

Norway lobster (*Nephrops norvegicus*) in Division 4.b, Functional Unit 33 (central North Sea, Horn's Reef)

ICES advice on fishing opportunities

Please note: The present advice replaces the advice given in June 2018 for catches in 2019 and 2020.

ICES advises that when the precautionary approach (PA) is applied, wanted catches in each of the years 2019 and 2020 should not exceed 898 tonnes. ICES cannot quantify the corresponding total catches.

To ensure that the stock in Functional Unit (FU) 33 is exploited sustainably, management should be implemented at the functional unit level.

Stock development over time

The state of this stock is unknown. Landings have been relatively stable since 2004, fluctuating without trend at around 1000 tonnes. The mean density of Norway lobster decreased by 43% from 2017 to 2018.

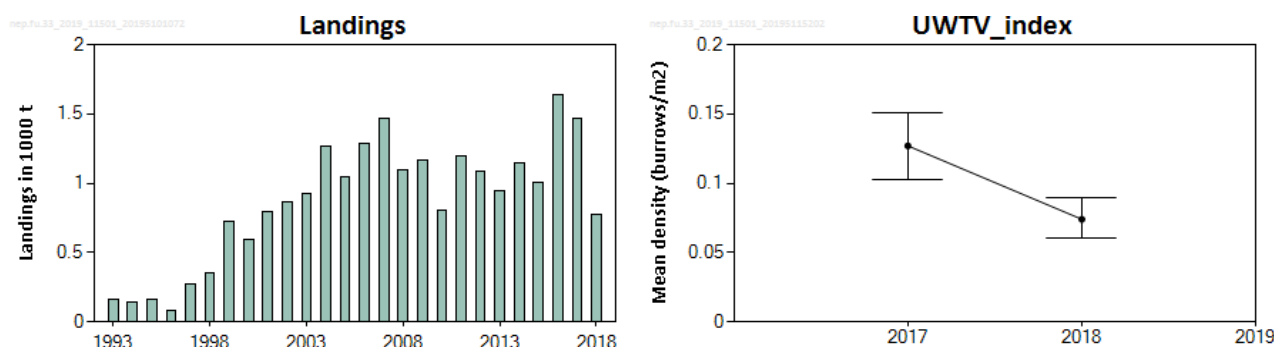


Figure 1 Norway lobster in Division 4.b, FU 33. Landings and stock density. Error bars represent 95% confidence intervals.

Stock and exploitation status

ICES cannot assess the stock and exploitation status relative to MSY and PA reference points, because the reference points are undefined.

Table 1 Norway lobster in Division 4.b, FU 33. State of the stock and fishery, relative to reference points.

		Fishing pressure				Stock size				
		2016	2017	2018		2016	2017	2018		
Maximum sustainable yield	F _{MSY}	?	?	?	Unknown	MSY B _{trigger}	?	?	?	Undefined
Precautionary approach	F _{pa} , F _{lim}	?	?	?	Unknown	B _{pa} , B _{lim}	?	?	?	Undefined
Management plan	F _{MGT}	—	—	—	Unknown	B _{MGT}	—	—	—	Unknown
Qualitative evaluation	-	—	—	—		-	?	?	↘	Decreasing

Catch scenarios

The ICES framework for category 4 Norway lobster stocks (ICES, 2012) was applied for this stock. As a first step, the ten-year landing average results in 8.7% harvest rate (HR), which is above the MSY proxy of 7.5%. Applying a 20% precautionary buffer on the ten-year average, the HR decreases to 7.0% HR. This is below the MSY proxy, so it forms the basis for the advice.

The advice for this functional unit has been previously based on an assumed density of 0.1 *Nephrops* m⁻², corresponding to the lowest observed density in the North Sea (FU 7, Fladen Ground). In 2017 and 2018, underwater TV (UWTV) surveys were conducted for the first time for this functional unit. The mean observed densities from these surveys (0.127 and 0.074 *Nephrops* m⁻² respectively) corresponds well with the previously assumed density. The 2018 UWTV survey estimates are used as a basis for the advice.

Discards are known to take place for the entire fishery; estimates are, however, only available from the Netherlands and Denmark, where large differences in discard rates are observed. These data are not believed to be representative for the entire fishery and have not been used to calculate the values in the catch scenario table (Table 2). Because of the lack of discard data from this functional unit, the advice is based on landings only.

Table 2 Norway lobster in Division 4.b, FU 33. The basis for the catch scenarios.

Variable	Value	Notes
Mean observed density	0.074 <i>Nephrops</i> m ⁻²	Density in UWTV 2018.
Mean weight in wanted catches	40.57 g	Estimated in 2015.
Mean weight unwanted catches	Unknown	Assumed mean discard weight of 17.2g for the calculation of the harvest rate only.
Surface area estimate	5737 km ²	WGNEPS (ICES, 2017).
Discard survival	0	ICES (2019).
Discard ratio	Unknown	Assumed maximum 25% discard rate for the calculation of the harvest rate only.

Table 3 Norway lobster in Division 4.b, FU 33. The catch scenarios for 2019 and 2020. All weights in tonnes (t).

Rationale	Basis	Wanted catches	Harvest rate *	% Advice change **
Precautionary approach	Average landings (2009–2018) – 20%	898	7.0%	–19.8%
Other options	0.5 × Average landings (2009 – 2018)	561	4.3%	–50%
	Advice for 2017 & 2018 – 20%	895	6.9%	–20%
	MSY harvest rate	969	7.5%	–13.4%
	Average landings (2009–2018)	1122	8.7%	0.29%
	Maximum landings	1636	12.7%	46%

* Based on an assumed maximum discard rate of 25% and mean discard weight of 17.2 g.

** Wanted catch 2019 & 2020 relative to advice value for 2017 & 2018 (1119 t).

The change in the advice (–19.8%) is mainly a result of using population density from the 2018 UWTV survey. The previous advice for this functional unit was based on an assumed density of 0.1 *Nephrops* m⁻², corresponding to the lowest observed density in the North Sea (FU 7, Fladen Ground).

Basis of the advice

Table 4 Norway lobster in Division 4.b, FU 33. The basis of the advice.

Advice basis	ICES precautionary approach
Management plan	The EU multiannual plan (MAP) for stocks in the North Sea (EU, 2018) and adjacent waters applies to catches of this stock.
	The MAP stipulates that when the F_{MSY} ranges are not available, fishing opportunities should be based on the best available scientific advice.

Quality of the assessment

Catch sampling needs to be improved. Discard data exist but are not considered representative and are not used to formulate advice. It is currently not possible to update mean weight estimates for landings because current sampling levels are too low.

The advice is 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.

Issues relevant for the advice

There is a single total allowable catch (TAC) for all of ICES Subarea 4, except the Norwegian Deep. Management should ensure that fishing opportunities are in line with the scale of the resource in each of the stocks.

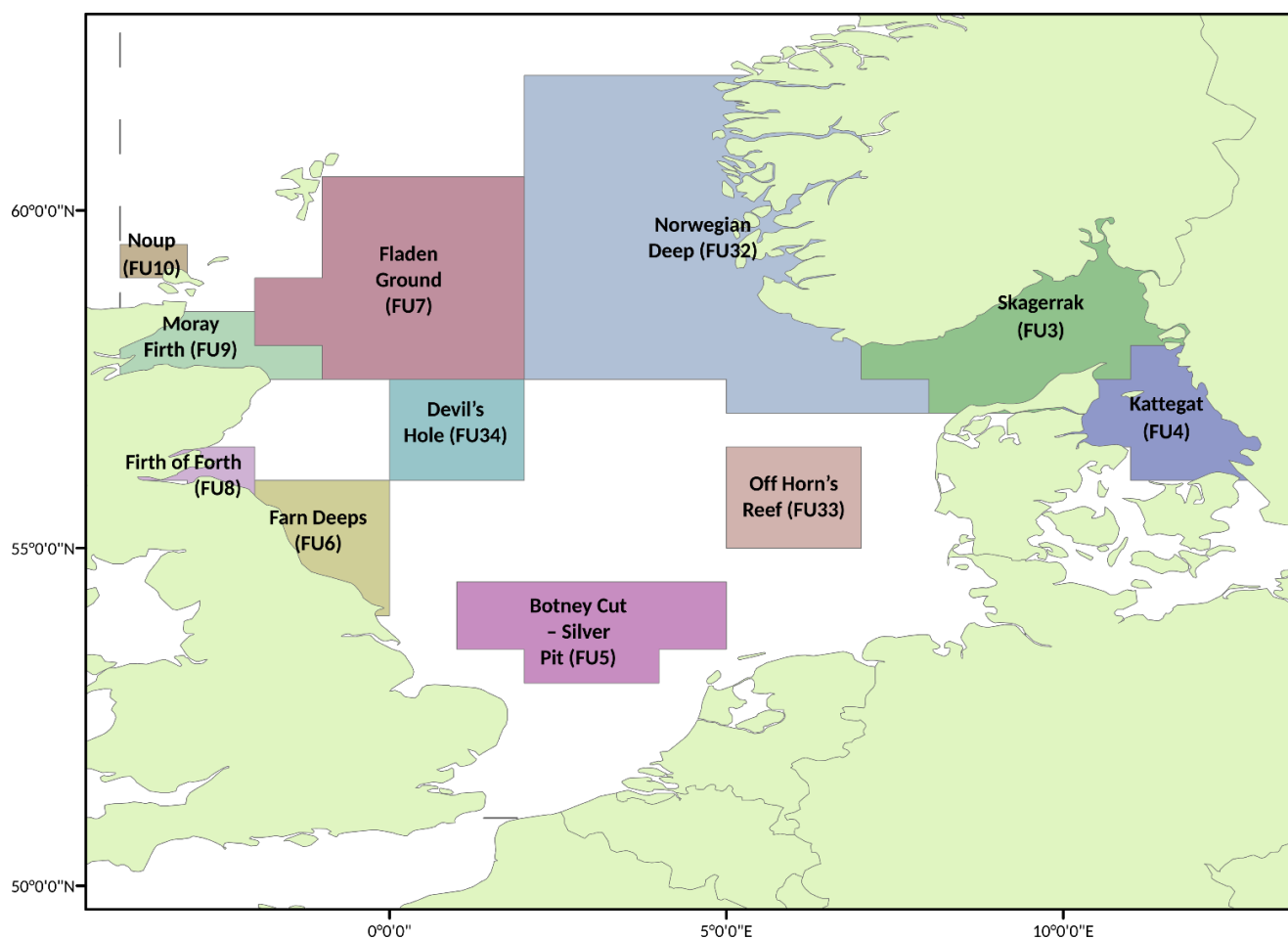


Figure 3 Norway lobster functional units in the North Sea and Skagerrak/Kattegat region.

Reference points

No reference points are defined for this stock.

Basis of the assessment

Table 5 Norway lobster in Division 4.b, FU 33. The basis of the assessment.

ICES stock data category	4 (ICES, 2018).
Assessment type	Data-limited approach for Norway lobster (ICES, 2019).
Input data	Commercial catches (international landings, and length frequencies from catch sampling); UWTV survey index.
Discards and bycatch	Discards are known to take place. The available data are not believed to be representative and have not been used to calculate the values in the catch options table.
Indicators	None.
Other information	None.
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK).

Information from stakeholders

A Dutch Science–Industry project to improve catch information (including discards) of Norway lobster by means of a fully catch monitored reference fleet has started in 2018. The objective is to develop time-series for future use in the stock assessments for nep.fu.5, nep.fu.33, and nep.27.4.outFU.

History of the advice, catch, and management

Table 6 Norway lobster in Division 4.b, FU 33. History of ICES advice, and ICES estimates of landings and discards. All weights in tonnes.

Year	ICES advice	Landings corresponding to advice	Catch corresponding to advice	ICES landings	ICES discards
1992		8 700			
1993		8 700		160	
1994		8 700		137	
1995		8 700		164	
1996		8 700		77	
1997		8 700		276	
1998		1 000		350	
1999		1 000		724	
2000		1 600		597	
2001		1 600		791	
2002		2 100		861	
2003		2 100		929	
2004		2 380		1 268	
2005		2 380		1 050	
2006		2 380		1 288	
2007	No increase in effort	-		1 467	
2008	No new advice, same as for 2007	-		1 096	
2009	No increase in effort	-		1 163	
2010	No new advice, same as for 2009	-		806	
2011	See scenarios	-		1 191	
2012	Reduce catches	-		1 084	
2013	Average landings (last 10 years)	< 1 100		946	
2014	No new advice, same as 2013	< 1 100		1 146	
2015	Average landings (last 10 years)	< 1 136		1 003	
2016	Average catches (last 10 years)	< 1 136		1 636	
2017	Precautionary approach	≤ 1 119 *		1 472	
2018	Precautionary approach	≤ 1 119 *		776	
2019	Precautionary approach	≤ 898 *			
2020	Precautionary approach	≤ 898 *			

* Wanted catches.

History of the catch and landings

Table 7 Norway lobster in Division 4.b, FU 33. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Wanted catch	Unwanted catch
Unknown	100% trawls	Unknown
	776 tonnes	

Table 8 Norway lobster in Division 4.b, FU 34. History of commercial landings; ICES estimated values are presented by country. All weights are in tonnes.

Year	Belgium	Denmark	Germany	Netherlands	UK	Total
1993	0	159		na	1	160
1994	0	137		na	0	137
1995	3	158		3	1	164
1996	1	74		2	0	77
1997	0	274		2	0	276
1998	4	333	8	12	1	350
1999	22	683	14	12	6	724
2000	13	537	12	39	9	597
2001	52	667	11	61	+	791
2002	21	772	13	51	4	861
2003	15	842	4	67	1	929
2004	37	1097	24	109	1	1 268
2005	16	803	31	191	9	1 050
2006	97	710	151	314	15	1 288
2007	118	610	201	496	42	1 467
2008	130	362	160	386	58	1 096
2009	121	231	150	491	170	1 163
2010	56	180	206	295	69	806
2011	163	396	202	403	28	1 191
2012	181	394	132	376	2	1 084
2013	156	310	174	304	2	946
2014	229	387	161	360	9	1 146
2015	299	371	142	187	4	1 003
2016	430	642	201	320	43	1 636
2017	423	511	197	336	5	1 472
2018	280	48	210	236	2	776

+ < 0.5 tonnes.

na = not available.

Summary of the assessment

Table 9 Norway lobster in Division 4.b, FU 33. Sensitivity analysis of harvest rates for a range of potential densities for wanted catch only (assuming discard rate of 0%). Shaded cells indicate harvest ratios above the F_{MSY} proxy for this stock of 7.5%. All weights in tonnes.

Basis	Wanted catch	Density (<i>Nephrops</i> m ⁻²)										
		0.05	0.074 *	0.1	0.13	0.2	0.3	0.4	0.5	0.6	0.7	0.8
		Harvest rate (%)										
0.5 × Average landings (2009–2018)	561	4.8%	3.3%	2.4%	1.9%	1.2%	0.8%	0.6%	0.5%	0.4%	0.3%	0.3%
Advice for 2017 & 2018 – 20%	895	7.7%	5.2%	3.8%	3.0%	1.9%	1.3%	1.0%	0.8%	0.6%	0.5%	0.5%
Average landings (2009–2018) – 20%	898	7.7%	5.2%	3.9%	3.0%	1.9%	1.3%	1.0%	0.8%	0.6%	0.6%	0.5%
Average landings (2009–2018)	1122	9.6%	6.5%	4.8%	3.7%	2.4%	1.6%	1.2%	1.0%	0.8%	0.7%	0.6%
F_{MSY}	1292	11.1%	7.5%	5.6%	4.3%	2.8%	1.9%	1.4%	1.1%	0.9%	0.8%	0.7%
Maximum	1636	14.1%	9.5%	7.0%	5.4%	3.5%	2.3%	1.8%	1.4%	1.2%	1.0%	0.9%

* A density of 0.074 *Nephrops* m⁻² is the observed density on the UWTV survey 2018 for this functional unit. The density of 0.13 *Nephrops* m⁻² (observed density on the UWTV survey 2017 for this functional unit) is included for comparison.

Table 10 Norway lobster in Division 4.b, FU 33. Sensitivity analysis of harvest rates for a range of potential densities and assuming a discard rate of 25% by number and a mean discard weight of 17.2 g (mean weight in the Danish discards in 2015). Shaded cells indicate harvest ratios above the F_{MSY} proxy for this stock of 7.5%. All weights are in tonnes.

Basis	Total Catch	Wanted Catch	Unwanted catch	Density (Nephrops m ⁻²)										
				0.05	0.074 *	0.1	0.13	0.2	0.3	0.4	0.5	0.6	0.7	0.8
				Harvest rate (%)										
0.5 Average landings (2009–2018)	640	561	79	6.4%	4.3%	3.2%	2.5%	1.6%	1.1%	0.8%	0.6%	0.5%	0.5%	0.4%
Advice for 2017 & 2018 – 20%	1022	895	127	10.3%	6.9%	5.1%	3.9%	2.6%	1.7%	1.3%	1.0%	0.9%	0.7%	0.6%
Average landings (2009–2018) – 20%	1025	898	127	10.3%	7.0%	5.1%	4.0%	2.6%	1.7%	1.3%	1.0%	0.9%	0.7%	0.6%
F _{MSY}	1106	969	137	11.1%	7.5%	5.6%	4.3%	2.8%	1.9%	1.4%	1.1%	0.9%	0.8%	0.7%
Average landings (2009–2018)	1281	1122	159	12.9%	8.7%	6.4%	4.9%	3.2%	2.1%	1.6%	1.3%	1.1%	0.9%	0.8%
Maximum	1867	1636	231	18.7%	12.7%	9.4%	7.2%	4.7%	3.1%	2.3%	1.9%	1.6%	1.3%	1.2%

* A density of 0.074 *Nephrops* m⁻² is the observed density on the UWTV survey 2018 for this functional unit. The density of 0.13 *Nephrops* m⁻² (observed density on the UWTV survey 2017 for this functional unit) is included for comparison.

Sources and references

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