

Cod (*Gadus morhua*) in Subdivision 5.b.1 (Faroe Plateau)

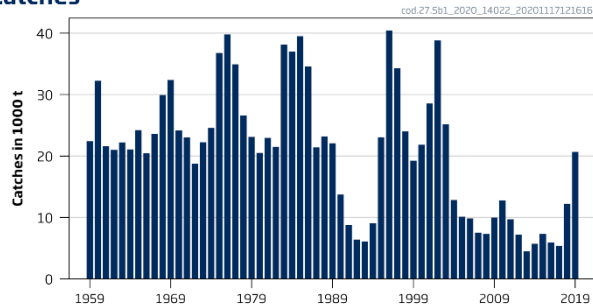
ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2021 should be no more than 6247 tonnes. ICES is not in a position to advise on the corresponding level of fishing effort.

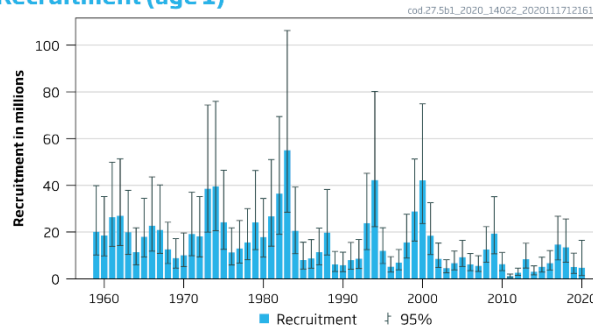
Note: This advice sheet is abbreviated due to the COVID-19 disruption. The previous advice issued for 2020 is attached as Annex 1.

Stock development over time

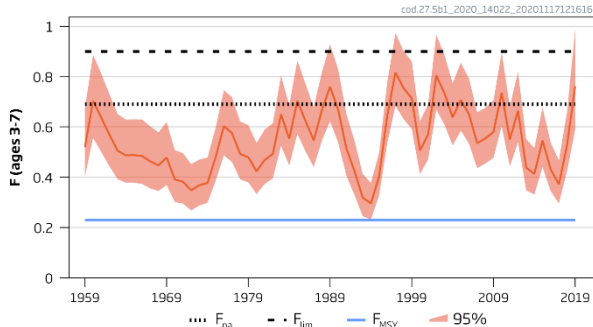
Catches



Recruitment (age 1)



F



SSB

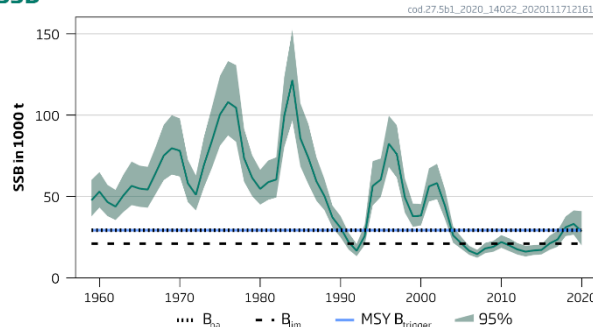


Figure 1 Cod in Subdivision 5.b.1. Summary of the stock assessment with 95% confidence intervals. Catches, recruitment (R), fishing mortality (F), and spawning-stock biomass (SSB).

Stock and exploitation status

Table 1 Cod in Subdivision 5.b.1. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size		
		2017	2018	2019	2018	2019	2020
Maximum sustainable yield	F_{MSY}	✗	✗	✗	Above	MSY $B_{trigger}$	✗ Below trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	⚠	Increased risk	B_{pa}, B_{lim}	⚠ Increased risk
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	— Not applicable

Catch scenarios

Table 2 Cod in Subdivision 5.b.1. Assumptions made for the interim year and in the forecast. All weights are in tonnes.

Variable	Value	Notes
$F_{\text{ages 3-7}} (2020)$	0.48	Based on catch estimate of 10600 tonnes in 2020.
SSB_{2021}	33111	Based on $F = 0.48$; in tonnes.
$R_{\text{age 1}} (2021)$	6279	Median of resampled estimates from 2010 to 2019; in thousands.
Landings (2020)	10600	Catch estimate for 2020 based on catch statistics to the end of September adjusted for the entire year; in tonnes.
Discards (2020)	0	Discarding is considered negligible; in tonnes.

Table 3 Cod in Subdivision 5.b.1. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2021)	$F_{\text{total}} (2021)$	SSB_{2022}	% SSB change *	% Advice change **
ICES advice basis					
MSY approach: F_{MSY}	6247	0.23	37415	+13	-47
Other scenarios					
$F = 0$	0	0	49910	+51	-100
$F = F_{2020}$	11366	0.48	31479	-5	-3
$F = F_{\text{pa}}$	15162	0.69	26798	-19	+30
$F = F_{\text{lim}}$	18099	0.90	23354	-29	+55

* SSB_{2022} relative to SSB_{2021} (33 111 tonnes).

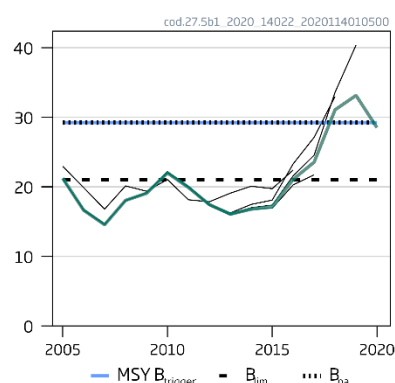
**The advice value for 2021 relative to the advice value for 2020 as issued in 2019 (11 679 tonnes).

The catch advice for 2021 has decreased compared to the advice for 2020; this is due to a substantial downward revision of the spawning-stock biomass (SSB).

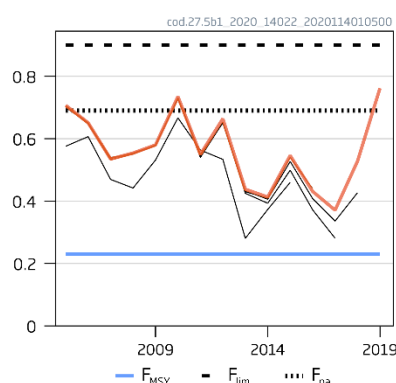
Quality of the assessment

With the addition of the 2020 survey information, the 2018 and 2019 recruitment estimates have been revised downwards contributing to the downward revision of SSB.

SSB (1000 t)



F (ages 3-7)



Rec (age 1; Millions)

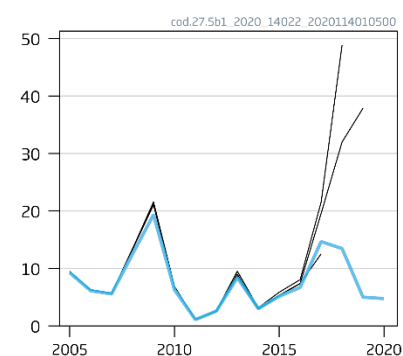


Figure 2 Cod in Subdivision 5.b.1. Historical assessment results. Results of the last five assessments are plotted, with the solid coloured line representing the current assessment.

History of the advice, catch, and management

Table 4 Cod in Subdivision 5.b.1. ICES advice and catch. All weights are in tonnes.

Fishing year	ICES advice	Catch corresponding to advice	Agreed TAC ***	ICES catch
1987	No increase in F	< 31000		21391
1988	No increase in F (revised estimate)	< 29000 (23000)		23182
1989	No increase in F	< 19000		22068
1990	No increase in F	< 20000		13692
1991	TAC	< 16000		8750
1992	No increase in F	< 20000		6396
1993	No fishing	0		6107
1994	No fishing	0	8500/12500 **	9046
1995	No fishing	0	12500 *	23045
1996	F at lowest possible level	-	20000 **	40422
1997	80% of F(95)	< 24000		34304
1998	30% reduction in effort from 1996/97	-		24005
1999	F less than proposed F_{pa} (0.35)	< 19000		19245
2000	F less than proposed F_{pa} (0.35)	< 20000		21833
2001	F less than proposed F_{pa} (0.35)	< 16000		28577
2002	75% of F(2000)	< 22000		38834
2003	75% of F(2001)	< 32000		25167
2004	25% reduction in effort	-		12840
2005	Rebuilding plan involving large reduction	-		10119
2006	Rebuilding plan involving large reduction	-		9844
2007	Rebuilding plan involving large reduction in effort	-		7511
2008	No fishing; development of a rebuilding plan	0		7315
2009	No fishing; development of a rebuilding plan	0		9979
2010	No fishing; development of a rebuilding plan	0		12762
2011	Reduce F to below F_{pa}	< 16000		9692
2012	MSY framework, reduce F by 30%	< 10000		7204
2013	MSY approach, $F < 0.20$	< 4800		4473
2014	MSY approach, reduce F by 69%	< 3600		5711
2015	MSY approach, reduce F by 23%	< 4500		7329
2016	Lowest possible level (LPL) and develop a mixed-fishery management plan	-		5876
2017	MSY approach ($F \leq 0.16$)	≤ 2800		5360
2018	MSY approach ($F \leq 0.22$)	≤ 4579		12214
2019	MSY approach	≤ 9354		20670
2020	MSY approach	≤ 11679		
2021	MSY approach	≤ 6247		

* From 1 September in the quota year to 31 August the following year.

** The TAC was increased during the quota year.

*** Not applicable since 1997.

Summary of the assessment

Table 5 Cod in Subdivision 5.b.1. Assessment summary.

Year	Recruitment			SSB			Catch	F		
	Age 1	97.5 percentile	2.5 percentile	SSB	97.5 percentile	2.5 percentile		Mean F _{ages 3–7}	97.5 percentile	2.5 percentile
	Thousands			Tonnes				Tonnes		
1959	20144	39870	10178	47632	60120	37738	22415	0.52	0.67	0.40
1960	18570	35237	9786	52981	64978	43200	32255	0.70	0.89	0.56
1961	26287	49877	13855	46563	57118	37959	21598	0.64	0.81	0.50
1962	26960	51337	14158	43803	54043	35503	20967	0.57	0.73	0.44
1963	19898	37896	10448	50770	63587	40537	22215	0.51	0.65	0.39
1964	11375	21819	5930	56504	71445	44688	21078	0.49	0.63	0.38
1965	17954	34399	9370	54851	68963	43627	24212	0.49	0.63	0.38
1966	22719	43637	11828	54237	68225	43117	20418	0.48	0.63	0.37
1967	20903	40169	10878	64503	80632	51600	23562	0.46	0.60	0.36
1968	12570	24217	6525	75163	94076	60053	29930	0.45	0.58	0.35
1969	8875	17193	4581	79658	99965	63476	32371	0.48	0.62	0.37
1970	10062	19585	5169	78124	98024	62265	24183	0.39	0.51	0.30
1971	19117	37081	9856	58112	72521	46565	23010	0.38	0.50	0.30
1972	18178	35110	9412	51023	62854	41420	18727	0.35	0.45	0.27
1973	38547	74382	19977	69347	86623	55517	22228	0.37	0.47	0.29
1974	39512	75969	20551	84323	105082	67665	24581	0.38	0.48	0.30
1975	24230	46498	12626	100446	124183	81246	36775	0.48	0.60	0.39
1976	11303	21810	5858	108018	133231	87577	39799	0.60	0.75	0.49
1977	12961	24926	6739	104531	130739	83577	34927	0.57	0.72	0.46
1978	15615	30042	8117	73510	91557	59021	26585	0.49	0.62	0.39
1979	24067	46329	12502	61493	75331	50198	23112	0.48	0.61	0.38
1980	17895	34355	9322	54657	66381	45003	20513	0.42	0.54	0.33
1981	26714	51051	13979	58812	72110	47966	22963	0.47	0.59	0.37
1982	36377	69476	19047	60465	74082	49351	21489	0.49	0.62	0.40
1983	55032	106286	28495	99677	123583	80395	38133	0.65	0.80	0.53
1984	20556	39287	10756	121553	152653	96788	36979	0.55	0.69	0.45
1985	8069	15610	4171	85733	107266	68523	39484	0.70	0.86	0.57
1986	8694	16695	4527	73679	94469	57464	34595	0.62	0.77	0.50
1987	11377	21683	5969	59253	74135	47359	21391	0.55	0.68	0.44
1988	19735	38232	10187	50210	60681	41546	23182	0.67	0.82	0.55
1989	6053	11719	3127	36997	44343	30868	22068	0.76	0.93	0.62
1990	5859	11357	3022	30697	37937	24839	13692	0.67	0.83	0.54
1991	7970	15566	4080	21924	27690	17359	8750	0.51	0.65	0.41
1992	8595	16773	4405	16624	20831	13267	6396	0.42	0.54	0.33
1993	23753	45151	12496	25681	32705	20166	6107	0.32	0.41	0.25
1994	42283	80147	22308	56479	71734	44468	9046	0.30	0.38	0.23
1995	11946	21861	6527	60395	73375	49712	23045	0.40	0.50	0.33
1996	5204	9464	2861	82440	99689	68176	40422	0.65	0.78	0.54
1997	6929	12541	3828	75959	93788	61519	34304	0.82	0.97	0.68
1998	15637	27621	8853	49422	61004	40039	24005	0.75	0.90	0.63
1999	28812	51253	16197	37804	45615	31330	19245	0.71	0.86	0.59
2000	42070	74926	23622	38225	45330	32234	21833	0.51	0.62	0.41
2001	18371	32560	10365	56177	67291	46900	28577	0.57	0.69	0.47
2002	8553	15224	4805	58224	70082	48371	38834	0.80	0.97	0.67

Year	Recruitment			SSB			Catch	F		
	Age 1	97.5 percentile	2.5 percentile	SSB	97.5 percentile	2.5 percentile		Mean F _{Pages 3–7}	97.5 percentile	2.5 percentile
	Thousands			Tonnes				Tonnes		
2003	4550	8117	2550	44056	54185	35821	25167	0.73	0.89	0.61
2004	6722	11881	3803	26113	31627	21560	12840	0.64	0.77	0.53
2005	9254	16358	5235	21235	25242	17864	10119	0.71	0.86	0.59
2006	6123	10818	3465	16631	19605	14108	9844	0.65	0.79	0.53
2007	5558	9853	3135	14547	17199	12305	7511	0.54	0.66	0.44
2008	12508	22334	7005	18049	21493	15157	7315	0.55	0.68	0.45
2009	19343	35066	10670	19056	22676	16014	9979	0.58	0.71	0.48
2010	6279	11283	3494	21990	26220	18443	12762	0.74	0.90	0.60
2011	1094	2000	599	19899	24210	16356	9692	0.55	0.68	0.44
2012	2575	4589	1444	17444	21319	14273	7205	0.66	0.82	0.54
2013	8390	15205	4629	16074	19723	13100	4473	0.44	0.55	0.35
2014	3019	5509	1655	16776	20075	14019	5711	0.41	0.52	0.33
2015	5150	9217	2878	17138	20419	14384	7329	0.55	0.68	0.44
2016	6695	12055	3718	21070	25855	17170	5876	0.43	0.54	0.35
2017	14667	26759	8040	23539	28979	19120	5360	0.37	0.47	0.30
2018	13455	25622	7066	31071	37669	25629	12214	0.53	0.66	0.42
2019	4999	10942	2284	33134	41417	26507	20670*	0.76	0.99	0.59
2020	4749	16539	1364	28507	41002	19820				

* Preliminary.

Sources and references

ICES. 2020. North-Western Working Group (NWWG). ICES Scientific Reports, 2:51. 431 pp.
<http://doi.org/10.17895/ices.pub.6051>.

Recommended citation: ICES. 2020. Cod (*Gadus morhua*) in Subdivision 5.b.1 (Faroe Plateau). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, cod.27.5b1. <https://doi.org/10.17895/ices.advice.5933>.

Annex 1

ICES Advice on fishing opportunities, catch, and effort
Faroes ecoregion
Published 29 November 2019

Cod (*Gadus morhua*) in Subdivision 5.b.1 (Faroe Plateau)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2020 should be no more than 11 679 tonnes. ICES is not in a position to advise on the corresponding level of fishing effort.

Stock development over time

The spawning-stock biomass (SSB) was below B_{lim} for several years, but has increased to above $MSY B_{trigger}$ in 2018. Fishing mortality (F) decreased from 2010 but is still above F_{MSY} in 2018. The 2009–2015 year classes are estimated to be below average size. The 2016–2018 year classes are estimated to be average or above average, though there is large uncertainty around these estimates.



Figure 1 Cod in Subdivision 5.b.1. Summary of the stock assessment with 95% confidence intervals.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is above F_{MSY} and below F_{pa} and F_{lim} , while spawning stock size is above $MSY B_{trigger}$, B_{pa} , and B_{lim} .

Table 1 Cod in Subdivision 5.b.1. 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}	✗	✗	✗	Above	$MSY B_{trigger}$	✗	✓
Precautious approach	F_{pa}, F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	○	✓
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—
								Full reproductive capacity
								Above trigger
								Not applicable

Catch scenarios

Table 2 Cod in Subdivision 5.b.1. Assumptions made for the interim year and in the forecast. All weights are in tonnes.

Variable	Value	Notes
$F_{\text{ages 3-7}}$ (2019)	0.43	$F_{2019} = F_{2018}$ as estimated by SAM.
SSB (2020)	69899	Based on $F(2019) = 0.44$.
$R_{\text{age 1}}$ (2020)	7401	In thousands. Median of resampled estimates from 2009 to 2018.
$R_{\text{age 1}}$ (2021)	7401	In thousands. Median of resampled estimates from 2009 to 2018.
Total catch (2019)	13645	Based on $F(2019) = 0.44$.
Landings (2019)	13645	Landings = catches.
Discards (2019)	0	Discarding is considered negligible.

Table 3 Cod in Subdivision 5.b.1. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2020)	F_{total} (2020)	SSB (2021)	% SSB change *	% Advice change **
ICES advice basis					
MSY approach: F_{MSY}	11679	0.23	110000	57	25
Other scenarios					
$F = 0$	0	0	121069	77	-100
$F = F_{2019}$	20371	0.43	99819	43	118
$F = F_{\text{pa}}$	29509	0.69	88289	26	215
$F = F_{\text{lim}}$	36058	0.90	81116	16	285

* SSB 2021 relative to SSB 2020 (69 899 t).

** Advice value for 2020 relative to the advice value for 2019 as issued in 2018 (13 554 t).

The catch advice for 2020 is increased compared to the advice for 2019; this is due to the increase in biomass resulting from the higher recruitment and lower fishing mortality in recent years.

Basis of the advice

Table 4 Cod in Subdivision 5.b.1. The basis of the advice.

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

Quality of the assessment

The stock was benchmarked in 2017, and the assessment model and input data were changed. The historical trajectory of stock development did not change substantially.

The current assessment confirms the large increase of SSB in recent years, consistent with the rapid increase in survey catch rates. The latest assessment shows a large downward revision in the 2018 recruitment estimate.

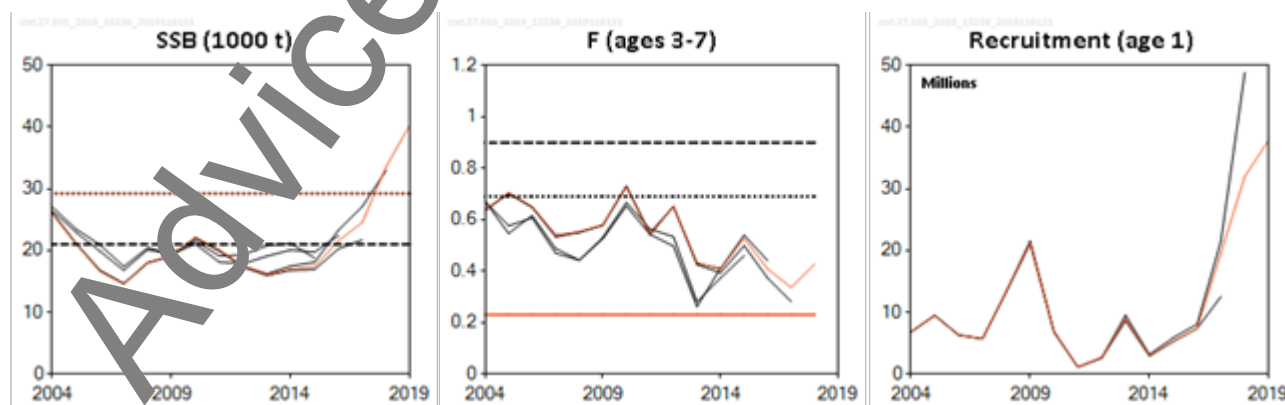


Figure 2 Cod in Subdivision 5.b.1. Historical assessment results. The age of recruitment changed from age 2 to age 1 at the 2017 benchmark; the recruitment plot therefore shows only three lines.

Issues relevant for the advice

An effort management system has been in place since 1996. ICES is currently not in a position to quantify the relationship between effort and F for this stock.

Faroe Plateau cod and Faroe haddock are caught in a mixed fishery.

Reference points

Table 5 Cod in Subdivision 5.b.1. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B _{trigger}	29226	$B_{lim} \times \exp(1.645 \times \sigma)$, where $\sigma = 0.20$	ICES (2017)
	F _{MSY}	0.23	Stochastic simulations assuming segmented regression, Ricker and Beverton and Holt stock–recruitment relationships	ICES (2017)
Precautionary approach	B _{lim}	21000	B _{loss} in 1992 from the 1998 assessment	ICES (1998, 2017)
	B _{pa}	29226	$B_{lim} \times \exp(1.645 \times \sigma)$, where $\sigma = 0.20$	ICES (2017)
	F _{lim}	0.90	Stochastic simulations (ICES, 2017): the F that gives a 50% probability of $SSB > B_{lim}$	ICES (2017)
	F _{pa}	0.69	$F_{lim} \times \exp(-1.645 \times \sigma)$, where $\sigma = 0.16$	ICES (2017)
Management plan	SSB _{mgt}	Not applicable		
	F _{mgt}	Not applicable		

Basis of the assessment

Table 6 Cod in Subdivision 5.b.1. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018a).
Assessment type	SAM with catch-at-age data and age-disaggregated indices, using catches in the model and in the forecast (ICES, 2019).
Input data	Commercial catches, ages, and length frequencies from catch sampling; survey indices (FO-GFS-Q1 and FO-GFS-Q3); annual mortality data from FO-GFS-Q1; natural mortality set at 0.2.
Discards and bycatch	Discarding is considered negligible.
Indicators	Co-occurrence of high recruitment of cod with sandeel abundance.
Other information	The stock was benchmarked in 2017 (ICES, 2018b).
Working group	North-Western Working Group (NWWG)

Information from stakeholders

There is no additional available information.

History of the advice, catch, and management

Table 7 Cod in Subdivision 5.b.1. ICES advice and catch. All weights are in tonnes.

Fishing year	ICES advice	Catch corresponding to advice	Agreed TAC***	ICES catch
1987	No increase in F	< 31000		21391
1988	No increase in F (Revised estimate)	< 29000 (23000)		23182
1989	No increase in F	< 19000		22068
1990	No increase in F	< 20000		13692
1991	No increase in F	< 16000		8750
1992	No increase in F	< 20000		6396
1993	No fishing	0		6107
1994	No fishing	0	8500/12500***	9046
1995	No fishing	0	12500*	23045
1996	F at lowest possible level	-	20000**	40422
1997	80% of F(95)	< 24000		34304

Fishing year	ICES advice	Catch corresponding to advice	Agreed TAC***	ICES catch
1998	30% reduction in effort from 1996/97	-		24005
1999	F less than proposed F_{pa} (0.35)	< 19000		19245
2000	F less than proposed F_{pa} (0.35)	< 20000		21833
2001	F less than proposed F_{pa} (0.35)	< 16000		28577
2002	75% of F(2000)	< 22000		38834
2003	75% of F(2001)	< 32000		25167
2004	25% reduction in effort	-		12840
2005	Rebuilding plan involving large reduction	-		10119
2006	Rebuilding plan involving large reduction	-		9844
2007	Rebuilding plan involving large reduction in effort	-		7511
2008	No fishing. Development of a rebuilding plan	0		7315
2009	No fishing. Development of a rebuilding plan	0		9979
2010	No fishing. Development of a rebuilding plan	0		12762
2011	Reduce F to below F_{pa}	< 16000		9692
2012	MSY framework, reduce F by 30%	< 10000		7204
2013	MSY approach, $F < 0.20$	< 4800		4473
2014	MSY approach, reduce F by 69%	< 3000		5711
2015	MSY approach, reduce F by 23%	< 1500		7281
2016	Lowest possible level (LPL) and develop a mixed-fishery management plan	-		5933
2017	MSY approach ($F \leq 0.16$)	≤ 2800		5366
2018	MSY approach ($F \leq 0.22$)	≤ 4579		12311
2019	MSY approach	≤ 9354		
2020	MSY approach	≤ 11679		

* In the quota year 1 September–31 August the following year.

** The TAC was increased during the quota year.

*** Not applicable since 1997.

History of the catch and landings

Table 8 Cod in Subdivision 5.b.1. Catch distribution by fleet in 2017 as estimated by ICES. All weights are in tonnes.

Catch (2018)	Landings			Discards
12311	Longlines 41%	Handlines 11%	Trawls 48%	Negligible
	12311			

Table 9 Cod in Subdivision 5.b.1. History of commercial catch and landings; catches in this table are those officially reported by each country and may differ from the ICES estimated catch. All weights are in tonnes.

Year	Denmark	Faroe Islands	France	Germany	Iceland	Norway	Greenland	Portugal	UK (E/W/N)	UK (Scotland)	Total
1986	8	34002	4	8		83			-		34595
1987	30	20303	17	12		21			8		21391
1988	10	22272	17	5		163					22467
1989		0535		7		285					20827
1990		12232		24		124					12380
1991		8203	**	16		89			1		8309
1992		5938	3***	12		39			74		6066
1993		5744	1***	+		57			186		5988
1994		8724		2***		36			56		8818
1995		19079	2***	2		38			43		19164
1996		39406	1***	+		507			126		40040
1997		33556		+		410			61***		34027
1998		23308				405			27***		23740

Year	Denmark	Faroe Islands	France	Germany	Iceland	Norway	Greenland	Portugal	UK (E/W/Nl)	UK (Scotland)	Total
1999		19156		39		450			51		19696
2000		^	1	2		374			18		395
2001		29762	9***	9		531*			10		30361
2002		40602	20	6	5	573			12		41248
2003		30259	14	7		447			15		30742
2004		17540	2	3***		414		1	17		17975
2005		13556				201			24		13781
2006		11629	7	1***		49	5				11691
2007		9905	1***			71	7			360	10344
2008		9394	1			40				383	9818
2009		10736	1			14	7			300	11058
2010		13878	1			10				312	14206
2011		11348									11348
2012		8437			28						8466
2013		5331			20		2				5333
2014		6655				2				226	6883
2015		7812				33	14			267	8128
2016		6736				31				515	7289
2017		6208	2			16				405	6631
2018		13372	2			6				530	13973

* Preliminary.

** Included in ICES Subdivision 5.b.2.

*** Reported as ICES Division 5.b.

^ No reported catch.

Table 10 Cod in Subdivision 5.b.1. Total officially reported landings, Faroese catches by area with corrections (to account for different round/gutted conversion factors as well as the subtraction of cod originating from the Icelandic cod stock), catches reported by other nations, and ICES catches used in the assessment. All weights are in tonnes.

Year	Officially reported	Faroese catches				Catches reported as Subdivision 5.b.2			Foreign catches in Subdivision 5.b.1				ICES catch (Used in the assessment)
		In 5.b.1	Corrections in 5.b.1	On Faroe-Iceland ridge	In Division 2.a within Faroe area jurisdiction	UK (E/W/NL)	UK (Scotland)	UK-	France**	Greenland**	Russia	UK**	
1986	34595												34595
1987	21391												21391
1988	22467				715								23182
1989	20827				1229				12				22068
1990	12380				1090		205		17				13692
1991	8309				351		90						8750
1992	6066				154	+	176						6396
1993	5988					1	118						6107
1994	8818					1	227						9046
1995	19164	3330***					51						23045
1996	40040						372						40422
1997	34027						177						34304
1998	23740						265						24005
1999	19696			-661			21						19245
2000	395	21793		-600			24						21833
2001	30361		-1766	-306			288						28577
2002	41248		-2409	-223			218						38834
2003	30742		-1795	-4034			254						25167
2004	17975		-1041	-4338			244						12840
2005	13781		-804	-3987			1129						10119
2006	11691		-690	-1435			278						9844
2007	10344		-588	-2304			53			6			7511
2008	9818		-557	-1978			32						7315
2009	11058		-637	-51			38			26	4		9979
2010	14206		-823	-680			54			5			12762
2011	11348		-673	-98						3			9692
2012	8466		-500	-766						5			7205
2013	5333		-316	-34							0		4473
2014	6883		-395	-777									5711
2015	8128		-465	-384									7381
2016	7289		-99	-958									5933
2017	6631		-368	-896									5366
2018	13973*		-93	-869									12311

* Preliminary.

** Reported to the Faroese Coastal Guard.

*** Expected misreporting/discarding.

Summary of the assessment

Table 11 Cod in Subdivision 5.b.1. Assessment summary.

Year	Recruitment			SSB			Catch	F		
	Age 1	2.5 percentile	97.5 percentile	SSB	2.5 percentile	97.5 percentile		Mean F ages 3–7	2.5 percentile	97.5 percentile
	thousands			tonnes						
1959	20461	10235	40902	47636	37722	60156	22415	0.523	0.404	0.677
1960	18780	9801	35984	53087	43256	65152	32255	0.701	0.555	0.885
1961	26625	13900	51001	46676	38013	57313	21598	0.637	0.5	0.811
1962	27269	14189	52405	43947	35571	54296	20967	0.569	0.443	0.73
1963	19940	10383	38293	50966	40632	63927	22215	0.505	0.392	0.651
1964	11315	5853	21875	56617	44726	71670	21078	0.487	0.377	0.628
1965	17851	9244	34471	54932	43645	69137	24212	0.48	0.377	0.629
1966	22627	11690	43800	54104	42972	68120	20418	0.433	0.373	0.627
1967	20899	10791	40474	64364	51436	80541	23532	0.462	0.356	0.602
1968	12554	6468	24370	75194	60013	94215	21330	0.447	0.345	0.578
1969	8782	4499	17142	79713	63453	100140	22371	0.477	0.368	0.617
1970	9901	5046	19426	78089	62178	98073	24184	0.392	0.301	0.509
1971	19000	9721	37139	57999	46429	72437	23010	0.382	0.295	0.495
1972	18095	9298	35215	50861	41243	62720	18727	0.35	0.27	0.454
1973	38709	19908	75267	69169	55316	86400	22228	0.369	0.289	0.472
1974	39666	20473	76852	83969	67335	104712	24581	0.379	0.299	0.48
1975	24214	12519	46834	100432	81111	124650	36775	0.48	0.386	0.597
1976	11176	5746	21736	107781	87731	132988	39799	0.601	0.485	0.744
1977	12871	6641	24947	104708	83000	131004	34927	0.575	0.46	0.718
1978	15507	7997	30068	73338	57849	91394	26585	0.493	0.392	0.621
1979	24058	12401	46671	61360	50056	75218	23112	0.48	0.38	0.607
1980	17816	9209	34467	54564	43890	66323	20513	0.425	0.335	0.538
1981	26722	13873	51470	58712	47893	72121	22963	0.469	0.374	0.589
1982	36610	19017	70479	60551	49227	73990	21489	0.494	0.397	0.616
1983	55656	28593	108332	100067	80607	124226	38133	0.648	0.524	0.801
1984	20472	10627	39436	121029	97206	153693	36979	0.553	0.447	0.685
1985	7911	4056	15431	65912	68647	107519	39484	0.699	0.569	0.86
1986	8563	4422	16582	73853	57595	94700	34595	0.622	0.502	0.77
1987	11346	5906	21798	69089	47226	73933	21391	0.548	0.442	0.68
1988	20025	10254	35106	50162	41503	60627	23182	0.667	0.546	0.816
1989	6028	3091	11713	37119	30953	44513	22068	0.757	0.619	0.925
1990	5777	2956	11283	30832	24933	38126	13692	0.664	0.535	0.824
1991	7808	3956	15372	21957	17375	27747	8750	0.514	0.406	0.651
1992	8368	4051	16472	16570	13215	20776	6396	0.424	0.329	0.545
1993	23505	12269	45031	25388	19916	32364	6107	0.321	0.248	0.417
1994	42514	22096	81066	55879	43956	71038	9046	0.3	0.235	0.383
1995	11837	6418	21832	60222	49540	73207	23045	0.405	0.329	0.498
1996	4958	2721	9069	82211	67980	99422	40422	0.642	0.533	0.774
1997	6991	3873	12621	75411	61072	93117	34304	0.813	0.682	0.97
1998	16361	9166	28592	49036	39724	60532	24005	0.754	0.631	0.901
1999	18899	16207	51530	37588	31147	45361	19245	0.712	0.59	0.859
2000	4467	23841	75644	38250	32233	45391	21833	0.51	0.415	0.626
2001	18360	10351	32568	56285	46948	67480	28577	0.573	0.473	0.693
2002	8987	5010	16120	58327	48435	70240	38834	0.802	0.667	0.963

Year	Recruitment			SSB			Catch	F		
	Age 1	2.5 percentile	97.5 percentile	SSB	2.5 percentile	97.5 percentile		Mean F ages 3–7	2.5 percentile	97.5 percentile
	thousands			tonnes			tonnes			
2003	4516	2532	8055	44053	35813	54188	25167	0.732	0.600	0.882
2004	6819	3857	12057	25996	21463	31485	12840	0.638	0.527	0.773
2005	9401	5315	16627	21112	17755	25104	10119	0.706	0.584	0.853
2006	6249	3536	11041	16597	14074	19572	9844	0.651	0.534	0.793
2007	5688	3208	10083	14526	12284	17178	7511	0.537	0.443	0.659
2008	13439	7469	24182	18047	15148	21500	7315	0.554	0.454	0.675
2009	21263	11588	39016	19168	16075	22855	9979	0.579	0.476	0.704
2010	6819	3755	12386	22183	18562	26511	12762	0.726	0.594	0.888
2011	1095	599	2000	20105	16485	24519	9692	0.545	0.438	0.676
2012	2609	1464	4650	17489	14289	21406	7205	0.515	0.528	0.807
2013	9017	4940	16461	16128	13113	19836	4473	0.433	0.343	0.546
2014	2957	1603	5455	16994	14144	20418	5111	0.406	0.324	0.509
2015	5343	2967	9621	17373	14514	20795	7309	0.527	0.422	0.659
2016	7401	4052	13520	21567	17429	26689	876	0.408	0.323	0.516
2017	19574	10423	36757	24538	19590	30735	5366	0.336	0.26	0.433
2018	31993	14895	68718	33595	26389	42766	12311	0.427	0.321	0.569
2019	37889	11438	125509	40370	28478	50228				

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