6 Faroe Saithe

Executive summary

The most recent benchmark assessment was completed in 2010.

Nominal landings decreased substantially from 44 000 t. in 2010 to 29 000 t. in 2011. The corresponding estimate of fishing mortality in 2011 (average of ages 4-8 years) dropped to F=0.36 which is the lowest since 2005 and very close to the historical average (F=0.35). The point estimate of the spawning stock biomass is around 66 000 t. which is below average of the 1990-2000 period (70 000 t.) Recruitment (numbers in the stock at age 3) in 2010 and 2011 are very close and predicted at 41 and 43 millions respectively while total stock biomass is estimated at 174 000 t.

This year assessment indicates that the 2011 assessment overestimated fishing mortality and spawning stock biomass by 22% and 35% respectively while the recruitment strength was estimated exactly.

For Faroe saithe, the highest recruitment has been observed at lower levels of SSB.

6.1 Stock description and management units.

See the stock annex.

6.2 Scientific data

6.2.1 Trends in landings and fisheries

Nominal landings of saithe from Faroese grounds (Division Vb) have varied cyclically between 10 000 t and 68 000 t since 1961. After a third high of about 60 000 t in 1990, landings declined steadily to 20 000 t in 1996. Since then landings have increased to 68 000 tonnes in 2005 (Table 6.2.1.1, Figure 6.2.1.1) but has declined to 57 000 tonnes in 2008 and 2009. Landings have dropped substantially to 29 000 t. in 2011 which is a 35% reduction compared to 2010 and below historical average (37 000 t.)

Since the introduction of the 200 miles EEZ in 1977, the saithe fishery has been prosecuted mostly by Faroese vessels. The principal fleet consists of large pair trawlers (>1000 HP), which have a directed fishery for saithe, about 50 - 77% of the reported landings in 1992-2011 (Table 6.2.1.2). The smaller pair trawlers (<1000 HP) and single trawlers (400-1000HP) have a more mixed fishery and they have accounted for about 10-20% of the total landings of saithe in the 1997—2011 period while the percentage of total landings by large single trawlers (>1000 HP) has declined drastically to 2.6% which is the lowest since 1985 . The share of catches by the jigger fleet was about 8% in the 1985-1998 period but has decreased to 3.1% since 1999. Jiggers caught 3.6% of the total domestic landings for saithe in 2011.

Cumulative landings of saithe for the domestic fleets since 2000 are shown in Figure 6.2.1.2. In the first quarter of 2010 monthly landings were higher than average for the 2000-2010 period but by the end of the year they decreased 10 000 t. Landings in the first three months of 2012 are higher than those on 2011 but below average. Foreign catches that have been reported to the Faroese Authorities but not officially reported to ICES are also included in the Working Group estimates. Catches in Subdivision IIa, which lies immediately north of the Faroes, have also been included. Little or no discarding is thought to occur in this fishery.

6.2.2 Catch at age

Catch at age is based on length, weight and otoliths samples from Faroese landings of small and large single and pair trawlers, and landing statistics by fleet provided by the Faroese Authorities. Catch at age is calculated for each fleet by four-month periods and the total was raised by the foreign catches. The catch-at-age data for previous years were also revised according to the final catch statistics (Tables 6.2.2.1 and 6.2.2.2). Sampling intensity went up to 7.7% in 2011 from 6.1% in 2010 (Table 6.2.2.3.) The number of 3-years old saithe in 2011 was 1 860 th. a 20% decrease with respect of that in 2010 and has been increasing in recent years.

6.2.3 Weight at age

Mean weights at age have varied by a factor of about 2 during the 1961—2010 period. Mean weights at age were generally high during the early 1980s and they subsequently decreased from the mid 1980s to the early 1990s (Table 6.2.3.1 and Figure 6.2.3.1). Mean weights increased again in the period 1992-96 but have shown a general decrease thereafter. With the exception of the 2006 year class (age 3 in 2009) weights for age groups 3 to 10 have showed an increase since 2006. Mean weight of the 2008 year-class (age 3 in 2011) is estimated at 1.11 kg. which is a decrease with respect to that in 2010 (1.43 kg.). Mean weights at age in the stock are assumed equal to those in the catch.

6.2.4 Maturity at age

Maturity at age data from the spring survey is available from 1983 onward (Steingrund, 2003.) Due to poor sampling in 1988 the proportion mature for that year was calculated as the average of the two adjacent years. At the 2012 working group a model using maturity at age from the Faroese groundfish spring survey was implemented to derive smoothed trends in maturity by age and year. The fitting was done locally and the smoothing level was chosen as a trade-off between retaining the trend in maturities and reducing the data noise. For 1962 to 1982 the average maturity of predicted ogives of the 1983-2011 period was used (Table 6.2.4.1 and Figure 6.2.4.1.) Proportion matures for most age groups show an upward trend since 2004.

6.2.5 Indices of stock size

6.2.5.1 Surveys

There are two annual groundfish surveys conducted in Faroese waters. The spring survey was initiated in 1983, while the summer survey began in 1996. The two surveys are not considered reliable indices of saithe abundance in Vb (Stock Annex B.3 and Benchmark report WKROUND 2010.) Trends in catch rates (CPUE) from both surveys are presented in Figure 6.2.5.1.1. An alternative depth-stratified spring survey index is also presented.

6.2.5.2 Commercial CPUE

The CPUE series that has been used in the assessment since 2000 was introduced in 1998 (ICES C.M. 1998/ACFM:19), and consists of saithe catch at age and effort in hours, referred to as the pair trawler series. A GLM model and a survey spatial scaling factor is used to standardised the CPUE series (Stock Annex B.4., Benchmark report, WKROUND 2010.) The benchmark working group regarded this novel approach to developing the commercial series as reasonable (Benchmark report, WKROUND 2010.) Observed and predicted annual CPUEs (1995-2011) derived from this approach indicate a downwards stock trend since 2006 (Figure 6.2.5.2.1.)

The correlation between the predicted CPUE and the depth-stratified spring index is r^2=0.8.

6.2.5.3 Information from the fishing industry

No additional information beyond the landings from the commercial fleet was presented for incorporation in the assessment.

6.3 Methods

The assessment model adopted at the benchmark assessment in 2010 is described in the Stock annex (Sec. C) and in the benchmark report (WKROUND 2010.) The 2010 XSA is calibrated with the standardized pair trawlers with catchability independent of stock size for all ages, catchability independent of age for ages ≥ 8, the shrinkage of the SE of the mean = 2.0, and no time tapered weighting. The tunings series used are shown in Table 6.3.1. while the XSA model diagnostics and outputs are presented in Table 6.3.2 and Tables 6.3.3-5 respectively. Patterns in log-catchability residuals from the XSA model are relatively random in recent years (Figure 6.3.2).

The 2012 assessment indicates that the point estimator of SSB in 2011 is 66 000 t and average fishing mortality (Fbar) is estimated to F=0.36 (Figures 6.3.3 and 6.3.4). The assessment model suggests that fishing mortality has dropped substantially from F=062 in 2009 to F=0.36 in 2011 reflecting the abrupt decline in landings from 58 kt. to 29kt. in the same time period. Predicted number of recruits in 2011 is 43 millions which is above the historical average but well below the high levels observed from 2000 to 2005. (Figure 6.3.5) Retrospective patterns show periods of over- and underestimation in average fishing mortality and consequently under- and overestimation in spawning stock biomass (Figure 6.3.6) Various factors could explain this phenomena, e.g., by changes in the vertical distribution of the stock or changes in the selection pattern that have been observed in recent years. With respect to recruitment the retrospective trend is very similar to that observed in F and SSB. The 2005 year-class was predicted at a historic high in 2008 but it is showing much weaker in 2011.

6.4 Reference points

6.4.1 Biological reference points and MSY framework

In the 2011 assessment for Faroe saithe a Management Strategy Evaluation (MSE) is performed using a harvest control rule in the FLR environment. In the 2012 assessment some changes were included in the simulation framework. Maturity by age and year were modified (and therefore SSB) according to the smoothing technique reported in Section 6.2.4. Extra stochasticity was added to weights at age in the form of autocorrelation and the constraint of running XSAs in the simulations was dropped to reduce the simulation running time. All these changes caused a upward revision of the F_{msy} point estimate from F_{msy}=0.28 to F_{msy}=0.32. The simulation framework is explained below.

The MSE approach requires mathematical representations of two systems: a 'true' system and an 'observed' one. The 'true' system is represented by the operating model (OM) that simulates the real world. In contrast, the 'observed' system represents the conventional management procedure (MP), from the data collection through stock assessment to the management implementation. The present MSE evaluation uses the working group stock assessment as the basis for the Operating Model and makes assumptions about the selection pattern of the fishing fleet and its dynamics. The model comprises a single stock that is fished by a single fleet. It implements a harvest control rule through a management procedure that explicitly models the stock assessment process and time lag in implementing the

management advice (delay between the gathering of data and making a management decision, i.e. setting the current fishing effort) which explicitly address uncertainty in recent parameter estimates. The stock recruitment relation used is the Hockey-stick or segmented regression with random noise on top of it reflecting the high variability in historical recruitment estimates (CV=0.5). Fishing mortality is estimated from effort, catchability (constant) and the selection pattern. The observed selection pattern since 1996 is used in the simulations which correspond with the implementation of the fishing days quota in the Faroese management system. Maturity-at-age is fixed and taken from the smoothing method implemented in 2012 while stochasticity is included in weights-at-age with a CV=0.18 and autocorrelation of Rho=0.35 applied to all age groups to somehow replicate the observed fluctuations pattern. The data sampling of catches and tuning fleets is carried out by multiplying by random errors. Natural mortality is fixed to M=0.2. Simulations were performed 1000 times on a 40-year forward period with the historical period being replicated in the OM.

Unlike the flat curves obtained from traditional yield-per-recruit calculations simulations curve show a relatively well defined maximum at F_{msy} =0.32. The reason for this difference is that when fishing mortality is above certain level (>0.3) some of the stochastic runs will lead to spawning stock being below the break point in the stock-recruitment function so recruitment and subsequent landing s will be reduced. The breakpoint of 55 kt. in the segmented regression or the revised B_{pa}=60 000 t. (see Section 2. Demersal stocks in the Faroe Area, Subsection 2.1.7 Faroe saithe) could be candidates for $B_{trigger}$ the point at which fishing mortality should be reduced according to the MSY framework. The results of the simulations are shown in Figures 6.4.1.1 and 6.4.1.2.

MSY and revised precautionary reference points (Section 2. Demersal stocks in the Faroe Area, Subsection 2.1.7 Faroe saithe) for faroe saithe are listed below:

Biological reference points	
Blim	45 000 t.
Bpa	60 000 t.
Flim	0.4
Fpa	0.28
Fmsy	0.32

The SSB-R relation with respect to reference fishing mortalities (Fhigh, Fmed and Flow) is presented in Figure 6.5.1.3 while the history of the stock/fishery in relation to the existing four reference points can be seen in Figure 6.5.1.4.

6.5 State of the stock – historical and compared to what is now

Recruitment in the 1980s was close to the historical average (32 millions). The strongest year class since 1986 was produced in the 1990s and the average for that decade was about 28 millions (Figure 6.5.1). The 1998 (88 millions) 1999 (106 millions) and 2005 year classes (106 millions) are the largest observed in the time series. Predicted number of 3-years old saithe in 2010 and 2011 are on par and very close to average recruitment from 2003 to 2011.The low levels observed since 2006 reflect a period of low productivity in the system which is also supported by survey indices. Although groundfish surveys are in general unreliable to establish year-class strength for species like saithe both Faroese annual surveys do suggest weak incoming year classes. Relatively low Fs during the 1960s and recruitment above average in early-1970s caused an increase in SSB well above the historical average around the mid-1970s while landings peaked to almost 58 000 t. in 1973. Increasing

Fs since 1980 lead to a decrease in the spawning stock biomass of saithe throughout the mid-1980s although recruitment of the 1983 year class rose to 61 000 millions, i.e. double the average from 1961 to 2011. The historically low SSB persisted in 1992-1998 (Figure 6.5.2.) and this along with low Fs caused landings to steeply decline to around 20 000 tonnes in 1996. The SSB increased since 1999 to above 125 000t in 2005 with the maturation of the 1995, 1996, 1997 and 1999 year classes and decreased to 93 000 t in 2009. The 2011 point estimate of SSB (66 000t) is above B_{pa} while fishing mortality F=0.36 is close to long-term average (F=0.35)(Figure 6.5.1.) Precautionary reference points are revised according to the following report section (Section 2. Demersal stocks in the Faroe Area, Subsection 2.1.7 Faroe saithe)

The relation between stock and recruitment (Figure 6.5.2) shows that the highest recruitment has been observed at lower levels of SSBs. Trends in total biomass are characterised by three distinctive cycles of around 15 years in amplitude comparable to those in recruitment estimates since 1961 (Figure 6.5.3)

6.6 Short term forecast

6.6.1 Input data

In the 2012 assessment two short term forecasts are presented: proposed(1) and spaly(2). The rationale for proposing an alternative stock prognosis is based on changes in the selection pattern observed in 2011 which are expected to continue in 2012.

(1) Proposed short term prognosis

Input data for the proposed prediction with management options are presented in Table 6.6.1.1a.

Population numbers at age 3 for the base short term prediction is calculated as the geometric mean of estimated recruitment strength from 2006 to 2010. Natural mortality is set to constant 0.2. As in 2011 in the 2012 assessment weight-at-age for 3-years old saithe is predicted by the year class strength (number of 3-years old in the stock) with a 3 year time lag (Eq. 1) whereas weight for ages 4 to 8 is estimated by weight-at-age the previous year from the same year class (Eq. 2) Diagnostics and results of the models are shown in Figures 6.6.1.1 to 6.6.1.3. For older age groups (9 to 14+) the status quo weights for 2011 are used.

$W_{3,y} = \alpha N_{3,y-3} + \beta$ for $a = 3$ (Eq. 1)

$W_{a+1,y+1} = \alpha W_{a,y} + \beta$ for $4 \leq a \leq 8$ (Eq. 2)

Proportion mature for 2012 is taken as the average of predicted maturity ogives from 2011 and 2012 while for 2013 and 2014 it is calculated as the mean of 2010-2012. The exploitation pattern used in this scenario is the status quo exploitation observed in 2011.

(1) Spaly short term prognosis

Input data for the prediction with management options for the spaly scenario are presented in Table 6.6.1.1b.

Population numbers at age 3 for the base short term prediction is calculated as the geometric mean of estimated recruitment strength from 2006 to 2010. Natural mortality is set to constant 0.2. As in 2011 in the 2012 assessment weight-at-age for 3-years old saithe is predicted by the year class strength (number of 3-years old in the stock) with a 3 year time lag (Eq. 1) whereas weight for ages 4 to 8 is estimated by weight-at-age the previous year from the same year class (Eq. 2) Diagnostics and results of the models are shown in Figures 6.6.1.1 to 6.6.1.3. For older age groups (9 to 14+) the status quo weights for 2011 are used.

$W_{3,y} = \alpha N_{3,y-3} + \beta$ for $a = 3$ (Eq. 1)

$W_{a+1,y+1} = \alpha W_{a,y} + \beta$ for $4 \leq a \leq 8$ (Eq. 2)

Proportion mature for 2012 is taken as the average of predicted maturity ogives from 2011 and 2012 while for 2013 and 2014 it is calculated as the mean of 2010-2012. The exploitation pattern for short term prognosis is set to the unscaled three year average from 2009 to 2011 (as suggested by ACFM, 2004).

6.6.2 Projection of catch and biomass

Results from predictions with management option for the proposed and spaly scenarios are presented in Table 6.6.2.1a and Table 6.6.2.1b respectively.

At status quo F=0.36 landings would reach 32 300 t in 2012 and 36 000 t in 2013 while spawning stock biomass is expected to around 74 000 tonnes in 2012 and increase to 86 800 tonnes in 2013. Landings in 2012 are predicted to rely on the three most recent year classes (52%) while in the SSB these year-classes will contribute to around 70% of the spawning biomass in 2012 (Figure 6.6.2.1b.) The discrepancy in expected landings between the proposed and spaly scenarios is around 19 000 tonnes. The exploitation pattern used in the proposed prognosis is that of 2011 where drastic changes were observed with respect to 2010. Using a 3-yrs. average in exploitation as specified by the spaly predictions would lead to an increase of 60% in expected catch for 2012 which seems quite unrealistic.

6.7 Yield per recruit and medium term forecasts

No medium term projections were performed for faroe saithe.

Input data to yield per recruit

The input data to long term prediction are shown in Table 6.7.1.1.

Mean weights-at-age for 1961-2011 were used for the long term projection. Natural mortality is set to constant 0.2. Proportion mature-at-age is taken as the average from 1983-2012.

The exploitation pattern was set equal to the average of the last five years (2007-2011) (as suggested from ACFM, 2004). Results from the yield per recruit analysis are shown in Table 6.7.1.2 and Figure 6.7.1.1.

6.8 Uncertainties in assessment and forecast

Sampling of catches for otoliths, length and weight measurements has increased since 2009. In 2011 the amount of catch sampled was almost 8% which is regarded as adequate.

Although noisy Faroese groundfish survey indices indicate that biomass of saithe has decreased substantially since 2004. The recruitment pulses observed from 2000 to 2004 were historically high but declined steeply since then and the four most recent year classes are slightly above average. Although the downward long term trend in weight persist most age groups show signs of positive growth since 2008. Using average weight of recent years would lead to underestimation of incoming year classes. This is circumvented somehow by the modelling framework implemented for faroe saithe using a lineal model for weight prediction (See 6.6.1). To avoid large year to year fluctuations in the spawning stock biomass (also dependent on age structure) a locally fitting model is used to reduce variability in maturities. Although some retrospective pattern still remains, updating the data input to the model, specifically with regard to catch at age and the commercial CPUE tuning index, has significantly improved the magnitude of the pattern and would appear to facilitate reasonable application of model findings to management actions (Benchmark report 2010.)

Retrospective patterns show periods of over- and underestimation in average fishing mortality and consequently under- and overestimation in spawning stock biomass. Various factors could explain this phenomena, e.g., by changes in the vertical distribution of the stock or changes in the selection pattern that have been observed in recent years. With respect to recruitment the retrospective trend is very similar to that observed in F and SSB. The 2005 year-class was predicted at a historic high in 2008 but it is showing much weaker in 2011.

6.8.1 Assessment quality

The assessment is tuned with commercial CPUE data. Problems associated with the use of commercial CPUE data (e.g. increased efficiency due to technological creep etc.) may affect the assessment. The standardisation of commercial CPUE data carried out at the 2010 benchmark assessment (Sec. 6.2.5.2 and Stock Annex Sec. B.4) has resulted in a substantial reduction in the bias observed in the retrospective pattern.

6.9 Comparison with previous assessment and forecast

The 2012 assessment was an update assessment but nevertheless some adjustments were done to improve the advisory process. Minor revisions were made on recent landings figures and thus in the commercial catch at age matrix. Maturity at age was modified according to the smoothing technique explained in 6.2.4 and the F_{msy} point estimate was also changed from F_{msy}=0.28 to F_{msy}=0.32 (See Section 6.4.1).

The 2011 assessment predicted recruitment in 2012 to around 43 millions which is a figure that the current assessment estimated exactly. Spawning stock biomass and fishing mortality were overestimated by 35% and 20% respectively. The latter deviation was no doubt caused by a shift of fishing effort to other pelagic species.

6.10 Management plans and evaluations

No management plan exists for saithe in Division Vb

6.11 Management considerations

Management consideration for saithe is under the general section for Faroese stocks.

Unlike the traditional yield-per-recruit curves the simulations carried out at the 2012 assessment (Sec. 6.4.1) show a relatively well defined maximum at F_{msy} =0.32. Candidates for $B_{trigger}$ might be set to the breakpoint of 55 kt. in the segmented regression or the revised B_{pa}=60 000 t. the point at which fishing mortality should be reduced according to the MSY framework (for more details see Section 6.4.1)

6.12 Ecosystem considerations

No evidence is available to indicate that the fishery is impacting the marine environment. A Ph.D. project was launched in 2008, with the aim of investigate the role of environmental indicators in the dynamics of Faroe saithe. The results and conclusions of the PhD will be available to the working group in the 2013 assessment.

6.13 Regulations and their effects

It seems to be no relationship between number of fishing days and fishing mortality, probably because of large fluctuations in catchability. Area restriction is an alternative to reduce fishing mortality- and this is used to protect small saithe in Faroese area.

6.14 Changes in fishing technology and fishing patterns

See section 6.2.

6.15 Changes in the environment

According to existing literature the productivity of the ecosystem clearly affects both cod and haddock recruitment and growth (Gaard *et al*., 2002), a feature outlined in Steingrund and Gaard (2005). The primary production on the Faroe Shelf (< 130 m depth), over the period May through June, varied interannually by a factor of five, giving rise to low- or high-productive periods of 2-5 years duration (Steingrund and Gaard, 2005). The productivity over the outer areas seems to be negatively correlated with the strength of the Subpolar Gyre (Hátún et al., 2005; Hátún *et al*., 2009; Steingrund *et al*., 2010), which may regulate the abundance of saithe in Faroese waters (Steingrund and Hátún, 2008). When comparing a gyre index (GI) to saithe in Faroese waters there was a marked positive relationship between annual variations in GI and the total biomass of saithe lagged 4 years (Figure 6.15.1.)

There is a negative relationship between mean weight-at-age and the stock size of saithe in Faroese waters. This could be due to simple density-dependence, where there is a competition for limited food resources. Stomach content data show that the food of saithe is dominated by blue whiting, Norway pout, and krill, and the annual variations in the stomach fullness are mainly attributable to variations in the feeding on blue whiting. There seems to be no relationship between stomach fullness and weights-at-age for saithe (í Homrum *et al*. WD 2009).

6.16 References

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Table 6.2.1.1. Faroe saithe (Division Vb). Nominal catches (tonnes round weight) by countries, 1988-2011, as officially reported to ICES.

Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Denmark	94	-	2	-	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-	-	-	16	-
Faroe Islands	44402	43,624	59,821	53,321	35,979	32,719	32,406	26,918	19,267	21,721	25,995
France [3]	313	-	-	-	120	75	19	10	12	9	17
Germany	-	-	-	32	5	2	1	41	3	5	-
German Dem.Rep.	-	9	-	-	-	-	-	-	-	-	-
German Fed. Rep.	74	20	15	-	-	-	-	-	-	-	-
Greenland	-	-	-	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-	-	-	-
Netherlands	-	22	67	65	-	-	-	-	-		-
Norway	52	51	46	103	85	32	156	10	16	67	53
Portugal	-	-	-	-	-	-	-	-	-	-	-
UK (Eng. & W.)	-	-	-	5	74	279	151	21	53	-	19
UK (Scotland)	92	9	33	79	98	425	438	200	580	460	337
USSR/Russia [2]	-	-	30	-	12	-	-	-	18	28	-
Total	45027	43,735	60,014	53,605	36,373	33,532	33,171	27,200	19,949	22,306	26,065
Working Group estimate [4,5]	45285	44,477	61,628	54,858	36,487	33,543	33,182	27,209	20,029	22,306	26,421

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 [1]
Denmark	-	-	-	-	-	-	-	34	-				
Estonia	-	-	-	-	-	-	-	-	-				
Faroe Islands	32,439		49,676	55,165	47,933	48,222	71,496	70,696	64,552	61,116	61,889	46,686	31,439
France	-	273	934	607	370	147	123	315	108	97	68	46	
Germany	100	230	667	422	281	186	1	49	3	3	0		
Greenland	-	-	-	125	-			73	239	0	1		6
Irland	-	-	5	-	-	-	-	-	-	-	-		
Iceland	-	-	-	-	-	-	-	-	-	-	148	-	
Netherlands	0	0	0	0	0	0	0	0	3	0	0	0	
Norway	160	72	60	77	62	82	82	35	81	38	23	28	
Portugal	-	-	-	-	-	5	-	-	-	-	-		
Russia	-	20	1	10	32	71	210	104	159	38	44	3	
UK (E/W/NI)	67	32	80	58	89	85	32	88	4	-	-		
UK (Scotland)	441	534	708	540	610	748	4,322	1,011	408	400	684		
United Kingdom	-	-	-	-	-	-	-	-	-	-	-	706	
Total	33,207	1,161	52,131	57,004	49,377	49,546	76,266	72,405	65,557	61,692	62,857	47,469	31,445
Working Group estimate [4,5,6,7]	33,207	39,020	51,786	53,546	46,555	46,355	67,967	66,902	60,785	57,043	57,949	43,885	29,087
							30.135	200.57	69.109	0	1	74.018	

[1] Preliminary.

[2] As from 1991.

[3] Quantity unknown 1989-91.

[4] Includes catches from Sub-division Vb2 and Division IIa in Faroese waters.

[5] Includes French, Greenlandic, Russian catches from Division Vb, as reported to the Faroese coastal guard service.

[6] Includes Faroese, French, Greenlandic catches from Division Vb, as reported to the Faroese coastal guard service.

[7] The 2001-2008 catches from Faroe Islands, as stated from Faroese coastal guard service, are corrected in order to be consistent with procedures used previous years.

Table 6.2.1.2. Faroe saithe (Division Vb). Total Faroese landings (rightmost column) and the contribution (%) by each fleet category (1985-2011). Averages for 1985-2011 are given at the bottom.

Year	Open boats	Long-liners <100 GRT	Single trawl <400 HP	Gillnets	Jiggers	Single trawl 400-1000 HP	Single trawl >1000 HP	Pair trawl <1000 HP	Pair trawl >1000 HP	Long-liners >100 GRT	Indust-rial trawlers	Others	Total round weight (tonnes)
1985	0.2	0.1	0.1	0.0	2.6	6.6	33.7	28.2	28.2	0.1	0.2	0.2	42598
1986	0.3	0.2	0.1	0.1	3.6	2.8	27.3	27.5	36.5	0.1	0.7	0.9	40107
1987	0.7	0.1	0.3	0.4	5.6	4.1	20.4	22.8	44.2	0.1	1.1	0.0	39627
1988	0.4	0.3	0.1	0.3	6.5	6.8	20.8	19.6	43.6	0.1	1.3	0.1	43940
1989	0.9	0.1	0.3	0.2	9.3	5.4	17.7	23.5	41.1	0.1	1.3	0.0	43624
1990	0.6	0.2	0.2	0.2	7.4	3.9	19.6	24.0	42.8	0.2	0.9	0.0	59821
1991	0.6	0.1	0.1	0.6	9.8	1.3	13.9	26.5	46.2	0.1	0.8	0.0	53321
1992	0.4	0.4	0.0	0.0	10.5	0.5	7.1	24.4	55.6	0.1	1.0	0.0	35979
1993	0.6	0.2	0.1	0.0	9.3	0.6	6.5	21.4	60.6	0.1	0.7	0.0	32719
1994	0.4	0.4	0.1	0.0	12.6	1.1	6.8	18.5	59.1	0.2	0.7	0.0	32406
1995	0.2	0.1	0.4	0.0	9.6	0.9	9.9	17.7	60.9	0.3	0.0	0.0	26918
1996	0.0	0.0	0.1	0.0	9.2	1.2	6.8	23.7	58.6	0.2	0.0	0.0	19267
1997	0.0	0.1	0.1	0.0	8.9	2.5	10.7	17.8	58.9	0.4	0.4	0.0	21721
1998	0.1	0.4	0.1	0.0	8.1	2.8	13.8	16.5	57.6	0.3	0.4	0.0	25995
1999	0.0	0.1	0.1	0.0	5.7	1.2	12.6	18.5	60.0	0.2	1.6	0.0	32439
2000	0.1	0.1	0.2	0.0	3.7	0.3	15.0	17.5	62.3	0.1	0.7	0.0	39020
2001	0.1	0.1	0.1	0.0	2.8	0.3	20.2	16.5	58.8	0.2	0.8	0.1	51786
2002	0.1	0.2	0.1	0.0	1.6	0.1	26.5	10.5	60.8	0.1	0.0	0.0	53546
2003	0.0	0.0	1.9	0.0	0.9	0.4	17.4	14.7	64.7	0.1	0.0	0.0	46555
2004	0.1	0.2	3.7	0.0	1.9	0.4	15.1	14.4	63.8	0.2	0.0	0.0	44605
2005	0.2	0.1	4.4	0.0	2.4	0.2	12.7	20.6	59.2	0.2	0.0	0.0	66394
2006	0.2	0.4	0.3	0.0	3.9	0.1	19.8	20.6	54.1	0.6	0.0	0.0	65394
2007	0.2	0.2	0.2	0.0	2.0	0.1	30.4	16.0	50.6	0.3	0.0	0.0	59711
2008	0.2	0.3	1.5	0.0	3.2	0.2	20.4	16.0	57.7	0.5	0.0	0.0	56532
2009	0.4	0.2	3.3	0.0	4.3	0.1	9.6	15.1	66.8	0.2	0.0	0.0	57247
2010	0.1	0.1	1.2	0.0	3.9	2.4	8.3	15.1	68.3	0.6	0.0	0.0	43223
2011	0.1	0.1	0.5	0.0	3.6	1.3	2.6	14.1	77.1	0.5	0.0	0.0	32268
Average	0.3	0.2	0.7	0.1	5.6	1.8	15.8	19.3	55.5	0.2	0.5	0.0	43213

Table 6.2.2.1. Faroe saithe (Division Vb). Catch number at age by fleet categories in 2011 (calculated from gutted weights).

Age	Jiggers	Single trawlers >1000 HP	Pair trawlers <1000 HP	Pair trawlers >1000HP	Others	Total Division Vb
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	71	32	216	1359	38	1717
4	93	74	309	1936	70	2484
5	67	47	232	1367	45	1757
6	57	44	235	1257	40	1633
7	11	13	74	323	11	432
8	16	14	82	356	12	480
9	22	16	96	488	15	637
10	22	10	62	366	11	472
11	20	9	51	310	9	398
12	5	2	12	104	2	125
13	1	1	3	25	1	31
14	0	0	1	2	0	4
15	0	0	0	0	0	0
Total No.	385	262	1375	7893	255	10169
Catch, t.	991	703	3791	20697	671	26852

Table 6.2.2.2. Faroe saithe (Division Vb). Catch number at age (thousands) from the commercial fleet(1961-2011)

year	3	4	5	6	7	8	9	10	11	12	13	14+
1961	183	379	483	403	216	129	116	82	45	27	6	49
1962	562	542	617	495	286	131	129	113	71	29	13	63
1963	614	340	340	415	406	202	174	158	94	169	61	44
1964	684	1908	1506	617	572	424	179	150	100	83	47	44
1965	996	850	1708	965	510	407	306	201	156	120	89	76
1966	488	1540	1201	1686	806	377	294	205	156	94	52	79
1967	595	796	1364	792	1192	473	217	190	97	75	38	27
1968	614	1689	1116	1095	548	655	254	128	89	59	40	88
1969	1191	2086	2294	1414	1118	589	580	239	115	100	36	54
1970	1445	6577	1558	1478	899	730	316	241	86	48	46	38
1971	2857	3316	5585	1005	828	469	326	164	100	54	13	33
1972	2714	1774	2588	2742	1529	1305	1017	743	330	133	28	49
1973	2515	6253	7075	3478	1634	693	550	403	215	103	25	58
1974	3504	4126	4011	2784	1401	640	368	340	197	124	45	96
1975	2062	3361	3801	1939	1045	714	302	192	193	126	64	108
1976	3178	3217	1720	1250	877	641	468	223	141	96	60	131
1977	1609	2937	2034	1288	767	708	498	338	272	129	80	121
1978	611	1743	1736	548	373	479	466	473	407	211	146	178
1979	287	933	1341	1033	584	414	247	473	368	206	136	349
1980	996	877	720	673	726	284	212	171	196	156	261	369
1981	411	1804	769	932	908	734	343	192	92	128	176	717
1982	387	4076	994	1114	380	417	296	105	88	56	49	797
1983	2483	1103	5052	1343	575	339	273	98	98	99	25	416
1984	368	11067	2359	4093	875	273	161	52	65	59	18	176
1985	1224	3990	5583	1182	1898	273	103	38	26	72	41	162
1986	1167	1997	4473	3730	953	1077	245	104	67	33	56	69
1987	1581	5793	3827	2785	990	532	333	81	43	5	11	81
1988	866	2950	9555	2784	1300	621	363	159	27	43	15	2
1989	451	5981	5300	7136	793	546	185	83	55	10	2	27
1990	294	3833	10120	9219	5070	477	123	61	60	18	19	42
1991	1030	5125	7452	5544	3487	1630	405	238	128	77	22	19
1992	521	4067	3667	2679	1373	894	613	123	63	37	52	19
1993	1316	2611	4689	1665	858	492	448	245	54	34	10	8
1994	690	3961	2663	2368	746	500	307	303	150	28	19	2
1995	398	1019	3468	1836	1177	345	241	192	104	73	25	19
1996	297	1087	1146	1449	1156	521	132	77	64	45	29	8
1997	344	832	2440	1767	1335	624	165	71	29	48	29	23
1998	163	1689	1934	3475	1379	683	368	77	32	28	24	21
1999	322	655	3096	2551	4113	915	380	147	24	27	5	37
2000	811	2830	1484	4369	2226	2725	348	186	56	18	2	5
2001	1125	2452	8437	2155	3680	1539	1334	293	90	24	19	13
2002	302	8399	5962	9786	862	1280	465	362	33	36	8	1
2003	330	2432	11152	3994	4287	417	419	304	91	40	3	0
2004	76	2011	8544	8762	2125	1807	265	293	146	100	10	2
2005	454	2948	9486	16606	7099	843	810	32	102	27	3	0
2006	1475	5045	7781	7712	10296	3760	640	282	32	12	12	5
2007	831	3320	11305	6473	3781	4294	1538	406	81	11	9	3
2008	4784	3108	3598	9370	3594	2223	2048	444	159	12	6	0
2009	459	7412	4978	1842	5167	2009	1696	1069	292	41	3	1
2010	2324	2916	5298	1125	1009	2098	1248	832	376	51	22	0
2011	1860	2691	1903	1769	468	520	690	511	431	135	33	4

Table 6.2.2.3. Faroe saithe (Division Vb). Sampling intensity in 2000-2010.

Year		Jiggers	Single trawlers >1000 HP	Pair trawlers <1000 HP	Pair trawlers >1000 HP	Others	Total	Amount sampled pr tonnes landed (%)
2000	**Lengths**	2443	2429	9910	28724		43506	10.7
	Otoliths	300	301	1019	2816		4436	
	Weights	300	241	959	2816		4316	
2001	**Lengths**	1788	4388	5613	30341		42130	7.7
	Otoliths	180	450	480	3237		4347	
	Weights	180	420	420	3177		4197	
2002	**Lengths**	1197	9235	5049	30761		46242	5.8
	Otoliths	120	1291	422	3001		4834	
	Weights	120	420	240	2760		3540	
2003	**Lengths**		4959	6393	34812	1388	47552	7.0
	Otoliths		719	960	3719	180	5578	
	Weights		420	239	2999		3658	
2004	**Lengths**	916	2665	3455	35609	1781	44426	6.1
	Otoliths	180	180	240	3537	240	4377	
	Weights	180	120	120	3357	1364	5141	
2005	**Lengths**	1048	4266	6183	32046	1564	45107	3.7
	Otoliths	120	413	690	2760	240	4223	
	Weights	340	385	791	3533	1564	6613	
2006	**Lengths**	1059	7979	8115	23082	1139	41374	3.6
	Otoliths	180	598	1138	2096	60	4072	
	Weights	180	60	1620	5678	812	8350	
2007	**Lengths**	683	10525	10593	18045	381	40227	4.2
	Otoliths	120	748	960	1977	0	3805	
	Weights	120	697	5603	9884	120	16424	
2008	**Lengths**	0	6892	3694	13995	234	24815	2.6
	Otoliths	0	690	600	1500	0	2790	
	Weights	0	0	2517	12914	234	15665	
2009	**Lengths**	511	5273	3695	23352	0	32831	4.1
	Otoliths	97	301	599	2519	0	3516	
	Weights	511	0	3494	19060	0	23065	
2010	**Lengths**	209	1442	3663	25793	151	31258	6.1
	Otoliths	5	119	480	2459	0	3063	
	Weights	5	0	3060	18749	151	21965	
2011	**Lengths**	583	18	1874	19990	753	23218	7.7
	Otoliths	60	0	300	2459	60	2879	
	Weights	583	18	1458	14256	753	17068	

Table 6.2.3.1. Faroe saithe (Division Vb). Catch weights at age (kg) from the commercial fleet (1961-2011)

year	3	4	5	6	7	8	9	10	11	12	13	14+
1961	1.43	2.30	3.35	4.29	5.13	6.16	7.06	7.27	7.50	8.20	9.15	9.99
1962	1.27	2.05	3.29	4.19	5.15	5.66	6.47	6.71	7.15	7.90	8.45	9.66
1963	1.28	2.20	3.21	4.57	5.06	5.93	6.26	8.00	7.27	8.55	9.02	9.82
1964	1.18	2.06	3.27	4.26	5.04	5.69	6.66	6.84	7.69	8.35	8.12	9.42
1965	1.18	2.13	2.94	4.10	4.88	5.93	6.32	7.29	8.07	7.88	9.48	9.85
1966	1.36	2.03	3.06	3.66	4.59	5.52	6.84	7.27	7.66	8.12	10.21	9.88
1967	1.27	1.78	2.53	3.57	4.37	5.31	5.81	6.55	7.81	7.59	8.55	9.14
1968	1.30	1.74	2.04	3.12	4.05	5.18	6.24	7.52	8.05	8.65	8.30	9.75
1969	1.19	1.67	2.30	2.85	3.67	5.00	5.71	6.41	6.55	7.59	7.95	9.10
1970	1.24	1.45	2.25	2.85	3.52	4.42	5.44	5.73	6.66	7.31	9.05	9.63
1971	1.10	1.32	1.82	2.98	3.70	4.27	5.39	5.97	6.49	7.17	7.38	9.61
1972	1.04	1.49	2.06	2.83	3.79	4.18	4.81	5.29	6.95	6.73	7.59	9.61
1973	1.31	1.75	1.90	2.70	4.43	5.26	6.16	6.33	8.08	8.78	9.78	11.11
1974	1.62	1.72	2.49	2.82	3.52	5.20	6.28	6.45	7.07	7.77	8.76	10.83
1975	1.29	1.92	2.62	3.62	4.13	4.75	5.95	7.07	8.35	9.03	9.98	11.08
1976	1.16	1.79	3.07	3.29	4.58	4.65	5.12	6.31	7.07	7.07	7.81	9.71
1977	1.22	1.64	2.66	3.79	4.24	5.60	5.35	5.91	6.84	6.73	6.95	9.26
1978	1.49	2.32	3.07	3.75	4.91	4.37	5.28	5.83	6.05	6.71	7.69	8.52
1979	1.22	1.88	2.62	3.40	4.18	4.95	5.69	6.38	7.02	7.26	8.15	9.62
1980	1.23	2.12	3.32	4.28	5.16	6.42	6.87	7.09	7.93	8.07	8.59	10.14
1981	1.31	2.13	3.00	3.81	4.75	5.25	5.95	6.43	7.00	7.47	8.14	9.43
1982	1.34	1.85	2.95	3.58	4.93	6.24	7.23	7.24	8.35	8.35	8.96	10.23
1983	1.21	2.03	2.97	4.14	4.72	5.90	6.81	7.05	7.25	8.29	9.48	10.51
1984	1.43	1.95	2.47	3.85	5.18	6.35	7.83	6.75	8.64	8.47	8.56	10.80
1985	1.40	2.03	2.97	3.60	5.34	7.20	6.97	9.86	10.67	10.46	10.20	13.05
1986	1.72	1.99	2.62	3.28	4.19	5.59	6.05	6.15	9.54	9.82	7.30	12.77
1987	1.61	1.84	2.40	3.18	4.07	5.15	5.50	6.63	6.34	10.25	8.49	10.48
1988	1.50	1.98	1.98	2.94	3.80	4.42	5.12	6.71	9.04	9.36	9.14	10.22
1989	1.31	1.74	1.91	2.37	3.81	4.67	5.51	5.97	6.94	8.54	9.51	10.48
1990	1.22	1.63	1.83	2.05	2.87	4.47	5.42	6.47	6.34	8.42	7.38	8.64
1991	1.24	1.57	1.86	2.21	2.65	3.38	4.82	5.52	6.41	7.40	8.08	8.67
1992	1.26	1.60	2.07	2.55	3.06	4.08	5.01	6.77	7.75	8.30	7.79	9.30
1993	1.41	1.86	2.32	3.13	3.73	4.39	5.21	6.54	8.40	7.28	9.41	9.64
1994	1.50	1.95	2.27	2.94	4.21	4.97	5.66	5.95	6.89	8.75	9.75	7.99
1995	1.46	2.18	2.42	2.90	3.65	5.06	5.44	6.17	7.08	7.74	7.30	7.10
1996	1.43	1.88	2.50	3.23	3.74	4.96	6.38	6.75	7.47	7.28	8.47	10.13
1997	1.48	1.78	2.03	2.78	3.60	4.77	5.98	7.66	7.88	8.54	9.49	10.41
1998	1.39	1.71	1.95	2.41	3.30	4.22	5.00	6.39	6.67	8.21	8.49	8.85
1999	1.37	1.71	1.91	2.40	2.85	4.12	5.26	5.53	6.96	8.03	8.35	8.91
2000	1.48	1.61	2.08	2.36	2.98	3.48	4.85	5.27	6.52	4.73	8.81	8.97
2001	1.33	1.59	1.79	2.59	3.06	3.87	4.37	5.57	6.70	5.78	7.75	7.77
2002	1.14	1.46	1.65	1.97	3.13	3.59	4.51	5.14	6.42	8.03	4.76	11.36
2003	1.12	1.30	1.61	1.98	2.53	3.97	4.83	5.50	6.10	6.99	5.96	10.00
2004	1.14	1.33	1.45	1.79	2.56	3.16	4.15	5.17	6.02	6.19	7.06	9.39
2005	1.15	1.33	1.52	1.67	2.09	2.98	3.79	6.09	6.13	6.65	7.42	10.00
2006	1.13	1.22	1.46	1.79	2.04	2.44	3.86	4.22	5.15	6.44	6.91	5.37
2007	1.06	1.39	1.41	1.82	2.36	2.68	3.28	4.10	5.00	6.33	7.84	7.97
2008	1.15	1.31	1.67	1.82	2.40	2.90	3.10	3.73	4.77	6.07	6.45	10.00
2009	0.94	1.49	1.89	2.41	2.60	3.15	3.63	4.02	5.01	5.83	6.31	9.01
2010	1.43	1.71	2.17	2.55	3.17	3.41	3.97	4.35	5.08	4.94	5.31	10.00
2011	1.11	1.69	2.25	2.92	3.61	4.20	4.53	5.09	5.42	6.09	6.76	10.00

Table 6.2.4.1. Faroe saithe (Division Vb). Proportion mature at age(1961-2012)

year	3	4	5	6	7	8	9	10	11	12	13	14+
1961	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1962	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1963	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1964	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1965	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1966	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1967	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1968	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1969	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1970	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1971	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1972	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1973	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1974	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1975	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1976	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1977	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1978	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1979	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1980	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1981	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1982	0.03	0.22	0.53	0.80	0.93	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1983	0.01	0.26	0.60	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1984	0.04	0.28	0.61	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1985	0.05	0.29	0.60	0.87	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00
1986	0.06	0.29	0.59	0.84	0.95	0.98	1.00	1.00	1.00	1.00	1.00	1.00
1987	0.06	0.28	0.56	0.80	0.92	0.97	0.99	1.00	1.00	1.00	1.00	1.00
1988	0.05	0.25	0.53	0.77	0.90	0.96	0.99	1.00	1.00	1.00	1.00	1.00
1989	0.04	0.22	0.49	0.73	0.88	0.95	0.99	1.00	1.00	1.00	1.00	1.00
1990	0.04	0.19	0.48	0.72	0.87	0.95	0.99	1.00	1.00	1.00	1.00	1.00
1991	0.03	0.18	0.48	0.73	0.88	0.96	0.99	1.00	1.00	1.00	1.00	1.00
1992	0.02	0.17	0.49	0.77	0.91	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1993	0.01	0.17	0.50	0.80	0.93	1.00	0.99	1.00	1.00	1.00	1.00	1.00
1994	0.01	0.17	0.51	0.81	0.94	1.00	0.99	1.00	1.00	1.00	1.00	1.00
1995	0.01	0.17	0.49	0.78	0.93	1.00	0.99	1.00	1.00	1.00	1.00	1.00
1996	0.02	0.17	0.47	0.74	0.90	0.99	0.99	1.00	1.00	1.00	1.00	1.00
1997	0.02	0.17	0.44	0.70	0.87	0.98	0.99	1.00	1.00	1.00	1.00	1.00
1998	0.02	0.16	0.42	0.66	0.84	0.96	0.99	1.00	1.00	1.00	1.00	1.00
1999	0.02	0.16	0.39	0.61	0.80	0.94	0.99	1.00	1.00	1.00	1.00	1.00
2000	0.02	0.17	0.37	0.57	0.77	0.92	0.98	1.00	1.00	1.00	1.00	1.00
2001	0.01	0.17	0.36	0.55	0.74	0.91	0.97	1.00	1.00	1.00	1.00	1.00
2002	0.01	0.17	0.36	0.54	0.74	0.89	0.97	1.00	1.00	1.00	1.00	1.00
2003	0.01	0.17	0.36	0.55	0.74	0.88	0.97	1.00	1.00	1.00	1.00	1.00
2004	0.00	0.17	0.37	0.56	0.74	0.88	0.96	1.00	1.00	1.00	1.00	1.00
2005	0.00	0.18	0.38	0.58	0.75	0.88	0.96	1.00	1.00	1.00	1.00	1.00
2006	0.00	0.18	0.40	0.61	0.77	0.89	0.96	1.00	1.00	1.00	1.00	1.00
2007	0.00	0.19	0.42	0.65	0.80	0.91	0.97	1.00	1.00	1.00	1.00	1.00
2008	0.00	0.20	0.45	0.68	0.84	0.92	0.97	1.00	1.00	1.00	1.00	1.00
2009	0.01	0.21	0.46	0.70	0.86	0.94	0.98	1.00	1.00	1.00	1.00	1.00
2010	0.01	0.22	0.47	0.71	0.86	0.95	0.98	1.00	1.00	1.00	1.00	1.00
2011	0.01	0.22	0.47	0.70	0.86	0.95	0.98	1.00	1.00	1.00	1.00	1.00
2012	0.02	0.22	0.46	0.68	0.85	0.95	0.98	1.00	1.00	1.00	1.00	1.00

Table 6.3.1. Faroe saithe (Division Vb). Effort (hours) and catch in number at age for commercial pair trawlers (1995-2011)

year	effort	3	4	5	6	7	8	9	10	11
1995	11366	47	180	577	236	146	49	24	19	14
1996	49063	310	958	821	1119	503	282	133	127	70
1997	36192	199	533	1488	1013	768	333	73	33	10
1998	35819	107	656	1148	1486	730	325	170	40	13
1999	44690	174	487	1554	2016	2024	817	190	83	12
2000	45425	434	1566	913	2700	1333	1604	192	106	31
2001	43420	611	1438	4946	1165	1855	748	618	127	29
2002	43173	133	3976	3964	6888	520	682	246	177	25
2003	40270	141	1494	6560	2373	2263	197	212	124	35
2004	37220	43	1200	5089	5116	1035	762	113	116	53
2005	34014	188	1189	4039	7266	3130	320	291	7	43
2006	26366	140	1176	2410	2584	3700	1376	268	85	14
2007	25829	204	879	2913	1815	1034	1215	435	110	19
2008	26266	796	762	947	2641	1063	726	611	156	51
2009	70964	154	4082	3377	1283	3612	1402	1153	751	195
2010	59835	459	2019	3586	737	657	1325	814	518	245
2011	60716	397	1936	1367	1257	323	356	488	366	310

Table 6.3.2. Faroe saithe (Division Vb). Diagnostics from XSA with commercial pair trawler tuning series.

```
 Lowestoft VPA Version 3.1
    21/05/2012  11:06
  Extended Survivors Analysis

 FAROE SAITHE (ICES Division Vb)                 SAI_IND

 CPUE data from file
pt_glmSD_adj2.dat

 Catch data for  51 years. 1961 to 2011. Ages  3 to  14.

      Fleet,            First, Last, First, Last, Alpha,  Beta
                      ,    year, year,  age ,  age
 PairTrawlers_GLM_SD ,    1995, 2011,   3,    11,   .000,  1.000

 Time series weights :

      Tapered time weighting not applied

 Catchability analysis :

      Catchability independent of stock size for all ages

      Catchability independent of age for ages >=    8

 Terminal population estimation :

Survivor estimates shrunk towards the mean F
      of the final   5 years or the   3 oldest ages.

      S.E. of the mean to which the estimates  are shrunk =   2.000

      Minimum standard error for population
      estimates derived from each fleet =    .300

      Prior weighting not applied

 Tuning converged after   38 iterations

 Regression weights
       , 1.000, 1.000, 1.000, 1.000, 1.000, 1.000, 1.000, 1.000, 1.000, 1.000

 Fishing mortalities
    Age,  2002,  2003,  2004,  2005,  2006,  2007,  2008,  2009,  2010,  2011

       3,  .003,  .006,  .002,  .007,  .079,  .051,  .159,  .026,  .065,  .049
       4,  .140,  .032,  .043,  .078,  .104,  .256,  .270,  .394,  .225,  .100
       5,  .373,  .280,  .148,  .295,  .301,  .357,  .488,  .935,  .548,  .224
       6,  .662,  .463,  .371,  .477,  .416,  .441,  .569,  .499,  .557,  .353
       7,  .568,  .698,  .482,  .588,  .621,  .369,  .472,  .727,  .567,  .475
       8,  .675,  .602,  .734,  .356,  .729,  .577,  .387,  .531,  .756,  .655
       9,  .488,  .486, 1.024,  .900,  .506,  .768,  .607,  .580,  .758,  .605
      10,  .845,  .699,  .765,  .305,  .969,  .713,  .523,  .760,  .636,  .838
      11,  .394,  .524,  .900,  .671,  .573,  .853,  .688,  .804,  .671,  .827
      12, 1.869, 1.253, 2.595,  .400,  .148,  .393,  .279,  .374,  .305,  .543
      13,  .521,  .816, 1.441,  .605,  .310,  .158,  .386,  .103,  .352,  .332
1
 XSA population numbers (Thousands)

                                  AGE

 YEAR  3,  4,  5,  6,  7, 8, 9,  10,  11, 12,

2002 ,    1.06E+05, 7.09E+04, 2.11E+04, 2.23E+04, 2.20E+03, 2.88E+03, 1.33E+03, 7.01E+02, 1.12E+02, 4.70E+01,
2003 ,    6.44E+04, 8.64E+04, 5.05E+04, 1.19E+04, 9.43E+03, 1.02E+03, 1.20E+03, 6.68E+02, 2.46E+02, 6.19E+01,
2004 ,    5.34E+04, 5.24E+04, 6.86E+04, 3.12E+04, 6.15E+03, 3.84E+03, 4.57E+02, 6.05E+02, 2.72E+02, 1.19E+02,
2005 ,    6.94E+04, 4.37E+04, 4.11E+04, 4.84E+04, 1.77E+04, 3.11E+03, 1.51E+03, 1.34E+02, 2.31E+02, 9.06E+01,
2006 ,    2.15E+04, 5.64E+04, 3.31E+04, 2.51E+04, 2.46E+04, 8.03E+03, 1.78E+03, 5.02E+02, 8.11E+01, 9.65E+01,
2007 ,    1.86E+04, 1.63E+04, 4.16E+04, 2.00E+04, 1.35E+04, 1.08E+04, 3.17E+03, 8.80E+02, 1.56E+02, 3.74E+01,
2008 ,    3.60E+04, 1.45E+04, 1.03E+04, 2.39E+04, 1.06E+04, 7.66E+03, 4.98E+03, 1.20E+03, 3.53E+02, 5.45E+01,
2009 ,    2.01E+04, 2.52E+04, 9.06E+03, 5.18E+03, 1.10E+04, 5.39E+03, 4.26E+03, 2.22E+03, 5.84E+02, 1.45E+02,
2010 ,    4.08E+04, 1.60E+04, 1.39E+04, 2.91E+03, 2.58E+03, 4.37E+03, 2.59E+03, 1.95E+03, 8.50E+02, 2.14E+02,
2011 ,    4.29E+04, 3.13E+04, 1.05E+04, 6.57E+03, 1.37E+03, 1.20E+03, 1.68E+03, 9.95E+02, 8.47E+02, 3.56E+02,
```

Estimated population abundance at 1st Jan 2012

, 0.00E+00, 3.34E+04, 2.32E+04, 6.85E+03, 3.78E+03, 6.96E+02, 5.08E+02, 7.52E+02, 3.52E+02,
3.03E+02,

Taper weighted geometric mean of the VPA populations:

2.67E+04, 2.01E+04, 1.35E+04, 7.93E+03, 4.32E+03, 2.35E+03, 1.26E+03, 6.60E+02, 3.42E+02, 1.76E+02,

Standard error of the weighted Log(VPA populations) :

,.5849, .6151, .6510, .6717, .6659, .6329, .6632, .7489, .8428, .9573,

	AGE
YEAR ,	13,
2002 ,	2.18E+01,
2003 ,	5.94E+00,
2004 ,	1.45E+01,
2005 ,	7.30E+00,
2006 ,	4.97E+01,
2007 ,	6.81E+01,
2008 ,	2.07E+01,
2009 ,	3.37E+01,
2010 ,	8.19E+01,
2011 ,	1.29E+02,

Estimated population abundance at 1st Jan 2012

, 1.69E+02,

Taper weighted geometric mean of the VPA populations:

,8.10E+01,

Standard error of the weighted Log(VPA populations) :

, 1.2653,
1

Log catchability residuals.

Fleet : PairTrawlers_GLM_SD

Age ,	1995,	1996,	1997,	1998,	1999,	2000,	2001
3 ,	-.27,	.63,	.17,	.53,	-.74,	.66,	.14
4 ,	.14,	-.54,	-.35,	-.44,	.01,	-.38,	.11
5 ,	.51,	-.58,	-.62,	-.36,	-.57,	-.12,	.10
6 ,	-.18,	-.15,	-.07,	-.66,	-.02,	.04,	.36
7 ,	.13,	-.41,	.19,	.03,	-.19,	-.05,	.30
8 ,	.05,	.12,	.07,	-.07,	.53,	.23,	.08
9 ,	-.08,	.37,	-.05,	.22,	-.06,	-.16,	.36
10 ,	-.39,	1.03,	.03,	.14,	.20,	.21,	.48
11 ,	-.08,	.14,	-.44,	-.10,	-.60,	.10,	.00

Age ,	2002,	2003,	2004,	2005,	2006,	2007,	2008,	2009,	2010,	2011
3 ,	-1.57,	-.94,	-1.86,	-.56,	.61,	1.13,	1.87,	-.24,	.33,	.11
4 ,	.24,	-.91,	-.55,	-.27,	-.27,	.78,	.74,	.93,	.77,	-.02
5 ,	.47,	.13,	-.41,	.03,	-.02,	-.01,	.30,	.90,	.54,	-.30
6 ,	.67,	.22,	.06,	.11,	-.04,	-.14,	.10,	-.12,	.10,	-.28
7 ,	.19,	.33,	-.04,	.15,	.25,	-.51,	-.21,	.09,	-.06,	-.19
8 ,	.11,	-.05,	.11,	-.62,	.31,	-.16,	-.43,	-.35,	.07,	.00
9 ,	-.21,	-.19,	.45,	.24,	.08,	.12,	-.07,	-.29,	.11,	-.05
10 ,	.25,	-.05,	.09,	-1.32,	.40,	.01,	-.06,	.01,	-.11,	.28
11 ,	-.07,	-.39,	.16,	.11,	.25,	.04,	.12,	.02,	-.02,	.28

Mean log catchability and standard error of ages with catchability
independent of year class strength and constant w.r.t. time

Age ,	3,	4,	5,	6,	7,	8	9,	10,	11	
Mean Log q,	-15.6859,	-13.6340,	-12.5433,	-12.1197,	-11.9458,	-11.8239,	-11.8239,	-11.8239,	-11.8239,	-11.8239,
S.E(Log q),	.9438,	.5435,	.4438,	.2816,	.2432,	.2744,	.2263,	.4765,	.2429,	

Regression statistics :

Ages with q independent of year class strength and constant w.r.t. time.

```
Age, Slope , t-value , Intercept, RSquare, No Pts, Reg s.e,  Mean Q

  3,   48.88,   -2.917,    261.03,     .00,     17,   38.06,  -15.69,
  4,    2.00,   -2.734,     17.01,     .33,     17,     .92,  -13.63,
  5,    1.16,    -.846,     12.97,     .65,     17,     .52,  -12.54,
  6,     .96,     .446,     12.01,     .89,     17,     .28,  -12.12,
  7,     .97,     .380,     11.85,     .92,     17,     .24,  -11.95,
  8,    1.07,    -.712,     12.08,     .88,     17,     .30,  -11.82,
  9,    1.08,   -1.155,     12.17,     .93,     17,     .24,  -11.78,
 10,     .96,     .270,     11.54,     .77,     17,     .47,  -11.75,
 11,     .89,    1.678,     11.14,     .94,     17,     .20,  -11.85,

 Fleet disaggregated estimates of survivors :

Age  3   Catchability constant w.r.t. time and dependent on age

 Year class = 2008

 PairTrawlers_GLM_SD
        Age,         3,
  Survivors,    37373.,
Raw Weights,     1.010,


 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,     37373.,   .971,       .000,    .00,   1,  .802,     .044

   F shrinkage mean  ,     21312.,   2.00,,,,                        .198,     .076

 Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
     33431.,       .87,      .25,    2,    .286,   .049
1
Age  4   Catchability constant w.r.t. time and dependent on age

 Year class = 2007

 PairTrawlers_GLM_SD
        Age,         4,          3,
  Survivors,    22806.,     32216.,
Raw Weights,     2.893,       .899,

 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,     24752.,   .485,       .147,    .30,   2,  .938,     .094

   F shrinkage mean  ,      8530.,   2.00,,,,                        .062,     .251

 Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
     23174.,       .47,      .21,    3,    .451,   .100

 Age  5   Catchability constant w.r.t. time and dependent on age

 Year class = 2006

 PairTrawlers_GLM_SD
        Age,         5,          4,          3,
  Survivors,     5065.,     14776.,      5371.,
Raw Weights,     3.831,      2.040,       .660,

 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,      7119.,   .335,       .348,   1.04,   3,  .963,     .217

   F shrinkage mean  ,      2465.,   2.00,,,,                        .037,     .530

 Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
      6846.,       .33,      .30,    4,    .916,   .224
```

```
  Age  6   Catchability constant w.r.t. time and dependent on age

 Year class = 2005

 PairTrawlers_GLM_SD
         Age,         6,          5,          4,          3,
   Survivors,     2844.,      6495.,      9568.,     24588.,
 Raw Weights,     7.807,      1.948,       .876,       .248,

  Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
      ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,      3819.,   .236,       .294,   1.25,   4,  .978,     .350

   F shrinkage mean  ,      2465.,   2.00,,,,                          .022,     .500

 Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
      3782.,       .23,      .25,    5,   1.082,   .353

 Age  7   Catchability constant w.r.t. time and dependent on age

 Year class = 2004

 PairTrawlers_GLM_SD
         Age,         7,          6,          5,          4,          3,
   Survivors,      574.,       769.,      1713.,      1455.,      2164.,
 Raw Weights,     6.907,      3.959,       .671,       .341,       .108,

 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,       699.,   .202,       .156,    .77,   5,  .980,     .474

   F shrinkage mean  ,       569.,   2.00,,,,                          .020,     .556

 Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
       696.,       .20,      .14,    6,    .687,   .475

 Age  8   Catchability constant w.r.t. time and dependent on age

 Year class = 2003

 PairTrawlers_GLM_SD
         Age,         8,          7,          6,          5,          4,          3,
   Survivors,      506.,       478.,       452.,       689.,      1105.,       934.,
 Raw Weights,     5.769,      3.271,      1.986,       .526,       .272,       .083,

  Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
      ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,       507.,   .176,       .069,    .39,   6,  .979,     .657

   F shrinkage mean  ,       571.,   2.00,,,,                          .021,     .601

Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
       508.,       .18,      .06,    7,    .353,   .655

 Age  9   Catchability constant w.r.t. time and age (fixed at the value for age)  8

 Year class = 2002

PairTrawlers_GLM_SD
        Age,         9,          8,          7,          6,          5,          4,          3,
  Survivors,      714.,       807.,       819.,       833.,       744.,       575.,       430.,
Raw Weights,     6.070,      2.850,      1.377,       .779,       .235,       .141,       .047,

 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,       753.,   .180,       .033,    .18,   7,  .979,     .604

   F shrinkage mean  ,       683.,   2.00,,,,                          .021,     .650
```

```
 Weighted prediction :

Survivors,        Int,      Ext,    N,    Var,     F
at end of year,   s.e,      s.e,     ,   Ratio,
      752.,       .18,      .03,    8,    .167,   .605

 Age 10   Catchability constant w.r.t. time and age (fixed at the value for age)  8

Year class = 2001

PairTrawlers_GLM_SD
       Age,       10,         9,         8,         7,         6,         5,         4,         3,
 Survivors,      468.,      392.,      248.,      286.,      307.,      347.,      269.,       55.,
Raw Weights,    1.799,     2.251,     1.323,      .825,      .531,      .170,      .105,      .035,

 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
PairTrawlers_GLM_SD ,       350.,   .173,       .101,    .58,   8,  .966,     .842

  F shrinkage mean  ,       432.,   2.00,,,,                         .034,     .727

Weighted prediction :

Survivors,        Int,      Ext,    N,    Var,     F
at end of year,   s.e,      s.e,     ,   Ratio,
      352.,       .18,      .09,    9,    .521,   .838

 Age 11   Catchability constant w.r.t. time and age (fixed at the value for age)  8

Year class = 2000

PairTrawlers_GLM_SD
        Age,        11,
  Survivors,      399.,
Raw Weights,     4.859,

       Age,       10,         9,         8,         7,         6,         5,         4,         3,
 Survivors,      271.,      227.,      197.,      181.,      291.,      311.,      175.,      118.,
Raw Weights,      .963,     1.440,      .978,      .676,      .446,      .143,      .092,      .030,

 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
PairTrawlers_GLM_SD ,       302.,   .170,       .109,    .64,   9,  .975,     .830

  F shrinkage mean  ,       367.,   2.00,,,,                         .025,     .725

Weighted prediction :

Survivors,        Int,      Ext,    N,    Var,     F
at end of year,   s.e,      s.e,     ,   Ratio,
      303.,       .17,      .10,   10,    .588,   .827

 Age 12   Catchability constant w.r.t. time and age (fixed at the value for age)  8
 Year class = 1999

PairTrawlers_GLM_SD
        Age,        12,         11,
  Survivors,         0.,        167.,
Raw Weights,       .000,       3.301,

        Age,       10,         9,         8,         7,         6,         5,         4,
3,
  Survivors,      171.,       157.,       145.,       218.,       189.,       112.,        68.,
35.,
Raw Weights,      .578,       .842,       .473,       .254,       .158,       .059,       .038,
.013,


 Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                 Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,       164.,   .188,       .047,    .25,   9,  .958,     .556

  F shrinkage mean  ,       347.,   2.00,,,,                         .042,     .301
```

```
Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
       169.,       .20,      .07,   10,    .338,   .543

  Age 13   Catchability constant w.r.t. time and age (fixed at the value for age)  8

 Year class = 1998

 PairTrawlers_GLM_SD
         Age,        13,         12,         11,
   Survivors,        0.,         0.,        77.,
 Raw Weights,      .000,       .000,      2.631,

        Age,       10,         9,         8,         7,         6,         5,         4,         3,
  Survivors,      72.,       86.,      103.,       88.,       80.,       86.,       97.,       88.,
Raw Weights,      .584,      .723,      .349,      .194,      .134,      .044,      .025,      .008,

  Fleet,                Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
     ,                  Survivors,    s.e,       s.e,   Ratio,    , Weights,    F
 PairTrawlers_GLM_SD ,        80.,   .187,       .033,    .17,   9,  .949,     .316

   F shrinkage mean  ,        27.,   2.00,,,,                        .051,     .743

 Weighted prediction :

 Survivors,        Int,      Ext,    N,    Var,     F
 at end of year,   s.e,      s.e,     ,   Ratio,
        76.,       .20,      .09,   10,    .425,   .332
```

Table 6.3.3. Faroe saithe (Division Vb). Fishing mortality (F) at age (1961-2011).

year	3	4	5	6	7	8	9	10	11	12	13	14	Fbar
1961	0.026	0.058	0.109	0.143	0.120	0.100	0.110	0.106	0.112	0.181	0.134	0.134	0.106
1962	0.052	0.101	0.127	0.156	0.143	0.099	0.138	0.149	0.125	0.098	0.124	0.124	0.125
1963	0.035	0.040	0.085	0.118	0.185	0.142	0.185	0.250	0.178	0.491	0.308	0.308	0.114
1964	0.052	0.144	0.251	0.218	0.236	0.301	0.180	0.241	0.248	0.235	0.243	0.243	0.230
1965	0.050	0.085	0.186	0.253	0.283	0.263	0.370	0.316	0.424	0.532	0.427	0.427	0.214
1966	0.026	0.103	0.167	0.283	0.348	0.350	0.308	0.456	0.433	0.493	0.464	0.464	0.250
1967	0.027	0.053	0.125	0.158	0.332	0.354	0.349	0.335	0.407	0.384	0.378	0.378	0.204
1968	0.030	0.099	0.098	0.140	0.156	0.307	0.326	0.358	0.258	0.467	0.363	0.363	0.160
1969	0.034	0.136	0.189	0.175	0.207	0.250	0.493	0.586	0.639	0.518	0.586	0.586	0.191
1970	0.044	0.262	0.142	0.179	0.160	0.202	0.206	0.390	0.431	0.609	0.480	0.480	0.189
1971	0.086	0.135	0.373	0.128	0.144	0.117	0.130	0.157	0.277	0.534	0.325	0.325	0.179
1972	0.094	0.070	0.148	0.316	0.293	0.354	0.400	0.490	0.541	0.730	0.592	0.592	0.236
1973	0.125	0.325	0.438	0.304	0.315	0.209	0.246	0.272	0.253	0.320	0.283	0.283	0.318
1974	0.222	0.311	0.358	0.307	0.192	0.195	0.164	0.237	0.207	0.227	0.225	0.225	0.273
1975	0.141	0.345	0.528	0.293	0.180	0.141	0.132	0.120	0.205	0.198	0.175	0.175	0.297
1976	0.196	0.340	0.298	0.328	0.208	0.160	0.129	0.137	0.122	0.149	0.136	0.136	0.267
1977	0.146	0.281	0.376	0.382	0.344	0.259	0.179	0.130	0.246	0.156	0.178	0.178	0.328
1978	0.085	0.233	0.267	0.163	0.180	0.375	0.272	0.259	0.228	0.307	0.266	0.266	0.244
1979	0.037	0.180	0.283	0.251	0.261	0.310	0.338	0.490	0.329	0.172	0.333	0.333	0.257
1980	0.088	0.153	0.205	0.224	0.281	0.195	0.258	0.415	0.386	0.226	0.344	0.344	0.212
1981	0.014	0.227	0.194	0.447	0.533	0.512	0.383	0.394	0.412	0.471	0.429	0.429	0.383
1982	0.028	0.184	0.189	0.477	0.329	0.502	0.399	0.191	0.315	0.477	0.330	0.330	0.336
1983	0.070	0.103	0.366	0.419	0.486	0.552	0.736	0.221	0.275	0.711	0.405	0.405	0.385
1984	0.016	0.498	0.332	0.575	0.535	0.451	0.558	0.292	0.224	0.265	0.262	0.262	0.478
1985	0.063	0.236	0.507	0.276	0.579	0.314	0.305	0.243	0.232	0.415	0.298	0.298	0.382
1986	0.021	0.138	0.452	0.774	0.376	0.785	0.518	0.578	0.895	0.518	0.670	0.670	0.505
1987	0.037	0.138	0.423	0.570	0.476	0.372	0.599	0.321	0.503	0.141	0.324	0.324	0.396
1988	0.022	0.089	0.355	0.632	0.577	0.629	0.471	0.650	0.167	1.600	0.814	0.814	0.456
1989	0.018	0.203	0.228	0.492	0.366	0.511	0.384	0.184	0.489	0.086	0.254	0.254	0.360
1990	0.016	0.204	0.628	0.785	0.802	0.393	0.203	0.209	0.197	0.290	0.233	0.233	0.562
1991	0.047	0.415	0.768	0.877	0.801	0.659	0.691	0.758	0.905	0.416	0.700	0.700	0.704
1992	0.030	0.262	0.596	0.707	0.553	0.485	0.560	0.461	0.457	0.733	0.555	0.555	0.521
1993	0.063	0.206	0.547	0.601	0.515	0.391	0.482	0.457	0.377	0.481	0.441	0.441	0.452
1994	0.046	0.274	0.335	0.597	0.600	0.652	0.453	0.716	0.567	0.343	0.547	0.547	0.492
1995	0.011	0.089	0.411	0.407	0.684	0.625	0.780	0.576	0.578	0.604	0.591	0.591	0.443
1996	0.014	0.039	0.137	0.300	0.489	0.758	0.520	0.619	0.381	0.533	0.515	0.515	0.345
1997	0.011	0.048	0.115	0.324	0.500	0.537	0.577	0.595	0.501	0.554	0.809	0.809	0.305
1998	0.014	0.071	0.150	0.238	0.455	0.520	0.718	0.589	0.593	1.457	0.601	0.601	0.287
1999	0.006	0.073	0.181	0.303	0.492	0.628	0.624	0.718	0.364	1.795	1.267	1.267	0.335
2000	0.025	0.068	0.235	0.419	0.474	0.722	0.521	0.729	0.671	0.514	0.605	0.605	0.384
2001	0.014	0.100	0.294	0.635	0.768	0.717	1.001	1.214	1.005	0.694	2.018	2.018	0.503
2002	0.003	0.140	0.373	0.662	0.568	0.675	0.489	0.845	0.394	1.869	0.524	0.524	0.484
2003	0.006	0.032	0.280	0.463	0.698	0.602	0.486	0.699	0.524	1.253	0.817	0.817	0.415
2004	0.002	0.043	0.148	0.371	0.482	0.734	1.024	0.766	0.901	2.595	1.443	1.443	0.356
2005	0.007	0.078	0.295	0.477	0.588	0.356	0.900	0.306	0.672	0.401	0.606	0.606	0.359
2006	0.079	0.104	0.301	0.416	0.621	0.729	0.506	0.969	0.574	0.148	0.311	0.311	0.434
2007	0.051	0.256	0.357	0.441	0.369	0.577	0.768	0.713	0.853	0.393	0.158	0.158	0.400
2008	0.159	0.270	0.488	0.569	0.472	0.387	0.607	0.524	0.688	0.279	0.387	0.387	0.437
2009	0.026	0.394	0.935	0.499	0.727	0.531	0.580	0.760	0.804	0.374	0.104	0.104	0.617
2010	0.065	0.225	0.548	0.557	0.568	0.756	0.758	0.636	0.671	0.306	0.353	0.353	0.531
2011	0.049	0.1	0.224	0.353	0.475	0.656	0.605	0.838	0.827	0.543	0.332	0.332	0.362

Table 6.3.4. Faroe saithe (Division Vb). Stock number at age (start of year) (Thousands)(1961-2011)

year	3	4	5	6	7	8	9	10	11	12	13	14+	TOTAL
1961	7827	7422	5158	3352	2114	1494	1233	905	468	180	53	431	30637
1962	12256	6243	5734	3786	2379	1535	1107	904	666	343	123	593	35669
1963	19837	9526	4621	4136	2652	1689	1138	789	638	481	254	182	45945
1964	14812	15686	7492	3476	3011	1804	1200	775	503	437	241	224	49661
1965	22363	11508	11116	4771	2287	1947	1093	821	498	322	283	240	57249
1966	21229	17408	8653	7555	3033	1411	1226	618	490	267	155	233	62279
1967	24898	16939	12859	5998	4660	1754	814	738	321	260	134	94	69468
1968	22879	19846	13149	9294	4194	2737	1008	470	432	175	145	317	74646
1969	39799	18176	14720	9755	6618	2938	1648	595	269	273	90	133	95016
1970	37092	31507	12994	9976	6708	4407	1872	825	271	116	133	109	106010
1971	38447	29061	19844	9229	6831	4678	2948	1247	457	144	52	131	113068
1972	33424	28892	20793	11194	6647	4843	3406	2118	873	284	69	120	112662
1973	23622	24910	22050	14682	6684	4058	2784	1868	1062	416	112	258	102506
1974	19421	17064	14737	11651	8873	3993	2696	1782	1165	675	247	525	82829
1975	17327	12730	10238	8436	7020	5997	2691	1874	1151	776	440	740	69419
1976	19709	12320	7381	4943	5152	4802	4264	1930	1361	768	521	1133	64283
1977	13106	13261	7176	4487	2916	3425	3352	3068	1378	986	542	816	54512
1978	8333	9274	8200	4035	2508	1693	2163	2293	2206	882	691	837	43115
1979	8686	6270	6016	5142	2808	1716	953	1350	1450	1438	531	1354	37712
1980	13074	6852	4289	3712	3276	1770	1030	557	677	854	991	1390	38472
1981	33145	9803	4816	2860	2430	2025	1192	652	301	377	558	2253	60412
1982	15673	26765	6394	3248	1498	1168	994	666	360	163	193	3113	60233
1983	40829	12482	18225	4335	1651	883	579	546	450	215	83	1368	81645
1984	26072	31181	9221	10350	2334	831	416	227	358	280	86	840	82197
1985	22325	21013	15515	5415	4770	1119	434	195	139	234	176	690	72026
1986	61845	17171	13594	7651	3364	2188	669	262	125	90	127	154	107240
1987	48594	49578	12251	7082	2889	1892	817	326	120	42	44	322	123958
1988	44827	38355	35350	6568	3278	1470	1068	368	194	60	30	4	131569
1989	28598	35918	28733	20296	2858	1508	641	546	157	134	10	132	119531
1990	20707	23006	23995	18729	10160	1623	741	358	372	79	101	222	100091
1991	24969	16688	15368	10489	6992	3731	897	495	238	250	48	41	80204
1992	19542	19511	9025	5839	3571	2570	1580	368	190	79	135	49	62458
1993	23777	15528	12294	4071	2357	1681	1295	739	190	98	31	25	62086
1994	16871	18277	10351	5823	1827	1153	931	655	383	107	50	5	56432
1995	38968	13189	11380	6065	2625	821	492	485	262	178	62	47	74572
1996	24290	31544	9876	6179	3304	1084	360	184	223	120	80	22	77267
1997	33451	19618	24843	7049	3748	1659	416	175	81	125	58	45	91269
1998	12741	27076	15309	18132	4172	1860	794	191	79	40	59	51	80505
1999	58774	10284	20640	10784	11701	2168	905	317	87	36	8	56	115759
2000	35755	47829	7827	14097	6521	5858	947	397	127	49	5	12	119425
2001	87894	28540	36598	5065	7589	3325	2331	461	157	53	24	16	172052
2002	105884	70944	21148	22330	2197	2883	1330	701	112	47	22	3	227600
2003	64371	86418	50484	11920	9427	1019	1202	668	246	62	6	0	225823
2004	53416	52404	68552	31242	6145	3840	457	605	272	119	14	3	217070
2005	69410	43665	41085	48395	17651	3108	1509	134	230	90	7	0	225285
2006	21484	56417	33082	25055	24597	8028	1782	502	81	96	50	21	171194
2007	18629	16255	41626	20045	13535	10822	3170	880	156	37	68	23	125245
2008	36005	14500	10304	23851	10554	7660	4975	1204	353	54	21	0	109482
2009	20054	25150	9059	5181	11049	5389	4260	2220	584	145	34	11	83137
2010	40771	16004	13884	2913	2575	4371	2594	1953	850	214	82	0	86212
2011	42887	31278	10464	6574	1367	1195	1680	995	846	356	129	15.5	97787

Table 6.3.5. Faroe saithe (Division Vb). Summary table.

year	Rec	TB	SSB	Land	y_SSB	Fbar
1961	7.827	105	68.8	9.592	0.129	0.106
1962	12.26	111.5	73.26	10.45	0.153	0.125
1963	19.84	129.8	76.84	12.69	0.172	0.114
1964	14.81	139.2	81.39	21.89	0.271	0.23
1965	22.36	150.3	85.25	22.18	0.282	0.214
1966	21.23	162.6	87.91	25.56	0.298	0.25
1967	24.9	161.6	86.06	21.32	0.239	0.204
1968	22.88	170.3	94.6	20.39	0.211	0.16
1969	39.8	197.3	104.2	27.44	0.272	0.191
1970	37.09	212.2	110.4	29.11	0.274	0.189
1971	38.45	218.4	122.7	32.71	0.244	0.179
1972	33.42	234.8	138.8	42.66	0.306	0.236
1973	23.62	210.1	131.5	57.43	0.437	0.318
1974	19.42	205.6	134.8	47.19	0.35	0.272
1975	17.33	189.8	136.1	41.58	0.306	0.297
1976	19.71	181.6	129.5	33.07	0.255	0.267
1977	13.11	168.9	122.5	34.84	0.272	0.328
1978	8.332	150.5	105.6	28.14	0.265	0.243
1979	8.686	127.9	96.43	27.25	0.276	0.257
1980	13.07	134.9	96.61	25.23	0.263	0.211
1981	33.14	153.8	85.35	30.1	0.369	0.382
1982	15.67	165.6	94.69	30.96	0.34	0.336
1983	40.83	187.7	96.67	39.18	0.405	0.385
1984	26.07	198.3	105.3	54.67	0.519	0.478
1985	22.33	192.6	110.8	44.61	0.427	0.382
1986	61.84	238	94.32	41.72	0.47	0.505
1987	48.59	254.1	96.43	40.02	0.431	0.396
1988	44.83	261.7	102.1	45.29	0.447	0.456
1989	28.6	231.1	104	44.48	0.441	0.36
1990	20.71	193.6	101.1	61.63	0.621	0.562
1991	24.97	151.3	75.84	54.86	0.728	0.704
1992	19.54	125	60.6	36.49	0.573	0.521
1993	23.78	134.3	59.63	33.54	0.553	0.452
1994	16.87	128.3	58.31	33.18	0.556	0.492
1995	38.97	154	55.36	27.21	0.482	0.443
1996	24.29	163.3	60.51	20.03	0.321	0.344
1997	33.45	182.4	68.86	22.31	0.324	0.305
1998	12.74	166.2	75.17	26.42	0.344	0.287
1999	58.77	213.7	78.48	33.21	0.416	0.335
2000	35.75	226.8	80.6	39.02	0.477	0.383
2001	87.89	291.2	82.62	51.79	0.626	0.503
2002	105.9	331.5	80.09	53.55	0.668	0.484
2003	64.37	329.4	94.68	46.56	0.491	0.415
2004	53.42	321.6	109.7	46.36	0.421	0.356
2005	69.41	335.4	125.2	67.97	0.543	0.359
2006	21.48	266.2	125.2	66.9	0.536	0.434
2007	18.63	214.4	120.2	60.79	0.508	0.4
2008	36.01	190.4	104.3	57.04	0.542	0.437
2009	20.05	160	93.51	57.95	0.612	0.617
2010	40.77	170.8	71.6	43.89	0.613	0.531
2011	42.89	173.7	65.92	29.09	0.441	0.362

Table 6.6.1.1a. Faroe saithe (Division Vb). Proposed input data for prediction with management options.

2012								
Age	**N**	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
3	25956	0.2	0.02	0	0	1.343	0.049	1.343
4	33434	0.2	0.22	0	0	1.789	0.100	1.789
5	23171	0.2	0.47	0	0	2.133	0.224	2.133
6	6848	0.2	0.69	0	0	2.703	0.353	2.703
7	3781	0.2	0.86	0	0	3.180	0.475	3.180
8	696	0.2	0.95	0	0	3.950	0.656	3.950
9	508	0.2	0.98	0	0	4.531	0.605	4.531
10	751	0.2	1.00	0	0	5.087	0.838	5.087
11	352	0.2	1.00	0	0	5.416	0.827	5.416
12	303	0.2	1.00	0	0	6.087	1.000	6.087
13	169	0.2	1.00	0	0	6.763	1.000	6.763
14	85	0.2	1.00	0	0	10.000	1.000	10.000
2013								
Age	**N**	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
3	25956	0.2	0.01	0	0	1.343	0.049	1.343
4	-	0.2	0.22	0	0	1.789	0.1	1.789
5	-	0.2	0.47	0	0	2.133	0.224	2.133
6	-	0.2	0.70	0	0	2.703	0.353	2.703
7	-	0.2	0.86	0	0	3.180	0.475	3.180
8	-	0.2	0.95	0	0	3.950	0.656	3.950
9	-	0.2	0.98	0	0	4.531	0.605	4.531
10	-	0.2	1.00	0	0	5.087	0.838	5.087
11	-	0.2	1.00	0	0	5.416	0.827	5.416
12	-	0.2	1.00	0	0	6.087	1.000	6.087
13	-	0.2	1.00	0	0	6.763	1.000	6.763
14	-	0.2	1.00	0	0	10.000	1.000	10.000
2014								
Age	**N**	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
3	25956	0.2	0.01	0	0	1.343	0.049	1.343
4	-	0.2	0.22	0	0	1.789	0.100	1.789
5	-	0.2	0.47	0	0	2.133	0.224	2.133
6	-	0.2	0.70	0	0	2.703	0.353	2.703
7	-	0.2	0.86	0	0	3.180	0.475	3.180
8	-	0.2	0.95	0	0	3.950	0.656	3.950
9	-	0.2	0.98	0	0	4.531	0.605	4.531
10	-	0.2	1.00	0	0	5.087	0.838	5.087
11	-	0.2	1.00	0	0	5.416	0.827	5.416
12	-	0.2	1.00	0	0	6.087	1.000	6.087
13	-	0.2	1.00	0	0	6.763	1.000	6.763
14	-	0.2	1.00	0	0	10.000	1.000	10.000
Input units are thousands and kg - output in tonnes								

Table 6.6.2.1a. Faroe saithe (Division Vb). Proposed prediction with management option.

2012						
Biomass	SSB	FMult	FBar	Landings		
189253	74151	1.000	0.362	32257		
2013					2014	
Biomass	SSB	FMult	FBar	Landings	Biomass	SSB
191092	85888	0.0000	0.0000	0	227815	122170
.	85888	0.1000	0.0362	4219	223214	118494
.	85888	0.2000	0.0723	8285	218784	114971
.	85888	0.3000	0.1085	12204	214516	111591
.	85888	0.4000	0.1446	15984	210403	108348
.	85888	0.5000	0.1808	19631	206438	105234
.	85888	0.6000	0.2170	23152	202612	102244
.	85888	0.7000	0.2531	26552	198920	99370
.	85888	0.8000	0.2893	29837	195356	96607
.	85888	0.9000	0.3254	33013	191913	93950
.	85888	1.0000	0.3616	36083	188586	91394
.	85888	1.1000	0.3978	39054	185369	88933
.	85888	1.2000	0.4339	41929	182259	86564
.	85888	1.3000	0.4701	44713	179250	84282
.	85888	1.4000	0.5062	47409	176338	82082
.	85888	1.5000	0.5424	50022	173518	79962
.	85888	1.6000	0.5786	52554	170787	77917
.	85888	1.7000	0.6147	55009	168141	75945
.	85888	1.8000	0.6509	57391	165577	74041
.	85888	1.9000	0.6870	59701	163091	72203
.	85888	2.0000	0.7232	61944	160679	70429
Input units are thousands and kg - output in tonnes						

Table 6.6.1.1b. Faroe saithe (Division Vb). Input data for prediction with management options (spaly scenario).

2012								
Age	**N**	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
3	25956	0.2	0.02	0	0	1.343	0.047	1.343
4	33434	0.2	0.22	0	0	1.789	0.240	1.789
5	23171	0.2	0.47	0	0	2.133	0.569	2.133
6	6848	0.2	0.69	0	0	2.703	0.470	2.703
7	3781	0.2	0.86	0	0	3.180	0.590	3.180
8	696	0.2	0.95	0	0	3.950	0.648	3.950
9	508	0.2	0.98	0	0	4.531	0.648	4.531
10	751	0.2	1.00	0	0	5.087	0.745	5.087
11	352	0.2	1.00	0	0	5.416	0.767	5.416
12	303	0.2	1.00	0	0	6.087	1.000	6.087
13	169	0.2	1.00	0	0	6.763	1.000	6.763
14	85	0.2	1.00	0	0	10.000	1.000	10.000
2013								
Age	**N**	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
3	25956	0.2	0.01	0	0	1.343	0.046667	1.343
4	-	0.2	0.22	0	0	1.789	0.239667	1.789
5	-	0.2	0.47	0	0	2.133	0.569	2.133
6	-	0.2	0.70	0	0	2.703	0.469667	2.703
7	-	0.2	0.86	0	0	3.180	0.59	3.180
8	-	0.2	0.95	0	0	3.950	0.647667	3.950
9	-	0.2	0.98	0	0	4.531	0.647667	4.531
10	-	0.2	1.00	0	0	5.087	0.744667	5.087
11	-	0.2	1.00	0	0	5.416	0.767333	5.416
12	-	0.2	1.00	0	0	6.087	1.000	6.087
13	-	0.2	1.00	0	0	6.763	1.000	6.763
14	-	0.2	1.00	0	0	10.000	1.000	10.000
2014								
Age	**N**	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
3	25956	0.2	0.01	0	0	1.343	0.047	1.343
4	-	0.2	0.22	0	0	1.789	0.240	1.789
5	-	0.2	0.47	0	0	2.133	0.569	2.133
6	-	0.2	0.70	0	0	2.703	0.470	2.703
7	-	0.2	0.86	0	0	3.180	0.590	3.180
8	-	0.2	0.95	0	0	3.950	0.648	3.950
9	-	0.2	0.98	0	0	4.531	0.648	4.531
10	-	0.2	1.00	0	0	5.087	0.745	5.087
11	-	0.2	1.00	0	0	5.416	0.767	5.416
12	-	0.2	1.00	0	0	6.087	1.000	6.087
13	-	0.2	1.00	0	0	6.763	1.000	6.763
14	-	0.2	1.00	0	0	10.000	1.000	10.000
Input units are thousands and kg - output in tonnes								

Table 6.6.1.1b. Faroe saithe (Division Vb). Prediction with management options (spaly scenario).

2012						
Biomass	SSB	FMult	FBar	Landings		
189253	74151	1.000	0.503	51123		
2013					2014	
Biomass	SSB	FMult	FBar	Landings	Biomass	SSB
170278	72480	0.0000	0.0000	0	207196	105348
.	72480	0.1000	0.0503	5827	200776	100522
.	72480	0.2000	0.1006	11371	194679	95953
.	72480	0.3000	0.1510	16647	188886	91627
.	72480	0.4000	0.2013	21670	183382	87529
.	72480	0.5000	0.2516	26452	178150	83647
.	72480	0.6000	0.3019	31008	173175	79968
.	72480	0.7000	0.3522	35348	168444	76482
.	72480	0.8000	0.4026	39486	163943	73177
.	72480	0.9000	0.4529	43430	159659	70044
.	72480	1.0000	0.5032	47193	155582	67072
.	72480	1.1000	0.5535	50782	151699	64253
.	72480	1.2000	0.6038	54208	148001	61579
.	72480	1.3000	0.6542	57479	144477	59041
.	72480	1.4000	0.7045	60603	141119	56631
.	72480	1.5000	0.7548	63587	137917	54344
.	72480	1.6000	0.8051	66439	134864	52172
.	72480	1.7000	0.8554	69165	131951	50108
.	72480	1.8000	0.9058	71772	129171	48148
.	72480	1.9000	0.9561	74267	126518	46285
.	72480	2.0000	1.0064	76654	123984	44514
Input units are thousands and kg - output in tonnes						

Table 6.7.1.1. Faroe saithe (Division Vb). Yield per recruit input data.

Yield per recruit								
Input data								
	Age	**M**	**Mat**	**PF**	**PM**	**SWt**	**Sel**	**CWt**
	3	0.2	0.020	0	0	1.312	0.070	1.312
	4	0.2	0.202	0	0	1.717	0.249	1.717
	5	0.2	0.466	0	0	2.146	0.510	2.146
	6	0.2	0.707	0	0	2.727	0.484	2.727
	7	0.2	0.860	0	0	3.503	0.522	3.503
	8	0.2	0.949	0	0	4.420	0.581	4.420
	9	0.2	0.983	0	0	5.215	0.664	5.215
	10	0.2	1.000	0	0	5.995	0.694	5.995
	11	0.2	1.000	0	0	6.933	0.769	6.933
	12	0.2	1.000	0	0	7.596	0.379	7.596
	13	0.2	1.000	0	0	7.944	0.267	7.944
	14	0.2	1.000	0	0	9.612	0.267	9.612
Weights in kilograms								

Table 6.7.1.2. Faroe saithe (Division Vb). Yield per recruit, summary table.

Yield per recruit results									
FMult	Fbar	CatchNos	Yield	StockNos	Biomass	SpwnNosJ	SSBJan	SpwnNosS	SSBSpwn
0.0	0	0	0	5.499954	21.34848	17.40507	17.40507	17.40507	17.40507
0.1	0.046936	0.156488	0.612427	4.731141	16.01975	12.18973	12.18973	12.18973	12.18973
0.2	0.093872	0.262925	0.943435	4.206114	12.65417	8.927091	8.927091	8.927091	8.927091
0.3	0.140808	0.338879	1.124693	3.830956	10.44117	6.807891	6.807891	6.807891	6.807891
0.4	0.187744	0.395471	1.224634	3.551541	8.926811	5.379295	5.379295	5.379295	5.379295
0.5	0.23468	0.439258	1.279626	3.335661	7.849876	4.381051	4.381051	4.381051	4.381051
0.6	0.281616	0.474243	1.309399	3.163524	7.055928	3.65954	3.65954	3.65954	3.65954
0.7	0.328552	0.502958	1.324858	3.022569	6.451112	3.121611	3.121611	3.121611	3.121611
0.8	0.375488	0.527057	1.332134	2.904565	5.976788	2.709238	2.709238	2.709238	2.709238
0.9	0.422424	0.547657	1.334727	2.803949	5.595284	2.38528	2.38528	2.38528	2.38528
1.0	0.46936	0.565536	1.33466	2.716848	5.281717	2.125316	2.125316	2.125316	2.125316
1.1	0.516296	0.581251	1.333116	2.640486	5.019197	1.912858	1.912858	1.912858	1.912858
1.2	0.563232	0.595212	1.330789	2.572823	4.795946	1.736481	1.736481	1.736481	1.736481
1.3	0.610168	0.607727	1.32809	2.512323	4.603543	1.588074	1.588074	1.588074	1.588074
1.4	0.657104	0.619032	1.32526	2.457803	4.435823	1.461744	1.461744	1.461744	1.461744
1.5	0.70404	0.629315	1.322438	2.408339	4.288171	1.353116	1.353116	1.353116	1.353116
1.6	0.750976	0.638722	1.319704	2.363192	4.157063	1.25888	1.25888	1.25888	1.25888
1.7	0.797912	0.647374	1.3171	2.321766	4.039763	1.176487	1.176487	1.176487	1.176487
1.8	0.844848	0.655369	1.314646	2.283572	3.934108	1.103943	1.103943	1.103943	1.103943
1.9	0.891784	0.662788	1.312347	2.248207	3.838367	1.039666	1.039666	1.039666	1.039666
2.0	0.93872	0.669699	1.310201	2.215333	3.751138	0.982387	0.982387	0.982387	0.982387

Reference point	Absolute F
Fbar(4-8)	0.4694
FMax	0.4224
F0.1	0.1408
Flow	0.1414
Fmed	0.3042
Fhigh	0.6857

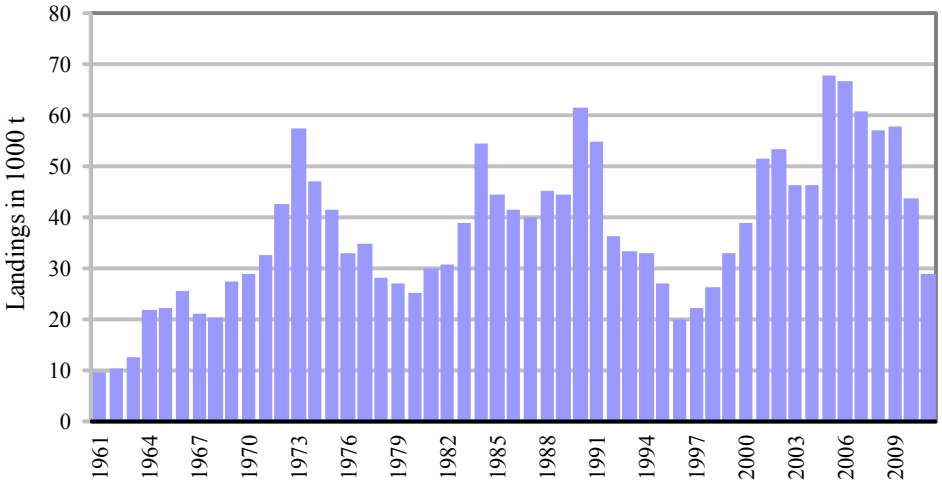

Figure 6.2.1.1. Faroe saithe (Division Vb). Landings in 1000 tonnes (1961-2011).

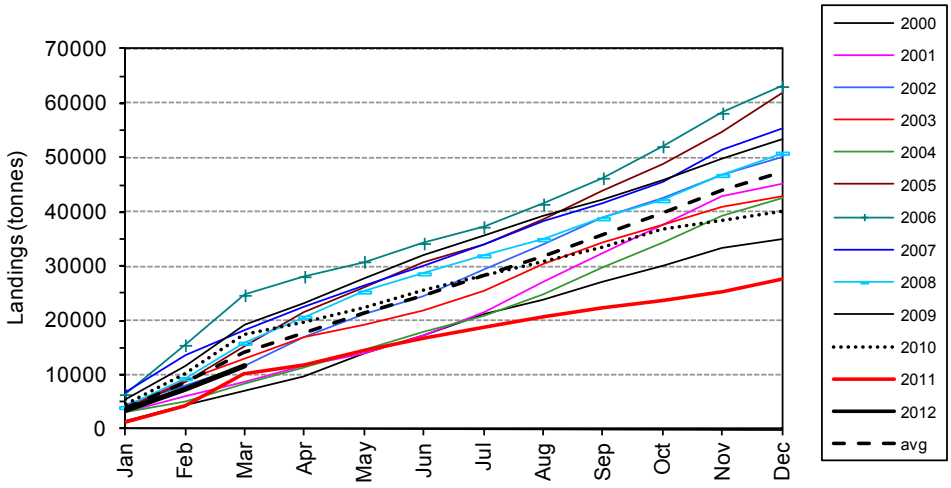

Figure 6.2.1.2. Saithe in the Faroes (Division Vb). Cumulative domestic landings (2000-2012)

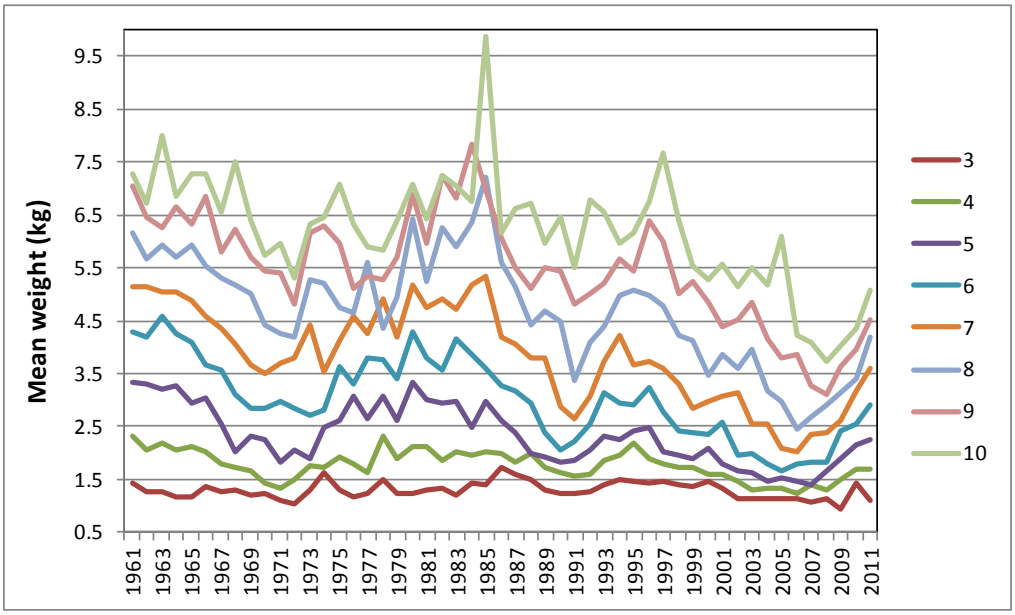

Figure 6.2.3.1. Faroe saithe (Division Vb). Mean weight at age (kg) in commercial catches (ages 3-10) (1961-2011)

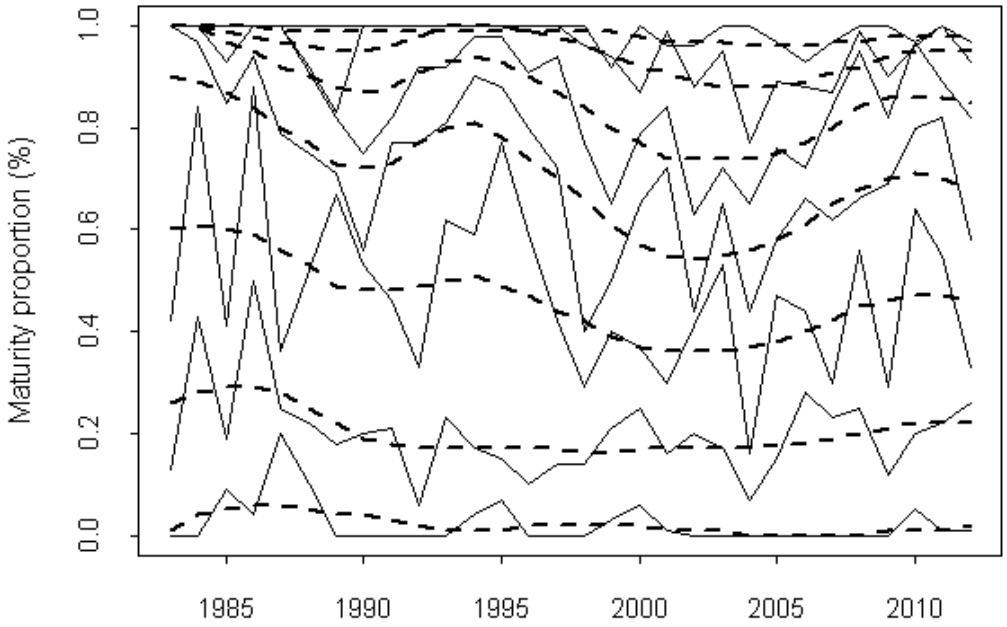

Figure 6.2.4.1. Faroe saithe (Division Vb). Observed (solid line) and smoothed (staple line) proportion mature at age (ages 3-9). Smoothed values are used in the assessment.

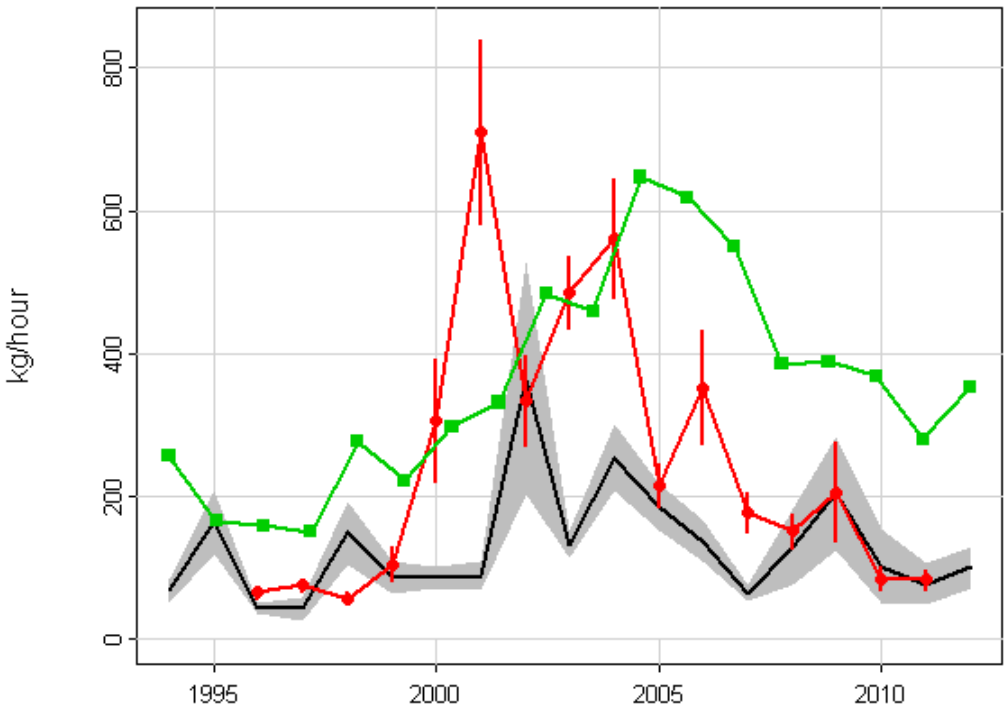

Figure 6.2.5.1.1. Faroe saithe (Division Vb). Catch rates (kg/hour) from the Faroese bottom-trawl spring (1994-2012)(black line) and summer survey (1996-2011)(red line). Shaded areas and arrows show standard errors in the estimation of indices. The green line displays a modified depth-stratified spring survey index.

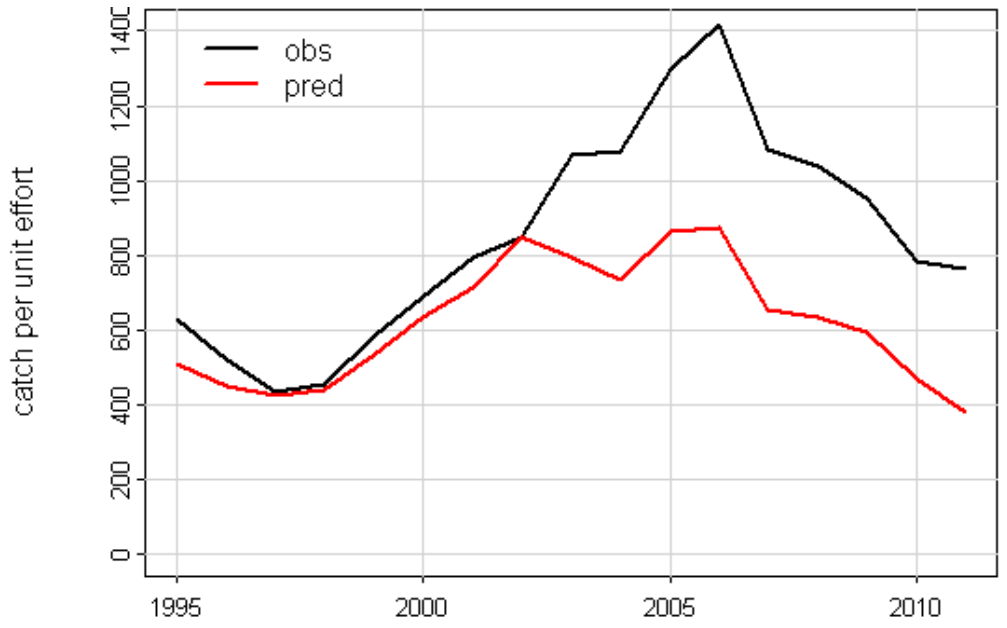

Figure 6.2.5.2.1 Faroe saithe (Division Vb). Observed (black line) and predicted (red line) catch rates (kg per hour) for the commercial fleet (pairtrawlers) used for tunning the assessment (1995-2011)

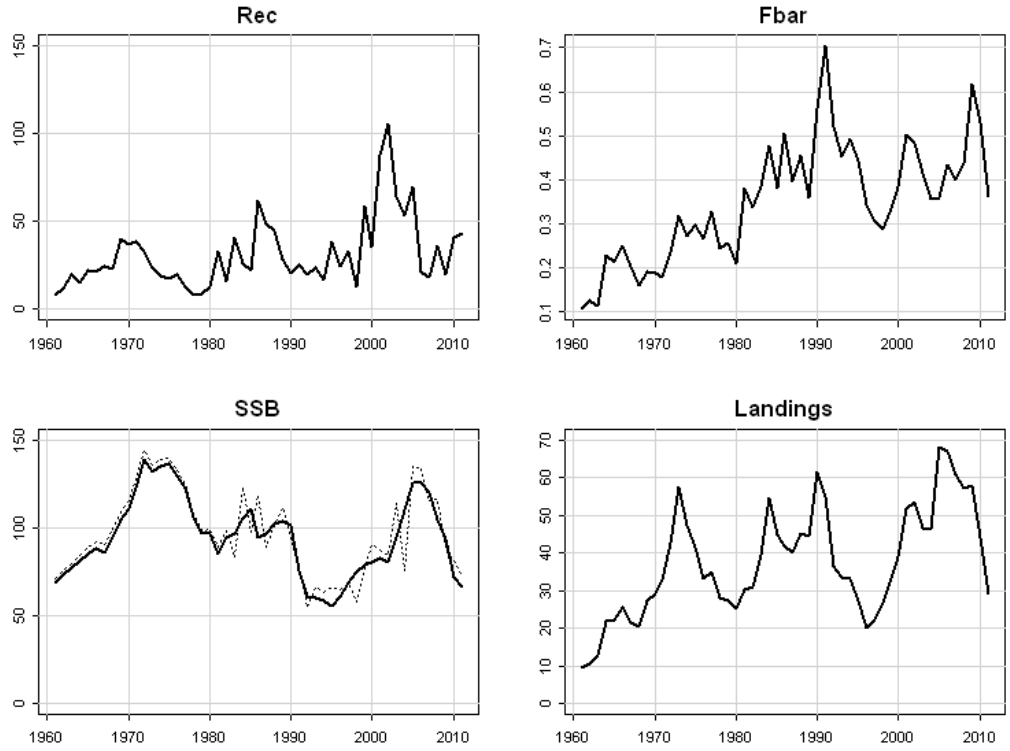

Figure 6.3.1. Faroe saithe (Division Vb). Recruitment (age 3) in millions (top-left), spawning stock biomass (thousand tonnes) (bottom-left), Fbar (ages 4 to 8)(top-right) and landings (thousands tonnes) (bottom-left) from the spaly run. The stapled line in the SSB plot represents the spawning stock biomass without the smoothed maturities.

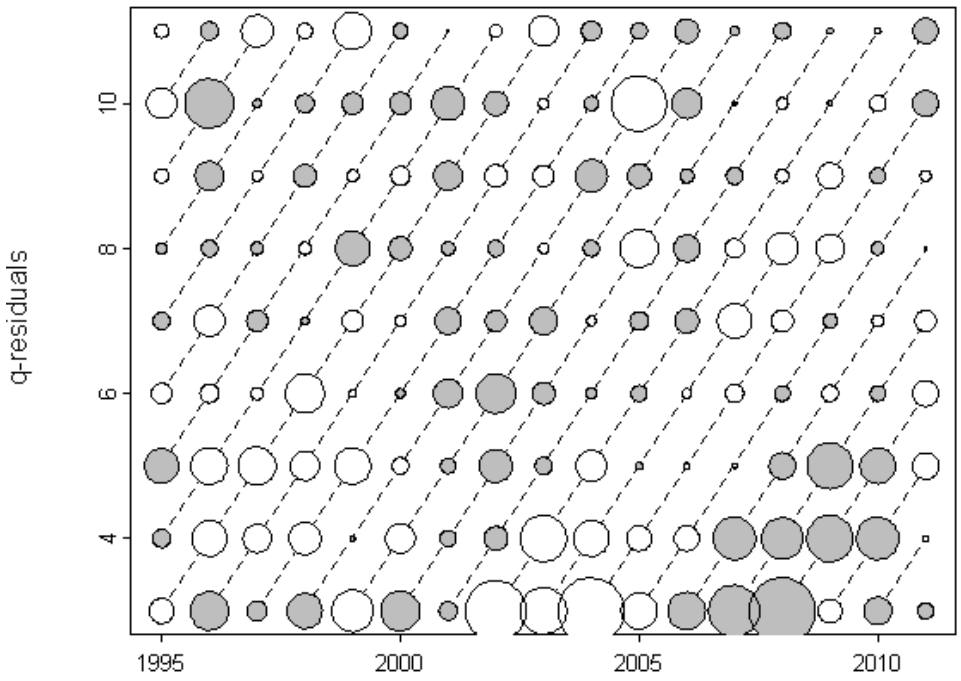

Figure 6.3.2. Faroe saithe (Division Vb). Log-catchability residuals for age groups 3 –11 from the XSA model (1995-2011)

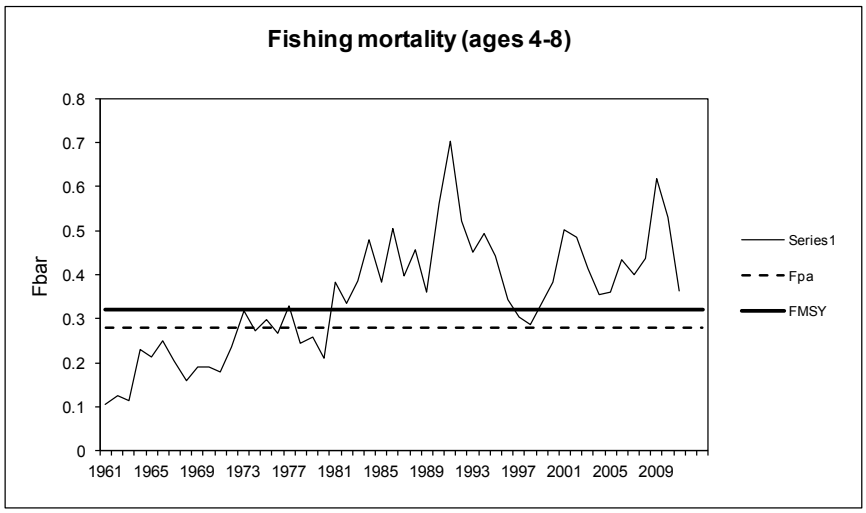

Figure 6.3.3. Faroe saithe (Division Vb). Fishing mortality (average over ages 4-8)(1961-2011)

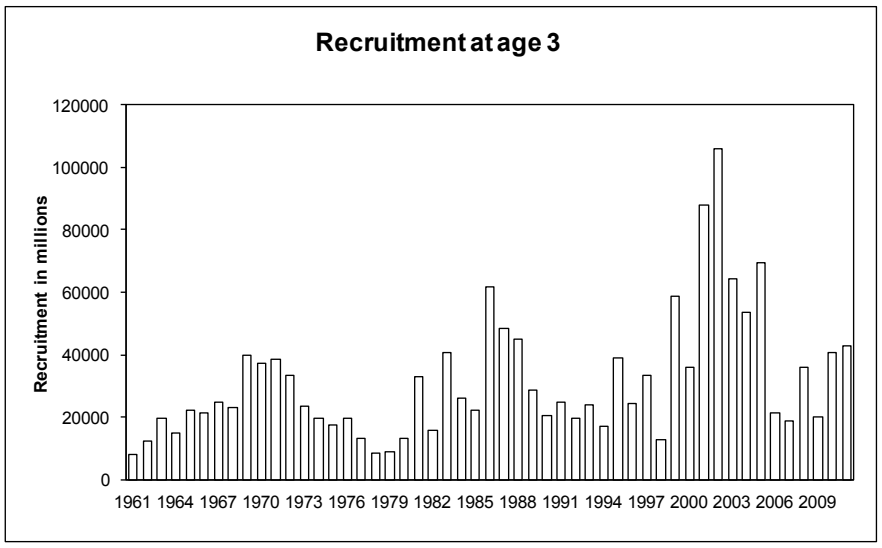

Figure 6.3.4. Faroe saithe (Division Vb). Recruitment at age 3 (tousands)(1961-2011).

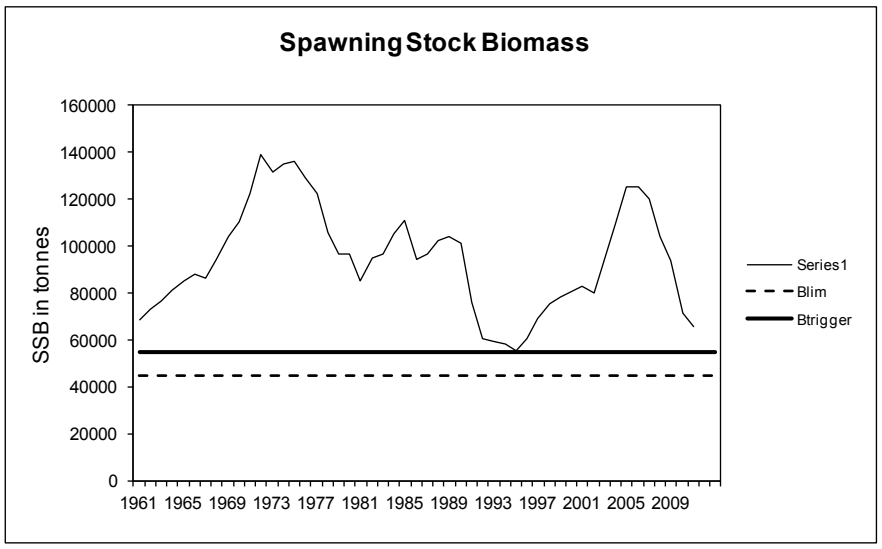

Figure 6.3.5. Faroe saithe (Division Vb). Spawning stock biomass (tonnes)(1961-2011).

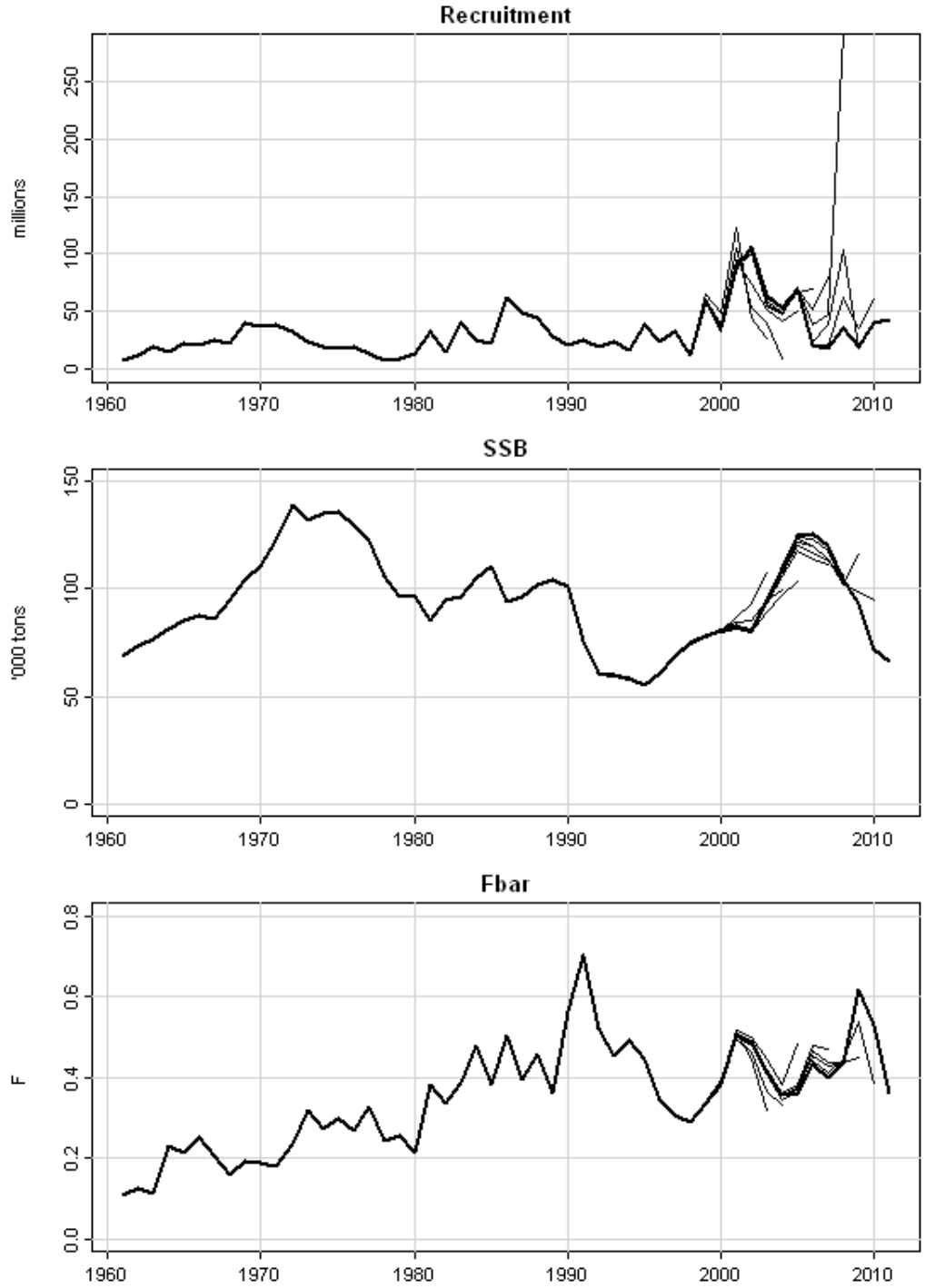

Figure 6.3.6. Faroe saithe (Division Vb). Retrospective analysis of recruitment at age 3, spawning stock biomass and average fishing mortality over age groups 4-8 from the 2012 adopted assessment.

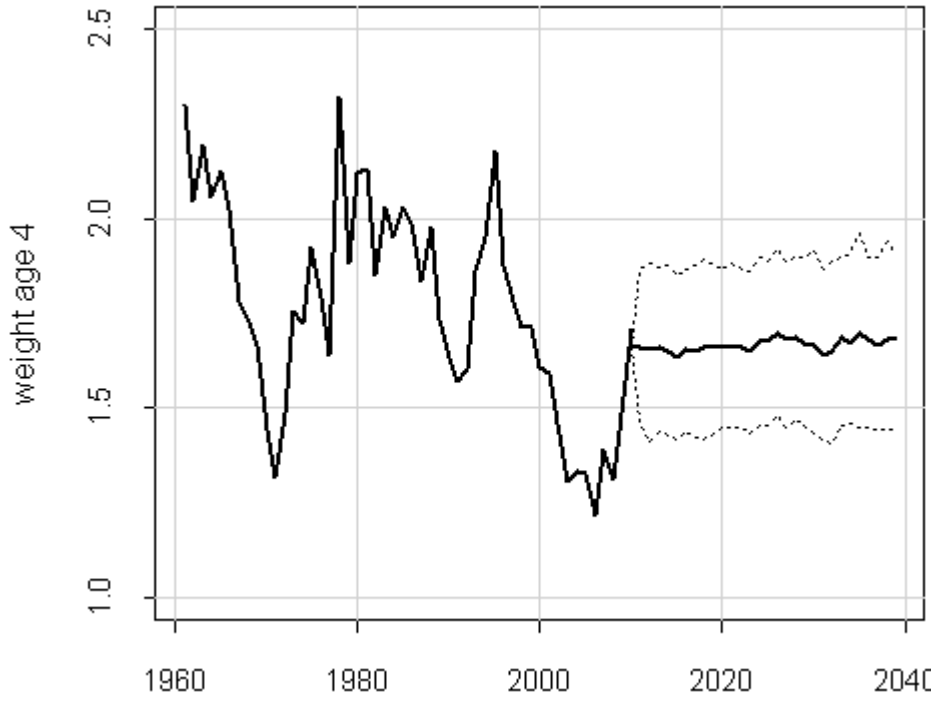

Figure 6.4.1.1. Faroe saithe (Division Vb). Development of weights (age 4) in the MSY simulations. Solid and discontinuous lines represent mean weight and 25% and 75% percentiles respectively.

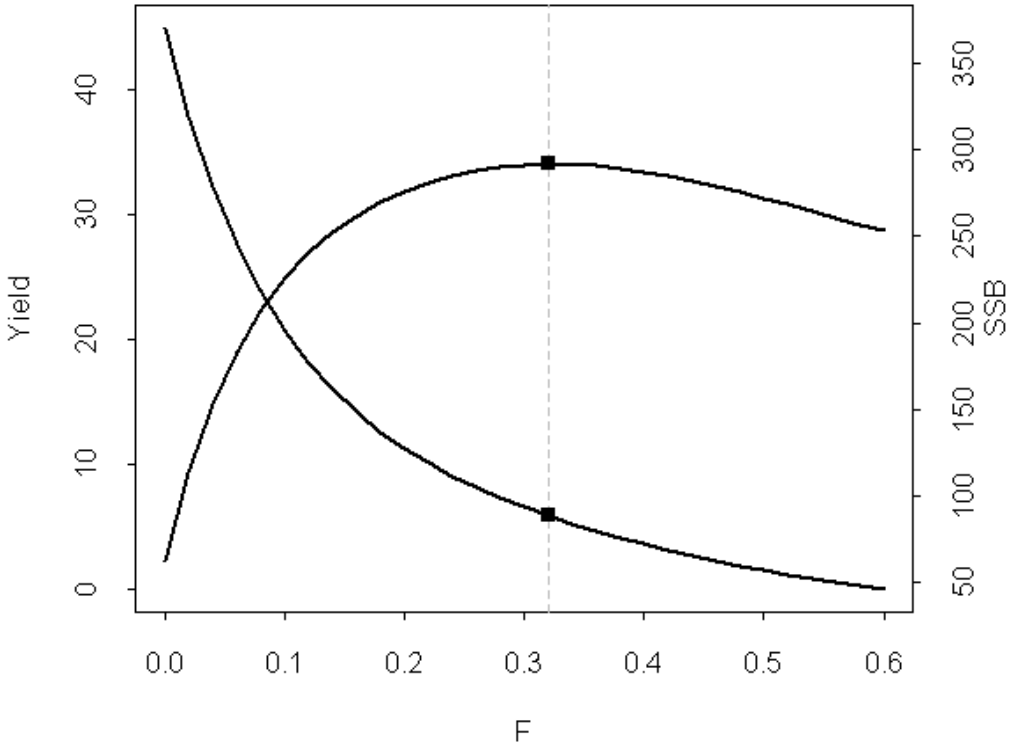

Figure 6.4.1.2. Faroe saithe (Division Vb). Yield and spawning per-recruit from the simulations. Fmsy=0.32, Ymsy=34 kt. and SSBmsy=89 kt.

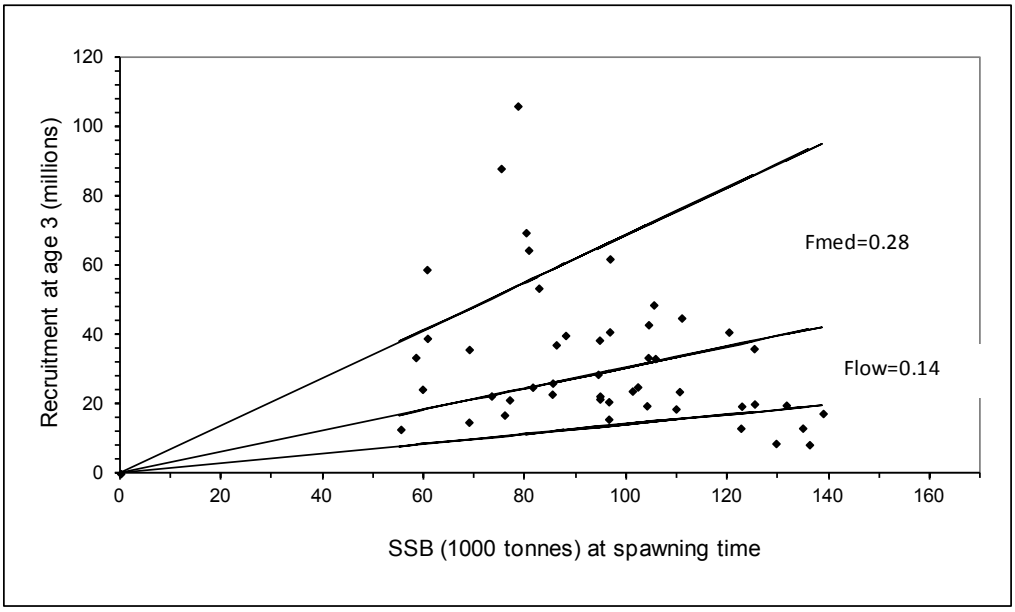

Figure 6.5.1.2. Faroe saithe(Division Vb). Stock-Recruitment ploton relation to Flow, Fmed and Fhigh.

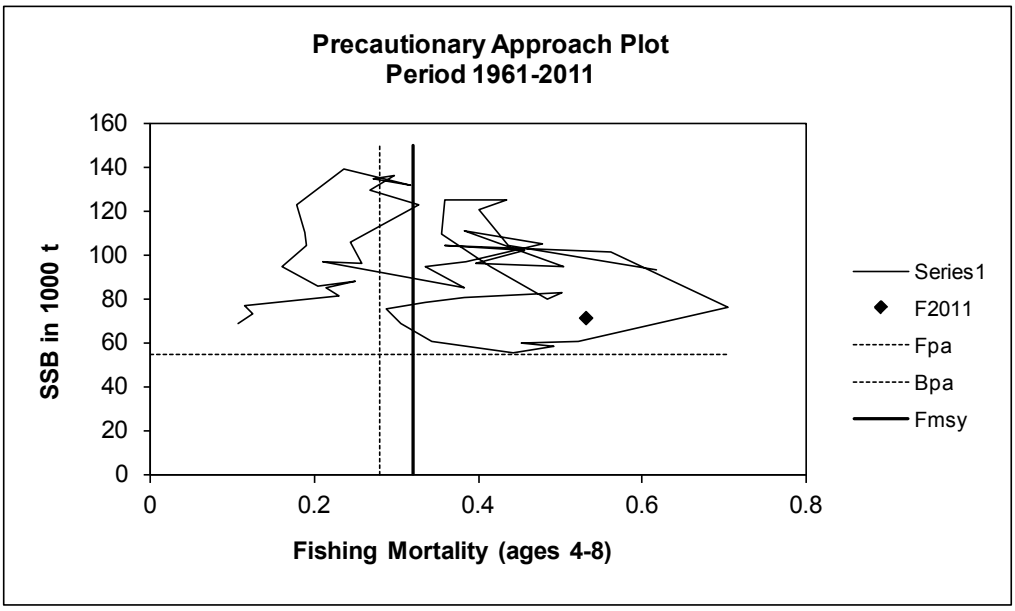

Figure 6.5.1.4. Faroe saithe(Division Vb). Precautionary approach plot, period 1961-2011. The history of the stock/fishery in relation to the four reference points.

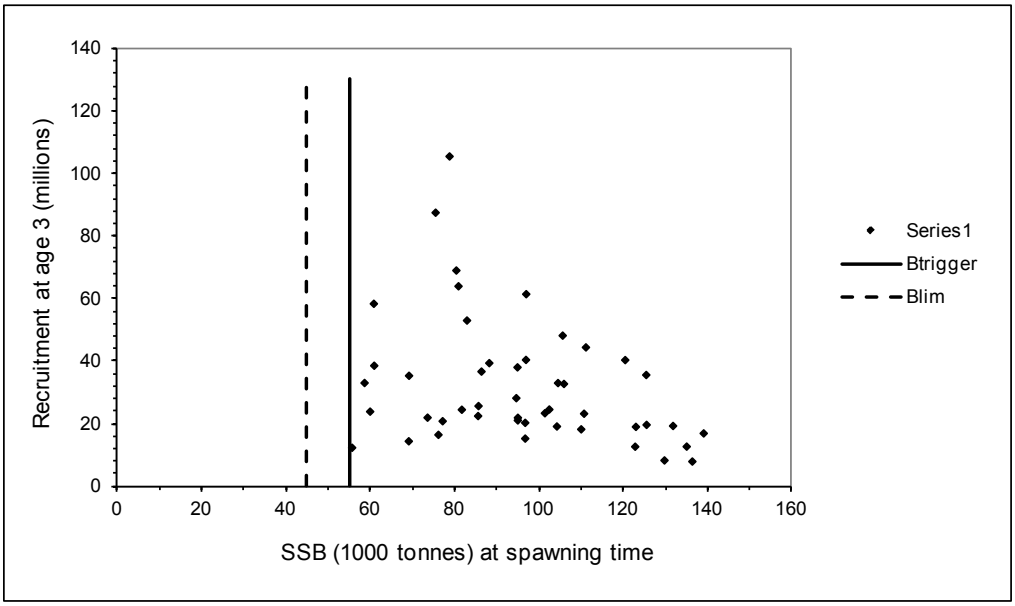

Figure 6.5.2. Faroe saithe (Division Vb). Stock-Recruitment plot.

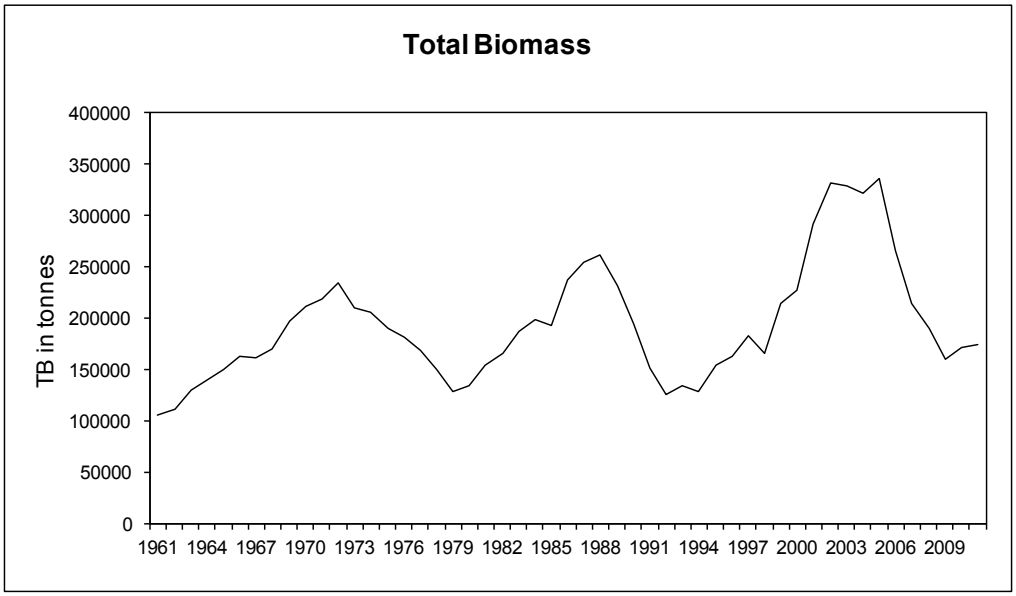

Figure 6.5.3. Faroe saithe (Division Vb). Total biomass (tonnes)(1961-2011)

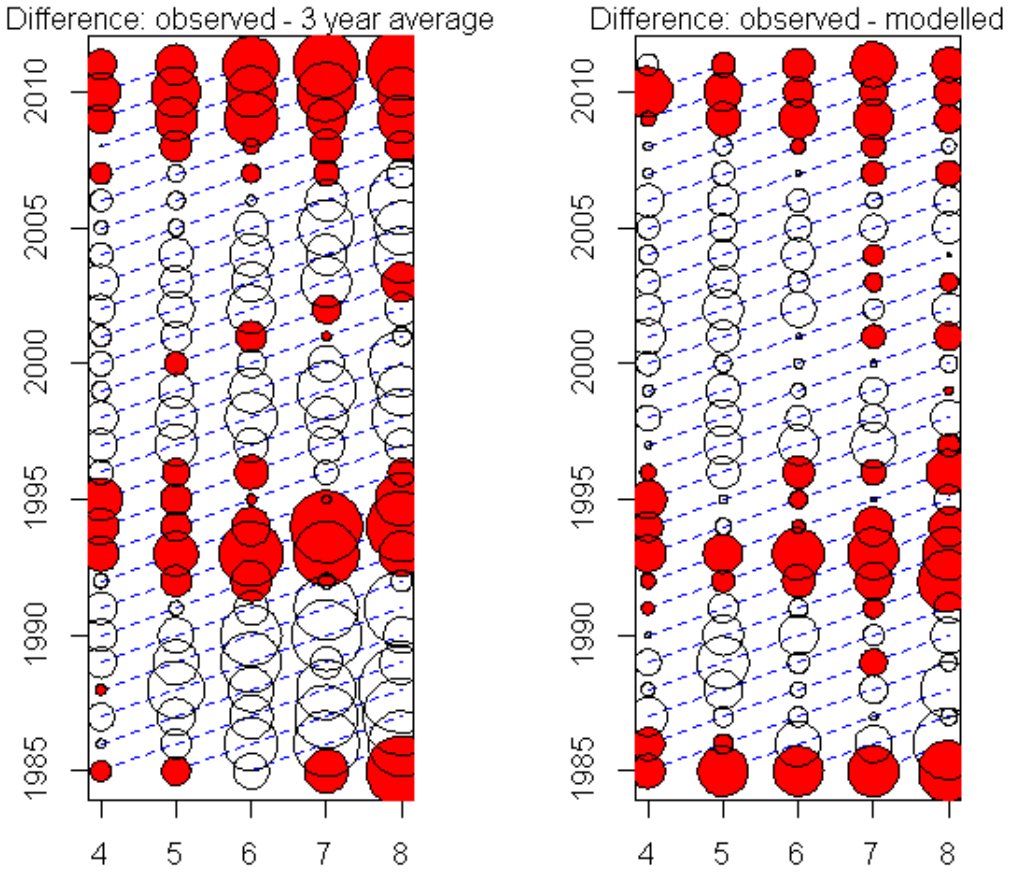

Figure 6.6.1.1 Faroe saithe (Division Vb). Residual plots from a 3-year average weight model and the predicted weight from previous year in the same year class model.

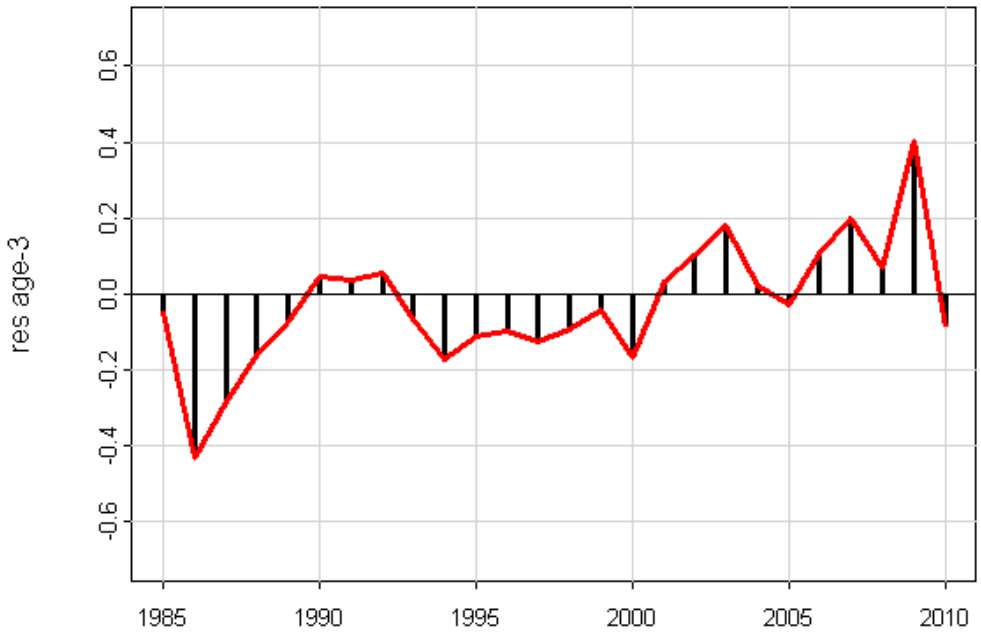

Figure 6.6.1.2 Faroe saithe (Division Vb). Residual plot for the model predicting weights for age 3 by year class strength 3 years before (used in short term prediction)

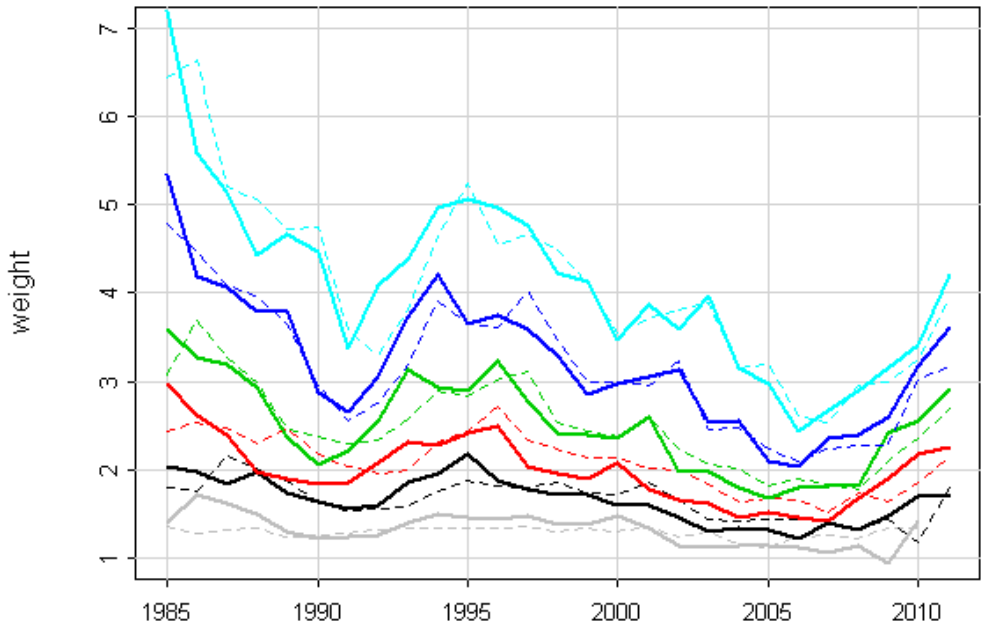

Figure 6.6.1.3. Faroe saithe (Division Vb). Observed and predicted weights-at-age for models used in the short term projection

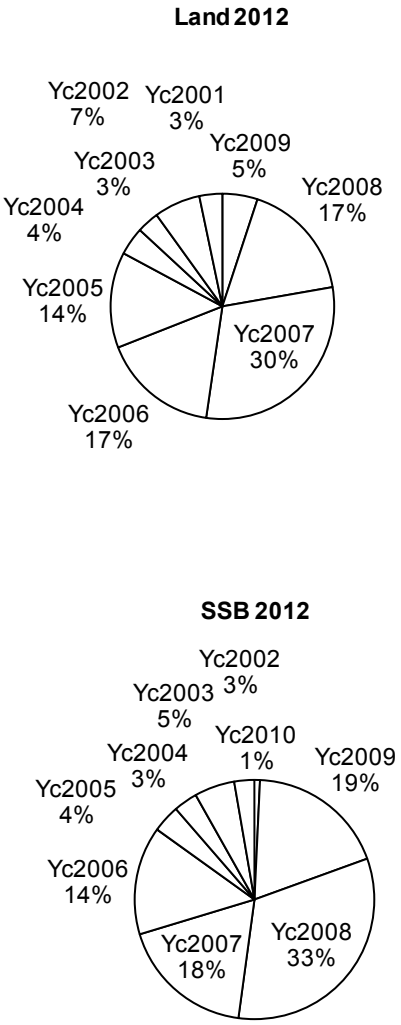

Figure 6.6.2.1a. Faroe saithe (Division Vb). Proposed projected composition in landings (upper figure) and SSB (lower figure) by year classes in 2012.

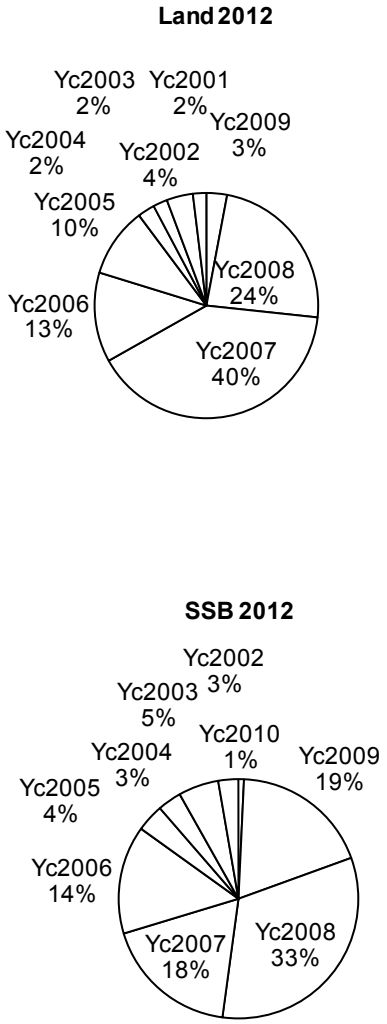

Figure 6.6.2.1b. Faroe saithe (Division Vb). Projected composition in landings (upper figure) and SSB (lower figure) by year classes in 2012 by the spaly scenario.

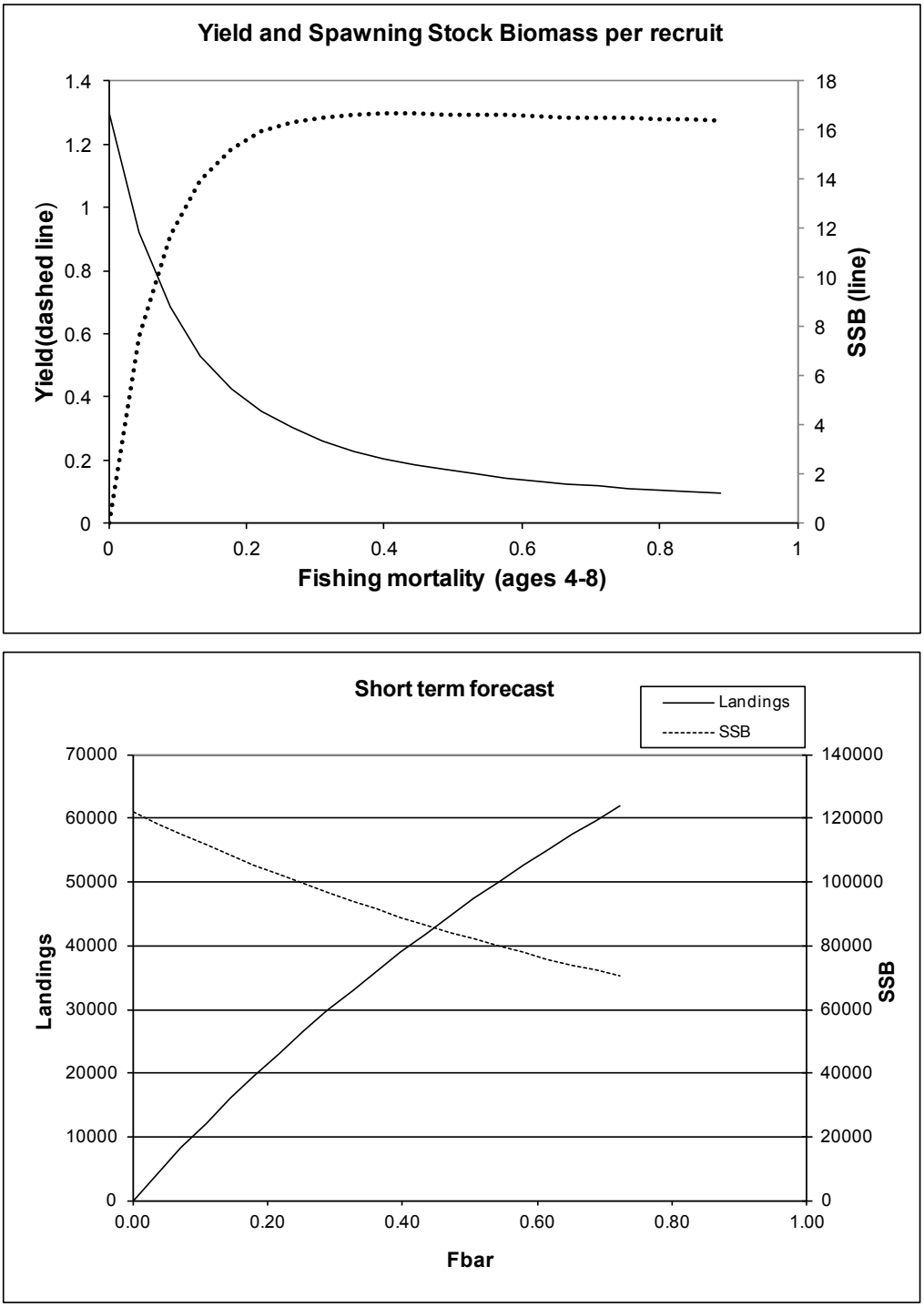

Figure 6.7.1.1. Faroe saithe (Division Vb). Prediction output.

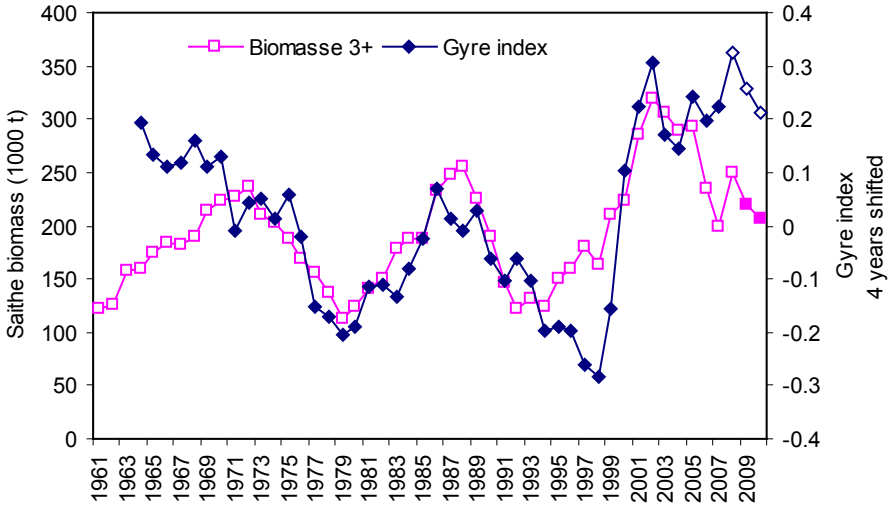

Figure 6.15.1. Faroe saithe (Division Vb). Relationship between the Gyre index (4 years shifted) and saithe biomasse (age 3+) in Faroese waters.

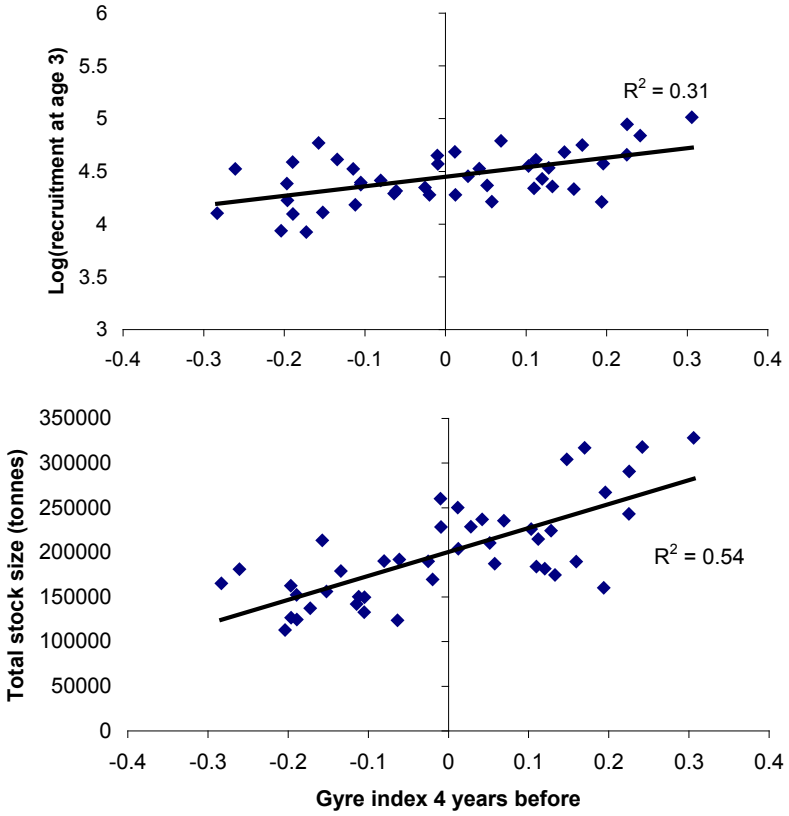

Figure 6.15.2. Relationship between the gyre index and both recruitment (top figure) and total stock biomass estimates (bottom figure.) Note that a large gyre index indicates a small subpolar gyre, and, consequently, a large influx of plankton-rich warmer-than-average water to the outer areas (bottom depth > 150 m) around the Faroes, where saithe typically are found.