

## Norway lobster (*Nephrops norvegicus*) in Division 4.b, Functional Unit 6 (central North Sea, Farn Deep)

### ICES advice on fishing opportunities

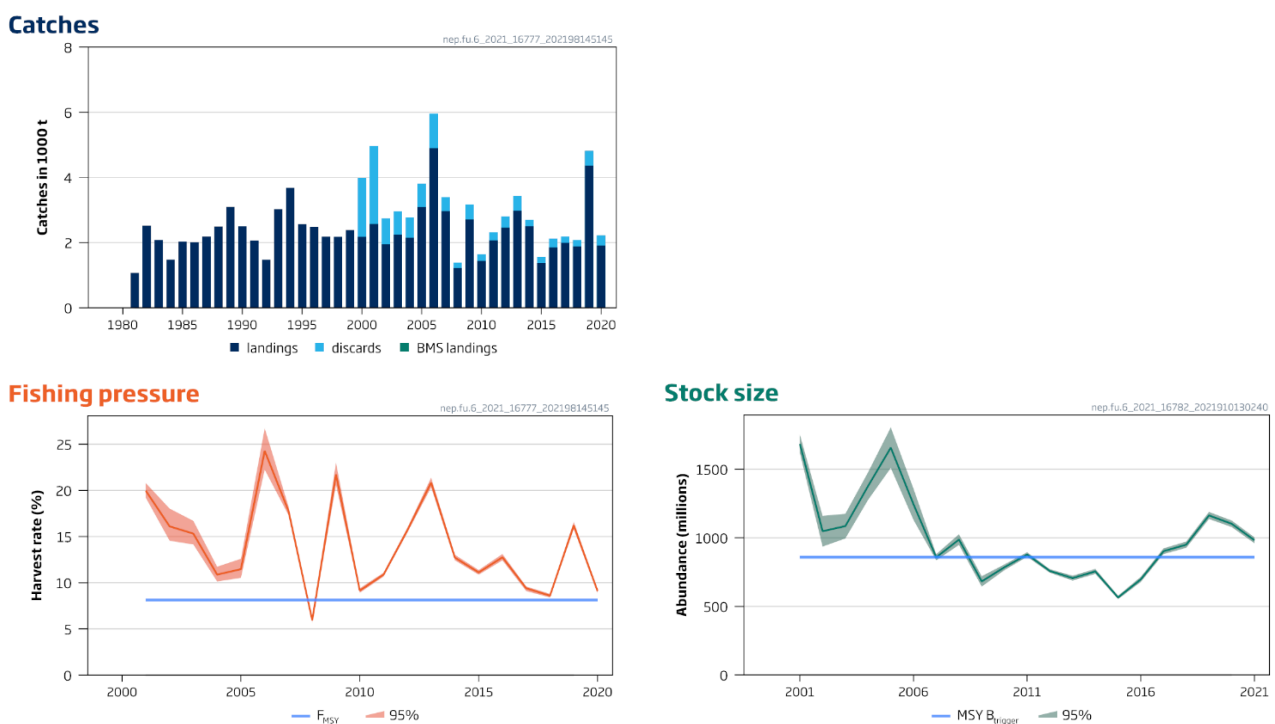
ICES advises that when the MSY approach is applied, and assuming that discard rates and fishery selection patterns do not change from the average of the years 2018–2020, catches in 2022 should be no more than 1940 tonnes.

To ensure that the stock in Functional Unit (FU) 6 is exploited sustainably, management should be implemented at the functional unit level. Any substantial transfer of the current surplus fishing opportunities from other FUs to FU 6 could rapidly lead to overexploitation.

ICES notes the existence of a management plan, developed and adopted by one of the relevant management authorities for Subarea 4. ICES considers this plan to be precautionary when implemented at the functional unit level.

### Stock development over time

Fishing pressure on the stock is above  $F_{MSY}$ , and the stock size is above MSY  $B_{trigger}$ .



**Figure 1** Norway lobster in Division 4.b, Functional Unit 6. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by stock abundance), and stock abundance (underwater TV survey).

### Catch scenarios

**Table 1** Norway lobster in Division 4.b, Functional Unit 6. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2022)	982	Underwater TV assessment 2021; individuals in millions
Mean weight in projected landings	26.90	Average 2018–2020; grammes
Mean weight in projected discards	11.55	Average 2018–2020; grammes
Projected discard rate (total)	22.0	Average 2018–2020; percentage by number of the total catch
Discard survival rate	15.0	Percentage by number of the discards

**Table 2** Norway lobster in Division 4.b, Functional Unit 6. Annual catch scenarios. All weights are in tonnes.

**Catch scenarios assuming recent discard rates**

Basis	Total catch	Dead removals	Projected landings	Projected dead discards	Projected surviving discards	% harvest rate*	% advice change**
	PL + PDD + PSD	PL + PDD	PL	PDD	PSD	for PL + PDD	
ICES advice basis							
MSY approach	1940	1909	1731	178	31	8.12	-16.0
Other scenarios							
F <sub>2020</sub>	2180	2145	1945	200	35	9.1	-5.6
F <sub>2018–2020</sub>	2701	2657	2410	247	44	11.3	16.9
F <sub>MSY lower</sub>	1673	1646	1492	153	27	7.0	-28
F <sub>MSY upper</sub> ***	1940	1909	1731	178	31	8.12	-16.0

\* Calculated for dead removals.

\*\*Advice values for 2022 relative to the 2021 value (MAP F<sub>MSY</sub> advice of 2310 tonnes).

\*\*\* F<sub>MSY upper</sub> = F<sub>MSY</sub> for this stock.

The 16% decrease in the advice relative to 2021 results from a decrease in stock abundance in combination with a decrease in individual mean weight in landings.

**Basis of the advice**

**Table 3** Norway lobster in Division 4.b, functional unit 6. The basis of the advice.

Advice basis	MSY approach.
Management plan	ICES is aware of the EU multiannual management plan (MAP) that has been agreed for this stock (EU, 2018) and considers it to be precautionary when implemented at the functional unit level. There is no agreement with UK regarding this plan, and it is not used as the basis of the advice for this stock. ICES provides catch scenarios consistent with the F <sub>MSY</sub> ranges in the MAP.

**Quality of the assessment**

Despite COVID-19 restrictions, the UWTV surveys in 2020 and 2021 were carried out as planned.

In 2020, only commercial catch samples from quarter 1 were available. In FU 6, commercial activity in 2019 was unusual, not only for the high annual landings but also for the high discard rates by weight in quarters 2 and 3. As this discarding practice in 2019 might have affected the length sampling, it was decided to calculate averages for the reference period 2016–2018 and scale to quarter 1 values in 2020. During the years 2016–2018, there was a consistent seasonal pattern in discard rate, so the approach was considered appropriate.

**Issues relevant for the advice**

During 2016–2020, the EU landing obligation was applied to all catches of Norway lobster fisheries with exemptions for high survival. From 2021, the high survivability exemption has been replaced by a *de minimis* exemption for vessels fishing with certain gears in UK waters of ICES Subarea 4 and Division 2.a. The new exemption applies to catches of Norway lobster below the minimum conservation reference size (MCRS), which shall not exceed 2% of the total annual catches of that species.

ICES is providing advice for 2022 assuming average discard rates as observed over the last three years of data. Observations from the 2018–2020 fishery indicate that discarding above MCRS continues and has not changed markedly since 2007 (Figure 3). Since 2016, less than one tonne of Norway lobster was recorded as below MCRS (BMS category) in FU 6, despite catches having been observed below the MCRS (Figure 3). In a situation where all catch is landed, there would be no surviving discards, and the total catch advice and MSY harvest rate would be lower than those given in the catch scenario table (Table 2). However, reducing the catch of smaller Norway lobster would allow an increase in landings above those given in the catch scenario table.

Catches have been generally higher than the level advised by ICES, highlighting the issue that current management arrangements are not sufficient to contain the fishery within the sustainable limits determined by ICES. A single TAC covers

the entire ICES Subarea 4, except for the Norwegian Deep. Management should be implemented at the functional unit level to ensure that fishing opportunities are in line with the scale of the resource for each of the stocks and the corresponding MSY approach. From April 2016, UK has imposed a range of measures on its vessels fishing for Norway lobster in FU 6 in an attempt to reduce fishing mortality on the stock (MMO, 2021).

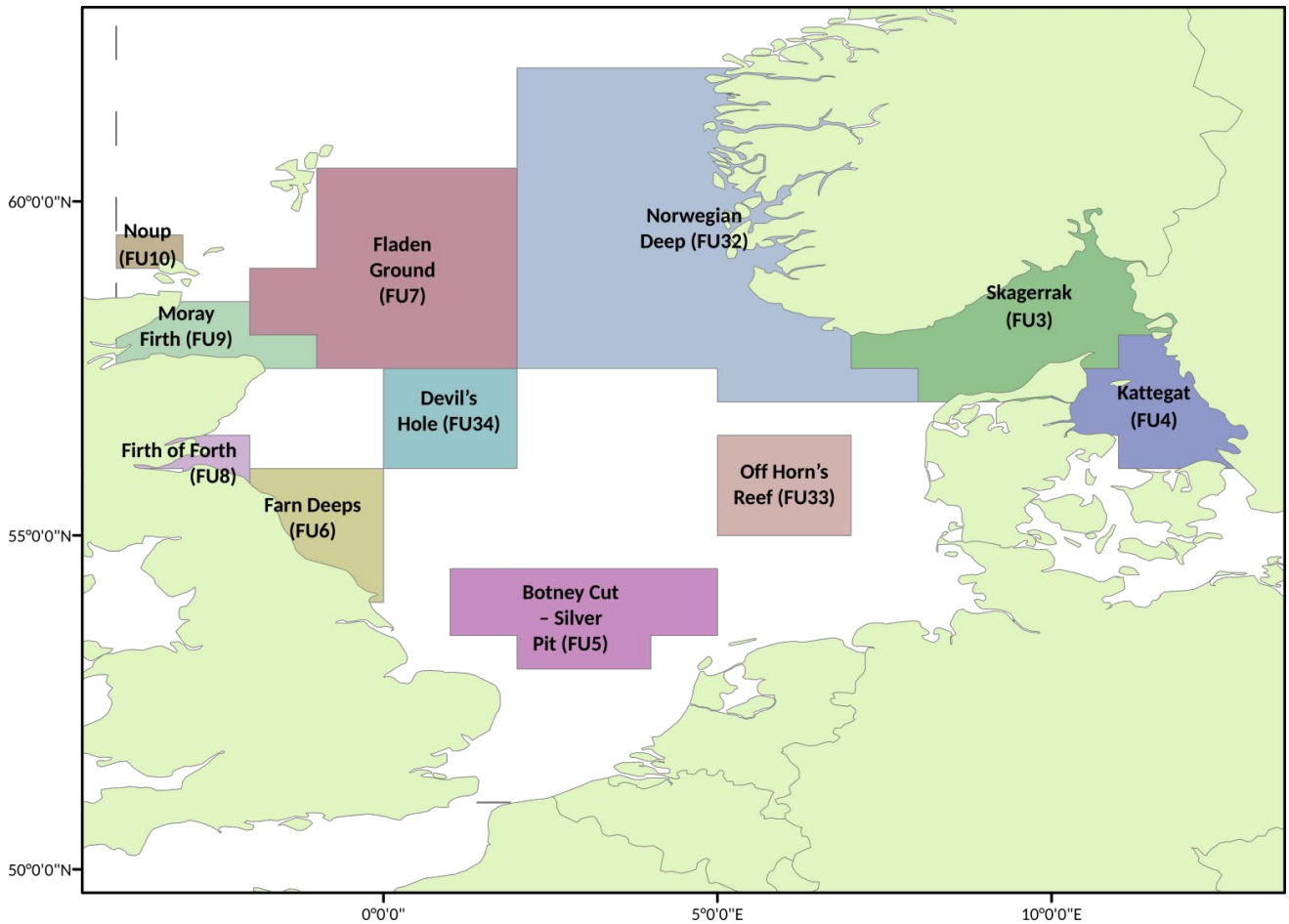


Figure 2 Norway lobster functional units in the North Sea and Skagerrak/Kattegat region.

## Reference points

**Table 4** Norway lobster in Division 4.b, Functional Unit 6. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	858	UTW survey index in 2007; individuals in millions	ICES (2010)
	$F_{MSY}$	8.12	Proxy, harvest rate equivalent to $F_{35\%SPR}$ males; percentage by number	ICES (2010)
Precautionary approach	$B_{lim}$	Not defined		
	$B_{pa}$	Not defined		
	$F_{lim}$	Not defined		
	$F_{pa}$	Not defined		
EU multiannual plan (MAP) (EU, 2018)	MAP MSY $B_{trigger}$	858	MSY $B_{trigger}$ ; individuals in millions	ICES (2010)
	MAP $B_{lim}$	Not defined		
	MAP $F_{MSY}$	8.12	Harvest rate equivalent to $F_{MSY}$ ; percentage by number	ICES (2010)
	MAP range $F_{lower}$	7.0–8.12	Harvest rate consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY; percentage by number	ICES (2015)
	MAP range $F_{upper}^*$	8.12–8.12	Harvest rate, $F_{MSY upper}$ value capped at $F_{MSY}$ because it has not been possible to evaluate the probability of $SSB < B_{lim}$ as no $B_{lim}$ is defined; percentage by number	ICES (2015)

\* For this stock,  $F_{MSY upper} = F_{MSY}$

## Basis of the assessment

**Table 5** Norway lobster in Division 4.b, Functional Unit 6. Basis of assessment and advice.

ICES stock data category	1 (ICES, 2021a)
Assessment type	Underwater TV survey (UWTV) linked to yield-per-recruit analysis from length data (ICES, 2021b)
Input data	One survey index (UWTV; U8672); length–frequency data from the fishery; commercial catches (international landings and length frequencies from English catch sampling and Scottish landing sampling, covering 80–90% of the landings); maturity data from commercial catch sampling. Natural mortalities from Morizur (1982): 0.3 for males and immature females, and 0.2 for mature females for all years.
Discards and bycatch	Included in the assessment, data from the majority of the main fleets (covering between 66 and 92% of the landings since 2012, with an average of 83%). In quarter 1 of 2020, 84% of all landings were sampled, but none later during that year. BMS landings, where reported, are included as dead removals in the assessment since 2016. Discards are available since 2000.
Indicators	Sex ratio, length frequencies
Other information	The 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)

## History of the advice, catch, and management

**Table 6** Norway lobster in Division 4.b, Functional Unit 6. ICES advice and catch estimates. All weights are in tonnes.

Year	ICES advice	Landings corresponding to advice	Catch corresponding to advice	ICES landings	ICES total discards*, ^^^
2004				2153	615
2005				3094	715
2006	No increase in effort			4903	1 051
2007	No increase in effort, harvest rate < 15%	3500		2966	432
2008	No new advice, same as for 2007	3500		1220	166
2009	No increase in effort and landings (2007)	< 3000		2713	461
2010	Harvest rate no greater than that equivalent to fishing at $F_{2008}$	< 1200		1443	201
2011	MSY transition	< 1900		2072	246

Year	ICES advice	Landings corresponding to advice	Catch corresponding to advice	ICES landings	ICES total discards* ^^^
2012	MSY transition	< 1400		2460	345
2013	MSY transition	< 1400		2982	450
2014	MSY transition	< 1026		2503	199
2015	(Update November) MSY approach	< 1127		1371	190
2016	MSY approach	< 680	≤ 738**	1854	272
2017	MSY approach		≤ 1143***	1993	200
2018	MSY approach		≤ 1876^	1881	195
2019	MAP^^ F <sub>ranges</sub> (harvest rate = 7.0–8.12%)		1709-1982^	4364	453
2020	Management plan		2055–2384^	1912	310
2021	Management plan		1991–2310^		
2022	MSY approach		≤ 1940^		

\* Dead + surviving discards.

\*\* Assuming all catches are landed and selection patterns do not change.

\*\*\* Assuming discarding below the minimum conservation reference size (MCRS) only.

^ Assuming discard rates average of the last three years.

^^ EU multiannual plan (MAP) for the North Sea (EU, 2018).

^^^ Since 2016, discard estimates include below minimum size (BMS) landings as reported to ICES.

## History of the catch and landings

**Table 7** Norway lobster in Division 4.b, Functional Unit 6. Catch distribution by fleet in 2020 as estimated by ICES.

Catch		Landings			Discards	
98% dead	2% surviving	Directed <i>Nephrops</i> fishery TR2 75%	Mixed <i>Nephrops</i> /demersal fishery TR1 17%	Other 8%	85% dead*	15% surviving
2222 tonnes		1912 tonnes			310 tonnes	

\*Discards include BMS landings.

**Table 8** Norway lobster in Division 4.b, Functional Unit 6. ICES estimates of landings by country, total landings, and discards . All weights are in tonnes.

Year	UK England & N. Ireland	UK Scotland	Other countries*	Total landings	Discards ^
1981	1006	67	0	1073	
1982	2443	81	0	2524	
1983	2073	5	0	2078	
1984	1471	8	0	1479	
1985	2009	18	0	2027	
1986	1987	28	0	2015	
1987	2158	33	0	2191	
1988	2390	105	0	2495	
1989	2930	168	0	3098	
1990	2306	192	0	2498	
1991	1884	179	0	2063	
1992	1403	60	10	1473	
1993	2941	89	0	3030	
1994	3530	153	0	3683	
1995	2478	90	1	2569	
1996	2386	96	1	2483	
1997	2109	80	0	2189	
1998	2029	147	1	2177	
1999	2197	194	0	2391	
2000	1947	231	0	2178	1805
2001	2319	255	0	2574	2393
2002	1739	215	0	1954	795
2003	2031	214	0	2245	716
2004	1952	201	0	2153	615
2005	2936	158	0	3094	715
2006	4430	434	39	4903	1051
2007	2525	437	4	2966	432
2008	976	244	0	1220	166
2009	2299	414	0	2713	461
2010	1258	185	0	1443	201
2011	1806	251	15	2072	246
2012	2177	257	26	2460	345
2013	2666	305	11	2982	450
2014	2104	345	54	2503	199
2015	1187	174	10	1371	190
2016	1726	125	3	1854	272
2017	1685	290	18	1993	200
2018	1557	304	20	1881	195
2019	3456	853	55	4364	453
2020**	1644	234	34	1912	310

\* "Other countries" includes the Netherlands, Belgium, Denmark, and Sweden.

\*\* Provisional.

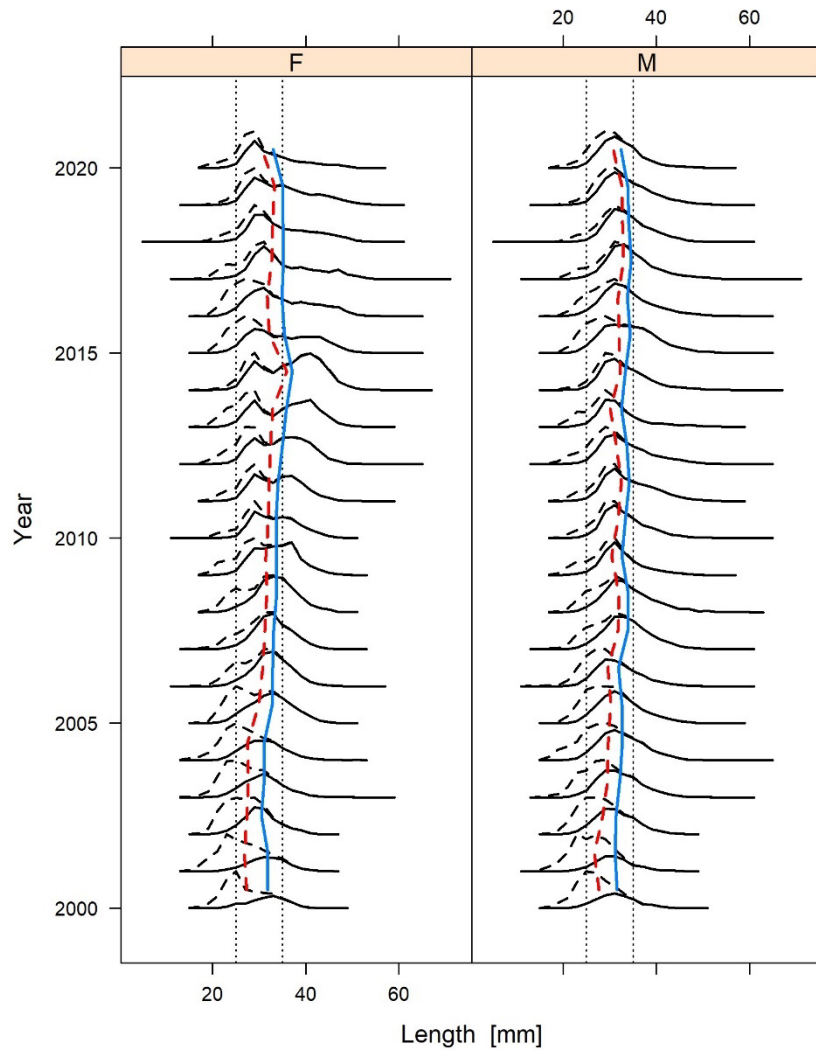
^ Since 2016, discards include BMS landings.

**Summary of the assessment**

**Table 9** Norway lobster in Division 4.b, Functional Unit 6. Assessment summary.

Year	UWTV abundance*	95% Confidence Intervals	Landings	Discards	Dead discards	Mean weight landings	Mean weight discards	Individuals landed	Individuals discarded	Individuals removed	Discard rate	Dead discard rate	Harvest rate
	millions		tonnes	tonnes	tonnes	grammes		millions	millions	millions	% by number	% by number	% by number
2001	1685	67	2574	2393	2034	20.60	9.62	125	249	336	67	57	20
2002	1048	112	1954	795	676	20.01	9.50	98	84	169	46	39	16.1
2003	1085	90	2245	716	608	21.89	9.56	103	75	166	42	36	15.3
2004	1377	101	2153	615	523	23.14	9.22	93	67	150	42	36	10.9
2005	1657	148	3094	715	608	23.58	10.32	131	69	190	35	29	11.5
2006	1244	114	4903	1051	893	22.53	10.58	218	99	302	31	27	24
2007	858	23	2966	432	367	24.95	10.89	119	40	153	25	21	17.8
2008	987	39	1220	166	141	26.63	10.97	46	15	59	25	21	5.9
2009	682	38	2713	461	392	24.45	10.54	111	44	148	28	24	22
2010	785	21	1443	201	171	25.18	11.74	57	17	72	23	19.5	9.2
2011	878	17	2072	246	209	27.05	11.02	77	22	96	23	19.2	10.9
2012	758	13	2460	345	293	27.34	10.16	90	34	119	27	23	15.7
2013	706	18	2982	450	383	27.60	9.79	108	46	147	30	25	21
2014	755	18	2503	199	169	29.93	13.59	84	15	96	14.9	12.7	12.7
2015	565	13	1371	190	162	29.39	9.99	47	19	63	29	25	11.1
2016	697	19	1854	272	231	27.97	10.23	66	27	89	29	24	12.8
2017	902	21	1993	200	170	29.38	10.28	68	19	84	22	18.9	9.4
2018	950	23	1881	195	166	28.14	11.22	67	17	82	21	17.5	8.6
2019	1163	26	4364	453	385	28.07	11.71	155	39	188	19.9	16.9	16.2
2020	1102	24	1912	310	264	24.49	11.72	78	26	101	25	22	9.1
2021	982	22											

\* For Norway lobster greater than 17 mm carapace length.



**Figure 3** Norway lobster in Division 4.b, Functional Unit 6. The dashed lines represent catches while the solid lines represent landings. Annual length–frequency distributions are shown on the horizontal; the bold vertical lines represent mean lengths. Minimum conservation reference size (25 mm) and 35 mm visual reference levels indicated. All lengths are shown in carapace length (mm).



## Sources and references

- EU. 2018. Regulation (EU) 2018/973 of the European Parliament and of the Council of 4 July 2018 establishing a multiannual plan for demersal stocks in the North Sea and the fisheries exploiting those stocks, specifying details of the implementation of the landing obligation in the North Sea and repealing Council Regulations (EC) No 676/2007 and (EC) No 1342/2008. Official Journal of the European Union, L 179: 1–13. <http://data.europa.eu/eli/reg/2018/973/oj>.
- ICES. 2010. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 5–11 May 2010, ICES Headquarters, Copenhagen, Denmark. ICES CM 2010/ACOM:13. 1058 pp. <https://doi.org/10.17895/ices.pub.5335>.
- ICES. 2013. Benchmark Workshop on *Nephrops* Stocks (WKNEPH), 25 February–1 March 2013, Lysekil, Sweden. ICES CM 2013/ACOM:45. 230 pp. <https://doi.org/10.17895/ices.pub.5336>.
- ICES. 2015. EU Request to ICES to provide  $F_{MSY}$  ranges for selected North Sea and Baltic Sea stocks. ICES Advice 2015, Book 6, Section 6.2.3.1, Version 6, 30-6-2016. 11 pp.
- ICES. 2021a. Advice on fishing opportunities. In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. <https://doi.org/10.17895/ices.advice.7720>.
- ICES. 2021b. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports. 3:66.988 pp. <https://doi.org/10.17895/ices.pub.8211>.
- MMO. 2021. Fishing gear requirements and Landing Obligation exemptions 2021. Applicable to Demersal towed gears fishing in UK waters of the North Sea. Document no.: V2, July 2021. Marine Management Organisation. 4 pp.
- Morizur, Y. 1982. Estimation de la mortalité pour quelque stocks de langoustine, *Nephrops norvegicus*. ICES CM 1982/K:10. 19 pp.

[Download the stock assessment data and figures.](#)

*Recommended citation:* ICES. 2021. Norway lobster (*Nephrops norvegicus*) in Division 4.b, Functional Unit 6 (central North Sea, Farn Deeps). In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, nep.fu.6. <https://doi.org/10.17895/ices.advice.7808>.