

## Norway lobster (*Nephrops norvegicus*) in Division 7.a, Functional Unit 15 (Irish Sea, West)

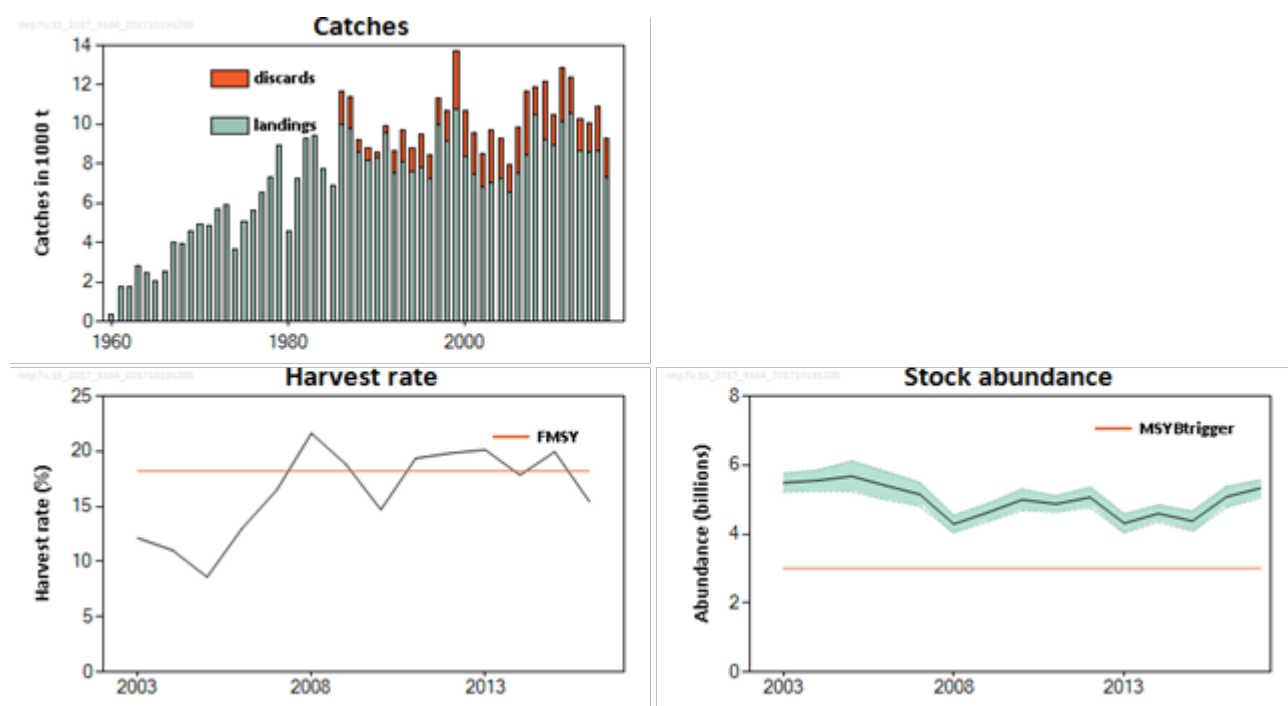
### ICES stock advice

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 2014–2016, catches in 2018 should be no more than 11 807 tonnes.

To ensure that the stock in Functional Unit 15 is exploited sustainably, management should be implemented at the functional unit level.

### Stock development over time

Since 2003, stock abundance has been above MSY  $B_{trigger}$ . In the last decade the harvest rate has fluctuated around  $F_{MSY}$  and is below  $F_{MSY}$  in 2016.



**Figure 1** Norway lobster in Division 7.a, Functional Unit 15. Summary of the stock assessment. Catches (discard data are only available from 1986), harvest rate (sum of landings and dead discards in numbers, divided by total abundance), survey abundance (Underwater TV, billions; SSB proxy; 95% confidence intervals). Harvest rates between 2003 and 2006 may be unreliable because of underreporting of landings. Orange lines represent MSY  $B_{trigger}$  and the  $F_{MSY}$  harvest rate.

## Stock and exploitation status

**Table 1** Norway lobster in Division 7.a, Functional Unit 15. 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 possible reference points		$B_{pa}$ , $B_{lim}$	✓	✓ Above possible reference points
Management plan	$F_{MGT}$	—	—	— Not applicable		$B_{MGT}$	—	— Not applicable

## Catch options

**Table 2** Norway lobster in Division 7.a, Functional Unit 15. The basis for the catch options.

Variable	Value	Source	Notes
Stock abundance (2018)	5.33 billion individuals	ICES (2017)	UWTV survey 2017 (used as abundance estimate for 2018).
Mean weight in landings	13.47 g	ICES (2017)	Average 2014–2016.
Mean weight in discards	7.68 g	ICES (2017)	Average 2014–2016.
Discard rate	28.4%	ICES (2017)	Average 2014–2016 (by number). Calculated as total discards divided by landings + total discards.
Discard survival rate	10%	ICES (2017)	Only applies in scenarios where discarding is assumed to continue.
Dead discard rate	26.3%	ICES (2017)	Average 2014–2016 (by number). Calculated as dead discards divided by dead removals (landings + dead discards). Only applies in scenarios where discarding is assumed to continue.

**Table 3** Norway lobster in Division 7.a, Functional Unit 15. Annual catch options. All weights are in tonnes.

a) Catch options for 2018 assuming zero discards.

Basis	Total catch	Wanted catch*	Unwanted catch*	Harvest rate**
ICES advice basis				
MSY approach; $F_{MSY}$	11472	9356	2116	18.2%
Other options				
$F_{2016}$	11156	9099	2058	17.7%

\* “Wanted” and “unwanted” catch are used to describe *Nephrops* that would be landed and discarded in the absence of the EU landing obligation, based on the average estimated discard rates for 2014–2016.

\*\* Calculated for dead removals and applied to total catch.

b) Catch options for 2018 assuming discarding continues at the recent average rate.

Basis	Total catch	Dead removals	Landings	Dead discards	Surviving discards	Harvest rate*
	L+DD+SD	L+DD	L	DD	SD	for L+DD
ICES advice basis						
MSY approach; $F_{MSY}$	11807	11590	9630	1959	218	18.2%
Other options						
$F_{2016}$	11483	11271	9366	1906	212	17.7%

\* Calculated for dead removals and applied to total catch.

All harvest rates are calculated in numbers and refer to dead removals. The difference in catch weights between catch options with the same harvest rates is related to the fact that, in the scenario allowing for discarding, a proportion of the discards is assumed to survive (10%).

## Basis of the advice

**Table 4** Norway lobster in Division 7.a, Functional Unit 15. The basis of the advice.

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

## Quality of the assessment

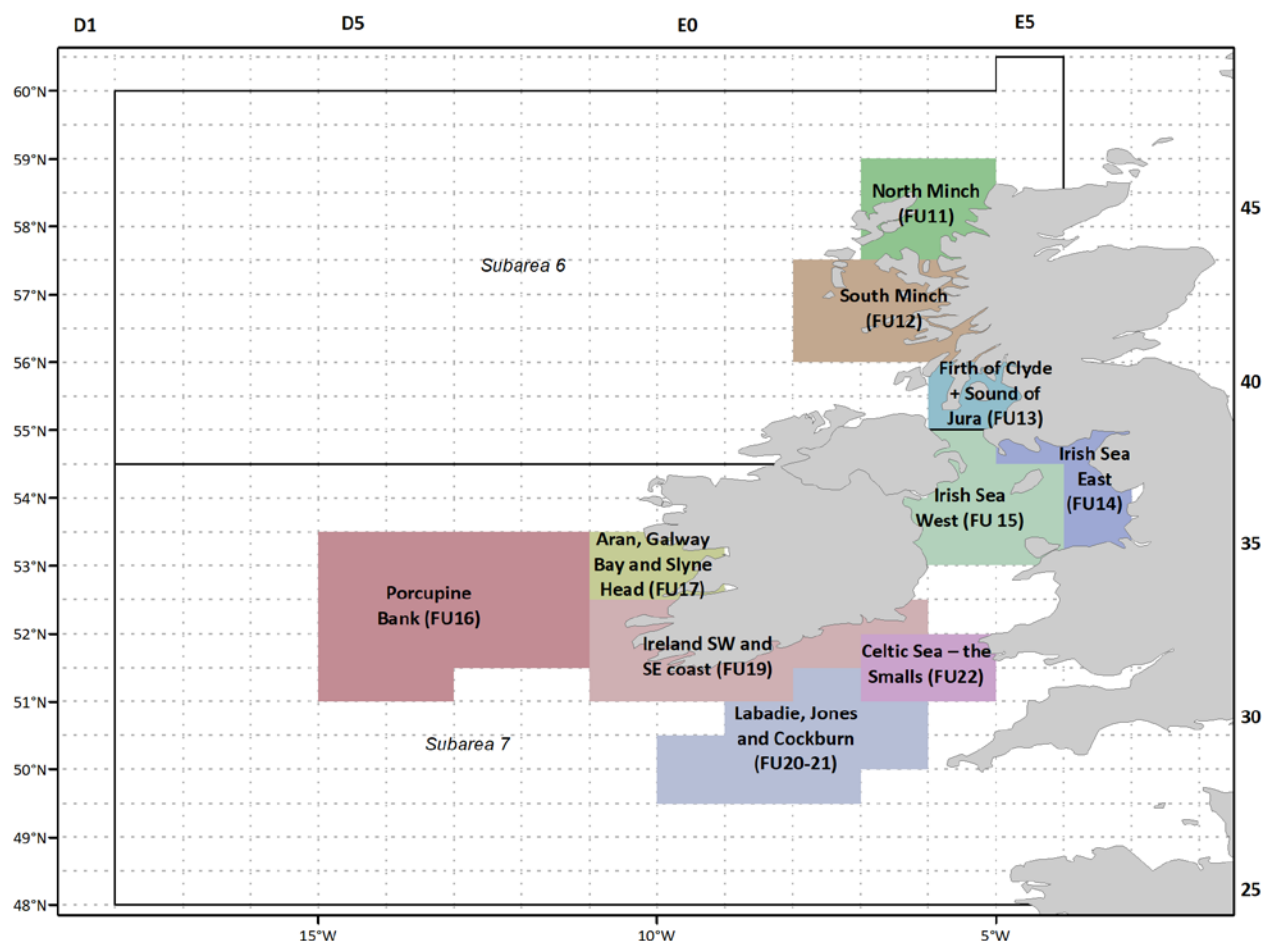
An annual UWTV survey has taken place since 2003 which gives abundance estimates for the Functional Unit (FU) 15 with high precision. The quality of input data and level of sampling for this stock are good.

## Issues relevant to the advice

Fisheries catching *Nephrops* in Subarea 7 are covered by the EU landings obligation (EU, 2015). Creel fisheries are exempted from the landings obligation, with a *de minimis* exemption consisting of a 6% discard rate by weight for the trawl fishery in 2018 (reduced from 7% in 2016 and 2017). The average discard rate by weight in the trawl fishery for FU 15 over the last three years is 18.5%. The discard rate by number used in the calculation of the catch advice implies that the discard rate by weight will be 18.5% in 2018 for the entire fishery.

The density of *Nephrops* in FU 15 is considered very high (average density 0.9 individuals m<sup>-2</sup>) compared to other FUs. Recent harvest rates have been high (around  $F_{max}$ ) and the stock size has been stable at a high level. The exploitation rate between the sexes is similar. A harvest rate consistent with a combined sex  $F_{max}$  of 18.2% is considered an appropriate proxy for  $F_{MSY}$ .

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 for each of the stocks and the corresponding MSY approach.



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

## Reference points

**Table 5** Norway lobster in Division 7.a, Functional Unit 15. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	3 billion individuals	Minimum abundance observed based on a scaled trawl survey index.	ICES (2016a)
	$F_{MSY}$	18.2% harvest rate	$F_{MSY}$ proxy equivalent to $F_{max}$ for combined sexes, derived from a length-based per recruit analysis.	ICES (2016a)
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 Division 7.a, Functional Unit 15. Basis of the assessment and advice.

ICES stock data category	1 ( <a href="#">ICES, 2016b</a> ).
Assessment type	Underwater TV survey.
Input data	One survey index (UWTV in FUs 14–15); commercial catches (international landings, length frequencies from catch sampling); fixed maturity ogive based on survey sampling, fixed natural mortality. Discard survival rate.
Discards and bycatch	Included in the assessment since 2003.
Indicators	Length–frequency distributions of the catches by sex. CPUE from Nephrops trawl survey.
Other information	The latest benchmark (based on the UWTV survey) was performed in 2009 (ICES, 2009).
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 7** Norway lobster in Division 7.a, Functional Unit 15. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards*
1989					8128	673
1990					8300	276
1991					9554	345
1992				8900	7541	1079
1993				9400	8102	1622
1994				9400	7606	1185
1995				9400	7796	1724
1996				9400	7247	1202
1997				9400	9971	1330
1998				9400	9128	1560
1999				9400	10786	2913
2000				9400	8370	2293
2001				9400	7441	2112
2002	Set TAC in line with 1995–99 landings			9550	6793	1732
2003	Set TAC in line with 1995–99 landings			9550	7065	2659
2004	Set TAC in line with 1995–99 landings			9550	7270	1993
2005	Set TAC in line with 1995–99 landings			9550	6554	1412
2006	No increase in effort			9550	7561	2285
2007	No increase in effort	-		-	8491	3246
2008	No increase in effort	-		-	10508	1421
2009	No increase in effort and landings	< 8500			9198	2934
2010	Harvest rate no greater than the equivalent to fishing at $F_{0.1}$	< 5500			8963	1539
2011	Transition scheme towards the ICES MSY framework	< 9500			10162	2683
2012	MSY approach	< 9800			10529	1871
2013	MSY approach	< 9300			8672	1590

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards*
2014	MSY approach	< 8200			8613	1418
2015	MSY approach	< 8223			8643	2228
2016	MSY approach		≤ 8682**		7327	1939
2017	MSY approach		≤ 11248***			
2018	MSY approach		≤ 11807***			

\* Dead + surviving discards.

\*\* Assuming all catches are landed.

\*\*\* Assuming recent discard rates.

### History of the catch and landings

**Table 8** Norway lobster in Division 7.a, Functional Unit 15. Catch distribution by fleet in 2016 as estimated by ICES.

Catch		Landings		Total discards*	
98% dead	2% surviving	99.8% <i>Nephrops</i> otter trawls (70–99 mm)	0.2% creels	90% dead	10% surviving
9266 t		7327 t		1939 t	

\* Dead + surviving discards.

**Table 9** Norway lobster in Division 7.a, Functional Unit 15. History of landings and discards; ICES estimates of landings and total discards. All weights are in tonnes.

Year	Ireland	UK	UK (E&W)	UK (NI)	UK (Scotland)	UK (Isle of Man)	Total landings	Total discards*
1965		1018					1018	
1966		1701					1701	
1967		2077					2077	
1968		1987					1987	
1969	1011	2803					3814	
1970	1392	3001					4393	
1971	1384	3190					4574	
1972	1604	4120					5724	
1973	1863	4031					5894	
1974	982	2689					3671	
1975	909	4165					5074	
1976	1614	3989					5603	
1977	2469	4045					6514	
1978	2921	4375					7296	
1979	3436	5512					8948	
1980	1709	2869					4578	
1981	3202	4047					7249	
1982	4398	4917					9315	
1983	4324	5124					9448	
1984	3306	4454					7760	
1985	2421	4480					6901	
1986	4682	5296					9978	1680
1987	4639	5114					9753	1608
1988	3201	5385					8586	639
1989	2477	5651					8128	673
1990	2710	5590					8300	276
1991	3371	6183					9554	345
1992	2370	5171					7541	1079

Year	Ireland	UK	UK (E&W)	UK (NI)	UK (Scotland)	UK (Isle of Man)	Total landings	Total discards*
1993	2715	5387					8102	1622
1994	1768	5838					7606	1185
1995	2259	5538					7796	1724
1996	1574	5673					7247	1202
1997	3349	6622					9971	1330
1998	3101	6027					9128	1560
1999	4582	6198				6	10786	2913
2000	3433	4937				0	8370	2293
2001	2689	4749				3	7441	2112
2002	2291	4501				1	6793	1732
2003	2709	4352				4	7065	2659
2004	2786	4470				13	7270	1993
2005	2133	4420				0	6554	1412
2006	2051		56	5429	23	1	7561	2285
2007	2767		102	5585	36	0	8491	3246
2008	3132		131	7166	26	50	10508	1421
2009	2343		200	6622	32	1	9198	2934
2010	2578		100	6251	33	0	8963	1539
2011	3575		88	6444	52	2	10162	2683
2012	3794		106	6586	39	3	10529	1871
2013	2465		56	6069	50	31	8672	1590
2014	2938		88	5558	29	***	8613	1418
2015	2202		26	6404	11	***	8643	2228
2016**	1609		52	5638	25	***	7327	1939

\* Dead + surviving discards.

\*\* Preliminary.

\*\*\*Included in UK (E&W) landings.

## Summary of the assessment

**Table 10** Norway lobster in Division 7.a, Functional Unit 15. Assessment summary.

Year	Landings in number	Total discards in number *	Removals in number	UWTV abundance estimates	95% conf. intervals	Harvest rate	Mean weight in landings	Mean weight in discards	Discard rate by number	Dead discard rate
	millions			billions		%	grammes		%	
2003	404	291	666	5.5	0.27	12.1	17.49	9.14	41.9	39.3
2004	416	218	612	5.5	0.3	11.0	17.48	9.14	34.4	32.0
2005	346	157	488	5.7	0.44	8.6	18.94	8.99	31.2	29.1
2006	467	261	701	5.4	0.41	13.0	16.19	8.75	35.9	33.4
2007	511	375	848	5.1	0.34	16.5	16.62	8.66	42.3	39.7
2008	755	191	927	4.3	0.25	21.6	13.92	7.44	20.2	18.6
2009	567	335	868	4.6	0.26	18.8	16.22	8.76	37.1	34.7
2010	572	180	733	5.0	0.31	14.7	15.67	8.55	23.9	22.0
2011	644	332	943	4.9	0.23	19.4	15.78	8.08	34.0	31.7
2012	771	258	1003	5.1	0.29	19.8	13.66	7.25	25.1	23.1
2013	662	229	867	4.3	0.27	20.1	13.1	6.94	25.7	23.6
2014	641	198	819	4.6	0.25	17.8	13.44	7.16	23.6	21.7
2015	620	280	872	4.4	0.29	19.9	13.94	7.96	31.1	28.9
2016	562	245	783	5.1	0.3	15.4	13.03	7.91	30.4	28.2
2017				5.3	0.3					

\*Dead + surviving discards.

## Sources and references

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