

6.3.31 Norway lobster (*Nephrops norvegicus*) in Division 4.b, Functional Unit 34 (central North Sea, Devil's Hole)

ICES stock advice

ICES advises that when the precautionary approach is applied, and under the assumptions that discarding would occur only below minimum conservation size (MCS) and that fishery selection patterns do not change from the average (2008–2011), catches in each of the years 2017 and 2018 should not exceed 492 tonnes. This would imply wanted catch of no more than 459 tonnes.

In order to ensure the stock in this functional unit (FU) is exploited sustainably, management should be implemented at the functional unit level.

Stock development over time

The state of the stock is unknown. The mean survey density indicates the stock has declined from 2009 to 2011 and fluctuated around 0.15 *Nephrops* m² in recent years.

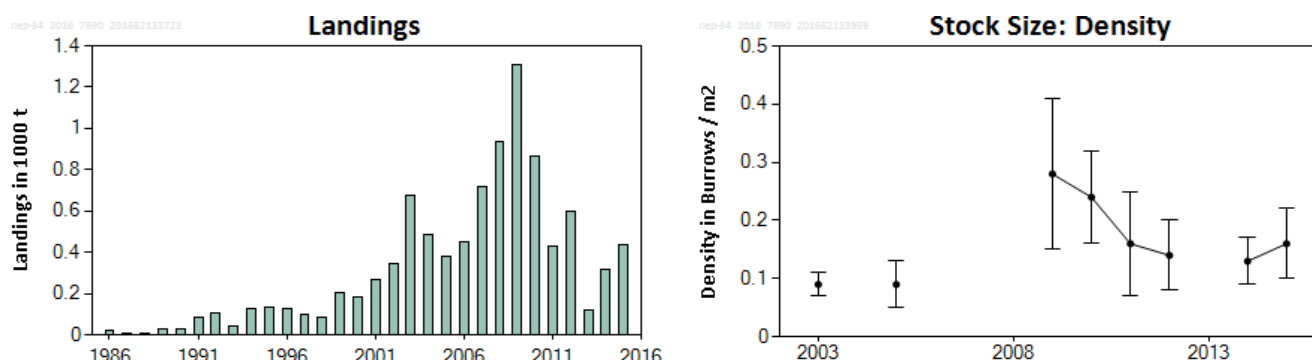


Figure 6.3.31.1 Norway lobster in Division 4.b, FU 34. Landings and stock density.

Stock and exploitation status

Table 6.3.31.1 Norway lobster in Division 4.b, FU 34. State of the stock and fishery, relative to reference points.

		Fishing pressure			Stock size		
		2013	2014	2015	2013	2014	2015
Maximum sustainable yield	F _{MSY}	?	?	?	MSY	?	?
Precautionary approach	F _{pa} , F _{lim}	?	?	?	B _{trigger}	?	?
Management plan	F _{MGT}	-	-	-	B _{pa} , B _{lim}	?	?
Qualitative evaluation	-			✓	SSB _{MGT}	-	-
				Below possible reference points			Stable

Catch options

The ICES framework for Category 4 Norway lobster stocks (ICES, 2012) was applied for this stock. As the first step, the ten-year average results in 8% harvest rate (HR), which is just above the upper limit. Applying a 20% precautionary buffer on the ten-year average implies a 6.4% HR but results in catches of 529 tonnes, which is 29% higher than the 2014 advice. Therefore, the advice is based on the same advice as given in 2014 + 20% (uncertainty cap), resulting in a potential HR of 5.92% based on the 2015 density estimate of 0.16 *Nephrops* m⁻². Considering that discard rates do not change from the assumed rate of 12.9% (by number) and that the discard mortality rate is 100%, this implies catches of no more than 492 tonnes.

Table 6.3.31.2 Norway lobster in Division 4.a, FU 34. The basis for the catch options.

Variable	Value	Source	Notes
Stock Density	0.16 <i>Nephrops</i> m ²	ICES (2016a)	UWTV 2015
Mean weight in landings	31.76 g	ICES (2016a)	Average 2007–2010 (benchmark estimate WKNEPH, 2013)
Mean weight in discards	15.3g	ICES (2016a)	Average 2013–2015 (from FU 7)
Mean weight in unwanted catch >MCS	16.13g	ICES (2016a)	Average 2013–2015 (from FU 7)
Mean weight in unwanted catch <MCS	7.58g	ICES (2016a)	Average 2013–2015 (from FU 7)
Discard rate (total)	12.9%	ICES (2013)	Average 2008–2011 (benchmark estimate WKNEPH, 2013; proportion by number)
Discard rate (>MCS)	11.6%	ICES (2016a)	Average 2013–2015 (from FU 7)
Discard rate (<MCS)	1.3%	ICES (2016a)	Average 2013–2015 (from FU 7)
Discard survival rate	0%	ICES (2016a)	Discard survival is assumed to be zero.
Surface area estimate	1753 km ²	ICES (2013)	Benchmark estimate WKNEPH (2013)

Table 6.3.31.3 Norway lobster in Division 4.a, FU 34. The catch options. All weights are in tonnes.

Catch options assuming zero discards

Rationale	Basis	Total Catches	Wanted Catches *	Unwanted catches *	Harvest rate **
Precautionary approach	2014 Advice + 20%	492	459	33	5.92%
Other options	Recent average landings (2013–2015)	314	293	21	3.78%
	2014 Advice - 20%	328	306	22	3.94%
	2014 Advice	410	383	27	4.94%
	Average landings (2006–2015) - 20%	529	494	35	6.37%
	Average landings (2006–2015)	662	618	44	7.97%
	Maximum landings	1398	1305	93	16.82%

* Wanted" and "unwanted" catch are used to described Norway lobster that would be landed and discarded in the absence of the EU landing obligation based on discard rates estimates for average ().

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

Discarding assumed below MCS only*

Rationale	Basis	Total catch	Dead removals	Wanted catch	Unwanted catch > MCS **	Discards < MCS	Surviving discards	Harvest rate***
		L+U+DD+SD	L+U+DD	L	U	DD	SD	for L+U+DD
Precautionary approach	2014 Advice + 20%	492	492	459	31	2	0	5.92%
Other options	Recent average landings (2013–2015)	314	314	293	20	1	0	3.78%
	2014 Advice - 20%	328	328	306	21	1	0	3.94%
	2014 Advice	410	410	383	26	1	0	4.94%
	Average landings (2006–2015) - 20%	529	529	494	33	2	0	6.37%
	Average landings (2006–2015)	662	662	618	42	2	0	7.97%
	Maximum landings	1398	1398	1305	88	5	0	16.82%

* Assumed for all fleets

** Unwanted landings are those animals > MCS but historically discarded

*** Calculated for dead removals

Basis of the advice

Table 6.3.31.3 Norway lobster in Division 4.b, FU 34. The basis of the advice.

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

Quality of the assessment

The time-series of underwater television (UWTV) survey data is incomplete. Surveys were conducted in 2003 and 2005 and the periods 2009–2012 and 2014–2015.

The catch options are based on a calculation of potential landing options and harvest rates, given the known surface area of Norway lobster habitat and observed densities of the functional unit. The surface area is based on an estimate of area derived from Scottish vessel monitoring system (VMS) data from Scottish Norway lobster vessels from 2006–2009. The area of ground shown in geological charts is significantly larger than this and landings have been made from these areas. Therefore the area should be regarded as a minimum estimate and the harvest rate could well be lower than implied by the analysis.

In recent years, sampling data of landings and discards are not available for this stock. Therefore, mean weights and discard proportions are borrowed from the adjacent FU7 and are used in addition to historical data.

Issues relevant for the advice

Maximum sustainable yield (MSY) harvest rates estimated for other FUs vary between 7.5% and 16%. Because this is a data-limited stock, ICES uses the lower boundary of that range as an upper limit for advice.

Since 2012, discard samples have not been provided for this fishery and information has been used from other FUs. As a consequence, there is increased uncertainty in the advice.

Results from a North Sea mixed-fisheries analysis are presented in ICES (2016c). For 2017, assuming a strictly implemented discard ban (corresponding to the “Minimum” scenario), haddock would be the most limiting stock (assuming that the full

advised catch is taken), constraining 36 out of 41 fleet segments (corresponding to 91% of the 2015 kW days of effort). Cod and eastern Channel sole would be limiting for fleets, corresponding to 5% and 4% of the 2015 effort, respectively. Conversely, in the “Maximum” scenario with *Nephrops* managed by separate TACs for the individual functional units (FUs), *Nephrops* would be considered the least limiting stocks in many FUs. *Nephrops* in FU 33, FU 5, FU 32, FU 7, and FU Others would be the least limiting stocks for fleets in these FUs, representing 32%, 16%, 10%, 4%, and 17% of the 2015 effort, respectively. Eastern Channel plaice and saithe would be least limiting for other fleet segments, representing 12% and 9% of the 2015 effort, respectively*.

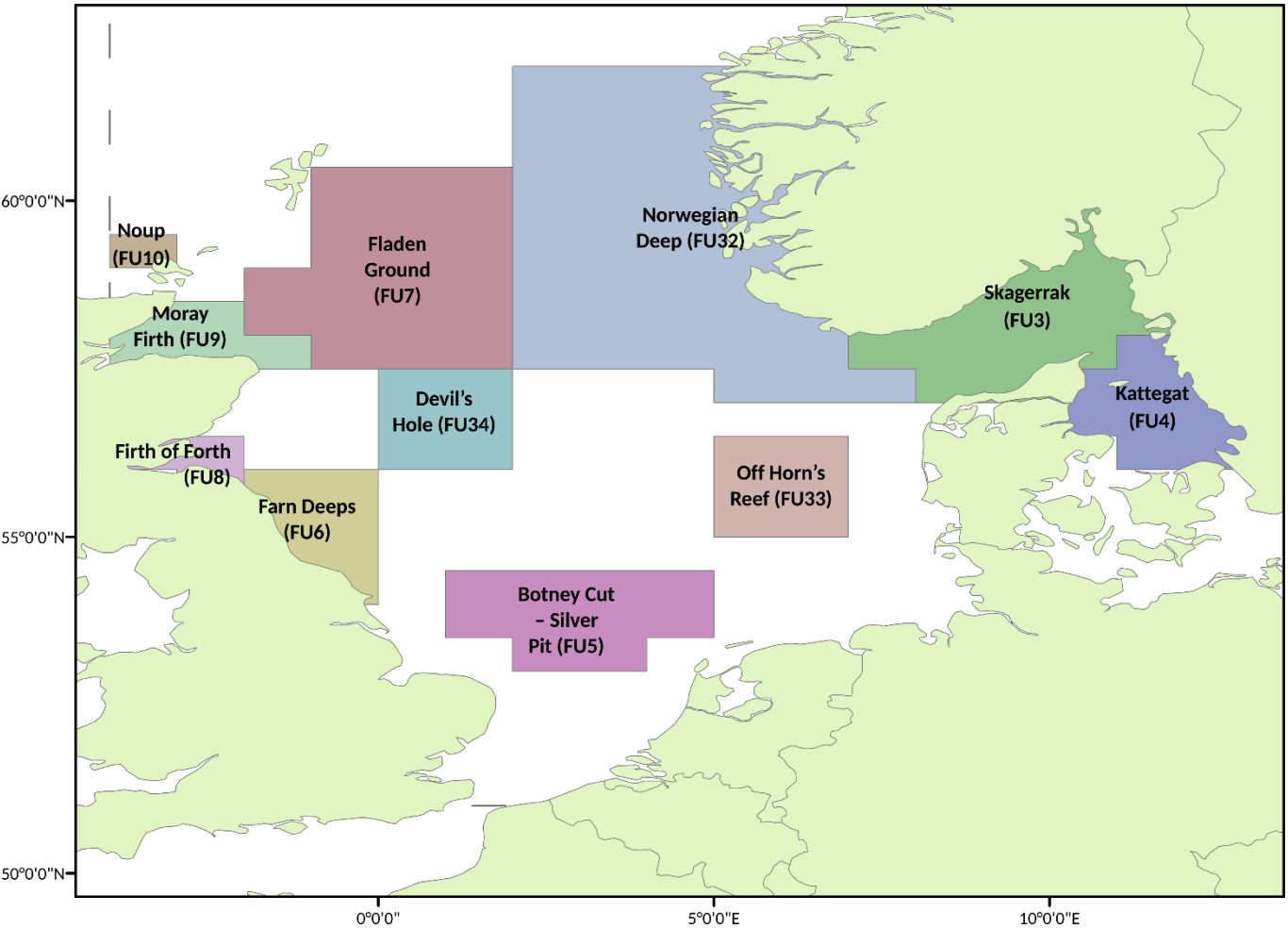


Figure 6.3.31.2 Norway lobster functional units in the North Sea and Skagerrak/Kattegat region.

Reference points

No reference points are defined for this stock.

Basis of the assessment

Table 6.3.31.4 Norway lobster in Division 4.b, FU 34. The basis of the assessment.

ICES stock data category	4.1.4 (ICES, 2016b)
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* Version 2: Paragraph on mixed fisheries considerations added

Assessment type	Data-limited method for <i>Nephrops</i>
Input data	Commercial catches (international landings, length frequencies from Scottish catch sampling 2006–2011), habitat extent, mean size, one survey index.
Discards and bycatch	Used to provide advice but not included in the assessment. Discard rates estimated for 2008–2011 were used to calculate discards.
Indicators	None
Other information	Latest benchmark was performed in 2013 (ICES, 2013)
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), Working Group on Mixed Fisheries Advice (WGMIXFISH-ADVICE)

Information from stakeholders

Results for Norway lobster exist in the fishers' survey for Area 3, which covers FU 34, show trends somewhat similar to the ones in the assessment (Napier, 2014). No new information is available for 2015.

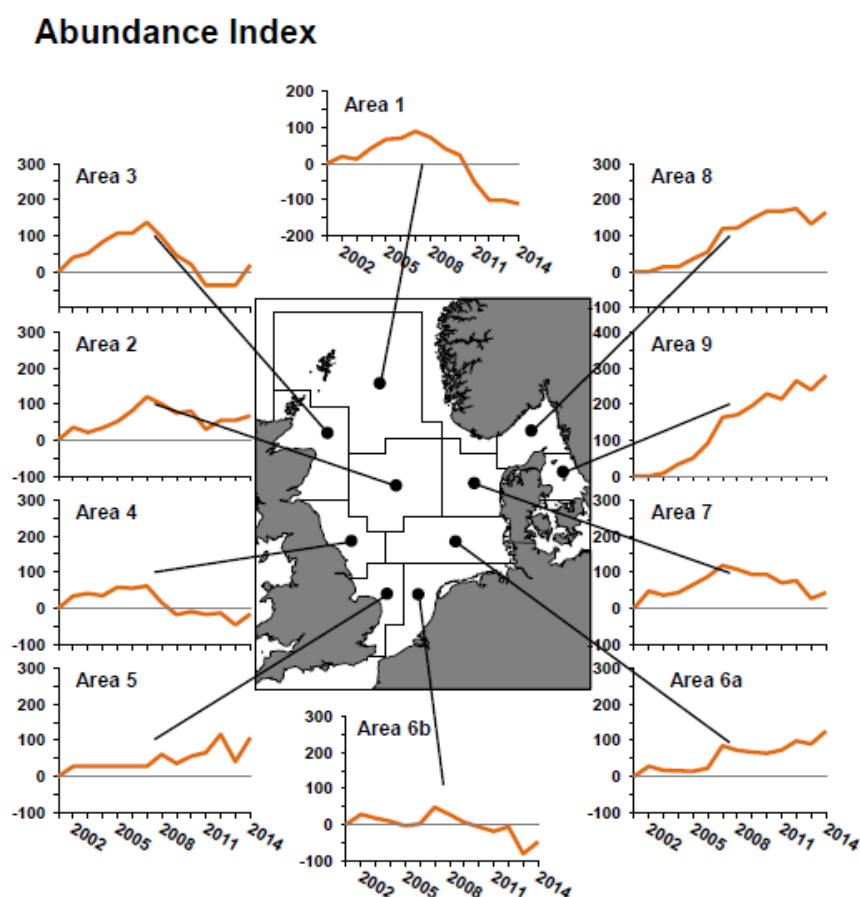


Figure 6.3.31.3 Cumulative time-series of index of perceptions of abundance of Norway lobster by roundfish sampling area from the Fishers' North Sea Stock Survey (Napier (2014); see page 14 for explanation of the index).

History of advice, catch, and management

Table 6.3.31.5 Norway lobster in Division 4.b, FU 34. History of ICES advice and ICES estimates of landings. All weights in thousand tonnes.

Year	ICES advice	Predicted landings corresp. to advice	Predicted catches corresp. to advice	ICES landings *
2009	No separate advice			1.3
2010	No separate advice			0.76
2011	No separate advice			0.43
2012	No separate advice			0.59
2013	Average landings (last 10 years)	< 0.6		0.12
2014	No new advice, same as 2013	< 0.6		0.32
2015	Recent average landings (last 3 years)	< 0.383	< 0.41	0.44
2016	No new advice, same as for 2015	< 0.383	< 0.41	
2017	Precautionary approach	≤ 0.459	≤ 0.492	
2018	Precautionary approach	≤ 0.459	≤ 0.492	

* Provisional international landings, only available from 2009. Does not include discards.

History of catch and landings

Table 6.3.31.6 Norway lobster in Division 4.b, FU 34. Catch distribution by fleet in 2015 as estimated by ICES.

Table 2: Norway lobster (fishery) and fish catch distribution by fleet in 2015 as estimated by IFREMER			
Catch (2015)	Estimated landings		Discards
Unknown	directed <i>Nephrops</i> fishery 56% TR2	mixed <i>Nephrops</i> /demersal fishery 44% TR1	Unknown
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Table 6.3.31.7 Norway lobster in Division 4.b, FU 34. History of commercial landings; ICES estimated values are presented by area for each country participating in the fishery. All weights in tonnes. Before 2009, only Scottish data are available.

Year	UK Scotland				UK (E, W & NI)	Denmark	Netherlands	Total Landings
	<i>Nephrops</i> trawl	Other trawl	Creel	Sub-total				
1991	64	21	0	85				85
1992	78	28	0	106				106
1993	23	21	0	44				44
1994	79	50	0	129				129
1995	37	95	0	132				132
1996	40	89	0	129				129
1997	30	70	0	100				100
1998	15	73	0	88				88
1999	80	122	0	202				202
2000	89	95	0	184				184
2001	159	112	0	271				271
2002	240	103	0	343				343
2003	518	157	0	675				675
2004	398	90	0	488				488
2005	253	125	0	378				378
2006	359	89	0	448				448
2007	649	68	0	717				717
2008	844	93	0	937				937
2009	1297	8	0	1305				1305
2010*	816	22	0	838	25	1	1	865
2011	406	16	0	422	6	4		432
2012	546	4	0	550	37	10		597
2013	65	41	0	106	11	3		120
2014	81	226	0	307	13			320
2015**	218	182	0	400	39	<0.5		439

*Landings for other countries previous to 2010 are currently unavailable

** Provisional.

Summary of the assessment

Table 6.3.31.8 Norway lobster in Division 4.b, FU 34. Stock density estimates (results of the 2003, 2005, and 2009–2015 surveys; adjusted for bias = 1.40).

Year	Stock density estimates		
	Stations	Mean density (burrows m ⁻²)	95% confidence interval (burrows m ⁻²)
2003	20	0.09	0.02
2004	no survey		
2005	29	0.09	0.04
2006	no survey		
2007	no survey		
2008	no survey		
2009	12	0.28	0.13
2010	19	0.24	0.08
2011	14	0.16	0.09
2012	15	0.14	0.06
2013	no survey		
2014	13	0.13	0.04
2015	17	0.16	0.06

* Provisional.

Sources and references

ICES. 2013. Report of the Benchmark Workshop on Nephrops Stocks (WKNEPH), 25 February–1 March 2013, Lysekil, Sweden. ICES CM 2013/ACOM:45. 230 pp.

ICES. 2016a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 26 April–5 May 2016. ICES CM 2016/ACOM:14.

ICES 2016b. Advice basis. *In* Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/Introduction_to_advice_2016.pdf

ICES. 2016c. Report of the Working Group on Mixed-Fisheries Advice for the North Sea (WGMIXFISH), 23–27 May 2015. ICES CM 2015/ACOM:22

Napier, I. R. 2014. Fishers' North Sea stock survey 2014. NAFC Marine Centre, Shetland, Scotland. <http://nsss.eu>