

Norway lobster (*Nephrops norvegicus*) in Division 7.a, Functional Unit 14 (Irish Sea, East)

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 1281 tonnes.

To ensure that the stock in Functional Unit 14 is exploited sustainably, management should be implemented at the functional unit level.

Stock development over time

The historical and current harvest rates are well below the F_{MSY} . The stock size has been above MSY $B_{trigger}$ since 2010.

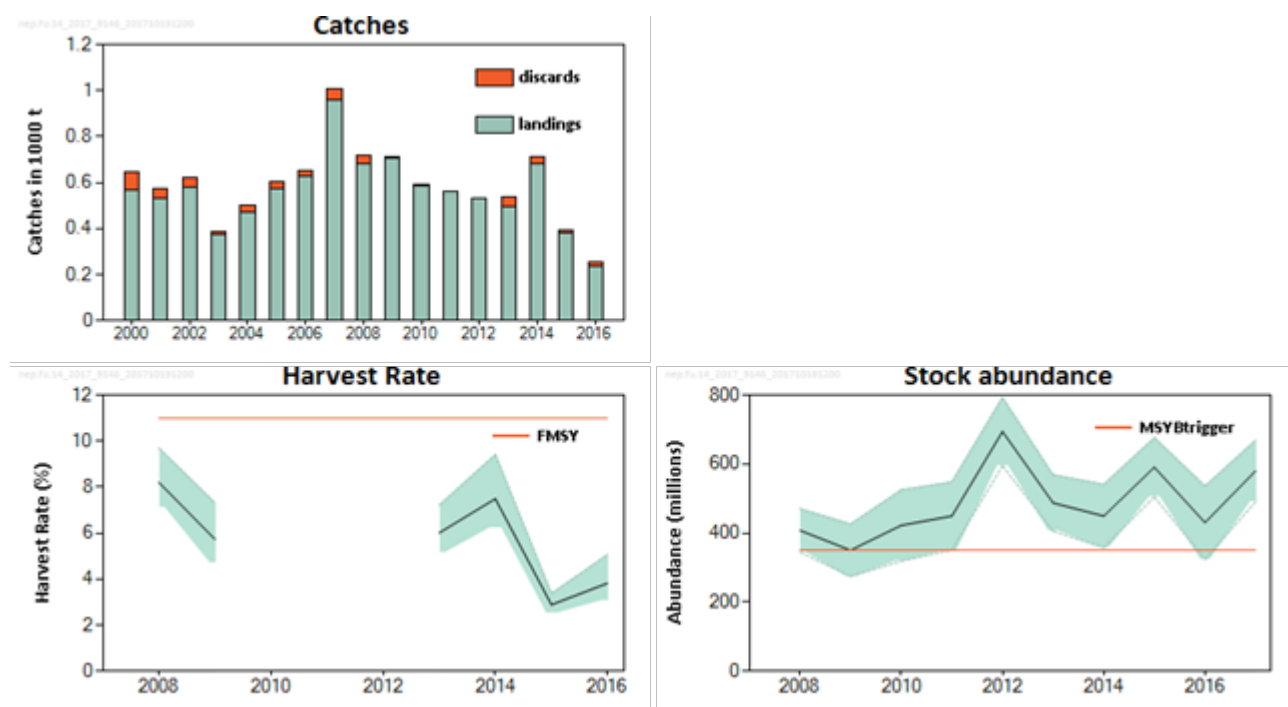


Figure 1 Norway lobster in Division 7.a, Functional Unit 14. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by total abundance), survey abundance (Underwater TV, millions; SSB proxy; 95% confidence intervals). No reliable harvest rate estimates exist for the period 2010–2012 because of insufficient sampling. 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 14. 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	✓	✓	✓ 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	SSB_{MGT}	-	-	- Not applicable

Catch options

Table 2 Norway lobster in Division 7.a, Functional Unit 14. The basis for the catch options.

Variable	Value	Source	Notes
Stock abundance (2018)	579.9 million	ICES (2017)	UWTV 2017 (used as abundance estimate for 2018).
Mean weight in landings	21.32 g	ICES (2017)	Average 2014–2016.
Mean weight in discards	8.63 g	ICES (2017)	Average 2014–2016.
Discard rate	11.56%	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	10.52%	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 14. 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}	1266	1203	64	11.0%
Other options				
$F_{2014-2016}$	541	514	27	4.7%

* “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}	1281	1275	1217	58	6	11.0%
Other options						
$F_{2014-2016}$	548	545	520	25	3	4.7%

* 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 14. 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

Since 2008 the underwater TV survey (UWTV) has provided abundance estimates for Functional Unit (FU) 14 with adequate precision. Sampling was poor during 2010–2012 and harvest rates and mean weight estimates are unreliable in that period. From 2013 onwards sampling information is of improved quality and used in the calculation of catch options.

In some years, there were few samples from Northern Ireland. This fleet generally lands smaller *Nephrops* and as a result mean weight is most likely to have been overestimated.

Issues relevant for the advice

From 2016, 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 14 over the last three years is 4.7%. The discard rate by number used in the calculation of the catch advice implies that the discard rate by weight will be 5.0% in 2018 for the entire fishery.

The density of *Nephrops* in FU 14 is considered medium (~ 0.48 burrow m^{-2} , average 2011–2017) compared with other FUs. Some biological parameters are poorly known and the sampling levels in the recent past have been low and variable. Harvest rate estimates have been below the $F_{0.1}$ for combined sexes. Based on these considerations ICES considers that $F_{0.1}$ is a suitable F_{MSY} proxy for this stock (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 in each of the stocks and the corresponding MSY approach.

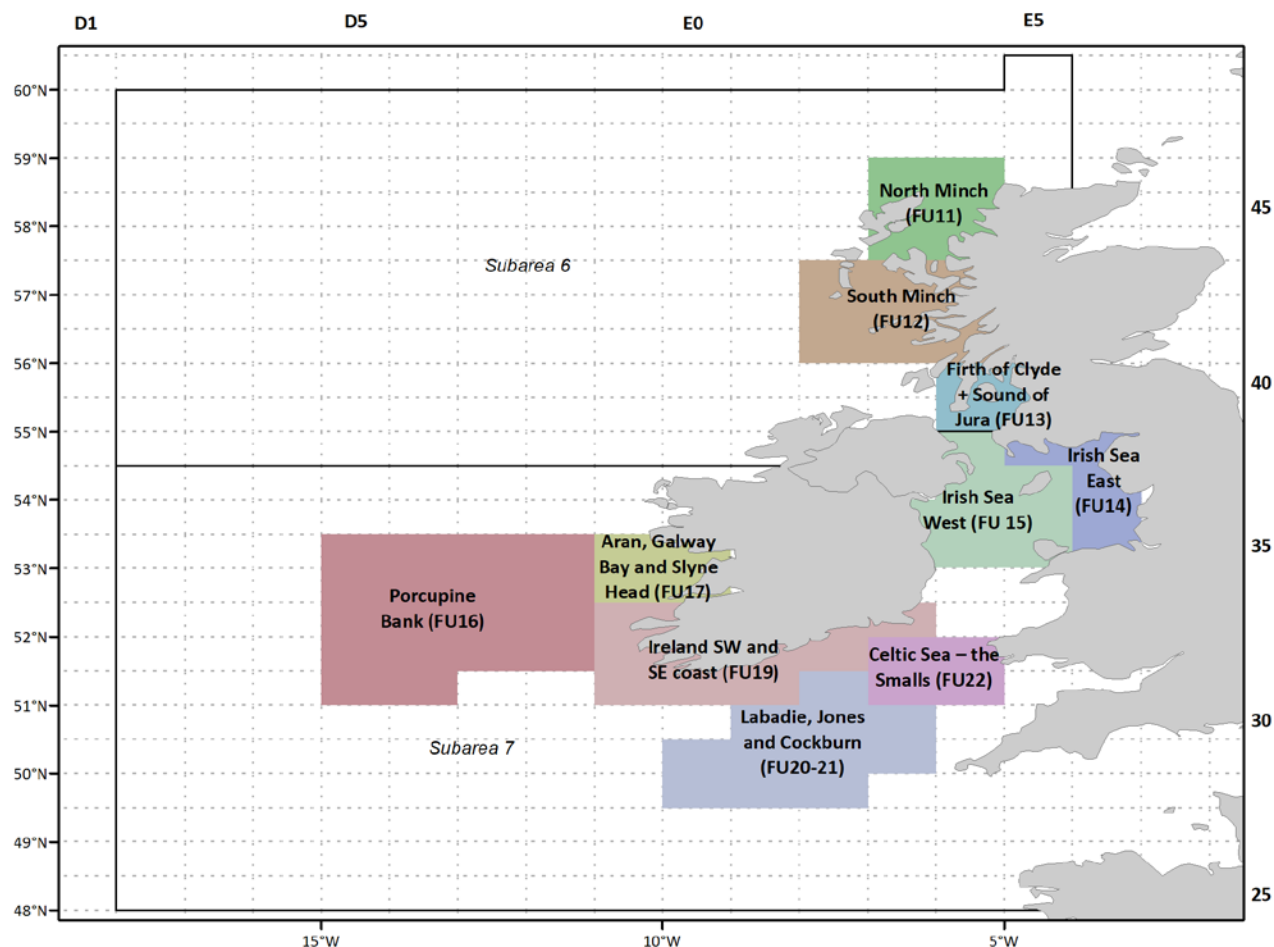


Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 5 Norway lobster in Division 7.a, Functional Unit 14. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	350 million individuals	The lowest observed abundance estimate from the UWTV survey time-series.	ICES (2015)
	F_{MSY}	11.0% harvest rate	F_{MSY} proxy equivalent to $F_{0.1}$ for combined sexes, derived from a length-based per recruit analysis.	ICES (2015)
Precautionary approach	B_{lim}			
	B_{pa}			
	F_{lim}			
	F_{pa}			
Management plan	SSB_{mgt}			
	F_{mgt}			

Basis of the assessment

Table 6 Norway lobster in Division 7.a, Functional Unit 14. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2016).
Assessment type	Underwater TV survey.
Input data	One survey index (FU14 UWTV); Commercial catches (international landings); length frequencies from the fishery; maturity data; natural mortalities from Brander and Bennett (1986, 1989); discard survival rate.
Discards and bycatch	Included in the assessment, data series from the majority of the fleet/main fleets.
Indicators	Sex ratio, length frequencies.
Other information	Latest benchmark was performed in 2015 (IBPNeph ; ICES, 2015).
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 14. 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					400	
1990					560	
1991					750	
1992				8900	430	
1993				9400	520	
1994				9400	450	
1995				9400	580	
1996				9400	480	
1997				9400	570	
1998				9400	390	
1999				9400	620	
2000				9400	570	80
2001				9400	530	40
2002	Set TAC in line with 1995–99 landings			9550	580	40
2003	Set TAC in line with 1995–99 landings			9550	380	10
2004	Set TAC in line with 1995–99 landings			9550	470	30
2005	Set TAC in line with 1995–99 landings			9550	570	30
2006	No increase in effort			9550	630	20
2007	No increase in effort			-	960	50
2008	As for 2007			-	680	40
2009	No increase in effort and landings (2007)	< 1000		-	700	10
2010	No new advice, same as for 2009	< 1000		-	580	na
2011	Transition towards the ICES MSY framework	< 680		-	560	na
2012	MSY approach	< 960		-	530	na
2013	MSY approach	< 880		-	500	40

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards *
2014	MSY approach	< 951		-	680	30
2015	MSY approach	< 662		-	380	20
2016	MSY approach		≤ 1272**	-	237^	15^
2017	MSY approach		≤ 995***	-		
2018	MSY approach		≤ 1281***			

* Dead + surviving discards.

** Assuming all catches are landed.

*** Assuming recent discarding rates.

^ Preliminary.

na = not available.

History of the catch and landings

Table 8 Norway lobster in Division 7.a, Functional Unit 14. Catch distribution by fleet in 2016 as estimated by ICES.

Catch (2016)		Landings	Discards	
99.4% dead	0.6% surviving	Taken almost entirely in the TR2 <i>Nephrops</i> fisheries (trawls 70–99 mm)	90% dead	10% surviving
252 t		237 t	15 t	

Table 9 Norway lobster in Division 7.a, Functional Unit 14. History of catch and landings; ICES estimated values are presented for each country. All weights are in tonnes. There is insufficient sampling for 2010–2012, with no reliable discard estimates for these years.

Year	Republic of Ireland	UK	Other countries	Total	Total discards**
2000	114	451	2	567	80
2001	26	506	0	532	42
2002	203	373	1	577	42
2003	69	306	1	376	11
2004	62	409	1	472	28
2005	34	536	0	570	33
2006	34	594	0	628	22
2007	86	873	0	959	47
2008	29	652	0	681	37
2009	16	692	0	708	6
2010	45	538	0	583	na
2011	31	530	0	561	na
2012	53	478	0.1	530	na
2013	35	460	0.2	495	39
2014	31	648	0	679	32
2015	88	290	0	378	18
2016*	21	216	0	237	15

* Provisional.

** Dead + surviving discards.

na = not available.

Summary of the assessment

Table 10 Norway lobster in Division 7.a, Functional Unit 14. Assessment summary.

Year	Landings in number	Total discards in number*	Removals in number	Dead discard rate number	Discard rate number	UWTV abundance estimate	95% Confidence Interval	Harvest rate	Landings	Total discards*	Mean weight in landings	Mean weight in discards
	Millions			%		Millions		%	tonnes		grammes	
2000	29.7	10.7		24.4	26.4				566.6	80.2	19.0	7.5
2001	25.5	5.2		15.5	17.0				532.3	41.6	20.9	8.0
2002	25.8	4.7		14.1	15.4				577.3	42.1	22.4	9.0
2003	12.9	1.4		9.0	9.9				376.0	10.8	29.1	7.6
2004	21.5	3.7		13.5	14.8				472.2	28.2	21.9	7.6
2005	26.5	4.0		11.8	13.0				569.7	33.4	21.5	8.4
2006	25.1	2.8		9.2	10.1				628.4	22.4	25.1	8.0
2007	40.1	6.4		12.5	13.8				959.0	46.8	23.9	7.3
2008	29.5	4.3	33.4	11.6	12.7	407.6	63.0	8.2	676.0	36.6	22.9	8.5
2009	19.4	0.7	20.0	3.3	3.7	350.0	76.0	5.7	707.0	6.3	36.5	8.6
2010**						422.0	103.0		582.3			
2011**						449.2	98.8		561.0			
2012**						693.8	99.0		530.0			
2013	24.9	4.9	29.3	15.0	16.4	487.0	81.6	6.0	495.4	39.3	19.9	7.9
2014	30.3	3.7	33.6	9.8	10.8	449.1	91.8	7.5	678.5	32.4	22.4	9.6
2015	15.0	2.2	17.0	11.9	13.0	590.5	86.0	2.9	377.7	17.6	25.2	7.8
2016	14.5	2.3	16.1	9.9	10.9	432.9	106.3	3.7	237.1	15.0	16.4	8.4
2017						579.9	89.2					

* Dead + surviving discards.

** No estimates for 2010–2012 because of insufficient sampling.

Sources and references

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