

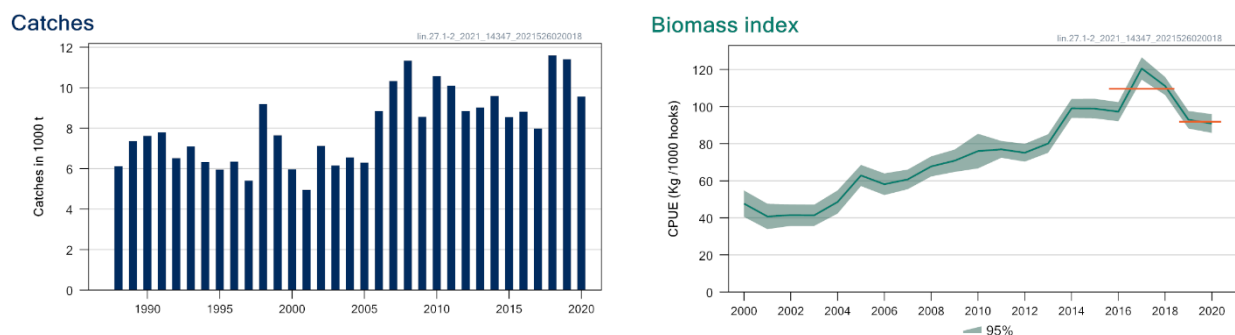
## Ling (*Molva molva*) in subareas 1 and 2 (Northeast Arctic)

### ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 10 454 tonnes in each of the years 2022 and 2023.

### Stock development over time

Fishing pressure on the stock is below  $F_{MSY}$  (Figure 2). No reference points for stock size have been defined for this stock.



**Figure 1** Ling in subareas 1 and 2. Summary of the stock assessment. Left: Total catches (in 1000 t). Right: Standardized CPUE (mean and 95% confidence interval) from the Norwegian longline fleet targeting ling for all areas combined (kg per 1000 hooks). The horizontal orange lines indicate the average of the most recent two years and the previous three years.

### Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2012). 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 (2020–2021) advised catch. The index is estimated to have decreased by less than 20%, which means that the uncertainty cap was not applied. The precautionary buffer was last applied in 2012 and has therefore been considered this year. Fishing pressure is below the MSY reference point; however, stock size is unknown, and therefore the precautionary buffer was applied in the advice. Discarding is considered negligible.

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

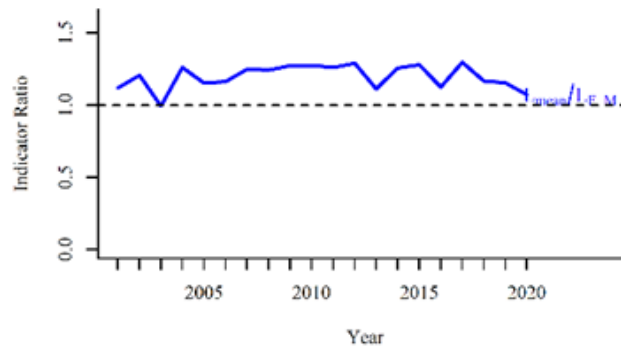
Index A (2019–2020)		92
Index B (2016–2018)		110
Index ratio (A/B)		0.84
Uncertainty cap	Not applied	
Advised catch for 2020–2021 (issued in 2019)		15 593 tonnes
Discard rate		Negligible
Precautionary buffer	Applied	0.8
Catch advice *		10 454 tonnes
% Advice change **		–33%

<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.

\* [Advised catch for 2020 and 2021] × [index ratio] × [precautionary buffer].

\*\* Advice value for 2022 and 2023 relative to advice value for 2020 and 2021.

The advice has decreased because of a decrease in the biomass index, and the precautionary buffer was applied.



**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 ( $L_{\text{mean}}/L_{F=M}$ ) for the Norwegian longline fleet from the length-based indicator method used for the evaluation of the exploitation status (ICES, 2021). The exploitation status is below the  $F_{\text{MSY proxy}}$  when the index ratio value is higher than 1.

### Basis of the advice

**Table 2** 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

This stock is classified as Category 4 in the NEAFC categorization of deep-sea species/stocks. This implies that fisheries are primarily restricted to coastal state Exclusive Economic Zones (EEZs) and therefore management measures are not taken by NEAFC unless complementary to coastal state conservation and management measures (NEAFC, 2016).

### Reference points

**Table 3** Ling in subareas 1 and 2. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{\text{trigger}}$	Not defined		
	$F_{\text{MSY}}$	$\frac{L_{\text{mean}}}{L_{F=M}} = 1$	Relative value from LBI analysis, assuming $M/K = 1.5$ . $L_{F=M}$ is based on $L_c$ (length at 50% of modal abundance), which varies each year	(ICES, 2021)
Precautionary approach	$B_{\text{lim}}$	Not defined		
	$B_{\text{pa}}$	Not defined		
	$F_{\text{lim}}$	Not defined		
	$F_{\text{pa}}$	Not defined		
Management plan	$SSB_{\text{mgt}}$	Not defined		
	$F_{\text{mgt}}$	Not defined		

## Basis of the assessment

**Table 4** Ling in subareas 1 and 2. Basis of the assessment and advice.

ICES stock data category	3 ( <a href="#">ICES, 2021a</a> )
Assessment type	CPUE trends-based assessment (ICES, 2021b)
Input data	Total international commercial catches; and standardized CPUE from the 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 ( <a href="#">WGDEEP</a> )

## History of the advice, catch, and management

**Table 5** Ling in subareas 1 and 2. ICES advice, TAC 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
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	11 604
2019	Same as 2018	≤ 13 103	36	11 413
2020	Precautionary approach	≤ 15 593	117 <sup>#</sup>	9 564
2021	Same as 2020	≤ 15 593	**	
2022	Precautionary approach	≤ 10 454		
2023	Same as 2022	≤ 10 454		

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

\*\* A TAC was not agreed at the time of publication.

## History of the catch and landings

There are no reported catches in the NEAFC Regulatory Area.

**Table 6** Ling in subareas 1 and 2. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings			Discards
	37% longline	59% gillnets	4% other gear types	
9564 tonnes	9564 tonnes			Negligible

<sup>#</sup> Version 2: Value corrected.

**Table 7** 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
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	11 332	238	11 604
2019	37	11 321	55	11 413
2020	73	9 395	96	9 564

**Summary of the assessment**

**Table 8** 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 for the biomass index.

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	47.68	54.80	40.55	5 964
2001	40.77	47.64	33.91	4 957
2002	41.50	47.29	35.70	7 132
2003	41.37	47.11	35.64	6 157
2004	48.57	54.83	42.31	6 560
2005	62.88	68.58	57.17	6 306
2006	58.14	63.99	52.29	8 848
2007	60.76	66.06	55.47	10 334
2008	67.75	73.17	62.33	11 346
2009	70.82	76.85	64.79	8 564
2010	76.03	85.38	66.68	10 580
2011	76.95	81.49	72.41	10 098
2012	75.13	79.95	70.31	8 849
2013	80.12	85.13	75.12	9 027
2014	99.05	104.19	93.90	9 597
2015	98.94	104.23	93.66	8 550
2016	97.29	102.45	92.13	8 822
2017	120.57	126.62	114.52	7 971
2018	111.13	116.01	106.26	11 604
2019	92.92	97.65	88.18	11 413
2020	90.89	95.95	85.83	9 564

## 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. <https://doi.org/10.1016/j.fishres.2014.12.015>.

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

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