

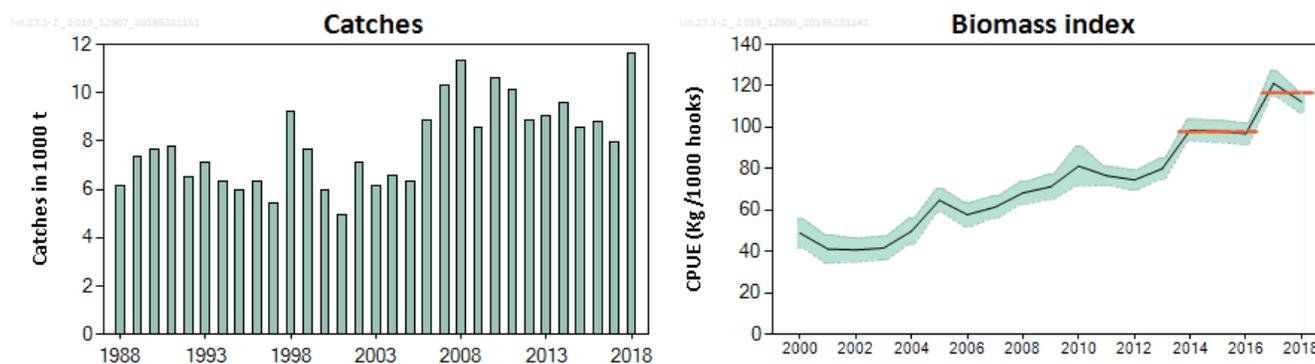
## Ling (*Molva molva*) in subareas 1 and 2 (Northeast Arctic)

### ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 15 593 tonnes in each of the years 2020 and 2021. All catches are assumed to be landed.

### Stock development over time

A standardized catch per unit effort (cpue) based on data from the Norwegian longline fleet shows an increasing trend from 2004 to present. Landings have been relatively stable, but with a sharp increase in 2018.



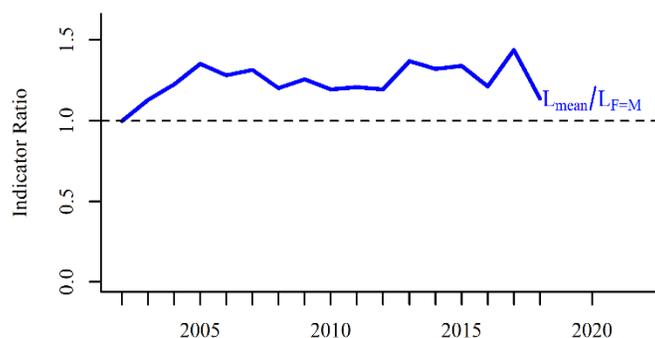
**Figure 1** Ling in subareas 1 and 2. Summary of the stock assessment. Catches in all areas (in thousand tonnes; left) and biomass index (estimates of cpue (kg per 1000 hooks), based on official logbooks from the Norwegian longline fishery in Division 2.a (right). The dashed orange lines indicate the average of the biomass index for 2014 to 2016 and for 2017 to 2018. The shaded areas on the biomass index plot represent 95% confidence intervals.

### Stock and exploitation status

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

**Table 1** Ling in subareas 1 and 2. State of the stock and fishery relative to reference points. The status evaluation is based on the reference point proxy for  $F_{MSY}$  using the length-based indicator model (ICES, 2019; see Figure 2). ).

		Fishing pressure			Stock size				
		2016	2017	2018	2016	2017	2018		
Maximum sustainable yield	$F_{MSY\ proxy}$	✓	✓	✓ Below	$MSY$	?	?	?	Undefined
Precautionary approach	$F_{pa}, F_{lim}$	✓	✓	✓ Below possible reference points	$B_{pa}, B_{lim}$	?	?	?	Undefined
Management plan	$F_{MGT}$	—	—	— Not applicable	$B_{MGT}$	—	—	—	Not applicable
Qualitative evaluation	-	?	?	?	Unknown	↔	↗	↘	Decreasing



**Figure 2** Ling in subareas 1 and 2. Index ratio of the average length relative to the expected length when fishing mortality equals natural mortality ( $L_{\text{mean}}/L_{F=M}$ ) from the length-based indicator method used for the evaluation of the exploitation status (ICES 2019). The exploitation status is below the  $F_{\text{MSY proxy}}$  when the index ratio value is higher than 1.

### Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2018). The standardized cpue series from the Norwegian longline reference fleet was used as an index for the stock development. The advice is based on a comparison of the two latest index values (index A) with the three preceding values (index B), multiplied by the recent (2018–2019) advised catch. The index is estimated to have increased by less than 20%, which means that the uncertainty cap was not applied. The stock size relative to candidate reference points is unknown. The precautionary buffer was applied for the revised 2012 advice. As the stock indicator has increased over several years and fishing pressure is below  $F_{\text{MSY proxy}}$ , the precautionary buffer was not applied. Discarding is considered to be negligible.

**Table 2** Ling in subareas 1 and 2. The basis for the catch scenarios <sup>^</sup>.

Index A (2017–2018)		117
Index B (2014–2016)		98
Index ratio (A/B)		1.19
Uncertainty cap	Not applied	-
Advised catch for 2018–2019		13 103 tonnes
Discard rate		Negligible
Precautionary buffer	Not applied	-
Catch advice *		15 593 tonnes
% Advice change **		19%

<sup>^</sup> 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.

\* [recent advised catch] × [index ratio].

\*\* Advice value for 2020 and 2021 relative to advice value for 2018 and 2019.

The advice has increased because of an increase in the index ratio.

### Basis of the advice

**Table 3** Ling in subareas 1 and 2. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	ICES is not aware of any agreed precautionary management plan for ling in this area.

## Quality of the assessment

The advice is based on a standardized cpue series from the Norwegian longline reference fleet which covers the main areas of the stock (Helle *et al.*, 2015).

## Issues relevant for the advice

There is no information to present for this stock.

## Reference points

**Table 4** Ling in subareas 1 and 2. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger\ proxy}$	Not defined		
	$F_{MSY\ proxy}$	87.75 cm (2018)	Expected mean length of catch above $L_{mean}$ when $F = M$ .	(ICES, 2019)
Precautionary approach	$B_{lim}$	Not defined		
	$B_{pa}$	Not defined		
	$F_{lim}$	Not defined		
	$F_{pa}$	Not defined		
Management plan	$SSB_{mgt}$	Not defined		
	$F_{mgt}$	Not defined		

## Basis of the assessment

**Table 5** Ling in subareas 1 and 2. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2018).
Assessment type	Cpue trends-based assessment (ICES, 2019).
Input data	International catch and cpue from Norwegian longline reference fleet.
Discards and bycatch	Discarding is considered to be negligible.
Indicators	Length-based indicator.
Other information	None.
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP).

## Information from stakeholders

There is no additional available information.

## History of the advice, catch, and management

**Table 6** Ling in subareas 1 and 2. ICES advice, TACs and catches. All weights are in tonnes.

Year	ICES advice*	Catch corresponding to advice	TAC EU in subareas 1 and 2	ICES catches
2003	30% reduction on fishing effort		45	6 157
2004	Biennial		45	6 560
2005	30% reduction on fishing effort		45	6 306
2006	Biennial		45	8 848
2007	Maintain catches below the recent level	6 000	45	10 334
2008	Biennial	6 000	45	11 346
2009	Same advice as last year	6 000	45	8 564
2010	Biennial	6 000	38	10 580
2011	Constrain catches to 8000 t	8 000	38	10 098
2012	No new advice, same as 2011	8 000	38	8 849

Year	ICES advice*	Catch corresponding to advice	TAC EU in subareas 1 and 2	ICES catches
2013	20% reduction in effort	10 000	36	9 027
2014	No new advice, same as 2013	10 000	36	9 597
2015	No new advice, same as 2013	10 000	36	8 550
2016	Precautionary approach	11 300	36	8 822
2017	Biennial	11 300	36	7 971
2018	Precautionary approach	≤ 13 103	36	11 613
2019	Same as 2018	≤ 13 103	36	
2020	Precautionary approach	≤ 15 593		
2021	Same as 2020	≤ 15 593		

\*Prior to 2007, the advice for ling was for the whole Northeast Atlantic area.

### History of the catch and landings

There are no reported catches in the NEAFC regulatory area.

**Table 7** Ling in subareas 1 and 2. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Landings			Discards
	49% longline	46% gillnets	5% other gear types	
11 613 tonnes	11 613 tonnes			Discarding is negligible

**Table 8** Ling in subareas 1 and 2. History of total official commercial catch by area. All weights are in tonnes.

Year	Subarea 1	Division 2.a	Division 2.b	Total subareas 1 and 2
1988		6 119	7	6 126
1989		7 368		7 368
1990		7 628		7 628
1991		7 793		7 793
1992		6 521		6 521
1993		7 093		7 093
1994		6 309	13	6 322
1995		5 954		5 954
1996	136	6 083	127	6 346
1997	31	5 373	5	5 409
1998	123	9 072	5	9 200
1999	64	7 581	6	7 651
2000	69	5 891	4	5 964
2001	66	4 858	33	4 957
2002	206	6 917	9	7 132
2003	89	6 062	6	6 157
2004	345	6 138	77	6 560
2005	107	6 106	93	6 306
2006	58	8 726	64	8 848
2007	96	10 058	180	10 334
2008	80	11 104	162	11 346
2009	236	8 244	84	8 564
2010	57	10 395	128	10 580
2011	129	9 798	171	10 098
2012	158	8 425	266	8 849

Year	Subarea 1	Division 2.a	Division 2.b	Total subareas 1 and 2
2013	126	8 825	76	9 027
2014	123	9 337	137	9 597
2015	92	8 362	96	8 550
2016	65	8 703	54	8 822
2017	43	7 900	28	7 971
2018	34	11 341	238	11 613

### Summary of the assessment

**Table 9** Ling in subareas 1 and 2. Assessment summary. Standardized cpue series from the Norwegian longline reference fleet (kg per 1000 hooks) and catches. High and low refer to the 95% confidence bounds.

Year	Biomass index	High	Low	Catches (tonnes)
1988				6 126
1989				7 368
1990				7 628
1991				7 793
1992				6 521
1993				7 093
1994				6 322
1995				5 954
1996				6 346
1997				5 409
1998				9 200
1999				7 651
2000	48.87	55.87	41.86	5 964
2001	41.21	47.97	34.46	4 957
2002	40.77	46.52	35.02	7 132
2003	41.65	47.35	35.95	6 157
2004	49.79	56.04	43.54	6 560
2005	64.71	70.43	58.99	6 306
2006	57.79	63.65	51.94	8 848
2007	61.42	66.72	56.13	10 334
2008	68.29	73.72	62.86	11 346
2009	71.27	77.3	65.24	8 564
2010	81.22	90.79	71.65	10 580
2011	76.58	81.16	71.99	10 098
2012	74.55	79.43	69.68	8 849
2013	79.97	85.01	74.93	9 027
2014	98.63	103.84	93.42	9 597
2015	98.05	103.37	92.73	8 550
2016	96.88	102.1	91.65	8 822
2017	121.14	127.26	115.03	7 971
2018	112.23	117.21	107.25	11 613

## Sources and references

Helle, K., Pennington, M., Hareide, N-R., and Fossen, I. 2015. Selecting a subset of the commercial catch data for estimating catch per unit effort series for ling (*Molva molva* L.). Fisheries Research, 165: 115–120.

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