

## Norway lobster (*Nephrops norvegicus*) in divisions 7.a, 7.g, and 7.j, Functional Unit 19 (Irish Sea, Celtic Sea, eastern part of southwest of Ireland)

### ICES advice on fishing opportunities

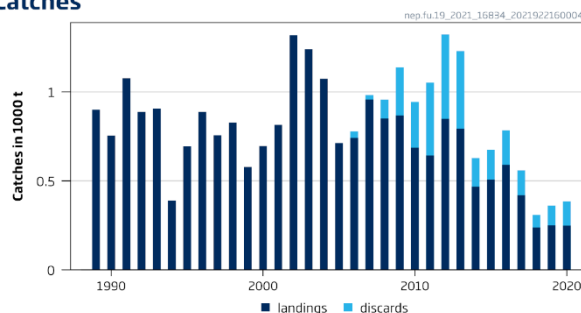
ICES advises that when the EU multiannual plan (MAP) for Western Waters and adjacent waters is applied, and assuming that discard rates and fishery selection patterns do not change from the average of the years 2018–2020, catches in 2022 that correspond to the F ranges in the MAP are between 363 and 407 tonnes.

To ensure that the stock in Functional Unit (FU) 19 is exploited sustainably, management should be implemented at the FU level.

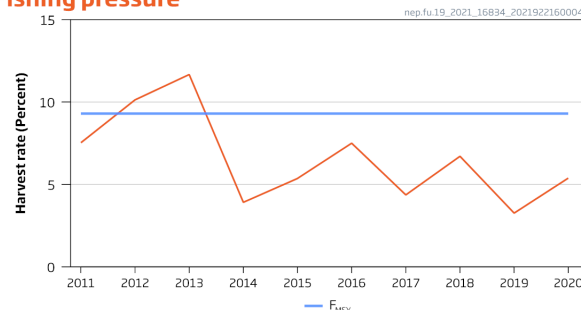
### Stock development over time

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

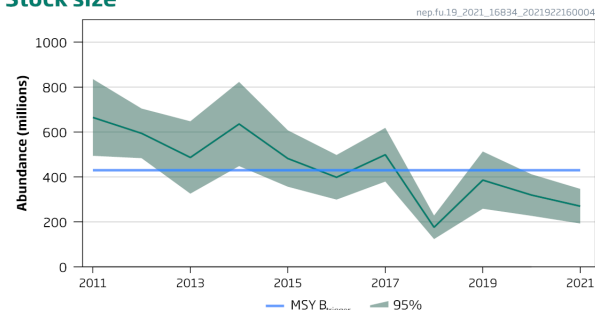
#### Catches



#### Fishing pressure



#### Stock size



**Figure 1** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. Summary of the stock assessment. Catches (discards are only available from 2006 onwards), harvest rate (sum of landings and dead discards in numbers divided by stock abundance), and stock abundance (underwater TV survey).

### Catch scenarios

The latest estimate of stock abundance is below  $MSY B_{trigger}$  (430 million). ICES maximum sustainable yield (MSY) approach states that under such conditions, the  $F_{MSY}$  harvest rate (9.3%) for FU 19 should be reduced by multiplying it by the ratio of current abundance to  $MSY B_{trigger}$ . This corresponds to a harvest rate of  $9.3 \times (270/430) = 5.8\%$  for the advice in 2022.

**Table 1** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. The basis for the catch advice and scenarios.

Variable	Value	Notes
Stock abundance (2022)	270	UWTV survey 2021; individuals in millions
Mean weight in projected landings	29.2	Average 2018–2020; in grammes
Mean weight in projected discards	15.2	Average 2018–2020; in grammes
Projected discard rate	44.7	Average 2018–2020; percentage by number of the total catch
Discard survival rate	25	Percentage by number of the discards

**Table 2** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. Annual catch 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	
<b>ICES advice basis</b>							
EU MAP <sup>^</sup> : $F_{MSY} \times \text{Stock abundance 2022} / MSY B_{trigger}$	407	377	286	90	30	5.8	-32
EU MAP <sup>^</sup> : $F_{MSY lower} \times \text{Stock abundance 2022} / MSY B_{trigger}$	363	336	255	81	27	5.2	-32
<b>Other scenarios</b>							
$F_{MSY upper} \times \text{Stock abundance 2022} / MSY B_{trigger}^{***}$	407	377	286	90	30	5.8	-32
$F_{MSY}$	648	600	456	144	48	9.3	8.9
$F_{MSY lower}$	578	535	407	129	43	8.3	-2.9
$F_{MSY upper}^{***}$	648	600	456	144	48	9.3	8.9
$F_{2020}$	375	347	264	83	28	5.4	-37

\* By number.

\*\* Advice values for 2022 relative to the corresponding 2021 values (MAP advice of 595, 531, and 595 tonnes, respectively); other option values are relative to 595 t).

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

<sup>^</sup> EU multiannual plan (MAP) for the Western Waters (EU, 2019).

The decrease in total catch advice is the result of the lower observed stock abundance in 2021 and the lower harvest rate used for the advice.

**Basis of the advice**

**Table 3** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. The basis of the advice.

Advice basis	Management plan
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 for making use of the <math>F_{MSY}</math> range for the stock. ICES considers the MAP to be precautionary when implemented at the FU level.</p> <p>Full details of the plan are described in EU (2019).</p>

**Quality of the assessment**

An annual underwater television (UWTV) survey has been carried out since 2011 in FU 19 (Figure 2), with full coverage of all the discrete patches since 2013. The survey gives estimates of burrow densities for the main patches of Norway lobster habitat in FU 19 and an abundance estimate for the entire stock with acceptable precision.

The main quality concern relates to mean weight estimates and discard rates, which are quite variable over the time-series. This partially reflects the difference in mean sizes of patches with different underlying densities. Adequate catch sampling remains difficult for such a heterogeneous area.

### Issues relevant for the advice

During 2016–2020, the EU landing obligation was applied to all catches of Norway lobster fisheries in ICES Subarea 7 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.

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 it has not estimated the survival rates estimated by BIM (2017).

In this FU vessels tend to be small with limited space and crew, and on-board tailing (keeping only the tail) of the catch is not as prevalent as in other FUs around Ireland. As a result, the proportion of discarded Norway lobster in FU 19 is high relative to other areas.

The density of Norway lobster in FU 19 is considered medium (average density 0.3 individuals  $m^{-2}$ ). 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 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.

### Mixed-fisheries considerations

Norway lobster (*Nephrops norvegicus*) in divisions 7.a, 7.g, and 7.j, Functional Unit 19 is caught as part of a mixed fishery. Mixed-fisheries advice will be provided as part of the Celtic Seas fisheries overview later in the year.

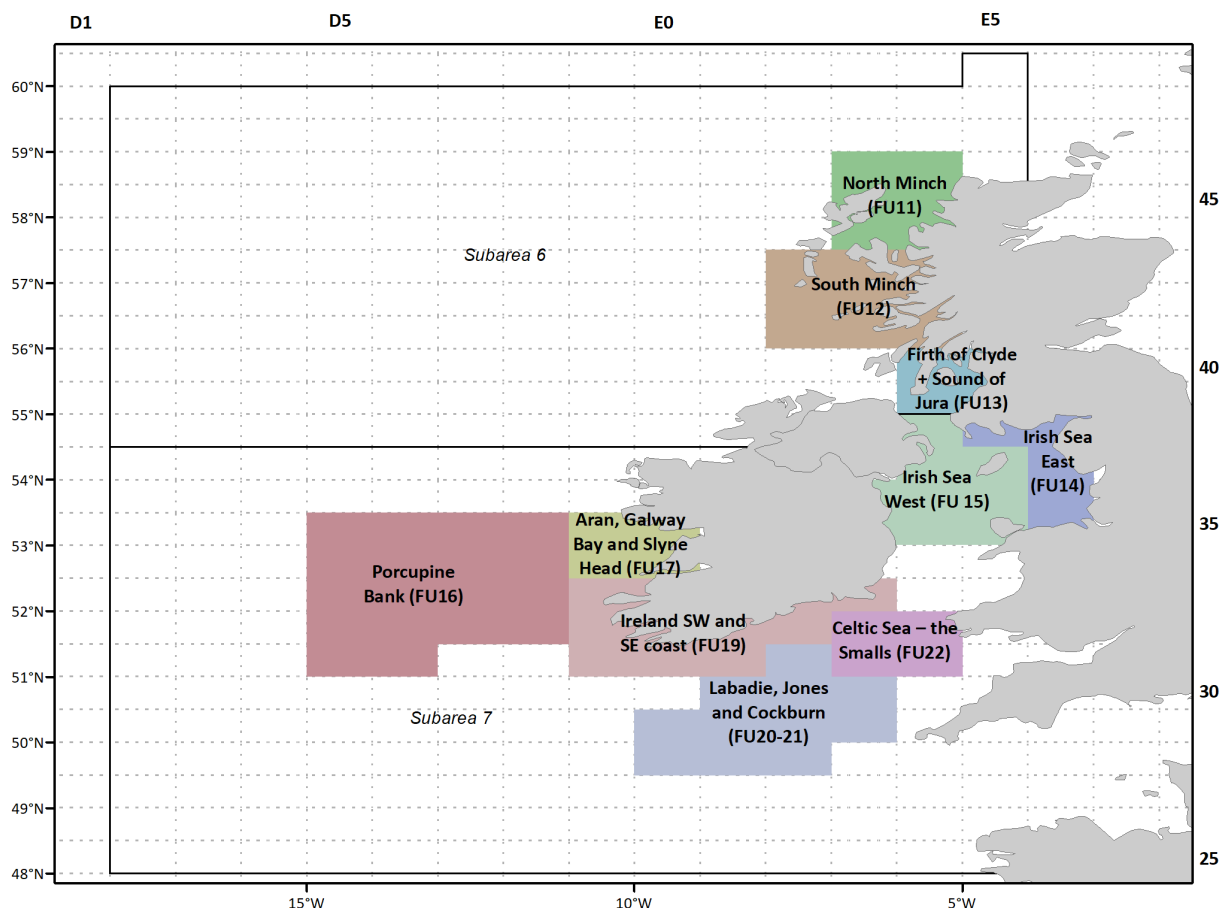


Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 4 Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	430	Five percent interval on the probability distribution of abundance for the time-series 2011–2015, assuming a normal distribution; individuals in millions	ICES (2016)
	$F_{MSY}$	9.3	Proxy harvest rate equivalent to $F_{0.1}$ for combined sexes, derived from a length-based per recruit analysis; percentage in 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 target			
	MSY $B_{trigger}$	430	MSY $B_{trigger}$ ; individuals in millions	ICES (2016)
	MAP $B_{lim}$	Not defined		
	MAP $F_{MSY}$	9.3	Harvest rate equivalent to $F_{MSY}$ ; percentage by numbers	ICES (2016)
	MAP range $F_{lower}$	8.3–9.3	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 $F_{upper}$	9.3–9.3	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 (2016)	

## Basis of the assessment

**Table 5** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. Basis of the assessment and advice.

ICES stock data category	1 ( <a href="#">ICES, 2021a</a> )
Assessment type	Underwater TV survey (ICES, 2021b)
Input data	Commercial catches (international landings from Ireland, France, and UK); length frequencies from catch and discard sampling (Ireland); one UWTV survey index (UWTV-FU 19 [U5917]); maturity data from commercial catch and survey sampling; fixed natural mortality. Discard survival rate.
Discards and bycatch	Included in the assessment since 2006
Indicators	Commercial length frequencies by sex. Two bottom trawl surveys (IGFS-WIBTS-Q4 [G7212] and EVHOE-WIBTS-Q4 [G9527]).
Other information	This stock was benchmarked in 2014 ( <a href="#">WKCELT</a> ; ICES, 2014)
Working group	Working Group for the Celtic Seas Ecoregion ( <a href="#">WGCSE</a> )

## History of the advice, catch, and management

**Table 6** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. ICES advice and estimated landings. All weights are in tonnes.

Year	ICES advice	Landings advice*	Catch advice**	ICES landings	Total discards***
1992		3800		888	
1993		~ 4000		905	
1994		~ 4000		390	
1995		~ 4000		694	
1996		4000		888	
1997		4000		756	
1998		4000		827	
1999		4000		579	
2000		4000		696	
2001		4000		815	
2002		4440		1318	
2003		4440		1240	
2004	Restrict landings to 2000–2002 levels	3300		1074	
2005	Restrict landings to 2000–2002 levels	3300		712	
2006	Restrict landings to 2000–2002 levels	3300		741	37
2007	Constrain effort at recent levels	--		957	26
2008	Constrain effort at recent levels	--		851	105
2009	No increase in effort and landings (2007)	< 800	--	868	258
2010	No new advice, same as for 2009	< 800	--	687	257
2011	See scenarios	-		643	409
2012	Reduce catches	-		849	473
2013	MSY approach	< 820		794	436
2014	MSY approach	< 521		468	161
2015	MSY approach	< 715		507	167
2016	MSY approach		≤ 793 <sup>^</sup>	590	194
2017	MSY approach		≤ 838	420	138
2018	MSY approach		≤ 1192	238	71
2019	MSY approach		≤ 173	249	112
2020	Management plan		839 (range 749–839)	249	136
2021	Management plan		595 (range 531–595)		
2022	Management plan		407 (range 363–407)		

\* Prior to 2007, ICES provided combined advice for FUs 16, 17, 18, and 19, as well as for “other rectangles” in this area.

\*\* Assuming recent discard rates.

\*\*\* Dead + surviving discards.

<sup>^</sup> Assuming all catches are landed.

## History of the catch and landings

**Table 7** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. Catch distribution by fleet in 2020 as estimated by ICES.

Catch		Landings	Discards	
91% dead	9% surviving	Almost 100% otter trawl	75% dead	25% surviving
385 tonnes		249 tonnes	136 tonnes	

**Table 8** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. History of ICES estimates of landings by country and discards. All weights are in tonnes. The figures in the table are rounded and therefore the total landings by country may not match exactly.

Year	France	Rep. of Ireland	UK	Total landings	Discards*
1989	245	652	2	899	
1990	181	569	4	754	
1991	212	860	5	1077	
1992	233	640	15	888	
1993	229	672	4	905	
1994	216	153	21	390	
1995	175	507	12	694	
1996	145	736	7	888	
1997	93	656	7	756	
1998	92	733	2	827	
1999	77	499	3	579	
2000	144	541	11	696	
2001	111	702	2	815	
2002	188	1130	0	1318	
2003	165	1075	0	1240	
2004	76	997	1	1074	
2005	62	648	2	712	
2006	65	675	1	741	37
2007	63	894	0	957	26
2008	46	790	15	851	105
2009	55	798	15	868	269
2010	14	660	13	687	257
2011	23	619	1	643	409
2012	11	837	1	849	473
2013	4	771	6	794	436
2014	6	459	3	468	161
2015	5	502	0	507	167
2016	4	583	3	590	193
2017	4	412	4	420	138
2018	4	229	5	238	71
2019**	2	247	1	249	112
2020**	1	247	1	249	136

\* Dead + surviving discards.

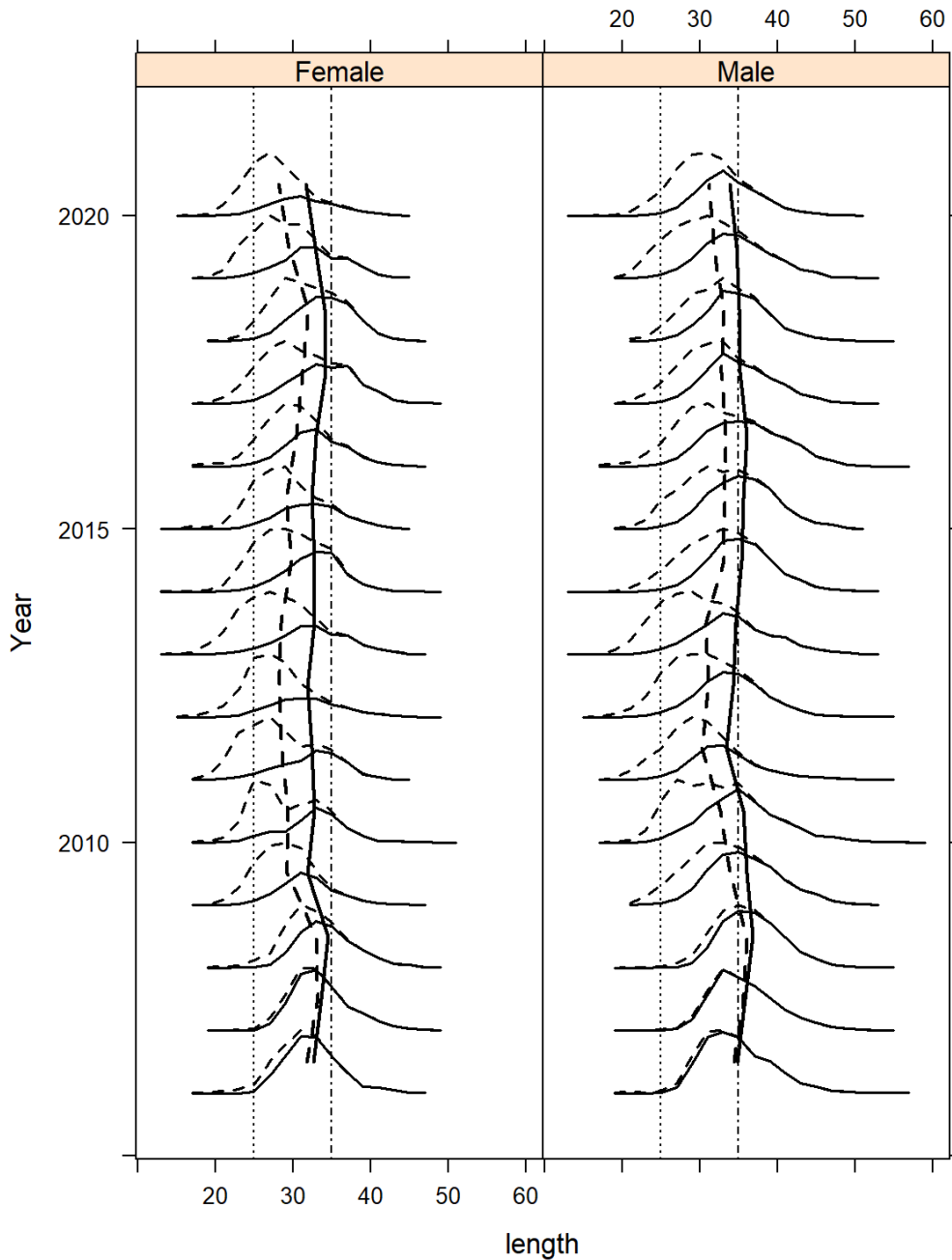
\*\*Landing values are preliminar.

Summary of the assessment

Table 9 Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. 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		
1989							899					
1990							754					
1991							1077					
1992							888					
1993							905					
1994							390					
1995							694					
1996							888					
1997							756					
1998							827					
1999							579					
2000							696					
2001							815					
2002							1318					
2003							1240					
2004							1074					
2005							712					
2006							741	37				
2007							957	26				
2008			25	5	29		851	105	17.7	13.9	33.7	19.4
2009			28	19	42		868	269	40	33	30.5	14.5
2010			23	19	37		687	257	45	38	29.6	13.5
2011	665	171	26	32	50	7.5	643	409	56	49	24.9	12.6
2012	594	111	32	37	60	10.1	849	473	54	46	26.3	12.7
2013	487	161	29	36	57	11.7	794	436	55	48	26.9	11.9
2014	636	188	16	11	25	3.9	468	161	41	34	28.6	14.1
2015	482	126	17	12	26	5.4	507	167	41	34	29.8	14.1
2016	399	99	20	14	30	7.5	590	193	41	34	29.9	14.2
2017	499	120	15	10	22	4.4	420	139	40	33	28.8	14.5
2018	176	53	8	4	11	6.7	238	71	35	29	28.2	15.7
2019	386	127	7	7	13	3.3	249	112	48	41	33.6	16.3
2020	320	93	10	10	17	5.4	249	136	51	44	25.8	13.5
2021	270	77										

\* Dead + surviving discards.



**Figure 3** Norway lobster in divisions 7.a, 7.g, and 7.j, Functional Unit 19. The dashed lines represent catches while the solid lines represent landings. Annual length–frequency distributions are shown on the horizontal, the vertical bold 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

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

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