalized (EU, 2018).

Quality of the assessment

Since 2006 a dedicated annual UWTV survey has taken place which gives abundance estimates for the stock with high precision. Sampling of this stock is adequate.

Revisions to sampling and partitioning of catch sampling data and landings led to changes in the assessment inputs (Annex 3 in ICES, 2018a). This did not have a material change to the historic perception of stock exploitation.

The long-term average (rather than a three-year average) was considered to be more appropriate as input for the mean weight in landings and discards in the calculation of catch scenarios, to account for interannual variation.

Issues relevant for the advice

From 2016 the EU landing obligation was applied to all catches of Norway lobster fisheries in ICES Subarea 7, with several exemptions. Observations from the 2016–2017 fishery indicate that discarding above the minimum conservation reference size (MCRS) continues and has not changed markedly (Figure 3). Consequently, ICES is providing advice for 2019 assuming average discard rates as observed over the last three years, which is considered to be a more realistic assumption.

For FU 22, the absolute density observed during the UWTV survey is medium (~ 0.4 individuals m^{-2}). The fishery in this area has been in existence since the 1960s and has been relatively stable for many years. Harvest rates around the $F_{35\%SpR}$ are expected to deliver high long-term yield with a low probability of recruitment overfishing and are used as proxy for F_{MSY} for FU 22.

A single TAC covers the entire ICES Subarea 7. Management should be implemented at the functional unit level to ensure that fishing opportunities are in line with the scale of the resource in each of the stocks.

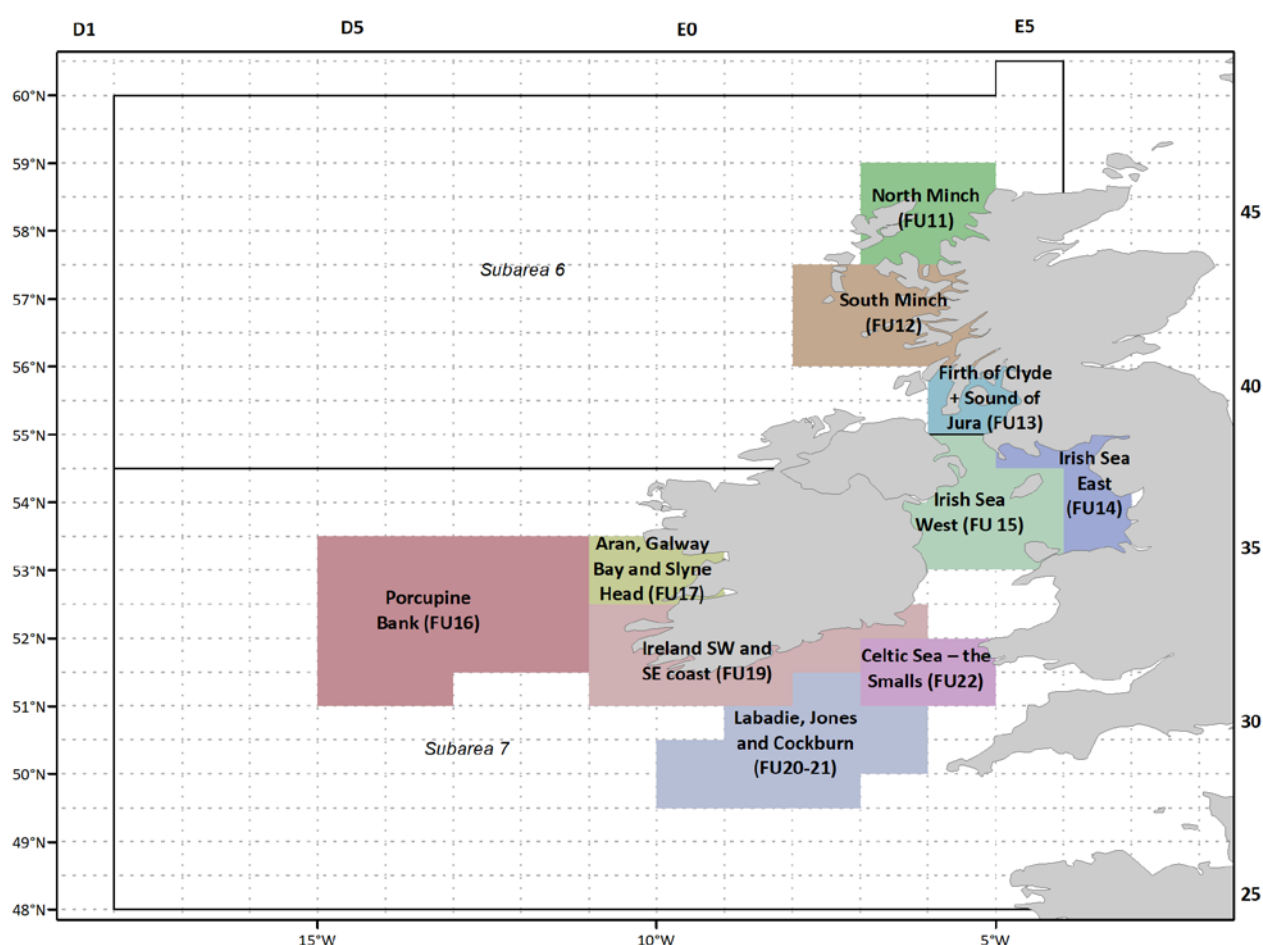


Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 5 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B_{trigger}	990 million individuals	5% interval on the probability distribution of abundance for the time-series 2006–2015, assuming a normal distribution.	ICES (2016)
	F_{MSY}	12.8% harvest rate	F_{MSY} proxy equivalent to $F_{35\%SPR}$ for combined sexes, derived from a length-based per recruit analysis.	ICES (2016)
Precautionary approach	B_{lim}	Not defined.		
	B_{pa}	Not defined.		
	F_{lim}	Not defined.		
	F_{pa}	Not defined.		
Management plan *	MAP MSY B_{trigger}	990 million individuals	MSY B_{trigger}	EU (2018)
	MAP B_{lim}	Not defined		
	MAP F_{MSY}	12.8% harvest rate	F_{MSY}	EU (2018)
	MAP range F_{lower}	10.2–12.8% harvest rate	Consistent with ranges provided by ICES (2016), resulting in no more than 5% reduction in long-term yield compared with MSY.	EU (2018)
	MAP range F_{upper}	12.8–12.8% harvest rate	$F_{\text{MSY upper}}$ value capped at F_{MSY} because it has not been possible to evaluate the probability of $SSB < B_{\text{lim}}$ (ICES, 2016).	EU (2018)

* Proposed EU multiannual plan (MAP) for the Western Waters (EU, 2018).

Basis of the assessment

Table 6 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018b).
Assessment type	Underwater TV survey.
Input data	One survey index (UWTV-FU 22), commercial catches (international landings), length frequencies (from catch and discard sampling), maturity data (from commercial catch sampling and during surveys), fixed natural mortality. Discard survival rate.
Discards and bycatch	Included in the assessment since 2003.
Indicators	IBTS Q4 survey; length–frequency distributions of the catches by sex.
Other information	This stock follows benchmarked procedures applied to other <i>Nephrops</i> stocks in Subarea 7 (ICES, 2009, 2014).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

No additional information is available for this stock.

History of the advice, catch, and management

Table 7 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice*	Landings advice*	Catch advice	ICES landings**	Total discards***
1992		3800			
1993		3800			
1994		3800			
1995		3800			
1996		3800			
1997		3800			
1998		3800			
1999		3800		1775	
2000		3800		2890	
2001		3800		2938	
2002		3800		1993	
2003		3800		2065	720
2004	Adjust TAC in line with landings of most recent 10 years	4600		1828	202
2005	Adjust TAC in line with landings of most recent 10 years	4600		2533	1648
2006	Recent average landings 2000–2002	4600		1761	454
2007	No increase in effort	-		2950	1906
2008	No increase in effort	< 5300		3090	289
2009	No increase in effort	< 5300		2185	371
2010	No new advice, same as for 2009	< 5300		2714	636
2011	See scenarios; MSY reduce catch or PA < 5300	-		1636	196
2012	MSY approach	2300		2618	347
2013	MSY approach (updated November 2012)	3100		2257	497
2014	MSY approach	2674		2526	460
2015	MSY approach	3409		2350	450
2016	MSY approach		≤ 3027^	3329	519
2017	MSY approach		≤ 2063^^	3560	424
2018	MSY approach		≤ 4322^^		
2019	MSY approach		≤ 2084^^		

* Advice prior to 2012 applies to FUs 20–22.

** Landings and discards revised (Annex 3 in ICES, 2018a).

*** Dead + surviving discards.

^ Assuming all catches are landed.

^^ Assuming recent discard rates.

History of the catch and landings

Table 8 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. Catch distribution by fleet in 2017 as estimated by ICES.

Catch		Landings	Total discards	
97.3% dead	2.7% surviving	100% otter trawl	75% dead	25% surviving
3985 t		3560 t	424 t	

Table 9 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. History of ICES estimates for landings and total discards. All weights are in tonnes.

Year	France	Rep. of Ireland	UK	Belgium	Total landings [^]	Total discards* [^]
1999	1034	741	0		1775	
2000	1192	1687	11		2890	
2001	882	2054	2		2938	
2002	598	1392	3		1993	
2003	799	1257	10		2065	720
2004	454	1349	26		1828	202
2005	478	1987	68		2533	1648
2006	293	1442	19	7	1761	454
2007	216	2716	13	5	2950	1906
2008	301	2539	241	9	3090	289
2009	258	1609	306	12	2185	371
2010	129	2219	351	15	2714	636
2011	64	1521	44	7	1636	196
2012	65	2506	41	6	2618	347
2013	83	2054	107	12	2257	497
2014	29	2428	61	8	2526	460
2015	9	2215	121	5	2350	450
2016	5	2967	354	3	3329	519
2017	7	2815	737	1	3560	424

* Surviving + dead discards.

[^] Landings and discards revised (Annex 3 in ICES, 2018a).

Summary of the assessment

Table 10 Norway lobster in divisions 7.g and 7.f, Functional Unit 22. Assessment summary.

Year	Landings [^] (in numbers)	Total discards* [^] (in numbers)	Removals (in numbers)	UWTV abundance estimates	95% conf. intervals	Harvest rate [^] (by number)	Landings	Discards	Mean weight in landings [^]	Mean weight in discards [^]	Discard proportion [^] (by number)	Proportion of dead discards [^] (by number)
	millions					%	tonnes		grammes		%	
2003	95	68	146				2065	720	21.7	10.7	41.5	34.7
2004	71	13	80				1828	202	25.9	15.4	15.6	12.2
2005	119	129	216				2533	1648	21.2	12.8	51.9	44.7
2006	100	45	134	1503	70	8.9	1761	454	17.6	10.1	31.1	25.3
2007	165	181	301	1136	126	26.5	2950	1906	17.9	10.5	52.3	45.1
2008	144	26	163	1114	123	14.6	3090	289	21.5	11.1	15.3	12.0
2009	92	33	117	1093	108	10.7	2185	371	23.7	11.3	26.4	21.2
2010	122	45	155	1141	88	13.6	2714	636	22.3	14.3	26.8	21.5
2011	60	13	70	1256	72	5.6	1636	196	27.3	14.9	18.0	14.1
2012	120	31	144	1498	239	9.6	2618	347	21.8	11.1	20.7	16.3
2013	94	40	124	1254	177	9.9	2257	497	24.1	12.4	30.0	24.3
2014	100	33	125	1622	268	7.7	2526	460	25.2	13.8	25.0	20.0
2015	114	44	147	1363	180	10.8	2350	450	20.6	10.1	28.0	22.6
2016	160	54	200	866	113	23.1	3329	519	20.8	9.7	25.1	20.0
2017	164	39	194	1600	153	12.1	3560	424	21.7	10.8	19.2	15.2
2018				876	154							

* Surviving + dead discards.

[^] Landings and discards revised (Annex 3 in ICES, 2018a).

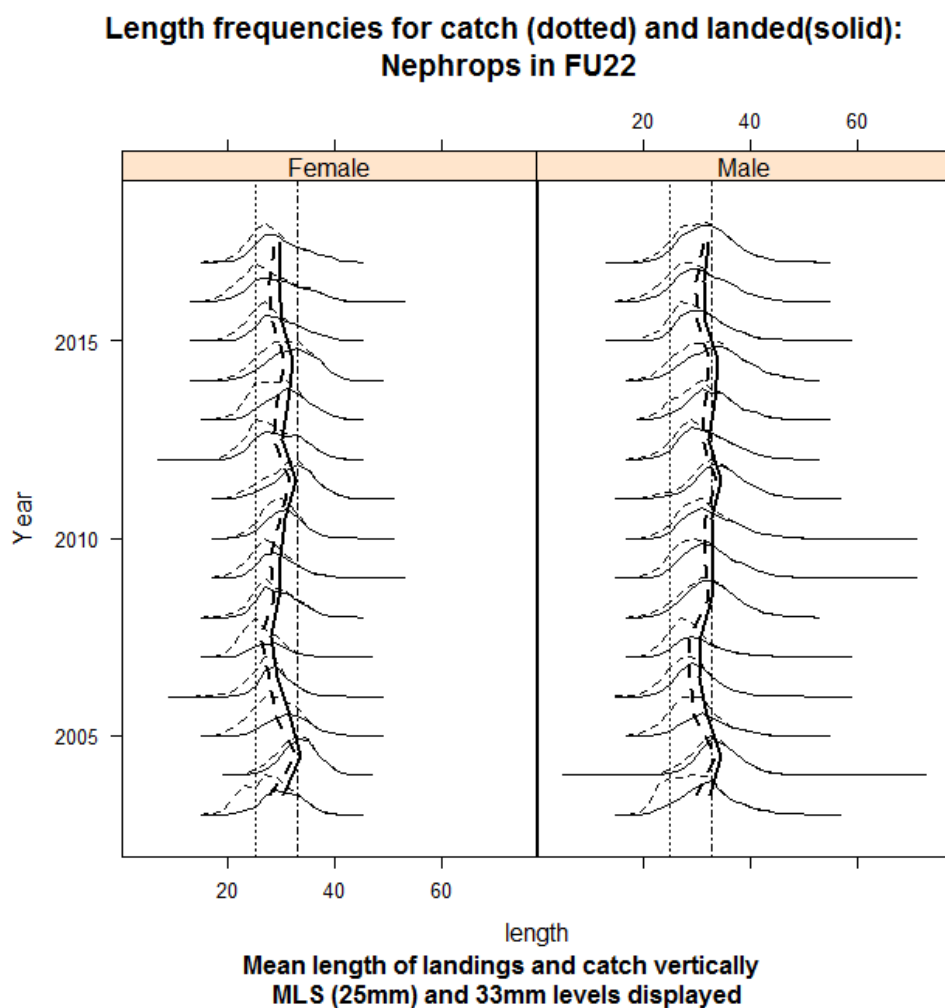


Figure 3 Norway lobster in Division 6.a, Functional Unit 11. Catch length–frequency distribution and mean size in catches and landings. Vertical lines are minimum landing size (20 mm) and 33 mm.

Sources and references

EU. 2018. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a multiannual plan for fish stocks in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulation (EU) 2016/1139 establishing a multiannual plan for the Baltic Sea, and repealing Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) 509/2007 and (EC) 1300/2008. COM/2018/0149 final. 30 pp. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018PC0149&from=EN>.

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