

4 Faroe Plateau cod

This section was updated in November 2021.

4.1 Stock description and management units

Both genetic and tagging data suggest that there are three cod stocks present in Faroese waters: on the Faroe Bank (Division 5.b.2), on the Faroe Plateau (Division 5.b.1) and on the Faroe-Iceland Ridge. Cod on the Faroe-Iceland Ridge seem to belong to the cod stock at Iceland, and the WG in 2005 decided to exclude these catches from the catch-at-age calculations. The stock annex provides more information.

4.2 Scientific data

4.2.1 Trends in landings and fisheries

The landings were obtained from the Fisheries Ministry and Statistics Faroe Islands. The landings are presented in Table 4.2.1 and the working group estimates are presented in Table 4.2.2. The catches on the Faroe-Iceland Ridge, i.e. for single trawlers and the large longliners were not included in the catch-at-age calculations (Table 4.2.3).

4.2.2 Catch-at-age

Landings-at-age for 2020 are provided for the Faroese fishery in Table 4.2.4. Faroese landings from the main fleet categories were sampled (Table 4.2.5). The catch-at-age is shown in Table 4.2.6. Catch curves are shown in Figure 4.2.1.

4.2.3 Weight-at-age

Mean weight-at-age data are provided for the Faroese fishery in Table 4.2.7. These were calculated using the length/weight relationship based on individual length/weight measurements of samples from the landings. The sum-of-products-check for 2019 showed a discrepancy of 0 %. The weights have increased in recent years, but decreased in 2020 (Figure 4.2.2).

4.2.4 Maturity-at-age

The proportion of mature cod by age during the Faroese groundfish surveys carried out during the spawning period (March) is given in Table 4.2.8 and in Figure 4.2.3. Full maturity is generally reached at age 5 or 6, but considerable changes have been observed in the proportion mature for younger ages between years. Maturities were slightly revised during the benchmark in February 2017. The maturities prior to 1983 were set to the average for 1983 to 1996.

4.2.5 Catch, effort and research vessel data

Fisheries independent CPUE series

The spring groundfish surveys in Faroese waters with the research vessel Magnus Heinason is used as a tuning series. The catch curves showed a normal pattern (Figure 4.2.4), i.e., a decreasing

trend after age 5. The stratified mean catch of cod per unit effort (Figure 4.2.5) has decreased in the recent years and was amongst the lowest values in 2021.

The other tuning series used is the Summer Groundfish Survey. The new research vessel, Jákup Sverri, conducted the august survey in 2021. The stratified mean catch of cod per unit effort has also decreased in recent years to low values (Figure 4.2.5). The catch curves (Figure 4.2.6) show that the fish are fully recruited to the survey gear at an age of 4 or 5 years. Both tuning series are presented in Table 4.2.9 and they show that the 2016 and 2017 year classes initially seemed to be of average strength but were less abundant in 2020–2021 than expected. Catch per tow in the spring and summer survey shows that there were occasional large hauls in both surveys (Figure 4.2.7 and Figure 4.2.8).

Commercial CPUE series

Three commercial CPUE series (longliners and pairtrawlers) are also presented (tables 4.2.10, 4.2.11, and 4.2.12 as well as Figure 4.2.7), although they are not used as tuning series. Note that the small boats (0–25 GRT) operating with longlines and jigging reels close to land have had an extremely high CPUE in recent years relative to the fishable biomass (Figure 4.2.10, Figure 4.2.11), a feature also observed for the larger longliners (Figure 4.2.9). When that happens, the recruitment of cod tends to be low (Steingrund *et al.*, 2010). However, the catchability for the large longliners came down to the average level in 2020 (Figure 4.2.11).

4.3 Information from the fishing industry

The sampling of the catches is included in the ‘scientific data’. The fishing industry has since 1996 gathered data on the size composition of the landings but this information has not been used in this assessment.

4.4 Methods

The benchmark in February 2017 decided to change the traditional assessment tool from XSA to SAM although it was recognised that the results of the assessment were mainly data-driven. The SAM model had some beneficial characteristics, e.g. that it provided uncertainty estimates for the catch in numbers, surveys and the output from the assessment (biomasses and fishing mortalities).

4.5 Reference points

Since the assessment model was replaced at the benchmark in February 2017, it was necessary to recalculate reference points at the NWWG meeting in 2017 (this was not finally conducted during the benchmark).

The B_{lim} was kept unchanged at 21 thousand tonnes, since this previously defined B_{loss} was the lowest spawning biomass from which the stock had made a recovery. It was noted that the biomass had been lower afterwards but the stock had not recovered by the time when the reference point was defined.

The $B_{pa} = B_{trigger} = 29\,226$ tonnes (changed from 40 000 tonnes). The uncertainty in the SAM assessment on the final year of SSB was found to be $\sigma = 0.20$ and the B_{pa} was found by using the formula $B_{pa} = B_{lim} \times \exp(\sigma \times 1.645)$. The $B_{trigger}$ was, according to ICES guidelines, set equal to B_{pa} since the stock had not been fished at F_{MSY} for five or more years.

$F_{lim} = 0.90$ (changed from 0.68). F_{lim} was derived from B_{lim} . A stock was simulated with a segmented regression on the spawning stock – recruitment function having the point of inflection at B_{lim} . F_{lim} was set to the F that, in equilibrium, gave a 50% probability that $SSB > B_{lim}$. This simulation was based on a fixed F , i.e., without inclusion of a $B_{trigger}$ and without inclusion of assessment/advice errors.

$F_{pa} = 0.69$ (changed from 0.35). F_{pa} was derived from F_{lim} in the reverse of the way B_{pa} was derived from B_{lim} , i.e., $F_{pa} = F_{lim} \times \exp(-\sigma \times 1.645)$, where $\sigma = 0.16$. This year (2021), the value of F_{pa} was set equal to the $F_{p0.5}$ of 0.41, which is the fishing mortality that leads to probability of 5% of SSB going below B_{lim} .

The calculations were conducted using EQSIM following ICES guidelines. Decisions made involved the spawning stock – recruitment relationship, the weights at age, the selection pattern and the level of advice error. The full time series (1959–2015) was used as basis for the spawning stock – recruitment relationship where the S-R function was based on the segmented regression (weight 0.61), Ricker (weight 0.36) and Beverton and Holt (weight 0.03). The Ricker curve was included because recruitment at very large stock sizes was low according to extension of stock biomass back to 1710 (ICES, 2016). The autocorrelation between SSB -R data points was approximately 0.55. The weights at age were based on the last 10 years (2007–2016). The selection pattern was also based on the last 10 years. The selection pattern has been very stable over time, so the use of the last 20 years would not make any big difference for the F_{MSY} . The advice error was estimated from advice sheets back to 1999: $cvF = 0.44$, $\phi F = 0.47$, $cvSSB = 0.38$, $\phi SSB = 0.24$. In total, 2000 iterations were performed that projected the stock 200 years into the future, of which, the last 50 years were kept to calculate ‘equilibrium’ values.

The result of the analyses was that $F_{MSY} = 0.23$ (changed from 0.32). The fishing mortality that is associated with a risk of 5% to fall below B_{lim} , $F_{p0.5}$, was estimated to be 0.41, i.e., greater than F_{MSY} .

4.6 State of the stock - historical and compared to what is now

As previous years, the two surveys were used for tuning. The commercial series showed a similar overall tendency as the surveys (Figure 4.2.9) but were not used in the tuning. At the benchmark in February 2017, the traditional XSA was replaced by a SAM assessment model. The SAM model settings and the model parameters are shown in Table 4.6.1, e.g. the fishing mortality is assumed equal for ages 7+. The variation in the catchability coefficients for the survey at age was set equal for ages 2+, although different for each survey, and age 1 was set different from the other ages, but different for the two surveys. An AR covariance structure was applied for the summer survey, eliminating year effects, but not for the spring survey. The observation residuals looked quite random (Figure 4.6.1) as well as the joint residuals (Figure 4.6.2).

The results from the SAM-run shows that fishing mortality (F_{3-7}) has decreased in recent years albeit increasing steeply the last three years (Table 4.6.2, Table 4.6.4, Figure 4.6.3). The population numbers, total biomass and spawning stock biomass have been low compared with other years in the series, but temporarily increased around 2017 and decreased again to a level below B_{lim} (Table 4.6.3, Table 4.6.4, Figure 4.6.4, Figure 4.6.5). The poor state of the stock since 2004 was due to poor recruitment (not poor individual growth). Prior to that time, extremely weak year classes (< 5 million individuals at age 2) were only observed three times, whereas it has happened several times since 2004. In the past there has been a poor relationship between the size of the spawning stock and subsequent recruitment (Figure 4.6.6), but the increasing number of low data points in recent years have strengthened the stock-recruitment relationship. The spawning stock

biomass in the terminal year was below B_{lim} and the fishing mortality around F_{lim} (Table 4.6.4). The spawning stock biomass in the assessment year was below B_{lim} .

The period of low biomass of Faroe Plateau cod since 2004 has been unprecedented over the last 300 years (Figure 4.6.4); for data and figures for the years before 1959, see ICES (2016), although there were short periods of low biomass between 1700 and 1750 and around 1813.

4.7 Short term forecast

4.7.1 Input data

The short-term prediction was performed in the SAM model. The SAM model provides predictions that carry the signals from the assessment into the short-term forecast. The forecast procedure starts from the last year's (assessment year) estimate of the state ($\log(N)$ and $\log(F)$) at age. One thousand replicates of the last state are simulated from its estimated joint distribution. Each of these replicates are then simulated forward according to the assumptions and parameter estimates found by the assessment model. In the forward simulations a 5-year average (years up to the assessment year) is used for catch mean weight, stock mean weight, proportion mature, and natural mortality. Recruitment is re-sampled from the last 10 years (up to the year before the assessment year). In each forward simulation step the fishing mortality is scaled, such that the median of the distribution is matching the requirement in the scenario (e.g. hitting a specific mean F value or a specific catch).

4.7.2 Results

The landings in 2021 were originally expected to be 9194 tonnes (Table 4.6.4) with an extremely high projected fishing mortality of 0.85. However, the landings in 2021 were estimated to be only 5454 tonnes, based on the January-September landings 2021 and comparing with 2010-2019. Therefore, (deviating from the stock annex) a catch constraint was set on the landings in 2021 of 5454 tonnes and forecasts based on this assumption (Table 4.6.4). The landings from the Faroe-Iceland Ridge should be added to this figure in order to get the total Faroese landings within the 5.b.1 area. The spawning stock biomass is expected to be 17 thousand tonnes in 2022 and 24 thousand tonnes in 2023 if the F_{MSY} is applied. This is markedly lower than expected in the last years' forecast.

4.8 Long term forecast

The yield per recruitment calculations were performed in the SAM model and were based on the last 20 years (up to the year before the assessment year). The F_{max} was estimated at 0.26 (Figure 4.8.1).

4.9 Uncertainties in assessment and forecast

Since there is no incentive to discard fish or misreport catches under the effort management system, the catch figures are considered adequate, as well as the catch-at-age.

The retrospective pattern indicates uncertainties in the assessment, especially in recruitment (Figure 4.9.1). The Mohn's rho was 353%, -20% and 17% for recruitment, F , and the spawning stock biomass, respectively. The massive downscaling of the recruitment is commented on later in this report (4.10).

Steingrund *et al.* (2010) found that the recruitment of Faroe Plateau cod (age 2) could be rather precisely estimated as there is a significant relationship between cod biomass (age 3+) and the amount of cannibalistic cod in nearshore waters in June–October the previous year. This approach showed that the recent year classes were extremely weak and that the 2016 and 2017 year classes were slightly stronger (Figure 4.9.2).

A preliminary catch-at-age for 2021 was calculated, based on the data already available (catch figures January–September scaled up to the whole year, 5454 tonnes, based on the landings in 2010–2019; age and length samples from the catch January–September). The catch-at-age figures for 2021 were (age 2 to 10+ in thousands): 3, 154, 553, 473, 131, 53, 19, 7, and 2. The fishing mortality in 2021 was much more reasonable (0.43 vs. 0.85) and the recruitment was even more downscaled leading to a more pessimistic forecast of future biomass. Question is whether an additional recruitment index should be used in future assessments that reflects the food availability in the ecosystem – much food, large recruitment, and *vice versa* (NWWG 2020, WD 23), see 4.10. The importance of food is also demonstrated in WD 30 where the downscaling of year classes from age 1 to age 3 was most severe when the condition factor of adult cod was low at the time the year classes were 2 years old.

4.10 Comparison with previous assessment and forecast

The assessment settings were according to the Stock Annex. The assessment this year showed substantial downscaling of the recruitment, a lower total stock biomass and spawning stock biomass and higher fishing mortality compared with last year's assessment (Figure 4.10.1). Reason for this downscaling of recruitment is likely either food shortage or cannibalism or both. This is indicated by a high catchability with longlines and a high abundance of age 3+ cod close to land (in the nursery areas of recruiting cod) that are easily caught by small longliners. This was observed in summer-autumn 2018 and especially in 2019 (Figure 4.2.10, Figure 4.2.11 and Figure 4.9.2). In hindsight, this has happened before (in 1997, 2002–2003) and was not surprising given the low abundance of sandeels and below-average abundance of Norway pout. For some reason, though, the weights-at-age in 2019 and 2020 were above average and this should be investigated further in the future.

4.11 Management plans and evaluations

A management plan based on the fishing day system was implemented in 2021. The management plan comprises the fishery for cod, haddock and saithe on the Faroe Plateau. Longliners and small trawlers are regulated by the status of the cod and haddock stocks whereas the large single trawlers and pair trawlers are regulated by the status of the saithe stock. The change in the allocated fishing days can be either -5%, 0% or +5% from one year to the next. Due to the management plan the fishery for cod, haddock and saithe on the Faroe Plateau was certified as sustainable by MSC in September 2021. The management plan is not yet evaluated by ICES.

4.12 Management considerations

The productivity of the Faroe Plateau cod stock seems to be less now than decades ago. It is stated in the management plan that if extraordinary situations arise there is an option to modify the management plan, although situations or actions are not explicitly specified.

4.13 Ecosystem considerations

Regarding the ecosystem effects on fishing, this issue is partly addressed in the overview section for Faroese stocks. Although the fishery has changed substantially during the last century the total biomass of cod+haddock+saithe has fluctuated around the same level. However, the proportion of saithe has increased steadily over the time period, whereas cod has decreased. This could indicate some effect of fishing on the ecosystem, although other factors cannot be ruled out.

4.14 Regulations and their effects

There seems to be a poor relationship between the number of fishing days and the fishing mortality because of large fluctuations in catchability. Area restrictions may help to reduce fishing mortality, but they cause practical problems for the fishing fleets (e.g. high concentrations of vessels in certain areas).

4.15 Changes in fishing technology and fishing patterns

Fishing effort per fishing day may have increased gradually since the effort management system was introduced in 1996, although little direct quantitative information exists. There also seems to have been substantial increases in fishing power when new vessels are replacing old vessels.

The fishing pattern in recent years has changed in comparison to previous years. The large long-liners seem to have exploited the deep areas (> 200 m) to a larger extent (ling and tusk) because the catches in shallower waters of cod and haddock have been so poor – which was also observed in the beginning of the 1990s. They also have fished in other areas, e.g. in Greenland and on the Flemish Cap. This could reduce the fishing mortality on cod and haddock, but the small long-liners and jiggers still exploit the shallow areas.

4.16 Changes in the environment

The primary production was low for a number of years, albeit high in 2008 to 2010 and in 2017, but it is not believed that this has any relationship with a change in the environment. Since 2002, the temperature has been about 1°C higher than in the 1990s, which may have had a negative effect on cod recruitment.

Table 4.2.1. Faroe Plateau cod (Subdivision 5.b.1). Nominal catch (t) by countries, as officially reported to ICES.

	Denmark	Faroe Islands	France	Germany	Iceland	Netherlands	Norway	Greenland	Portugal	UK	UK Scotland	Total
1986	8	34492	4	8			83	-		0	0	34595
1987	30	21303	17	12			21	-		8	0	21391
1988	10	22272	17	5			163	-		0	0	22467
1989	-	20535	-	7			285	-		0	0	20827
1990	-	12232	-	24			124	-		0	0	12380
1991	-	8203	..**	16			89	-		1	0	8309
1992	-	5938	3***	12			39	-		74	0	6066
1993	-	5744	1***	+			57	-		186	0	5988
1994	-	8724	-	2***			36	-		56	0	8818
1995	-	19079	2***	2			38	-		43	0	19164
1996	-	39406	1***	+			507	-		126	0	40040
1997	-	33556	-	+			410	-		61***	0	34027
1998	-	23308	..*	-			405	-		27***	0	23740
1999	-	19156	..*	39	-		450	-		51	0	19696
2000		0	1	2	-		374	-		18	0	395
2001		29762	9***	9	-		531	-		50	0	30361
2002		40602	20	6	5		573			42	0	41248
2003		30259	14	7	-		447	-		15	0	30742
2004		17540	2	3***			414		1	15	0	17975
2005		13556	-				201			24	0	13781
2006		11629	7	1***			49	5		0	0	11691
2007		9905	1***				71	7		0	360	10344
2008		9394	1				40			0	383	9818
2009		10736	1				14	7		0	300	11058

	Denmark	Faroe Islands	France	Germany	Iceland	Netherlands	Norway	Greenland	Portugal	UK	UK Scotland	Total
2010		13878	1				10			0	312	14206
2011		11348	-				0			0	0	11348
2012		8437	0		28		0			0	0	8466
2013		5331	0		20		0	2		0	0	5333
2014		6655					2			0	226	6883
2015		7812					33	14		0	367	8174
2016		6736					31	5		0	456	7232
2017		6215	2			0	16			0	388	6625
2018		13297	2			0	69			0	504	13872
2019		22342	1			0	219			0	238	22800
2020		10614*	2			0	163			0	683	11463

* Preliminary, ** Included in 5.b.2, *** Reported as 5.b.

Table 4.2.2. Faroe Plateau cod (Subdivision 5.b.1). Nominal catch (t) used in the assessment.

	Officially reported	Faroese catches				Reported as 5.b.2			Foreign catches				Used in the assessment
		in 5.b.1	Adjustment in 5.b.1	On Faroe-Iceland ridge	in 2.a within Faroe area jurisdiction	UK (E/W/Ni)	UK (Scotl.)	UK	French ***	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****				-	551						23045
1996	40040					-	382						40422
1997	34027					-	277						34304
1998	23740					-	265						24005
1999	19696			-661		-	210						19245
2000	395	21793*		-600		-	245						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

	Officially reported	Faroe catches				Reported as 5.b.2			Foreign catches				Used in the assessment	
		in 5.b.1	Adjustment in 5.b.1	On Faroe-Iceland ridge	in 2.a within Faroe area jurisdiction	UK (E/W/NI)	UK (Scotl.)	UK	French ***	Greenland ***	Russia ***	UK ***		
2009	11058		-637		-510			38			26	4		9979
2010	14206		-823		-680			54			5			12762
2011	11348		-673		-986						3			9692
2012	8466		-500		-766						5			7205
2013	5333		-316		-544							0		4473
2014	6883		-395		-777									5711
2015	8174		-460		-384									7329
2016	7232		-399		-958									5876
2017	6625		-369		-896									5360
2018	13872		-789		-869									12214
2019	22800		-1326		-804									20670
2020	11463*		-630		-402									10431

* Preliminary, ** In order to be consistent with procedures used previous years, *** Reported to Faroese Coastal Guard, **** expected misreporting/discard.

Table 4.2.3. Faroe Plateau cod (Subdivision 5.b.1). The landings of Faroese fleets (in percentage) of total catch (t). Note that the catches on the Faroe-Iceland ridge (mainly belonging to single trawlers and longliners) are included in this table, but excluded in the catch in numbers.

	Tonnes						Percentage				
	Jigging	Longline	Gillnet	Single trawl	Pairtrawl	Sum	Jigging	Longline	Gillnet	Single trawl	Pairtrawl
1985	1686.2	19971.4	223.7	10170.5	7084.2	39422	4.3	50.7	0.6	25.8	18.0
1986	1008.6	10255.8	454.3	6834.6	15352.1	34492	2.9	29.7	1.3	19.8	44.5
1987	619.5	7366.4	113.9	4443.6	8610.3	21303	2.9	34.6	0.5	20.9	40.4
1988	1670.9	6498.5	573.2	4245.2	9115.5	22272	7.5	29.2	2.6	19.1	40.9
1989	1900.8	10498.2	647.5	3460.1	3873.9	20535	9.3	51.1	3.2	16.8	18.9
1990	1005.3	7222.0	175.8	1572.7	2150.4	12232	8.2	59.0	1.4	12.9	17.6
1991	652.4	4348.2	167.3	1236.8	1743.9	8203	8.0	53.0	2.0	15.1	21.3
1992	418.3	2497.0	1.1	757.7	1945.0	5938	7.0	42.1	0.0	12.8	32.8
1993	514.5	1768.3	0.0	1326.8	2064.9	5744	9.0	30.8	0.0	23.1	35.9
1994	1672.1	2634.1	46.7	1531.9	2787.9	8724	19.2	30.2	0.5	17.6	32.0
1995	4748.7	7751.4	58.7	2931.8	3576.2	19079	24.9	40.6	0.3	15.4	18.7
1996	7881.2	17338.6	0.0	3546.5	10639.6	39406	20.0	44.0	0.0	9.0	27.0
1997	3280.2	20531.2	162.1	4151.2	5403.4	33556	9.8	61.2	0.5	12.4	16.1
1998	1515.3	14600.3	312.9	4124.7	2720.0	23308	6.5	62.6	1.3	17.7	11.7
1999	1039.0	9305.8	439.5	4291.9	3988.2	19156	5.4	48.6	2.3	22.4	20.8
2000	2290.6	8133.9	206.0	6851.3	4259.7	21793	10.5	37.3	0.9	31.4	19.5
2001	4491.4	14349.7	48.2	5815.3	4139.4	28838	15.6	49.8	0.2	20.2	14.4
2002	3790.3	23423.1	103.4	7313.0	3717.2	38347	9.9	61.1	0.3	19.1	9.7
2003	2180.5	17654.6	445.6	6269.5	2821.4	29382	7.4	60.1	1.5	21.3	9.6
2004	1105.6	10453.9	92.1	2793.9	2324.3	16772	6.6	62.3	0.5	16.7	13.9
2005	830.3	7735.4	131.0	5518.8	1248.7	15472	5.4	50.0	0.8	35.7	8.1
2006	611.4	5689.7	20.6	1525.6	784.8	8636	7.1	65.9	0.2	17.7	9.1
2007	542.8	5788.9	25.5	1937.0	569.5	8866	6.1	65.3	0.3	21.8	6.4

	Tonnes						Percentage				
	Jigging	Longline	Gillnet	Single trawl	Pairtrawl	Sum	Jigging	Longline	Gillnet	Single trawl	Pairtrawl
2008	494.0	5086.2	51.1	1720.6	313.0	7666	6.4	66.3	0.7	22.4	4.1
2009	721.5	5113.6	21.1	624.9	663.8	7146	10.1	71.6	0.3	8.7	9.3
2010	1293.2	7075.5	4.4	547.3	1339.8	10258	12.6	69.0	0.0	5.3	13.1
2011	639.4	5895.5	8.9	577.2	2377.7	9502	6.7	62.0	0.1	6.1	25.0
2012	339.7	3777.3	0.0	547.2	1712.7	6378	5.3	59.2	0.0	8.6	26.9
2013	381.9	2901.8	10.0	505.1	944.7	4749	8.0	61.1	0.2	10.6	19.9
2014	365.2	3732.0	24.4	727.1	844.7	5699	6.4	65.5	0.4	12.8	14.8
2015	533.9	3643.2	5.6	934.7	771.5	5890	9.1	61.9	0.1	15.9	13.1
2016	521.7	3226.6	36.6	852.4	922.4	5562	9.4	58.0	0.7	15.3	16.6
2017	491.7	1966.9	26.6	1623.9	1168.8	5279	9.3	37.3	0.5	30.8	22.1
2018	1176.7	4182.7	31.1	3134.8	1852.7	10379	11.3	40.3	0.3	30.2	17.9
2019	2474.2	8959.9	25.5	1944.7	2770.6	16176	15.3	55.4	0.2	12.0	17.1
2020	1207.6	6160.6	34.2	1106.6	1203.8	9718	12.4	63.4	0.4	11.4	12.4

Table 4.2.4. Faroe Plateau cod (Subdivision 5.b.1). Catch in numbers at age per fleet in terminal year. Numbers are in thousands. LL<100: Longliners smaller than 100 GRT. LL>100: Longliners larger than 100 GRT.

Age	Numbers in thousands				Percent		
	LL < 100	LL > 100	Trawlers	Total	LL < 100	LL > 100	Trawlers
1	0	0	0	0			
2	8.2	18.1	1.2	27.4	30	66	4
3	1234.9	305.4	92.5	1632.8	76	19	6
4	647.8	348.6	223.1	1219.5	53	29	18
5	256.5	135.6	86	478.1	54	28	18
6	168.3	116.3	39.1	323.7	52	36	12
7	104.6	65.5	14	184.1	57	36	8
8	6.2	31.2	6.7	44	14	71	15
9	0	6.7	1.8	8.5	0	79	21
10+	0	0.2	1.1	1.3	0	15	85
Sum	2426.5	1027.6	465.5	3919.4	62	26	12

Table 4.2.5. Faroe Plateau cod (Subdivision 5.b.1). Number of samples, lengths, otoliths, and individual weights in terminal year.

Drift	Samples		Only lengths		Lengths and Weights		Otoliths	
	Q1-2	Q3-4	Q1-2	Q3-4	Q1-2	Q3-4	Q1-2	Q3-4
Open boats	1	1	145	88	0	0	65	60
Longliners < 100 GRT	1	2	0	272	219	0	59	120
Jiggers	1	2	158	264	0	0	60	120
Single trawlers < 400 HP	0	0	0	0	0	0	0	0
Single trawlers > 400 HP	0	0	0	0	0	0	0	0
Pair trawlers < 1000 HP	14	7	0	0	2455	938	833	416
Pair trawlers > 1000 HP	6	8	0	0	1164	1029	359	453
Longliners > 100 GRT	12	4	132	0	2170	730	680	240
Sum	35	24	435	624	6008	2697	2056	1409

Table 4.2.6. Faroe Plateau cod (Subdivision 5.b.1). Catch in numbers at age.

Year\age	1	2	3	4	5	6	7	8	9	10+
1959	0	2002	4239	858	1731	200	207	50	10	0
1960	0	4728	4027	2574	513	876	171	131	61	0
1961	0	3093	2686	1331	1066	232	372	78	29	0
1962	0	4424	2500	1255	855	481	93	94	22	0
1963	0	4110	3958	1280	662	284	204	48	30	0
1964	0	2033	3021	2300	630	350	158	79	41	0
1965	0	852	3230	2564	1416	363	155	48	63	0
1966	0	1337	970	2080	1339	606	197	104	33	0
1967	0	1609	2690	860	1706	847	309	64	27	0
1968	0	1529	3322	2663	945	1226	452	105	11	0
1969	0	878	3106	3300	1538	477	713	203	92	0
1970	0	402	1163	2172	1685	752	244	300	44	0
1971	0	328	757	821	1287	1451	510	114	179	0
1972	0	875	1176	810	596	1021	596	154	25	0
1973	0	723	3124	1590	707	384	312	227	120	97
1974	0	2161	1266	1811	934	563	452	149	141	91
1975	0	2584	5689	2157	2211	813	295	190	118	150
1976	0	1497	4158	3799	1380	1427	617	273	120	186
1977	0	425	3282	6844	3718	788	1160	239	134	9
1978	0	555	1219	2643	3216	1041	268	201	66	56
1979	0	575	1732	1673	1601	1906	493	134	87	38
1980	0	1129	2263	1461	895	807	832	339	42	18
1981	0	646	4137	1981	947	582	487	527	123	55
1982	0	1139	1965	3073	1286	471	314	169	254	122
1983	0	2149	5771	2760	2746	1204	510	157	104	102
1984	0	4396	5234	3487	1461	912	314	82	34	66
1985	0	998	9484	3795	1669	770	872	309	65	80
1986	0	210	3586	8462	2373	907	236	147	47	38
1987	0	257	1362	2611	3083	812	224	68	69	26
1988	0	509	2122	1945	1484	2178	492	168	33	25
1989	0	2237	2151	2187	1121	1026	997	220	61	9
1990	0	247	2892	1504	865	410	298	295	51	26
1991	0	192	451	2152	622	303	142	93	53	24
1992	0	205	455	466	911	293	132	53	30	34
1993	0	120	802	603	222	329	96	33	22	25
1994	0	573	788	1062	532	125	176	39	23	16
1995	0	2615	2716	2008	1012	465	118	175	44	49
1996	0	351	5164	4608	1542	1526	596	147	347	47
1997	0	200	1278	6710	3731	657	639	170	51	120

Year\age	1	2	3	4	5	6	7	8	9	10+
1998	0	455	745	1558	5140	1529	159	118	28	25
1999	0	1246	1044	840	1164	2339	461	62	18	8
2000	0	2170	2737	811	443	700	840	108	8	1
2001	0	3967	3812	2130	373	372	728	443	36	6
2002	0	2099	7354	3405	1688	474	538	417	293	7
2003	0	697	2186	4696	1979	657	182	94	118	21
2004	0	98	673	1230	2051	717	234	63	41	36
2005	0	504	604	896	1146	841	208	41	19	31
2006	0	1110	1097	469	663	801	333	76	10	3
2007	0	506	1226	723	315	289	255	85	20	3
2008	0	287	761	783	430	187	157	156	57	19
2009	0	873	2262	861	618	296	85	55	43	17
2010	0	2114	2034	861	468	481	178	58	33	38
2011	0	328	2344	1234	365	188	126	50	19	2
2012	0	49	517	1347	555	200	99	69	25	22
2013	0	55	173	333	587	175	39	25	15	5
2014	0	387	517	286	499	350	86	14	9	1
2015	0	154	1026	517	208	280	219	46	23	7
2016	0	175	374	702	214	146	143	67	18	2
2017	0	112	280	333	438	151	75	41	24	8
2018	0	929	1026	717	541	476	94	60	36	4
2019	0	576	2170	1407	1242	928	239	37	23	9
2020	0	27	1633	1220	478	324	184	44	9	1

Table 4.2.7. Faroe Plateau cod (Subdivision 5.b.1). Mean weight at age (kg) in the catches. Stock weights are set equal to catch weights.

Year\age	2	3	4	5	6	7	8	9	10+
1959	0.850	1.730	3.230	4.400	5.800	6.370	7.340	7.880	10.270
1960	1.000	2.030	3.370	4.420	6.020	6.650	8.120	11.000	10.270
1961	1.080	2.220	3.450	4.690	5.520	7.090	9.910	8.030	10.270
1962	1.000	2.270	3.350	4.580	4.930	9.080	6.590	6.660	10.270
1963	1.040	1.940	3.510	4.600	5.500	6.780	8.710	11.720	10.820
1964	0.970	1.830	3.150	4.330	6.080	7.000	6.250	6.190	14.390
1965	0.920	1.450	2.570	3.780	5.690	7.310	7.930	8.090	11.110
1966	0.980	1.770	2.750	3.510	4.800	6.320	7.510	10.340	11.650
1967	0.960	1.930	3.130	4.040	4.780	6.250	7.000	11.010	10.690
1968	0.880	1.720	3.070	4.120	4.650	5.500	7.670	10.950	9.280
1969	1.090	1.800	2.850	3.670	4.890	5.050	7.410	8.660	14.390
1970	0.960	2.230	2.690	3.940	5.140	6.460	10.310	7.390	9.340
1971	0.810	1.800	2.980	3.580	3.940	4.870	6.480	6.370	10.220
1972	0.660	1.610	2.580	3.260	4.290	4.950	6.480	6.900	11.550
1973	1.110	2.000	3.410	3.890	5.100	5.100	6.120	8.660	7.570
1974	1.080	2.220	3.440	4.800	5.180	5.880	6.140	8.630	7.620
1975	0.790	1.790	2.980	4.260	5.460	6.250	7.510	7.390	8.170
1976	0.940	1.720	2.840	3.700	5.260	6.430	6.390	8.550	13.620
1977	0.870	1.790	2.530	3.680	4.650	5.340	6.230	8.380	10.720
1978	1.112	1.385	2.140	3.125	4.363	5.927	6.348	8.715	12.229
1979	0.897	1.682	2.211	3.052	3.642	4.719	7.272	8.368	13.042
1980	0.927	1.432	2.220	3.105	3.539	4.392	6.100	7.603	9.668
1981	1.080	1.470	2.180	3.210	3.700	4.240	4.430	6.690	10.000
1982	1.230	1.413	2.138	3.107	4.012	5.442	5.563	5.216	6.707
1983	1.338	1.950	2.403	3.107	4.110	5.020	5.601	8.013	8.031
1984	1.195	1.888	2.980	3.679	4.470	5.488	6.466	6.628	10.981
1985	0.905	1.658	2.626	3.400	3.752	4.220	4.739	6.511	10.981
1986	1.099	1.459	2.046	2.936	3.786	4.699	5.893	9.700	8.815
1987	1.093	1.517	2.160	2.766	3.908	5.461	6.341	8.509	9.811
1988	1.061	1.749	2.300	2.914	3.109	3.976	4.896	7.087	8.287
1989	1.010	1.597	2.200	2.934	3.468	3.750	4.682	6.140	9.156
1990	0.945	1.300	1.959	2.531	3.273	4.652	4.758	6.704	8.689
1991	0.779	1.271	1.570	2.524	3.185	4.086	5.656	5.973	8.147
1992	0.989	1.364	1.779	2.312	3.477	4.545	6.275	7.619	9.725
1993	1.155	1.704	2.421	3.132	3.723	4.971	6.159	7.614	9.587
1994	1.194	1.843	2.613	3.654	4.584	4.976	7.146	8.564	8.796
1995	1.218	1.986	2.622	3.925	5.180	6.079	6.241	7.782	8.627
1996	1.016	1.737	2.745	3.800	4.455	4.978	5.270	5.593	7.482
1997	0.901	1.341	1.958	3.012	4.158	4.491	5.312	6.172	7.056

Year\age	2	3	4	5	6	7	8	9	10+
1998	1.004	1.417	1.802	2.280	3.478	5.433	5.851	7.970	8.802
1999	1.050	1.586	2.350	2.774	3.214	5.496	8.276	9.129	10.652
2000	1.416	2.170	3.187	3.795	4.048	4.577	8.182	11.895	13.009
2001	1.164	2.076	3.053	3.976	4.394	4.871	5.563	7.277	12.394
2002	1.017	1.768	2.805	3.529	4.095	4.475	4.650	6.244	7.457
2003	0.820	1.362	2.127	3.329	4.092	4.670	6.000	6.727	6.810
2004	1.037	1.154	1.693	2.363	3.830	5.191	6.326	7.656	9.573
2005	0.986	1.373	1.760	2.293	3.138	5.287	8.285	8.703	9.517
2006	0.839	1.304	1.988	2.386	3.330	4.691	7.635	9.524	11.990
2007	0.937	1.324	1.970	3.076	3.529	4.710	6.464	9.461	9.509
2008	1.209	1.478	2.104	2.714	3.804	4.669	5.915	7.233	9.559
2009	0.805	1.431	2.287	2.723	3.435	5.081	6.281	8.312	9.959
2010	1.049	1.642	2.400	3.212	3.678	4.774	5.973	7.094	9.800
2011	0.815	1.367	2.413	3.493	4.525	5.076	6.631	6.863	10.089
2012	1.007	1.315	1.893	3.102	4.279	5.573	5.871	7.482	9.206
2013	1.011	1.527	2.528	3.180	4.672	6.776	6.966	9.028	10.324
2014	1.099	1.653	2.466	3.000	4.148	6.489	9.394	9.236	12.120
2015	1.198	1.733	2.769	3.650	4.403	5.768	8.035	10.334	11.127
2016	1.358	1.993	2.752	3.937	4.419	5.399	7.059	10.227	10.975
2017	1.281	2.162	3.051	4.042	4.985	5.650	7.407	9.172	10.882
2018	1.278	2.095	3.392	4.249	4.919	5.553	6.987	8.530	10.099
2019	1.328	2.123	3.408	4.292	4.956	5.663	7.009	8.817	10.393
2020	0.975	1.329	2.523	4.085	4.971	6.021	8.442	11.328	14.004
2021	0.933	1.392	2.503	3.948	5.362	6.126	8.049	10.159	11.798

Table 4.2.8. Faroe Plateau cod (Subdivision 5.b.1). Proportion mature at age. The average for 1983 to 1996 is used prior to 1983.

Year	Age									
	1	2	3	4	5	6	7	8	9	10+
1959	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1960	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1961	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1962	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1963	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1964	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1965	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1966	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1967	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1968	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1969	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1970	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1971	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1972	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1973	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1974	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1975	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1976	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1977	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1978	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1979	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1980	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1981	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1982	0.00	0.18	0.64	0.87	0.95	0.99	0.99	0.99	1.00	1.00
1983	0.00	0.03	0.71	0.93	0.94	1.00	1.00	1.00	1.00	1.00
1984	0.00	0.07	0.96	0.98	0.97	1.00	1.00	1.00	1.00	1.00
1985	0.00	0.00	0.50	0.96	0.96	1.00	1.00	1.00	1.00	1.00
1986	0.00	0.00	0.38	0.93	1.00	1.00	0.96	0.94	1.00	1.00
1987	0.00	0.00	0.67	0.91	1.00	1.00	1.00	1.00	1.00	1.00
1988	0.00	0.06	0.72	0.90	0.97	1.00	1.00	1.00	1.00	1.00
1989	0.00	0.05	0.54	0.98	1.00	1.00	1.00	1.00	1.00	1.00
1990	0.00	0.00	0.68	0.90	0.99	0.96	0.98	1.00	1.00	1.00
1991	0.00	0.00	0.72	0.86	1.00	1.00	1.00	1.00	1.00	1.00
1992	0.00	0.06	0.50	0.82	0.98	1.00	1.00	1.00	1.00	1.00
1993	0.00	0.03	0.73	0.78	0.91	0.99	1.00	1.00	1.00	1.00
1994	0.00	0.05	0.33	0.88	0.96	1.00	0.96	1.00	1.00	1.00
1995	0.00	0.09	0.35	0.33	0.66	0.97	1.00	1.00	1.00	1.00
1996	0.00	0.04	0.43	0.74	0.85	0.94	1.00	1.00	1.00	1.00

Year	Age									
	1	2	3	4	5	6	7	8	9	10+
1997	0.00	0.00	0.64	0.91	0.97	1.00	1.00	1.00	1.00	1.00
1998	0.00	0.00	0.62	0.90	0.99	0.99	1.00	1.00	1.00	1.00
1999	0.00	0.02	0.43	0.88	0.98	1.00	1.00	1.00	1.00	1.00
2000	0.00	0.02	0.39	0.69	0.92	0.99	1.00	1.00	1.00	1.00
2001	0.00	0.07	0.47	0.86	0.94	1.00	1.00	1.00	1.00	1.00
2002	0.00	0.04	0.37	0.76	0.97	0.93	0.97	1.00	1.00	1.00
2003	0.00	0.00	0.29	0.79	0.88	0.98	1.00	1.00	1.00	1.00
2004	0.00	0.00	0.51	0.78	0.92	0.89	0.87	1.00	1.00	1.00
2005	0.00	0.05	0.66	0.90	0.93	0.98	0.92	1.00	1.00	1.00
2006	0.00	0.04	0.59	0.80	0.99	0.99	1.00	1.00	1.00	1.00
2007	0.00	0.00	0.47	0.78	0.91	0.99	0.97	1.00	1.00	1.00
2008	0.00	0.10	0.78	0.91	0.90	0.95	1.00	1.00	1.00	1.00
2009	0.00	0.09	0.61	0.81	0.96	0.94	0.96	1.00	1.00	1.00
2010	0.00	0.08	0.61	0.77	0.94	0.97	1.00	1.00	1.00	1.00
2011	0.00	0.06	0.51	0.69	0.84	0.93	0.98	1.00	1.00	1.00
2012	0.00	0.00	0.63	0.85	0.94	0.97	1.00	1.00	1.00	0.83
2013	0.00	0.24	0.82	0.95	0.98	1.00	1.00	1.00	1.00	1.00
2014	0.00	0.24	0.73	0.98	1.00	1.00	1.00	1.00	1.00	1.00
2015	0.00	0.28	0.48	0.70	0.95	0.97	1.00	1.00	1.00	1.00
2016	0.00	0.21	0.89	0.91	0.97	1.00	1.00	1.00	1.00	1.00
2017	0.00	0.10	0.73	0.98	0.98	0.97	1.00	1.00	1.00	1.00
2018	0.00	0.14	0.64	0.78	0.94	0.95	0.91	0.92	1.00	1.00
2019	0.00	0.07	0.55	0.83	0.98	0.97	1.00	1.00	1.00	1.00
2020	0.00	0.07	0.45	0.74	0.93	1.00	1.00	1.00	1.00	1.00
2021	0.00	0.03	0.69	0.81	0.94	1.00	0.96	1.00	1.00	1.00

Table 4.2.9. Faroe Plateau cod (Subdivision 5.b.1). Summer survey tuning series (number of individuals per 200 stations) and spring survey tuning series (number of individuals per 100 stations) used as tuning series in the assessment model. Zero values were replaced by 0.1.

Year	Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9
1996	200	39.0	724.2	6568.0	3719.9	1298.6	700.2	232.4	48.4	75.5
1997	200	55.0	514.5	1476.6	6647.4	1445.9	177.0	138.1	30.6	1.4
1998	200	411.5	529.2	507.9	981.8	3677.1	901.0	49.6	36.5	17.8
1999	200	121.7	374.3	1257.2	752.3	676.4	1419.0	236.8	40.0	10.0
2000	200	461.6	1374.3	1151.0	672.7	310.5	436.6	601.2	36.5	7.6
2001	200	212.2	3442.3	2446.6	1534.3	417.2	237.4	282.9	242.7	30.9
2002	200	737.1	2368.2	5574.6	1812.6	811.5	149.2	84.3	69.9	49.9
2003	200	68.3	357.4	1038.0	2211.5	566.0	123.7	17.7	12.0	18.4
2004	200	204.1	451.8	839.2	1081.3	1547.3	344.3	80.1	25.6	21.6
2005	200	218.8	616.3	736.6	871.7	1167.8	754.8	142.4	44.7	12.7
2006	200	133.5	980.1	689.3	348.3	311.5	256.3	122.8	28.0	15.5
2007	200	85.6	233.2	449.5	314.0	179.7	134.8	75.8	30.8	12.7
2008	200	181.6	70.3	370.6	328.0	400.6	159.8	52.5	27.8	33.3
2009	200	612.4	435.5	1975.0	821.1	552.9	392.3	131.5	47.2	37.6
2010	200	269.1	1247.8	1551.3	1008.4	363.2	244.2	148.9	41.8	34.2
2011	200	7.1	302.8	1374.7	1083.8	380.7	160.7	105.0	37.4	14.1
2012	200	40.9	22.2	231.1	1080.5	512.6	88.3	35.7	19.2	4.7
2013	200	394.5	105.1	205.3	209.3	888.9	541.5	104.3	44.3	30.9
2014	200	14.4	644.0	866.2	357.9	357.6	400.8	124.0	36.8	22.2
2015	200	205.8	233.0	2236.9	1694.9	412.5	361.1	241.6	66.8	15.8
2016	200	205.6	590.4	838.8	1849.4	693.1	146.5	142.7	73.2	14.6
2017	200	708.3	831.3	997.4	1591.2	1636.3	361.0	129.7	65.0	17.8
2018	200	980.3	982.0	779.4	781.5	502.9	409.8	105.8	27.7	19.8
2019	200	234.0	743.9	922.9	801.5	437.6	276.2	123.4	36.3	16.6
2020	200	83.6	164.6	857.0	685.5	212.3	86.0	48.6	29.6	4.5
2021	200	114.4	102.9	136.6	485.8	211.2	62.0	20.2	15.3	9.1

Year	Effort (hours)	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9
1994	100	7.8	611.1	336.9	915.0	509.3	130.1	187.3	29.0	0.0
1995	100	4.4	628.7	848.3	1524.9	1518.4	1200.4	282.5	348.3	49.5
1996	100	0.0	216.6	4042.0	3986.7	1889.7	1374.3	421.6	83.2	169.2
1997	100	2.1	74.9	841.6	5395.5	2362.7	332.6	225.4	57.4	4.9
1998	100	1.2	69.5	422.0	1568.5	4928.3	1136.3	82.0	40.6	35.0
1999	100	10.7	708.4	676.9	991.9	1227.7	2085.0	253.4	25.0	13.6
2000	100	2.0	321.5	1433.1	747.1	442.1	507.8	838.6	64.5	1.6
2001	100	1.4	945.3	2381.3	1992.4	456.6	323.9	576.9	125.2	5.3
2002	100	0.2	397.1	4559.4	2896.1	1578.3	330.5	230.8	177.9	130.7
2003	100	0.0	91.4	723.4	3915.6	1263.7	531.3	68.5	52.3	39.8
2004	100	0.5	629.8	581.8	846.8	1178.8	295.0	66.5	22.4	12.0
2005	100	0.0	382.1	440.3	1151.8	1442.4	839.5	140.1	14.0	3.8
2006	100	1.1	167.7	156.5	177.0	360.1	292.6	94.7	15.4	4.0
2007	100	0.0	41.7	271.8	286.2	154.8	170.4	105.1	38.6	14.8
2008	100	5.6	174.0	464.9	832.6	469.8	149.4	83.2	39.4	13.5
2009	100	73.7	309.3	470.5	980.0	1162.5	427.1	73.4	31.8	24.8
2010	100	36.9	699.5	1316.9	747.7	539.3	381.2	99.1	41.4	17.4
2011	100	0.0	149.5	1318.6	1241.6	562.7	300.4	237.4	84.8	21.8
2012	100	0.0	1.4	273.2	1301.5	327.5	73.7	27.1	23.9	6.2
2013	100	3.5	65.2	379.6	1694.7	2055.9	297.3	32.6	22.6	17.5
2014	100	1.0	143.6	126.2	160.3	421.2	333.2	74.8	21.9	13.4
2015	100	0.0	22.5	532.4	226.5	193.9	304.9	138.9	32.6	8.0
2016	100	6.2	82.7	279.3	697.0	152.2	73.7	77.4	27.2	7.7
2017	100	26.6	109.4	529.0	695.0	1085.1	136.0	56.3	31.7	10.3
2018	100	22.7	592.3	923.6	1002.7	730.6	714.4	155.0	50.8	35.3
2019	100	39.0	352.1	1080.5	760.0	555.5	350.7	187.4	20.2	14.2
2020	100	0.2	11.2	676.7	728.7	306.2	147.2	76.2	36.1	4.1
2021	100	35.3	84.6	224.7	629.1	242.9	86.8	17.3	9.5	4.8

Table 4.2.10. Faroe Plateau cod (Subdivision 5.b.1). Pair trawler abundance index (number of individuals per 1000 fishing hours). This series was not used in the tuning in the assessment model. The season is June–December. The otoliths are selected from deep (> 150 m) locations.

Year	Age							
	2	3	4	5	6	7	8	9
1989	1200	1638	1783	1381	928	719	297	194
1990	116	2856	2057	834	465	419	200	0
1991	8	148	1401	869	329	225	65	93
1992	84	487	696	1234	760	353	129	62
1993	51	1081	2192	746	1062	398	67	107
1994	1314	2129	1457	2208	697	1241	461	53
1995	577	3645	5178	4199	2769	543	539	106
1996	242	10608	16683	7985	4410	194	0	723
1997	28	674	6038	9375	2413	944	113	0
1998	80	731	1805	5941	4904	801	286	0
1999	444	2082	1933	3008	5136	2220	218	4
2000	3478	3956	1737	956	1003	1694	382	0
2001	3385	6700	3009	555	415	797	862	25
2002	571	6409	5019	1235	432	400	41	228
2003	63	1341	4450	3630	870	270	152	145
2004	23	0	278	2534	2831	1733	274	184
2005	42	399	655	1766	2171	860	148	70
2006	93	135	699	755	1580	612	787	71
2007	64	916	1767	1392	802	656	206	46
2008	54	295	418	573	387	456	487	182
2009	11	734	801	756	448	247	147	105
2010	1578	2917	1787	543	603	190	0	81
2011	22	1487	4078	1967	622	441	95	25
2012	0	95	1531	1789	950	223	40	107
2013	35	102	761	1583	670	103	57	36
2014	292	1631	1006	1690	1812	477	94	101
2015	43	967	1943	1019	1190	1086	320	96
2016	130	485	2227	1521	905	691	362	177
2017	158	392	855	1477	561	276	216	142
2018	620	1205	1929	1927	1466	629	176	74
2019	2170	5140	2243	1207	339	86	8	6
2020	43	1322	2504	1014	392	211	100	30

Table 4.2.11. Faroe Plateau cod (Subdivision 5.b.1). Longliner abundance index (number of individuals per 100 000 hooks). This series was not used in the tuning in the assessment model. The age composition was obtained from all longliners > 100 GRT. The area was restricted to the area west of Faroe Islands at depths between 100 and 200 m.

Year	Age							
	1	2	3	4	5	6	7	8
1993	405	2610	9306	3330	806	2754	847	258
1994	101	8105	14105	7863	4659	962	1187	71
1995	0	15249	23062	2895	2505	1568	708	1073
1996	0	2269	18658	13265	4153	8435	4513	1147
1997	0	1738	5837	26368	18089	2805	2807	402
1998	1892	4490	2025	2565	11738	2732	131	19
1999	849	10968	3811	985	1891	3759	548	109
2000	2695	10983	6710	998	780	1473	2136	109
2001	287	12999	7409	2660	515	1135	1808	2545
2002	105	6862	20902	10819	7759	1561	1945	1265
2003	16	2099	6057	15910	7778	1830	708	650
2004	59	510	1773	2438	3214	1059	293	71
2005	297	2169	1543	2313	2327	1360	170	13
2006	151	5813	5319	674	2205	2352	1148	56
2007	274	3578	6383	2778	1927	1159	1118	134
2008	1270	2243	4449	4773	2564	1133	816	716
2009	294	2670	15107	6308	3028	2491	683	132
2010	23	20287	16914	8733	2595	4780	1878	864
2011	160	2817	28218	14391	4295	2207	1252	195
2012	0	1833	9562	8309	2364	1296	403	197
2013	0	52	209	2887	5132	2654	1222	359
2014	93	5898	9602	4695	4398	3475	1289	116
2015	0	1260	10417	8202	3167	3342	2428	414
2016	157	1790	3118	5109	1985	873	1370	1548
2017	584	1624	1700	1255	1073	743	462	553
2018	0	3690	8057	7624	6613	7832	1836	1899
2019	0	5430	15027	7622	6057	2776	698	73
2020	0	91	2831	5361	2172	840	453	213

Table 4.2.12. Longliner abundance index (number of individuals per day) for longliners < 25 GRT operating mainly near shore. This series was not used in the tuning of the assessment model. The age composition was obtained from all longliners. Data were not available for 2020.

Year	Age							
	1	2	3	4	5	6	7	8
1983	0.9	7.5	4.7	3.8	1.6	0.9	0.5	0.2
1984	0.0	33.3	32.1	13.2	5.8	6.3	1.0	0.7
1985	0.0	3.7	50.1	35.0	25.3	14.1	19.6	5.8
1986	0.0	5.6	41.6	24.0	15.3	6.8	6.2	2.2
1987	0.0	6.8	11.3	16.6	27.5	12.4	5.3	0.9
1988	0.0	3.1	6.4	13.0	8.5	19.1	6.5	2.6
1989	0.1	43.7	21.3	20.5	13.9	7.5	16.1	2.2
1990	0.0	7.9	40.3	8.6	12.2	6.5	7.7	4.2
1991	0.0	0.0	5.2	27.0	8.7	3.9	2.4	0.7
1992	0.0	6.2	17.1	6.9	3.9	3.6	1.8	1.4
1993	0.4	4.6	19.2	7.3	1.4	1.3	0.3	1.3
1994	0.1	14.9	18.4	15.4	6.6	2.1	2.6	0.5
1995	0.0	53.6	47.8	12.2	8.4	5.1	2.0	3.1
1996	0.0	5.9	76.2	52.1	13.1	28.8	14.3	4.2
1997	0.0	4.6	16.6	71.8	54.5	7.9	7.6	0.9
1998	5.8	12.1	5.6	8.2	33.1	9.9	0.4	0.4
1999	0.3	29.2	10.0	4.7	7.0	15.9	2.5	0.1
2000	9.6	40.4	23.5	1.3	1.3	2.4	4.2	0.5
2001	0.6	96.6	48.7	17.1	3.0	5.7	12.6	12.9
2002	0.1	47.6	97.2	43.4	30.0	7.3	11.5	6.8
2003	0.0	17.5	37.4	106.4	59.1	12.9	4.1	1.5
2004	0.0	7.0	21.5	21.0	31.1	8.2	0.3	0.0
2005	0.6	14.7	20.5	18.5	32.9	15.6	1.5	0.0
2006	2.0	58.7	47.0	9.1	10.6	13.6	4.1	0.4
2007	0.2	11.2	23.2	8.9	4.2	4.9	3.5	0.6
2008	0.3	3.4	16.2	21.1	14.4	3.3	1.5	2.1
2009	3.1	33.3	154.6	57.5	33.9	23.5	9.6	5.9
2010	2.6	135.7	147.1	62.4	27.3	28.5	8.5	1.8
2011	0.0	19.7	156.5	65.0	25.2	15.6	8.5	1.9
2012	0.3	4.6	39.3	59.0	15.1	5.2	2.6	1.3
2013	1.2	16.6	23.8	63.6	58.0	7.8	2.9	0.0
2014	2.1	103.4	102.0	46.9	27.3	17.1	1.4	0.0
2015	0.9	25.4	148.6	65.3	23.0	17.9	10.7	0.7
2016	3.2	30.5	40.6	36.9	7.8	4.9	5.6	0.0
2017	14.6	41.2	36.0	18.8	11.6	2.1	0.1	0.0
2018	1.2	126.1	86.6	40.4	25.1	27.8	6.5	9.3
2019	0.0	60.5	148.2	83.0	63.4	46.5	7.8	1.0

Table 4.6.1. Faroe Plateau cod (Subdivision 5.b.1). Configuration in the SAM-run and the model parameters.

```
> conf
```

```
$minAge
```

```
[1] 1
```

```
$maxAge
```

```
[1] 10
```

```
$maxAgePlusGroup
```

```
[1] 1
```

```
$keyLogFsta
```

```
  [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
```

```
[1,] -1  0  1  2  3  4  5  5  5  5
```

```
[2,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
[3,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
$corFlag
```

```
[1] 2
```

```
$keyLogFpar
```

```
  [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
```

```
[1,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
[2,]  0  1  2  3  4  5  6  7  7 -1
```

```
[3,]  8  9 10 11 12 13 14 15 15 -1
```

```
$keyQpow
```

```
  [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
```

```
[1,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
[2,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
[3,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
$keyVarF
```

```
  [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
```

```
[1,]  0  0  0  0  0  0  0  0  0  0
```

```
[2,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
[3,] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
```

```
$keyVarLogN
```

```
[1] 0 1 1 1 1 1 1 1 1 1
```

```
$keyVarObs
```

```
      [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
[1,]  0  0  0  0  0  0  0  0  0  0
[2,]  1  2  2  2  2  2  2  2  2 -1
[3,]  3  4  4  4  4  4  4  4  4 -1
```

\$obsCorStruct

[1] ID AR ID

Levels: ID AR US

\$keyCorObs

```
      1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9 9-10
[1,] NA NA NA NA NA NA NA NA NA
[2,]  0  0  0  0  0  0  0  0 -1
[3,] NA NA NA NA NA NA NA NA -1
```

\$stockRecruitmentModelCode

[1] 0

\$noScaledYears

[1] 0

\$keyScaledYears

numeric(0)

\$keyParScaledYA

<0 x 0 matrix>

\$fbarRange

[1] 3 7

\$keyBiomassTreat

[1] -1 -1 -1

\$obsLikelihoodFlag

[1] LN LN LN

Levels: LN ALN

\$fixVarToWeight

[1] 0

Table of model parameters: (Not updated yet)

Parameter name	par	sd(par)	exp(par)	Low	High
logFpar_0	-8.996	0.225	0	0	0
logFpar_1	-7.726	0.132	0	0	0.001
logFpar_2	-6.639	0.127	0.001	0.001	0.002
logFpar_3	-6.137	0.124	0.002	0.002	0.003
logFpar_4	-5.912	0.122	0.003	0.002	0.003
logFpar_5	-5.802	0.12	0.003	0.002	0.004
logFpar_6	-5.655	0.115	0.004	0.003	0.004
logFpar_7	-5.519	0.117	0.004	0.003	0.005
logFpar_8	-13.047	0.39	0	0	0
logFpar_9	-8.332	0.142	0	0	0
logFpar_10	-6.633	0.135	0.001	0.001	0.002
logFpar_11	-5.747	0.132	0.003	0.002	0.004
logFpar_12	-5.435	0.13	0.004	0.003	0.006
logFpar_13	-5.378	0.129	0.005	0.004	0.006
logFpar_14	-5.443	0.128	0.004	0.003	0.006
logFpar_15	-5.576	0.099	0.004	0.003	0.005
logSdLogFsta_0	-1.375	0.118	0.253	0.2	0.32
logSdLogN_0	-0.276	0.125	0.759	0.591	0.974
logSdLogN_1	-1.266	0.117	0.282	0.223	0.356
logSdLogObs_0	-1.276	0.096	0.279	0.231	0.338
logSdLogObs_1	0.02	0.157	1.02	0.745	1.397
logSdLogObs_2	-0.634	0.085	0.531	0.448	0.629
logSdLogObs_3	0.69	0.139	1.994	1.511	2.632
logSdLogObs_4	-0.461	0.053	0.631	0.567	0.702
transfIRARdist_0	-0.62	0.223	0.538	0.345	0.84
itrans_rho_0	1.676	0.208	5.343	3.523	8.104

Model	log(L)	#par	AIC
Current	-925.72	26	1903.43
base	-925.72	26	1903.43

Table 4.6.2. Faroe Plateau cod (Subdivision 5.b.1). Fishing mortality at age from the SAM model.

Year Age	1	2	3	4	5	6	7	8	9	10
1959		0.226	0.467	0.496	0.539	0.526	0.578	0.578	0.578	0.578
1960		0.292	0.607	0.653	0.721	0.723	0.803	0.803	0.803	0.803
1961		0.252	0.528	0.582	0.656	0.671	0.749	0.749	0.749	0.749
1962		0.216	0.46	0.52	0.594	0.608	0.666	0.666	0.666	0.666
1963		0.178	0.389	0.456	0.527	0.552	0.606	0.606	0.606	0.606
1964		0.147	0.337	0.419	0.505	0.555	0.629	0.629	0.629	0.629
1965		0.128	0.311	0.403	0.501	0.57	0.66	0.66	0.66	0.66
1966		0.11	0.278	0.376	0.484	0.58	0.705	0.705	0.705	0.705
1967		0.099	0.261	0.359	0.461	0.555	0.673	0.673	0.673	0.673
1968		0.094	0.257	0.359	0.452	0.533	0.629	0.629	0.629	0.629
1969		0.093	0.266	0.38	0.479	0.575	0.687	0.687	0.687	0.687
1970		0.071	0.212	0.308	0.389	0.475	0.571	0.571	0.571	0.571
1971		0.063	0.195	0.291	0.375	0.471	0.574	0.574	0.574	0.574
1972		0.059	0.186	0.275	0.345	0.423	0.509	0.509	0.509	0.509
1973		0.062	0.201	0.296	0.363	0.436	0.538	0.538	0.538	0.538
1974		0.061	0.2	0.299	0.371	0.448	0.568	0.568	0.568	0.568
1975		0.072	0.248	0.381	0.473	0.565	0.728	0.728	0.728	0.728
1976		0.077	0.28	0.453	0.585	0.72	0.97	0.97	0.97	0.97
1977		0.071	0.273	0.45	0.573	0.682	0.887	0.887	0.887	0.887
1978		0.061	0.243	0.398	0.494	0.581	0.747	0.747	0.747	0.747
1979		0.06	0.247	0.401	0.485	0.559	0.7	0.7	0.7	0.7
1980		0.056	0.233	0.369	0.433	0.487	0.592	0.592	0.592	0.592
1981		0.06	0.255	0.406	0.476	0.54	0.663	0.663	0.663	0.663
1982		0.061	0.267	0.427	0.499	0.569	0.705	0.705	0.705	0.705
1983		0.079	0.357	0.575	0.664	0.746	0.897	0.897	0.897	0.897
1984		0.069	0.313	0.507	0.574	0.633	0.744	0.744	0.744	0.744
1985		0.073	0.348	0.598	0.711	0.834	1.022	1.022	1.022	1.022
1986		0.061	0.301	0.533	0.633	0.744	0.904	0.904	0.904	0.904
1987		0.055	0.266	0.472	0.553	0.649	0.793	0.793	0.793	0.793
1988		0.069	0.33	0.586	0.679	0.788	0.948	0.948	0.948	0.948
1989		0.082	0.383	0.684	0.787	0.895	1.048	1.048	1.048	1.048
1990		0.068	0.316	0.584	0.693	0.8	0.955	0.955	0.955	0.955
1991		0.05	0.231	0.437	0.532	0.626	0.763	0.763	0.763	0.763
1992		0.04	0.18	0.345	0.43	0.519	0.656	0.656	0.656	0.656

Year Age	1	2	3	4	5	6	7	8	9	10
1993		0.031	0.138	0.259	0.32	0.388	0.505	0.505	0.505	0.505
1994		0.032	0.135	0.245	0.296	0.354	0.464	0.464	0.464	0.464
1995		0.044	0.18	0.322	0.394	0.482	0.648	0.648	0.648	0.648
1996		0.058	0.239	0.446	0.599	0.801	1.157	1.157	1.157	1.157
1997		0.07	0.278	0.512	0.719	1.023	1.568	1.568	1.568	1.568
1998		0.076	0.284	0.486	0.656	0.924	1.437	1.437	1.437	1.437
1999		0.087	0.302	0.481	0.618	0.853	1.335	1.335	1.335	1.335
2000		0.079	0.262	0.382	0.454	0.587	0.869	0.869	0.869	0.869
2001		0.09	0.299	0.432	0.511	0.661	0.966	0.966	0.966	0.966
2002		0.119	0.404	0.597	0.735	0.956	1.34	1.34	1.34	1.34
2003		0.103	0.357	0.539	0.688	0.904	1.217	1.217	1.217	1.217
2004		0.077	0.276	0.431	0.582	0.812	1.123	1.123	1.123	1.123
2005		0.095	0.334	0.498	0.649	0.888	1.203	1.203	1.203	1.203
2006		0.105	0.358	0.499	0.614	0.795	1.013	1.013	1.013	1.013
2007		0.095	0.32	0.43	0.506	0.639	0.806	0.806	0.806	0.806
2008		0.093	0.32	0.434	0.513	0.657	0.861	0.861	0.861	0.861
2009		0.104	0.362	0.48	0.552	0.679	0.849	0.849	0.849	0.849
2010		0.117	0.427	0.583	0.698	0.885	1.108	1.108	1.108	1.108
2011		0.083	0.314	0.439	0.534	0.679	0.837	0.837	0.837	0.837
2012		0.08	0.321	0.477	0.623	0.85	1.105	1.105	1.105	1.105
2013		0.051	0.21	0.317	0.417	0.566	0.733	0.733	0.733	0.733
2014		0.05	0.213	0.317	0.409	0.532	0.648	0.648	0.648	0.648
2015		0.057	0.253	0.385	0.52	0.726	0.932	0.932	0.932	0.932
2016		0.042	0.191	0.295	0.408	0.593	0.773	0.773	0.773	0.773
2017		0.033	0.159	0.25	0.357	0.534	0.7	0.7	0.7	0.7
2018		0.051	0.255	0.399	0.561	0.809	0.993	0.993	0.993	0.993
2019		0.071	0.397	0.658	0.953	1.352	1.557	1.557	1.557	1.557
2020		0.051	0.305	0.525	0.775	1.105	1.228	1.228	1.228	1.228
2021		0.055	0.328	0.568	0.842	1.196	1.323	1.323	1.323	1.323

Table 4.6.3. Faroe Plateau cod (Subdivision 5.b.1). Stock number at age from the SAM model.

Year	1	2	3	4	5	6	7	8	9	10
1959	19919	11907	12053	2395	4214	607	503	159	25	0
1960	18377	16491	8526	5990	1191	1864	334	226	94	12
1961	26117	14174	8167	3669	2527	518	689	138	70	39
1962	26784	22368	7892	3652	1806	1112	236	222	51	42
1963	19942	22920	13761	3799	1779	759	494	123	82	39
1964	11348	16945	13513	7283	1822	866	344	222	73	54
1965	18071	8061	12850	7954	3701	873	395	135	118	55
1966	22882	15272	5219	8002	4114	1630	375	184	64	73
1967	20949	19593	12472	3471	5141	2117	719	124	67	56
1968	12515	18193	15832	8486	2367	3083	987	302	36	51
1969	8890	10004	13891	10742	4577	1218	1632	399	164	38
1970	10175	6815	6665	8490	6046	2267	566	773	135	84
1971	19280	7771	5136	3923	4696	3561	1174	244	422	104
1972	18145	17387	7309	3745	2351	2531	1622	506	89	277
1973	38472	13280	15208	5819	2550	1401	1010	705	280	215
1974	39524	34813	9188	9268	3536	1591	900	445	353	236
1975	24205	34756	25556	6650	6193	2136	850	398	225	292
1976	11337	20565	24120	13946	3569	3350	1103	472	149	199
1977	12971	8205	14942	17630	7598	1638	1567	388	203	43
1978	15684	10539	6680	8840	9238	2981	642	450	130	96
1979	24140	12421	8277	4932	4625	4743	1344	273	161	80
1980	17869	21866	10655	5135	2757	2251	2224	679	115	68
1981	26664	13280	17915	6830	2788	1473	1074	1105	312	104
1982	36177	22120	10053	10651	3867	1385	683	421	475	209
1983	54788	29173	18080	6759	5874	2156	734	271	183	231
1984	20566	54385	20406	9394	3272	2428	808	219	83	148
1985	8149	16713	37586	10784	4110	1415	1188	378	98	112
1986	8767	5812	13486	20903	5034	1689	451	315	96	65
1987	11345	6997	5837	7694	9005	2064	601	140	111	51
1988	19496	8932	6964	4346	3749	4324	928	276	50	47
1989	5951	20263	6954	4411	2128	1699	1632	330	100	22
1990	5820	4149	12460	3706	1793	809	558	465	95	41
1991	7964	4549	2706	6457	1611	685	302	183	130	46
1992	8547	6743	3562	1690	2874	721	270	123	70	73

Year	1	2	3	4	5	6	7	8	9	10
1993	23392	6149	6365	2873	908	1297	297	93	56	65
1994	41296	20347	6168	5042	2116	511	708	139	38	60
1995	11725	43595	16603	5874	3689	1533	340	525	91	76
1996	5173	8934	31473	12682	3447	2482	932	180	368	74
1997	6824	4524	6504	21685	6890	1116	921	266	38	138
1998	15085	6492	3437	4515	11684	2805	286	145	48	31
1999	27862	12735	5536	2524	2734	4968	759	81	23	12
2000	41091	24652	10221	2994	1369	1687	1949	154	18	4
2001	17848	42763	15757	6500	1413	921	1167	718	51	9
2002	8214	16432	26433	8433	3429	787	600	511	283	14
2003	4528	6355	8537	12652	3689	1175	260	150	149	46
2004	6622	3403	3851	4277	4948	1264	331	80	53	54
2005	9014	6040	2612	2540	2705	1842	385	79	23	32
2006	5897	9091	3684	1425	1361	1242	556	103	21	8
2007	5389	4961	4706	2111	824	634	454	169	43	7
2008	12006	3939	3864	2456	1341	479	275	182	87	25
2009	18506	8185	5632	2300	1500	749	221	102	75	36
2010	5992	15719	6694	2611	1078	783	336	94	43	40
2011	1058	4579	9096	3559	997	437	281	96	37	10
2012	2534	714	2416	4609	1533	362	169	100	30	23
2013	8224	1818	1076	1373	2140	596	109	51	26	11
2014	2978	7632	2353	896	1078	965	228	45	23	6
2015	5111	2479	5348	1743	562	620	413	96	25	11
2016	6619	4359	2366	3110	858	303	270	123	32	7
2017	13868	5229	2854	2010	1864	444	171	104	37	15
2018	11354	12595	4547	2540	1542	1073	225	83	50	12
2019	2596	8743	6853	2951	1613	1022	393	67	26	13
2020	2757	1319	5613	3169	1019	456	225	81	13	3
2021	6562	2161	1143	3057	1263	360	101	50	22	4

Table 4.6.4. Faroe Plateau cod (Subdivision 5.b.1). Summary table from the SAM model (catch is also provided) and forecast with F_{MSY} fishing mortality.

Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	Catch	TSB	Low	High
1959	19919	10026	39575	47528	37481	60268	0.521	0.401	0.678	22415	65346	51836	82376
1960	18377	9645	35014	52884	42921	65159	0.701	0.553	0.889	32255	75677	61261	93485
1961	26117	13707	49763	46615	37860	57394	0.637	0.498	0.815	21598	68024	54802	84435
1962	26784	14007	51218	43770	35375	54158	0.569	0.442	0.734	20967	70656	55731	89579
1963	19942	10421	38165	50650	40336	63602	0.506	0.391	0.655	22215	82036	63908	105308
1964	11348	5888	21871	56446	44508	71587	0.489	0.378	0.634	21078	82295	64578	104872
1965	18071	9386	34794	54740	43406	69033	0.489	0.377	0.634	24212	70975	56309	89460
1966	22882	11856	44163	54436	43134	68699	0.484	0.372	0.631	20418	73732	58439	93028
1967	20949	10849	40452	64625	51554	81010	0.462	0.353	0.603	23562	91319	72287	115362
1968	12515	6464	24231	74973	59740	94091	0.446	0.343	0.58	29930	102000	80828	128716
1969	8890	4567	17306	79513	63181	100067	0.478	0.367	0.621	32371	102448	81206	129245
1970	10175	5204	19896	78025	62035	98136	0.391	0.3	0.51	24183	93133	74224	116858
1971	19280	9892	37578	58066	46418	72637	0.381	0.293	0.496	23010	69129	55471	86150
1972	18145	9348	35222	51044	41358	62998	0.348	0.267	0.453	18727	66551	53575	82669
1973	38472	19843	74592	69306	55367	86753	0.367	0.286	0.471	22228	95584	75312	121313
1974	39524	20458	76360	84633	67724	105764	0.377	0.297	0.48	24581	127963	100287	163276
1975	24205	12552	46675	100337	80904	124439	0.479	0.383	0.599	36775	143416	113865	180637
1976	11337	5849	21975	108465	87605	134291	0.601	0.484	0.748	39799	145337	116470	181360
1977	12971	6712	25068	104149	82940	130780	0.573	0.457	0.718	34927	127012	101247	159333
1978	15684	8112	30325	73701	58964	92121	0.493	0.389	0.623	26585	90741	73036	112737
1979	24140	12478	46700	61553	50097	75629	0.478	0.376	0.608	23112	78081	63520	95979

Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	Catch	TSB	Low	High
1980	17869	9262	34475	54654	44896	66534	0.423	0.332	0.538	20513	78897	63323	98302
1981	26664	13883	51214	58766	47794	72255	0.468	0.371	0.59	22963	82539	66008	103209
1982	36177	18848	69440	60594	49296	74480	0.493	0.394	0.618	21489	91694	72923	115297
1983	54788	28249	106260	99269	79831	123439	0.648	0.522	0.805	38133	126167	99544	159910
1984	20566	10708	39500	120968	96088	152289	0.554	0.446	0.69	36979	162424	124565	211789
1985	8149	4195	15829	85740	68198	107795	0.703	0.57	0.867	39484	133716	104363	171324
1986	8767	4545	16910	73510	57013	94781	0.623	0.501	0.775	34595	95483	75329	121028
1987	11345	5923	21731	59460	47288	74763	0.547	0.439	0.681	21391	71702	57782	88976
1988	19496	10022	37925	50161	41316	60898	0.666	0.542	0.819	23182	61812	50943	75000
1989	5951	3061	11572	36798	30573	44290	0.759	0.619	0.931	22068	61890	49208	77840
1990	5820	2989	11335	30507	24600	37832	0.67	0.538	0.833	13692	40361	32143	50682
1991	7964	4058	15629	21799	17202	27625	0.518	0.408	0.658	8750	26792	21323	33664
1992	8547	4363	16742	16550	13171	20795	0.426	0.33	0.549	6396	26925	21142	34291
1993	23392	12273	44583	25584	20055	32637	0.322	0.247	0.419	6107	35673	27535	46216
1994	41296	21741	78439	55813	43906	70949	0.299	0.233	0.382	9046	64277	49912	82776
1995	11725	6400	21479	59462	48918	72279	0.405	0.328	0.501	23045	130603	102109	167048
1996	5173	2845	9407	81529	67286	98786	0.648	0.536	0.784	40422	130909	106284	161239
1997	6824	3768	12359	75744	61143	93831	0.82	0.686	0.98	34304	87404	70953	107668
1998	15085	8515	26726	49425	39889	61242	0.757	0.632	0.908	24005	58971	48444	71787
1999	27862	15636	49647	37848	31257	45829	0.718	0.593	0.868	19245	56820	47495	67976
2000	41091	23020	73346	37912	31915	45037	0.511	0.414	0.63	21833	89092	71822	110515
2001	17848	10049	31698	55412	46207	66452	0.574	0.472	0.698	28577	122156	97473	153091

Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	Catch	TSB	Low	High
2002	8214	4614	14622	57522	47681	69393	0.806	0.669	0.972	38834	109352	88873	134551
2003	4528	2533	8094	43579	35341	53737	0.741	0.612	0.896	25167	64266	52663	78425
2004	6622	3738	11733	25905	21320	31476	0.645	0.531	0.784	12840	34896	29056	41910
2005	9014	5086	15975	21150	17743	25211	0.715	0.59	0.866	10119	29187	24617	34605
2006	5897	3328	10449	16404	13880	19388	0.656	0.536	0.802	9844	26336	21998	31530
2007	5389	3032	9581	14335	12097	16987	0.54	0.438	0.666	7511	23516	19608	28202
2008	12006	6725	21435	17874	14982	21324	0.557	0.455	0.682	7315	24337	20257	29239
2009	18506	10231	33476	18807	15797	22391	0.584	0.479	0.713	9979	29309	24304	35345
2010	5992	3339	10754	21764	18243	25965	0.74	0.606	0.904	12762	42956	34590	53345
2011	1058	579	1934	19636	16153	23871	0.56	0.451	0.696	9692	32623	26525	40123
2012	2534	1418	4526	17317	14144	21201	0.675	0.548	0.832	7205	20888	17085	25537
2013	8224	4540	14898	15979	13012	19622	0.449	0.356	0.565	4473	17981	14736	21941
2014	2978	1635	5425	16438	13757	19642	0.424	0.339	0.53	5711	23907	19508	29298
2015	5111	2859	9138	16786	14103	19978	0.563	0.455	0.697	7329	25377	20889	30827
2016	6619	3694	11861	20567	16792	25191	0.452	0.363	0.563	5876	26634	21676	32727
2017	13868	7648	25146	22955	18703	28174	0.4	0.32	0.5	5360	30990	25210	38095
2018	11354	6092	21159	29670	24752	35566	0.604	0.495	0.737	12214	50357	40768	62202
2019	2596	1342	5022	29764	24678	35899	0.983	0.809	1.195	20670	45612	37246	55857
2020	2757	1282	5928	17732	14085	22323	0.787	0.604	1.026	10431	25400	19930	32371
2021	6562	1778	24213	15240	10369	22399	0.852	0.528	1.375	9194	19466	13403	28274

F _{MSY} projection. TAC in 2021 of 5454 tonnes													
Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	Catch	TSB	Low	High
2021	6763	1780	26087	15540	10659	22431	0.428	0.273	0.661	5454	19896	13938	28685
2022	2978	1058	13868	17289	10851	28248	0.136	0.072	0.271	2206	25666	15335	48185
2023	5111	1058	13868	23848	12965	48049	0.136	0.062	0.31	3098	33556	18204	65915
2024	2978	1058	13868	30416	15341	71624	0.136	0.055	0.329	3956	40802	21324	90861

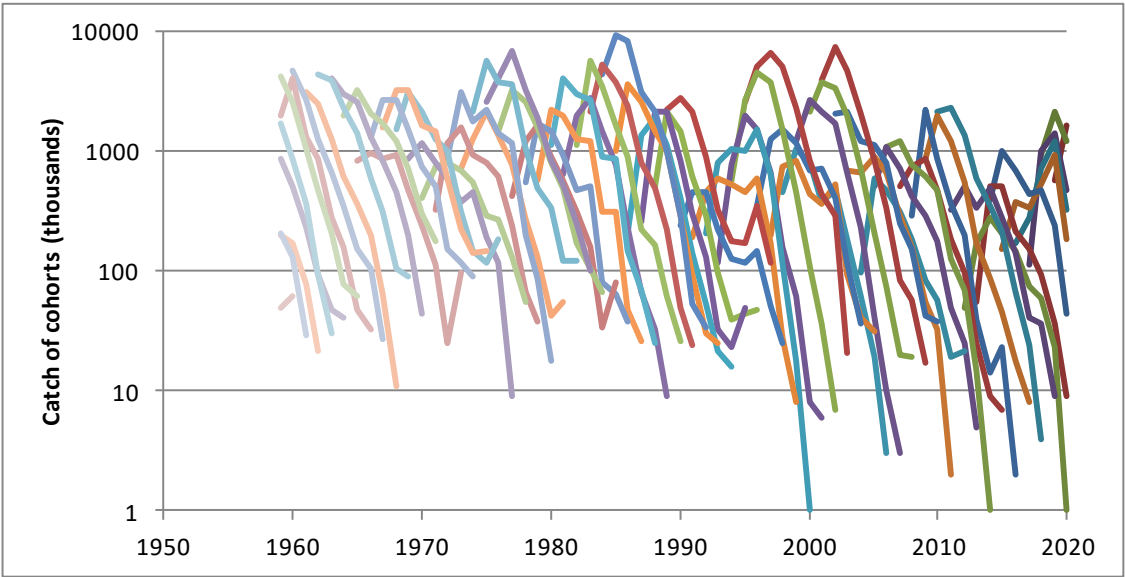


Figure 4.2.1. Faroe Plateau cod (Subdivision 5.b.1). Catch in numbers at age shown as catch curves.

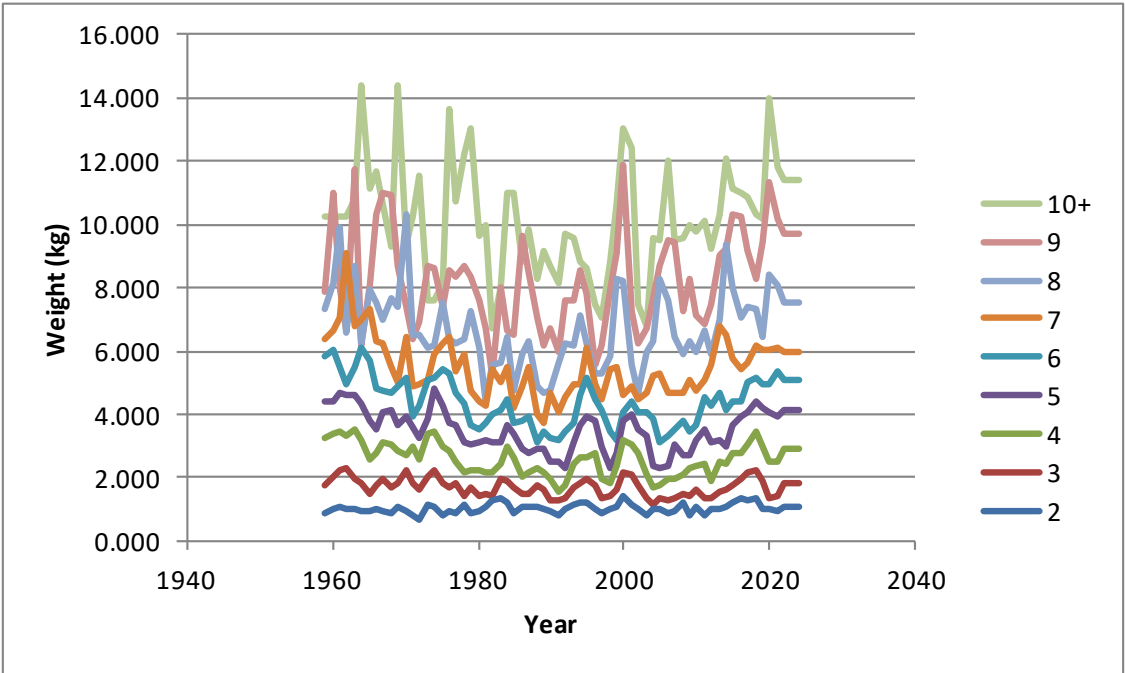


Figure 4.2.2. Faroe Plateau cod (Subdivision 5.b.1). Mean weight at age in the catches. The last three years are based on a previous 5 year average.

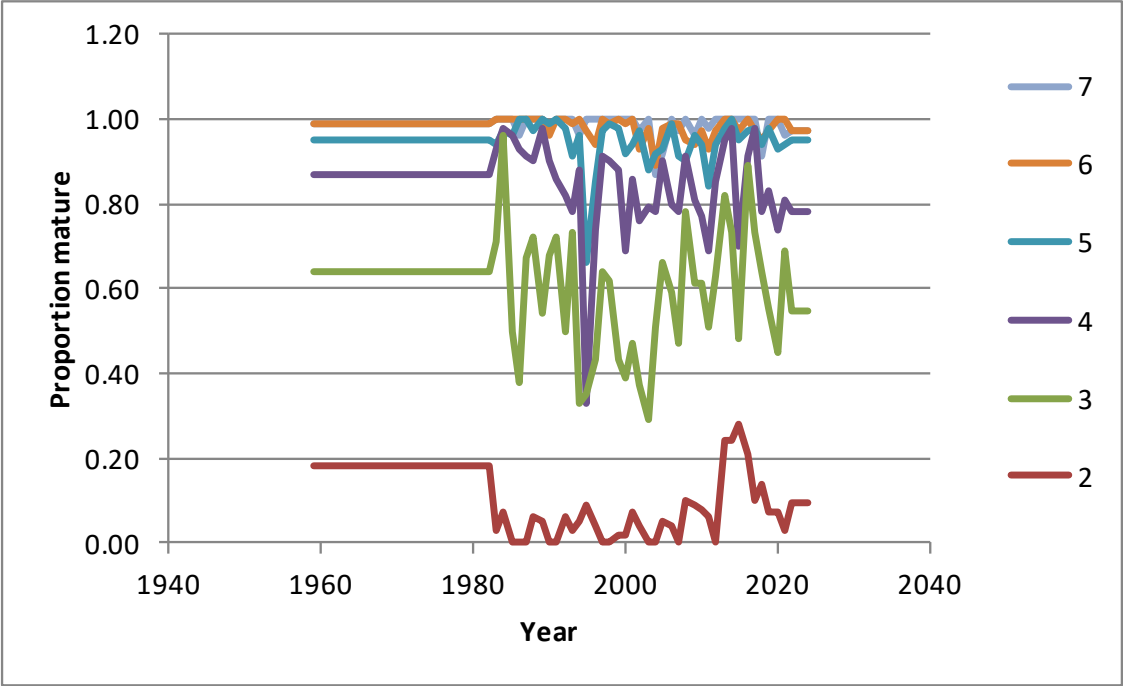


Figure 4.2.3. Faroe Plateau cod (Subdivision 5.b.1). Proportion mature at age as observed in the spring groundfish survey. The last three years are based on a previous 5 year average.

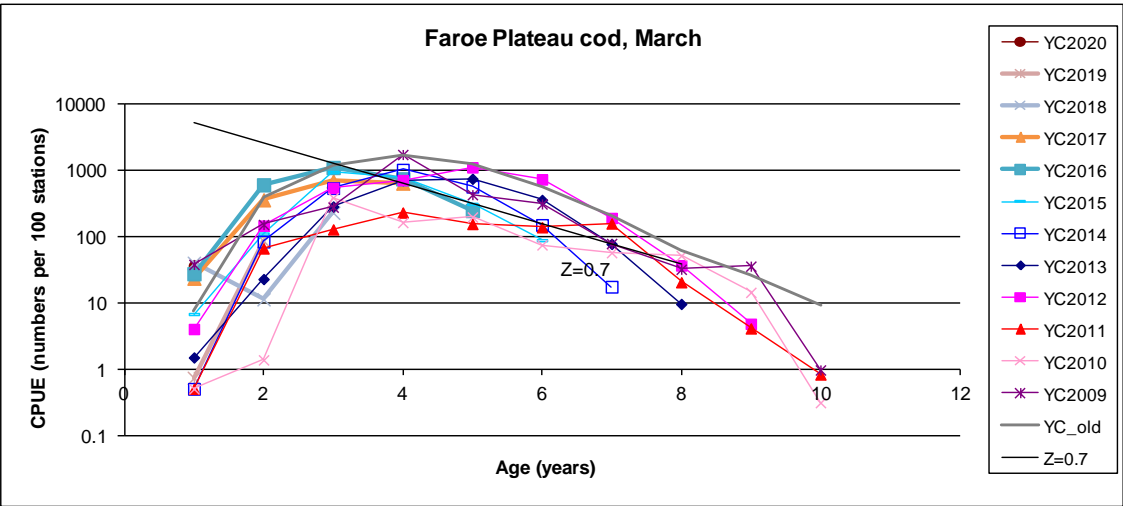


Figure 4.2.4. Faroe Plateau cod (Subdivision 5.b.1). Catch curves from the spring groundfish survey.

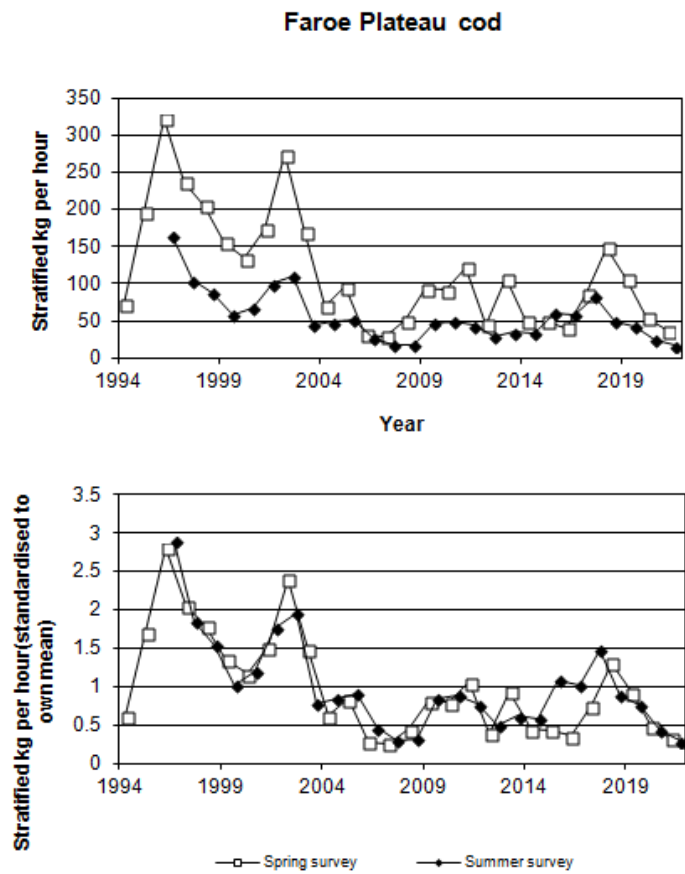


Figure 4.2.5. Faroe Plateau cod (Subdivision 5.b.1). Stratified kg/hour in the spring and summer surveys.

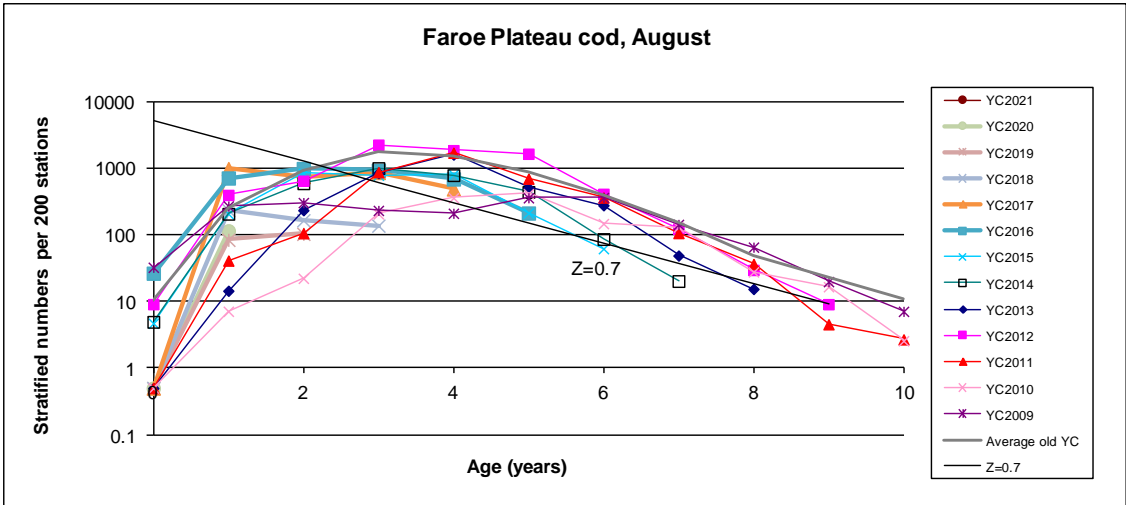


Figure 4.2.6. Faroe Plateau cod (Subdivision 5.b.1). Catch curves from the summer groundfish survey.

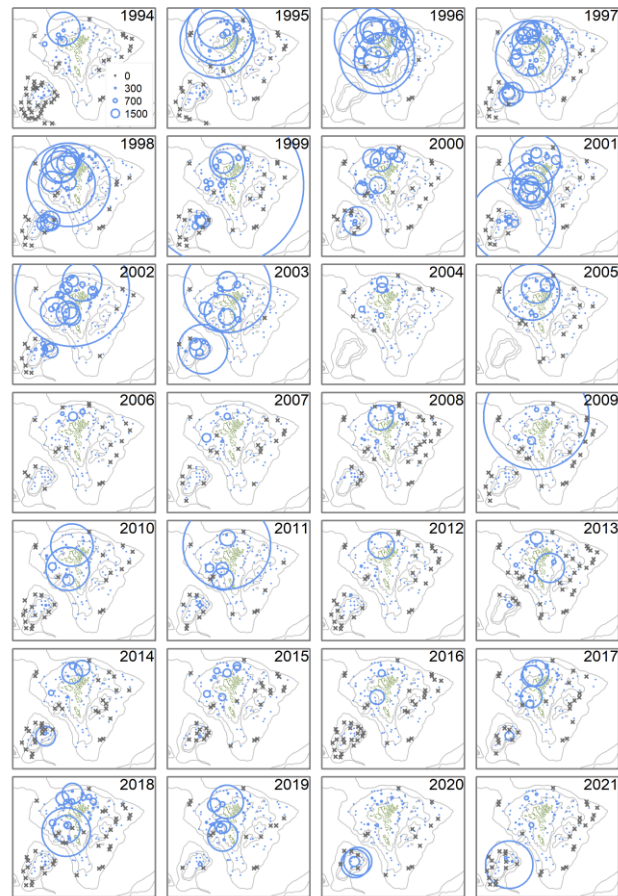


Figure 4.2.7. Faroe Plateau cod (Subdivision 5.b.1). Catch per tow in the spring groundfish survey.

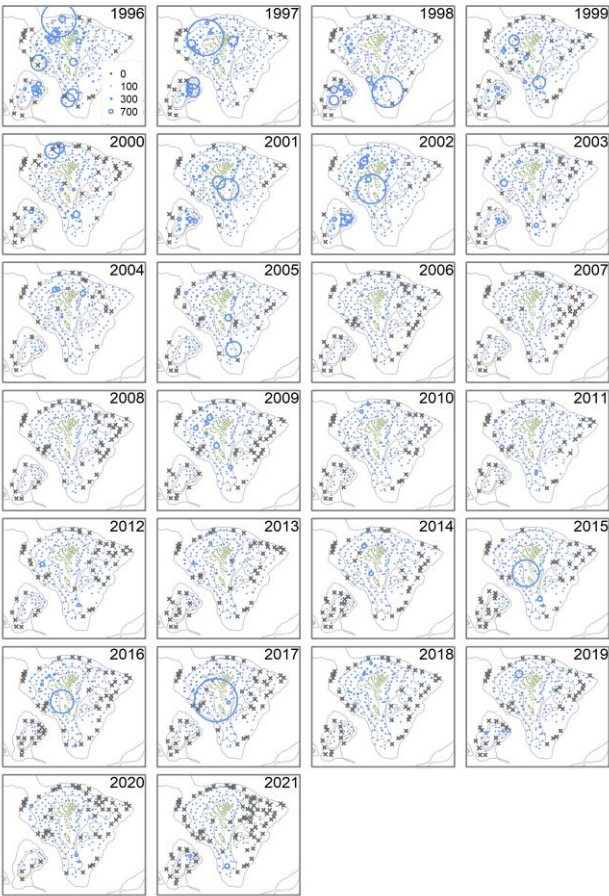


Figure 4.2.8. Faroe Plateau cod (Subdivision 5.b.1). Catch per tow in the summer groundfish survey.

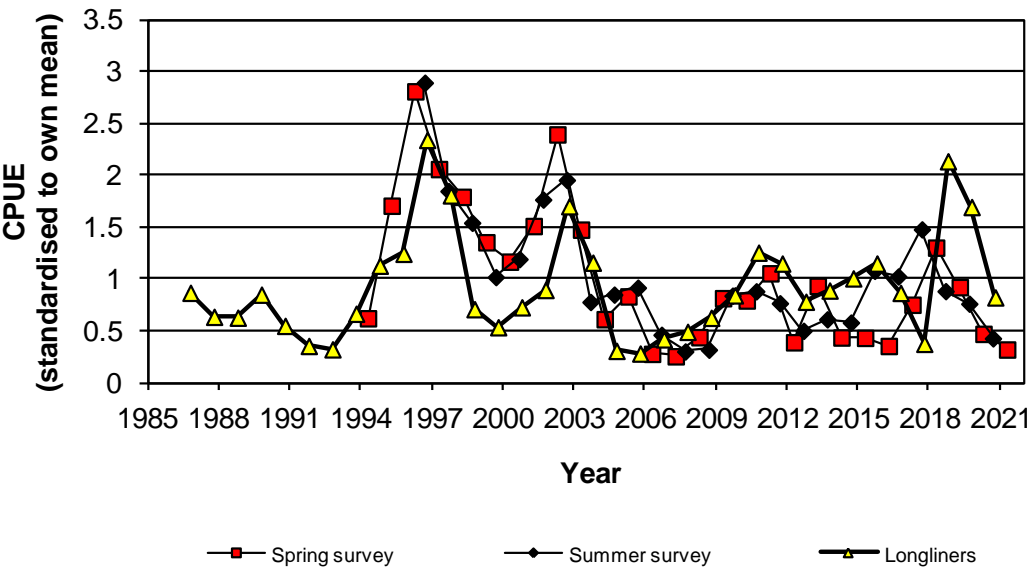


Figure 4.2.9. Faroe Plateau cod (Subdivision 5.b.1). Standardised catch per unit effort for pair trawlers and longliners. The two surveys are shown as well.

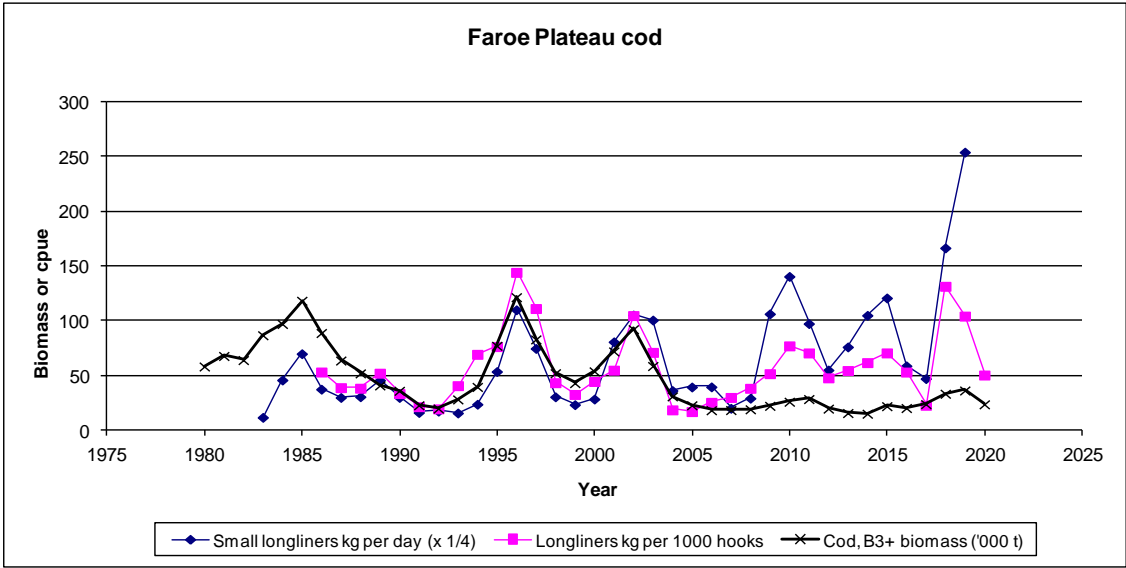


Figure 4.2.10. Faroe Plateau cod (Subdivision 5.b.1). Catch per unit effort for small and large longliners compared with the fishable (age 3+) biomass. No data for small longliners were available for 2020.

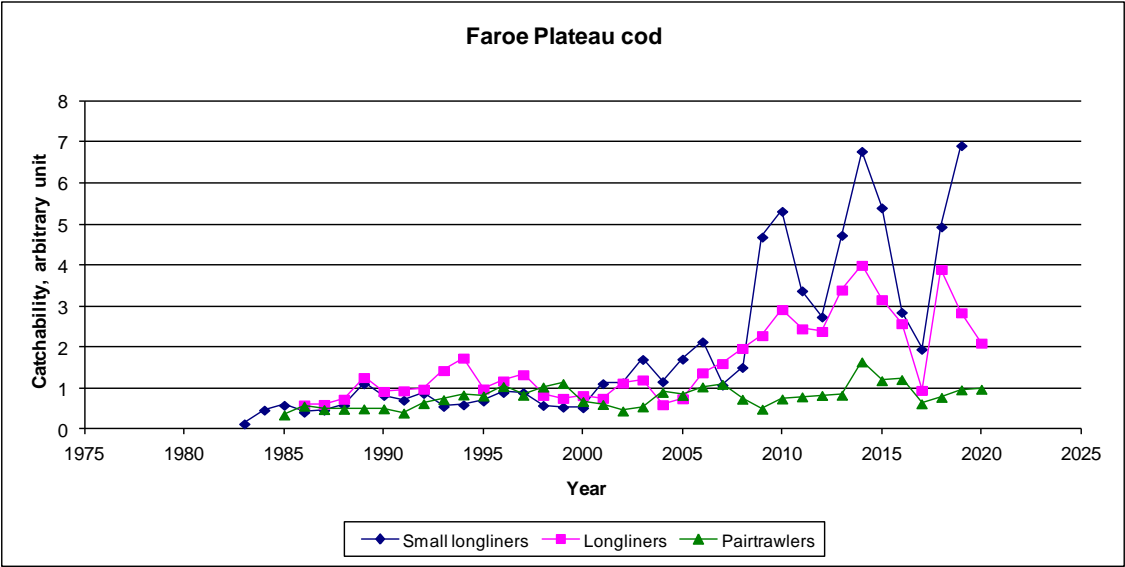


Figure 4.2.11. Faroe Plateau cod (Subdivision 5.b.1). Catchability (cpue divided by age 3+ biomass) for small and large longliners and pair trawlers. No data for small longliners were available for 2020.

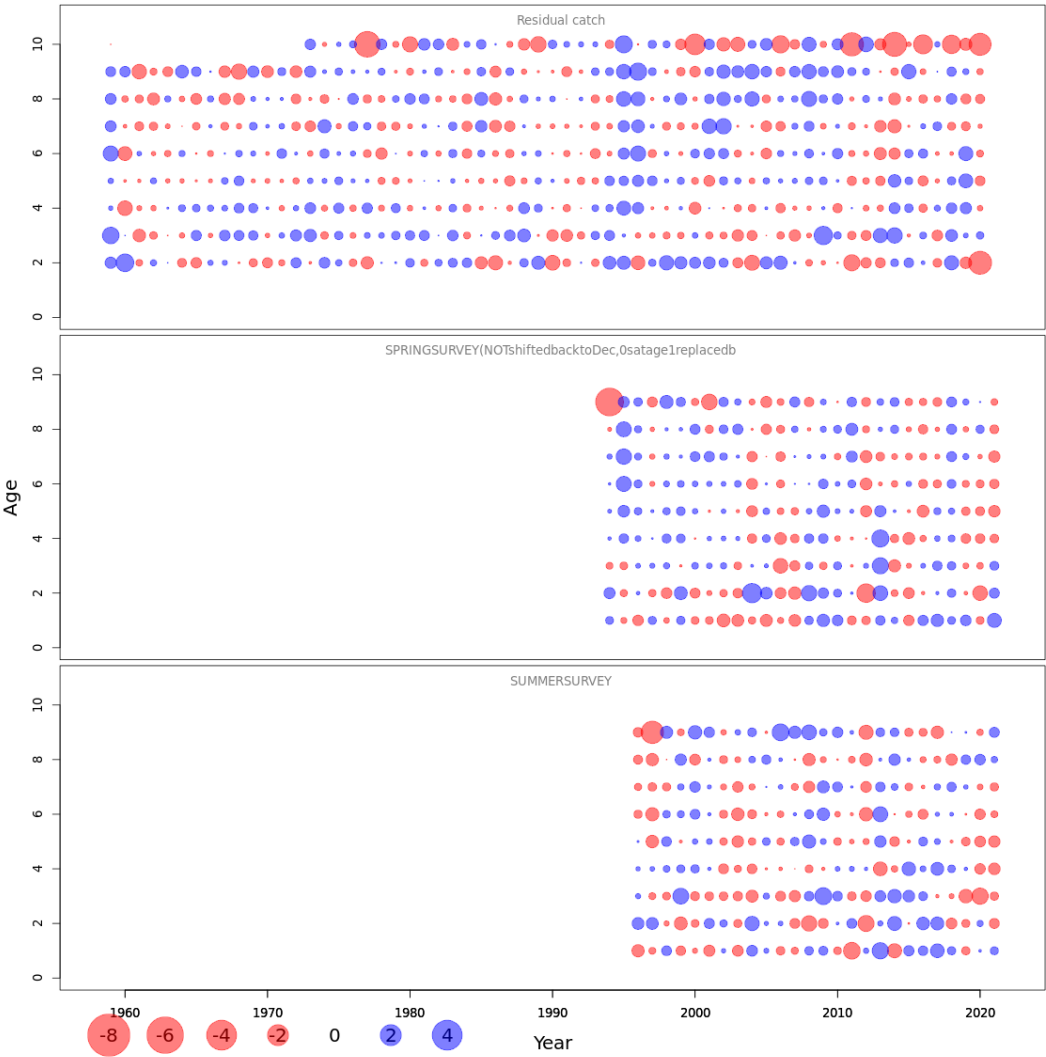


Figure 4.6.1. Faroe Plateau cod (Subdivision 5.b.1). Observation residuals for the catch, spring survey and the summer survey as estimated by the SAM model.



Figure 4.6.2. Faroe Plateau cod (Subdivision 5.b.1). Joint sample residuals for the population numbers and fishing mortality as estimated by the SAM model.

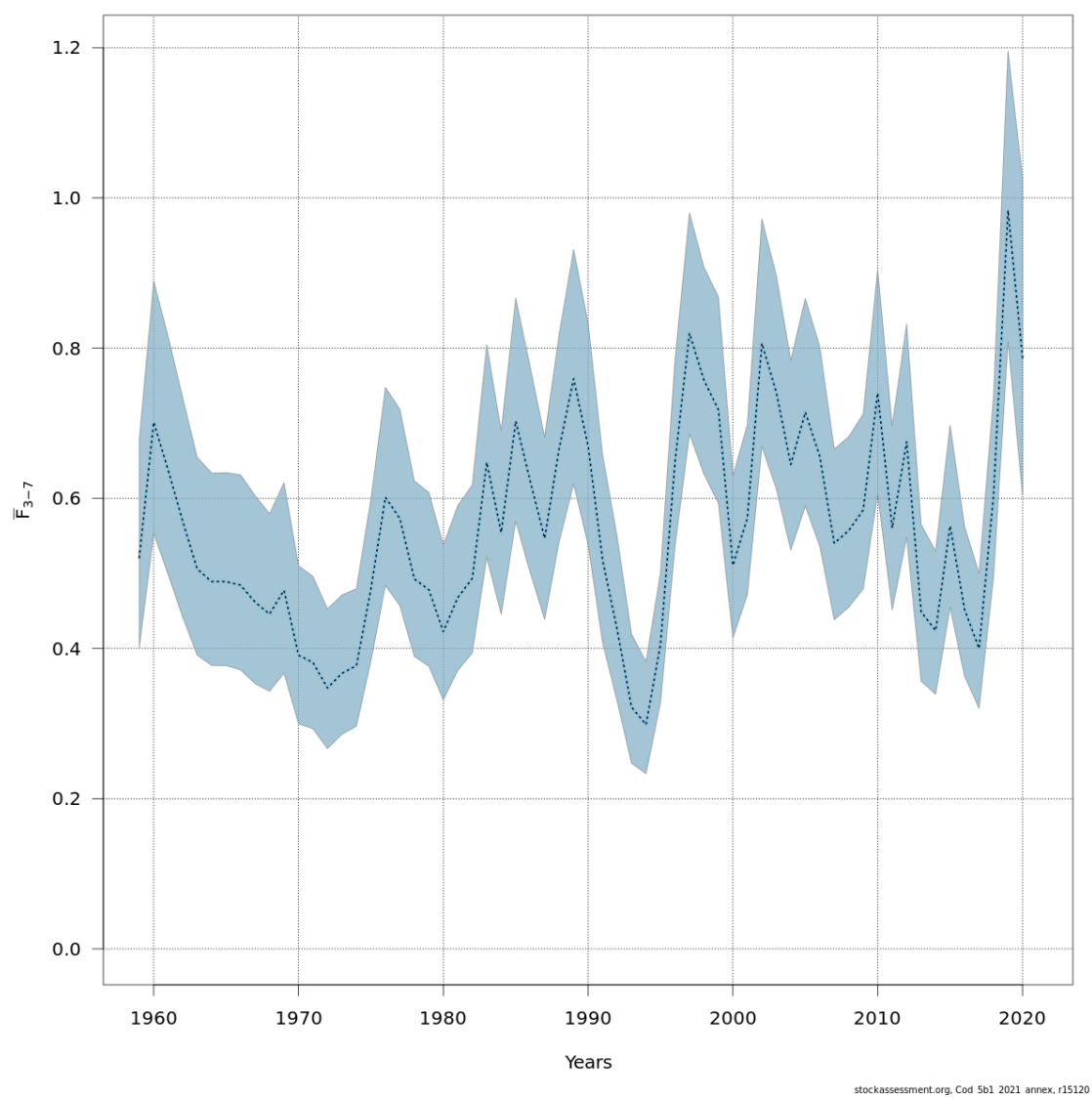


Figure 4.6.3. Faroe Plateau cod (Subdivision 5.b.1). Development of fishing mortality over time.

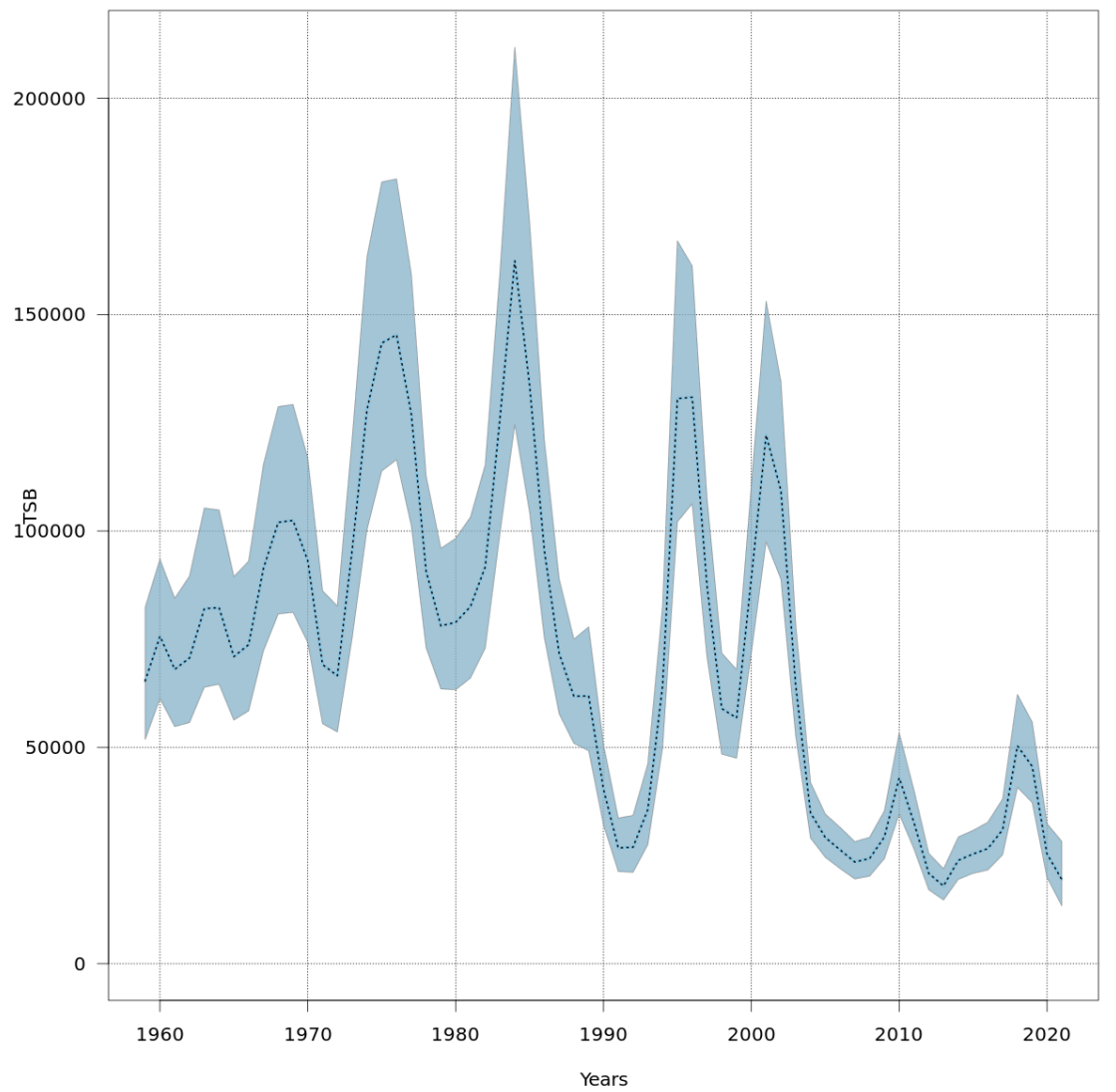
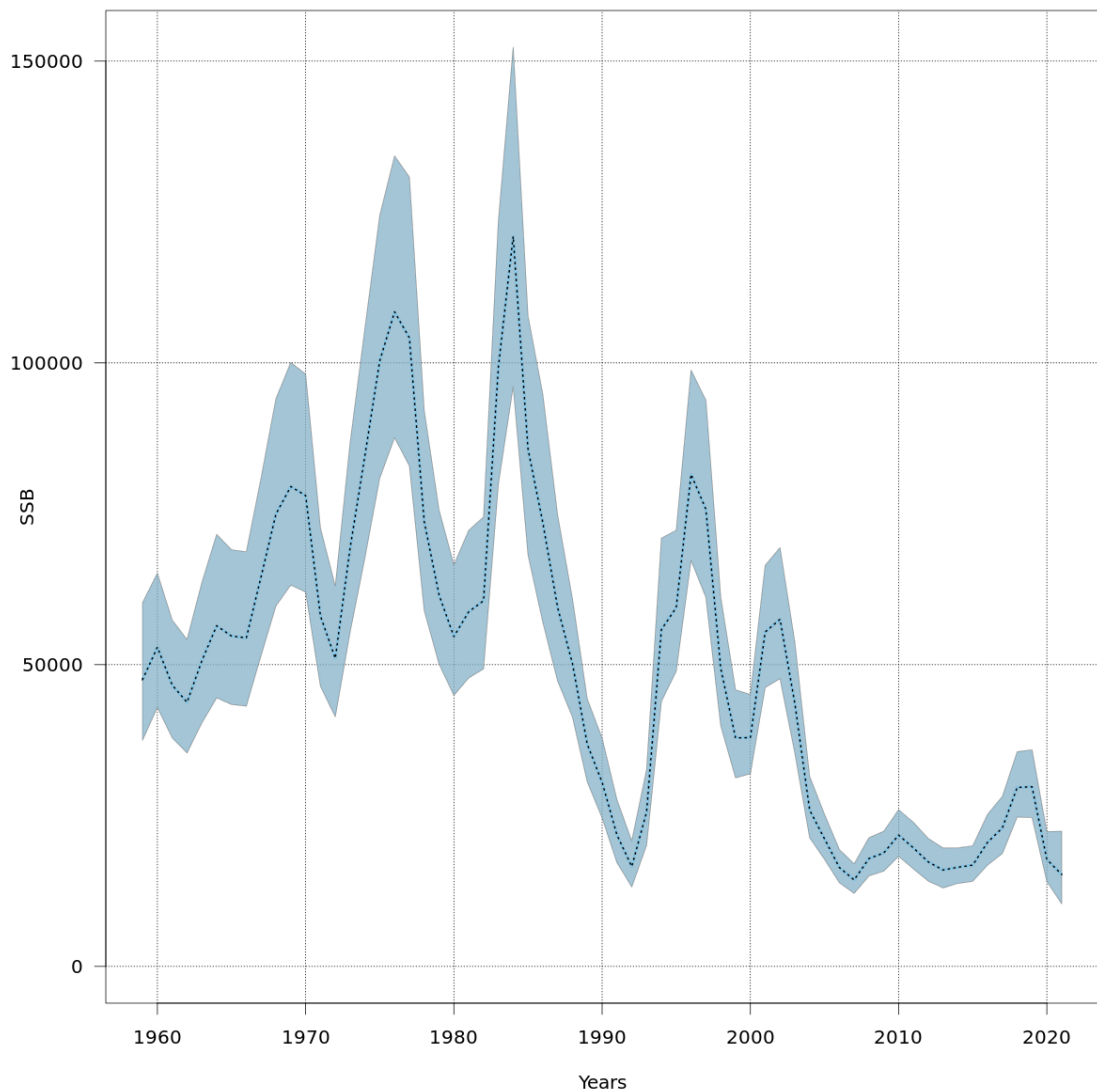


Figure 4.6.4. Faroe Plateau cod (Subdivision 5.b.1). Development of the total stock over time.



stockassessment.org, Cod 5b1 2021 annex, r15120

Figure 4.6.5. Faroe Plateau cod (Subdivision 5.b.1). Development of the spawning stock biomass over time.

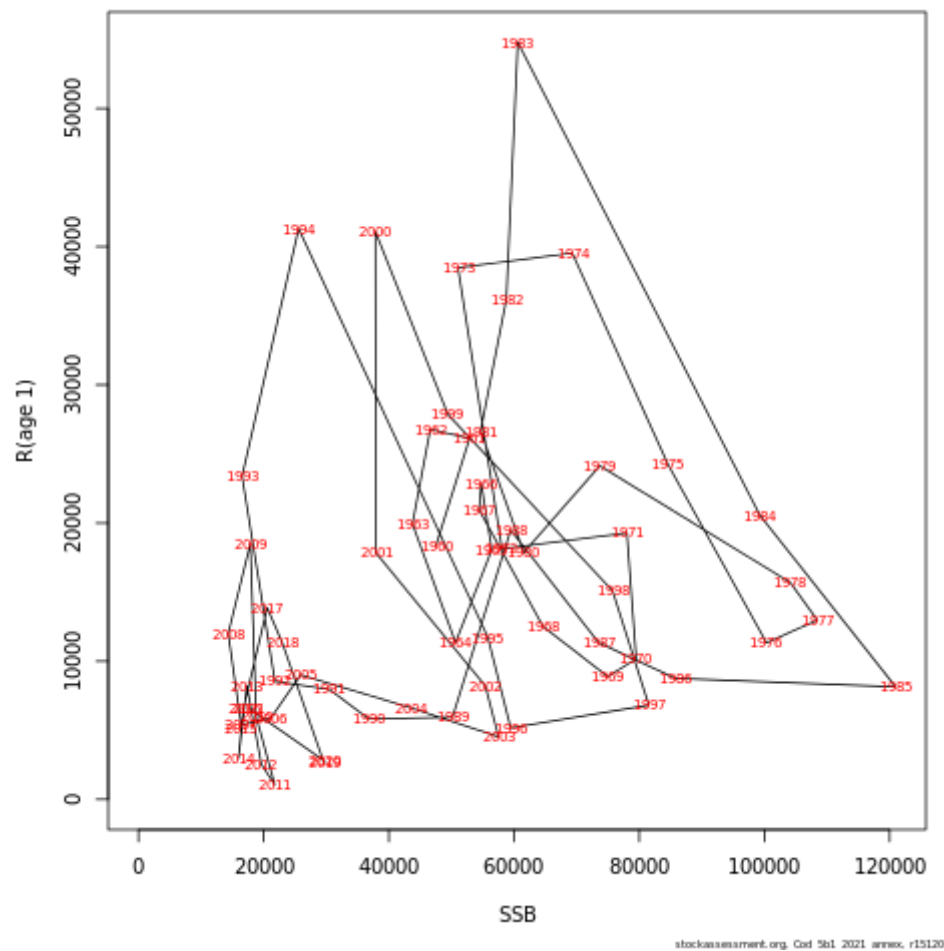


Figure 4.6.6. Faroe Plateau cod (Subdivision 5.b.1). Spawning stock (tons) – recruitment (thousands) relationship. Years are shown at each data point.

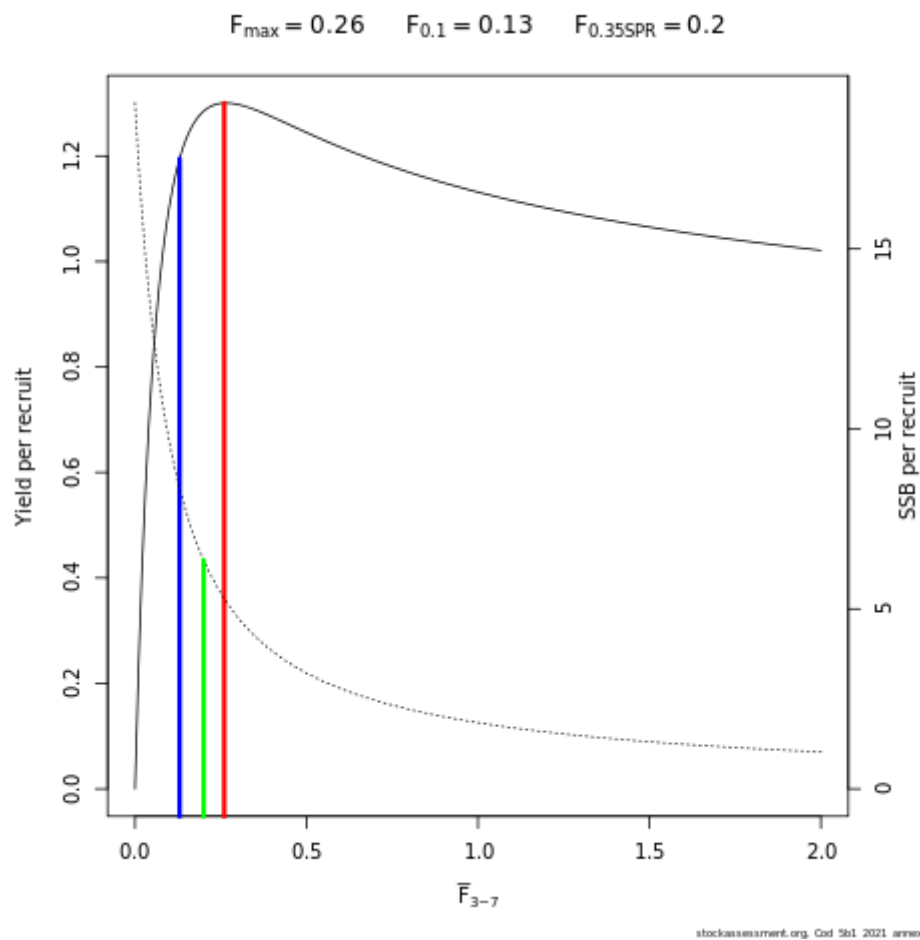


Figure 4.8.1. Faroe Plateau cod (Subdivision 5.b.1). Yield per recruit and spawning stock biomass (SSB) per recruit versus fishing mortality.

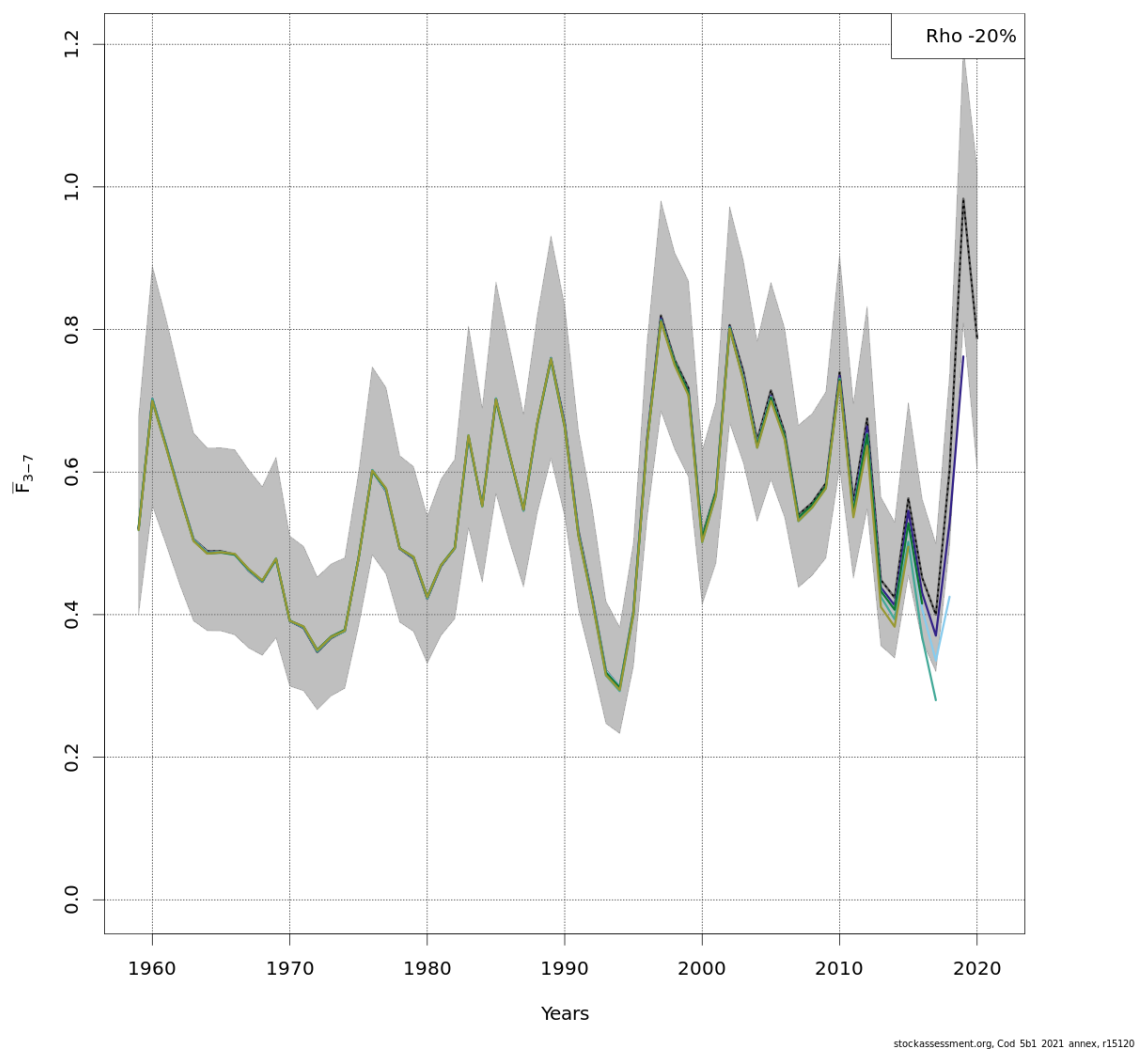


Figure 4.9.1. Faroe Plateau cod (Subdivision 5.b.1). Results from the SAM retrospective analysis of fishing mortality (ages 3-7).

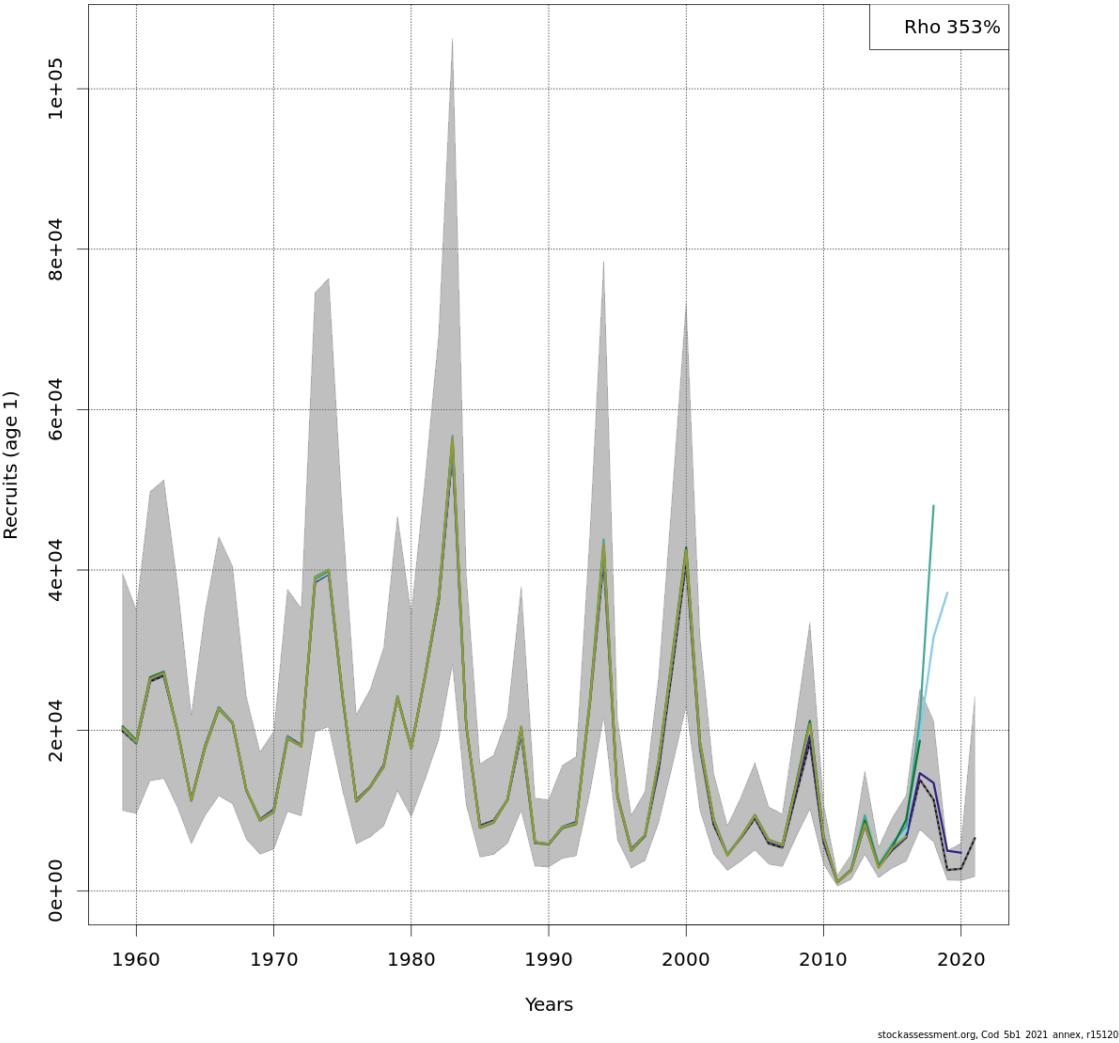


Figure 4.9.1. Faroe Plateau cod (Subdivision 5.b.1). Results from the SAM retrospective analysis (continued). Recruitment at age 1.

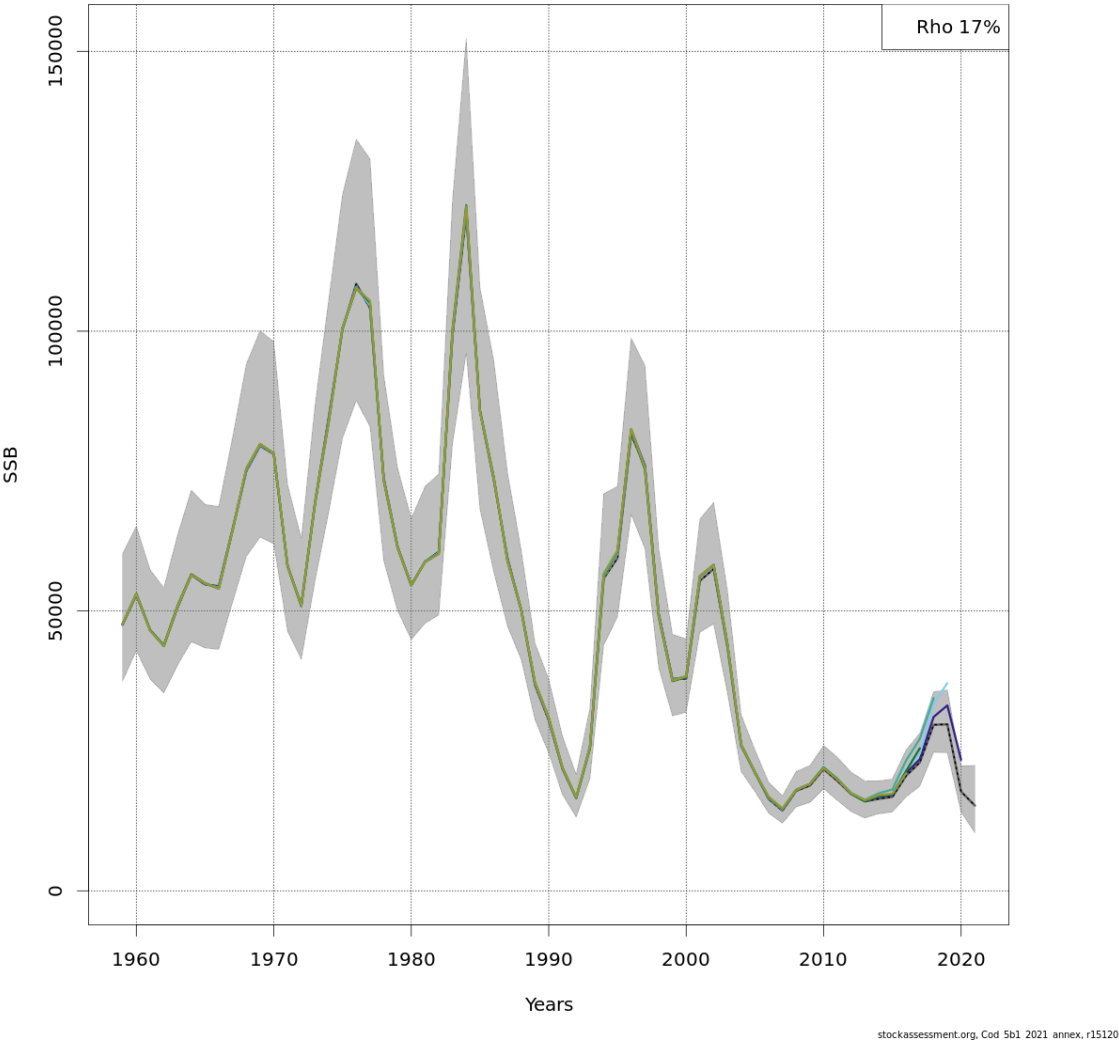


Figure 4.9.1. Faroe Plateau cod (Subdivision 5.b.1). Results from the SAM retrospective analysis (continued). Spawning stock biomass.

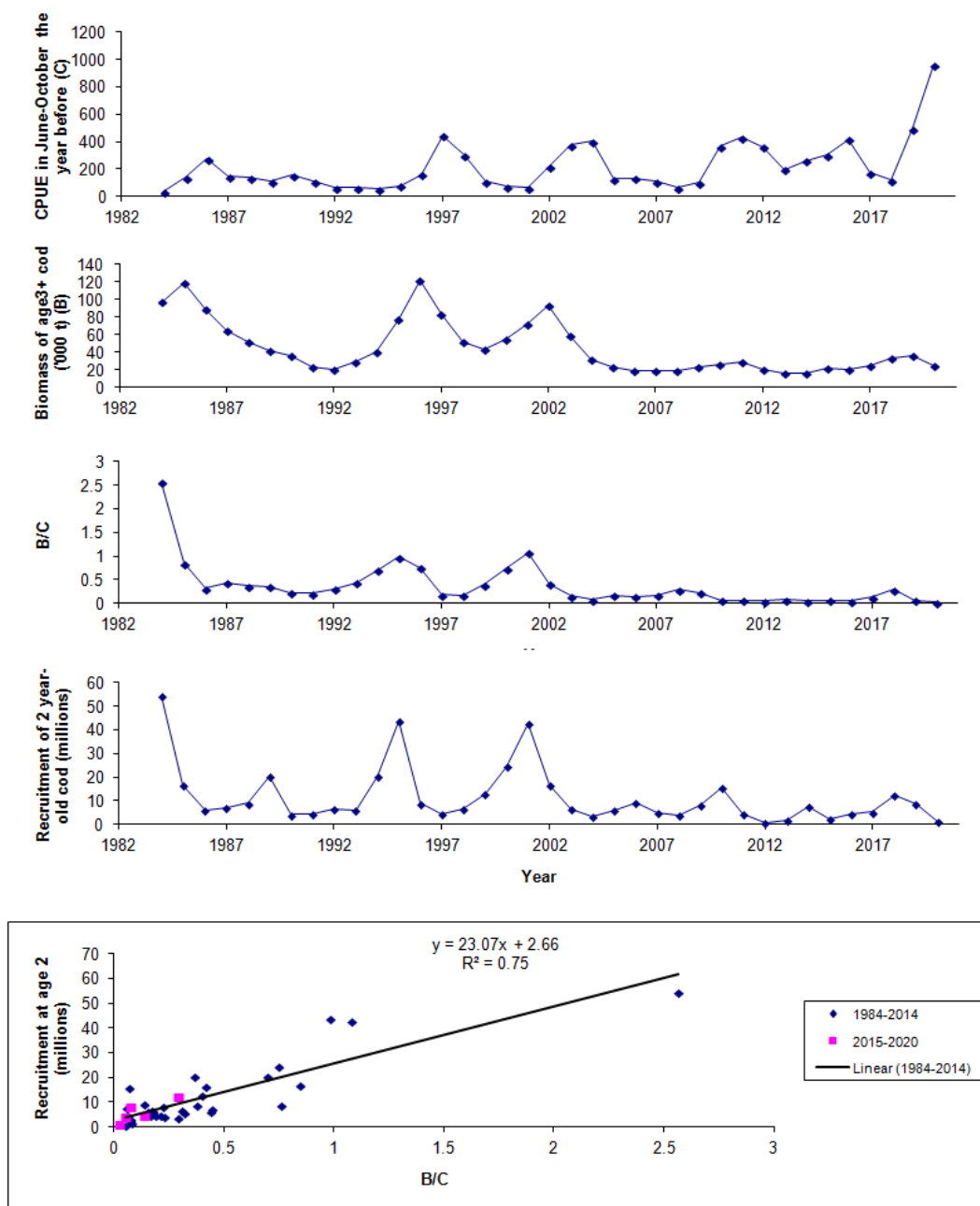


Figure 4.9.2. Faroe Plateau cod (Subdivision 5.b.1). Modelling cod recruitment in three steps. First, the catch-per-unit-effort of cod (C) for small boats operating close to land, as being indicative of the amount of cannibalistic cod. Second, the amount of cod (older than the recruiting cod) (B), as being indicative of e.g. culling-down of potential predators/competitors of recruiting cod. Third, the ratio between B and C, as indicative of recruitment success. Fourth and fifth, a comparison with observed recruitment. No cpue data were available for 2020.

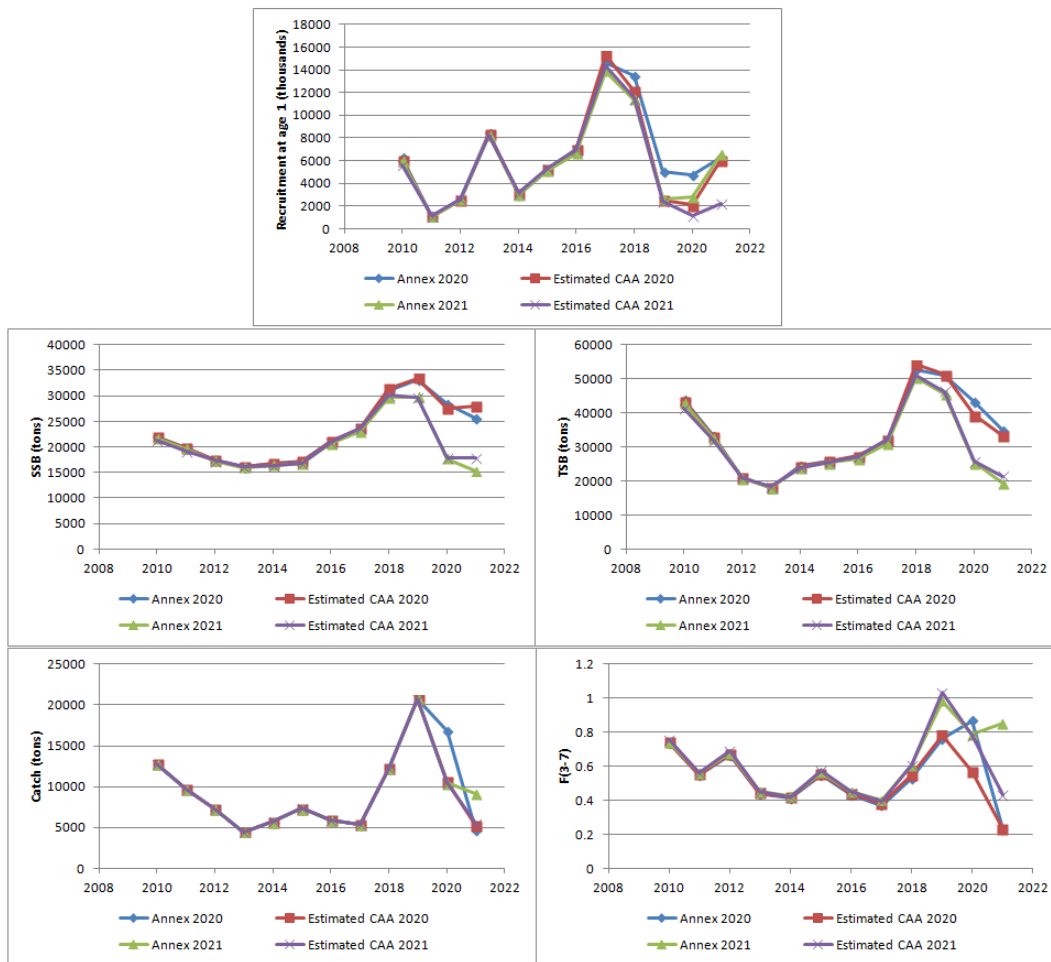


Figure 4.9.3. Faroe Plateau cod (Subdivision 5.b.1). The current assessment (Annex 2021) compared with an assessment that included a preliminary catch-at-age for 2021 (Estimated CAA 2021). The results from the 2020 assessment are shown for comparison..

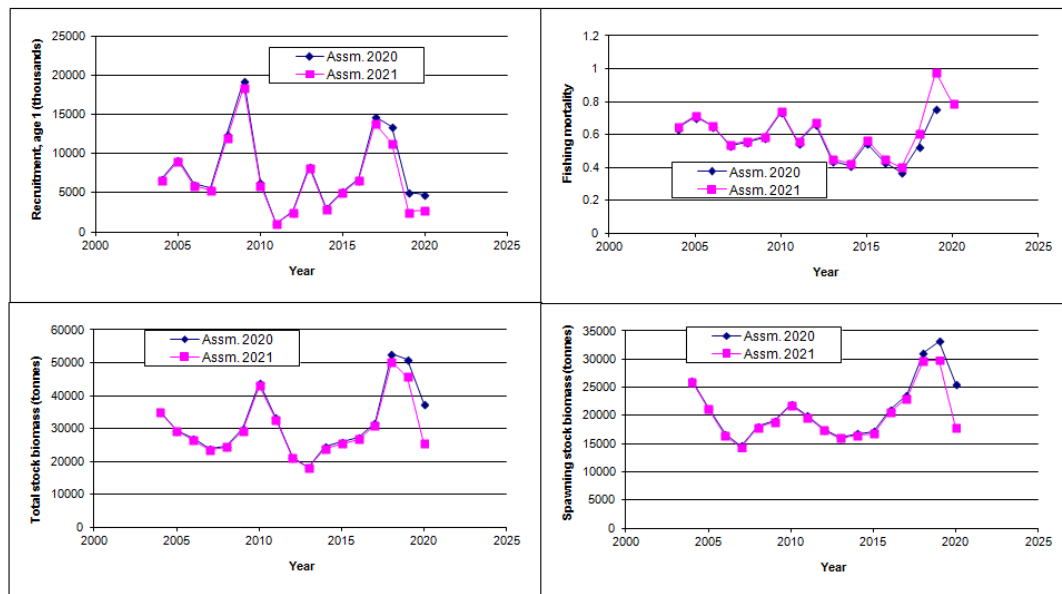


Figure 4.10.1. Faroe Plateau cod (Subdivision 5.b.1). Comparison between the results from the current autumn assessment compared with last year's assessment.