5.3.41 Norway lobster (*Nephrops norvegicus*) in Division 7.a – FU 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 2013–2015, catches in 2017 should be no more than 995 tonnes. This implies landings of no more than 941 tonnes.

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

Stock development over time

The historical harvest rate, calculated as (landings + dead discards) (abundance estimate)$^{-1}$, is well below the F_{MSY}. The stock size has been above MSY $B_{trigger}$ since 2010.

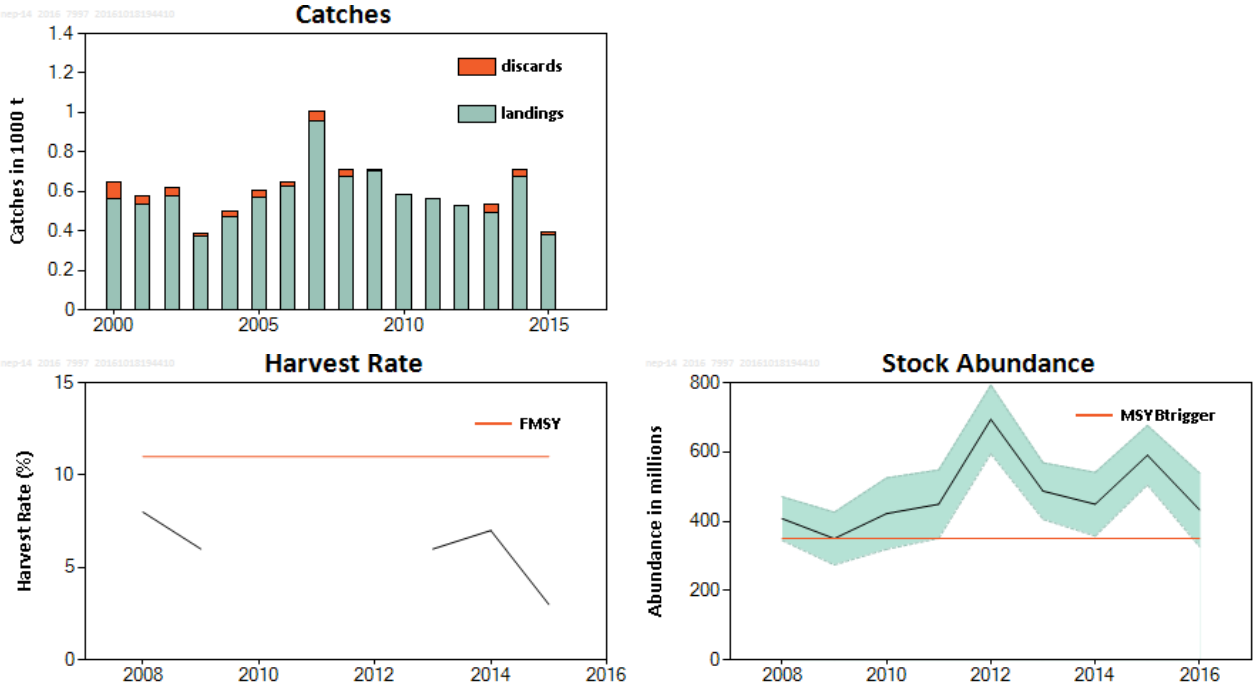

Figure 5.3.41.1 Norway lobster in Division 7.a – FU 14. Catches (thousand tonnes), harvest rate (fishing mortality proxy), survey abundance (Underwater TV, millions; SSB proxy; 95% confidence intervals). No reliable harvest rate estimates exist for the period 2010–2012 because of insufficient sampling. Orange lines represent MSY $B_{trigger}$ and the F_{MSY} harvest rate proxy.

Stock and exploitation status

Table 5.3.41.1 Norway lobster in Division 7.a – FU 14. 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 $B_{trigger}$	✓	✓	✓	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	SSB_{MGT}	-	-	-	Not applicable

Catch options

Table 5.3.41.2 Norway lobster in Division 7.a – FU 14. The basis for the catch options.

Variable	Value	Source	Notes
Stock abundance	432.9 million	ICES (2016a)	UWTV 2016.
Mean weight in landings	22.5 g	ICES (2016a)	Average 2013–2015.
Mean weight in discards	8.4 g	ICES (2016a)	Average 2013–2015.
Discard rate	13.4%	ICES (2016a)	Average 2013–2015 (by number).Calculated as discards divided by landings + discards.
Discard survival rate	10%	ICES (2016a)	Only applies in scenarios where discarding is allowed.
Dead discard rate	12.2%	ICES (2016a)	Average 2013–2015 (by number). Calculated as dead discards divided by dead removals (landings + dead discards). Only applies in scenarios where discarding is allowed.

Table 5.3.41.3 Norway lobster in Division 7.a – FU 14. The catch options. All weights in tonnes.

Catch options assuming zero discards

Rationale	Basis	Total catch	Wanted catch*	Unwanted catch*	Harvest rate**
MSY approach	MSY approach	982	928	54	11%
Other option	F_{2015}	259	245	14	2.9%

* "Wanted" and "unwanted" catches 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 assuming recent discard rates	995	990	941	49	5	11.0%

* 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 5.3.41.4 Norway lobster in Division 7.a – FU 14. The basis of the advice.

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

Quality of the assessment

Since 2008 the underwater TV survey (UWTV) has provided abundance estimates for the FU 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 adequate quality and used in the calculation of catch options.

Issues relevant for the advice

From 2016, fisheries catching *Nephrops* in Division 7.a 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 14 over the last three years is 5.5%. The catch advice assumes that the discard rate will be 5.4% by weight in 2017 for the entire fishery.

The density of *Nephrops* in FU 14 is considered medium (~0.48 burrow m^{-2}, average 2011–2016) 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.

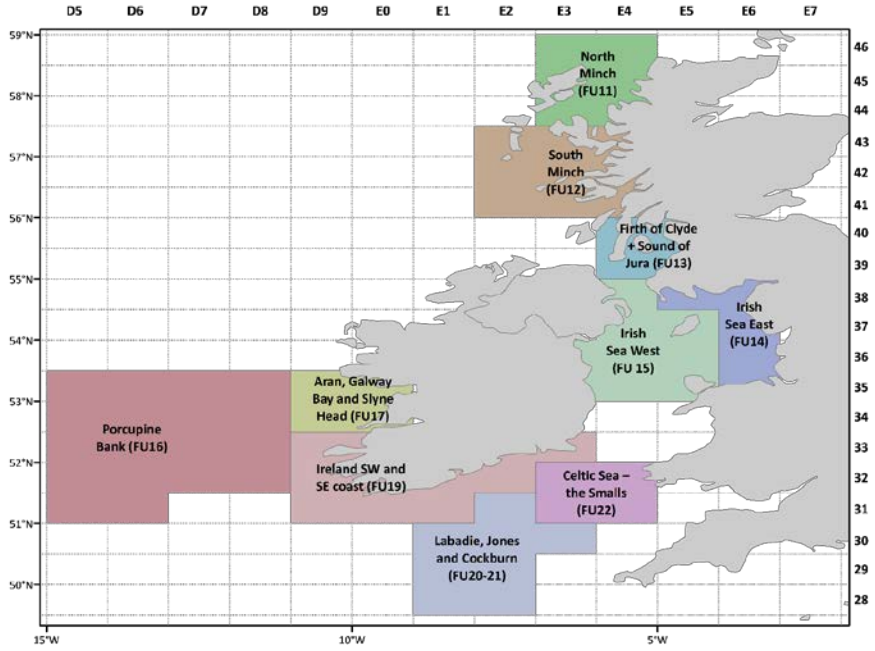

Figure 5.3.41.2 *Nephrops* functional units in Division 6.a and Subarea 7.

Reference points

Table 5.3.41.5 Norway lobster in Division 7.a – FU 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.	ICES (2015)
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 5.3.41.6 Norway lobster in Division 7.a – FU 14. The basis of the assessment.

ICES stock data category	1 (ICES, 2016b).
Assessment type	Underwater TV survey and yield-per-recruit analysis from length data.
Input data	One survey index (FU14 UWTV); Commercial catches (international landings); length frequencies from 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 (ICES, 2015).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE).

Information from stakeholders

There is no available information.

History of the advice, catch, and management

Table 5.3.41.7 Norway lobster in Division 7.a – FU 14. History of ICES advice, the agreed TAC, and ICES estimates of landings and total discards. Weights are in thousand tonnes.

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings (FU 14)	Total discards (FU 14)*
1989					0.40	
1990					0.56	
1991					0.75	
1992				8.9	0.43	
1993				9.4	0.52	
1994				9.4	0.45	
1995				9.4	0.58	
1996				9.4	0.48	
1997				9.4	0.57	
1998				9.4	0.39	
1999				9.4	0.62	
2000				9.4	0.57	0.08
2001				9.4	0.53	0.04
2002	Set TAC in line with 1995–99 landings			9.55	0.58	0.04
2003	Set TAC in line with 1995–99 landings			9.55	0.38	0.01
2004	Set TAC in line with 1995–99 landings			9.55	0.47	0.03
2005	Set TAC in line with 1995–99 landings			9.55	0.57	0.03
2006	No increase in effort			9.55	0.63	0.02
2007	No increase in effort			-	0.96	0.05
2008	As for 2007			-	0.68	0.04
2009	No increase in effort and landings (2007)	< 1.0		-	0.70	0.01
2010	No new advice, same as for 2009	< 1.0		-	0.58	na
2011	Transition towards the ICES MSY framework	< 0.68		-	0.56	na
2012	MSY approach	< 0.96		-	0.53	na
2013	MSY approach	< 0.88		-	0.50	0.04
2014	MSY approach	< 0.951		-	0.68	0.03
2015	MSY approach	< 0.662		-	0.38^	0.02^
2016	MSY approach		≤ 1.272**	-		
2017	MSY approach		≤ 0.995***	-		

* Dead + surviving discards.

** Assuming all catches are landed.

*** Assuming discarding at average rates (2013–2015).

^ Preliminary.

na = not available.

History of catch and landings

Table 5.3.41.8 Norway lobster in Division 7.a – FU 14. Catch distribution by fleet in 2015 as estimated by ICES.

Catch (2015)		Landings	Discards	
99.4% dead	0.6% surviving	Almost entirely taken in *Nephrops* fisheries TR2 (trawls 70–99 mm)	90% dead	10% surviving
395 t		378 t	18 t	

Table 5.3.41.9 Norway lobster in Division 7.a – FU 14. History of commercial catch and landings; ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes. Insufficient sampling for 2010–2012, no reliable discards 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

* Provisional.

** Dead + surviving discards.

na = not available.

Summary of the assessment

Table 5.3.41.10 Norway lobster in Division 7.a – FU 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	millions	%	%	millions	%	%	tonnes	tonnes	grammes	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						432.9	106.3					

* Dead + surviving discards.

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

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