

Norway lobster (*Nephrops norvegicus*) in Division 6.a, Functional Unit 11 (West of Scotland, North Minch)

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 3853 tonnes.

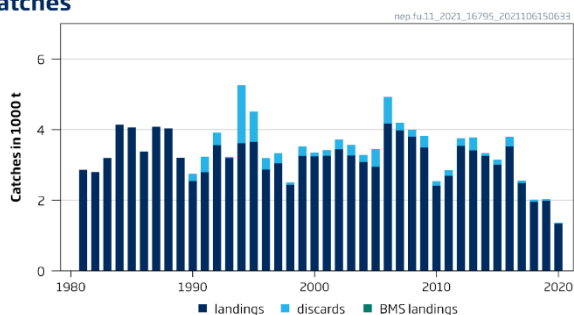
To ensure that the stock in Functional Unit (FU) 11 is exploited sustainably, management should be implemented at the FU level.

ICES notes the existence of a management plan, developed and adopted by one of the relevant management authorities for Subarea 6. ICES considers this plan to be precautionary when implemented at the FU level.

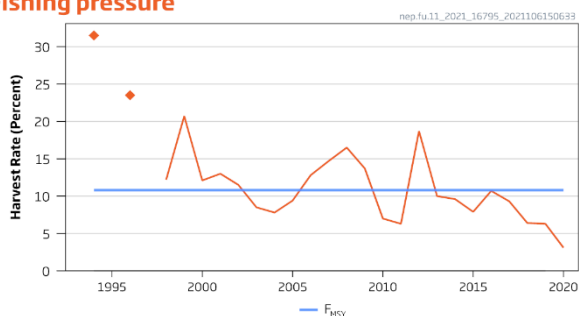
Stock development over time

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

Catches



Fishing pressure



Stock size

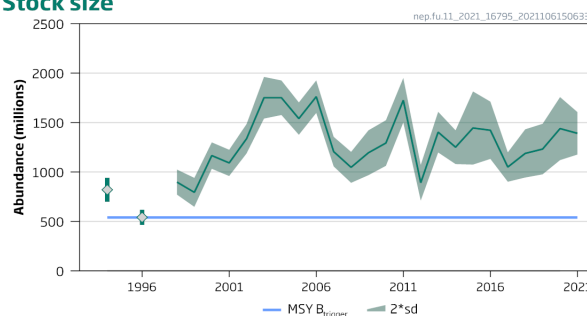


Figure 1 Norway lobster in Division 6.a, Functional Unit 11. Summary of the stock assessment. Catches (discard data are only available from 1990), harvest rate (sum of landings and dead discards in numbers, divided by stock abundance), and stock abundance (underwater TV survey; 2 * standard deviations). Harvest rates before 2006 may be underestimated because of underreporting of landings.

Catch scenarios

Table 1 Norway lobster in Division 6.a, Functional Unit 11. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2022)	1391	UWTV survey 2021; individuals in millions
Mean weight in projected landings	26.17	Average 1999–2020; in grammes
Mean weight in projected discards	11.07	Average 1999–2020; in grammes
Projected discard rate	5.9	Average 2018–2020, percentage by number of the total catch
Discard survival rate	25	Percentage by number of discards

Table 2 Norway lobster in Division 6.a, Functional Unit 11. Annual catch advice and scenarios. All weights are in tonnes. The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the tables.

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	3853	3828	3752	76	25	10.8	-2.5
Other scenarios							
F _{MSY} lower	2997	2977	2918	59	20	8.4	-24
F _{MSY} upper ***	3853	3828	3752	76	25	10.8	-2.5
F ₂₀₂₀	1106	1099	1077	22	7	3.1	-72

* By number

** Advice values for 2022 are relative to the 2021 advice (MAP F_{MSY} advice of 3953 tonnes)

*** F_{MSY} upper = F_{MSY} for this stock.

The decrease in total catch advice is the result of the lower observed stock abundance in 2021.

Basis of the advice

Table 3 Norway lobster in Division 6.a, Functional Unit 11. 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, 2019) 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 _{MSY} ranges in the MAP.

Quality of the assessment

Since 1994, the underwater TV survey (UWTV) has provided abundance estimates by FU with acceptable precision. The UWTV survey for FU 11 does not cover Norway lobster grounds in the inshore waters and sea lochs, waters that are typically fished by smaller vessels (Figure 2). The total area of these grounds is estimated to be less than 5% of the total stock area; the exclusion of these inshore areas from the survey is therefore not considered to impact the quality of the assessment.

The long-term average – rather than a three-year average – is considered more appropriate as input for the mean weight in landings and discards in the calculation of catch scenarios. This is due to interannual variation.

Discard sampling was impacted by the COVID-19 pandemic in 2020, with samples only available from quarter 1. Estimates of discard rates for quarters 2–4 in the assessment were based on mean discard rates across all quarters 2017–2019 (ICES, 2021a). Landings in quarter 2 were not sampled due to COVID-19 restrictions, and samples from quarter 3 were used as replacements. This change is considered to have had minimal impact on the quality of the assessment because discard rates have been consistently low in recent years.

Issues relevant for the advice

During 2016–2020, the EU landing obligation was applied to all catches of Norway lobster fisheries in ICES Subarea 6 with exemptions for high survival. In 2021, this stock is still under a landing obligation, and there are still exemptions in place. Observations from the 2018–2020 fishery indicate that some discarding above the minimum conservation reference size (MCRS) continues (Figure 3). Consequently, ICES is providing advice for 2022 assuming average discard rates as observed over the last three years. This is considered to be the most realistic assumption. 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.

The absolute density observed for FU 11 in the UWTV survey is intermediate compared to other Norway lobster FUs, with an average density of around 0.48 individuals m^{-2} . This suggests that the stock may have a medium productivity capability. Historical harvest rates in this FU have been around $F_{35\%SPR}$ (the fishing mortality that gives 35% spawning potential ratio), and landings have been relatively stable in the last thirty years. For these reasons, $F_{35\%SPR}$ (combined between sexes) is considered to deliver high long-term yield with a low probability of recruitment overfishing and is therefore chosen as a proxy for F_{MSY} .

A single TAC covers the entire ICES Subarea 6. Management should be implemented at the FU level to ensure that fishing opportunities are in line with the scale of the resource for each of the stocks and consistent with an MSY approach.

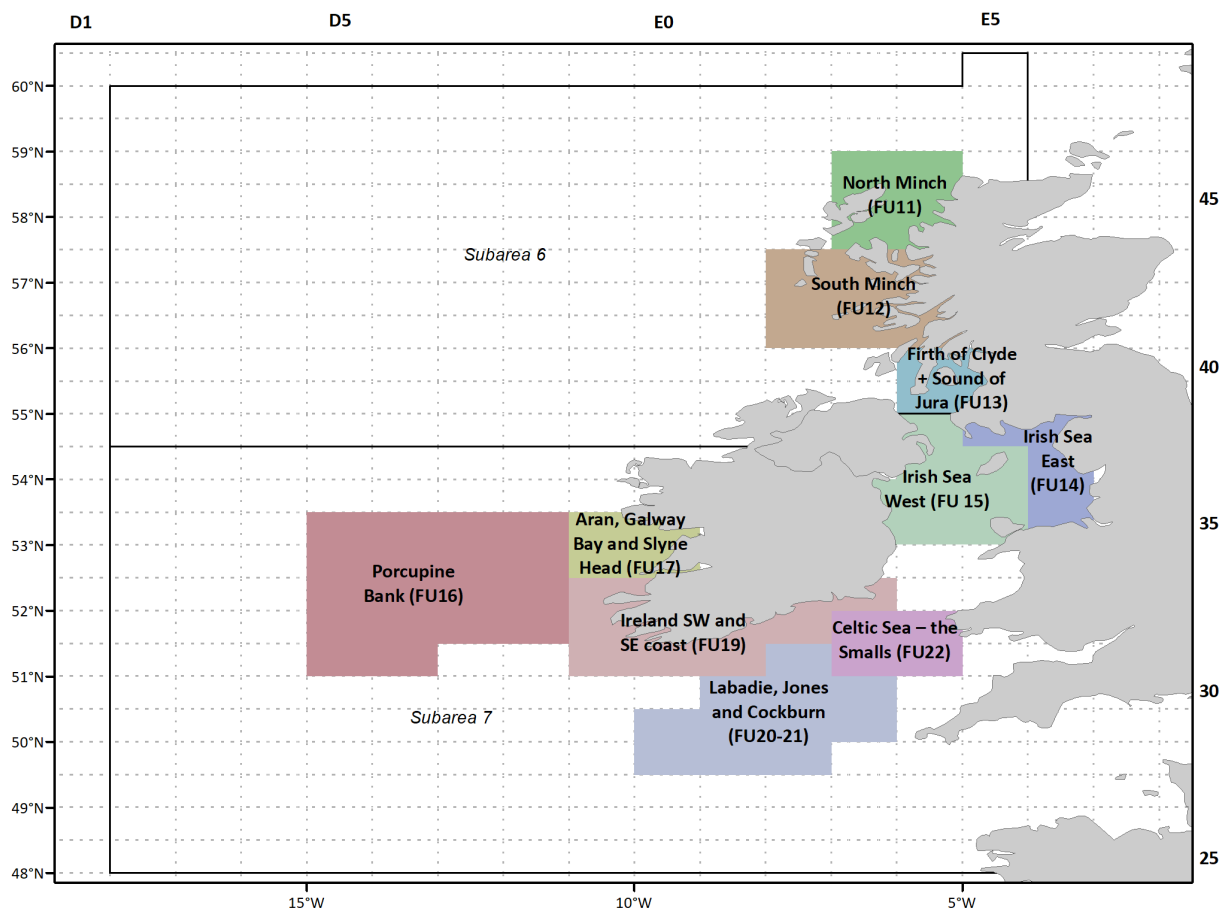


Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 4 Norway lobster in Division 6.a, Functional Unit 11. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	540	Lowest observed abundance estimate from UWTV survey time-series; individuals in millions	ICES (2016)
	F_{MSY}	10.8	Proxy harvest rate equivalent to $F_{35\%SPR}$ combined sexes derived from length-based per recruit analysis; percentage by number	ICES (2016)
Precautionary approach	B_{lim}	Not defined		
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
EU management plan (EU, 2019)	MAP MSY $B_{trigger}$	540	MSY $B_{trigger}$; individuals in millions	ICES (2016)
	MAP B_{lim}	Not defined		
	MAP F_{MSY}	10.8	Harvest rate equivalent to F_{MSY} ; percentage by number	ICES (2016)
	MAP range F_{lower}	8.4–10.8	Harvest rate, consistent with ranges provided by ICES, resulting in no more than 5% reduction in long-term yield compared with MSY; percentage by number	ICES (2016)
	MAP range F_{upper}	10.8–10.8	Harvest rate, $F_{MSY upper}$ value capped at F_{MSY} because it has not been possible to evaluate the probability of $SSB < B_{lim}$; percentage by number	ICES (2016)

Basis of the assessment

Table 5 Norway lobster in Division 6.a, Functional Unit 11. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2021b)
Assessment type	Underwater TV survey (ICES, 2021a)
Input data	One survey index (UWTV-FU11[U6028]); commercial catches (international landings, length frequencies from Scottish catch sampling); fixed maturity parameters from survey data; fixed natural mortalities. Discard survival rate.
Discards and bycatch	Included in the assessment since 1990; data series from the majority of the main fleets covering all landings
Indicators	Size structure, mean size, and sex ratio of catches
Other information	The latest benchmark (based on the UWTV survey) was performed in 2013 (ICES, 2013)
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

History of the advice, catch, and management

Table 6 Norway lobster in Division 6.a, Functional Unit 11. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice	Landings advice	Catch advice*	ICES landings	Total discards**
1989				3205	
1990				2546	199
1991				2793	441
1992	Maintain current effort			3559	353
1993	Maintain current effort			3193	29
1994	Maintain current effort			3614	1637
1995	Maintain current effort			3655	856
1996	Maintain current effort			2872	323
1997	As for 1996			3046	286
1998	Maintain current effort			2441	67
1999	As for 1998			3257	273
2000	Maintain current effort			3247	100
2001	As for 2000			3259	160
2002	Maintain current effort			3440	277
2003	As for 2002			3269	299
2004	Maintain current effort			3082	202
2005	As for 2004			2949	507
2006	No increase in effort			4166	757

Year	ICES advice	Landings advice	Catch advice*	ICES landings	Total discards**
2007	No increase in effort and harvest rate of 15%	3200		3978	214
2008	As for 2007	3200		3799	194
2009	No increase in effort and recent average catch	< 4100		3496	327
2010	Harvest rate no greater than that equivalent to fishing at $F_{0.1}$	< 1000		2413	128
2011	MSY transition scheme	< 3100		2697	154
2012	MSY approach	< 3200		3542	213
2013	MSY approach	< 4200		3413	364
2014	MSY approach	< 3485		3257	77
2015	MSY approach	< 3092		3002	143
2016	MSY approach		≤ 3770***	3529	266
2017	MSY approach		≤ 3814	2491	65
2018	MSY approach		≤ 2819	1956	59
2019	MSY approach		≤ 3270	1979	51
2020	Management plan		3347 (range 2604–3347)	1331	31
2021	Management plan		3953 (range 3075–3953)		
2022	MSY approach		≤ 3853		

* Assuming recent discarding rates from 2017 onwards.

** Dead + surviving discards.

*** Assuming all catches are landed.

History of the catch and landings

Table 7 Norway lobster in Division 6.a, Functional Unit 11. Catch distribution by fleet in 2020 as estimated by ICES.

Catch		Landings			Discards	
99.4% dead	0.6% surviving	Directed <i>Nephrops</i> fishery		Mixed <i>Nephrops</i> /demersal fishery	75% dead	25% surviving
		68.9% trawl	31.1% creels	0% trawl		
1362 tonnes		1331 tonnes			31 tonnes	

Table 8 Norway lobster in Division 6.a, Functional Unit 11. History of ICES estimates of landings (for Scotland by gear) and total discards. All weights are in tonnes.

Year	UK – Scotland					Other UK & Ireland	Total landings	Total discards*
	<i>Nephrops</i> trawl	Other trawl	Creel	Below minimum conservation reference size	Subtotal			
1981	2320	171	370		2861	0	2861	
1982	2323	105	371		2799	0	2799	
1983	2784	96	317		3197	0	3197	
1984	3449	160	534		4143	0	4143	
1985	3235	117	708		4060	0	4060	
1986	2641	203	537		3381	0	3381	
1987	3459	143	482		4084	0	4084	
1988	3450	148	437		4035	0	4035	
1989	2603	112	490		3205	0	3205	
1990	1941	134	471		2546	0	2546	199
1991	2229	126	438		2793	0	2793	441
1992	2978	149	432		3559	0	3559	353
1993	2699	86	408		3193	0	3193	29
1994	2916	246	453		3614	0	3614	1637
1995	2940	183	532		3655	0	3655	856
1996	2354	148	370		2872	0	2872	323
1997	2553	102	391		3046	0	3046	286
1998	2023	68	350		2441	0	2441	67

Year	UK – Scotland					Other UK & Ireland	Total landings	Total discards*
	Nephrops trawl	Other trawl	Creel	Below minimum conservation reference size	Subtotal			
1999	2792	56	409		3257	0	3257	273
2000	2695	28	524		3247	0	3247	100
2001	2649	42	568		3259	0	3259	160
2002	2775	79	586		3440	0	3440	277
2003	2606	45	618		3269	0	3269	299
2004	2391	30	661		3082	0	3082	202
2005	2270	23	656		2949	0	2949	507
2006	3446	23	697		4166	0	4166	757
2007	3361	26	591		3978	0	3978	214
2008	3229	13	557		3799	0	3799	194
2009	2849	34	613		3496	0	3496	327
2010	1783	9	621		2413	0	2413	128
2011	2109	17	571		2697	0	2697	154
2012	2963	12	565		3540	2	3542	213
2013	2356	480	575		3411	2	3413	364
2014	2752	13	490		3255	2	3257	77
2015	2561	23	418		3002	0	3002	143
2016	3039	15	475	0.4**	3529	0	3529	266
2017	2086	30	374	0	2490	1	2491	64
2018	1592	30	331	0	1953	3	1956	59
2019***	1521	31	425	0	1977	2	1979	51
2020***	900	17	414	0	1331	0	1331	31

* Dead + surviving discards.

** Below minimum conservation reference size landings are not rounded; the values shown are the reported ones.

***Landing values are preliminary

Summary of the assessment

Table 9 Norway lobster in Division 6.a, Functional Unit 11. Assessment summary.

Year	UWTV abundance estimate	± 2*Standard deviations	Landings in number	Total discards in number*	Removals in number	Harvest rate (by number)**	Landings	Total discards*	Discard proportion (by number)	Dead discard proportion (by number)	Mean weight in landings	Mean weight in discards
1994	820	122	154	139	258	32	3614	1637	47	40	23.45	11.80
1995	No survey		164	80	225	-	3655	856	33	27	22.24	10.65
1996	541	76	108	26	127	24	2872	323	19.4	15.3	26.68	12.49
1997	No survey		140	26	159	-	3046	286	15.4	12	21.71	11.18
1998	898	127	103	8	110	12.2	2441	67	7.5	5.7	23.65	8.04
1999	794	147	144	28	165	21	3257	273	16.4	12.8	22.70	9.69
2000	1166	134	134	10	142	12.1	3247	100	6.9	5.2	24.19	10.08
2001	1092	133	129	17	141	13	3259	160	11.7	9.1	25.33	9.32
2002	1337	149	133	28	154	11.5	3440	277	17.6	13.8	25.93	9.78
2003	1751	211	126	30	148	8.5	3269	299	19.2	15.2	26.03	10.00
2004	1751	175	122	18	136	7.8	3082	202	13.0	10.1	25.16	11.02
2005	1540	164	107	50	144	9.4	2949	507	32	26	27.65	10.09
2006	1762	165	170	74	225	12.8	4166	757	30	25	24.52	10.27
2007	1206	150	168	12	177	14.7	3978	214	6.5	5.0	23.61	18.1
2008	1047	157	159	19	173	16.5	3799	194	10.5	8.1	23.90	10.36
2009	1195	227	138	35	164	13.7	3496	327	20	16.0	25.42	9.34

Year	UWTV abundance estimate	± 2*Standard deviations	Landings in number	Total discards in number*	Removals in number	Harvest rate (by number)**	Landings	Total discards*	Discard proportion (by number)	Dead discard proportion (by number)	Mean weight in landings	Mean weight in discards
	millions					%	tonnes	%		grammes		
2010	1293	231	82	12	91	7.0	2413	128	12.4	9.6	29.39	10.98
2011	1726	226	96	16	108	6.3	2697	154	14.2	11.0	27.56	9.66
2012	891	181	151	21	167	18.7	3542	213	12.6	9.3	23.43	10.33
2013	1403	206	122	24	140	10.0	3413	364	16.4	12.8	27.52	15.18
2014	1251	171	115	8	121	9.6	3257	77	6.3	4.8	27.96	9.99
2015	1445	370	103	15	114	7.9	3002	143	12.6	9.8	28.74	9.66
2016	1422	290	136	22	152	10.7	3529	266	14.0	10.9	25.76	12.05
2017***	1050	149	95	5	99	9.4	2491	65	5.3	4.0	25.89	12.51
2018***	1188	244	72	5	75	6.4	1956	59	6.6	5.1	27.39	11.46
2019***	1232	256	74	4	78	6.3	1979	51	5.5	4.2	26.59	11.92
2020	1439	319	43	3	45	3.1	1331	31	5.7	4.3	31.06	11.84
2021	1391	215										

* Dead + surviving discards.

** Values prior to 2006 may be underestimates because of the underreporting of landings.

*** Values updated in 2021 due to minor revisions in landings data.

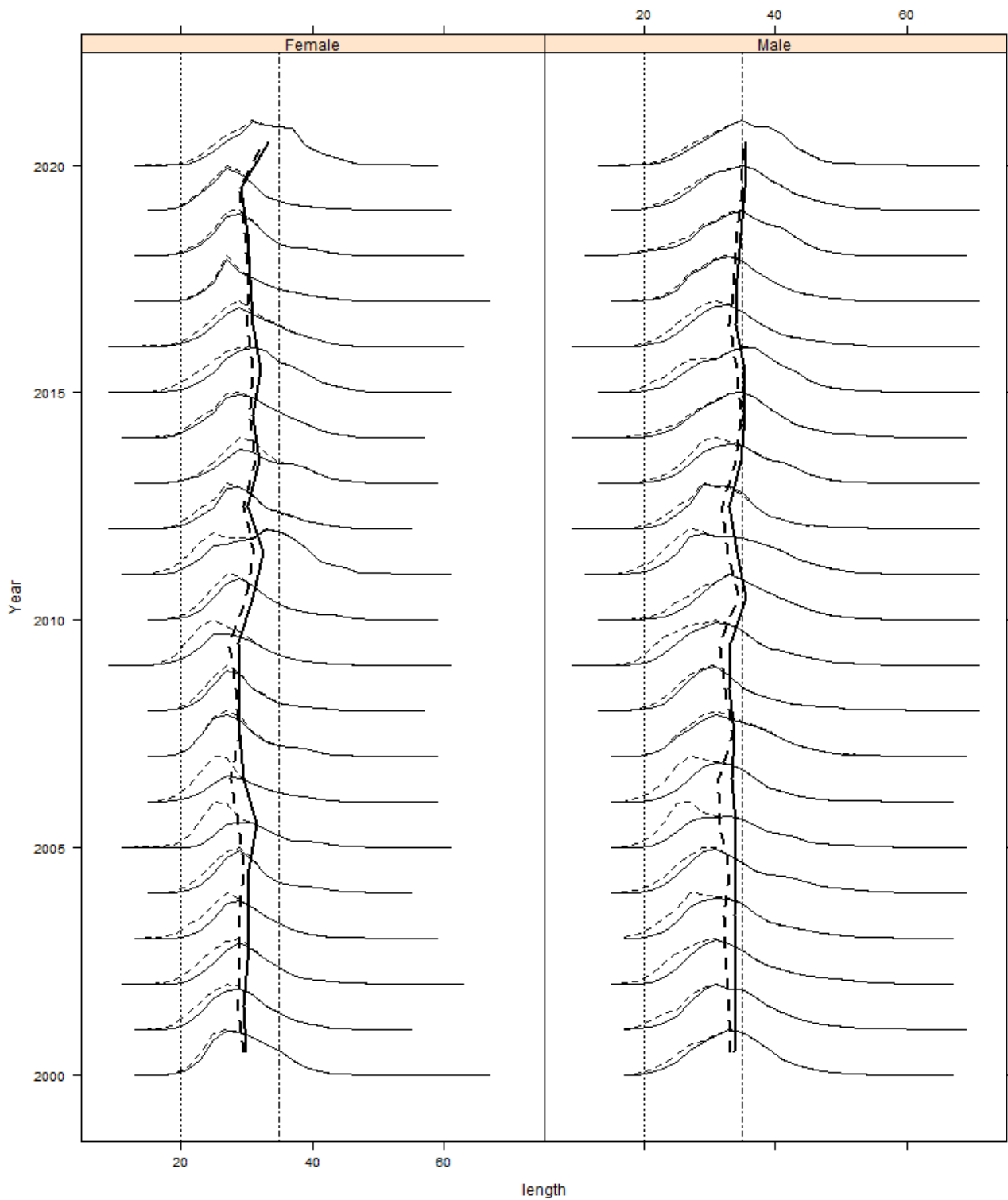


Figure 3 Norway lobster in Division 6.a, Functional Unit 11. The dashed lines represent catches while solid lines represent landings. Annual length–frequency distributions are shown on the horizontal; the vertical bold lines represent mean lengths. Minimum conservation reference size (20 mm) and 35 mm visual reference levels indicated. All lengths are shown in carapace length (mm).

Sources and references

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

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