

### 5.3.44 Norway lobster (*Nephrops norvegicus*) in Division 7.b – FU 17 (West of Ireland, Aran Grounds)

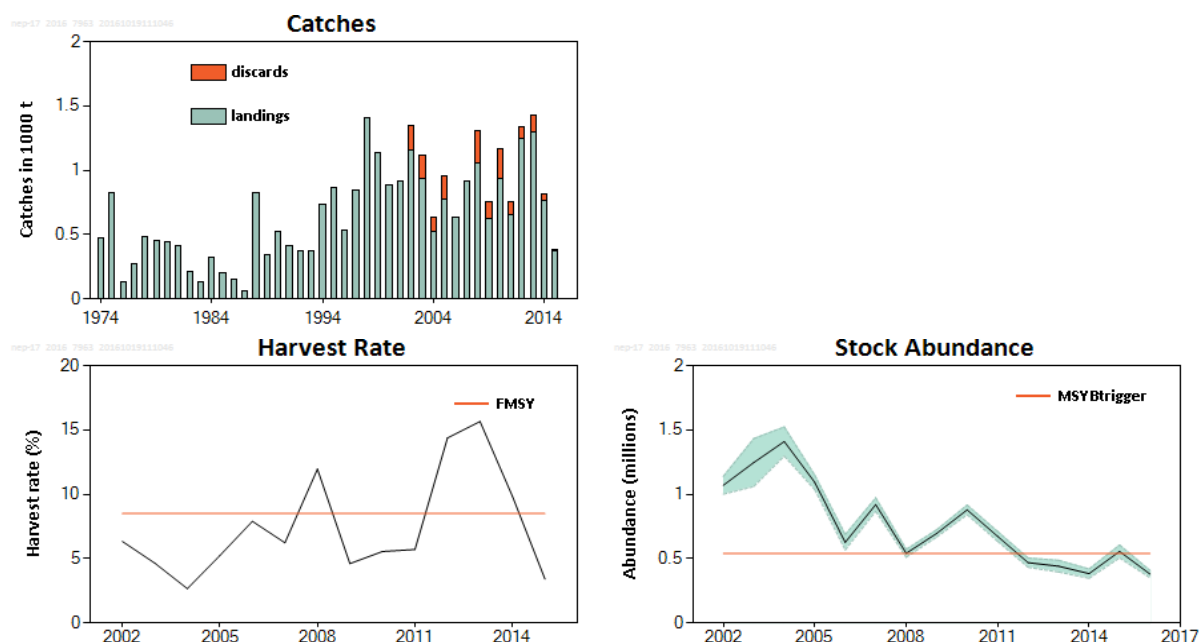
#### ICES stock advice

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 2013–2015, catches in 2017 should be no more than 489 tonnes. This implies landings of no more than 456 tonnes.

To ensure that the stock in functional unit (FU) 17 is exploited sustainably, management should be implemented at the functional unit level.

#### Stock development over time

The abundance shows an overall decreasing trend over time and is currently below MSY  $B_{trigger}$ . The harvest rate, calculated as (landings + dead discards)/(abundance estimate), has been well above the  $F_{MSY}$  recently but declined well below  $F_{MSY}$  in 2015.



**Figure 5.3.44.1** Norway lobster in Division 7.b – FU 17. Catches (thousand tonnes), harvest rate (fishing mortality proxy), survey abundance (Underwater TV, millions; SSB proxy; 95% confidence intervals). Orange lines represent MSY  $B_{trigger}$  and the  $F_{MSY}$  harvest rate proxy.

#### Stock and exploitation status

**Table 5.3.44.1** Norway lobster in Division 7.b – FU 17. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size		
		2013	2014	2015		2014	2015	2016
Maximum sustainable yield	$F_{MSY}$	✗	✗	✓ Below	MSY	✗	✓	✗ Below
Precautionary approach	$F_{pa}$ , $F_{lim}$	?	?	✓ Below possible reference points	$B_{pa}$ , $B_{lim}$	?	✓	? Undefined
Management plan	$F_{MGT}$	-	-	- Not applicable	$SSB_{MGT}$	-	-	- Not applicable

### Catch options

The latest estimate of stock abundance (value from June 2016 survey, 379 million) is below the MSY  $B_{trigger}$  value (540 million). The ICES MSY approach states that under such conditions the  $F_{MSY}$  harvest rate (8.5% for FU 17 Norway lobster) should be reduced by multiplying it by the ratio of current abundance to MSY  $B_{trigger}$ . This corresponds to a harvest rate of  $8.5 \times 379 \div 540 = 6.0\%$  for the advice in 2017.

**Table 5.3.44.2** Norway lobster in Division 7.b – FU 17. The basis for the catch options.

Variable	Value	Source	Notes
Stock abundance	379 million individuals	ICES (2016a)	UWTV survey 2016.
Mean weight in landings	22.3 g	ICES (2016a)	Average 2008–2015
Mean weight in discards	11.3 g	ICES (2016a)	Average 2008–2015.
Discard rate	12.7%	ICES (2016a)	Average 2013–2015 (by number). Calculated as discards divided by landings + discards.
Discard survival rate	25%	ICES (2016a)	Only applies in scenarios where discarding is allowed.
Dead discard rate	9.8%	ICES (2016a)	Average 2013–2015 (by number). Calculated as dead discards divided by removals (landings + dead discards). Only applies in scenarios where discarding is allowed.

**Table 5.3.44.3** Norway lobster in Division 7.b – FU 17. The catch options. All weights are in tonnes.

Catch options assuming zero discards

Rationale	Basis	Total catch	Wanted catch*	Unwanted catch*	Harvest rate**
MSY approach	MSY approach	473	441	32	6.0%
Other options	$F_{MSY}$	675	629	46	8.5%
	$F_{2015}$	270	252	18	3.4%

\* “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 2013–2015.

\*\* Applied to total catch.

Catch options assuming discarding is allowed

Rationale	Basis	Total catches	Dead removals	Landings	Dead discards	Surviving discards	Harvest rate*
		L+DD+SD	L+DD	L	DD	SD	for L+DD
MSY approach	MSY approach	489	481	456	25	8	6.0%
Other option	$F_{MSY}$	697	685	649	36	12	8.5%

\* Applied to dead removals.

All harvest rates are calculated in numbers and refer to the 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.

### Basis of the advice

**Table 5.3.44.4** Norway lobster in Division 7.b – FU 17. The basis of the advice.

Advice basis	MSY approach.
Management plan	There is no management plan for Norway lobster in this area.

### Quality of the assessment

Biological sampling for this stock is adequate. Since 2002 a dedicated annual UWTV survey has provided abundance estimates for the Aran Grounds with high precision.

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 options, owing to interannual variation.

### Issues relevant for the advice

From 2016, fisheries catching *Nephrops* in Division 7.b 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 7% discard rate by weight for the trawl fishery in 2016 and 2017. The average discard rate by weight in the trawl fishery for FU 17 over the last three years is 6.3%. The catch advice assumes that the discard rate will be 6.7% by weight in 2017 for the entire fishery.

The observed burrow density has declined, from high ( $> 0.8$  individuals  $m^{-2}$ ) at the start of the series to medium density ( $\sim 0.3$  individuals  $m^{-2}$ ) towards the end of the time-series. The nature of the fishery has also changed, from a continuous fishery throughout the year to a fishery more concentrated on periods of high catch rates. For these reasons a harvest rate consistent with a combined sex  $F_{0.1}$  is considered an appropriate proxy for  $F_{MSY}$  (ICES, 2015).

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.

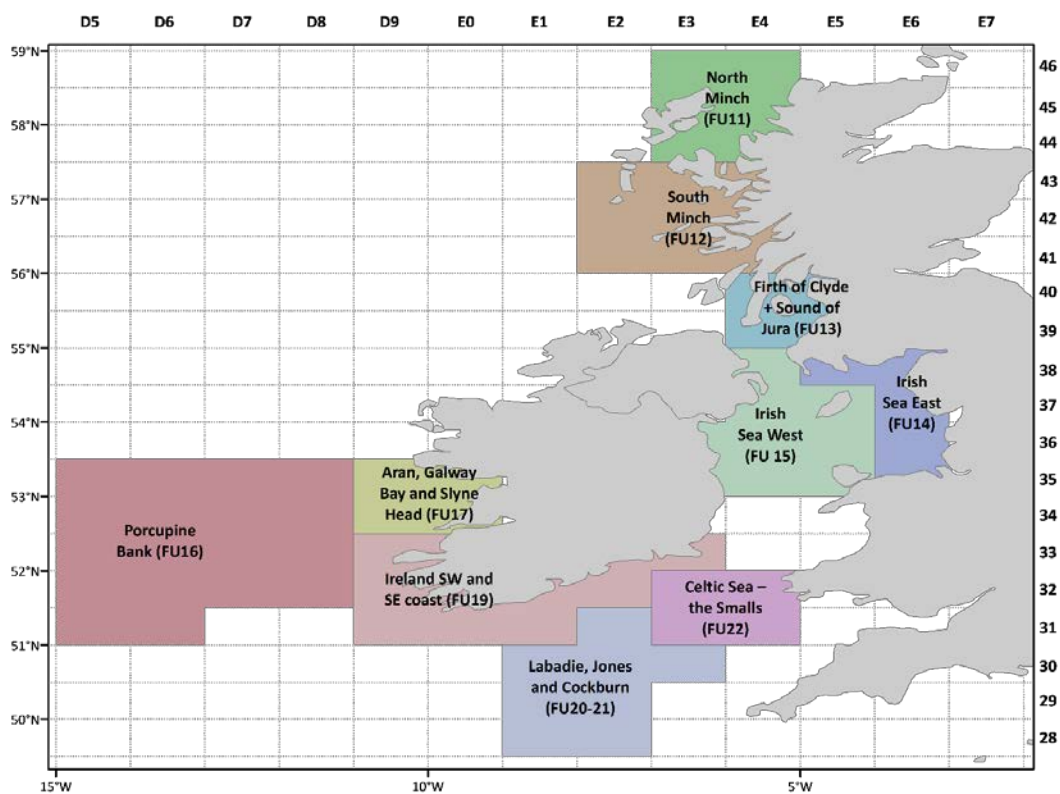


Figure 5.3.44.2 *Nephrops* functional units in Division 6.a and Subarea 7.

## Reference points

**Table 5.3.44.5** Norway lobster in Division 7.b – FU 17. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{\text{trigger}}$	540 million individuals	Based on abundance in 2008 from the UWTV survey time-series.	ICES (2015)
	$F_{\text{MSY}}$	8.5% harvest rate	$F_{\text{MSY}}$ proxy equivalent to $F_{0.1}$ for combined sexes in 2015.	ICES (2015)
Precautionary approach	$B_{\text{lim}}$	Not defined		
	$B_{\text{pa}}$	Not defined		
	$F_{\text{lim}}$	Not defined		
	$F_{\text{pa}}$	Not defined		
Management plan	$SSB_{\text{MGT}}$	Not defined		
	$F_{\text{MGT}}$	Not defined		

## Basis of the assessment

**Table 5.3.44.6** Norway lobster in Division 7.b – FU 17. The basis of the assessment.

ICES stock data category	1 ( <a href="#">ICES, 2016b</a> ).
Assessment type	Underwater TV survey combined with yield-per-recruit analysis from length data.
Input data	One survey index (UWTV-FU 17); commercial catches (international landings, length frequencies from Irish catch sampling); maturity data (commercial catch and discard sampling, survey sampling); fixed natural mortality. Discard survival rate.
Discards and bycatch	Included in the assessment since 2001.
Indicators	Length distributions by sex of the catches.
Other information	This stock was benchmarked in 2015 (ICES, 2015).
Working group	Working Group for the Celtic Seas Ecoregion ( <a href="#">WGCSE</a> ).

### Information from stakeholders

A meeting was held with stakeholders in March 2015 to discuss the state of the Aran *Nephrops* stock. In response to this meeting, voluntary effort limits were put in place for April, May, and June 2015. These voluntary measures led to a significant reduction in the 2015 harvest rate.

### History of the advice, catch, and management

**Table 5.3.44.7** Norway lobster in Division 7.b – FU 17. History of ICES advice, and ICES estimates of landings. All weights are in thousand tonnes.

Year	ICES advice	Landings advice	Catch advice	Recommended landings divisions 7.b, 7.c, 7.j, and 7.k**	ICES landings FU 17	Total discards FU 17***
1987					0.1	
1988					0.1	
1989					0.8	
1990					0.3	
1991					0.5	
1992				3.8	0.4	
1993				~4.0	0.4	
1994				~4.0	0.7	
1995				~4.0	0.9	
1996				4.0	0.5	
1997				4.0	0.8	
1998				4.0	1.4	
1999				4.0	1.1	
2000				4.0	0.9	
2001				4.0	0.9	
2002				4.44	1.2	0.2
2003				4.44	0.9	0.2
2004	Restrict landings to 2000–2002 levels			3.3	0.5	0.1
2005	Restrict landings to 2000–2002 levels			3.3	0.8	0.2
2006	Restrict landings to 2000–2002 levels			3.3	0.6	
2007	Constrain effort at recent levels			--	0.9	
2008	Constrain effort at recent levels			--	1.1	0.2
2009	No increase in effort and landings (2007)	< 0.9			0.6	0.1
2010	Harvest ratio no greater than the lower bound of the range of $F_{0.1}$ for similar stocks	< 0.5			0.9	0.2
2011	MSY approach	< 0.95			0.7	0.1
2012	MSY approach	< 1.1			1.2	0.1
2013	MSY approach (updated November 2012)	< 0.59			1.3	0.1
2014	MSY approach	< 0.59			0.8	0.0
2015	MSY approach	< 0.524			0.4	0.0
2016	MSY approach		$\leq 0.991^*$			
2017	MSY approach		$\leq 0.489^{\wedge}$			

\* Assuming all catches are landed.

\*\* Before 2007 ICES gave combined advice for FUs 16, 17, 18, and 19, and other rectangles in this area.

\*\*\* Dead + surviving discards.

$\wedge$  Assuming discarding at average rates (2013–2015).

## History of catch and landings

**Table 5.3.44.8** Norway lobster in Division 7.b – FU 17. Catch distribution by fleet in 2015 as estimated by ICES.

Total catch		Estimated landings	Total discards	
99% dead	1% surviving	Almost 100% otter trawl (70–99 mm)	75% dead	25% surviving
385 t		370 t	15 t	

**Table 5.3.44.9** Norway lobster in Division 7.b – FU 17. History of ICES landings estimates by country. All weights are in tonnes.

Year	France	Rep. of Ireland	UK	Total landings	Total discards**
1974	477			477	
1975	822			822	
1976	131			131	
1977	272			272	
1978	481			481	
1979	452			452	
1980	442			442	
1981	414			414	
1982	210			210	
1983	131			131	
1984	324			324	
1985	207			207	
1986	147		1	148	
1987	62		0	62	
1988	14	814		828	
1989	27	317	3	347	
1990	30	489		519	
1991	11	399		410	
1992	11	361	2	374	
1993	11	361	0	372	
1994	18	707	4	729	
1995	91	774	2	867	
1996	2	519	7	528	
1997	2	839	0	841	
1998	9	1401	0	1410	
1999	0	1140	0	1140	
2000	1	879	0	880	
2001	1	912	0	913	
2002	2	1152	0	1154	192
2003	0	933	0	933	183
2004	0	525	0	525	112
2005	0	778	0	778	182
2006	0	637	0	637	
2007	0	913	0	913	
2008	0	1050	7	1057	248
2009	0	626	0	625	129
2010	0	930	9	939	224
2011	0	659	0	659	92
2012	0	1246	0	1246	86
2013	0	1295	0	1295	129
2014	0	766	0	766	48
2015*	0	370	0	370	15

\* Preliminary.

\*\* Dead + surviving discards.

## Summary of the assessment

**Table 5.3.44.10** Norway lobster in Division 7.b – FU 17. 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	Dead discard rate
	millions	millions	millions	millions	millions	%	grammes	grammes	%	%
2002	55	18	68	1070	69	6.3	21.2	10.8	25%	20%
2003	44	18	58	1246	186	4.6	21.2	10.0	29%	24%
2004	29	11	38	1410	113	2.7	18.1	9.9	28%	23%
2005	42	20	57	1092	56	5.2	18.4	9.2	32%	26%
2006	NA	NA	50	627	60	7.9	NA	NA	NA	NA
2007	NA	NA	57	920	52	6.2	NA	NA	NA	NA
2008	48	22	65	541	31	12.0	21.9	11.2	31%	26%
2009	25	9	32	696	29	4.6	25.1	13.6	28%	22%
2010	37	15	49	879	38	5.6	25.2	14.7	29%	23%
2011	32	9	38	672	39	5.7	20.6	10.8	21%	17%
2012	60	8	66	468	36	14.4	20.9	10.4	11%	9%
2013	60	12	69	441	46	15.7	21.6	10.7	17%	13%
2014	34	5	38	383	37	9.8	22.6	9.6	13%	10%
2015	18	2	19	556	50	3.4	20.9	9.1	8%	6%
2016				379	28					

\*Dead + surviving discards.

## Sources and references

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