Norway lobster (*Nephrops norvegicus*) in divisions 7.g and 7.h, functional units 20 and 21 (Celtic Sea)

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 1682 tonnes and 1710 tonnes, assuming recent discard rates. The entire range is considered precautionary when applying the ICES advice rule.

To ensure that the stock in functional units 20 and 21 is exploited sustainably, management should be implemented at the level of the combined functional units 20 and 21.

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

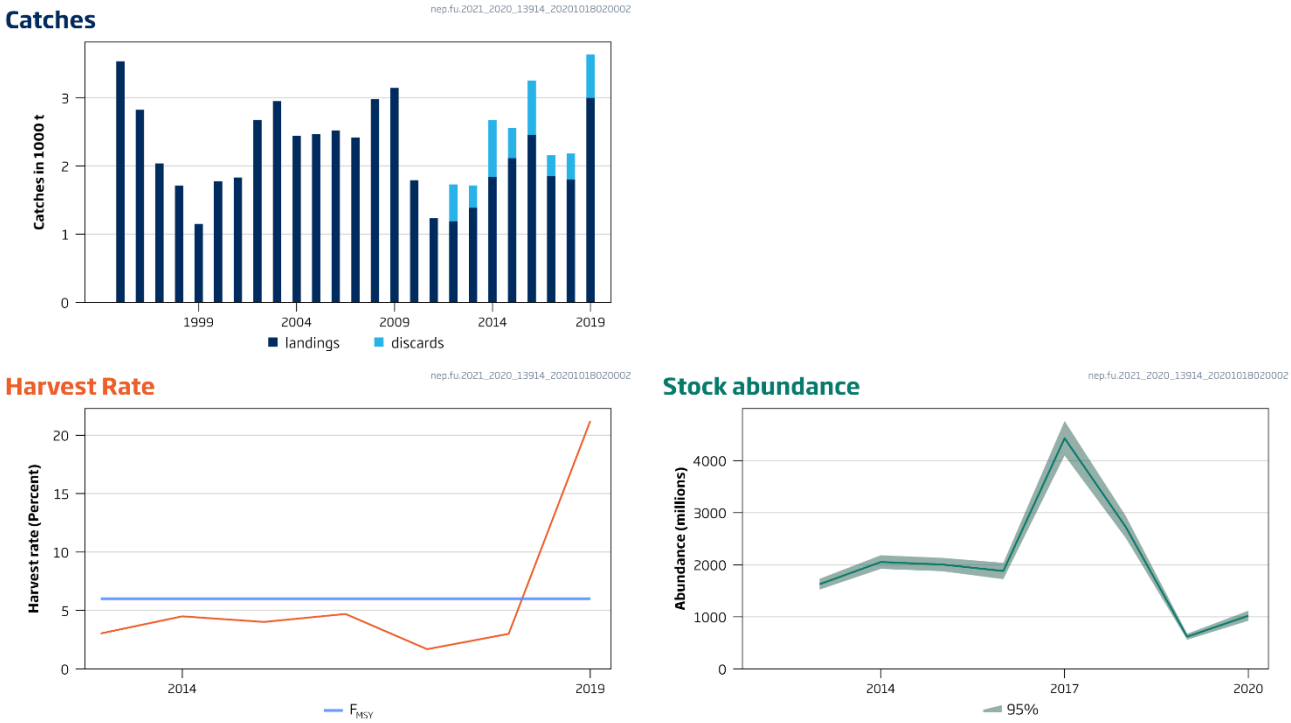

Figure 1 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Summary of the stock assessment. Catches (discard data only available from 2012), harvest rate (sum of landings and dead discards in numbers divided by stock abundance), and stock abundance (underwater TV survey).

Stock and exploitation status

Table 1 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. 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}	✓	✓	✗	Above	MSY $B_{trigger}$	?	?	?	Undefined
Precautionary approach	F_{pa},F_{lim}	✓	✓	?	Undefined	B_{pa},B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	✓	✓	✗	Above the range	B_{MGT}	?	?	?	Undefined
Qualitative evaluation	-	–	–	–		-	↘	↘	↗	Increasing

Catch scenarios

Table 2 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. The basis for the catch advice and scenarios.

Variable	Value	Notes
Stock abundance (2021)	1020	UWTV survey 2020; numbers of individuals in millions
Mean weight in projected landings	29.6	Average 2007–2019; in grammes
Mean weight in projected discards	16.2	Average 2007–2019; in grammes
Projected discards	26.4	Average 2017–2019; percentage by number
Discard survival *	25	Percentage by number
Projected dead discards	21.2	Average 2017–2019; percentage by number

* Only applied in scenarios where discarding is allowed.

Table 3 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. 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 ^ : F_{MSY}	1710	1640	1430	211	70	6.0	49
F = MAP $F_{MSY\ lower}$	1682	1613	1406	207	69	5.9	49
F = MAP $F_{MSY\ upper}$ ***	1710	1640	1430	211	70	6.0	49
Other scenarios							
MSY approach	1710	1640	1430	211	70	6.0	49
F_{2019}	6048	5800	5056	745	248	21.2	426

Catch scenarios assuming zero discards

Basis	Total catch	Projected landings	Projected discards ^^	Harvest rate * %	% advice change **
	PL + PD	PL	PD	for PL + PDD	
ICES advice basis					
EU MAP ^ : F_{MSY}	1598	1336	262	6.0	39
F = MAP $F_{MSY\ lower}$	1571	1313	258	5.9	39
F = MAP $F_{MSY\ upper}$ ***	1598	1336	262	6.0	39
Other scenarios					
MSY approach	1598	1336	262	6.0	39
F_{2019}	5650	4723	927	21.2	391

^ EU multiannual plan (MAP) for Western Waters (EU, 2019).
^^ Represents the amount that would normally be discarded.
* By number.
** Advice value for 2021 relative to the the 2020 values (MAP advice value of 1150, 1131, and 1150 tonnes, respectively); other values are relative to F_{MSY}.
*** $F_{MSY\ upper}$ = F_{MSY} for this stock.

The increase in total catch advice is the result of the increase in the observed stock abundance in 2020.

History of the advice, catch, and management

Table 4 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice *	Landings advice	Catch advice	ICES landings	ICES discards **
1992		~ 3800			
1993		3800			
1994		3800			
1995		3800		3536	
1996		3800		2822	
1997		3800		2038	
1998		3800		1713	
1999		3800		1152	
2000		3800		1778	
2001		3800		1833	
2002		3800		2674	
2003		3800		2953	
2004	Adjust TAC in line with landings of most recent 10 years	4600		2443	
2005	Adjust TAC in line with landings of most recent 10 years	4600		2469	
2006	Recent average landings 2000–2002	4600		2523	
2007	No increase in effort	-		2419	
2008	No increase in effort	< 5300		2980	
2009	No increase in effort	< 5300		3145	
2010	No new advice, same as for 2009	< 5300		1793	
2011	See scenarios; MSY reduce catch or PA < 5.3	-		1237	
2012	Reduce catch	-		1189	542
2013	Average landings (last 10 years)	< 2500		1387	327
2014	No new advice, same as for 2013	< 2500		1837	834
2015	Same as for 2013	< 2500		2116	442
2016	Precautionary approach (harvest rate consistent with previous advice)		≤ 3045 ***	2453	801
2017	MSY approach		≤ 3552 ^	1849	306
2018	MSY approach		≤ 8673 ^	1803	381
2019	MSY approach		≤ 5320 ^	2999	637
2020	Management Plan		1150 (range 1131–1150) ^		
2021	Management Plan		1710 (range 1682–1710) ^		

* Advice prior to 2013 applies to functional units 20–22.
** Dead + surviving discards.
*** Assuming all catches are landed.
^ Assuming recent discard rates.

Summary of the assessment

Table 5 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Assessment summary.

Year	UWTV abundance estimate	95% confidence interval	Landings in number	Total discards in number *	Removals in number	Harvest rate by number	Landings	Total discards *	Discard rate (by number)	Dead discard rate (by number)	Mean weight in landings	Mean weight in discards
	millions					%	tonnes		%		grammes	
2012			38.2	36.1	65.3		1189	542	48.5	41.4	31.1	15.0
2013	1624	103	34.8	19.2	49.2	3.0	1387	327	35.6	29.3	39.9	17.0
2014	2051	131	50.6	55.5	92.2	4.5	1836	834	52.3	45.2	36.3	15.0
2015	2003	129	59.4	28.1	80.5	4.0	2116	442	32.2	26.2	35.7	15.7
2016	1879	157	60.2	37.5	88.3	4.7	2453	801	38.4	31.8	40.7	21.4
2017	4428	332	60.1	19.2	74.5	1.7	1849	306	24.3	19.4	30.8	15.9
2018	2721	212	64.7	21.5	80.8	3.0	1803	381	25.0	20.0	27.9	17.7
2019	617	58	99.1	42.3	130.9	21.2	2999	637	29.9	24.3	30.2	15.0
2020	1020	96										

* Dead + surviving discards.

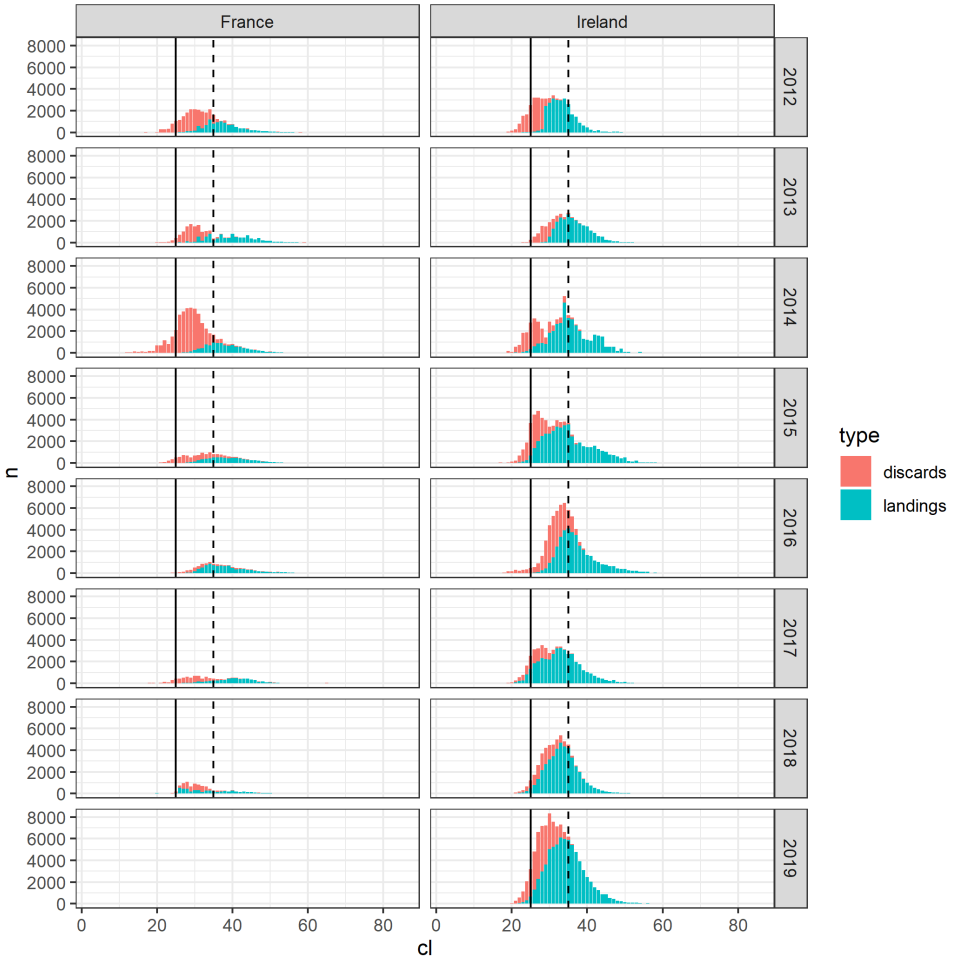

Figure 2 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Commercial length–frequency distribution by country. The solid vertical lines indicate the minimum conservation reference size (MCRS; 25 mm), while the dashed vertical lines indicate the minimum landing size (French MLS; 35 mm). French data for 2019 were not included.

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.

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Recommended citation: ICES. 2020. Norway lobster (*Nephrops norvegicus*) in divisions 7.g and 7.h, functional units 20 and 21 (Celtic Sea). *In* Report of the ICES Advisory Committee, 2020. ICES Advice 2020, nep.fu.2021. https://doi.org/10.17895/ices.advice.5912.

Annex 1

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

Norway lobster (*Nephrops norvegicus*) in divisions 7.g and 7.h, functional units 20 and 21 (Celtic Sea)

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 1131 tonnes and 1150 tonnes. The entire range is considered precautionary when applying the ICES advice rule.

To ensure that the stock in functional units 20 and 21 is exploited sustainably, management should be implemented at the level of the combined functional units 20 and 21.

Stock development over time

The harvest rate is below F_{MSY} for the time-series. Stock abundance has decreased since 2017, and is at its lowest observed level in 2019.

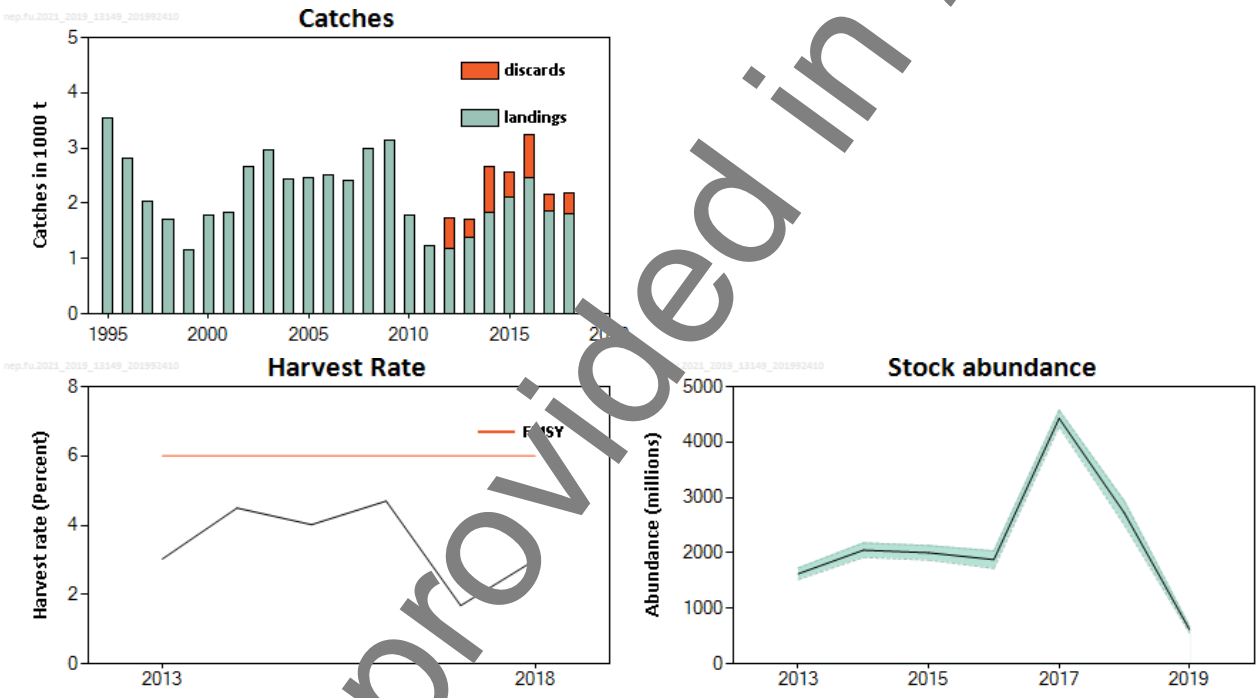

Figure 1 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Summary of the stock assessment. Catches (discard data only available from 2012), harvest rate (sum of landings and dead discards in numbers divided by total abundance), and stock abundance (underwater TV survey, millions; 95% confidence intervals). The orange line represents the F_{MSY} harvest rate.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY}; no reference points for stock size have been defined for this stock.

Table 1 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. 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 $B_{trigger}$	?	?	? Undefined
Precautionary approach	F_{pa},F_{lim}	✓	✓	✓ Below possible reference points	B_{pa},B_{lim}	?	?	? Undefined
Management plan	F_{MGT}	✓	✓	✓ Below range	B_{MGT}	?	?	? Undefined

Catch scenarios

Table 2 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. The basis for the catch advice and scenarios.

Variable	Value	Notes
Stock abundance (2020)	617 million	UWTV survey 2019 (number of individuals).
Mean weight in wanted catch	33.1 grammes	Average 2016–2018.
Mean weight in unwanted catch	18.3 grammes	Average 2016–2018.
Unwanted catch	29.2%	Average 2016–2018 (proportion by number).
Discards survival	25%	Proportion by number
Dead unwanted catch	23.7%	Average 2016–2018.

Table 3 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. 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	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}	1150	1096	935	161	54	6.0	−78
F = MAP $F_{MSY\ lower}$	1131	1078	920	158	53	5.9	−79
F = MAP $F_{MSY\ upper}$ ***	1150	1096	935	161	54	6.0	−78
Other options							
MSY approach	1150	1096	935	161	54	6.0	−78
F_{2018}	569	543	463	80	27	3.0	−89

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}	1066	868	198	6.0	−80
F = MAP $F_{MSY\ lower}$	1049	854	195	5.9	−80
F = MAP $F_{MSY\ upper}$ ***	1066	868	198	6.0	−80
Other options					
MSY approach	1066	868	198	6.0	−80
F_{2018}	528	430	98	3.0	−90

^ EU multiannual plan (MAP) for Western waters (EU, 2019).
* By number.
** Advice value for 2020 relative to the advice value for 2019 (5320 tonnes).
*** $F_{MSY\ lower}$ / $F_{MSY\ upper}$ for this stock

The reduction in total catch advice is the result of the large decrease in the observed stock abundance in 2019.

Basis of the advice

Table 4 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. 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	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. 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: 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%. ICES considers that the F_{MSY} range for this stock used in the MAP is precautionary. Full details of the plan are described in EU (2019).

Quality of the assessment

Since 2013 a dedicated annual underwater television (UWTV) survey has taken place in FUs 20–21 (Figure 2), which gives abundance estimates of adequate quality. However, the time-series is still too short to provide an MSY $B_{trigger}$.

In 2019, the survey camera system and reviewing method changed. A comparison showed no significant difference in density estimates between the new and the old method. Previous assumptions relating to correction factors are still applied.

Due to the large reduction in stock abundance in 2019, a review process was implemented according to the *Nephrops* UWTV Survey Series Protocols (ICES, 2018a). This confirmed the low burrow density estimates in the 20% of stations that were re-counted.

Sampling of landings and discards remains very low. This impacts on the quality of the mean weight estimates used in the assessment.

Issues relevant for the advice

The decrease in catch advice for 2020 compared to previous years is directly linked to the reduced estimate of stock abundance in 2019. Reasons for this abundance decrease are not known.

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 and has not changed markedly (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.

Irish discard survival experiments indicate that the trawl discard survival may be around 64% (BIM, 2017). As a result, an exemption from the landings obligation based on high survivability has been granted by the European Commission. ICES continues to use the survival rate of 25% (ICES, 2016) as the survival rates estimated by BIM (2017) have not been evaluated by ICES.

The density of *Nephrops* in FUs 20–21 is considered medium (average density 0.3 individuals m^{-2}). The knowledge of biological parameters is poor and the exploitation rate on males is usually higher than on females. For these reasons, a harvest rate consistent with a combined sex $F_{0.1}$ is considered an appropriate proxy for F_{MSY}.

A single TAC covers the entire ICES Subarea 7. Management should be implemented at the functional unit level (the combined FU 20 and 21 for this stock) to ensure that fishing opportunities are in line with the scale of the resource for each of the stocks and the corresponding maximum sustainable yield (MSY) approach.

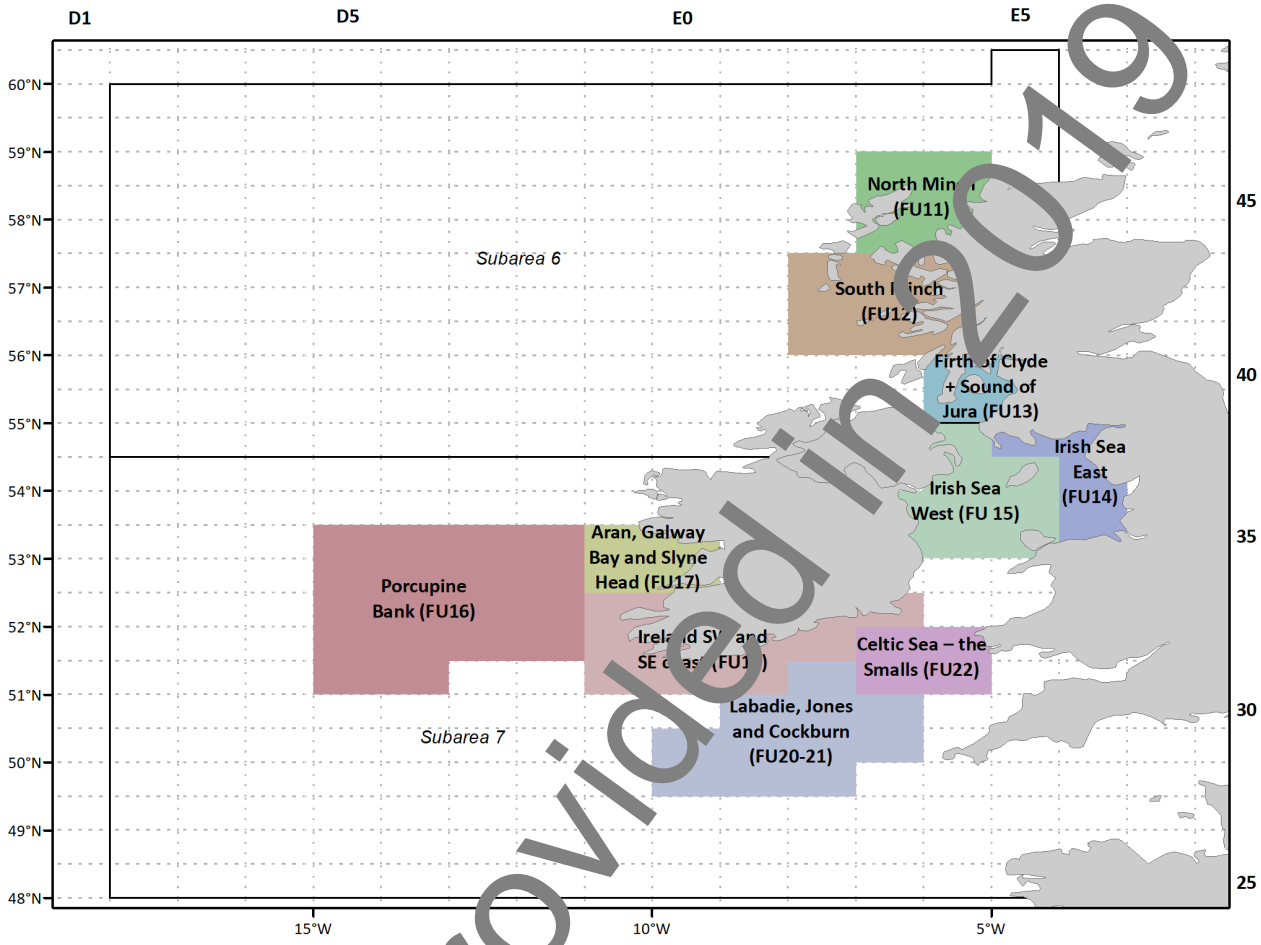

Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 5 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	Not defined		
	F_{MSY}	6.0% harvest rate	F_{MSY} proxy, equivalent to $F_{0.1}$ for combined sexes, derived from length-based per recruit analysis.	ICES (2016)
Precautionary approach	B_{lim}	Not defined		
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	MAP MSY $B_{trigger}$	Not defined		
	MAP B_{lim}	Not defined		
	MAP F_{MSY}	6.0% harvest rate	F_{MSY}	EU (2019); ICES (2016)
	MAP range F_{lower}	5.9–6.0% harvest rate	Consistent with ranges provided by ICES (2017), resulting in no more than 5% reduction in long-term yield compared with MSY.	EU (2019); ICES (2016)
	MAP range F_{upper}	6.0–6.0% 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 divisions 7.g and 7.h, functional units 20 and 21. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018b).
Assessment type	Underwater TV survey (ICES, 2019).
Input data	One survey index (UWTV-FU 2021), commercial catches (international landings (Ireland, France, and UK), length frequencies from Irish and French catch and discard sampling); maturity data (from commercial catch sampling and surveys), fixed natural mortality. Discard survival rate.
Discards and bycatch	Included in the assessment since 2012.
Indicators	Mean sizes in the catches. Two bottom trawl surveys (IGFS-WIBTS-Q4 and EVHOE-WIBTS-Q4).
Other information	This stock was last benchmarked in 2014 (WKCELT; ICES, 2014).
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 divisions 7.g and 7.h, functional units 20 and 21. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice*	Landings advice	Catch advice	ICES landings	ICES discards**
1992		~3800			
1993		3800			
1994		3800			
1995		3800		3536	
1996		3800			
1997		3800		2038	
1998		3800			
1999		3800		1152	
2000		3800		1778	
2001		3800			
2002		3800			
2003		3800		2953	
2004	Adjust TAC in line with landings of most recent 10 years	4600		2443	
2005	Adjust TAC in line with landings of most recent 10 years	4600		2469	
2006	Recent average landings 2000–2002	4600		2523	
2007	No increase in effort	-		2419	
2008	No increase in effort	< 5300		2980	
2009	No increase in effort	< 5300		3145	
2010	No new advice, same as for 2009	< 5300		1793	
2011	See scenarios; MSY reduce catch or PA < 5.3	-		1237	
2012	Reduce catch	-		1189	542
2013	Average landings (last 10 years)	< 250		1387	327
2014	No new advice, same as for 2013	< 2500		1837	834
2015	Same as for 2013	< 2500		2116	442
2016	Precautionary approach (harvest rate consistent with previous advice)		≤ 3045***	2453	801
2017	MSY approach		≤ 3552^	1849	306
2018	MSY approach		≤ 8673^	1803	381
2019	MSY approach		≤ 5320^		
2020	Management plan		1150 (range 1131–1150)^		

* Advice prior to 2013 applies to FUs 20–22.
** Dead + surviving discard
***Assuming all catches are landed.
^ Assuming recent discard rates.

History of the catch and landings

Table 8 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Catch distribution by fleet in 2018 as estimated by ICES. All weights are in tonnes.

Catch		Landings	Discards	
95.6% dead	4.4% surviving	~ 100% otter trawl (both 70–99 mm and > 100 mm)	75% dead	25% surviving
2184 t		1803 t	381 t	

Table 9 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. History of ICES estimates of landings by country and discards. All weights are in tonnes.

Year	France	Rep. of Ireland	UK	Total landings	Discards*
1995	3419	117	na	[illegible]	
1996	2721	101	na	2822	
1997	1957	81	na	[illegible]038	
1998	1583	130	na	1713	
1999	1051	83	18	1152	
2000	1661	107	10	1778	
2001	1750	69	14	1833	
2002	2559	104	11	2674	
2003	2796	148	9	2953	
2004	2140	299	4	2443	
2005	2008	455	6	2469	
2006	2066	450	7	2523	
2007	1816	600	3	2419	
2008	2036	937	7	2980	
2009	1930	1202	13	3145	
2010	975	756	62	1793	
2011	566	637	34	1237	
2012	453	708	28	1189	542
2013	486	844	57	1387	327
2014	465	1342	29	1836	834
2015	355	1620	141	2116	442
2016	477	1531	445	2453	801
2017	341	1113	395	1849	306
2018	195	1197	411	1803	381

* Dead + surviving discards.

Summary of the assessment

Table 10 Norway lobster in divisions 7.g and 7.h, functional units 20 and 21. Assessment summary.

Year	UWTV abundance estimate	95% Confidence Interval	Landings in number	Total discards in number*	Removals in number	Harvest rate by number	Landings	Total discards*	Discard rate (by number)	Dead discard rate (by number)	Mean weight in landings	Mean weight in discards
	millions					%	tonnes		%		grammes	
2012			38.2	36.1	65.3		1189	542	48.5	41.4	31.1	15.0
2013	16[illegible]4	103	34.8	19.2	49.2	3.0	1387	327	35.6	29.3	39.9	17.0
2014	20[illegible]1	131	50.6	55.5	92.2	4.5	1836	834	52.3	45.2	36.3	15.0
2015	2003	129	59.4	28.1	80.5	4.0	2116	442	32.2	26.2	35.7	15.7
2016	[illegible]	157	60.2	37.5	88.3	4.7	2453	801	38.4	31.8	40.7	21.4
2017	4428	332	60.1	19.2	74.5	1.7	1849	306	24.3	19.4	30.8	15.9
2018	[illegible]2721	212	64.7	21.5	80.8	3.0	1803	381	25.0	20.0	27.9	17.7
2019	617	58										

* Dead + surviving discards.

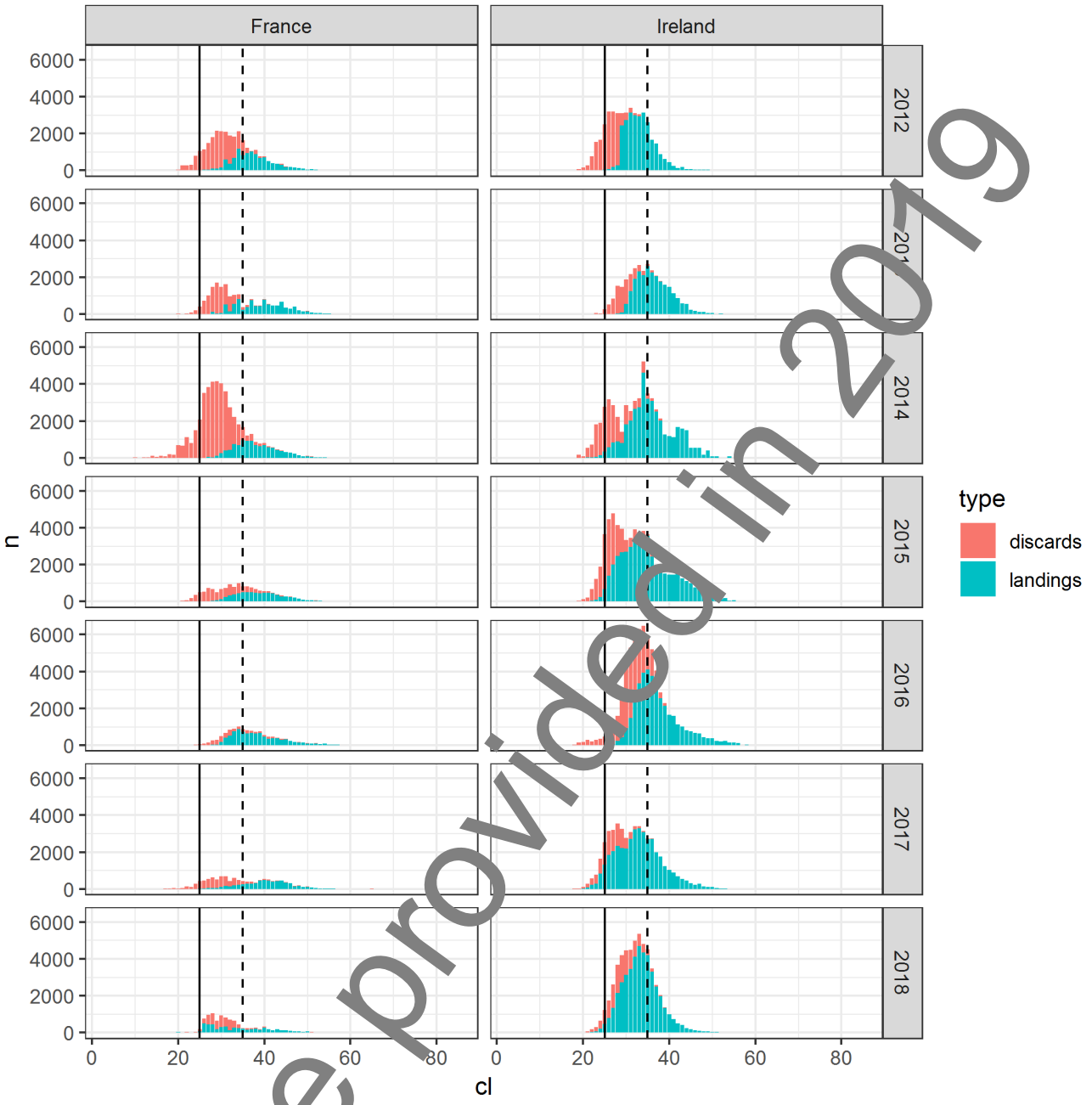

Figure 3 Norway lobst[illegible]ns 7.g and 7.h, Functional Units 20 and 21. Commercial length–frequency distribution by country. Th[illegible] solid [illegible]rtical lines indicate the minimum conservation reference size (MCRS; 25 mm) while the dashed vertical lines [illegible]dica[illegible]e the minimum landing size (French MLS; 35 mm).

Sources and references

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