

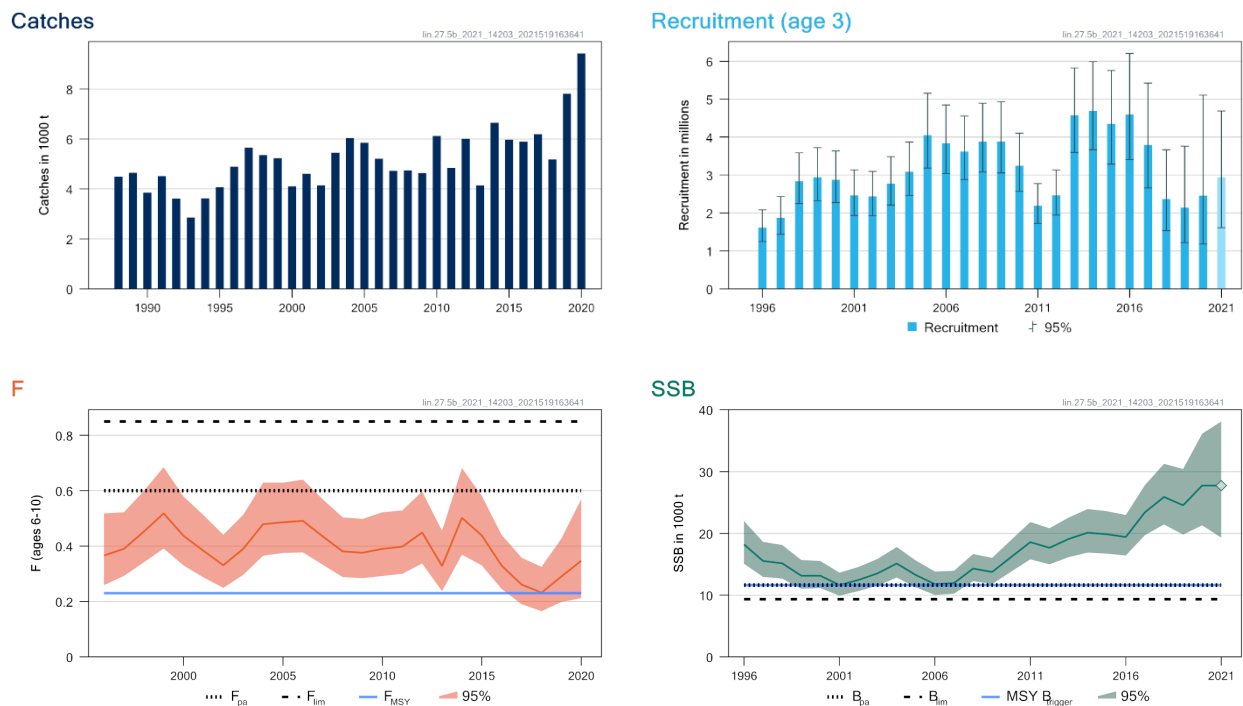
## Ling (*Molva molva*) in Division 5.b (Faroes grounds)

### ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2022 should be no more than 5636 tonnes. ICES is not in a position to advise on the corresponding level of fishing effort.

### Stock development over time

Fishing pressure on the stock is above  $F_{MSY}$  but below  $F_{pa}$  and  $F_{lim}$ ; spawning-stock size is above MSY  $B_{trigger}$ ,  $B_{pa}$ , and  $B_{lim}$ .



**Figure 1** Ling in Division 5.b. Summary of the stock assessment. Catches, recruitment (R), fishing mortality (F), and spawning-stock biomass (SSB). The assumed recruitment value for 2021 is shaded in a lighter colour, and the diamond SSB value for 2021 is predicted.

### Catch scenarios

**Table 1** Ling in Division 5.b. Assumptions made for the interim year and in the forecast. All values are median estimates from the stochastic forecast.

Variable	Value	Notes
$F_{ages\ 6-10}$ (2021)	0.357	$F_{sq} = F_{2020}$
SSB (2022)	25 070	Short-term forecast fishing at $F_{sq}$ ; tonnes
$R_{age\ 3}$ (2021/2022)	2 942	Recruitment, resampled from the years 1996–2019; thousands
Total catch (2021)	8 744	Catch from short-term forecast using $F_{sq}$ ; tonnes

**Table 2** Ling in Division 5.b. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2022)	F <sub>total</sub> (2022)	SSB (2023)	% SSB change *	% Advice change **
ICES advice basis					
MSY approach = F <sub>MSY</sub>	5 636	0.23	25 018	0	+36
Other scenarios					
F = 0	0	0	31 436	+25	-100
F <sub>pa</sub> = F <sub>P05</sub>	11 838	0.60	17 951	-28	+185
F <sub>lim</sub>	14 816	0.85	14 728	-41	+256
F = F <sub>2021</sub>	8 083	0.357	22 279	-11	+94

\* SSB<sub>2023</sub> relative to SSB<sub>2022</sub> (25 070 tonnes).

\*\* The advice value for 2022 relative to advice value for 2020 and 2021 (4 157 tonnes).

The catch advice has increased because the assessment has been benchmarked and the advice is now based on estimates from an age-based assessment.

### Basis of the advice

**Table 3** Ling in Division 5.b. The basis of the advice.

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

### Quality of the assessment

The assessment of ling in Division 5.b has been benchmarked and, as a result, the stock has been upgraded from category 3 to category 1 with estimated reference points (ICES, 2021a).

### Issues relevant for the advice

This stock is classified as Category 4 in the NEAFC categorization of deep-sea species/stocks (NEAFC, 2016). 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.

ICES is not able to provide direct effort advice because the relationship between catch and fishing effort in the commercial fisheries is unknown.

### Reference points

**Table 4** Ling in Division 5.b. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B <sub>trigger</sub>	11 627	B <sub>pa</sub> ; in tonnes	ICES, 2021a
	F <sub>MSY</sub>	0.23	Stochastic simulations (EqSim) with segmented regression fixed at B <sub>lim</sub>	ICES, 2021a
Precautionary approach	B <sub>lim</sub>	9 340	B <sub>lim</sub> = B <sub>pa</sub> /exp( $\sigma \times 1.645$ ), $\sigma = 0.13$ ; in tonnes	ICES, 2021a
	B <sub>pa</sub>	11 627	B <sub>pa</sub> = B <sub>loss</sub> lowest observed SSB (2001) from benchmark assessment; in tonnes	ICES, 2021a
	F <sub>lim</sub>	0.85	The F that on average leads to B <sub>lim</sub> from Eqsim	ICES, 2021a
	F <sub>pa</sub>	0.60	F <sub>P05</sub> ; the F that leads to SSB $\geq$ B <sub>lim</sub> with 95% probability	ICES, 2021a
Management plan	SSB <sub>mgt</sub>			
	F <sub>mgt</sub>			

## Basis of the assessment

**Table 5** Ling in Division 5.b. Basis of assessment and advice.

ICES stock data category	1 (ICES, 2021b)
Assessment type	Age-based analytical assessment (SAM; ICES, 2021c) that uses catches in the model and in the forecast
Input data	Commercial catches (mainly Faroese catches, ages and length frequencies from catch sampling); survey indices from the Faroese groundfish spring survey (G1264) and the Faroese groundfish summer survey (G3284); time invariant maturity ogive; natural mortalities set at 0.15
Discards and bycatch	Discarding is considered negligible
Indicators	None
Other information	Benchmarked for the first time in 2021 (ICES, 2021a)
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP)

## History of the advice, catch, and management

**Table 6** Ling in Division 5.b. ICES advice, TACs<sup>^</sup> and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	TAC EU Subarea 5 (EU and international waters)	TAC EU Division 5.b (Faroese waters) **	TAC Norway Division 5.b (Faroese waters) **	ICES landings
2003	30% reduction on fishing effort ***		54	3600		5453
2004	Biennial***		54	3600	2200	6039
2005	No increased in effort		48	3600	2200	5849
2006	Biennial			3065	2457	5213
2007	No increased in effort	-	34	3065	2406	4731
2008	Biennial	-	34	3065	2525	4747
2009	No increased in effort	-	34	3065	2525	4643
2010	Biennial	-	34	2700	2425	6129
2011	No increase in effort and a reduction in catches should be considered	-	33	0	-	4843
2012	No new advice, same as 2011	-	33	0	-	6011
2013	20% decrease in effort	-	33	0	-	4133
2014	No new advice, same as 2013	-	33	-	1250	6655
2015	Same effort advised as for 2013	-	33	-	1900	5974
2016	Adjust effort corresponding to catch advice	6730	33	2000	2000	5890
2017	Biennial	6730	33	2000	2000	6195
2018	Adjust effort corresponding to catch advice	≤ 5196	33	1885	2200	5185
2019	Biennial	≤ 5196	33	1885	2300	7816
2020	Adjust effort corresponding to catch advice	≤ 4157	33	1885	2500	9427*
2021	Biennial	≤ 4157	^^	^^	2500	
2022	MSY approach	≤ 5636				

<sup>^</sup> The Faroese fisheries in Division 5.b are managed using days at sea.

\* Preliminary value.

\*\* Combined TAC for ling and blue ling.

\*\*\* Advice for ling in the Northeast Atlantic.

^^ TACs were not agreed at the time of publication.

## History of the catch and landings

There are no reported catches in the NEAFC Regulatory Area.

**Table 7** Ling in Division 5.b. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings		Discards
	Trawl 32%	Longline 68%	
9427 tonnes	9427 tonnes		Negligible

**Table 8** Ling in Division 5.b. History of ICES estimated commercial catch presented by area for each country. All weights are in tonnes.

Year	Subdivision 5.b.1									Subdivision 5.b.2				Division 5.b
	Denmark ***	Faroes	France	Germany	Norway	UK (E&W) **	UK (Scotland)	Russia	Total 5.b.1	Faroes	France	Norway	Total 5.b.2	Total 5.b
1988	42	1383	53	4	884	1	5		2372	832		1284	2116	4488
1989		1498	44	2	1415		3		2962	362		1328	1690	4652
1990		1575	36	1	1441		9		3062	162		633	795	3857
1991		1828	37	2	1594		4		3465	492		555	1047	4512
1992		1218	3		1153	15	11		2400	577		637	1214	3614
1993		1242	5	1	921	62	11		2242	282		332	614	2856
1994		1541	6	13	1047	30	20		2657	479		486	965	3622
1995		2789	4	13	446	2	32		3286	281		503	784	4070
1996		2672			1284	12	28		3996	102		798	900	4896
1997		3224	7		1428	34	40		4733	526		398	924	5657
1998		2422	6		1452	4	145		4029	511		819	1330	5359
1999		2446	17	3	2034		71		4571	164	4	498	666	5238
2000		2103	7	1	1305	2	61		3479	229	1	399	629	4109
2001		2069	14	3	1496	5	99		3686	420	6	497	923	4609
2002		1638	6	2	1640	3	239		3528	150	4	457	611	4139
2003		2139	12	2	1526	3	215		3897	624	4	927	1555	5453
2004		2733	15	1	1799	3	178	2	4731	1058	3	247	1308	6039
2005		2886	3		1553	3	175		4620	575	7	647	1229	5849
2006	3	3563	6		850		136		4558	472	6	177	655	5213
2007	2	3004	9		1071		6		4092	327	4	309	640	4731
2008		3354	4		740	32	25	11	4166	458	3	120	580	4747
2009	13	3471	2		419		270		4174	270	1	198	469	4643
2010	28	4906	2		442		121		5500	393	1	236	630	6129
2011	49	4270	2						4321	522	< 1		522	4843
2012	11 7	5452	7						5576	434	1		435	6011
2013	3	3734	7						3745	387	1		388	4133
2014		5653	10		308		7	13	5983	276		389	672	6655
2015		4375	16		993	1	3	6	5391	244	1	337	585	5976
2016		4214	8		855	< 1	114		5180	569	4	126	710	5890
2017		4371	4		864		54		5294	359		542	901	6195
2018		3836	2		793		48		4673	428		78	512	5185
2019		4861	25		1983		29		6895	338		580	920	7816
2020*		5642	16		2537		88		8277	1015		128	1149	9427

\* Preliminary.

\*\* Includes Subdivision 5.b.2.

\*\*\* Includes Greenland.

Summary of the assessment

**Table 9** Ling in Division 5.b. Assessment summary. Weights are in tonnes, recruitment in thousands.

Year	Recruitment			SSB			Catch	F		
	Age 3	97.5 percentile	2.5 percentile	SSB	97.5 percentile	2.5 percentile		Mean F <sub>ages 6–10</sub>	97.5 percentile	2.5 percentile
	thousands			tonnes			tonnes			
1988							4488			
1989							4652			
1990							3857			
1991							4512			
1992							3614			
1993							2856			
1994							3622			
1995							4070			
1996	1611	2083	1246	18217	22017	15073	4896	0.37	0.52	0.26
1997	1872	2433	1441	15537	18636	12953	5657	0.39	0.52	0.29
1998	2840	3587	2248	15158	18129	12675	5359	0.45	0.60	0.34
1999	2942	3722	2325	13156	15704	11021	5238	0.52	0.69	0.39
2000	2876	3636	2275	13150	15537	11130	4109	0.44	0.58	0.33
2001	2463	3136	1934	11635	13649	9919	4609	0.38	0.51	0.29
2002	2439	3095	1923	12462	14571	10659	4139	0.33	0.44	0.25
2003	2776	3487	2209	13537	15887	11535	5453	0.39	0.51	0.30
2004	3089	3871	2464	15126	17806	12849	6039	0.48	0.63	0.37
2005	4052	5155	3184	13261	15617	11261	5849	0.49	0.63	0.38
2006	3837	4850	3036	11776	13824	10032	5213	0.49	0.64	0.38
2007	3620	4553	2879	11953	13955	10238	4731	0.44	0.57	0.33
2008	3880	4893	3077	14301	16663	12273	4747	0.38	0.50	0.29
2009	3881	4935	3052	13759	16048	11796	4643	0.38	0.50	0.28
2010	3247	4104	2569	16193	18966	13825	6129	0.39	0.52	0.29
2011	2189	2776	1726	18588	21858	15808	4843	0.40	0.53	0.30
2012	2469	3137	1944	17674	20838	14990	6011	0.45	0.60	0.34
2013	4576	5822	3597	19092	22570	16151	4133	0.33	0.46	0.24
2014	4687	5990	3668	20120	23961	16895	6655	0.50	0.68	0.37
2015	4349	5755	3287	19870	23610	16723	5976	0.44	0.58	0.33
2016	4598	6205	3406	19425	22986	16416	5890	0.33	0.44	0.25
2017	3796	5425	2657	23425	27831	19716	6195	0.26	0.36	0.190
2018	2370	3668	1531	25905	31280	21453	5185	0.23	0.33	0.165
2019	2143	3761	1221	24560	30444	19813	7816	0.29	0.43	0.198
2020	2456	5105	1181	27763	36171	21309	9427*	0.35	0.57	0.21
2021	2942	4687	1611	27756	38145	19317				

\* Preliminary.

## Sources and references

- ICES. 2021a. Benchmark Workshop for Barents Sea and Faroese Stocks (WKBARFAR 2021). ICES Scientific Reports. 3:21. 205 pp. <https://doi.org/10.17895/ices.pub.7920>.
- ICES. 2021b. Advice on fishing opportunities. *In* Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. <https://doi.org/10.17895/ices.advice.7720>.
- ICES. 2021c. Working Group on the Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP). ICES Scientific Reports. 3:47. 944 pp. <http://doi.org/10.17895/ices.pub.8108>.
- NEAFC. 2016. The NEAFC approach to conservation and management of deep-sea species and categorization of deep-sea species/stocks. Adopted at the 35th Annual Meeting, November 2016  
[https://www.neafc.org/system/files/NEAFC\\_approach\\_to\\_DSS\\_conservation-and-management\\_Nov16.pdf](https://www.neafc.org/system/files/NEAFC_approach_to_DSS_conservation-and-management_Nov16.pdf).

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

*Recommended citation:* ICES. 2021. Ling (*Molva molva*) in Division 5.b (Faroes grounds). *In* Report of the ICES Advisory Committee, 2021. ICES Advice 2021, lin.27.5b. <https://doi.org/10.17895/ices.advice.7788>.