ICES Advice on fishing opportunities, catch, and effort
Greater North Sea Ecoregion
nep.fu.32

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Norway lobster (Nephrops norvegicus) in Division 4.a, Functional Unit 32 (northern North Sea, Norway Deep)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in each of the years 2019 and 2020 should be no more than 397 tonnes. If this stock is not under the Norwegian discard ban in 2019 and 2020 and discard rates do not change from the average of the period 2014–2016, this implies landings of no more than 389 tonnes.

Stock development over time

The state of this stock is unknown. Catches have been decreasing since 2006. Discarding has been low in the last four years.
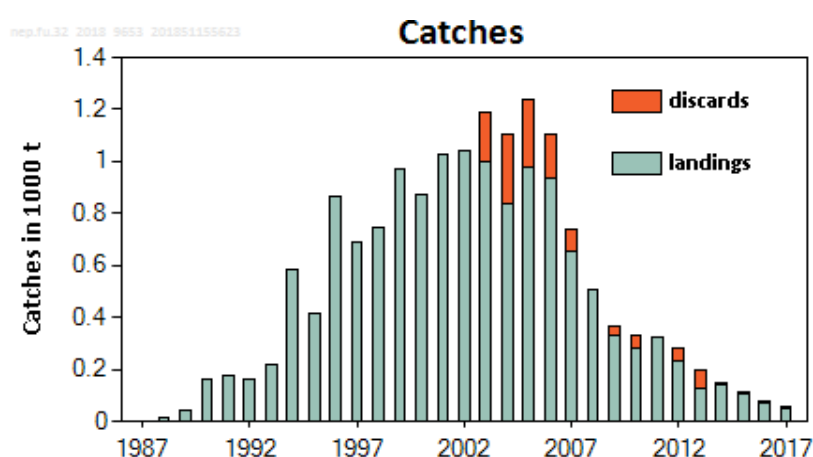

Figure 1   Norway lobster in Division 4.a, FU 32. ICES estimated catches. Discard estimates are not available for 2008 and 2011, and prior to 2003.

Stock and exploitation status

ICES cannot assess the stock and exploitation status relative to MSY and precautionary approach (PA) reference points because the reference points are undefined.

Table 1   Norway lobster in Division 4.a, FU 32. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size		
		2015	2016	2017		2015	2016	2017
Maximum sustainable yield	F_{MSY}	?	?	? Unknown	MSY $B_{trigger}$	?	?	? Unknown
Precautionary approach	F_{pa}, F_{lim}	?	?	? Unknown	B_{pa}, B_{lim}	?	?	? Unknown
Management plan	F_{MGT}	–	–	– Not applicable	B_{MGT}	–	–	– Not applicable
Qualitative evaluation	-	✓	✓	✓ Below possible reference points	-	?	?	? Unknown

Catch scenarios

The ICES framework for Category 4 Norway lobster stocks was applied (ICES, 2012). In the absence of a full analytical assessment, ICES bases its advice for Norway lobster on average catches, unless this is considered to be not precautionary. Maximum sustainable yield (MSY) harvest rates estimated for other FUs vary between 7.5% and 16%. ICES uses the lower boundary as an upper limit for advice for category 4 Norway lobster stocks. If the harvest rate is less than 7.5%, the default basis for advice is the average catch of the last ten years (2008–2017).

In the absence of information from this functional unit, the advice is based on an assumed low density of 0.1 *Nephrops* m^{-2}, which is among the lowest observed densities in the North Sea. Average landings for 2008–2017 implies a harvest rate below the range of MSY harvest rates in the North Sea (between 7.5% and 16%). Discards are estimated for the Danish part of the fleet. Norwegian discards are assumed to have been zero for the last ten years.

Average landings (2008–2017) results in a greater than 20% reduction in the advice compared to advice for 2017 and 2018. Therefore, the uncertainty cap is applied. This implies catches of no more than 397 t and a very low harvest rate (1%).

Table 2   Norway lobster in Division 4.a, FU 32. The basis for the catch scenarios.

Variable	Value	Notes
Density in TV assessment	0.1 *Nephrops* m^{-2}	Abundance in UWTV 2014 (from FU 7)
Mean weight in landings	92 g	Average 2014–2016 (Denmark)
Mean weight in discards	29 g	Average 2014–2016 (Denmark)
Discard rate (total)	0.06	Average 2004–2016 (Danish discards over total catches; proportion by number)
Discard survival rate	0.25	
Surface area estimate	3613 km²	Benchmark estimate WKNEP (2016)

Table 3   Norway lobster in Division 4.a, FU 32. Catch scenarios for 2019 and 2020. All weights are in tonnes.

Rationale	Basis	Total catch	Dead removals	Landings (Wanted catch)	Dead discards	Surviving discards	Harvest rate*	% advice change **
		L+ DD+SD	L +DD	L	DD	SD	For L+DD	
Precautionary approach	Advice for 2017 & 2018 -20%	397	395	389	6	2	1.23%	-20%
Other scenarios	0.5 × Average landings (2008–2017)	162	161	159	2	1	0.50%	-67%
	Average landings (2008–2017)	325	323	318	5	2	1.00%	-34%
	Advice for 2017 & 2018	496	494	486	7	2	1.53%	0%
	Maximum landings	1214	1208	1190	18	6	3.8%	145%
	MSY harvest rate	2427	2415	2379	36	12	7.5%	389%

* Calculated for dead removals.
** Total catch 2019 and 2020 relative to advice value for 2017 and 2018 (496 t)

Basis of the advice

Table 4   Norway lobster in Division 4.a, FU 32. The basis of the advice.

Advice basis	Precautionary approach
Management plan	ICES is not aware of any agreed precautionary management plan for Norway lobster in this area. For this stock it is not possible to estimate F_{MSY} ranges, therefore ICES continues to give advice based on the ICES precautionary approach.

Quality of the assessment

The advice is based on a calculation of potential catch options and harvest rate, given the estimated surface area of Norway lobster habitat and assumed densities of the functional unit. The area of the Norway lobster grounds in FU 32 is based on the distribution of the current Danish trawl fishery; this estimate does not include the Norway lobster habitat along the Norwegian coast where a growing creel fishery takes place. Due to very low sample sizes, the 2017 data were not used to calculate the discard rate and mean weights in the catches.

Issues relevant for the advice

The total area of *Nephrops* grounds in FU 32 was previously estimated using information on the distribution of the Norwegian and Danish fisheries, as well as suitable sediment (55 500 km^2). As the fishery has contracted and is currently located in the southern part of FU 32, the Danish logbook data were analysed as part of the 2016 benchmark to provide a new area estimate based on the distribution of the Danish fishery (3613 km^2). The extent of the Norwegian trawling and creel grounds was not included in the new area estimate and therefore the new stock area estimate is likely to be a minimum estimate of the distribution area.

In contrast to the other functional units, management is implemented at the functional unit level for FU 32.

Norway lobster in FU 32 is not included in the Norwegian discard ban.

Mixed-fisheries considerations[†]

Results from a North Sea mixed-fisheries analysis are presented in the ICES mixed-fisheries advice (ICES, 2018a). The analysis has been updated taking into account latest changes made to the assessments and forecasts for stocks with reopened advice.

After years of positive development, North Sea cod is again estimated to be the most limiting stock in the Greater North Sea mixed-fisheries model. For 2019, assuming a strictly implemented discard ban (corresponding to the "Minimum" scenario), cod is estimated to constrain 24 out of 40 fleet segments. Whiting is the second most limiting stock, constraining twelve fleet segments. Conversely, in the "Maximum" scenario, saithe and both plaice stocks (North Sea and eastern English Channel) plaice would be the least limiting for 17, 9, and 3 fleet segments, respectively. Finally, if Norway lobster were managed by separate TACs, Norway lobster in FU 7 would be the least limiting for seven fleet segments (ICES, 2018b). Norway lobster in FU 32 is not limiting in mixed-fisheries scenarios (ICES, 2018a).

For those demersal fish stocks for which the F_{MSY} range is available, a "range" scenario is presented that minimizes the potential for TAC mismatches in 2019 within the F_{MSY} range. Currently, these range scenarios do not take into account Norway lobster stocks.

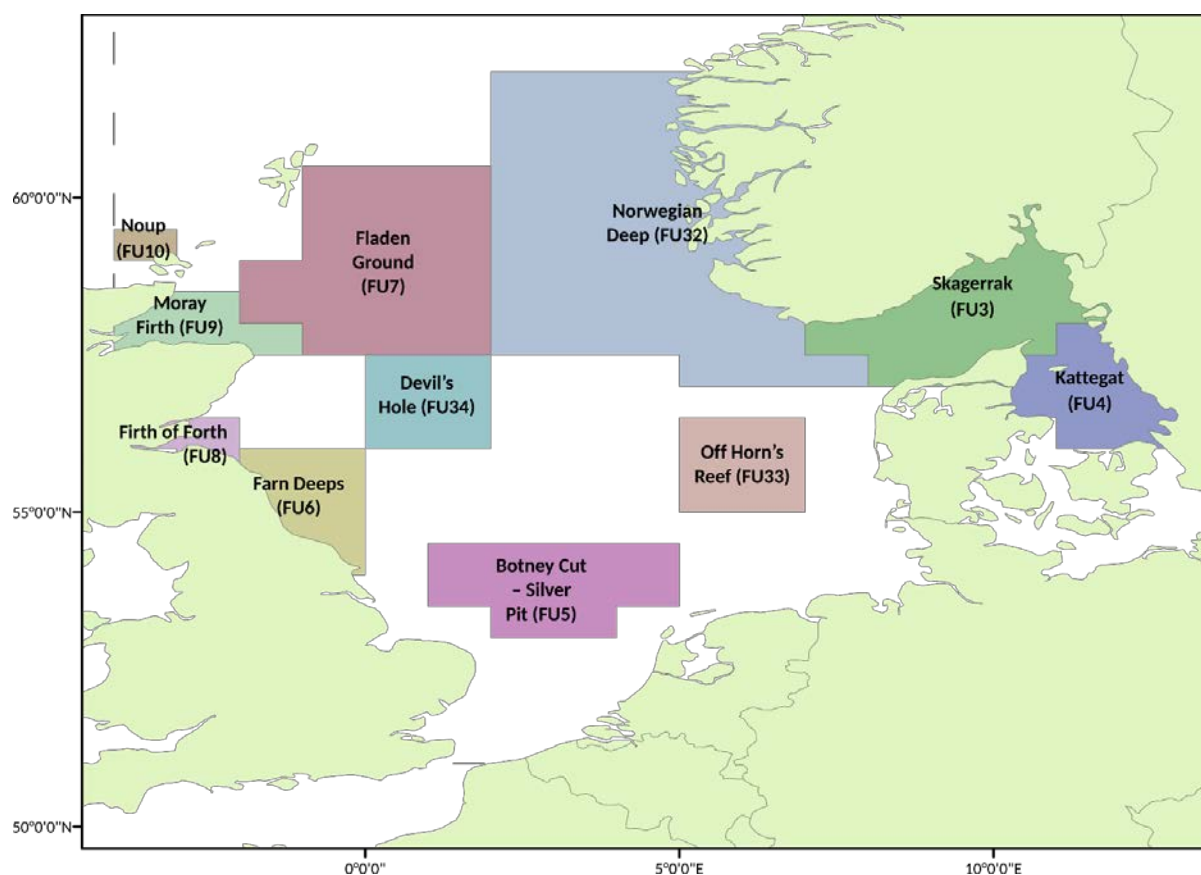[†] Version 2: mixed-fisheries text updated.

Figure 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 5   Norway lobster in Division 4.a, FU 32. The basis of the assessment.

ICES stock data category	4.1.4 (ICES, 2018c).
Assessment type	Data-limited method for Nephrops (ICES, 2018d).
Input data	Commercial catches (international landings, Danish discards)
Discards and bycatch	Discards are only quantified for the Danish part of the fisheries. Danish discards for 2008 and 2011 are lacking. Norwegian discards are assumed to be zero for the whole time-series.
Indicators	Length frequency in Danish catches. One commercial index (Danish LPUE). Mean sizes in Danish landings and discards. Biomass index from Norwegian bottom trawl survey.
Other information	Benchmarked in 2016 (ICES, 2016).
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

There is no additional available information.

History of the advice, catch, and management

Table 6   Norway lobster in Division 4.a, FU 32. History of ICES advice, the agreed TAC, and ICES estimates of landings and discards. All weights in tonnes.

Year	ICES advice	Landings corresponding to advice	Catch corresponding to advice	TAC*	ICES landings	ICES discards^
1987					2	
1988					17	
1989					40	
1990					166	
1991					177	
1992					163	
1993					339	
1994					755	
1995					489	
1996					952	
1997					760	
1998					836	
1999					1119	
2000					1085	
2001					1190	
2002		1.2		No TAC agreed	1171	
2003		1.2		No TAC agreed	1090	193
2004		1.5		1000	922	267
2005		1.5		1000	1089	259
2006	No increase in effort			1300	1033	168
2007	No increase in effort			1300	755	85
2008	No new advice, same as for 2007			1300	675	**
2009	No increase in effort			1200	477	38
2010	No new advice, same as for 2009			1200	407	48
2011	See scenarios	-		1200	395	**
2012	Reduce catches	-		1200	310	47
2013	Average landings (last 10 years)	< 800		1000	191	68
2014	No new advice, same as 2013	< 800		1000	205	5
2015	Average landings (last 10 years)	< 625		1000	192	6
2016	Precautionary approach		≤ 642***	1000	177	1
2017	Precautionary approach		≤ 496***	1000	147	1
2018	Precautionary approach		≤ 496***	800		
2019	Precautionary approach	≤ 389	≤ 397			
2020	Precautionary approach	≤ 389	≤ 397			

* EU TAC for Norwegian zone of Subarea 4.
** Discard estimates are missing for 2008 and 2011.
*** Assumes the EU landing obligation comes into force and selection patterns do not change.
^ Dead + surviving discards.

History of the catch and landings

Table 7   Norway lobster in Division 4.a, FU 32. Catch distribution by fleet in 2017 as estimated by ICES.

Catch (2017)		Wanted catch		Unwanted catch	
100% dead	0% surviving	42% trawling	58% creels	75% dead	25% surviving
148 t		147 t		1 t	

Table 8   Norway lobster in Division 4.a, FU 32. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery.

Year	Denmark	Danish discards		Norway			Sweden	UK	Netherlands	Total landings	TAC
		Dead	Surviving	Trawl	Creel	Sub-total					
1993	220			102	1	103		16		339	
1994	584			161	0	161		10		755	
1995	418			68	1	69		2		489	
1996	868			73	1	74		10		952	
1997	689			56	8	64		7		760	
1998	743			88	1	89		4		836	
1999	972			119	15	134		13		1119	
2000	871			143	0	143	37	34		1085	
2001	1026			72	13	85	26	53		1190	
2002	1043			42	21	63	13	52		1171	
2003	996	145	48	68	11	79	1	14		1090	
2004	835	200	67	72	8	80	1	6		922	1000
2005	979	194	65	89	13	102	2	6		1089	1000
2006	939	126	42	62	19	81	1	7	5	1033	1300
2007	652	64	21	77	20	97	5	1		755	1300
2008	505			112	30	142	24	4		675	1300
2009	331	29	10	107	31	138	2	6		477	1200
2010	282	36	12	82	41	123	1	1		407	1200
2011	322			29	40	69	1	3		395	1200
2012	234	35	12	25	50	75	1			310	1200
2013	128	51	17	18	45	63				191	1000
2014	143	4	1	15	47	62				205	1000
2015*	110	5	2	8	74	82				192	1000
2016	80	1	0	7	90	97			1	178	1000
2017	53	1	0	9	94	94				147	1000
2018											800

* Provisional.

Summary of the assessment

Table 9 Norway lobster in Division 4.a, FU 32. Sensitivity analysis of harvest rates for a range of potential densities. All weights in tonnes. Shaded cells indicate harvest ratios above the F_{MSY} proxy for this stock of 7.5%.

Basis	Live discards	Dead discards	Landings	Dead removals	Range of potential densities (*Nephrops* m^{-2})								
					0.05	0.1*	0.2	0.3	0.4	0.5	0.6	0.7	0.8
					Harvest rate								
0.5 × Average landings (2008–2017)	1	2	159	161	1.00%	0.50%	0.25%	0.167%	0.125%	0.100%	0.083%	0.072%	0.063%
Average landings (2008–2017)	2	5	318	323	2.0%	1.00%	0.50%	0.33%	0.25%	0.20%	0.167%	0.143%	0.125%
Advice for 2017 & 2018 -20%	2	6	389	395	2.5%	1.23%	0.61%	0.41%	0.31%	0.25%	0.20%	0.175%	0.153%
Advice for 2017 & 2018	2	7	486	494	3.1%	1.53%	0.77%	0.51%	0.38%	0.31%	0.26%	0.22%	0.192%
Maximum landings	6	18	1190	1208	7.503%	3.8%	1.88%	1.25%	0.94%	0.75%	0.63%	0.54%	0.47%
MSY harvest rate	12	36	2379	2415	15.0%	7.5%	3.8%	2.5%	1.88%	1.50%	1.25%	1.07%	0.94%

* A density of 0.1 *Nephrops* m^{-2} is used as basis for the advice.

Sources and references

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