

Norway lobster (*Nephrops norvegicus*) in divisions 8.a and 8.b, functional units 23–24 (northern and central Bay of Biscay)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2021 should be no more than 6105 tonnes, assuming recent discard rates.

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

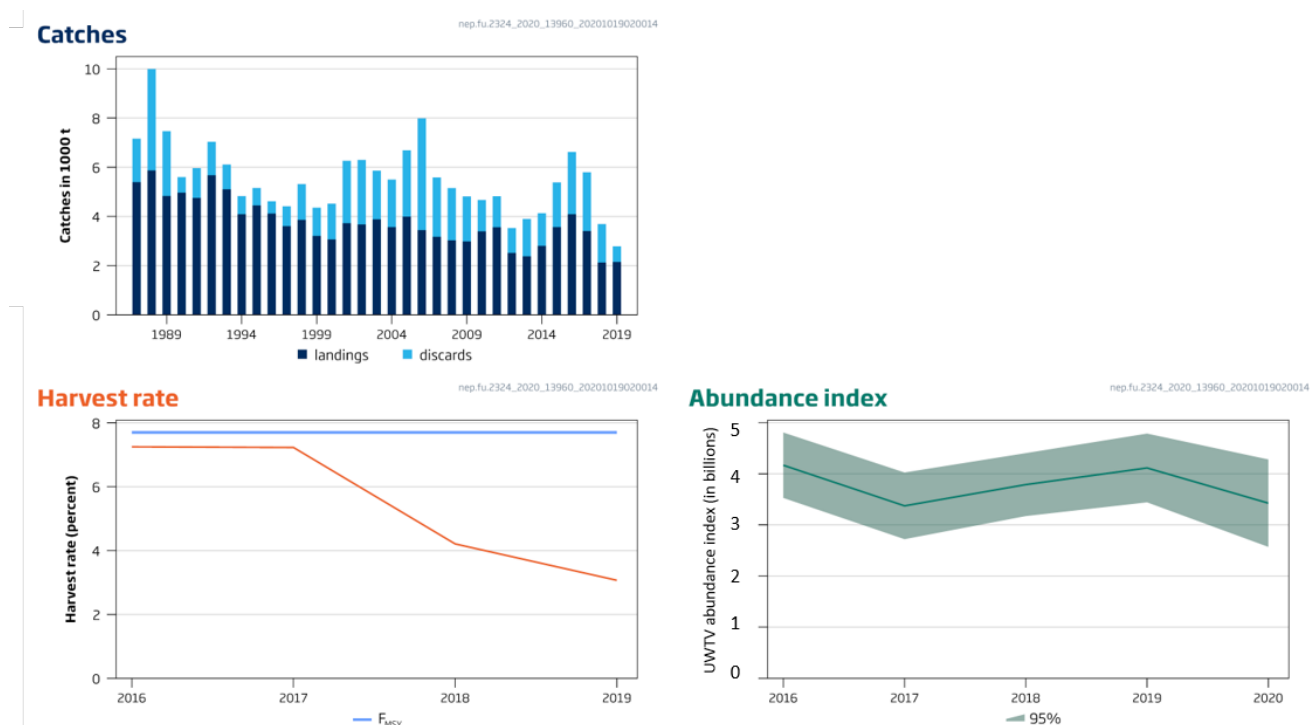


Figure 1 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by stock abundance), and stock abundance (underwater television [UWTV] survey, in billions; 95% confidence intervals). The discard survival rate was revised from 2017 onwards to 50%.

Stock and exploitation status

Table 1 Norway lobster in divisions 8.a and 8.b, functional units 23–24. 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	?	?
					$B_{trigger}$?	?
							Undefined
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Below possible reference points	B_{pa}, B_{lim}	?	?
							Undefined
Management plan	F_{MGT}	✓	✓	✓ Below	B_{MGT}	—	—
							Not applicable

Catch scenarios

Table 2 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2021)	3425.061	Number of individuals (millions); UWTV Survey 2020
Mean weight in projected landings	23.82	Average 2017–2019; in grammes
Mean weight in projected discards	10.99	Average 2017–2019; in grammes
Projected discards	53.6	Average 2017–2019; percentage by number
Discard survival *	50	Percentage by number
Dead projected discards	37.4	Average 2017–2019; percentage by number

* Only applied in scenarios where discarding is allowed.

Table 3 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Catch scenarios for 2021. 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	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: F _{MSY}	6105	5044	3984	1060	1060	7.70	-7.1
Other scenarios							
F ₂₀₁₉	2438	2014	1591	423	423	3.07	-63
EU MAP ^: F _{MSY}	6105	5044	3984	1060	1060	7.70	-7.1

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					
MSY approach: F _{MSY}	4469	2917	1553	7.7	-32
Other scenarios					
EU MAP ^: F _{MSY}	4469	2917	1553	7.7	-32
F ₂₀₁₉	1785	1165	620	3.07	-73

* By number.

** Advice value for 2021 relative to the advice value for 2020 (6573 tonnes).

*** Ranges are not defined 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.

Issues relevant for the advice

The discard survival rate was revised from 30% to 50% and this new rate was applied starting from 2017 (the year the chute system became widely used to quickly release discards; ICES, 2020a). This has changed the historical perception of the harvest rate relative to F_{MSY} . While the catch advice for 2021 is 7.1% lower than the advice for 2020 due to a decrease in stock abundance, the corresponding landings increased slightly (2.5%) due to the revision of the survival rate.

History of the advice, catch, and management

Table 4 Norway lobster in divisions 8.a and 8.b, functional units 23–24. History of ICES advice, the agreed TAC, and ICES estimates of landings and discards. All weights are in tonnes.

Year	ICES advice	Landings corresponding to the advice	Catch advice	Agreed TAC	ICES estimated landings	ICES estimated total discards *
2003	50% reduction of current exploitation rate	2200		3000	3886	1977
2004	20% reduction of current exploitation rate	3300		3150	3571	1932
2005	20% reduction of current exploitation rate	3100		3100	3991	2698
2006	Maintain recent catch	3500		4000	3447	4544
2007	Maintain recent catch	3600		4320	3176	2411
2008	Maintain recent catch	3600		4320	3030	2123
2009	Maintain recent landings (average 2005–2007)	3400		4100	2987	1833
2010	No new advice, same as for 2009	3400		3900	3398	1275
2011	See scenarios			3900	3559	1263
2012	Reduce catch			3900	2520	1013
2013	Decrease landings by 5% (19% increase, followed by 20% PA reduction)	< 3200		3900	2380	1521
2014	Same advice as 2013	< 3200		3900	2807	1326
2015	Increase landings by no more than 14%	< 3214		3900	3569	1822
2016	Same advice as 2015	< 3214		3900	4091	2531
2017	MSY approach	≤ 4160 **	≤ 6376 **	4160	3412	2387
2018	MSY approach		≤ 5531 **	3600	2125	1571
2019	MSY approach		≤ 6221 **	3878	2154	634
2020	MSY approach		≤ 6573 **	3886		
2021	MSY approach		≤ 6105 **			

* Dead + surviving discards.

** Assuming recent discard rates.

Summary of the assessment

Table 5 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Assessment summary.

Year	Abundance index	High	Low	Landings in number	Total discards in number	Removals in number *	Harvest rate (by number) **	Landings	Discards	Discard rate (by number)	Dead discard rate (by number)	Mean weight in landings	Mean weight in discards
	thousands			millions			%	tonnes		%		grammes	
1987				289	268.2	476.7		5397	1767	48.1	39.4	18.68	6.59
1988				324.5	687.0	805.4		5875	4123	67.9	59.7	18.10	6.00
1989				244.9	404.2	527.8		4835	2634	62.3	53.6	19.75	6.52
1990				213.8	78.5	268.8		4972	627	26.9	20.5	23.26	7.98
1991				217.4	151.6	323.5		4754	1213	41.1	32.8	21.87	8.00
1992				274.3	174.4	396.3		5681	1354	38.9	30.8	20.71	7.76
1993				240.6	124.4	327.7		5109	1007	34.1	26.6	21.23	8.09
1994				188.9	88.3	250.7		4092	741	31.8	24.6	21.66	8.39
1995				202.3	84.8	261.6		4452	706	29.5	22.7	22.01	8.33
1996				182	55.3	220.7		4118	495	23.3	17.5	22.62	8.97
1997				188.7	105.0	262.2		3610	805	35.8	28.0	19.13	7.67
1998				161.5	151.0	267.2		3865	1453	48.3	39.6	23.92	9.62
1999				135.3	122.7	221.2		3209	1148	47.6	38.8	23.72	9.35
2000				133.4	163.3	247.7		3069	1455	55.0	46.2	23.01	8.91
2001				172.8	305.5	386.7		3730	2537	63.9	55.3	21.58	8.30
2002				180.4	329.0	410.7		3679	2620	64.6	56.1	20.39	7.96
2003				163.8	201.8	305.1		3886	1977	55.2	46.3	23.73	9.80
2004				154.4	222.1	309.9		3571	1932	59.0	50.2	23.13	8.70
2005				179.8	315.3	400.5		3991	2698	63.7	55.1	22.20	8.56
2006				128.8	487.3	469.9		3447	4544	79.1	72.6	26.76	9.32
2007				117.3	214.8	267.6		3176	2411	64.7	56.2	27.09	11.22
2008				115.3	198.0	253.9		3030	2123	63.2	54.6	26.29	10.72

Year	Abundance index	High	Low	Landings in number	Total discards in number	Removals in number *	Harvest rate (by number) **	Landings	Discards	Discard rate (by number)	Dead discard rate (by number)	Mean weight in landings	Mean weight in discards
	thousands			millions			%	tonnes		%		grammes	
2009				123.5	174.5	245.6		2987	1833	58.6	49.7	24.19	10.51
2010				138.1	113.5	217.6		3398	1275	45.1	36.5	24.60	11.23
2011				108	121.6	193.1		3559	1263	53.0	44.1	32.95	10.39
2012				101.4	117.9	184.0		2520	1012	53.8	44.9	24.85	8.58
2013				114.9	154.9	223.3		2380	1521	57.4	48.6	20.72	9.82
2014				121.6	117.9	204.1		2807	1326	49.2	40.4	23.08	11.25
2015				138.9	156.4	248.4		3569	1822	53.0	44.1	25.69	11.65
2016	4167477	4807506	3527448	161.4	201.0	302.1	7.3	4091	2531	55.5	46.6	25.35	12.60
2017	3372539	4025128	2719950	143.5	200.6	243.8	7.2	3412	2387	58.3	41.1	23.78	11.90
2018	3787769	4403749	3171789	83.5	151.9	159.4	4.2	2125	1571	64.5	47.6	25.46	10.34
2019	4113422	4786156	3440687	96.9	59.1	126.5	3.1	2154	634	37.9	23.4	22.23	10.73
2020	3425061	4280555	2569567										

* Removals are calculated as landings plus dead discards, assuming a 30% survival rate for discards.

** Revised the time-series in 2020 following ICES (2020a).

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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Annex 1

ICES Advice on fishing opportunities, catch, and effort
Bay of Biscay and the Iberian Coast ecoregion
Published 31 October 2019

Norway lobster (*Nephrops norvegicus*) in divisions 8.a and 8.b, functional units 23–24 (northern and central Bay of Biscay)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2020 should be no more than 6573 tonnes.

Stock development over time

Stock abundance has increased since 2017. The harvest rate in 2018 is estimated to be below F_{MSY} .

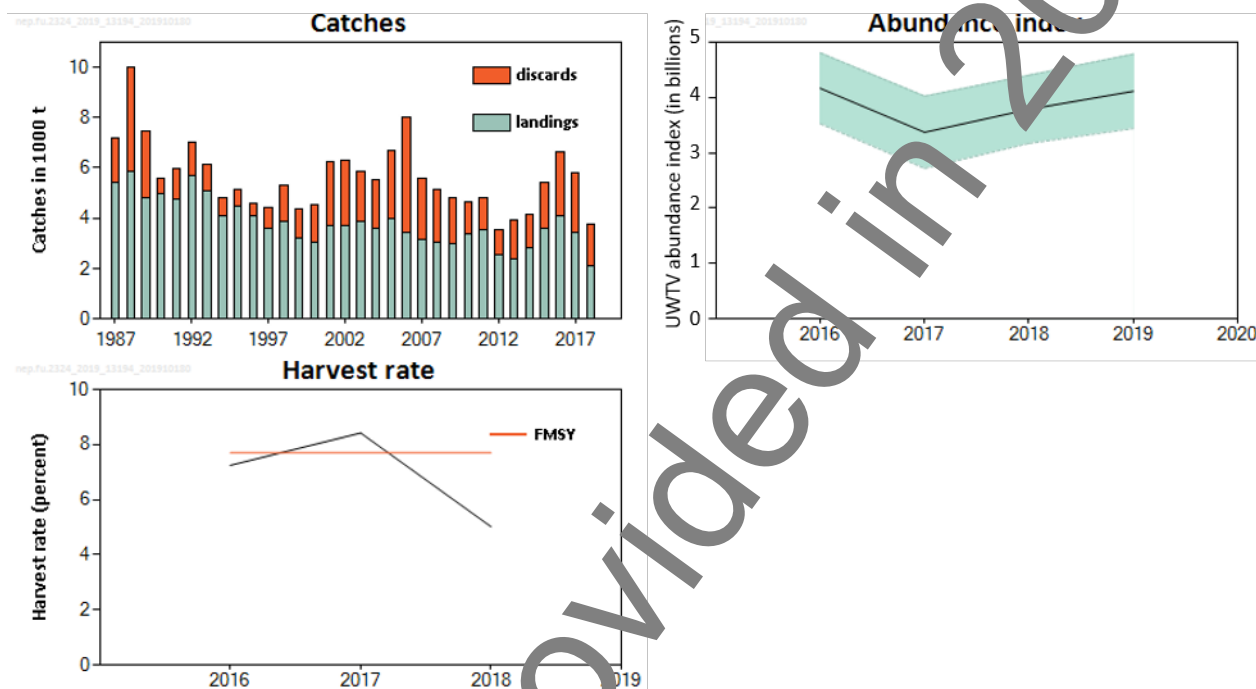


Figure 1 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Summary of the stock assessment. Catches, harvest rate (sum of landings and dead discards in numbers, divided by total abundance), and stock abundance (underwater television (UWTV) survey, in billions; 95% confidence intervals). The orange line represents the F_{MSY} harvest rate.

Stock and exploitation status

ICES assesses that fishing pressure on the stock in 2018 is below F_{MSY} ; no reference points for stock size have been defined for this stock.

Table 1 Norway lobster in divisions 8.a and 8.b, functional units 23–24. 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 Btrigger	?	?
Precautory approach	F_{pa}, F_{lim}	✓	?	✓ Below possible reference points	Bpa, Blim	?	?
Management plan	FMGT	✓	✗	✓ Below	BMGT	—	—
							Not applicable

Catch scenarios

Table 2 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance	4113 million	Abundance in UWTV assessment 2019
Mean weight in wanted catch	24.86 grammes	Average 2016–2018
Mean weight in unwanted catch	11.73 grammes	Average 2016–2018
Unwanted catch proportion (total)	59.46%	Average (proportion by number) 2016–2018
Discards survival	30%	Proportion by number.
Dead discard rate (total)	50.71%	Average (proportion by number) 2016–2018

Table 3 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Catch scenarios for 2020. 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							
MSY approach: F_{MSY}	6573	5767	3886	2381	806	7.70%	5.7%
Other options							
F_{2018}	4284	3759	2533	1256	525	5.02%	-31%
EU MAP ^a : F_{MSY}	6573	5767	3886	2381	806	7.70%	5.7%

Catch scenarios assuming zero discards

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					
MSY approach: F _{MSY}	5401	3193	2208	7.7%	-13.2
Other options					
EU MAP [^] : F _{MSY}	5401	3193	2208	7.7%	-13.2
F ₂₀₁₈	4366	2581	1785	6.2%	-30.0

* By number.

** Advice value for 2020 relative to the advice value for 2019 (6221 tonnes).

*** Ranges are not defined for this stock.

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

The advice for 2020 has increased by 5.7%, due to an increase in stock abundance.

Basis of the advice

Table 4 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis of the advice.

Advice basis	MSY approach
Management plan	The EU multiannual plan (MAP) for stocks in the Western Waters and adjacent waters applies to catches of this stock.
	The MAP stipulates that when the F_{MSY} ranges are not available, fishing opportunities should be based on the best available scientific advice.

Quality of the assessment

Poor fits in the length–frequency models normally used for calculating F_{MSY} for category 1 *Nephrops* stocks meant that F_{MSY} values could not be estimated for functional units (FUs) 23–24 (Figure 2) using this method. The reasons for this require further investigation.

The F_{MSY} reference point (harvest rate of 7.7%) was established as an intermediate rate between the 10% average realized harvest rates of functional units with an observed history of sustainable exploitation, and the lower harvest rates of 5.5% in the FUs 23–24 stock in the recent past (ICES, 2017).

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

Issues relevant for the advice

ICES provides advice based on the MSY approach because the F_{MSY} range for the EU M_{lim} is not defined.

From 2016, fisheries catching *Nephrops* in Subarea 8 are covered by the EU landings obligation (EU, 2015). However, an exemption for high survival has been granted for this fishery since 2016.

The assessment and advice for this stock were carried out by applying a discard survival rate of 30%, based on historical experiments (Charuau *et al.*, 1982). Méhault *et al.* (2016), however, found that the discard survival rate (55%) is higher than the historical reference. Further experiments (Mérillet *et al.*, 2018) estimated the rate at 51% when using the quick chute system for discarding *Nephrops*, which is mandatory since 1 January 2017. This updated estimate was deemed reliable enough to confirm the existing exemption (STECF, 2017). The updated discard survival rate will be considered when the revision of the reference points is carried out.

An improved selection pattern would reduce catches of undersized *Nephrops* and result in a higher yield in the long term.

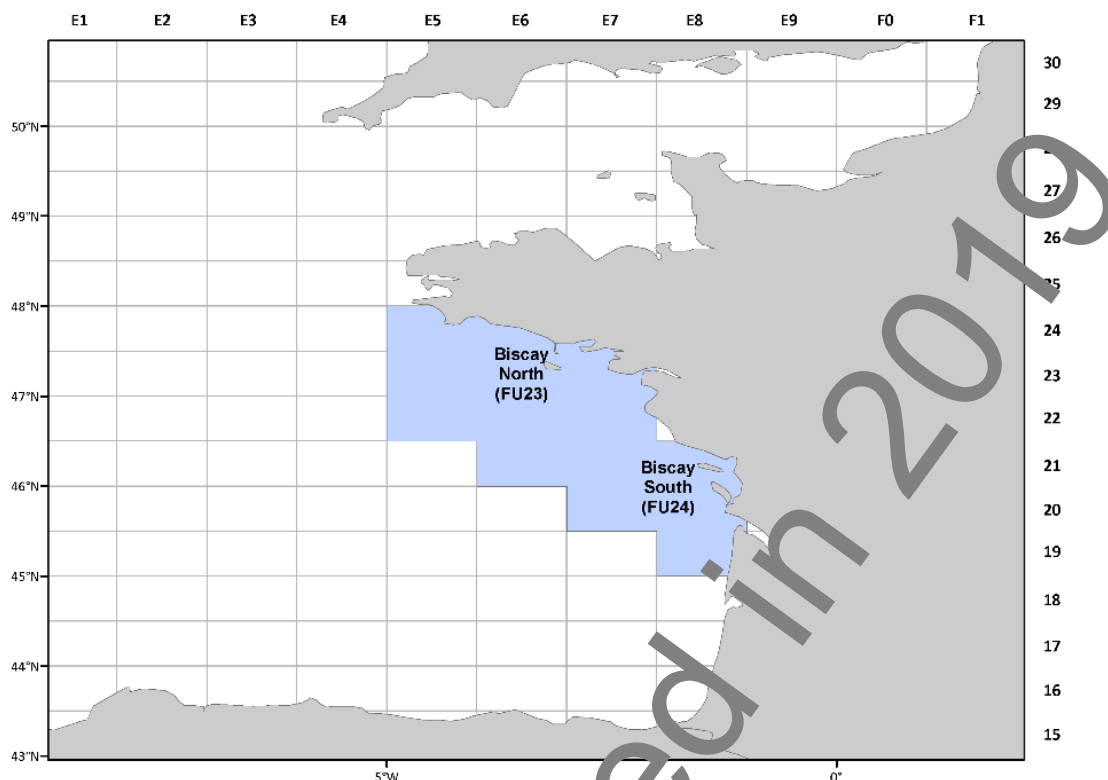


Figure 2 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The functional units (FUs) 23 and 24 constitute a single stock of *Nephrops*.

Reference points

Table 5 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B_{trigger}	Not defined		
	F_{MSY}	7.7% harvest rate	F_{MSY} based on the average realized harvest rates of functional units with an observed history of sustainable exploitation, while also taking into account the low harvest rates applied to the FUs 23–24 stock in the recent past.	ICES (2016)
Precautionary approach	B_{lim}	Not defined		
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	F_{Blim}	Not defined		
	F_{mgt}	Not defined		
	Not defined MAP	Not defined		
	MSY B_{trigger}			
	MAP B_{lim}	Not defined		
	MAP F_{MSY}	7.7% harvest rate	F_{MSY}	EU (2019), ICES (2017)
	MAP range F_{lower}	Not defined		
	MAP range F_{upper}	Not defined		

Basis of the assessment

Table 6 Norway lobster in divisions 8.a and 8.b, functional units 23–24. The basis of the assessment.

ICES stock data category	1 (ICES, 2018)
Assessment type	Underwater television (UWTV) survey (ICES, 2019).
Input data	One survey index (UWTV-FU 23–24); commercial catches (international landings, length frequencies from sampling); fixed maturity parameters from sampling on board; fixed natural mortality; discard survival rate of 30% (Charuau <i>et al.</i> , 1982).
Discards and bycatch	Included in the assessment for the entire time-series (> 50% of catches in number).
Indicators	Length–frequency distributions by sex.
Other information	The latest benchmark (based on the UWTV survey) was performed in October 2016 (ICES, 2017).
Working group	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WG-BIE)

Information from stakeholders

There is no additional information available.

History of the advice, catch, and management

Table 7 Norway lobster in divisions 8.a and 8.b, functional units 23–24. History of ICES advice, the agreed TAC, and ICES estimates of landings and discards. All weights are in tonnes.

Year	ICES advice	Landings corresponding to the advice	Catch advice	Agreed TAC	ICES estimated landings	ICES estimated total discards*
2003	50% reduction of current exploitation rate	2200		3000	3886	1977
2004	20% reduction of current exploitation rate	3300		3150	3571	1932
2005	20% reduction of current exploitation rate	3100		3100	3991	2698
2006	Maintain recent catch	3500		4000	3447	4544
2007	Maintain recent catch	3600		4320	3176	2411
2008	Maintain recent catch	3600		4320	3030	2123
2009	Maintain recent landings (average 2005–2007)	3400		4100	2987	1833
2010	No new advice, same as for 2009	3400		3900	3398	1275
2011	See scenarios			3900	3559	1263
2012	Reduce catch			3900	2520	1013
2013	Decrease landings by 5% (19% increase, followed by 20% PA reduction)	< 3200		3900	2380	1521
2014	Same advice as 2013	< 3200		3900	2807	1326
2015	Increase landings by no more than 14%	< 3214		3900	3569	1822
2016	Same advice as 2015	< 3214		3900	4091	2531
2017	MSY approach	≤ 4160**	≤ 6376**	4160	3412	2387
2018	MSY approach		≤ 5531**	3600	2125	1627
2019	MSY approach		≤ 6221**	3878		
2020	MSY approach		≤ 6573**			

* Dead + surviving discards.

** Assuming recent discard rates.

History of the catch and landings

Table 8 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Official catch distribution by fleet in 2018 as estimated by ICES. All weights are in tonnes.

Catch		Landings	Discards*	
13.0% surviving	87.0% dead	≈ 100% bottom trawl	70% dead	30% surviving
3752		2125	1627	

* Dead + surviving discards.

Table 9 Norway lobster in divisions 8.a and 8.b, functional units 23–24. ICES estimates of removals, landings, and discards. Only the French fleet is fishing in these FUs. All weights are in tonnes.

Year	Removals*	Landings	Discards
1987	6634	5397	1767
1988	8772	5875	4138
1989	6940	4835	3007
1990	5423	4972	644
1991	5603	4753	1213
1992	6532	4681	1217
1993	5791	5100	974
1994	4594	4092	717
1995	4933	4452	687
1996	4460	4118	487
1997	4249	3610	914
1998	4882	3865	1453
1999	3974	3209	1092
2000	4005	3069	1337
2001	5569	3730	2628
2002	5454	3679	2535
2003	5270	3886	1977
2004	4923	3571	1932
2005	5880	3991	2698
2006	6627	3447	4544
2007	4871	3176	2411
2008	4517	3030	2123
2009	4270	2987	1833
2010	4290	3398	1275
2011	4043	3559	1263
2012	3229	2520	1013
2013	3444	2380	1521
2014	3735	2807	1326
2015	4845	3569	1822
2016	5863	4091	2531
2017	5083	3412	2387
2018	3264	2125	1627

* Removals are calculated as landings plus dead discards, assuming a 30% survival rate for discards.

Summary of the assessment

Table 10 Norway lobster in divisions 8.a and 8.b, functional units 23–24. Assessment summary.

Year	Landings in number	Total discards in number	Removals* in number	Abundance index	High	Low	Harvest rate (by number)	Mean weight in landings	Mean weight in discards	Discard rate (by number)	Dead discard rate (by number)	Landings	Discards
	millions			number of individuals			%	grammes		%		tonnes	
1987	288.974	268.244	39.386					0.019	0.007	48.14	39.386	5397	1767
1988	324.498	686.969	59.709					0.018	0.006	67.918	59.709	5875	4123
1989	244.875	404.228	53.608					0.02	0.007	62.275	53.608	4835	2634
1990	213.779	78.546	20.458					0.023	0.008	26.869	20.458	4972	627
1991	217.338	151.634	32.813					0.022	0.008	41.096	32.813	4754	1213
1992	274.286	174.362	30.795					0.021	0.008	38.864	30.795	5681	1354
1993	240.638	124.368	26.567					0.021	0.008	34.073	26.567	5109	1007
1994	188.879	88.267	24.649					0.022	0.008	31.848	24.649	4092	741
1995	202.294	84.78	22.682					0.022	0.008	29.533	22.682	4452	706
1996	182.041	55.25	17.522					0.023	0.009	23.283	17.522	4118	495
1997	188.694	104.994	28.031					0.019	0.008	35.75	28.031	3610	805
1998	161.549	150.995	39.55					0.024	0.01	48.312	39.55	3865	1453
1999	135.304	122.72	38.834					0.024	0.009	47.562	38.834	3209	1148
2000	133.383	163.33	46.155					0.023	0.009	55.047	46.155	3069	1455
2001	172.819	305.547	55.31					0.022	0.008	63.873	55.31	3730	2537
2002	180.442	329.002	56.069					0.02	0.008	64.581	56.069	3679	2620
2003	163.771	201.841	46.315					0.024	0.01	55.206	46.315	3886	1977
2004	154.405	222.102	50.172					0.023	0.009	58.99	50.172	3571	1932
2005	179.758	315.346	55.117					0.022	0.009	63.693	55.117	3991	2698
2006	128.777	487.288	72.594					0.027	0.009	79.097	72.594	3447	4544
2007	117.273	214.788	56.18					0.027	0.011	64.683	56.18	3176	2411
2008	115.274	198.031	54.598					0.026	0.011	63.207	54.598	3030	2123
2009	123.504	174.48	49.722					0.024	0.011	58.554	49.722	2987	1833
2010	138.12	113.53	36.523					0.025	0.011	45.114	36.523	3398	1275

Year	Landings in number	Total discards in number	Removals* in number	Abundance index	High	Low	Harvest rate (by number)	Mean weight in landings	Mean weight discards	Discard rate (by number)	Dead discard rate (by number)	Landings	Discards
	millions			number of individuals			%	grammes		%		tonnes	
2011	108.011	121.603	44.074					0.033	0.01	52.96	44.074	3559	1263
2012	101.424	117.935	44.872					0.025	0.009	53.763	44.872	2520	1012
2013	114.853	154.914	48.564					0.021	0.01	57.425	48.564	2380	1521
2014	121.594	117.93	40.437					0.023	0.011	49.235	40.437	2807	1326
2015	138.92	156.4	44.074					0.026	0.012	52.959	44.074	3569	1822
2016	161.371	200.973	46.575	4167746000	4807776000	3527716000	7.2	0.025	0.013	55.465	46.575	4091	2531
2017	143.502	200.6	49.457	3372539114	4025129114	2719949114	8.4	0.024	0.012	58.297	49.457	3412	2387
2018	83.463	152.342	56.096	3787768868	4403748868	3171788868	5.0	0.025	0.011	64.605	56.096	2125	1627
2019				4113421560	4786151560	3440691560							

* Removals are calculated as landings plus dead discards, assuming a 30% survival rate for discards.

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