

Norway lobster (*Nephrops norvegicus*) in Division 7.a, Functional Unit 14 (Irish Sea, East)

ICES advice on fishing opportunities

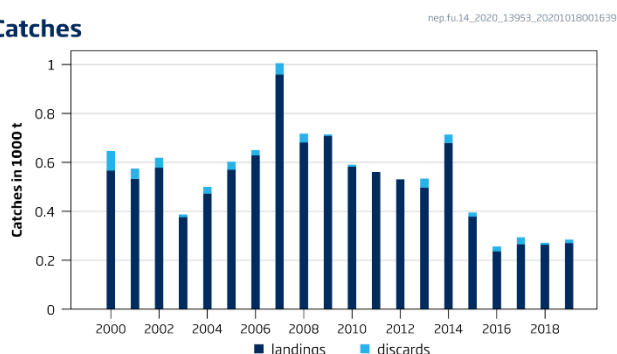
ICES advises that when the EU multiannual plan (MAP) for Western Waters and adjacent waters is applied, catches in 2021 that correspond to the F ranges in the MAP are between 871 tonnes and 1053 tonnes, assuming recent discard rates. The entire range is considered precautionary when applying the ICES advice rule.

To ensure that the stock in Functional Unit 14 is exploited sustainably, management should be implemented at the functional unit (FU) level.

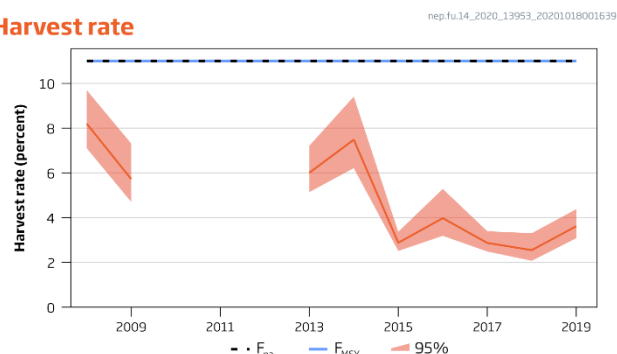
Note: This advice sheet is abbreviated due to the COVID-19 disruption. The previous advice issued for 2020 is attached as Annex 1.

Stock development over time

Catches



Harvest rate



Stock abundance

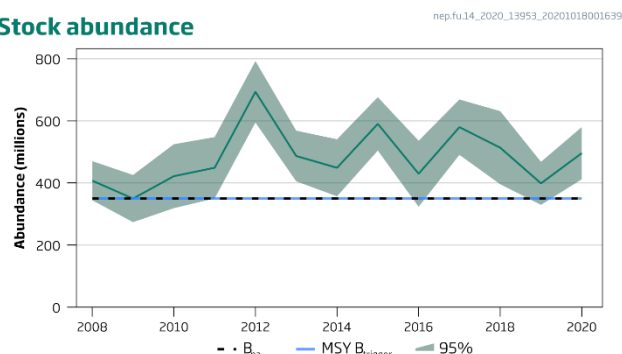


Figure 1 Norway lobster in Division 7.a, Functional Unit 14. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by stock abundance), and stock abundance (underwater TV survey). No reliable harvest rate estimates exist for the period 2010–2012 because of insufficient sampling.

Stock and exploitation status

Table 1 Norway lobster in Division 7.a, Functional Unit 14. State of the stock and the fishery relative to reference points.

		Fishing pressure				Stock size			
		2017	2018	2019		2018	2019	2020	
Maximum sustainable yield	F _{MSY}	✓	✓	✓	Below	MSY B _{trigger}	✓	✓	Above trigger
Precautionary approach	F _{pa} /F _{lim}	✓	✓	✓	Below possible reference points	B _{pa} /B _{lim}	✓	✓	Above possible reference points
Management plan	F _{MGT}	✓	✓	✓	Below the range	B _{MGT}	✓	✓	Above trigger

Catch scenarios

Table 2 Norway lobster in Division 7.a, Functional Unit 14. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2021)	496	UWTV survey 2020; number of individuals in millions
Mean weight in projected landings	20.43	Average 2017–2019; in grammes
Mean weight in projected discards	9.23	Average 2017–2019; in grammes
Projected discards	12.27	Average 2017–2019; percentage by number
Discard survival *	10	Percentage by number
Dead projected discards	11.18	Average 2017–2019; percentage by number

* Only applied in scenarios where discarding is allowed.

Table 3 Norway lobster in Division 7.a, Functional Unit 14. 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 table.

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							
EU MAP \wedge : F_{MSY}	1053	1047	991	56	6	11.00	35
F= MAP F_{MSY} lower	871	866	819	47	5	9.1	35
F = MAP F_{MSY} upper ***	1053	1047	991	56	6	11.0	35
Other scenarios							
MSY approach	1053	1047	991	56	6	11.0	35
F ₂₀₁₉	347	345	326	19	2	3.6	-56

Catch scenarios assuming zero discards

Basis	Total catch	Projected landings	Projected discards ^^	Harvest rate *	% advice change **
	PL + PD	PL	PD	for PL + PD	
ICES advice basis					
EU MAP ^: F _{MSY}	1040	978	62	11.0	34
F= MAP F _{MSY} lower	861	809	51	9.1	34
F = MAP F _{MSY} upper ***	1040	978	62	11.0	34
Other scenarios					
MSY approach	1040	978	62	11.0	34
F ₂₀₁₉	342	322	20	3.6	-56

* By number.

** Advice basis values for 2021 are relative to the 2020 advice values (MAP advice of 779, 644, and 779 tonnes, respectively); other option values are relative to F_{MSY} .

*** $F_{MSY \text{ upper}} = F_{MSY}$ for this stock.

\wedge EU multiannual plan (MAP) for the Western Waters and adjacent waters (EU, 2019).

$\wedge\wedge$ Represents the amount that would normally be discarded.

The advice for 2021 is higher than that for 2020, because of a higher observed stock abundance.

History of the advice, catch, and management

Table 4 Norway lobster in Division 7.a, Functional Unit 14. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards *
1989					400	
1990					560	
1991					750	
1992				8900	430	
1993				9400	520	
1994				9400	450	
1995				9400	580	
1996				9400	480	
1997				9400	570	
1998				9400	390	
1999				9400	620	
2000				9400	567	80
2001				9400	532	42
2002	Set TAC in line with 1995–1999 landings			9550	577	42
2003	Set TAC in line with 1995–1999 landings			9550	377	11
2004	Set TAC in line with 1995–1999 landings			9550	472	28
2005	Set TAC in line with 1995–1999 landings			9550	570	33
2006	No increase in effort			9550	628	22
2007	No increase in effort			-	959	47
2008	As for 2007			-	681	37
2009	No increase in effort and landings (2007)	< 1000		-	708	6
2010	No new advice, same as for 2009	< 1000		-	582	NA
2011	Transition towards the ICES MSY framework	< 680		-	561	NA
2012	MSY approach	< 960		-	530	NA
2013	MSY approach	< 880		-	495	39
2014	MSY approach	< 951		-	679	32
2015	MSY approach	< 662		-	378	18
2016	MSY approach		≤ 1272 **	-	237	20
2017	MSY approach		≤ 995 ***	-	265	29
2018	MSY approach		≤ 1281 ***		263	9
2019	MSY approach		≤ 922 ***		270	15
2020	Management plan		779 (range 644–779) ***			
2021	Management plan		1053 (range 871–1053) ***			

* Dead + surviving discards.

** Assuming all catches are landed.

*** Assuming recent discarding rates.

NA = not available.

Summary of the assessment

Table 5 Norway lobster in Division 7.a, Functional Unit 14. Assessment summary.

Year	UWTV abundance estimate	95% confidence interval	Landings in numbers	Total discards in numbers *	Removals in numbers	Harvest rate (by numbers)	Landings	Discards	Mean weight in landings	Mean weight in discards	Discard rate (by numbers)	Dead discard rate (by numbers)
			millions			%	tonnes		grammes		%	
2000			30	11	40		567	80	19.1	7.5	26.4	24.4
2001			26	5	31		532	42	20.9	8.0	17.0	15.5
2002			26	5	30		577	42	22.4	9.0	15.4	14.1
2003			13	1	14		377	11	29.4	7.6	9.9	9.0
2004			22	4	25		472	28	21.9	7.6	14.8	13.5
2005			27	4	30		570	33	21.5	8.4	13.0	11.8
2006			25	3	28		628	22	25.1	8.0	10.1	9.2
2007			40	6	46		959	47	23.9	7.3	13.8	12.5
2008	408	63	30	4	34	8.2	681	37	22.9	8.5	12.7	11.6
2009	350	76	19	1	20	5.7	708	6	36.5	8.6	3.7	3.3
2010 **	422	103					582					
2011 **	449	99					561					
2012 **	694	99					530					
2013	487	82	25	5	30	6.0	495	39	19.9	7.9	16.4	15.0
2014	449	92	30	4	34	7.5	679	32	22.4	9.6	10.8	9.8
2015	591	86	15	2	17	2.9	378	18	25.2	7.8	13.0	11.9
2016	433	106	15	2	17	4.0	237	20	15.8	8.4	13.6	12.4
2017	580	89	14	3	17	2.9	265	29	19.0	9.5	17.6	16.2
2018	514	118	12	1	13	2.6	263	9	21.4	9.8	7.0	6.3
2019	399	69	13	2	14	3.6	270	15	21.0	8.4	12.2	11.1
2020	496	84										

* Dead + surviving discards.

** No estimates for 2010–2012 because of insufficient sampling.

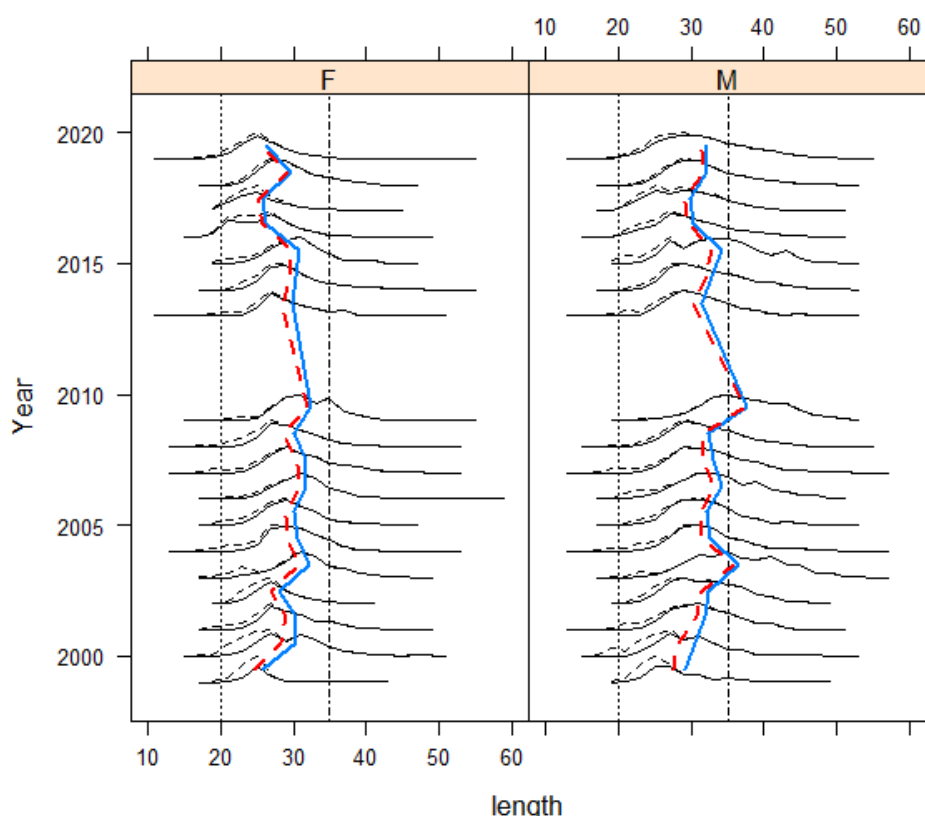


Figure 2 Norway lobster in Division 7.a, Functional Unit 14. Catch length–frequency distribution and mean size in catches (red dotted) and landings (solid blue). Vertical lines indicate the minimum conservation reference size (20 mm) and the 35 mm visual reference level.

Sources and references

EU. 2019. Regulation (EU) 2019/472 of the European Parliament and of the Council of 19 March 2019 establishing a multiannual plan for stocks fished in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulations (EU) 2016/1139 and (EU) 2018/973, and repealing Council Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007 and (EC) No 1300/2008. Official Journal of the European Union, L 83: 1–17. <http://data.europa.eu/eli/reg/2019/472/oj>.

ICES. 2020. Working Group for the Celtic Seas Ecoregion (WGCSE). ICES Scientific Reports, 2:40. 924 pp. <http://doi.org/10.17895/ices.pub.5978>.

Recommended citation: ICES. 2020. Norway lobster (*Nephrops norvegicus*) in Division 7.a, Functional Unit 14 (Irish Sea, East). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, nep.fu.14. <https://doi.org/10.17895/ices.advice.5865>.

Annex 1

ICES Advice on fishing opportunities, catch, and effort
Celtic Seas ecoregion
Published 31 October 2019

Norway lobster (*Nephrops norvegicus*) in Division 7.a, Functional Unit 14 (Irish Sea, East)

ICES advice on fishing opportunities

ICES advises that when the EU multiannual plan (MAP) for Western waters and adjacent waters is applied, catches in 2020 that correspond to the F ranges in the MAP are between 644 tonnes and 779 tonnes. The entire range is considered precautionary when applying the ICES advice rule.

To ensure that the stock in Functional Unit 14 is exploited sustainably, management should be implemented at the functional unit (FU) level.

Stock development over time

The harvest rate has been well below F_{MSY} for more than a decade and has generally declined since 2014. The stock abundance has been fluctuating above $MSY B_{trigger}$ since 2010.

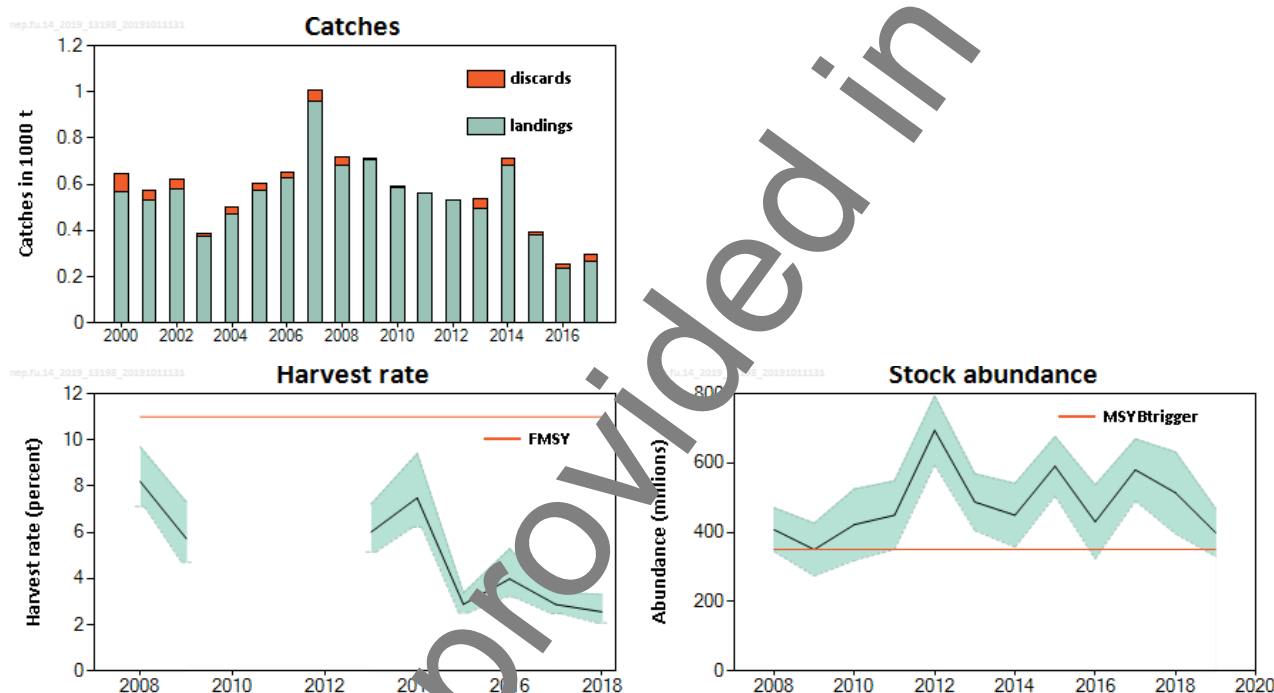


Figure 1 Norway lobster in Division 7.a, Functional Unit 14. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by total abundance), and stock abundance (underwater TV survey, in millions; 95% confidence intervals). No reliable harvest rate estimates exist for the period 2010–2012 because of insufficient sampling. Orange lines represent the F_{MSY} harvest rate and $MSY B_{trigger}$.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} , and that spawning stock size is above $MSY B_{trigger}$.

Table 1 Norway lobster in Division 7.a, Functional Unit 14. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size		
		2016	2017	2018		2017	2018	2019
Maximum sustainable yield	F_{MSY}	✓	✓	✓	Below	$MSY B_{trigger}$	✓	✓
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓	Below possible reference points	B_{pa}, B_{lim}	✓	✓
Management plan	F_{MGT}	✓	✓	✓	Below	B_{MGT}	✓	✓

Catch scenarios

Table 2 Norway lobster in Division 7.a, Functional Unit 14. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2020)	399 million	UWTV survey 2019 (number of individuals)
Mean weight in wanted catch	18.72 grammes	Average 2016–2018
Mean weight in unwanted catch	9.22 grammes	Average 2016–2018
Unwanted catch	12.71%	Average 2016–2018 (proportion by number)
Discards survival	10%	Proportion by number
Dead unwanted catch	11.59%	Average 2016–2018 (proportion by number)

Table 3 Norway lobster in Division 7.a, Functional Unit 14. 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 table.

Catch scenarios assuming recent discard rates

Catch scenarios assuming recent discard rates							
Basis	Total catch	Dead removals	Wanted catch	Dead unwanted catch	Surviving unwanted catch	Harvest rate * %	% advice change **
	WC + DUC + SUC	WC + DUC	WC	DUC	SUC	for WC + DUC	
ICES advice basis							
EU MAP ^: F _{MSY}	779	773	727		5	11.0	-15.6
F= MAP F _{MSY lower}	644	640	601	39	4	9.1	-30
F = MAP F _{MSY upper} ***	779	773	727	17	5	11.0	-14.6
Other options							
MSY approach	779	773	727	17	5	11.0	-14.6
F ₂₀₁₈	181	179	168	11	1	2.6	-80

Catch scenarios assuming zero discards

Basis	Total catch	Wanted catch	Unwanted catch	Harvest rate *	% advice change **
	WC + UC	WC	UC	for WC + UC	
ICES advice basis					
EU MAP [^] : F _{MSY}	769	717	51	11.0	-16.6
F= MAP F _{MSY lower}	636	593	43	9.1	-31
F = MAP F _{MSY upper} ***	769	717	51	11.0	-16.6
Other options					
MSY approach	769	717	51	11.0	-16.6
F ₂₀₁₈	178	166	12	2.6	-81

* By number.

** Advice value 2020 relative to the advice value 2019 (922 tonnes).

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

[^] EU multiannual plan (MAP) for the Western waters and adjacent waters (EU, 2019).

The advice for 2020 is lower than that for 2019, because of a lower estimated stock abundance.

Basis of the advice

Table 4 Norway lobster in Division 7.a, Functional Unit 14. The basis of the advice.

Advice basis	The EU multiannual plan (MAP) for stocks in the Western waters and adjacent waters (EU, 2019)
Management plan	<p>The EU multiannual plan (MAP) for stocks in the Western waters and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities, depending on stock status and making use of the F_{MSY} range for the stock.</p> <p>In accordance with the MAP, catches higher than those corresponding to F_{MSY} can only be taken providing SSB is greater than $MSY B_{trigger}$, and one of the following conditions is met:</p> <ul style="list-style-type: none"> a) if it is necessary for the achievement of objectives of mixed fisheries; b) if it is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics; c) in order to limit variations in fishing opportunities between consecutive years to not more than 20%. <p>ICES considers that the F_{MSY} range for this stock used in the MAP is precautionary.</p> <p>Full details of the plan are described in EU (2019).</p>

Quality of the assessment

Since 2008 the underwater television survey (UWTV) has provided abundance estimates for FU 14 (Figure 2) with acceptable precision. Catch sampling was inadequate during 2011–2012 while harvest rates and mean weight estimates were unreliable in that period. From 2013 onwards sampling information has improved, but remains poor.

In 2018 there was a lack of individuals of 20–25 mm carapace length in the biological sampling.

Issues relevant for the advice

From 2016 the EU landing obligation was applied to all catches of Norway lobster fisheries in ICES Subarea 7, with several exemptions. Observations from the 2016–2018 fishery indicate that discarding above the minimum conservation reference size (MCRS) continues (Figure 3). Consequently, ICES is providing advice for 2020 assuming average discard rates as observed over the last three years. This is considered to be the most realistic assumption.

The survival rate of discards of 10% assumed for FU14 and FU15 is lower than that for other stocks because fishing practices are similar in these two FUs and both are largely spring/summer fisheries where animals discarded are exposed to warmer temperatures.

The density of *Nephrops* in FU 14 is considered medium (~ 0.47 burrow m^{-2} , average 2011–2019) compared with other FUs. Some biological parameters are poorly known, and the sampling levels in the recent past have been low and variable. Harvest rate estimates have been below $F_{0.1}$ for combined sexes. Based on these considerations, ICES considers that $F_{0.1}$ is a suitable F_{MSY} proxy for this stock (ICES, 2015).

A single TAC covers the entire ICES Subarea 7. Management should be implemented at the functional unit level, to ensure that fishing opportunities are in line with the scale of the resource in each of the stocks as well as the corresponding maximum sustainable yield (MSY) approach.

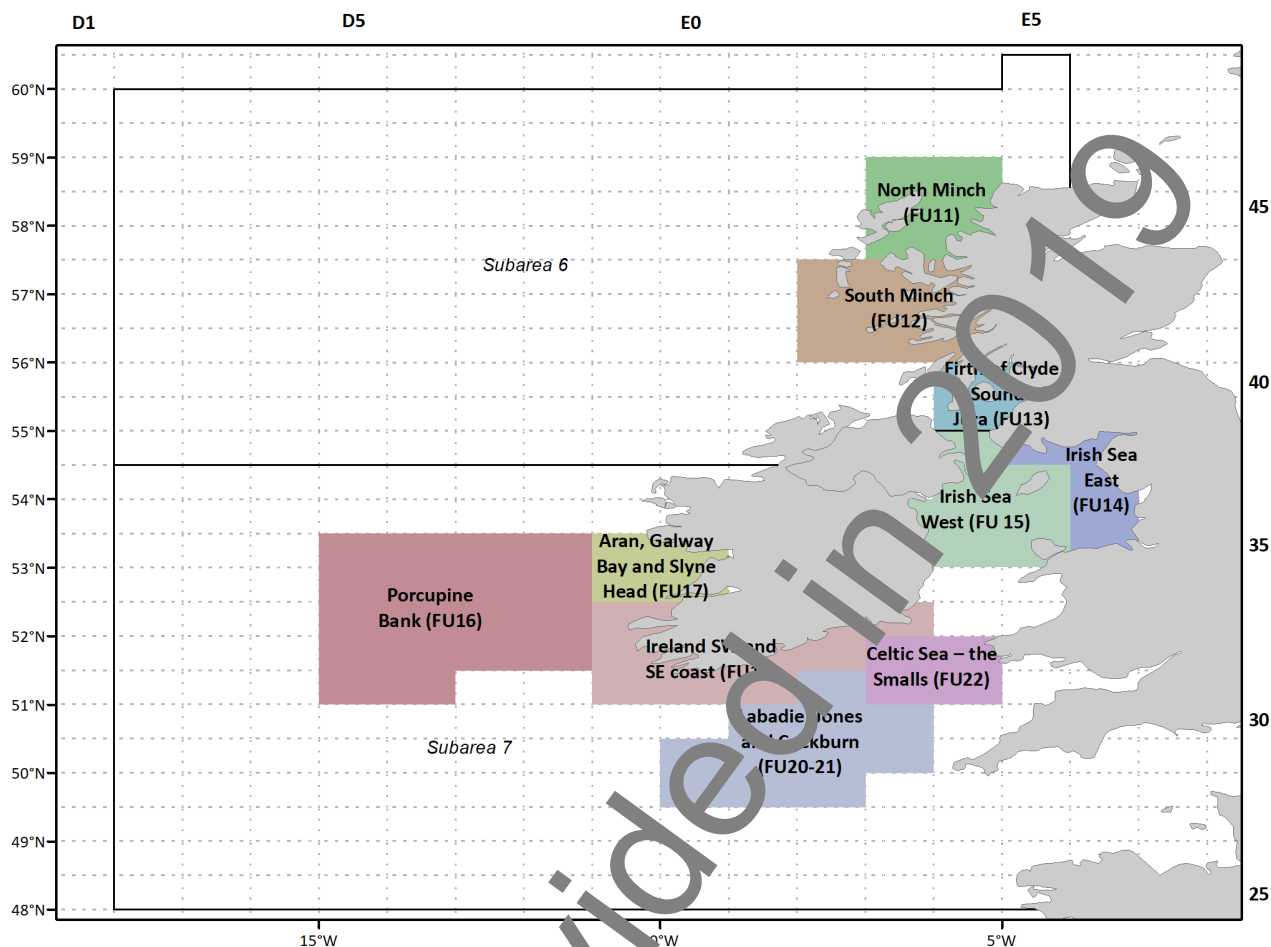


Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 5 Norway lobster in Division 7.a, Functional Unit 14. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	350 million individuals	The lowest observed abundance estimate from the UWTV survey time-series.	ICES (2016)
	F_{MSY}	11.0% harvest rate	F_{MSY} proxy equivalent to $F_{0.1}$ for combined sexes, derived from a length-based per recruit analysis	ICES (2016)
Precautionary approach	B_{lim}			
	B_{pa}			
	F_{lim}			
	F_{pa}			
Management plan	MAP MSY $B_{trigger}$	350 million individuals	MSY $B_{trigger}$	EU (2019)
	MAP B_{lim}	Not defined		
	MAP F_{MSY}	11.0% harvest rate	F_{MSY}	EU (2019)
	MAP range F_{lower}	9.1–11.0% harvest rate	Consistent with ranges provided by ICES (2016), resulting in a more than 5% reduction in long-term yield compared with MSY.	EU (2019); ICES (2016)
	MAP range F_{upper}	11.0–11.0% harvest rate	F_{MSY} upper value capped at F_{MSY} because it has not been possible to evaluate the probability of SSB < B_{lim} (ICES, 2016).	EU (2019); ICES (2016)

Basis of the assessment

Table 6 Norway lobster in Division 7.a, Functional Unit 14. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018)
Assessment type	Underwater TV survey (ICES, 2015).
Input data	One survey index (FU14 UWTV); commercial catches (international landings); length frequencies from the fishery; maturity data; natural mortalities from Brander and Bennett (1986, 1989); discard survival rate.
Discards and bycatch	Included in the assessment; data series from the majority of the fleets/main fleets.
Indicators	Sex ratio, length frequencies.
Other information	The latest benchmark was performed in 2015 (IBPNeph; ICES, 2015).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

No additional information is available for this stock.

History of the advice, catch, and management

Table 7 Norway lobster in Division 7.a, Functional Unit 14. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards *
1989					400	
1990					560	
1991					750	
1992				8900	400	
1993				9400	520	
1994				9400	450	
1995				9400	580	
1996				9400	480	
1997				9400	570	
1998				9400	390	
1999				9400	620	
2000				9400	567	80
2001				9400	532	42
2002	Set TAC in line with 1995–99 landings			9550	577	42
2003	Set TAC in line with 1995–99 landings			9550	377	11
2004	Set TAC in line with 1995–99 landings			9550	472	28
2005	Set TAC in line with 1995–99 landings			9550	570	33
2006	No increase in effort			9550	628	22
2007	No increase in effort			-	959	47
2008	As for 2007			-	681	37
2009	No increase in effort and landings (2007)	< 1000		-	708	6
2010	No new advice, same as for 2009	< 1000		-	582	NA
2011	Transition towards the ICES MSY framework	< 80		-	561	NA
2012	MSY approach	< 960		-	530	NA
2013	MSY approach	< 880		-	495	39
2014	MSY approach	< 951		-	679	32
2015	MSY approach	< 662		-	378	18
2016	MSY approach		≤ 1272**	-	237	20
2017	MSY approach		≤ 995***	-	265	29
2018	MSY approach		≤ 1281***		263	9
2019	MSY approach		≤ 922***			
2020	Management plan		779 (range 644–779)***			

* Dead + surviving discards.

** Assuming all catches are landed.

*** Assuming recent discarding rates.

NA = not available.

History of the catch and landings

Table 8 Norway lobster in Division 7.a, Functional Unit 14. Catch distribution by fleet in 2018 as estimated by ICES.

Catch		Landings	Discards	
99.7% dead	0.3% surviving	Taken almost entirely in the <i>Nephrops</i> directed trawl fisheries (70–99 mm)	90% dead	10% surviving
272 t		263 t	9 t	

Table 9 Norway lobster in Division 7.a, Functional Unit 14. History of landings and discards; ICES estimated landings are presented for each country. All weights are in tonnes. There was insufficient sampling for 2010–2012, with no reliable discard estimates for these years.

Year	Republic of Ireland	UK	Other countries	Total landings	Discards *
2000	114	451	2	567	80
2001	26	506	0	532	42
2002	203	373	1	577	42
2003	69	306	1	377	11
2004	62	409	1	472	28
2005	34	536	0	570	33
2006	34	594	0	628	22
2007	86	873	0	959	47
2008	29	652	0	681	37
2009	16	692	0	708	6
2010	45	538	0	582	NA
2011	31	530	0	561	NA
2012	53	478	0	530	NA
2013	35	460	0	495	39
2014	31	648	0	679	32
2015	88	290	0	378	18
2016	21	216	0	237	20
2017	7	258	0	265	29
2018	5	258		263	9

* Dead + surviving discards.

NA = not available.

Summary of the assessment

Table 10 Norway lobster in Division 7.a, Functional Unit 14. Assessment summary.

Year	UWTV abundance estimate	95% Confidence Interval	Landings in numbers	Total discards in numbers*	Removals in numbers	Harvest rate (by numbers)	Landings	Discards	Mean weight in landings	Mean weight in discards	Discard rate (by numbers)	Dead discard rate (by numbers)
			millions			%	tonnes		grammes		%	
2000			30	11	40		567	80	19.1	7.5	26.4	24.4
2001			26	5	31		532	42	20.9	8.0	17.0	15.5
2002			26	5	30		577	42	22.4	9.0	15.4	14.1
2003			13	1	14		377	11	29.4	7.6	9.9	9.0
2004			22	4	25		472	28	21.9	7.6	14.8	13.5
2005			27	4	30		570	33	21.5	8.4	13.0	11.8
2006			25	3	28		628	22	25.1	8.0	10.1	9.2
2007			27	6	46		959	47	23.9	7.3	13.8	12.5
2008	408	63	30	4	34	8.2	681	37	22.9	8.5	12.7	11.6
2009	350	76	19	1	20	5.7	708	6	36.5	8.6	3.7	3.3
2010**	422	103					582					
2011**	449	99					561					
2012**	694	95					530					
2013	487	82	25	5	30	6.0	495	39	19.9	7.9	16.4	15.0
2014	449	92	30	4	34	7.5	679	32	22.4	9.6	10.8	9.8
2015	551	86	15	2	17	2.9	378	18	25.2	7.8	13.0	11.9
2016	433	106	15	2	17	4.0	237	20	15.8	8.4	13.6	12.4
2017	350	89	14	3	17	2.9	265	29	19.0	9.5	18.0	16.5
2018	514	118	12	1	13	2.6	263	9	21.4	9.8	7.0	6.3
2019	399	69										

* Dead + surviving discards.

** No estimates for 2010–2012 because of insufficient sampling.

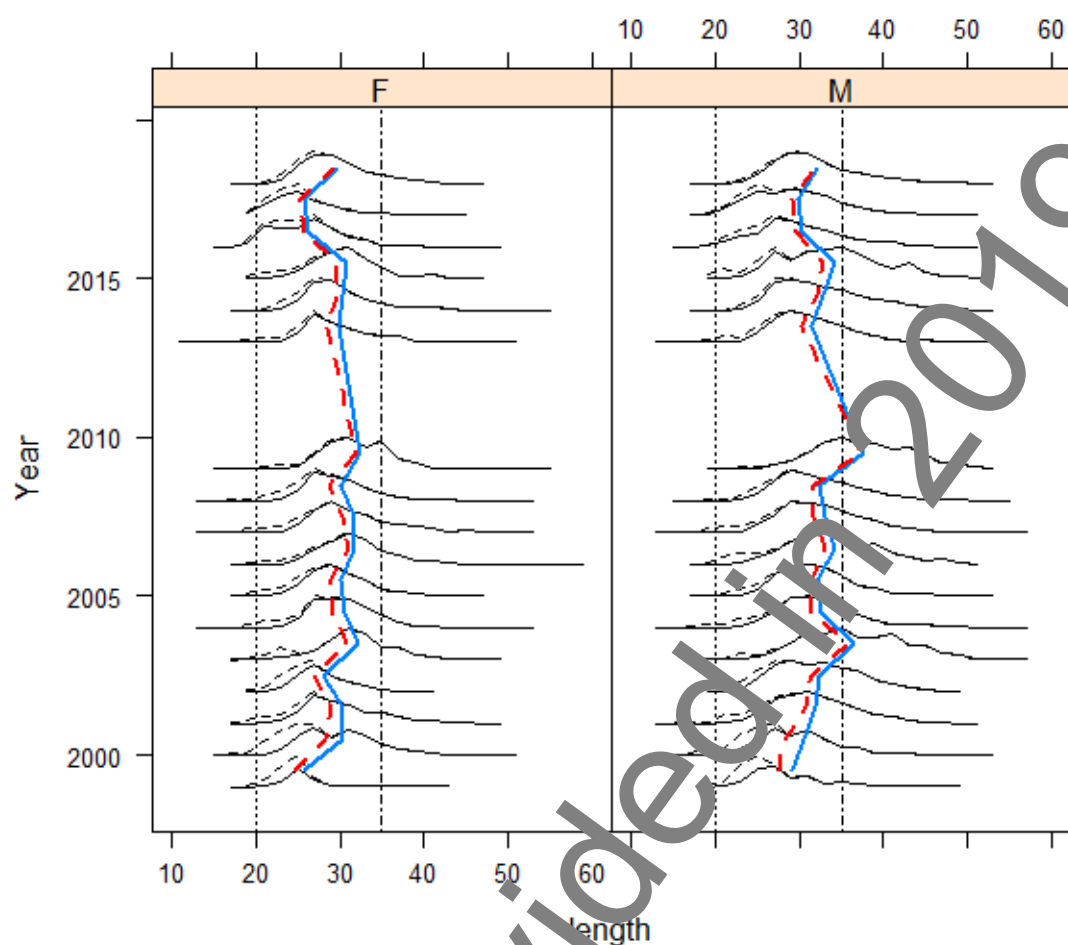


Figure 3 Norway lobster in Division 7.a, Functional Unit 14. Catch length–frequency distribution and mean size in catches (red dotted) and landings (solid blue). Vertical lines indicate the minimum conservation reference size (20 mm) and the 35 mm visual reference level.

Sources and references

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