Advisory Committee on Fishery Management

ICES CM1997/Assess:4

REPORT OF THE
ARCTIC FISHERIES WORKING GROUP

ICES Headquarters, Copenhagen, Denmark

21-29 August 1996

Part 2 of 2

International Council for the Exploration of the Sea

Conseil International pour l'Exploration de la Mer

Palægade 2–4 DK–1261 Copenhagen K Denmark

Table 5.1 North-East Arctic SAITHE. Nominal catch (t) by countries (Sub-area I and Divisions IIa and IIb combined) as officially reported to ICES.

Year	Faroe Islands	France	Germany Dem.Rep.	Germany Fed. Rep.	Norway	Poland	Portugal	Russia[3]	Spain	UK (England & Wales)	UK (Scotland)	Others[5]	Total
1960	23	1,700	-	25,948	96,050	-	-	-	-	9,780	-	14	133,515
1961	61	3,625	-	19,757	77,875	-	-	-	-	4,595	20	18	105,951
1962	2	544	-	12,651	101,895	-	-	912	-	4,699	-	4	120,707
1963	-	1,110	-	8,108	135,297	-	-	-	-	4,112	-	-	148,627
1964	-	1,525	-	4,420	184,700	-	-	84	-	6,511	-	186	197,506
1965	-	1,618	-	11,387	165,531	-	-	137	-	6,741	5	181	185,600
1966	-	2,987	813	11,269	175,037	-	-	563	-	13,078	-	41	203,788
1967	-	9,472	304	11,822	150,860	-	-	441	-	8,379	-	48	181,326
1968	-	-	70	4,753	96,641	-	-	-	-	8,781	2	-	110,246
1969	20	193	6,744	4,355	115,140	-	-	-	-	13,585	-	23	140,033
1970	1,097	-	29,362	23,466	151,759	-	-	43,550	-	15,469	221	-	264,924
1971	215	14,536	16,840	12,204	128,499	6,017	-	39,397	13097	10,361	106	-	241,272
1972	109	14,519	7,474	24,595	143,775	1,111	-	1,278	13125	8,223	125	-	210,456
1973	7	11,320	12,015	30,338	148,789	23	-	2,411	2115	6,593	248	-	213,769
1974	46	7,119	29,466	33,155	152,699	2,521	-	38,931	7075	3,001	103	5	264,121
1975	28	3,156	28,517	41,260	122,598	3,860	6,430	13,389	11397	2,,623	140	55	233,453
1976	20	5,609	10,266	49,056	131,675	3,164	7,233	9,013	21661	4,651	73	47	242,486
1977	270	5,658	7,164	19,985	139,705	1	783	989	1327	6,853	82	-	182,817
1978	809	4,345	6,484	18,190	121,069	35	203	381	121	2,790	37	-	154,464
1979	1,117	2,601	2,435	14,823	141,346	-	-	3	685	1,170	-	-	164,180
1980	532	1,016	-	12,511	128,878	-	-	43	780	794	-	-	144,554
1981	236	194	-	8,431	166,139	-	-	121	-	395	-	-	175,498
1982	339	82	-	7,224	159,643	-	-	14	-	731	1	-	168,034
1983	539	418	-	4,933	149,556	-	-	206	33	1,251	-	-	156,936
1984	503	431	6	4,532	152,818	-	-	161	-	335	-	-	158,786
1985	490	657	11	1,873	103,899	-	-	51	-	202	-	-	107,147
1986	426	308	-	3,470	66,152	-	-	27	-	54	21	-	67,396
1987	712	576	-	4,909	85,710	-	-	426	-	54	3	1	92,391
1988	441	411	-	4,574	108,244	-	-	130	-	436	6	-	114,242
1989	388	460[2]	-	606	119,625	-	-	23	506	-	702	-	122,310
1990	1,207	340[2]	-	1,143	92,397	-	-	52	-	681	28	-	95,848
1991	963	77[2]	Greenland	2,003	103,283	-	-	504[4]	-	449	42	5	107,326
1992	165	1,890[2]	734	3,451	119,765	-	-	964	6	516	25	-	127,606
1993	31	566[2]	78	3,687	139,288	-	1	9,509	4	408	7	5	153,584
1994[1]	67	151[2]	15	1,863	137,298	-	1	1,640	655	548	9	6	142,253
1995[1]	172[2]	222[2]	53	872	166,205	-	4	1,144	-	589	99	18	169,378

[1] Provisional figures.
[2] As reported to Norwegian authorities.
[3] USSR prior to 1991.
[4] Includes Estonia.
[5] Includes Denmark,Netherlands, Iceland, Ireland and Sweden

Table 5.2 North-East Arctic SAITHE. Landings ('000 tonnes) by gear category for Sub-area I, Division IIa and Division IIb combined.

Year	Purse Seine	Trawl	Gill Net	Others	Total
1977	75.2	69.5	19.3	12.7	176.7 [2]
1978	62.9	57.7	21.1	13.9	155.6 [2]
1979	74.7	52.0	21.6	15.8	164.1
1980	61.3	46.8	21.1	15.4	144.6
1981	64.3	72.4	24.0	14.8	175.5
1982	76.4	59.4	16.7	15.6	168.0
1983	54.1	68.2	19.6	15.1	156.9
1984	36.4	85.6	23.7	13.1	158.8
1985	31.1	49.9	14.6	11.5	107.1
1986	7.9	36.2	12.3	8.2	64.6 [2]
1987	34.9	28.0	19.0	10.8	92.7 [2]
1988	43.5	45.4	15.3	10.0	114.2
1989	48.6	44.8	16.8	12.4	122.7
1990	24.6	44.0	19.3	7.9	95.8
1991	38.9	40.1	18.9	9.4	107.3
1992	27.1	66.9	21.2	12.4	127.6
1993	33.1	75.9	21.2	15.7	145.9 [4]
1994	29.3	79.3	20.5	13.1	142.2
1995 [1]	22.0 [3]	104.3	27.1	16.0	169.4

[1] Preliminary.
[2] Unresolved discrepancy between Norwegian catch by gear figures and the total reported to ICES for these years.
[3] Includes 0.144 tonnes not categorized by vessel size in Table 5.3.
4 As reported by Working Group members.

Table 5.3

The SAS System 19:15 Saturday, August 24, 1996
SAI-ARCT: Saithe in the North-East Arctic (Fishing Areas I and II)

FLT06: Norway Ac Survey (Catch: Thousands)

Year	Fishing effort	Catch, age 2	Catch, age 3	Catch, age 4	Catch, age 5
1988	1	15.7	22.5	19.0	7.1
1989	1	24.8	28.4	17.0	10.1
1990	1	99.6	31.9	14.7	5.1
1991	1	87.8	104.0	4.6	4.0
1992	1	163.5	273.6	57.5	6.2
1993	1	106.9	227.7	103.9	12.7
1994	1	34.4	87.8	112.4	39.5
1995	1	41.9	152.1	87.5	54.4

The SAS System 19:15 Saturday, August 24, 1996
SAI-ARCT: Saithe in the North-East Arctic (Fishing Areas I and II)

FLT07: Norway Purse Seine

Year	Fishing effort	Catch, age 2	Catch, age 3	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7
1977	206	30547	81152	8964	2144	133	9
1978	214	43402	37652	8788	2126	456	88
1979	199	23054	41942	6706	6575	1362	363
1980	215	15615	23353	15280	3280	1683	681
1981	203	10325	68716	5770	2219	154	36
1982	213	14490	28360	43980	250	140	0
1983	161	8924	12402	9775	12090	463	179
1984	124	8576	21699	3842	2144	1363	21
1985	98	632	28815	2688	1096	340	95
1986	96	1408	9869	593	181	108	51
1987	94	1848	12364	32183	386	19	2
1988	103	875	3253	27063	13169	72	6
1989	131	4231	5250	8521	18211	2880	24
1990	96	8551	7207	3319	2582	1845	673
1991	107	3694	43110	1907	453	162	95
1992	90	3954	29527	5214	89	45	38
1993	79	1762	8010	24251	1302	39	23
1994	71	1099	6365	16182	8997	1151	90
1995	90	14	5523	13358	4379	1333	103

The SAS System 19:15 Saturday, August 24, 1996
SAI-ARCT: Saithe in the North-East Arctic (Fishing Areas I and II)

FLT08: Norway Trawl

Year	Fishing effort	Catch, age 3	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8	Catch, age 9	Catch, age 10
1976	37	11184	583	1080	1137	869	612	332	284
1977	53	4557	9047	3260	202	660	322	361	209
1978	51	488	3104	3440	1400	319	591	254	304
1979	43	7374	6538	2340	762	845	419	294	129
1980	57	10270	10301	1726	2891	1392	406	24	108
1981	71	5698	12137	10877	1901	1053	1351	83	108
1982	58	1719	10344	10006	5519	420	306	215	134
1983	58	3341	10024	14949	2189	1720	535	181	60
1984	86	14876	25819	7038	7161	656	744	180	176
1985	64	10070	6177	3844	3877	2446	441	564	66
1986	45	4388	8150	4078	3172	2044	779	208	215
1987	30	470	7862	2452	1169	1405	189	153	67
1988	50	1539	2241	14077	3031	1438	609	346	137
1989	60	3923	9038	9226	8659	1154	178	83	150
1990	60	8909	7960	3932	3722	3967	479	54	66
1991	52	20741	7106	2683	2456	1516	1044	139	37
1992	58	10361	13228	3067	2269	2660	2029	890	214
1993	68	10746	26279	17961	1947	657	604	190	240
1994	79	1456	16229	28224	10542	1045	151	68	83
1995	106	7729	27192	24765	21683	2550	326	18	62

Table 5.4

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NORTHEAST ARCTIC SAITHE : recruits as 2 year-olds
1,11,2                (No. of surveys, No. of years, VPA Column No.)
1983, 270,  3.1
1984, 203,  19.5
1985, 102,  1.8
1986, 77,   15.7
1987, 87,   24.8
1988, 279,  99.6
1989, 420,  87.8
1990, 312,  163.5
1991, 219,  106.9
1992, 128,  34.4
1993, -11,  41.9


 Analysis by RCT3 ver3.1 of data from file :

 G:\ACFM\AFWG\SAI_ARCT\RCT3.IN

 NORTHEAST ARCTIC SAITHE : recruits as 2 year-olds

 Data for    1 surveys over   11 years :  1983 - 1993

 Regression type = C
 Tapered time weighting applied
 power =    3 over  20 years
 Survey weighting not applied

 Final estimates shrunk towards mean
 Minimum S.E. for any survey taken as    .20
 Minimum of   3 points used for regression

 Forecast/Hindcast variance correction used.
```

Year Class	Weighted Average Prediction	Log WAP	Int Std Error	Ext Std Error	Var Ratio	VPA	Log VPA
1983	No valid surveys						
1984	No valid surveys						
1985	No valid surveys						
1986	182	5.21	.49	.15	.10	78	4.36
1987	142	4.96	.58	.30	.27	88	4.48
1988	121	4.80	.54	.54	.99	279	5.63
1989	157	5.06	.58	.47	.65	421	6.04
1990	210	5.35	.63	.65	1.04	313	5.75
1991	227	5.43	.59	.44	.54	220	5.39
1992	193	5.27	.55	.04	.00	128	4.86
1993	191	5.25	.53	.09	.03		

Table 5.5

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Lowestoft VPA Version 3.1

  23-Aug-96  18:40:13

Extended Survivors Analysis

Arctic Saithe (run: XSASME05/X05)

CPUE data from file /users/fish/ifad/ifapwork/afwg/sai_arct/FLEET.X05

Catch data for  30 years. 1966 to 1995. Ages  2 to  11.

     Fleet,           First, Last, First, Last, Alpha,  Beta
                   ,   year, year,  age ,  age
FLT06: Norway Ac Sur,  1988, 1995,   2,     5,   .750,   .850
FLT07: Norway Purse ,  1977, 1995,   2,     7,   .000,  1.000
FLT08: Norway Trawl ,  1976, 1995,   3,    10,   .000,  1.000


Time series weights :

     Tapered time weighting applied
     Power =    3 over  20 years


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   5 oldest ages.

     S.E. of the mean to which the estimates  are shrunk =    .500

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

     Prior weighting not applied


Tuning converged after   16 iterations
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Table 5.5 Continued

Log catchability residuals.

Fleet : FLT06: Norway Ac Sur

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
2	99.99	99.99	-.91	-.52	-.38	-.94	.01	-.09	-.69	3.31
3	99.99	99.99	-.88	-.22	.02	-.07	.22	.33	-.36	.83
4	99.99	99.99	-.82	-.17	.17	-.81	.26	.16	.45	.63
5	99.99	99.99	-.98	-.11	-.35	-.11	.54	-.15	.26	.76
6	No data for this fleet at this age									
7	No data for this fleet at this age									
8	No data for this fleet at this age									
9	No data for this fleet at this age									
10	No data for this fleet at this age									

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

Age	2	3	4	5
Mean Log q	-7.3642	-7.0386	-7.4218	-7.8140
S.E(Log q)	1.4132	.5040	.5441	.5377

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
2	4.19	-4.232	-6.13	.24	8	3.16	-7.36
3	.83	.659	7.83	.73	8	.44	-7.04
4	.73	1.365	8.50	.82	8	.38	-7.42
5	1.01	-.041	7.78	.70	8	.59	-7.81

Table 5.5 Continud

Fleet : FLT07: Norway Purse

Age	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
2	99.99	1.81	1.65	1.62	.33	.83	1.24	1.19	1.26	-1.84
3	99.99	1.07	.72	.34	.24	.43	.36	-.12	1.08	1.47
4	99.99	-.36	-.46	-.23	-.21	-.49	.51	.10	-.49	-.07
5	99.99	-.09	-.25	.83	.60	-.55	-2.02	1.19	.35	.09
6	99.99	-.73	-.06	.99	1.06	-.68	-1.61	.72	1.20	.42
7	99.99	-3.15	.18	1.28	1.65	-1.26	99.99	.38	-.70	.48
8	No data for this fleet at this age									
9	No data for this fleet at this age									
10	No data for this fleet at this age									

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
2	-.73	.27	-.28	.97	.77	-.60	-.04	-.38	-.21	-1.02
3	-.67	-.12	-.84	-.22	.46	.87	.09	-.78	-.62	-.40
4	-1.68	.85	.89	.23	.07	-.42	-.62	.34	.29	.21
5	-1.29	-.74	1.30	1.80	.75	-.61	-1.86	-.50	.83	.07
6	-.65	-1.87	-.98	1.28	1.66	-.59	-.97	-.91	1.32	.42
7	.08	-2.98	-1.36	-.82	1.83	.04	-.24	.43	1.73	.48
8	No data for this fleet at this age									
9	No data for this fleet at this age									
10	No data for this fleet at this age									

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

Age	2	3	4	5	6	7
Mean Log q	-8.7026	-6.8419	-6.7026	-7.4542	-8.3676	-9.1196
S.E(Log q)	.8888	.6972	.6450	1.1240	1.1578	1.2997

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
2	.89	.594	9.04	.74	19	.81	-8.70
3	1.18	-.408	5.93	.33	19	.86	-6.84
4	.66	2.128	8.27	.80	19	.37	-6.70
5	.52	2.708	8.97	.76	19	.46	-7.45
6	.47	2.758	9.10	.73	19	.43	-8.37
7	.68	.605	9.01	.27	18	.91	-9.12

Table 5.5 Continued

Fleet : FLT08: Norway Trawl

Age	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
2	No data for this fleet at this age									
3	1.03	-.12	-1.87	.47	1.07	-.68	-.82	-.08	1.40	1.17
4	-2.10	.15	-.93	.43	-.14	.45	-.49	.29	.93	.33
5	-.58	-.32	-.36	-.69	-.74	.07	.95	.41	-.11	-.24
6	-1.21	-2.15	-.70	-1.25	-.27	-.31	.16	.11	.04	.09
7	-.50	-1.47	-1.09	-.32	-.29	-.82	-1.00	-.31	-.86	.18
8	-.74	-.97	-.73	.31	-.29	.58	-1.03	.13	-.68	-.16
9	-.88	-.98	-.49	-.60	-2.19	-1.33	-.08	-.90	-.36	.05
10	-.68	-.96	-.47	-.21	-1.13	-.30	.03	-.53	-.51	-.10

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
2	No data for this fleet at this age									
3	-.40	-1.93	-.54	.60	1.46	1.19	-.19	.00	-1.87	.10
4	.83	-.28	-1.75	.22	.55	.77	-.10	-.29	-.67	-.10
5	.56	.23	.06	-.12	-.39	-.12	.10	.26	-.15	-.38
6	.29	.19	.28	-.03	-.37	-.34	.20	-.04	.23	-.14
7	.54	.73	.85	-.14	.08	-.44	.47	-.05	.09	-.46
8	.43	-.54	.74	-.12	-.06	-.07	.79	.14	-.33	-.15
9	.06	.02	.38	-.43	-.61	-.43	.42	-.53	-1.35	-1.70
10	.14	.01	.27	.38	.02	-.17	.57	-.10	-.38	-.85

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
Mean Log q	-7.1687	-5.8440	-5.4356	-5.1744	-5.1395	-5.3321	-5.3321	-5.3321
S.E(Log q)	1.1088	.7097	.3481	.2839	.5345	.4776	.8484	.4300

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	3.46	-1.254	-4.28	.03	20	3.74	-7.17
4	3.47	-3.111	-7.66	.14	20	1.84	-5.84
5	1.12	-.783	4.81	.81	20	.40	-5.44
6	1.09	-.659	4.74	.83	20	.32	-5.17
7	1.11	-.306	4.74	.43	20	.62	-5.14
8	.88	.568	5.62	.70	20	.44	-5.33
9	.61	2.654	6.29	.82	20	.34	-5.81
10	1.03	-.101	5.41	.61	20	.45	-5.43

Table 5.5 Continued

Terminal year survivor and F summaries :

Age 2 Catchability constant w.r.t. time and dependent on age

Year class = 1993

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	63200.,	1.502,	.000,	.00,	1, .077,	.001
FLT07: Norway Purse ,	834.,	.925,	.000,	.00,	1, .204,	.073
FLT08: Norway Trawl ,	1.,	.000,	.000,	.00,	0, .000,	.000
F shrinkage mean ,	2155.,	.50,,,,			.718,	.029

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
2306.,	.42,	.74,	3,	1.752,	.027

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

Year class = 1992

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	135237.,	.505,	.478,	.95,	2, .312,	.105
FLT07: Norway Purse ,	50265.,	.571,	.090,	.16,	2, .243,	.260
FLT08: Norway Trawl ,	77226.,	1.154,	.000,	.00,	1, .060,	.177
F shrinkage mean ,	49446.,	.50,,,,			.386,	.264

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
69760.,	.29,	.26,	6,	.875,	.194

Age 4 Catchability constant w.r.t. time and dependent on age

Year class = 1991

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	74607.,	.380,	.342,	.90,	3, .319,	.464
FLT07: Norway Purse ,	54879.,	.435,	.266,	.61,	3, .243,	.589
FLT08: Norway Trawl ,	37256.,	.622,	.794,	1.28,	2, .121,	.781
F shrinkage mean ,	89422.,	.50,,,,			.316,	.401

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
67389.,	.24,	.19,	9,	.792,	.503

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

Year class = 1990

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	92546.,	.322,	.119,	.37,	4, .280,	.313
FLT07: Norway Purse ,	49383.,	.413,	.255,	.62,	4, .156,	.523
FLT08: Norway Trawl ,	36585.,	.316,	.098,	.31,	3, .336,	.657
F shrinkage mean ,	56679.,	.50,,,,			.228,	.470

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
54942.,	.19,	.13,	12,	.674,	.481

Table 5.5 Continued

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

Year class = 1989

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	29275.,	.326,	.122,	.37,	4, .135,	.695
FLT07: Norway Purse ,	31596.,	.420,	.196,	.47,	5, .094,	.657
FLT08: Norway Trawl ,	20991.,	.226,	.017,	.08,	4, .505,	.875
F shrinkage mean ,	27328.,	.50,,,,			.265,	.730

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
24475.,	.18,	.06,	14,	.330,	.789

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

Year class = 1988

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	3811.,	.335,	.108,	.32,	4, .073,	.769
FLT07: Norway Purse ,	5426.,	.537,	.310,	.58,	6, .076,	.595
FLT08: Norway Trawl ,	3864.,	.240,	.171,	.71,	5, .451,	.762
F shrinkage mean ,	3596.,	.50,,,,			.399,	.801

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
3850.,	.23,	.08,	16,	.360,	.764

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

Year class = 1987

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	446.,	.349,	.335,	.96,	4, .044,	.775
FLT07: Norway Purse ,	481.,	.509,	.559,	1.10,	6, .041,	.735
FLT08: Norway Trawl ,	418.,	.253,	.077,	.31,	6, .465,	.811
F shrinkage mean ,	440.,	.50,,,,			.450,	.782

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
431.,	.26,	.08,	17,	.301,	.793

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

Year class = 1986

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	107.,	.345,	.116,	.34,	4, .018,	.781
FLT07: Norway Purse ,	104.,	.551,	.226,	.41,	6, .018,	.795
FLT08: Norway Trawl ,	63.,	.332,	.301,	.91,	7, .327,	1.101
F shrinkage mean ,	159.,	.50,,,,			.637,	.587

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
116.,	.34,	.20,	18,	.592,	.739

Table 5.5 Continued

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

Year class = 1985

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT06: Norway Ac Sur,	93.,	.351,	.193,	.55,	3, .014,	1.316
FLT07: Norway Purse ,	128.,	.458,	.228,	.50,	6, .013,	1.095
FLT08: Norway Trawl ,	77.,	.289,	.179,	.62,	8, .423,	1.464
F shrinkage mean ,	242.,	.50,,,,			.550,	.720

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
146.,	.30,	.22,	18,	.721,	1.012

Table 5.6

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Table 1 Catch numbers at age

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
2,	7450,	6952,	5297,	4090,	25952,	19842,	11608,	13829,	21159,	81601,
3,	22392,	29664,	25196,	77333,	43540,	77019,	65178,	76296,	36782,	60832,
4,	54537,	24836,	18384,	11949,	62846,	59280,	52389,	25206,	44027,	11691,
5,	13124,	35956,	5101,	16939,	13987,	26961,	29146,	26911,	15671,	16366,
6,	12899,	4125,	8282,	4747,	16189,	9556,	10186,	16031,	20419,	4436,
7,	4652,	5616,	787,	4798,	5122,	9592,	5616,	7114,	12148,	7808,
8,	1374,	2916,	1913,	1126,	7950,	2901,	3547,	3935,	4802,	6789,
9,	933,	1413,	900,	1711,	2504,	4352,	1865,	2871,	3258,	2914,
10,	965,	1397,	577,	675,	3697,	2195,	2140,	2610,	2505,	2350,
+gp,	2900,	3493,	1166,	511,	2799,	5490,	3149,	3924,	3821,	4140,
TOTALNUM,	121226,	116368,	67603,	123879,	184586,	217188,	184824,	178727,	164592,	198927,
TONSLAND,	201860,	191191,	107181,	140379,	260404,	244732,	210508,	215659,	262301,	233453,
SOPCOF %,	110,	100,	113,	98,	96,	80,	82,	82,	97,	102,

Table 1 Catch numbers at age

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
2,	54151,	31662,	45758,	28334,	18226,	10467,	17225,	11638,	14624,	2216,
3,	125030,	99049,	48969,	61963,	40796,	83954,	34733,	17244,	41466,	48917,
4,	30576,	34317,	27685,	23328,	36644,	21822,	65052,	23768,	33233,	11974,
5,	7947,	10140,	12476,	14122,	9211,	21528,	13060,	32700,	12064,	7189,
6,	8712,	2062,	4534,	4400,	6379,	3619,	8212,	3226,	11204,	5279,
7,	3435,	4332,	1468,	2901,	3200,	2550,	1054,	3008,	1135,	3740,
8,	3212,	1456,	1848,	963,	1338,	2008,	1251,	1177,	1772,	775,
9,	2679,	1606,	938,	1356,	147,	369,	461,	760,	560,	878,
10,	1724,	963,	976,	438,	730,	279,	263,	247,	557,	134,
+gp,	2880,	1134,	2150,	1192,	1629,	629,	448,	760,	897,	701,
TOTALNUM,	240346,	186721,	146802,	138997,	118300,	147225,	141759,	94528,	117512,	81803,
TONSLAND,	242486,	182808,	154465,	164234,	154379,	175516,	170903,	155405,	158796,	107147,
SOPCOF %,	100,	101,	103,	114,	100,	100,	100,	100,	100,	99,

Table 1 Catch numbers at age

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
2,	3311,	3867,	5017,	11157,	11543,	6135,	14333,	3379,	1389,	70,
3,	22115,	17869,	8126,	12378,	21002,	73878,	49750,	26933,	9088,	16520,
4,	12895,	49829,	35847,	19915,	13463,	11619,	26640,	63451,	37361,	48699,
5,	6062,	4339,	32827,	32643,	8996,	5395,	4865,	26254,	47178,	37534,
6,	4525,	3118,	4560,	18751,	9152,	5066,	5594,	3427,	17101,	32469,
7,	2805,	3490,	2328,	1939,	7735,	2988,	4850,	1636,	1720,	4877,
8,	1399,	755,	1219,	377,	1126,	2009,	3353,	1263,	502,	577,
9,	351,	620,	966,	191,	154,	272,	1480,	950,	296,	140,
10,	454,	257,	320,	179,	121,	81,	291,	650,	267,	282,
+gp,	285,	797,	102,	149,	253,	132,	267,	106,	676,	309,
TOTALNUM,	54202,	84941,	91312,	97679,	73545,	107575,	111423,	128049,	115578,	141477,
TONSLAND,	70458,	91679,	114508,	122664,	95393,	107326,	127606,	153584,	142253,	169378,
SOPCOF %,	99,	102,	99,	100,	100,	99,	100,	100,	100,	100,

Table 5.7

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Table 2 Catch weights at age (kg) YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
2,	.3400,	.3400,	.3400,	.3400,	.3400,	.3400,	.3400,	.3400,	.3400,	.3400,
3,	.7100,	.7100,	.7100,	.7100,	.7100,	.7100,	.7100,	.7100,	.7100,	.7100,
4,	1.1100,	1.1100,	1.1100,	1.1100,	1.1100,	1.1100,	1.1100,	1.1100,	1.1100,	1.1100,
5,	1.6300,	1.6300,	1.6300,	1.6300,	1.6300,	1.6300,	1.6300,	1.6300,	1.6300,	1.6300,
6,	2.3300,	2.3300,	2.3300,	2.3300,	2.3300,	2.3300,	2.3300,	2.3300,	2.3300,	2.3300,
7,	3.1600,	3.1600,	3.1600,	3.1600,	3.1600,	3.1600,	3.1600,	3.1600,	3.1600,	3.1600,
8,	4.0300,	4.0300,	4.0300,	4.0300,	4.0300,	4.0300,	4.0300,	4.0300,	4.0300,	4.0300,
9,	4.8700,	4.8700,	4.8700,	4.8700,	4.8700,	4.8700,	4.8700,	4.8700,	4.8700,	4.8700,
10,	5.6300,	5.6300,	5.6300,	5.6300,	5.6300,	5.6300,	5.6300,	5.6300,	5.6300,	5.6300,
+gp,	8.1060,	7.9940,	7.7160,	7.4790,	7.4040,	7.0520,	7.4770,	7.3850,	7.2170,	7.1270,
SOPCOFAC,	1.0963,	.9990,	1.1338,	.9756,	.9575,	.7953,	.8212,	.8167,	.9694,	1.0155,

Table 2 Catch weights at age (kg) YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
2,	.3400,	.3400,	.3400,	.3400,	.4500,	.4300,	.5100,	.6000,	.5300,	.3800,
3,	.7100,	.7100,	.7100,	.7100,	.7900,	.7300,	.7700,	1.0500,	.7100,	.7500,
4,	1.1100,	1.1100,	1.1100,	1.1100,	1.2700,	1.4000,	1.1200,	1.3300,	1.2600,	1.3300,
5,	1.6300,	1.6300,	1.6300,	1.6300,	2.0300,	2.0500,	2.0200,	1.8600,	2.0200,	2.0700,
6,	2.3300,	2.3300,	2.3300,	2.3300,	2.5500,	2.7600,	2.6100,	2.8000,	2.7000,	2.6300,
7,	3.1600,	3.1600,	3.1600,	3.1600,	3.2900,	3.3000,	3.2700,	4.0000,	3.8800,	3.2800,
8,	4.0300,	4.0300,	4.0300,	4.0300,	4.3400,	4.3800,	3.9100,	4.1800,	4.4700,	3.9600,
9,	4.8700,	4.8700,	4.8700,	4.8700,	5.1500,	5.9500,	4.6900,	5.3300,	5.3600,	4.5400,
10,	5.6300,	5.6300,	5.6300,	5.6300,	5.7500,	6.3900,	5.6300,	5.6800,	6.0600,	5.5500,
+gp,	7.3200,	7.3940,	7.5270,	7.8090,	6.9370,	6.8410,	7.5580,	8.6650,	7.1900,	8.0120,
SOPCOFAC,	1.0020,	1.0061,	1.0278,	1.1388,	.9991,	.9975,	.9961,	.9991,	.9997,	.9930,

Table 2 Catch weights at age (kg) YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
2,	.3200,	.3400,	.3300,	.4500,	.5400,	.4000,	.4500,	.4600,	.3500,	.5000,
3,	.5900,	.5300,	.6200,	.7400,	.7600,	.7200,	.7000,	.6300,	.5200,	.5600,
4,	1.2200,	.8400,	.8700,	.9700,	1.0800,	1.1900,	1.1000,	1.0200,	.7400,	.7800,
5,	1.9700,	1.6600,	1.3100,	1.3900,	1.5600,	1.7800,	1.9800,	1.7000,	1.2200,	1.2100,
6,	2.3000,	2.3200,	2.4300,	1.8100,	2.1200,	2.2400,	2.3400,	2.5000,	2.1600,	1.7300,
7,	2.8700,	2.9700,	3.8700,	3.0200,	2.4000,	2.8600,	2.8100,	2.8800,	3.1900,	2.7900,
8,	3.7200,	4.0000,	5.3800,	3.7600,	3.6500,	3.3200,	3.2500,	3.0900,	3.9700,	3.7400,
9,	4.3000,	4.7200,	5.8300,	4.6400,	3.6000,	4.5300,	4.0600,	3.7000,	4.6200,	4.4000,
10,	4.6900,	5.4400,	5.3600,	4.7500,	6.3700,	5.7000,	6.1900,	6.1900,	5.2800,	5.2800,
+gp,	6.5970,	6.9040,	7.4480,	7.5000,	4.7950,	7.1250,	7.3760,	8.1750,	6.0700,	7.4720,
SOPCOFAC,	.9929,	1.0154,	.9902,	.9978,	1.0001,	.9912,	1.0000,	1.0008,	1.0038,	1.0020,

Table 5.8

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Terminal Fs derived using XSA (With F shrinkage)

Table 8 Fishing mortality (F) at age

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
2,	.0348,	.0409,	.0161,	.0131,	.0786,	.1054,	.0473,	.1400,	.1205,	.2766,
3,	.1878,	.1887,	.2045,	.3405,	.1882,	.3516,	.5902,	.4931,	.6695,	.5970,
4,	.3618,	.3283,	.1711,	.1409,	.5154,	.4223,	.4309,	.4779,	.5964,	.4621,
5,	.3135,	.4323,	.1026,	.2357,	.2438,	.4358,	.3791,	.4125,	.6260,	.4625,
6,	.2450,	.1524,	.1650,	.1310,	.3714,	.2618,	.2905,	.3706,	.6408,	.3579,
7,	.2738,	.1597,	.0391,	.1358,	.2039,	.3938,	.2419,	.3390,	.5366,	.5438,
8,	.1220,	.2759,	.0748,	.0723,	.3486,	.1701,	.2458,	.2668,	.4045,	.6631,
9,	.1107,	.1779,	.1276,	.0887,	.2275,	.3270,	.1574,	.3223,	.3700,	.4613,
10,	.2140,	.2409,	.1021,	.1332,	.2806,	.3196,	.2643,	.3444,	.5197,	.5016,
+gp,	.2140,	.2409,	.1021,	.1332,	.2806,	.3196,	.2643,	.3444,	.5197,	.5016,
FBAR 3- 6,	.2770,	.2754,	.1608,	.2120,	.3297,	.3679,	.4227,	.4385,	.6332,	.4699,

Table 8 Fishing mortality (F) at age

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
2,	.2188,	.2179,	.1964,	.2067,	.0581,	.0787,	.1461,	.1147,	.1247,	.0091,
3,	.9069,	.7907,	.6162,	.4446,	.5173,	.4108,	.4031,	.2135,	.7524,	.7826,
4,	.6960,	.6832,	.5299,	.6845,	.5182,	.5846,	.6553,	.5360,	.8218,	.5038,
5,	.6688,	.5231,	.5714,	.5716,	.6425,	.6678,	.8690,	.8403,	.5791,	.4106,
6,	.4818,	.3591,	.4706,	.4034,	.5541,	.5664,	.5845,	.5408,	.8011,	.5434,
7,	.5226,	.4715,	.4711,	.6341,	.5824,	.4487,	.3162,	.4389,	.3685,	.6945,
8,	.4510,	.4390,	.3767,	.6580,	.6907,	.9307,	.4144,	.7076,	.5049,	.4646,
9,	.6041,	.4278,	.5687,	.5277,	.1906,	.4082,	.5636,	.4797,	.9115,	.5067,
10,	.5508,	.4530,	.5046,	.5742,	.6106,	.6672,	.5779,	.6839,	.8008,	.5707,
+gp,	.5508,	.4530,	.5046,	.5742,	.6106,	.6672,	.5779,	.6839,	.8008,	.5707,
FBAR 3- 6,	.6884,	.5890,	.5470,	.5260,	.5580,	.5574,	.6280,	.5326,	.7386,	.5601,

Table 8 Fishing mortality (F) at age

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	FBAR 93-95
AGE											
2,	.0182,	.0430,	.0747,	.1527,	.0468,	.0163,	.0522,	.0172,	.0121,	.0271,	.0188,
3,	.1182,	.1288,	.1196,	.2662,	.4767,	.4698,	.1774,	.1311,	.0587,	.1941,	.1280,
4,	.4816,	.4234,	.4108,	.4783,	.5196,	.5322,	.3067,	.3600,	.2710,	.5031,	.3781,
5,	.5192,	.2934,	.5519,	.8326,	.4131,	.4056,	.4453,	.5657,	.5002,	.4813,	.5157,
6,	.4949,	.5579,	.5757,	.7214,	.5887,	.4336,	1.0040,	.6591,	.9295,	.7886,	.7924,
7,	.6321,	.9245,	1.1435,	.5180,	.7608,	.3852,	1.0070,	.9614,	.8486,	.7637,	.8579,
8,	.6127,	.3422,	1.0461,	.5496,	.6566,	.4489,	1.0330,	.8044,	.9299,	.7932,	.8425,
9,	.3963,	.6117,	1.0153,	.4360,	.4549,	.3200,	.7129,	.9839,	.4363,	.7394,	.7199,
10,	.5390,	.5707,	.7588,	.5081,	.5496,	.4621,	.6789,	.8161,	.8556,	1.0121,	.8946,
+gp,	.5390,	.5707,	.7588,	.5081,	.5496,	.4621,	.6789,	.8161,	.8556,	1.0121,	
FBAR 3- 6,	.4035,	.3509,	.4145,	.5746,	.4995,	.4603,	.4833,	.4290,	.4398,	.4918,	

Table 5.9

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Terminal Fs derived using XSA (With F shrinkage)

Table 10 Stock number at age (start of year)										Numbers*10**-3
YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
2,	241045,	191589,	367539,	347035,	379358,	219290,	277407,	117023,	206040,	373258,
3,	144547,	190610,	150569,	296123,	280428,	287110,	161586,	216618,	83298,	149546,
4,	198557,	98084,	129217,	100478,	172471,	190198,	165376,	73320,	108317,	34917,
5,	53901,	113218,	57832,	89159,	71452,	84342,	102082,	87995,	37222,	48845,
6,	65603,	32255,	60161,	42733,	57671,	45844,	44658,	57206,	47694,	16295,
7,	21464,	42040,	22676,	41761,	30692,	32568,	28887,	27346,	32331,	20573,
8,	13223,	13364,	29338,	17853,	29850,	20494,	17985,	18569,	15952,	15478,
9,	9841,	9583,	8303,	22289,	13598,	17246,	14154,	11516,	11643,	8715,
10,	5536,	7213,	6567,	5984,	16700,	8868,	10182,	9901,	6831,	6584,
+gp,	16550,	17933,	13226,	4512,	12564,	22025,	14892,	14776,	10313,	11485,
TOTAL,	770267,	715889,	845428,	967928,	1064783,	927984,	837210,	634270,	559639,	685695,

Table 10 Stock number at age (start of year)										Numbers*10**-3
YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
2,	304511,	178686,	283615,	167657,	356570,	152903,	140092,	118719,	137815,	270301,
3,	231762,	200315,	117647,	190801,	111628,	275443,	115716,	99112,	86668,	99601,
4,	67395,	76619,	74381,	52012,	100148,	54480,	149549,	63312,	65543,	33438,
5,	18009,	27512,	31679,	35847,	21476,	48838,	24859,	63579,	30330,	23591,
6,	25182,	7554,	13350,	14648,	16571,	9248,	20506,	8536,	22466,	13916,
7,	9327,	12735,	4319,	6827,	8011,	7795,	4297,	9358,	4069,	8256,
8,	9778,	4528,	6506,	2208,	2965,	3664,	4075,	2565,	4940,	2305,
9,	6529,	5100,	2390,	3655,	936,	1217,	1183,	2204,	1035,	2441,
10,	4499,	2922,	2722,	1108,	1765,	633,	662,	551,	1117,	341,
+gp,	7435,	3409,	5936,	2982,	3893,	1410,	1116,	1674,	1773,	1762,
TOTAL,	684428,	519379,	542545,	477745,	623965,	555631,	462054,	369609,	355755,	455951,

Table 10 Stock number at age (start of year)										Numbers*10**-3		
YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	1996,	GMST 66-
AGE												
2,	203206,	101609,	77031,	87096,	278768,	419945,	311655,	219083,	127904,	[2894,]	[0,]	210885,
3,	219298,	163375,	79692,	58528,	61213,	217791,	338270,	242192,	176313,	103462,	[2306,]	155871,
4,	37284,	159536,	117592,	57893,	36718,	31114,	111465,	231937,	173920,	136130,	69760,	84921,
5,	16542,	18858,	85530,	63840,	29379,	17881,	14960,	67155,	132481,	108588,	67389,	41376,
6,	12810,	8058,	11513,	40323,	22731,	15914,	9758,	7846,	31226,	65778,	54942,	21088,
7,	6617,	6394,	3776,	5300,	16047,	10330,	8445,	2927,	3323,	10092,	24475,	11465,
8,	3375,	2879,	2077,	985,	2585,	6139,	5754,	2526,	916,	1165,	3850,	6230,
9,	1186,	1497,	1674,	597,	466,	1098,	3208,	1677,	925,	296,	431,	3393,
10,	1204,	653,	665,	497,	316,	242,	653,	1288,	513,	490,	116,	1936,
+gp,	748,	2003,	209,	409,	654,	391,	591,	207,	1279,	527,	302,	
TOTAL,	502270,	464863,	379759,	315469,	448877,	720842,	804758,	776837,	648801,	[429421,]	[235570,]	

Table 5.10

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Terminal Fs derived using XSA (With F shrinkage)

Table 14 Stock biomass at age with SOP (start of year) Tonnes YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
2,	89844,	65076,	141683,	115117,	123496,	59299,	77457,	32495,	67909,	128877,
3,	112507,	135199,	121208,	205123,	190635,	162126,	94216,	125608,	57331,	107825,
4,	241613,	108766,	162622,	108812,	183300,	167910,	150751,	66467,	116551,	39359,
5,	96315,	184363,	106879,	141788,	111513,	109340,	136648,	117141,	58814,	80853,
6,	167568,	75080,	158929,	97142,	128657,	84954,	85451,	108857,	107725,	38557,
7,	74356,	132714,	81243,	128750,	92861,	81852,	74965,	70574,	99037,	66018,
8,	58417,	53805,	134049,	70195,	115179,	65686,	59524,	61118,	62319,	63345,
9,	52540,	46621,	45847,	105900,	63407,	66797,	56607,	45802,	54965,	43103,
10,	34168,	40570,	41919,	32867,	90023,	39706,	47075,	45524,	37278,	37645,
+gp,	147068,	143217,	115706,	32925,	89067,	123530,	91441,	89118,	72147,	83122,
TOTALBIO,	1074397,	985411,	1110085,	1038621,	1188138,	961199,	874134,	762703,	734075,	688705,

Table 14 Stock biomass at age with SOP (start of year) Tonnes YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
2,	103738,	61124,	99109,	64915,	160307,	65586,	71170,	71167,	73023,	101995,
3,	164876,	143092,	85851,	154270,	88104,	200577,	88755,	103973,	61519,	74177,
4,	74956,	85566,	84857,	65746,	127070,	76083,	166845,	84129,	82563,	45157,
5,	29413,	45118,	53072,	66541,	43555,	99870,	50020,	118150,	61250,	48961,
6,	58791,	17708,	31969,	38866,	42217,	25463,	53312,	23878,	60643,	36342,
7,	29533,	40487,	14026,	24568,	26332,	25661,	13998,	37398,	15785,	26889,
8,	39485,	18361,	26949,	10131,	12855,	16007,	15872,	10711,	22076,	9085,
9,	31861,	24986,	11963,	20269,	4816,	7221,	5525,	11739,	5545,	10981,
10,	25379,	16550,	15751,	7105,	10141,	4037,	3714,	3127,	6768,	1873,
+gp,	54533,	25361,	45926,	26521,	26984,	9621,	8398,	14491,	12742,	14328,
TOTALBIO,	612564,	478353,	469473,	478932,	542382,	530128,	477609,	478761,	401913,	369789,

Table 14 Stock biomass at age with SOP (start of year) Tonnes YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
2,	64564,	35078,	25171,	39106,	150550,	166508,	140244,	100859,	44937,	[1450,]
3,	128467,	87920,	48926,	43214,	46527,	155437,	236788,	152704,	92031,	58056,
4,	45164,	136071,	101304,	56031,	39660,	36701,	122610,	236765,	129190,	106395,
5,	32357,	31786,	110948,	88540,	45836,	31549,	29621,	114254,	162240,	131656,
6,	29254,	18983,	27704,	72821,	48195,	35335,	22833,	19632,	67704,	114025,
7,	18855,	19281,	14472,	15971,	38516,	29285,	23731,	8438,	10641,	28213,
8,	12466,	11694,	11064,	3677,	9437,	20203,	18699,	7811,	3652,	4364,
9,	5062,	7177,	9665,	2766,	1677,	4929,	13026,	6209,	4290,	1305,
10,	5607,	3608,	3530,	2353,	2015,	1367,	4039,	7977,	2720,	2590,
+gp,	4899,	14042,	1541,	3062,	3137,	2758,	4360,	1692,	7794,	3944,
TOTALBIO,	346694,	365640,	354325,	327542,	385550,	484071,	615952,	656341,	525200,	[451999,]

Table 5.11

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Terminal Fs derived using XSA (With F shrinkage)

Table 15 Spawning stock biomass with SOP (spawning time) Tonnes

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	2416,	1088,	1626,	1088,	1833,	1679,	1508,	665,	1166,	394,
5,	52973,	101399,	58783,	77984,	61332,	60137,	75156,	64427,	32348,	44469,
6,	142433,	63818,	135090,	82571,	109359,	72211,	72634,	92529,	91566,	32773,
7,	72869,	130059,	79618,	126175,	91004,	80215,	73466,	69163,	97056,	64698,
8,	58417,	53805,	134049,	70195,	115179,	65686,	59524,	61118,	62319,	63345,
9,	52540,	46621,	45847,	105900,	63407,	66797,	56607,	45802,	54965,	43103,
10,	34168,	40570,	41919,	32867,	90023,	39706,	47075,	45524,	37278,	37645,
+gp,	147068,	143217,	115706,	32925,	89067,	123530,	91441,	89118,	72147,	83122,
TOTSPBIO,	562884,	580577,	612639,	529706,	621203,	509961,	477409,	468345,	448845,	369548,

Table 15 Spawning stock biomass with SOP (spawning time) Tonnes

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	750,	856,	849,	657,	1271,	761,	1668,	841,	826,	452,
5,	16177,	24815,	29189,	36597,	23955,	54929,	27511,	64982,	33688,	26928,
6,	49972,	15051,	27174,	33036,	35885,	21643,	45315,	20296,	51546,	30891,
7,	28942,	39677,	13746,	24077,	25806,	25148,	13718,	36650,	15469,	26352,
8,	39485,	18361,	26949,	10131,	12855,	16007,	15872,	10711,	22076,	9085,
9,	31861,	24986,	11963,	20269,	4816,	7221,	5525,	11739,	5545,	10981,
10,	25379,	16550,	15751,	7105,	10141,	4037,	3714,	3127,	6768,	1873,
+gp,	54533,	25361,	45926,	26521,	26984,	9621,	8398,	14491,	12742,	14328,
TOTSPBIO,	247098,	165658,	171547,	158394,	141713,	139367,	121721,	162837,	148659,	120890,

Table 15 Spawning stock biomass with SOP (spawning time) Tonnes

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	452,	1361,	1013,	560,	397,	367,	1226,	2368,	1292,	1064,
5,	17796,	17482,	61021,	48697,	25210,	17352,	16292,	62840,	89232,	72411,
6,	24866,	16136,	23549,	61898,	40966,	30034,	19408,	16687,	57549,	96921,
7,	18478,	18896,	14182,	15652,	37746,	28699,	23256,	8269,	10429,	27649,
8,	12466,	11694,	11064,	3677,	9437,	20203,	18699,	7811,	3652,	4364,
9,	5062,	7177,	9665,	2766,	1677,	4929,	13026,	6209,	4290,	1305,
10,	5607,	3608,	3530,	2353,	2015,	1367,	4039,	7977,	2720,	2590,
+gp,	4899,	14042,	1541,	3062,	3137,	2758,	4360,	1692,	7794,	3944,
TOTSPBIO,	89626,	90395,	125565,	138666,	120584,	105710,	100307,	113853,	176958,	210249,

Table 5.12

Run title : Arctic Saithe (run: XSASME05/X05)

At 23-Aug-96 18:42:44

Table 17 Summary (with SOP correction)

Terminal Fs derived using XSA (With F shrinkage)

	RECRUITS, Age 2	TOTALBIO,	TOTSPBIO,	LANDINGS,	YIELD/SSB,	SOPCOFAC,	FBAR 3- 6,
1966,	241045,	1074397,	562884,	201860,	.3586,	1.0963,	.2770,
1967,	191589,	985411,	580578,	191191,	.3293,	.9990,	.2754,
1968,	367539,	1110085,	612639,	107181,	.1749,	1.1338,	.1608,
1969,	347035,	1038620,	529706,	140379,	.2650,	.9756,	.2120,
1970,	379358,	1188138,	621203,	260404,	.4192,	.9575,	.3297,
1971,	219290,	961199,	509961,	244732,	.4799,	.7953,	.3679,
1972,	277407,	874134,	477409,	210508,	.4409,	.8212,	.4227,
1973,	117024,	762704,	468345,	215659,	.4605,	.8167,	.4385,
1974,	206040,	734075,	448845,	262301,	.5844,	.9694,	.6332,
1975,	373258,	688705,	369548,	233453,	.6317,	1.0155,	.4699,
1976,	304511,	612564,	247098,	242486,	.9813,	1.0020,	.6884,
1977,	178686,	478353,	165658,	182808,	1.1035,	1.0061,	.5890,
1978,	283615,	469473,	171547,	154465,	.9004,	1.0278,	.5470,
1979,	167657,	478932,	158394,	164234,	1.0369,	1.1388,	.5260,
1980,	356570,	542382,	141713,	154379,	1.0894,	.9991,	.5580,
1981,	152903,	530128,	139367,	175516,	1.2594,	.9975,	.5574,
1982,	140092,	477609,	121721,	170903,	1.4041,	.9961,	.6280,
1983,	118719,	478761,	162837,	155405,	.9544,	.9991,	.5326,
1984,	137815,	401914,	148659,	158796,	1.0682,	.9997,	.7386,
1985,	270301,	369789,	120890,	107147,	.8863,	.9930,	.5601,
1986,	203206,	346694,	89626,	70458,	.7861,	.9929,	.4035,
1987,	101609,	365640,	90395,	91679,	1.0142,	1.0154,	.3509,
1988,	77031,	354325,	125565,	114508,	.9119,	.9902,	.4145,
1989,	87096,	327542,	138666,	122664,	.8846,	.9978,	.5746,
1990,	278767,	385550,	120584,	95393,	.7911,	1.0001,	.4995,
1991,	419945,	484072,	105710,	107326,	1.0153,	.9912,	.4603,
1992,	311655,	615952,	100307,	127606,	1.2722,	1.0000,	.4833,
1993,	219083,	656341,	113853,	153584,	1.3490,	1.0008,	.4290,
1994,	127904,	525200,	176958,	142253,	.8039,	1.0038,	.4398,
1995,	210000,	555549,	210249,	169378,	.8056,	1.0020,	.4918,
Arith. Mean	221988,	625690,	267697,	164289,	.8154		.4687,
Units,	(Thousands),	(Tonnes),	(Tonnes),	(Tonnes),			

Table 5.13. North-East Arctic Saithe
Estimation of weight at age in the prediction

	Observed weight-at-age in the catch[1]			
Age	**1993**	**1994**	**1995**	**1993-95**
2	0.46	0.35	0.50	0.44
3	0.63	0.52	0.56	0.57
4	1.02	0.74	0.78	0.85
5	1.70	1.22	1.21	1.38
6	2.50	2.16	1.73	2.13
7	2.88	3.19	2.79	2.95
8	3.09	3.97	3.74	3.60
9	3.70	4.62	4.40	4.24
10	6.19	5.28	5.28	5.58
11+	7.91	5.78	6.72	6.80

1) The abundant year classes 1988-1990 outlined

	Weight-at-age in VPA[1]			Weight-at-age used in the predictions[1,2]				
Age	**1993**	**1994**	**1995**	**96**	**97**	**98**	**99**	**2000**
2	0.46	0.35	0.50	0.44	0.44	0.44	0.44	0.44
3	0.63	0.52	0.56	0.57	0.57	0.57	0.57	0.57
4	1.02	0.74	0.78	0.85	0.85	0.85	0.85	0.85
5	1.70	1.22	1.21	1.38	1.38	1.38	1.38	1.38
6	2.50	2.16	1.73	1.81	2.13	2.13	2.13	2.13
7	2.88	3.19	2.79	2.33	2.41	2.95	2.95	2.95
8	3.09	3.97	3.74	3.60	3.60	3.60	3.60	3.60
9	3.70	4.62	4.40	4.24	4.24	4.24	4.24	4.24
10	6.19	5.28	5.28	5.58	5.58	5.58	5.58	5.58
11+	7.91	5.78	6.72	6.80	6.80	6.80	6.80	6.80

1) The abundant year classes 1988-1990 outlined
2) Values in the shaded area differ from the 1993-1995 mean

Saithe in the North-East Arctic (Fishing Areas I and II)

Prediction with management option table: Input data

Year: 1996								
Age	Stock size	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
2	210000.00	0.2000	0.0000	0.0000	0.0000	0.440	0.0204	0.440
3	168462.00	0.2000	0.0000	0.0000	0.0000	0.570	0.1388	0.570
4	69760.000	0.2000	0.0100	0.0000	0.0000	0.850	0.4100	0.850
5	67389.000	0.2000	0.5500	0.0000	0.0000	1.380	0.5592	1.380
6	54942.000	0.2000	0.8500	0.0000	0.0000	1.810	0.8592	1.810
7	24475.000	0.2000	0.9800	0.0000	0.0000	2.330	0.9304	2.330
8	3850.000	0.2000	1.0000	0.0000	0.0000	3.600	0.9136	3.600
9	431.000	0.2000	1.0000	0.0000	0.0000	4.240	0.7806	4.240
10	116.000	0.2000	1.0000	0.0000	0.0000	5.580	0.9700	5.580
11+	302.000	0.2000	1.0000	0.0000	0.0000	6.800	0.9700	6.800
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1997								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
2	210000.00	0.2000	0.0000	0.0000	0.0000	0.440	0.0204	0.440
3	.	0.2000	0.0000	0.0000	0.0000	0.570	0.1388	0.570
4	.	0.2000	0.0100	0.0000	0.0000	0.850	0.4100	0.850
5	.	0.2000	0.5500	0.0000	0.0000	1.380	0.5592	1.380
6	.	0.2000	0.8500	0.0000	0.0000	2.130	0.8592	2.130
7	.	0.2000	0.9800	0.0000	0.0000	2.410	0.9304	2.410
8	.	0.2000	1.0000	0.0000	0.0000	3.600	0.9136	3.600
9	.	0.2000	1.0000	0.0000	0.0000	4.240	0.7806	4.240
10	.	0.2000	1.0000	0.0000	0.0000	5.580	0.9700	5.580
11+	.	0.2000	1.0000	0.0000	0.0000	6.800	0.9700	6.800
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1998								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
2	210000.00	0.2000	0.0000	0.0000	0.0000	0.440	0.0204	0.440
3	.	0.2000	0.0000	0.0000	0.0000	0.570	0.1388	0.570
4	.	0.2000	0.0100	0.0000	0.0000	0.850	0.4100	0.850
5	.	0.2000	0.5500	0.0000	0.0000	1.380	0.5592	1.380
6	.	0.2000	0.8500	0.0000	0.0000	2.130	0.8592	2.130
7	.	0.2000	0.9800	0.0000	0.0000	2.950	0.9304	2.950
8	.	0.2000	1.0000	0.0000	0.0000	3.600	0.9136	3.600
9	.	0.2000	1.0000	0.0000	0.0000	4.240	0.7806	4.240
10	.	0.2000	1.0000	0.0000	0.0000	5.580	0.9700	5.580
11+	.	0.2000	1.0000	0.0000	0.0000	6.800	0.9700	6.800
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : MANHS01
Date and time: 10SEP96:10:29

Table 5.15

Saithe in the North-East Arctic (Fishing Areas I and II)

Prediction with management option table

Year: 1996					Year: 1997					Year: 1998	
F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	Stock biomass	Sp.stock biomass
1.0070	0.4952	515576	210544	163000	0.0000	0.0000	490437	166681	0	675348	296516
.	.	.	.	.	0.0500	0.0246	.	166681	9707	662629	286273
.	.	.	.	.	0.1000	0.0492	.	166681	19092	650338	276418
.	.	.	.	.	0.1500	0.0738	.	166681	28167	638458	266933
.	.	.	.	.	0.2000	0.0984	.	166681	36944	626973	257804
.	.	.	.	.	0.2500	0.1230	.	166681	45435	615869	249017
.	.	.	.	.	0.3000	0.1475	.	166681	53651	605131	240559
.	.	.	.	.	0.3500	0.1721	.	166681	61601	594745	232416
.	.	.	.	.	0.4000	0.1967	.	166681	69296	584697	224575
.	.	.	.	.	0.4500	0.2213	.	166681	76745	574976	217026
.	.	.	.	.	0.5000	0.2459	.	166681	83958	565568	209755
.	.	.	.	.	0.5500	0.2705	.	166681	90943	556462	202753
.	.	.	.	.	0.6000	0.2951	.	166681	97709	547648	196008
.	.	.	.	.	0.6500	0.3197	.	166681	104264	539113	189511
.	.	.	.	.	0.7000	0.3443	.	166681	110615	530847	183251
.	.	.	.	.	0.7500	0.3689	.	166681	116771	522841	177220
.	.	.	.	.	0.8000	0.3934	.	166681	122738	515085	171408
.	.	.	.	.	0.8500	0.4180	.	166681	128524	507570	165807
.	.	.	.	.	0.9000	0.4426	.	166681	134135	500287	160409
.	.	.	.	.	0.9500	0.4672	.	166681	139577	493227	155208
.	.	.	.	.	1.0000	0.4918	.	166681	144856	486383	150189
.	.	.	.	.	1.0500	0.5164	.	166681	149979	479746	145353
.	.	.	.	.	1.1000	0.5410	.	166681	154951	473309	140689
.	.	.	.	.	1.1500	0.5656	.	166681	159778	467065	136192
.	.	.	.	.	1.2000	0.5902	.	166681	164464	461007	131855
.	.	.	.	.	1.2500	0.6148	.	166681	169014	455127	127671
.	.	.	.	.	1.3000	0.6393	.	166681	173435	449421	123635
.	.	.	.	.	1.3500	0.6639	.	166681	177729	443881	119742
.	.	.	.	.	1.4000	0.6885	.	166681	181902	438502	115985
.	.	.	.	.	1.4500	0.7131	.	166681	185958	433278	112359
.	.	.	.	.	1.5000	0.7377	.	166681	189900	428203	108860
-	-	Tonnes	Tonnes	Tonnes	-	-	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

Notes: Run name : MANHS01
Date and time : 10SEP96:10:29
Computation of ref. F: Simple mean, age 3 - 6
Basis for 1996 : TAC constraints

Table 5.16

Saithe in the North-East Arctic (Fishing Areas I and II)

Single option prediction: Summary table

							1 January		Spawning time	
Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	1.0070	0.4952	117442	163004	599727	515576	113147	210544	113147	210544
1997	0.1758	0.0865	22989	32732	595918	490432	76647	166677	76647	166677
1998	0.1758	0.0865	29859	46928	677162	632478	116846	262174	116846	262174
1999	0.1758	0.0865	36929	64023	737485	771759	163953	380028	163953	380028
2000	0.1758	0.0865	42655	82245	780501	906468	204379	509352	204379	509352
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Notes: Run name : SPRHS03
Date and time : 10SEP96:11:43
Computation of ref. F: Simple mean, age 3 - 6
Prediction basis : F factors

Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	1.0070	0.4952	117442	163004	599727	515576	113147	210544	113147	210544
1997	0.3248	0.1597	40910	57625	595918	490432	76647	166677	76647	166677
1998	0.3248	0.1597	50231	76034	661047	599931	106804	236477	106804	236477
1999	0.3248	0.1597	59364	96999	705976	698741	141206	318140	141206	318140
2000	0.3248	0.1597	65972	117252	734545	784806	167900	400322	167900	400322
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	1.0070	0.4952	117442	163004	599727	515576	113147	210544	113147	210544
1997	0.6710	0.3300	77771	106954	595918	490432	76647	166677	76647	166677
1998	0.6710	0.3300	84846	117887	628048	535605	87030	186850	87030	186850
1999	0.6710	0.3300	92163	131807	647986	572615	101504	214593	101504	214593
2000	0.6710	0.3300	96260	143044	657757	598844	110544	239289	110544	239289
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	1.0070	0.4952	117442	163004	599727	515576	113147	210544	113147	210544
1997	0.8000	0.3934	90015	122736	595918	490432	76647	166677	76647	166677
1998	0.8000	0.3934	94360	127101	617136	515082	80751	171405	80751	171405
1999	0.8000	0.3934	99995	136432	630581	537182	90266	186566	90266	186566
2000	0.8000	0.3934	102863	143819	636550	552182	95794	200613	95794	200613
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	1.0070	0.4952	117442	163004	599727	515576	113147	210544	113147	210544
1997	1.0000	0.4918	107614	144854	595918	490432	76647	166677	76647	166677
1998	1.0000	0.4918	106471	136844	601498	486380	72008	150187	72008	150187
1999	1.0000	0.4918	109250	139067	607032	491286	75674	151233	75674	151233
2000	1.0000	0.4918	110452	141573	609085	495338	77630	155008	77630	155008
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	1.0070	0.4952	117442	163004	599727	515576	113147	210544	113147	210544
1997	1.2606	0.6200	128310	169959	595918	490432	76647	166677	76647	166677
1998	1.2606	0.6200	118542	143699	583183	453901	62183	126801	62183	126801
1999	1.2606	0.6200	117742	137934	581379	444210	60714	116456	60714	116456
2000	1.2606	0.6200	117374	136260	580615	441109	60158	113661	60158	113661
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Saithe in the North-East Arctic (Fishing Areas I and II)

Single option prediction: Detailed tables

Year: 1996 F-factor: 1.0070 Reference F: 0.4952

						1 January		Spawning time	
Age	Absolute F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
2	0.0205	3871	1703	210000	92400	0	0	0	0
3	0.1398	19963	11379	168462	96023	0	0	0	0
4	0.4129	21533	18303	69760	59296	698	593	698	593
5	0.5631	26544	36631	67389	92997	37064	51148	37064	51148
6	0.8652	29246	52935	54942	99445	46701	84528	46701	84528
7	0.9369	13699	31919	24475	57027	23986	55886	23986	55886
8	0.9200	2131	7670	3850	13860	3850	13860	3850	13860
9	0.7861	215	913	431	1827	431	1827	431	1827
10	0.9768	67	372	116	647	116	647	116	647
11+	0.9768	173	1179	302	2054	302	2054	302	2054
Total		117442	163004	599727	515576	113147	210544	113147	210544
Unit	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year: 1997 F-factor: 0.6710 Reference F: 0.3300

						1 January		Spawning time	
Age	Absolute F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
2	0.0137	2588	1139	210000	92400	0	0	0	0
3	0.0931	13597	7750	168437	96009	0	0	0	0
4	0.2751	26264	22324	119934	101944	1199	1019	1199	1019
5	0.3752	10784	14882	37796	52158	20788	28687	20788	28687
6	0.5765	12596	26829	31418	66919	26705	56882	26705	56882
7	0.6243	8052	19406	18936	45636	18557	44723	18557	44723
8	0.6130	3295	11860	7852	28266	7852	28266	7852	28266
9	0.5238	468	1985	1256	5326	1256	5326	1256	5326
10	0.6509	70	393	161	897	161	897	161	897
11+	0.6509	56	384	129	876	129	876	129	876
Total		77771	106954	595918	490432	76647	166677	76647	166677
Unit	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year: 1998 F-factor: 0.6710 Reference F: 0.3300

						1 January		Spawning time	
Age	Absolute F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
2	0.0137	2588	1139	210000	92400	0	0	0	0
3	0.0931	13691	7804	169596	96670	0	0	0	0
4	0.2751	27514	23387	125641	106795	1256	1068	1256	1068
5	0.3752	21279	29365	74577	102916	41017	56604	41017	56604
6	0.5765	8525	18158	21263	45290	18074	38497	18074	38497
7	0.6243	6146	18129	14452	42634	14163	41781	14163	41781
8	0.6130	3484	12544	8304	29895	8304	29895	8304	29895
9	0.5238	1298	5504	3482	14765	3482	14765	3482	14765
10	0.6509	267	1490	609	3399	609	3399	609	3399
11+	0.6509	54	369	124	841	124	841	124	841
Total		84846	117887	628048	535605	87030	186850	87030	186850
Unit	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

(cont.)

Table 5.17 (Cont'd)

Saithe in the North-East Arctic (Fishing Areas I and II)

Single option prediction: Detailed tables

(cont.)

Year: 1999 F-factor: 0.6710 Reference F: 0.3300

						1 January		Spawning time	
Age	Absolute F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
2	0.0137	2588	1139	210000	92400	0	0	0	0
3	0.0931	13691	7804	169596	96670	0	0	0	0
4	0.2751	27703	23547	126505	107530	1265	1075	1265	1075
5	0.3752	22292	30763	78126	107814	42969	59297	42969	59297
6	0.5765	16821	35828	41955	89365	35662	75960	35662	75960
7	0.6243	4159	12270	9781	28854	9585	28277	9585	28277
8	0.6130	2659	9574	6338	22816	6338	22816	6338	22816
9	0.5238	1373	5821	3683	15616	3683	15616	3683	15616
10	0.6509	740	4130	1689	9423	1689	9423	1689	9423
11+	0.6509	137	933	313	2128	313	2128	313	2128
Total		92163	131807	647986	572615	101504	214593	101504	214593
Unit	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Year: 2000 F-factor: 0.6710 Reference F: 0.3300

						1 January		Spawning time	
Age	Absolute F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
2	0.0137	2588	1139	210000	92400	0	0	0	0
3	0.0931	13691	7804	169596	96670	0	0	0	0
4	0.2751	27703	23547	126505	107530	1265	1075	1265	1075
5	0.3752	22445	30974	78663	108555	43265	59705	43265	59705
6	0.5765	17621	37533	43952	93618	37359	79575	37359	79575
7	0.6243	8207	24210	19300	56934	18914	55795	18914	55795
8	0.6130	1800	6479	4289	15442	4289	15442	4289	15442
9	0.5238	1048	4443	2811	11918	2811	11918	2811	11918
10	0.6509	783	4368	1786	9966	1786	9966	1786	9966
11+	0.6509	375	2547	855	5812	855	5812	855	5812
Total		96260	143044	657757	598844	110544	239289	110544	239289
Unit	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Notes: Run name : SPRHS03
Date and time : 10SEP96:11:43
Computation of ref. F: Simple mean, age 3 - 6
Prediction basis : F factors

Table 6.1 *Sebastes mentella* in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I and Divisions IIa and IIb combined.

Year	Canada	Den-mark	Faroe Islands	France	Ger-many[3]	Green-land	Ireland	Norway	Portugal	Russia[4]	Spain	UK England and Wales	UK Scotland	Total
1986	-	-	-	-	1,252	-	-	1,274	1,273	17,815	-	84	-	23,112[2]
1987	-	-	200	63	1,321	-	-	1,488	1,175	6,196	25	49	1	10,518
1988	No species specific data presently available													15,586
1989	-	-	335	1,093	3,833	-	-	4,633	340	13,080	5	166	9	23,494
1990	-	-	108	142	6,354	36	-	10,173	830	17,355	-	72	-	35,070
1991	-	-	487	85	-	23	-	33,592	166	14,302	1	57	17	48,730
1992	-	-	23	12	-	-	-	10,751	972	3,577	14	222	16	15,587
1993[1]	8	4	13	50	35	1	-	4,787	963	6,260	57	293	-	12,471
1994[1]	-	28	4	74	18	1	3	6,029	895	5,021	30	124	12	12,239
1995[1]	-	-	3	16	153	2	4	2,744	927	6,364	67	93	4	10,359

[1] Provisional figures.
[2] Including 1,414 tonnes in Division IIb not split on countries.
[3] Includes former GDR prior to 1991.
[4] USSR prior to 1991.

Table 6.2 *Sebastes mentella* in Sub-areas I and II. Nominal catch (t) by countries in Sub-area 1.

Year	Faroe Islands	Germany[4]	Norway	Russia[5]	UK England & Wales	UK Scotland	Total
1986[3]	-	-	1,274	911	-	-	2,185
1987[3]	-	2	1,166	234	3	-	1,405
1988	No species specific data presently available						
1989	13	-	60	484	8[2]	1[2]	566
1990	2	-	-	100	-	-	102
1991	-	-	8	420	-	-	428
1992	-		561	408	-	-	969
1993[1]	2[2]	-	23	588	-	-	613
1994[1]	2[2]	2	37	308	-	-	349
1995[1]	2[2]	-	22	203	-	-	227

[1] Provisional figures.
[2] Split on species according to reports to Norwegian authorities.
[3] Based on preliminary estimates of species breakdown by area.
[4] Includes former GDR prior to 1991.
[5] USSR prior to 1991.

Table 6.3 *Sebastes mentella* in Sub-areas I and II. Nominal catch (t) by countries in Division IIa.

Year	Faroe Islands	France	Ger-many[4]	Green-land	Ireland	Norway	Portugal	Russia[5]	Spain	UK England & Wales	UK Scotland	Total
1986[3]	-	-	1,252	-	-	-	1,273	16,904	-	84	-	19,513
1987[3]	200	63	970	-	-	149	1,156	4,469	-	34	1	7,042
1988	No species specific data presently available											
1989	312[2]	1,065[2]	3,200	-	-	4,573	251	9,749	-	151[2]	6[2]	19,307
1990	98[2]	137[2]	1,673	-	-	8,842	824	6,492	-	9	-	18,075
1991	487[2]	72[2]	-	-	-	32,810	159[2]	7,596	-	19[2]	4[2]	41,147
1992	23[2]	7[2]	-	-	-	9,816	824[2]	1,096	-	25[2]	-	11,791
1993[1]	11[2]	15[2]	35	1[2]	-	4,720	648[2]	5,328	-	2[2]	-	10;760
1994[1]	2[2]	33[2]	16[2]	1[2]	2[2]	5,629	687[2]	4,692	8[2]	4[2]	-	11,074
1995[1]	1[2]	163[2]	153[2]	2[2]	2[2]	2,332	715[2]	5,916	65[2]	41[2]	2[2]	9,245

[1] Provisional figures.
[2] Split on species according to reports to Norwegian authorities.
[3] Based on preliminary estimates of species breakdown by area.
[4] Includes former GDR prior to 1991.
[5] USSR prior to 1991.

Table 6.4 *Sebastes mentella* in Sub-areas I and II. Nominal catch (t) by countries in Division IIb

Year	Canada	Den-mark	Faroe Islands	France	Ger-many[5]	Green-land	Ireland	Norway	Portugal	Russia[6]	Spain	UK England and Wales	UK Scotland	Total
1986[4]	Data not available on countries													1,414
1987[4]	-	-	-	-	349	-	-	173	19	1,493	25	12	-	2,071
1988	No species specific data presently available													
1989	-	-	10	28	633	-	-	-	89	2,847	5	7[2]	2[2]	3,621
1990	-	-	8[2]	5[2]	4,681	36[2]	-	1,331	6	10,763	-	63[2]	-	16,893
1991	-	-	-	13[2]	-	23	-	774	7	6,286	1	38[2]	13[2]	7,155
1992	-	-	-	5[2]	-	-	-	374	148[2]	2,073	14	197[2]	16[2]	2,827
1993[1]	8[2]	4[2]	-	35[2]	-	-	-	44	315[2]	344	57[3]	291[2]	-	1,098
1994[1]	-	28[2]	-	41[2]	-	-	1[2]	363	208[2]	21	22[3]	120[2]	12[2]	816
1995[1]	-	-	-	-	-	-	2[2]	390	212[2]	227	2[3]	52[2]	2[2]	887

[1] Provisional figures. .
[2] Split on species according to reports to Norwegian authorities.
[3] Split on species according to the 1992 catches.
[4] Based on preliminary estimates of species breakdown by area.
[5] Includes former GDR prior to 1991.
[6] USSR prior to 1991.

Table 6.5

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1965,
AGE	
1,	0,
2,	0,
3,	0,
4,	0,
5,	0,
6,	48,
7,	285,
8,	1592,
9,	2163,
10,	1141,
11,	1545,
12,	1972,
13,	2471,
14,	2804,
15,	1996,
16,	2067,
17,	1592,
18,	1473,
+gp,	2589,
TOTALNUM,	23738,
TONSLAND,	15662,
SOPCOF %,	104,

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	0,	0,	7,	31,	0,	0,	466,	172,	606,	5834,
7,	0,	0,	0,	94,	0,	0,	792,	1660,	4847,	19417,
8,	27,	7,	15,	409,	33,	114,	5728,	4865,	15451,	42425,
9,	279,	15,	89,	524,	131,	284,	3586,	9729,	28781,	82480,
10,	532,	182,	192,	838,	620,	681,	2049,	4636,	30144,	108462,
11,	465,	285,	355,	933,	2122,	1590,	1770,	2633,	19843,	119075,
12,	731,	343,	436,	954,	3428,	4429,	3865,	3148,	10603,	57231,
13,	1223,	394,	554,	849,	3983,	4884,	4564,	5208,	8634,	29651,
14,	1927,	489,	864,	618,	3526,	5451,	4704,	5666,	8634,	20894,
15,	2007,	496,	768,	482,	2808,	4940,	4098,	4578,	6514,	16499,
16,	1741,	628,	931,	807,	3983,	7496,	4704,	5380,	5908,	13465,
17,	1422,	613,	694,	451,	2743,	4486,	3632,	3777,	3332,	13668,
18,	944,	540,	665,	849,	3559,	7382,	3167,	2747,	2878,	12207,
+gp,	1980,	3254,	1802,	2536,	5714,	14934,	3447,	3053,	5300,	22366,
TOTALNUM,	13278,	7246,	7372,	10375,	32650,	56671,	46572,	57252,	151475,	563674,
TONSLAND,	10143,	6239,	5413,	6836,	22916,	45063,	28862,	38380,	69372,	239070,
SOPCOF %,	102,	100,	94,	95,	94,	98,	101,	118,	99,	91,

Table 6.5 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	18891,	0,	2905,	3633,	1065,	932,	5,	20,	0,	98,
7,	29815,	2418,	30158,	20497,	7412,	3000,	854,	86,	34,	571,
8,	59395,	17175,	65162,	43553,	26296,	8620,	4775,	1987,	525,	2009,
9,	78241,	33454,	53391,	46996,	44131,	26716,	12554,	4576,	2106,	4949,
10,	110712,	52102,	33569,	37469,	40441,	48290,	47348,	16695,	7969,	17096,
11,	112524,	49617,	19909,	26298,	27089,	39206,	57134,	31310,	22092,	31564,
12,	93144,	53938,	17242,	20717,	19950,	33394,	46529,	51099,	36763,	41511,
13,	49550,	33287,	9270,	16341,	11172,	21178,	37731,	48307,	47096,	33190,
14,	26134,	19095,	7410,	6059,	6400,	11853,	15506,	29973,	25468,	10519,
15,	13881,	12605,	5456,	3589,	5607,	6038,	9492,	17132,	12002,	4243,
16,	9839,	5796,	4134,	3465,	6801,	2697,	5780,	8347,	4336,	1971,
17,	6300,	4874,	2134,	2465,	3441,	2172,	3368,	5238,	1499,	658,
18,	7233,	5499,	1545,	1964,	3001,	1344,	2160,	2055,	517,	343,
+gp,	11439,	13906,	2917,	6579,	2546,	1910,	4184,	673,	472,	52,
TOTALNUM,	627098,	303766,	255202,	239625,	205352,	207350,	247420,	217498,	160879,	148774,
TONSLAND,	269022,	146365,	92611,	87145,	79354,	81546,	115383,	105273,	72934,	63068,
SOPCOF %,	98,	95,	101,	100,	97,	95,	100,	99,	104,	101,

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	5,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	60,	0,
4,	0,	0,	0,	0,	0,	0,	1108,	551,	61,	0,
5,	0,	0,	0,	0,	0,	2044,	957,	288,	85,	74,
6,	29,	0,	0,	48,	1,	1653,	1873,	154,	710,	563,
7,	117,	0,	0,	475,	748,	5453,	2498,	154,	702,	898,
8,	215,	109,	0,	1933,	4036,	7994,	1898,	169,	695,	1241,
9,	1049,	1055,	379,	3972,	6797,	6781,	1622,	496,	954,	703,
10,	3079,	3145,	1838,	4432,	7297,	8226,	1780,	2028,	2464,	737,
11,	5921,	2679,	3512,	4303,	6038,	5344,	1531,	3041,	2630,	1212,
12,	10701,	3580,	4084,	4667,	8568,	6227,	2108,	2549,	2944,	2025,
13,	15930,	6213,	6958,	7062,	11600,	9880,	2288,	2236,	1477,	4266,
14,	7051,	3702,	7313,	6068,	7499,	10824,	2258,	2894,	2168,	3274,
15,	2495,	1459,	4022,	4412,	3174,	4049,	2506,	1817,	2099,	2160,
16,	704,	656,	1960,	3282,	1698,	2105,	2137,	1466,	3210,	1465,
17,	390,	210,	983,	2399,	1419,	9603,	1512,	1020,	1235,	772,
18,	81,	66,	328,	1733,	1093,	6522,	677,	511,	706,	814,
+gp,	67,	0,	106,	2220,	15595,	19299,	9258,	5834,	3134,	2510,
TOTALNUM,	47829,	22874,	31483,	47006,	75563,	106004,	36011,	25208,	25339,	22714,
TONSLAND,	23112,	10518,	15586,	23494,	35070,	48730,	15587,	12471,	12239,	10383,
SOPCOF %,	100,	100,	100,	99,	97,	100,	103,	100,	104,	100,

Table 6.6

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 2 Catch weights at age (kg)
YEAR, 1965,

AGE	
1,	.0000,
2,	.0000,
3,	.0000,
4,	.0000,
5,	.0000,
6,	.1680,
7,	.1830,
8,	.2250,
9,	.3110,
10,	.3670,
11,	.4320,
12,	.5080,
13,	.6110,
14,	.6790,
15,	.7530,
16,	.8210,
17,	.8720,
18,	.9100,
+gp,	.9990,
SOPCOFAC,	1.0367,

Table 2 Catch weights at age (kg)

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.1680,	.1680,	.1680,	.1680,	.1680,	.1680,	.1680,	.1680,	.1680,	.1680,
7,	.1830,	.1830,	.1830,	.1830,	.1830,	.1830,	.1830,	.1830,	.1830,	.1830,
8,	.2250,	.2250,	.2250,	.2250,	.2250,	.2250,	.2250,	.2250,	.2250,	.2250,
9,	.3110,	.3110,	.3110,	.3110,	.3110,	.3110,	.3110,	.3110,	.3110,	.3110,
10,	.3670,	.3670,	.3670,	.3670,	.3670,	.3670,	.3670,	.3670,	.3670,	.3670,
11,	.4320,	.4320,	.4320,	.4320,	.4320,	.4320,	.4320,	.4320,	.4320,	.4320,
12,	.5080,	.5080,	.5080,	.5080,	.5080,	.5080,	.5080,	.5080,	.5080,	.5080,
13,	.6110,	.6110,	.6110,	.6110,	.6110,	.6110,	.6110,	.6110,	.6110,	.6110,
14,	.6790,	.6790,	.6790,	.6790,	.6790,	.6790,	.6790,	.6790,	.6790,	.6790,
15,	.7530,	.7530,	.7530,	.7530,	.7530,	.7530,	.7530,	.7530,	.7530,	.7530,
16,	.8210,	.8210,	.8210,	.8210,	.8210,	.8210,	.8210,	.8210,	.8210,	.8210,
17,	.8720,	.8720,	.8720,	.8720,	.8720,	.8720,	.8720,	.8720,	.8720,	.8720,
18,	.9100,	.9100,	.9100,	.9100,	.9100,	.9100,	.9100,	.9100,	.9100,	.9100,
+gp,	.9930,	1.0320,	1.0100,	1.0260,	1.0000,	1.0220,	.9770,	.9800,	1.0000,	1.0070,
SOPCOFAC,	1.0223,	1.0037,	.9372,	.9489,	.9357,	.9849,	1.0143,	1.1784,	.9888,	.9146,

Table 6.6 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 2	Catch weights at age (kg)									
YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.1680,	.1680,	.1680,	.1070,	.1070,	.1020,	.1020,	.1020,	.1020,	.1020,
7,	.1830,	.1830,	.1830,	.1550,	.1550,	.1380,	.1380,	.1380,	.1050,	.1350,
8,	.2250,	.2250,	.2250,	.2000,	.2000,	.1880,	.1880,	.1880,	.1650,	.1670,
9,	.3110,	.3110,	.3110,	.2520,	.2520,	.2520,	.2520,	.2520,	.2120,	.2150,
10,	.3670,	.3670,	.3670,	.3100,	.3100,	.3100,	.3100,	.3100,	.2830,	.3030,
11,	.4320,	.4320,	.4320,	.3740,	.3740,	.3640,	.3640,	.3200,	.3380,	.3520,
12,	.5080,	.5080,	.5080,	.4720,	.4720,	.4400,	.4400,	.4000,	.3830,	.4200,
13,	.6110,	.6110,	.6110,	.5680,	.5680,	.5600,	.5600,	.4660,	.4380,	.4810,
14,	.6790,	.6790,	.6790,	.7150,	.7150,	.6800,	.6800,	.5630,	.5020,	.5640,
15,	.7530,	.7530,	.7530,	.8980,	.8980,	.8280,	.8280,	.7300,	.5660,	.6730,
16,	.8210,	.8210,	.8210,	.9340,	.9340,	.9060,	.9060,	.9920,	.7110,	.8090,
17,	.8720,	.8720,	.8720,	1.0240,	1.0240,	.9700,	.9700,	1.1260,	.8610,	1.0140,
18,	.9100,	.9100,	.9100,	1.0500,	1.0500,	1.0500,	1.0500,	1.1490,	.9660,	1.0690,
+gp,	1.0210,	1.0320,	1.0300,	1.1300,	1.1050,	1.1180,	1.1220,	1.2280,	1.2910,	1.1600,
SOPCOFAC,	.9847,	.9515,	1.0130,	.9966,	.9734,	.9503,	1.0022,	.9891,	1.0415,	1.0066,

Table 2	Catch weights at age (kg)									
YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0200,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0600,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0500,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.1300,	.0900,	.1300,
6,	.1020,	.1440,	.1440,	.1980,	.1400,	.1300,	.1900,	.1700,	.1600,	.1500,
7,	.1200,	.1800,	.1800,	.2020,	.1460,	.1800,	.2200,	.2300,	.2200,	.1700,
8,	.1370,	.1950,	.1950,	.2420,	.1580,	.2100,	.2600,	.2500,	.2400,	.1900,
9,	.2180,	.2190,	.2090,	.2820,	.2060,	.2700,	.2800,	.2800,	.3000,	.2100,
10,	.3010,	.2880,	.2800,	.3310,	.2800,	.3400,	.3100,	.3300,	.3400,	.2800,
11,	.3530,	.3300,	.3330,	.3780,	.3550,	.3500,	.3300,	.3800,	.3700,	.3200,
12,	.4480,	.4390,	.3970,	.4560,	.4710,	.4200,	.3800,	.4400,	.4000,	.3800,
13,	.5100,	.5110,	.4680,	.5140,	.5430,	.4600,	.4600,	.4700,	.4400,	.4100,
14,	.5810,	.5640,	.5370,	.5680,	.6110,	.5100,	.4300,	.5000,	.4500,	.4700,
15,	.6480,	.6360,	.5850,	.5890,	.6250,	.5800,	.4300,	.5700,	.4900,	.5300,
16,	.8450,	.7720,	.7470,	.6720,	.7220,	.5900,	.4500,	.5800,	.5500,	.5900,
17,	.9480,	.8090,	.8080,	.7080,	.5760,	.5800,	.5200,	.6200,	.5800,	.6500,
18,	1.0560,	.9540,	.9010,	.7740,	.6590,	.5900,	.5700,	.6500,	.6700,	.7100,
+gp,	1.2610,	1.1800,	1.0470,	.8380,	.6590,	.7000,	.6700,	.6620,	.7900,	.8060,
SOPCOFAC,	1.0023,	.9976,	1.0000,	.9915,	.9668,	1.0033,	1.0289,	1.0027,	1.0365,	.9990,

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 5 Proportion mature at age
YEAR, 1965,

AGE	
1,	.0000,
2,	.0000,
3,	.0000,
4,	.0000,
5,	.0000,
6,	.0000,
7,	.0000,
8,	.0300,
9,	.0600,
10,	.0800,
11,	.2200,
12,	.3600,
13,	.5500,
14,	.7200,
15,	.8500,
16,	.8800,
17,	.9500,
18,	.9700,
+gp,	1.0000,

Table 5 Proportion mature at age

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0300,	.0300,	.0300,	.0300,	.0300,	.0300,	.0300,	.0300,	.0300,	.0300,
9,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,
10,	.0800,	.0800,	.0800,	.0800,	.0800,	.0800,	.0800,	.0800,	.0800,	.0800,
11,	.2200,	.2200,	.2200,	.2200,	.2200,	.2200,	.2200,	.2200,	.2200,	.2200,
12,	.3600,	.3600,	.3600,	.3600,	.3600,	.3600,	.3600,	.3600,	.3600,	.3600,
13,	.5500,	.5500,	.5500,	.5500,	.5500,	.5500,	.5500,	.5500,	.5500,	.5500,
14,	.7200,	.7200,	.7200,	.7200,	.7200,	.7200,	.7200,	.7200,	.7200,	.7200,
15,	.8500,	.8500,	.8500,	.8500,	.8500,	.8500,	.8500,	.8500,	.8500,	.8500,
16,	.8800,	.8800,	.8800,	.8800,	.8800,	.8800,	.8800,	.8800,	.8800,	.8800,
17,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,
18,	.9700,	.9700,	.9700,	.9700,	.9700,	.9700,	.9700,	.9700,	.9700,	.9700,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 6.7 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 5 Proportion mature at age

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0090,	.0090,	.0090,	.0090,	.0090,	.0090,	.0090,	.0090,	.0050,	.0000,
8,	.0160,	.0160,	.0160,	.0160,	.0160,	.0160,	.0160,	.0160,	.0080,	.0000,
9,	.1010,	.1010,	.1010,	.1010,	.1010,	.1010,	.1010,	.1010,	.0570,	.0100,
10,	.1950,	.1950,	.1950,	.1950,	.1950,	.1950,	.1950,	.1950,	.1680,	.0790,
11,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3020,	.2180,
12,	.5400,	.5400,	.5400,	.5400,	.5400,	.5400,	.5400,	.5400,	.5340,	.4530,
13,	.7020,	.7020,	.7020,	.7020,	.7020,	.7020,	.7020,	.7020,	.7210,	.7810,
14,	.8620,	.8620,	.8620,	.8620,	.8620,	.8620,	.8620,	.8620,	.8790,	.8460,
15,	.9660,	.9660,	.9660,	.9660,	.9660,	.9660,	.9660,	.9660,	.9520,	.9000,
16,	.9940,	.9940,	.9940,	.9940,	.9940,	.9940,	.9940,	.9940,	.9850,	.9250,
17,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
18,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 5 Proportion mature at age

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.0150,	.0150,	.0150,	.0000,	.0000,	.0000,
9,	.0340,	.0450,	.0830,	.0040,	.0500,	.0550,	.0620,	.0230,	.0230,	.0000,
10,	.1130,	.0760,	.0950,	.0780,	.1260,	.1320,	.1330,	.1130,	.1130,	.0550,
11,	.2380,	.1780,	.1940,	.2010,	.2050,	.2020,	.2240,	.2670,	.2670,	.1110,
12,	.5070,	.4300,	.4620,	.4860,	.5060,	.4810,	.4110,	.4380,	.4380,	.3680,
13,	.7940,	.7350,	.6890,	.6530,	.6230,	.5450,	.5390,	.5740,	.5740,	.5870,
14,	.8720,	.8270,	.8010,	.7670,	.7260,	.7410,	.7740,	.8430,	.8430,	.6960,
15,	.9120,	.8850,	.8620,	.8320,	.8010,	.8500,	.8880,	.9510,	.9510,	.7290,
16,	.9500,	.9580,	1.0000,	1.0000,	1.0000,	.9620,	.9460,	.9200,	.9200,	.7890,
17,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.9920,	.9890,	.9890,	1.0000,
18,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 6.8

The SAS System 18:40 Wednesday, August 28, 1996

SMN-ARCT: Sebastes mentella in the North-East Arctic (Fishing Areas I & II)

FLT04: RUSSIAN PST-TRAWLERS. S.mentella, effort and catch-in-numbers

Year	Fishing effort	Catch, age 9	Catch, age 10	Catch, age 11	Catch, age 12	Catch, age 13	Catch, age 14	Catch, age 15	Catch, age 16	Catch, age 17	Catch, age 18
1982	107438	12274	46292	55860	45491	36890	15160	9280	5651	3293	2112
1983	93578	4434	16176	30337	49510	46805	29041	16599	8087	5075	1991
1984	51171	1823	7253	20429	34813	43613	23884	11197	3898	1383	418
1985	56802	3699	14997	28079	37598	30822	9769	3967	1826	617	318
1986	26976	587	2315	4522	8434	13164	5747	2010	522	309	52
1987	9093	637	1898	1618	2161	3751	2235	880	396	126	40
1988	11241	191	928	1773	2062	3513	3692	2031	990	496	166
1989	14533	2827	3274	2899	2891	5310	4882	2041	1250	730	320
1990	17355	4590	5031	4261	6224	8590	5580	1910	811	165	17
1991	17878	3998	4055	3694	3653	4949	4612	2030	724	178	150
1992	5962	983	850	654	596	614	572	488	306	194	80
1993	6260	403	1590	2506	2044	1584	1543	1296	809	491	240
1994	6341	399	1343	1406	1728	600	1132	948	1519	663	231
1995	7395	512	471	972	1484	3545	2676	1656	1027	360	322

The SAS System 18:40 Wednesday, August 28, 1996

SMN-ARCT: Sebastes mentella in the North-East Arctic (Fishing Areas I & II)

FLT10: RUSSIAN SURVEY. Effort and catch rates. S.mentella (Catch: Number)

Year	Fishing effort	Catch, age 1	Catch, age 2	Catch, age 3	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8	Catch, age 9	Catch, age 10
1978	1	2.0	81.0	17.0	49.0	43.0	67.0	195.0	198.0	87.0	15.0
1979	1	0.0	2.0	12.0	64.0	228.0	373.0	576.0	519.0	349.0	122.0
1980	1	19.0	9.0	2.0	25.0	24.0	48.0	86.0	123.0	180.0	119.0
1981	1	4.0	14.0	10.0	9.0	68.0	35.0	48.0	56.0	67.0	57.0
1982	1	22.0	20.0	36.0	50.0	51.0	49.0	50.0	0.0	0.0	0.0
1983	1	132.0	39.0	25.0	23.0	38.0	37.0	50.0	0.0	0.0	0.0
1984	1	30.0	130.0	200.0	160.0	90.0	20.0	10.0	10.0	0.0	0.0
1985	1	100.0	50.0	150.0	60.0	60.0	110.0	200.0	190.0	130.0	40.0
1986	1	70.0	20.0	60.0	340.0	120.0	110.0	160.0	60.0	20.0	0.0
1987	1	0.0	0.0	0.0	310.0	440.0	470.0	250.0	10.0	0.0	0.0
1988	1	30.0	10.0	10.0	50.0	340.0	390.0	180.0	20.0	0.0	0.0
1989	1	581.0	379.0	18.0	52.0	183.0	323.0	326.0	63.0	0.0	0.0
1990	1	90.0	43.0	13.0	84.0	162.0	190.0	133.0	43.0	16.0	15.0
1991	1	63.0	170.0	133.0	80.0	36.0	17.0	22.0	40.0	31.0	5.0
1992	1	10.0	61.0	234.0	258.0	41.0	21.0	17.0	24.0	42.0	49.0
1993	1	1.0	5.0	10.0	46.0	39.0	20.0	12.0	6.0	2.0	6.0
1994	1	1.0	2.0	15.0	43.0	54.0	86.0	106.0	56.0	28.0	17.0
1995	1	35.0	15.0	1.0	12.0	17.0	40.0	112.0	96.0	82.0	38.0

Table 6.9

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Lowestoft VPA Version 3.1

  29-Aug-96  11:57:09

Extended Survivors Analysis

Arctic S. mentella (run: XSATJA05/X05)

CPUE data from file /users/fish/ifad/ifapwork/afwg/smn_arct/FLEET.X05

Catch data for  31 years. 1965 to 1995. Ages  1 to  19.

     Fleet,           First, Last, First, Last, Alpha,  Beta
                ,      year, year,  age ,  age
FLT04: RUSSIAN PST-T,   1982, 1995,   9,    18,   .000,  1.000
FLT10: RUSSIAN SURVE,   1978, 1995,   1,    10,   .850,   .950


Time series weights :

     Tapered time weighting applied
     Power =    3 over  20 years


Catchability analysis :

     Catchability independent of stock size for all ages

     Catchability independent of age for ages >=   17


Terminal population estimation :

     Survivor estimates shrunk towards the mean F
     of the final   2 years or the   5 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   47 iterations




Regression weights
      ,  .751,  .820,  .877,  .921,  .954,  .976,  .990,  .997, 1.000, 1.000


Fishing mortalities
   Age,  1986,  1987,  1988,  1989,  1990,  1991,  1992,  1993,  1994,  1995

     1,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .000
     2,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .002,  .000
     3,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .003,  .000
     4,  .000,  .000,  .000,  .000,  .000,  .000,  .005,  .004,  .001,  .000
     5,  .000,  .000,  .000,  .000,  .000,  .031,  .010,  .001,  .001,  .002
     6,  .000,  .000,  .000,  .000,  .000,  .033,  .033,  .002,  .004,  .005
     7,  .002,  .000,  .000,  .003,  .007,  .084,  .057,  .003,  .009,  .005
     8,  .003,  .002,  .000,  .026,  .030,  .087,  .034,  .004,  .015,  .018
     9,  .015,  .016,  .006,  .063,  .110,  .058,  .020,  .010,  .028,  .017
    10,  .058,  .050,  .031,  .088,  .141,  .169,  .017,  .029,  .058,  .024
    11,  .138,  .060,  .066,  .084,  .148,  .131,  .039,  .034,  .043,  .033
    12,  .221,  .104,  .109,  .105,  .214,  .201,  .063,  .075,  .037,  .038
    13,  .453,  .172,  .270,  .249,  .363,  .363,  .095,  .079,  .051,  .063
    14,  .559,  .159,  .281,  .355,  .402,  .600,  .117,  .150,  .092,  .138
    15,  .319,  .188,  .233,  .244,  .283,  .350,  .236,  .117,  .139,  .113
    16,  .250,  .116,  .367,  .269,  .125,  .274,  .281,  .189,  .278,  .122
    17,  .365,  .098,  .227,  .916,  .160, 1.777,  .287,  .187,  .215,  .089
    18,  .291,  .086,  .196,  .687, 1.407, 2.124,  .482,  .133,  .172,  .192
```

Table 6.9 (Cont'd)

XSA population numbers (Thousands)

	AGE								
YEAR ,	1,	2,	3,	4,	5,	6,	7,	8,	
1986 ,	8.95E+04,	1.17E+05,	1.68E+05,	2.16E+05,	1.05E+05,	9.26E+04,	7.57E+04,	7.96E+04,	7.57E+04, 5.71E+04,
1987 ,	1.04E+05,	8.10E+04,	1.06E+05,	1.52E+05,	1.96E+05,	9.52E+04,	8.38E+04,	6.84E+04,	7.19E+04, 6.75E+04,
1988 ,	1.50E+05,	9.41E+04,	7.33E+04,	9.56E+04,	1.38E+05,	1.77E+05,	8.61E+04,	7.58E+04,	6.18E+04, 6.40E+04,
1989 ,	3.19E+05,	1.35E+05,	8.52E+04,	6.63E+04,	8.65E+04,	1.25E+05,	1.60E+05,	7.79E+04,	6.86E+04, 5.55E+04,
1990 ,	1.83E+05,	2.89E+05,	1.23E+05,	7.71E+04,	6.00E+04,	7.83E+04,	1.13E+05,	1.44E+05,	6.87E+04, 5.83E+04,
1991 ,	7.75E+04,	1.65E+05,	2.61E+05,	1.11E+05,	6.97E+04,	5.43E+04,	7.08E+04,	1.01E+05,	1.27E+05, 5.57E+04,
1992 ,	2.70E+04,	7.01E+04,	1.50E+05,	2.36E+05,	1.00E+05,	6.11E+04,	4.76E+04,	5.89E+04,	8.41E+04, 1.08E+05,
1993 ,	3.69E+03,	2.44E+04,	6.34E+04,	1.35E+05,	2.13E+05,	8.99E+04,	5.35E+04,	4.07E+04,	5.15E+04, 7.45E+04,
1994 ,	7.90E+03,	3.34E+03,	2.21E+04,	5.74E+04,	1.22E+05,	1.92E+05,	8.12E+04,	4.83E+04,	3.66E+04, 4.61E+04,
1995 ,	9.75E+04,	7.15E+03,	3.01E+03,	1.99E+04,	5.19E+04,	1.10E+05,	1.73E+05,	7.28E+04,	4.30E+04, 3.22E+04,

Estimated population abundance at 1st Jan 1996

, .00E+00, 8.82E+04, 6.47E+03, 2.73E+03, 1.80E+04, 4.69E+04, 9.93E+04, 1.56E+05, 6.47E+04, 3.83E+04,

Taper weighted geometric mean of the VPA populations:

, 7.24E+04, 6.81E+04, 7.92E+04, 9.84E+04, 1.04E+05, 1.02E+05, 9.30E+04, 8.14E+04, 7.60E+04, 7.24E+04,

Standard error of the weighted Log(VPA populations) :

, 1.3654, 1.3868, 1.2084, .6515, .4344, .4091, .4586, .4834, .5294, .5368,

	AGE								
YEAR ,	11,	12,	13,	14,	15,	16,	17,	18,	
1986 ,	4.81E+04,	5.68E+04,	4.59E+04,	1.73E+04,	9.60E+03,	3.35E+03,	1.34E+03,	3.38E+02,	
1987 ,	4.88E+04,	3.79E+04,	4.12E+04,	2.64E+04,	8.95E+03,	6.31E+03,	2.36E+03,	8.43E+02,	
1988 ,	5.81E+04,	4.16E+04,	3.09E+04,	3.14E+04,	2.04E+04,	6.71E+03,	5.09E+03,	1.93E+03,	
1989 ,	5.62E+04,	4.92E+04,	3.37E+04,	2.14E+04,	2.15E+04,	1.46E+04,	4.20E+03,	3.67E+03,	
1990 ,	4.60E+04,	4.67E+04,	4.01E+04,	2.38E+04,	1.36E+04,	1.52E+04,	1.01E+04,	1.52E+03,	
1991 ,	4.58E+04,	3.59E+04,	3.41E+04,	2.52E+04,	1.44E+04,	9.24E+03,	1.22E+04,	7.79E+03,	
1992 ,	4.25E+04,	3.64E+04,	2.66E+04,	2.15E+04,	1.25E+04,	9.18E+03,	6.36E+03,	1.86E+03,	
1993 ,	9.63E+04,	3.70E+04,	3.09E+04,	2.19E+04,	1.73E+04,	8.95E+03,	6.27E+03,	4.32E+03,	
1994 ,	6.55E+04,	8.42E+04,	3.11E+04,	2.58E+04,	1.70E+04,	1.39E+04,	6.70E+03,	4.71E+03,	
1995 ,	3.94E+04,	5.68E+04,	7.34E+04,	2.67E+04,	2.13E+04,	1.34E+04,	9.54E+03,	4.89E+03,	

Estimated population abundance at 1st Jan 1996

, 2.85E+04, 3.45E+04, 4.94E+04, 6.24E+04, 2.11E+04, 1.72E+04, 1.07E+04, 7.90E+03,

Taper weighted geometric mean of the VPA populations:

, 6.63E+04, 5.69E+04, 4.28E+04, 2.59E+04, 1.55E+04, 9.13E+03, 5.18E+03, 2.44E+03,

Standard error of the weighted Log(VPA populations) :

, .5059, .4648, .3954, .2517, .3380, .4893, .7275, .9025,

Table 6.9 (Cont'd)

Log catchability residuals.

Fleet : FLT04: RUSSIAN PST-T

Age	1978	1979	1980	1981	1982	1983	1984	1985
1	No data for this fleet at this age							
2	No data for this fleet at this age							
3	No data for this fleet at this age							
4	No data for this fleet at this age							
5	No data for this fleet at this age							
6	No data for this fleet at this age							
7	No data for this fleet at this age							
8	No data for this fleet at this age							
9	99.99	99.99	99.99	99.99	-.61	-1.15	-.95	-.15
10	99.99	99.99	99.99	99.99	-.11	-.84	-.73	.47
11	99.99	99.99	99.99	99.99	-.25	-.37	-.08	.52
12	99.99	99.99	99.99	99.99	-.44	-.07	.49	.56
13	99.99	99.99	99.99	99.99	-.64	-.09	.77	.59
14	99.99	99.99	99.99	99.99	-1.03	-.16	.73	-.04
15	99.99	99.99	99.99	99.99	-.71	.26	.89	.20
16	99.99	99.99	99.99	99.99	-.58	.40	1.04	.37
17	99.99	99.99	99.99	99.99	-.25	.83	.82	.79
18	99.99	99.99	99.99	99.99	-.19	.31	.39	.14

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	No data for this fleet at this age									
2	No data for this fleet at this age									
3	No data for this fleet at this age									
4	No data for this fleet at this age									
5	No data for this fleet at this age									
6	No data for this fleet at this age									
7	No data for this fleet at this age									
8	No data for this fleet at this age									
9	-1.38	-.16	-1.43	.93	1.26	.45	.54	.08	.41	.34
10	-.54	.17	-.71	.46	.69	.51	-.70	.26	.57	-.29
11	-.01	.00	-.29	-.01	.43	.25	-.35	.12	-.08	-.10
12	.13	.21	-.14	-.23	.46	.16	-.64	.53	-.49	-.40
13	.40	.21	.26	.32	.51	.09	-.78	-.04	-1.04	-.27
14	.33	-.13	.04	.48	.35	.17	-.89	.06	-.46	.23
15	-.11	.16	-.02	-.32	-.08	-.08	-.32	.23	-.07	.09
16	-.35	-.24	.52	-.33	-1.04	-.62	-.37	.53	.75	.17
17	.31	-.19	.26	.89	-1.99	-1.46	-.24	.61	.85	-.33
18	-.12	-.31	.12	.10	-1.84	-1.07	.20	.24	.12	.27

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

Age	9	10	11	12	13	14	15	16	17	18
Mean Log q	-13.6218	-12.7863	-12.4451	-12.0871	-11.5863	-11.3261	-11.4518	-11.5381	-11.7597	-11.7597
S.E(Log q)	.8577	.5677	.2657	.4217	.5427	.4640	.3124	.6067	.9383	.6789

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
9	1.72	-.619	15.38	.07	14	1.52	-13.62
10	2.13	-1.392	14.68	.14	14	1.16	-12.79
11	1.05	-.228	12.51	.73	14	.29	-12.45
12	1.07	-.223	12.17	.49	14	.48	-12.09
13	.77	.690	11.37	.49	14	.43	-11.59
14	1.34	-.418	11.72	.14	14	.65	-11.33
15	1.09	-.270	11.61	.50	14	.36	-11.45
16	1.34	-.651	12.37	.28	14	.84	-11.54
17	3.24	-1.972	19.00	.08	14	2.69	-11.76
18	.99	.025	11.88	.65	14	.69	-11.91

Table 6.9 (Cont'd)

Fleet : FLT10: RUSSIAN SURVE

Age	1978	1979	1980	1981	1982	1983	1984	1985
1	-3.43	99.99	-.96	-2.62	-.94	.23	-.90	.77
2	.35	-3.47	-1.90	-1.30	-1.05	-.40	.18	-.43
3	-1.05	-1.20	-3.11	-1.44	.00	-.46	1.59	.68
4	-1.18	-.41	-1.15	-2.29	-.51	-1.13	.71	-.30
5	-1.66	.40	-1.35	-.11	-.52	-.74	.27	-.23
6	-1.49	.62	-1.05	-.86	-.33	-.73	-1.28	.58
7	-.71	.72	-.82	-1.03	-.49	-.31	-2.04	1.03
8	.09	1.03	-.08	-.55	99.99	99.99	-1.26	1.58
9	-.25	1.03	.33	-.34	99.99	99.99	99.99	1.61
10	-1.18	.63	.49	-.27	99.99	99.99	99.99	.84
11	No data for this fleet at this age							
12	No data for this fleet at this age							
13	No data for this fleet at this age							
14	No data for this fleet at this age							
15	No data for this fleet at this age							
16	No data for this fleet at this age							
17	No data for this fleet at this age							
18	No data for this fleet at this age							

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	.78	99.99	-.58	1.62	.32	.82	.03	-.28	-1.04	.00
2	-.88	99.99	-1.35	1.92	-1.02	.91	.75	-.70	.38	1.63
3	.11	99.99	-.85	-.41	-1.10	.47	1.59	-.70	.76	.04
4	.82	1.08	-.28	.12	.45	.04	.46	-.71	.08	-.14
5	.44	1.11	1.21	1.05	1.30	-.33	-.58	-1.39	-.51	-.81
6	.48	1.91	1.10	1.26	1.20	-.82	-.73	-1.19	-.49	-.70
7	.96	1.31	.95	.93	.38	-.88	-.76	-1.28	.49	-.22
8	.49	-1.16	-.57	.58	-.42	-.09	-.10	-1.14	.93	1.06
9	-.43	99.99	99.99	99.99	-.47	-.47	.22	-2.35	.65	1.55
10	99.99	99.99	99.99	99.99	-.08	-1.11	.37	-1.34	.21	1.34
11	No data for this fleet at this age									
12	No data for this fleet at this age									
13	No data for this fleet at this age									
14	No data for this fleet at this age									
15	No data for this fleet at this age									
16	No data for this fleet at this age									
17	No data for this fleet at this age									
18	No data for this fleet at this age									

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

Age	1	2	3	4	5	6	7	8	9	10
Mean Log q	-7.8423	-7.7056	-7.9632	-7.1831	-7.1209	-7.1275	-7.0312	-7.5835	-7.7091	-7.9686
S.E(Log q)	.9498	1.1877	1.0036	.6973	.9193	1.0617	.9908	.8938	1.2450	.9498

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
1	.83	.976	8.41	.78	16	.79	-7.84
2	1.36	-1.026	6.48	.47	17	1.61	-7.71
3	.97	.099	8.05	.62	17	1.03	-7.96
4	.86	.497	7.80	.55	18	.62	-7.18
5	1.34	-.378	5.62	.11	18	1.28	-7.12
6	.71	.501	8.41	.23	18	.78	-7.13
7	.67	.729	8.48	.33	18	.68	-7.03
8	.89	.197	7.98	.27	16	.84	-7.58
9	1.29	-.272	6.68	.12	12	1.73	-7.71
10	1.50	-.487	6.38	.15	11	1.52	-7.97

Table 6.9 (Cont'd)

Terminal year survivor and F summaries :

Age 1 Catchability constant w.r.t. time and dependent on age

Year class = 1994

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	88228.,	.992,	.000,	.00,	1,	1.000,	.000
F shrinkage mean ,	0.,	2.00,,,,				.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
88228.,	.99,	.00,	1,	.000,	.000

Age 2 Catchability constant w.r.t. time and dependent on age

Year class = 1993

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	6471.,	.774,	1.303,	1.68,	2,	1.000,	.000
F shrinkage mean ,	0.,	2.00,,,,				.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
6471.,	.77,	1.30,	2,	1.683,	.000

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

Year class = 1992

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	2727.,	.623,	.184,	.29,	3,	1.000,	.000
F shrinkage mean ,	0.,	2.00,,,,				.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
2727.,	.62,	.18,	3,	.295,	.000

Age 4 Catchability constant w.r.t. time and dependent on age

Year class = 1991

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	18044.,	.473,	.257,	.54,	4,	1.000,	.000
F shrinkage mean ,	0.,	2.00,,,,				.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
18044.,	.47,	.26,	4,	.542,	.000

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

Year class = 1990

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	46167.,	.425,	.315,	.74,	5,	.957,	.002
F shrinkage mean ,	65261.,	2.00,,,,				.043,	.001

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
46864.,	.42,	.28,	6,	.668,	.002

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

Year class = 1989

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	96850.,	.398,	.380,	.95,	6,	.962,	.006
F shrinkage mean ,	187895.,	2.00,,,,				.038,	.003

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
99349.,	.39,	.34,	7,	.881,	.005

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

Year class = 1988

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	156668.,	.373,	.375,	1.00,	7,	.966,	.005
F shrinkage mean ,	140002.,	2.00,,,,				.034,	.006

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
156069.,	.37,	.34,	8,	.930,	.005

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

Year class = 1987

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, ,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	1.,	.000,	.000,	.00,	0,	.000,	.000
FLT10: RUSSIAN SURVE,	63444.,	.349,	.339,	.97,	8,	.969,	.018
F shrinkage mean ,	119688.,	2.00,,,,				.031,	.010

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
64687.,	.34,	.31,	9,	.915,	.018

Age 9 Catchability constant w.r.t. time and dependent on age

Year class = 1986

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, ,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	53762.,	.895,	.000,	.00,	1,	.141,	.012
FLT10: RUSSIAN SURVE,	36251.,	.359,	.336,	.93,	8,	.830,	.018
F shrinkage mean ,	34901.,	2.00,,,,				.029,	.019

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
38284.,	.33,	.27,	10,	.832,	.017

Age 10 Catchability constant w.r.t. time and dependent on age

Year class = 1985

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, ,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	26320.,	.494,	.319,	.65,	2,	.329,	.026
FLT10: RUSSIAN SURVE,	30191.,	.338,	.326,	.97,	9,	.651,	.023
F shrinkage mean ,	15785.,	2.00,,,,				.021,	.043

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
28476.,	.28,	.23,	12,	.845,	.024

Age 11 Catchability constant w.r.t. time and dependent on age

Year class = 1984

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, ,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	35736.,	.257,	.181,	.71,	3,	.671,	.032
FLT10: RUSSIAN SURVE,	32145.,	.349,	.330,	.94,	9,	.317,	.035
F shrinkage mean ,	29393.,	2.00,,,,				.012,	.038

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
34477.,	.21,	.16,	13,	.796,	.033

Age 12 Catchability constant w.r.t. time and dependent on age

Year class = 1983

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	45535.,	.222,	.146,	.66,	4,	.723,	.041
FLT10: RUSSIAN SURVE,	62673.,	.343,	.290,	.85,	10,	.267,	.030
F shrinkage mean ,	33245.,	2.00,,,,				.010,	.056

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
49443.,	.19,	.14,	15,	.749,	.038

Age 13 Catchability constant w.r.t. time and dependent on age

Year class = 1982

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	53581.,	.207,	.169,	.82,	5,	.758,	.073
FLT10: RUSSIAN SURVE,	102357.,	.354,	.184,	.52,	10,	.233,	.039
F shrinkage mean ,	60194.,	2.00,,,,				.009,	.065

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
62374.,	.18,	.12,	16,	.699,	.063

Age 14 Catchability constant w.r.t. time and dependent on age

Year class = 1981

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	20201.,	.192,	.252,	1.32,	6,	.827,	.143
FLT10: RUSSIAN SURVE,	25829.,	.369,	.314,	.85,	10,	.163,	.114
F shrinkage mean ,	24161.,	2.00,,,,				.010,	.121

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
21064.,	.17,	.16,	17,	.945,	.138

Age 15 Catchability constant w.r.t. time and dependent on age

Year class = 1980

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	17240.,	.168,	.156,	.93,	7,	.887,	.113
FLT10: RUSSIAN SURVE,	17368.,	.404,	.309,	.76,	9,	.104,	.112
F shrinkage mean ,	15039.,	2.00,,,,				.008,	.128

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
17233.,	.16,	.11,	17,	.737,	.113

Age 16 Catchability constant w.r.t. time and dependent on age

Year class = 1979

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	11089.,	.167,	.142,	.85,	8,	.920,	.118
FLT10: RUSSIAN SURVE,	7902.,	.473,	.329,	.70,	8,	.070,	.162
F shrinkage mean ,	5291.,	2.00,,,,				.010,	.234

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
10747.,	.16,	.11,	17,	.697,	.122

Age 17 Catchability constant w.r.t. time and dependent on age

Year class = 1978

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	8115.,	.172,	.167,	.97,	9,	.934,	.087
FLT10: RUSSIAN SURVE,	6152.,	.527,	.365,	.69,	7,	.052,	.113
F shrinkage mean ,	3284.,	2.00,,,,				.013,	.202

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
7902.,	.17,	.13,	17,	.778,	.089

Age 18 Catchability constant w.r.t. time and age (fixed at the value for age) 17

Year class = 1977

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT04: RUSSIAN PST-T,	3712.,	.190,	.137,	.72,	10,	.945,	.189
FLT10: RUSSIAN SURVE,	1596.,	.542,	.554,	1.02,	9,	.035,	.395
F shrinkage mean ,	6993.,	2.00,,,,				.020,	.105

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
3650.,	.19,	.12,	20,	.653,	.192

Table 6.10

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 8 Fishing mortality (F) at age
YEAR, 1965,

AGE	
1,	.0000,
2,	.0000,
3,	.0000,
4,	.0000,
5,	.0000,
6,	.0003,
7,	.0021,
8,	.0116,
9,	.0237,
10,	.0129,
11,	.0175,
12,	.0146,
13,	.0225,
14,	.0209,
15,	.0210,
16,	.0182,
17,	.0244,
18,	.0214,
+gp,	.0214,
FBAR 10-16,	.0182,

Table 8 Fishing mortality (F) at age

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0001,	.0000,	.0000,	.0009,	.0004,	.0015,	.0124,
7,	.0000,	.0000,	.0000,	.0005,	.0000,	.0000,	.0015,	.0036,	.0130,	.0547,
8,	.0002,	.0001,	.0001,	.0032,	.0002,	.0004,	.0125,	.0106,	.0381,	.1359,
9,	.0023,	.0001,	.0008,	.0049,	.0011,	.0017,	.0144,	.0239,	.0721,	.2599,
10,	.0065,	.0016,	.0019,	.0084,	.0065,	.0065,	.0138,	.0209,	.0865,	.3731,
11,	.0059,	.0039,	.0035,	.0101,	.0240,	.0186,	.0190,	.0199,	.1054,	.5019,
12,	.0093,	.0048,	.0066,	.0106,	.0421,	.0576,	.0518,	.0385,	.0937,	.4375,
13,	.0101,	.0056,	.0086,	.0144,	.0503,	.0702,	.0699,	.0824,	.1267,	.3617,
14,	.0199,	.0045,	.0136,	.0108,	.0687,	.0812,	.0806,	.1047,	.1713,	.4482,
15,	.0168,	.0057,	.0078,	.0085,	.0559,	.1167,	.0729,	.0946,	.1511,	.5018,
16,	.0206,	.0059,	.0120,	.0092,	.0809,	.1857,	.1395,	.1162,	.1525,	.4661,
17,	.0141,	.0082,	.0072,	.0065,	.0353,	.1108,	.1157,	.1425,	.0881,	.5468,
18,	.0163,	.0060,	.0099,	.0099,	.0583,	.1131,	.0958,	.1082,	.1381,	.4665,
+gp,	.0163,	.0060,	.0099,	.0099,	.0583,	.1131,	.0958,	.1082,	.1381,	.4665,
FBAR 10-16,	.0127,	.0046,	.0077,	.0103,	.0469,	.0766,	.0639,	.0682,	.1267,	.4415,

Table 6.10 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 8 Fishing mortality (F) at age YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0351,	.0000,	.0075,	.0138,	.0060,	.0087,	.0001,	.0002,	.0000,	.0012,
7,	.0729,	.0051,	.0630,	.0609,	.0319,	.0188,	.0088,	.0011,	.0004,	.0068,
8,	.2108,	.0493,	.1641,	.1095,	.0932,	.0426,	.0340,	.0231,	.0073,	.0249,
9,	.3519,	.1580,	.1908,	.1533,	.1388,	.1162,	.0726,	.0373,	.0278,	.0792,
10,	.5803,	.3717,	.2104,	.1780,	.1715,	.1985,	.2762,	.1173,	.0760,	.2910,
11,	.7310,	.4937,	.2109,	.2266,	.1692,	.2237,	.3385,	.2646,	.2010,	.4243,
12,	.8291,	.8454,	.2812,	.3146,	.2398,	.2893,	.3987,	.5079,	.4992,	.6204,
13,	.7448,	.7133,	.2909,	.4158,	.2489,	.3827,	.5428,	.8259,	1.1209,	1.0385,
14,	.5525,	.6368,	.2958,	.2796,	.2525,	.4026,	.4736,	1.0018,	1.3785,	.7141,
15,	.5366,	.4995,	.3301,	.2036,	.4004,	.3560,	.5776,	1.3459,	1.4378,	.7911,
16,	.5612,	.3971,	.2676,	.3209,	.6405,	.3035,	.6021,	1.4263,	1.5839,	.8744,
17,	.3668,	.5312,	.2211,	.2259,	.5367,	.3809,	.6721,	1.7553,	.9884,	1.0489,
18,	.5545,	.5577,	.2818,	.2899,	.4171,	.3662,	.7124,	1.0390,	.7381,	.5561,
+gp,	.5545,	.5577,	.2818,	.2899,	.4171,	.3662,	.7124,	1.0390,	.7381,	.5561,
FBAR 10-16,	.6479,	.5653,	.2696,	.2770,	.3033,	.3080,	.4585,	.7842,	.8996,	.6791,

Table 8 Fishing mortality (F) at age YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	FBAR 93-95
AGE											
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0016,	.0000,	.0005,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0029,	.0000,	.0010,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0049,	.0043,	.0011,	.0000,	.0018,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0313,	.0101,	.0014,	.0007,	.0015,	.0012,
6,	.0003,	.0000,	.0000,	.0004,	.0000,	.0325,	.0327,	.0018,	.0039,	.0054,	.0037,
7,	.0016,	.0000,	.0000,	.0031,	.0070,	.0844,	.0568,	.0030,	.0091,	.0055,	.0059,
8,	.0028,	.0017,	.0000,	.0264,	.0298,	.0866,	.0345,	.0044,	.0152,	.0181,	.0126,
9,	.0147,	.0156,	.0065,	.0628,	.1099,	.0579,	.0205,	.0102,	.0278,	.0173,	.0184,
10,	.0583,	.0503,	.0307,	.0876,	.1411,	.1689,	.0174,	.0290,	.0578,	.0243,	.0371,
11,	.1384,	.0595,	.0657,	.0840,	.1484,	.1308,	.0386,	.0338,	.0431,	.0329,	.0366,
12,	.2206,	.1045,	.1090,	.1051,	.2141,	.2012,	.0629,	.0751,	.0374,	.0382,	.0503,
13,	.4535,	.1725,	.2699,	.2486,	.3629,	.3628,	.0949,	.0791,	.0512,	.0630,	.0645,
14,	.5595,	.1594,	.2809,	.3548,	.4024,	.6000,	.1171,	.1498,	.0924,	.1379,	.1267,
15,	.3192,	.1881,	.2326,	.2436,	.2826,	.3504,	.2362,	.1170,	.1387,	.1126,	.1228,
16,	.2499,	.1157,	.3671,	.2694,	.1248,	.2736,	.2807,	.1890,	.2776,	.1219,	.1962,
17,	.3647,	.0983,	.2271,	.9162,	.1598,	1.7765,	.2875,	.1875,	.2153,	.0889,	.1639,
18,	.2908,	.0859,	.1963,	.6865,	1.4071,	2.1238,	.4821,	.1328,	.1717,	.1924,	.1656,
+gp,	.2908,	.0859,	.1963,	.6865,	1.4071,	2.1238,	.4821,	.1328,	.1717,	.1924,	
FBAR 10-16,	.2856,	.1214,	.1937,	.1990,	.2395,	.2983,	.1211,	.0961,	.0998,	.0759,	

Table 6.11

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 10 Stock number at age (start of year) Numbers*10**-3

YEAR,	1965,
AGE	
1,	975089,
2,	531549,
3,	317848,
4,	200890,
5,	167159,
6,	156697,
7,	146056,
8,	145020,
9,	97258,
10,	93515,
11,	93825,
12,	143516,
13,	116506,
14,	142835,
15,	101080,
16,	120463,
17,	69498,
18,	73122,
+gp,	128446,
TOTAL,	3820375,

Table 10 Stock number at age (start of year) Numbers*10**-3

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	979683,	879853,	716435,	699680,	822670,	948769,	946618,	669797,	458023,	309900,
2,	882297,	886453,	796124,	648258,	633097,	744382,	858481,	856535,	606057,	414437,
3,	480966,	798335,	802096,	720362,	586568,	572850,	673545,	776786,	775024,	548384,
4,	287601,	435196,	722364,	725767,	651811,	530749,	518336,	609448,	702865,	701272,
5,	181773,	260232,	393781,	653621,	656701,	589783,	480241,	469010,	551452,	635978,
6,	151251,	164475,	235468,	356308,	591421,	594207,	533658,	434540,	424378,	498974,
7,	141740,	136858,	148823,	213054,	322371,	535140,	537661,	482430,	393024,	383416,
8,	131886,	128252,	123834,	134661,	192689,	291694,	484215,	485742,	434942,	351013,
9,	129705,	119310,	116040,	112036,	121457,	174321,	263827,	432687,	434890,	378854,
10,	85945,	117097,	107942,	104913,	100876,	109774,	157462,	235309,	382257,	366127,
11,	83531,	77261,	105780,	97487,	94132,	90686,	98680,	140529,	208507,	317206,
12,	83427,	75139,	69637,	95376,	87322,	83156,	80544,	87606,	124651,	169789,
13,	127983,	74792,	67663,	62596,	85393,	75752,	71029,	69203,	76274,	102703,
14,	103069,	114640,	67300,	60697,	55831,	73478,	63897,	59929,	57663,	60803,
15,	126575,	91428,	103266,	60074,	54333,	47164,	61300,	53342,	48836,	43963,
16,	89562,	112621,	82255,	92708,	53898,	46491,	37977,	51569,	43911,	37992,
17,	107034,	79383,	101306,	73542,	83118,	44981,	34937,	29888,	41544,	34113,
18,	61370,	95495,	71246,	91006,	66115,	72599,	36433,	28157,	23451,	34421,
+gp,	128650,	575180,	192963,	271700,	106052,	146671,	39606,	31252,	43119,	62797,
TOTAL,	4364049,	5222002,	5024322,	5273847,	5365856,	5772644,	5978445,	6003756,	5830867,	5452139,

Table 6.11 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 10 Stock number at age (start of year)						Numbers*10**-3				
YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	187470,	153353,	172739,	161460,	138117,	152744,	156888,	291653,	205535,	129031,
2,	280409,	169630,	138759,	156301,	146095,	124973,	138209,	141958,	263899,	185976,
3,	374998,	253724,	153487,	125554,	141427,	132192,	113081,	125056,	128449,	238785,
4,	496198,	339312,	229579,	138881,	113606,	127968,	119613,	102319,	113156,	116225,
5,	634537,	448978,	307022,	207732,	125665,	102795,	115790,	108230,	92583,	102387,
6,	575457,	574152,	406252,	277805,	187964,	113706,	93013,	104771,	97931,	83772,
7,	445941,	502725,	519515,	364829,	247912,	169064,	101999,	84157,	94782,	88611,
8,	328459,	375143,	452585,	441389,	310614,	217270,	150121,	91480,	76066,	85730,
9,	277253,	240704,	323106,	347532,	357956,	256041,	188394,	131293,	80885,	68328,
10,	264344,	176444,	185976,	241572,	269755,	281913,	206263,	158524,	114446,	71184,
11,	228114,	133876,	110092,	136346,	182941,	205616,	209151,	141595,	127558,	95975,
12,	173752,	99369,	73939,	80678,	98355,	139764,	148755,	134900,	98338,	94405,
13,	99192,	68616,	38606,	50501,	53294,	70019,	94699,	90340,	73456,	54010,
14,	64725,	42619,	30423,	26114,	30151,	37595,	43210,	49796,	35792,	21666,
15,	35142,	33706,	20400,	20479,	17866,	21194,	22742,	24349,	16546,	8160,
16,	24085,	18594,	18508,	13269,	15117,	10832,	13434,	11549,	5735,	3555,
17,	21569,	12434,	11311,	12814,	8710,	7209,	7236,	6657,	2510,	1065,
18,	17865,	13523,	6614,	8205,	9250,	4608,	4457,	3343,	1041,	845,
+gp,	28112,	34026,	12453,	27406,	7817,	6526,	8579,	1085,	944,	128,
TOTAL,	4557623,	3690931,	3211367,	2838866,	2462612,	2182030,	1935632,	1803059,	1629652,	1449839,

Table 10 Stock number at age (start of year)						Numbers*10**-3						
YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	1996,	GMST
AGE												
1,	89547,	104021,	149694,	319236,	182904,	77463,	26994,	3687,	7903,	97499,	0,	2316
2,	116752,	81025,	94122,	135449,	288857,	165498,	70091,	24425,	3336,	7151,	88228,	2496
3,	168278,	105642,	73315,	85165,	122559,	261368,	149749,	63421,	22100,	3014,	6471,	2476
4,	216062,	152264,	95589,	66338,	77060,	110896,	236496,	135498,	57386,	19940,	2727,	2339
5,	105165,	195501,	137775,	86492,	60025,	69727,	100343,	212936,	122080,	51867,	18044,	2139
6,	92644,	95157,	176897,	124664,	78261,	54313,	61147,	89884,	192399,	110382,	46864,	1919
7,	75707,	83800,	86102,	160063,	112755,	70813,	47572,	53547,	81184,	173414,	99349,	1762
8,	79636,	68391,	75825,	77908,	144379,	101313,	58887,	40669,	48305,	72790,	156069,	1628
9,	75661,	71853,	61779,	68610,	68655,	126800,	84068,	51478,	36638,	43047,	64687,	1464
10,	57118,	67463,	64012,	55540,	58302,	55657,	108283,	74525,	46107,	32244,	38284,	1265
11,	48148,	48754,	58051,	56172,	46038,	45813,	42535,	96286,	65504,	39376,	28476,	1024
12,	56817,	37934,	41566,	49186,	46733,	35914,	36370,	37031,	84230,	56768,	34477,	802
13,	45935,	41231,	30918,	33726,	40066,	34136,	26573,	30904,	31083,	73414,	49443,	603
14,	17299,	26410,	31397,	21358,	23799,	25219,	21489,	21868,	25836,	26720,	62374,	421
15,	9599,	8945,	20375,	21453,	13553,	14401,	12523,	17296,	17034,	21315,	21064,	291
16,	3347,	6312,	6706,	14611,	15215,	9244,	9179,	8948,	13922,	13416,	17233,	204
17,	1342,	2359,	5087,	4204,	10098,	12152,	6362,	6273,	6702,	9544,	10747,	141
18,	338,	843,	1935,	3668,	1522,	7788,	1861,	4318,	4705,	4889,	7902,	93
+gp,	278,	0,	624,	4670,	21457,	22659,	25333,	49227,	20849,	15045,	14881,	
TOTAL,	1259671,	1197906,	1211770,	1388511,	1412240,	1301173,	1125855,	1022219,	887301,	871835,	767319,	

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 12 Stock biomass at age (start of year) Tonnes

YEAR,	1965,
AGE	
1,	0,
2,	0,
3,	0,
4,	0,
5,	0,
6,	26325,
7,	26728,
8,	32630,
9,	30247,
10,	34320,
11,	40532,
12,	72906,
13,	71185,
14,	96985,
15,	76113,
16,	98900,
17,	60602,
18,	66541,
+gp,	128317,
TOTALBIO,	862334,

Table 12 Stock biomass at age (start of year) Tonnes

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	25410,	27632,	39559,	59860,	99359,	99827,	89654,	73003,	71295,	83828,
7,	25938,	25045,	27235,	38989,	58994,	97931,	98392,	88285,	71923,	70165,
8,	29674,	28857,	27863,	30299,	43355,	65631,	108948,	109292,	97862,	78978,
9,	40338,	37105,	36089,	34843,	37773,	54214,	82050,	134566,	135251,	117824,
10,	31542,	42975,	39615,	38503,	37021,	40287,	57789,	86358,	140288,	134369,
11,	36085,	33377,	45697,	42114,	40665,	39176,	42630,	60708,	90075,	137033,
12,	42381,	38171,	35376,	48451,	44360,	42243,	40916,	44504,	63323,	86253,
13,	78198,	45698,	41342,	38246,	52175,	46284,	43399,	42283,	46604,	62751,
14,	69984,	77841,	45697,	41213,	37909,	49891,	43386,	40691,	39153,	41285,
15,	95311,	68845,	77759,	45235,	40913,	35515,	46159,	40167,	36773,	33104,
16,	73530,	92462,	67532,	76113,	44251,	38169,	31179,	42338,	36051,	31192,
17,	93333,	69222,	88339,	64129,	72479,	39223,	30465,	26063,	36226,	29746,
18,	55847,	86901,	64834,	82815,	60164,	66065,	33154,	25623,	21341,	31323,
+gp,	127750,	593586,	194893,	278764,	106052,	149898,	38695,	30627,	43119,	63237,
TOTALBIO,	825322,	1267715,	831827,	919575,	775470,	864355,	786817,	844507,	929285,	1001087,

Table 6.12 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 12 Stock biomass at age (start of year) Tonnes										
YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	96677,	96458,	68250,	29725,	20112,	11598,	9487,	10687,	9989,	8545,
7,	81607,	91999,	95071,	56549,	38426,	23331,	14076,	11614,	9952,	11963,
8,	73903,	84407,	101831,	88278,	62123,	40847,	28223,	17198,	12551,	14317,
9,	86226,	74859,	100486,	87578,	90205,	64522,	47475,	33086,	17148,	14691,
10,	97014,	64755,	68253,	74887,	83624,	87393,	63941,	49143,	32388,	21569,
11,	98545,	57834,	47560,	50993,	68420,	74844,	76131,	45311,	43115,	33783,
12,	88266,	50480,	37561,	38080,	46424,	61496,	65452,	53960,	37663,	39650,
13,	60606,	41925,	23588,	28685,	30271,	39210,	53031,	42098,	32174,	25979,
14,	43948,	28939,	20657,	18672,	21558,	25564,	29383,	28035,	17967,	12220,
15,	26462,	25380,	15361,	18390,	16043,	17549,	18831,	17774,	9365,	5491,
16,	19774,	15265,	15195,	12393,	14119,	9814,	12171,	11457,	4078,	2876,
17,	18808,	10842,	9863,	13122,	8919,	6992,	7019,	7496,	2161,	1080,
18,	16257,	12306,	6019,	8615,	9713,	4838,	4679,	3841,	1006,	904,
+gp,	28703,	35115,	12827,	30969,	8638,	7296,	9625,	1333,	1219,	148,
TOTALBIO,	836796,	690564,	622523,	556935,	518595,	475296,	439525,	333032,	230776,	193214,

Table 12 Stock biomass at age (start of year) Tonnes										
YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	9450,	13703,	25473,	24683,	10957,	7061,	11618,	15280,	30784,	16557,
7,	9085,	15084,	15498,	32333,	16462,	12746,	10466,	12316,	17860,	29480,
8,	10910,	13336,	14786,	18854,	22812,	21276,	15311,	10167,	11593,	13830,
9,	16494,	15736,	12912,	19348,	14143,	34236,	23539,	14414,	10991,	9040,
10,	17193,	19429,	17923,	18384,	16325,	18923,	33568,	24593,	15676,	9028,
11,	16996,	16089,	19331,	21233,	16344,	16035,	14037,	36589,	24236,	12600,
12,	25454,	16653,	16502,	22429,	22011,	15084,	13821,	16294,	33692,	21572,
13,	23427,	21069,	14470,	17335,	21756,	15702,	12224,	14525,	13676,	30100,
14,	10051,	14895,	16860,	12131,	14541,	12862,	9240,	10715,	11626,	12558,
15,	6220,	5689,	11920,	12636,	8471,	8352,	5385,	9859,	8347,	11297,
16,	2828,	4873,	5010,	9818,	9509,	5454,	4130,	5190,	7657,	7916,
17,	1272,	1908,	4111,	2976,	6655,	7170,	3308,	3889,	3887,	6203,
18,	356,	804,	1743,	2839,	1003,	4595,	1061,	2807,	3153,	3471,
+gp,	351,	0,	653,	3914,	14956,	15861,	16973,	32588,	16471,	12126,
TOTALBIO,	150086,	159269,	177192,	218913,	195943,	195357,	174680,	209225,	209650,	195780,

Table 6.13

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 13 Spawning stock biomass at age (spawning time) Tonnes

YEAR,	1965,
AGE	
1,	0,
2,	0,
3,	0,
4,	0,
5,	0,
6,	0,
7,	0,
8,	979,
9,	1815,
10,	2746,
11,	8917,
12,	26246,
13,	39152,
14,	69829,
15,	64696,
16,	87032,
17,	57572,
18,	64545,
+gp,	128317,
TOTSPBIO,	551847,

Table 13 Spawning stock biomass at age (spawning time) Tonnes

YEAR,	1966,	1967,	1968,	1969,	1970,	1971,	1972,	1973,	1974,	1975,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
7,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
8,	890,	866,	836,	909,	1301,	1969,	3268,	3279,	2936,	2369,
9,	2420,	2226,	2165,	2091,	2266,	3253,	4923,	8074,	8115,	7069,
10,	2523,	3438,	3169,	3080,	2962,	3223,	4623,	6909,	11223,	10750,
11,	7939,	7343,	10053,	9265,	8946,	8619,	9379,	13356,	19816,	30147,
12,	15257,	13742,	12735,	17442,	15970,	15208,	14730,	16021,	22796,	31051,
13,	43009,	25134,	22738,	21035,	28696,	25456,	23869,	23256,	25632,	34513,
14,	50388,	56045,	32902,	29673,	27295,	35922,	31238,	29298,	28190,	29725,
15,	81015,	58518,	66095,	38450,	34776,	30187,	39235,	34142,	31257,	28138,
16,	64707,	81366,	59428,	66980,	38941,	33589,	27437,	37257,	31725,	27449,
17,	88667,	65761,	83922,	60922,	68855,	37262,	28942,	24759,	34415,	28259,
18,	54171,	84294,	62889,	80331,	58359,	64083,	32159,	24854,	20700,	30383,
+gp,	127750,	593586,	194893,	278764,	106052,	149898,	38695,	30627,	43119,	63237,
TOTSPBIO,	538736,	992319,	551825,	608943,	394418,	408669,	258499,	251832,	279926,	323091,

Table 6.13 (Cont'd)

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Terminal Fs derived using XSA (With F shrinkage)

Table 13 Spawning stock biomass at age (spawning time) Tonnes YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
7,	734,	828,	856,	509,	346,	210,	127,	105,	50,	0,
8,	1182,	1351,	1629,	1412,	994,	654,	452,	275,	100,	0,
9,	8709,	7561,	10149,	8845,	9111,	6517,	4795,	3342,	977,	147,
10,	18918,	12627,	13309,	14603,	16307,	17042,	12469,	9583,	5441,	1704,
11,	29564,	17350,	14268,	15298,	20526,	22453,	22839,	13593,	13021,	7365,
12,	47664,	27259,	20283,	20563,	25069,	33208,	35344,	29138,	20112,	17961,
13,	42546,	29431,	16559,	20137,	21250,	27526,	37228,	29553,	23197,	20289,
14,	37883,	24945,	17807,	16095,	18583,	22037,	25328,	24166,	15793,	10338,
15,	25562,	24517,	14839,	17765,	15498,	16952,	18190,	17170,	8916,	4942,
16,	19655,	15174,	15104,	12319,	14034,	9755,	12098,	11388,	4016,	2660,
17,	18808,	10842,	9863,	13122,	8919,	6992,	7019,	7496,	2161,	1080,
18,	16257,	12306,	6019,	8615,	9713,	4838,	4679,	3841,	1006,	904,
+gp,	28703,	35115,	12827,	30969,	8638,	7296,	9625,	1333,	1219,	148,
TOTSPBIO,	296184,	219307,	153511,	180252,	168987,	175479,	190193,	150983,	96011,	67538,

Table 13 Spawning stock biomass at age (spawning time) Tonnes YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
5,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
6,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
7,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
8,	0,	0,	0,	0,	342,	319,	230,	0,	0,	0,
9,	561,	708,	1072,	77,	707,	1883,	1459,	332,	253,	0,
10,	1943,	1477,	1703,	1434,	2057,	2498,	4465,	2779,	1771,	497,
11,	4045,	2864,	3750,	4268,	3350,	3239,	3144,	9769,	6471,	1399,
12,	12905,	7161,	7624,	10900,	11138,	7255,	5680,	7137,	14757,	7938,
13,	18601,	15486,	9970,	11320,	13554,	8558,	6588,	8337,	7850,	17669,
14,	8764,	12318,	13505,	9305,	10557,	9531,	7152,	9033,	9801,	8741,
15,	5673,	5035,	10275,	10513,	6785,	7100,	4782,	9376,	7938,	8235,
16,	2687,	4668,	5010,	9818,	9509,	5247,	3907,	4774,	7044,	6245,
17,	1272,	1908,	4111,	2976,	6655,	7170,	3282,	3846,	3844,	6203,
18,	356,	804,	1743,	2839,	1003,	4595,	1061,	2807,	3153,	3471,
+gp,	351,	0,	653,	3914,	14956,	15861,	16973,	32588,	16471,	12126,
TOTSPBIO,	57157,	52429,	59415,	67364,	80613,	73255,	58724,	90778,	79353,	72525,

Table 6.14

Run title : Arctic S. mentella (run: XSATJA05/X05)

At 29-Aug-96 11:58:58

Table 16 Summary (without SOP correction)

Terminal Fs derived using XSA (With F shrinkage)

	RECRUITS, Age 6	TOTALBIO,	TOTSPBIO,	LANDINGS,	YIELD/SSB,	FBAR 10-16,
1965,	156697,	862334,	551847,	15662,	.0284,	.0182,
1966,	151251,	825322,	538736,	10143,	.0188,	.0127,
1967,	164475,	1267715,	992319,	6239,	.0063,	.0046,
1968,	235468,	831827,	551825,	5413,	.0098,	.0077,
1969,	356308,	919574,	608943,	6836,	.0112,	.0103,
1970,	591421,	775470,	394418,	22916,	.0581,	.0469,
1971,	594207,	864355,	408669,	45063,	.1103,	.0766,
1972,	533658,	786816,	258499,	28862,	.1117,	.0639,
1973,	434540,	844507,	251832,	38380,	.1524,	.0682,
1974,	424378,	929285,	279926,	69372,	.2478,	.1267,
1975,	498974,	1001087,	323091,	239070,	.7399,	.4415,
1976,	575457,	836796,	296184,	269022,	.9083,	.6479,
1977,	574152,	690564,	219307,	146365,	.6674,	.5653,
1978,	406252,	622523,	153511,	92611,	.6033,	.2696,
1979,	277805,	556935,	180252,	87145,	.4835,	.2770,
1980,	187964,	518595,	168987,	79354,	.4696,	.3033,
1981,	113706,	475296,	175479,	81546,	.4647,	.3080,
1982,	93013,	439525,	190193,	115383,	.6067,	.4585,
1983,	104771,	333032,	150983,	105273,	.6972,	.7842,
1984,	97931,	230776,	96011,	72934,	.7596,	.8996,
1985,	83772,	193214,	67538,	63068,	.9338,	.6791,
1986,	92644,	150086,	57157,	23112,	.4044,	.2856,
1987,	95157,	159269,	52429,	10518,	.2006,	.1214,
1988,	176897,	177192,	59415,	15586,	.2623,	.1937,
1989,	124664,	218913,	67364,	23494,	.3488,	.1990,
1990,	78261,	195943,	80613,	35070,	.4350,	.2395,
1991,	54313,	195357,	73255,	48730,	.6652,	.2983,
1992,	61147,	174680,	58724,	15587,	.2654,	.1211,
1993,	89884,	209225,	90778,	12471,	.1374,	.0961,
1994,	192399,	209650,	79353,	12239,	.1542,	.0998,
1995,	110382,	195780,	72525,	10383,	.1432,	.0759,
Arith. Mean	249414,	538440,	243554,	58318,	.3582,	.2516,
Units,	(Thousands),	(Tonnes),	(Tonnes),	(Tonnes),		

Table 6.15

Sebastes mentella in the North-East Arctic (Fishing Areas I & II)

Single option prediction: Input data

Year: 1996								
Age	Stock size	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
6	46864.000	0.1000	0.0000	0.0000	0.0000	0.160	0.0031	0.160
7	99349.000	0.1000	0.0000	0.0000	0.0000	0.207	0.0049	0.207
8	156069.00	0.1000	0.0000	0.0000	0.0000	0.227	0.0106	0.227
9	64687.000	0.1000	0.0000	0.0000	0.0000	0.263	0.0154	0.263
10	38284.000	0.1000	0.0550	0.0000	0.0000	0.317	0.0311	0.317
11	28476.000	0.1000	0.1110	0.0000	0.0000	0.357	0.0307	0.357
12	34477.000	0.1000	0.3680	0.0000	0.0000	0.407	0.0421	0.407
13	49443.000	0.1000	0.5870	0.0000	0.0000	0.440	0.0540	0.440
14	62374.000	0.1000	0.6960	0.0000	0.0000	0.470	0.1061	0.473
15	21064.000	0.1000	0.7290	0.0000	0.0000	0.530	0.1029	0.530
16	17233.000	0.1000	0.7890	0.0000	0.0000	0.573	0.1644	0.573
17	10747.000	0.1000	1.0000	0.0000	0.0000	0.617	0.1373	0.617
18	7902.000	0.1000	1.0000	0.0000	0.0000	0.677	0.1387	0.677
19+	14881.000	0.1000	1.0000	0.0000	0.0000	0.753	0.1387	0.753
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1997								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
6	16327.000	0.1000	0.0000	0.0000	0.0000	0.160	0.0031	0.160
7	.	0.1000	0.0000	0.0000	0.0000	0.207	0.0049	0.207
8	.	0.1000	0.0000	0.0000	0.0000	0.227	0.0106	0.227
9	.	0.1000	0.0000	0.0000	0.0000	0.263	0.0154	0.263
10	.	0.1000	0.0550	0.0000	0.0000	0.317	0.0311	0.317
11	.	0.1000	0.1110	0.0000	0.0000	0.357	0.0307	0.357
12	.	0.1000	0.3680	0.0000	0.0000	0.407	0.0421	0.407
13	.	0.1000	0.5870	0.0000	0.0000	0.440	0.0540	0.440
14	.	0.1000	0.6960	0.0000	0.0000	0.470	0.1061	0.473
15	.	0.1000	0.7290	0.0000	0.0000	0.530	0.1029	0.530
16	.	0.1000	0.7890	0.0000	0.0000	0.573	0.1644	0.573
17	.	0.1000	1.0000	0.0000	0.0000	0.617	0.1373	0.617
18	.	0.1000	1.0000	0.0000	0.0000	0.677	0.1387	0.677
19+	.	0.1000	1.0000	0.0000	0.0000	0.753	0.1387	0.753
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1998								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
6	2233.000	0.1000	0.0000	0.0000	0.0000	0.160	0.0031	0.160
7	.	0.1000	0.0000	0.0000	0.0000	0.207	0.0049	0.207
8	.	0.1000	0.0000	0.0000	0.0000	0.227	0.0106	0.227
9	.	0.1000	0.0000	0.0000	0.0000	0.263	0.0154	0.263
10	.	0.1000	0.0550	0.0000	0.0000	0.317	0.0311	0.317
11	.	0.1000	0.1110	0.0000	0.0000	0.357	0.0307	0.357
12	.	0.1000	0.3680	0.0000	0.0000	0.407	0.0421	0.407
13	.	0.1000	0.5870	0.0000	0.0000	0.440	0.0540	0.440
14	.	0.1000	0.6960	0.0000	0.0000	0.470	0.1061	0.473
15	.	0.1000	0.7290	0.0000	0.0000	0.530	0.1029	0.530
16	.	0.1000	0.7890	0.0000	0.0000	0.573	0.1644	0.573
17	.	0.1000	1.0000	0.0000	0.0000	0.617	0.1373	0.617
18	.	0.1000	1.0000	0.0000	0.0000	0.677	0.1387	0.677
19+	.	0.1000	1.0000	0.0000	0.0000	0.753	0.1387	0.753
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

(cont.)

Table 6.15 (Cont'd)

Sebastes mentella in the North-East Arctic (Fishing Areas I & II)

Single option prediction: Input data

(cont.)

Year: 1999								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
6	4794.000	0.1000	0.0000	0.0000	0.0000	0.160	0.0031	0.160
7	.	0.1000	0.0000	0.0000	0.0000	0.207	0.0049	0.207
8	.	0.1000	0.0000	0.0000	0.0000	0.227	0.0106	0.227
9	.	0.1000	0.0000	0.0000	0.0000	0.263	0.0154	0.263
10	.	0.1000	0.0550	0.0000	0.0000	0.317	0.0311	0.317
11	.	0.1000	0.1110	0.0000	0.0000	0.357	0.0307	0.357
12	.	0.1000	0.3680	0.0000	0.0000	0.407	0.0421	0.407
13	.	0.1000	0.5870	0.0000	0.0000	0.440	0.0540	0.440
14	.	0.1000	0.6960	0.0000	0.0000	0.470	0.1061	0.473
15	.	0.1000	0.7290	0.0000	0.0000	0.530	0.1029	0.530
16	.	0.1000	0.7890	0.0000	0.0000	0.573	0.1644	0.573
17	.	0.1000	1.0000	0.0000	0.0000	0.617	0.1373	0.617
18	.	0.1000	1.0000	0.0000	0.0000	0.677	0.1387	0.677
19+	.	0.1000	1.0000	0.0000	0.0000	0.753	0.1387	0.753
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : SPRTJA02
Date and time: 29AUG96:16:51

Table 6.16

The SAS System 16:24 Thursday, August 29, 1996

Sebastes mentella in the North-East Arctic (Fishing Areas I & II)

Prediction with management option table

Year: 1996					Year: 1997					Year: 1998	
F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	Stock biomass	Sp.stock biomass
0.6157	0.0467	212016	79226	7000	0.0000	0.0000	210342	85638	0	213608	98139
.	.	.	.	.	0.1000	0.0076	.	85638	1295	212268	97119
.	.	.	.	.	0.2000	0.0152	.	85638	2577	210943	96111
.	.	.	.	.	0.3000	0.0228	.	85638	3846	209631	95116
.	.	.	.	.	0.4000	0.0304	.	85638	5101	208333	94132
.	.	.	.	.	0.5000	0.0380	.	85638	6343	207049	93160
.	.	.	.	.	0.6000	0.0455	.	85638	7573	205778	92199
.	.	.	.	.	0.7000	0.0531	.	85638	8790	204520	91250
.	.	.	.	.	0.8000	0.0607	.	85638	9994	203275	90313
.	.	.	.	.	0.9000	0.0683	.	85638	11187	202043	89386
.	.	.	.	.	1.0000	0.0759	.	85638	12366	200823	88471
.	.	.	.	.	1.1000	0.0835	.	85638	13534	199616	87566
.	.	.	.	.	1.2000	0.0911	.	85638	14690	198422	86673
.	.	.	.	.	1.3000	0.0987	.	85638	15834	197240	85789
.	.	.	.	.	1.4000	0.1063	.	85638	16967	196070	84917
.	.	.	.	.	1.5000	0.1139	.	85638	18088	194912	84054
.	.	.	.	.	1.6000	0.1214	.	85638	19198	193765	83202
.	.	.	.	.	1.7000	0.1290	.	85638	20296	192631	82360
.	.	.	.	.	1.8000	0.1366	.	85638	21384	191507	81528
.	.	.	.	.	1.9000	0.1442	.	85638	22460	190395	80706
.	.	.	.	.	2.0000	0.1518	.	85638	23526	189295	79894
-	-	Tonnes	Tonnes	Tonnes	-	-	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

Notes: Run name : MANTJA01
Date and time : 29AUG96:16:24
Computation of ref. F: Simple mean, age 10 - 16
Basis for 1996 : TAC constraints

Table 6.17

Sebastes mentella in the North-East Arctic (Fishing Areas I & II)

Single option prediction: Summary table

F=0

							1 January		Spawning time	
Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	0.6157	0.0467	14667	7000	651850	212029	152872	79235	152872	79235
1997	0.0000	0.0000	0	0	592206	210355	158840	85647	158840	85647
1998	0.0000	0.0000	0	0	538083	213620	177133	98149	177133	98149
1999	0.0000	0.0000	0	0	491672	214779	203375	114985	203375	114985
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Notes: Run name : SPRTJA02
Date and time : 29AUG96:16:51
Computation of ref. F: Simple mean, age 10 - 16
Prediction basis : F factors

F_{low}

							1 January		Spawning time	
Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	0.6157	0.0467	14667	7000	651850	212029	152872	79235	152872	79235
1997	0.2635	0.0200	6861	3384	592206	210355	158840	85647	158840	85647
1998	0.2635	0.0200	7773	3987	531561	210120	172707	95487	172707	95487
1999	0.2635	0.0200	7876	4218	478381	207265	193512	108853	193512	108853
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Notes: Run name : SPRTJA02
Date and time : 29AUG96:16:51
Computation of ref. F: Simple mean, age 10 - 16
Prediction basis : F factors

F_{med}

							1 January		Spawning time	
Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	0.6157	0.0467	14667	7000	651850	212029	152872	79235	152872	79235
1997	1.0145	0.0770	25533	12538	592206	210355	158840	85647	158840	85647
1998	1.0145	0.0770	27108	13707	513825	200659	160807	88348	160807	88348
1999	1.0145	0.0770	25759	13479	443968	188027	168502	93381	168502	93381
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Notes: Run name : SPRTJA02
Date and time : 29AUG96:16:51
Computation of ref. F: Simple mean, age 10 - 16
Prediction basis : F factors

F_{high}

							1 January		Spawning time	
Year	F Factor	Reference F	Catch in numbers	Catch in weight	Stock size	Stock biomass	Sp.stock size	Sp.stock biomass	Sp.stock size	Sp.stock biomass
1996	0.6157	0.0467	14667	7000	651850	212029	152872	79235	152872	79235
1997	2.3188	0.1760	55127	26855	592206	210355	158840	85647	158840	85647
1998	2.3188	0.1760	52615	25934	485758	185869	142425	77374	142425	77374
1999	2.3188	0.1760	45311	22726	394391	160969	134082	72323	134082	72323
Unit	-	-	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes	Thousands	Tonnes

Notes: Run name : SPRTJA02
Date and time : 29AUG96:16:51
Computation of ref. F: Simple mean, age 10 - 16
Prediction basis : F factors

Table 7.1 *Sebastes marinus* in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I and Divisions IIa and IIb combined.

Year	Faroe Islands	France	Ger-many[2]	Green-land	Ice-land	Ire-land	Nether -lands	Norway	Portugal	Russia[3]	Spain	UK England & Wales	UK Scotland	Total
1986	29	2,719	3,369	-	-	-	-	21,680	-	2,350	-	42	14	30,203
1987	250	1,553	4,508	-	-	-	-	16,728	-	850	-	181	7	24,077
1988	No species specific data presently available on countries													25,908
1989	3	784	412	-	-	-	-	20,662	-	1,264	-	93	4	23,222
1990	278	1,684	387	1	-	-	-	23,917	-	1,549	-	260	15	28,091
1991	152	719	981	-	-	-	-	15,872	-	1.052	-	228	47	19.051
1992	35	1,294	530	623	-	-	-	12,700	5	758	2	225	18	16,190
1993[1]	139	906	650	14	-	-	-	12,968	77	1,313	8	440	1	16,516
1994[1]	22	647	1,008	5	4	-	-	13,935	90	1,199	4	135	1	17,050
1995[1]	27	635	477	4	1	1	1	12,923	9	639	-	159	9	14,885

[1] Provisional figures.
[2] Includes former GDR prior to 1991.
[3] USSR prior to 1991.

Table 7.2 *Sebastes marinus* in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I.

Year	Faroe Islands	Germany[4]	Iceland	Norway	Russia[5]	UK England & Wales	UK Scotland	Total
1986[3]	-	50	-	2,972	155	32	3	3,212
1987[3]	-	8	-	2,013	50	11	-	2,082
1988	No species specific data presently available							
1989	-	-	-	1,763	110	4[2]	1[2]	1,878
1990	5	-	-	1,263	14	-	-	1,282
1991	-	-	-	1,993	92	-	-	2,085
1992	-	-	-	2,162	174	-	-	2,336
1993[1]	24[2]	-	-	1,745	330	-	-	2,099
1994[1]	12[2]	72	4	1,652	109		-	1,849
1995[1]	19[2]	-	1	2,257	201	1	-	2,479

[1] Provisional figures.
[2] Split on species according to reports to Norwegian authorities.
[3] Based on preliminary estimates of species breakdown by area.
[4] Includes former GDR prior to 1991.
[5] USSR prior to 1991.

Table 7.3 *Sebastes marinus* in Sub-areas I and II. Nominal catch (t) by countries in Division IIa.

Year	Faroe Islands	France	Ger-many[4]	Green-land	Ireland	Nether-lands	Norway	Portugal	Russia[5]	UK England & Wales	UK Scotland	Total
1986[3]	29	2,719	3,319	-	-	-	18,708	-	2,195	10	11	26,991
1987[3]	250	1,553	2,967	-	-	-	14,715	-	800	170	7	20,462
1988	No species specific data presently available											
1989	3[2]	784[2]	412	-	-	-	18,833	-	912	89[2]	3[2]	21,036
1990	273	1,684	387	-	-	-	22,444	-	392	260	1	25,441
1991	152[2]	719[2]	678	-	-	-	13,835	-	534	228[2]	47[2]	16,193
1992	35[2]	1,294[2]	211	614	-	-	10,536	-	404	192[2]	18[2]	13,304
1993[1]	115[2]	906[2]	473	14[2]	-	-	11,223	77[2]	940	430[2]	1[2]	14,179
1994[1]	10[2]	647[2]	654[2]	5[2]	-	-	12,265	90[2]	1,030	129[2]	-	14,830
1995[1]	8[2]	635[2]	289[2]	4[2]	1[2]	1	10,533	2[2]	405	158[2]	9[2]	12,045

[1] Provisional figures.
[2] Split on species according to reports to Norwegian authorities.
[3] Based on preliminary estimates of species breakdown by area.
[4] Includes former GDR prior to 1991.
[5] USSR prior to 1991.

Table 7.4 *Sebastes marinus* in Sub-areas I and II. Nominal catch (t) by countries in Division IIb.

Year	Germany[5]	Greenland	Norway	Portugal	Russia[6]	Spain	UK England & Wales	UK Scotland	Total
1986									+
1987[4]	1,533	-	-	-	-	-	-	-	1,533
1988	No species specific data presently available								
1989	-	-	66	-	242	-	-	-	308
1990	-	1[2]	210	-	1,157	-	-	-	1,368
1991	303	-	44	-	426	-	-	-	773
1992	319	9[2]	2	5[2]	180	2	33[2]	-	550
1993[1]	177	-	-	-	43	8[3]	10[2]	-	238
1994[1]	282	-	18	-	60	4[3]	6[2]	1[2]	371
1994[1]	188	-	133	7	33	-	-	-	361

[1] Provisional figures.
[2] Split on species according to reports to Norwegian authorities.
[3] Split on species according to the 1992 catches.
[4] Based on preliminary estimates of species breakdown by area.
[5] Includes former GDR prior to 1991.
[6] USSR prior to 1991.

Table 8.1 GREENLAND HALIBUT in Sub-areas I and II.
Nominal catch (t) by countries (Subarea I, Divisions IIa and IIb combined) as officially reported to ICES.

Year	Denmark	Estonia	Faroe Islands	France	Fed. Rep. Germany	Greenland	Iceland	Ireland	Lithuania	Norway	Portugal	Russia[4]	Spain	UK (England & Wales)	UK (Scotland)	Total
1984	-		-	138	2,165	-	-	-		4,376	-	15,181	-	23	-	21,883
1985	-		-	239	4,000	-	-	-		5,464	-	10,237	-	5	-	19,945
1986	-		42	13	2,178	-	-	-		7,890	-	12,200	-	10	2	22,875
1987	+		-	13	2,024	-	-	-		7,261	-	9,733	-	61	20	19,112
1988	-		186	67	744	-	-	-		9,076	-	9,430	-	82	2	19,587
1989	-		67	31	600	-	-	-		10,622	-	8,812	-	6	-	20,138
1990	-		163	49	954	-	-	-		17,243	-	4,764 [2]	-	10	-	23,183
1991	11	2,564	314	119	101	-	-	-	-	27,587	-	2,490 [2]	132 [2]	+	2	33,320
1992	-	-	16	111 [1]	13	13	-	-	-	8,313	31	718	23	7	3	9,253
1993	2 [2]	-	61	40 [3]	22	8	56	-	30 [3]	10,366 [2]	43	1,235	-	16	-	11,879
1994	4	-	86 [3]	27 [3]	217 [2]	3	15	5	4 [2]	8,322 [2]	36	283	2 [2]	76	2	9,151
1995 [1]	-	-	12 [3]	-	34 [2]	12 [2]	25	2	-	9192 [2]	84 [1]	788 [2]	757	115	7	11,028

[1] Provisional figures.
[2] Working Group figure.
[3] As reported to Norwegian authorities.
[4] USSR prior to 1991.

TABLE 8.2 GREENLAND HALIBUT in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I as officially reported to ICES.

Year	Estonia	Faroe Islands	Fed. Rep. Germany	Iceland	Norway	Russia[3]	Spain	UK (England & Wales)	UK (Scotland)	Total
1984	-	-	-	-	593	81	-	17	-	691
1985	-	-	-	-	602	122	-	1	-	725
1986	-	-	1	-	557	615	-	5	1	1,179
1987	-	-	2	-	984	259	-	10	+	1,255
1988	-	9	4	-	978	420	-	7	-	1,418
1989	-	-	-	-	322 [2]	482	-	+	-	804
1990	-	7	-	-	312 [2]	321 [2]	-	-	-	640
1991	164	-	-	-	2,033 [2]	522 [2]	-	-	-	2,719
1992	-	-	+	-	2,282 [2]	467	-	-	-	2,749
1993	-	32	-	56	1,691 [2]	867	-	-	-	2,646
1994	-	17	217	15	1,157 [2]	175	-	+	-	1,581
1995 [1]	-	12	- [1]	25	1,316 [2]	264 [2]	57	-	-	1,674

[1] Provisional figures.
[2] Working Group figures.
[3] USSR prior to 1991.

Table 8.3 GREENLAND HALIBUT in Sub areas I and II.
Nominal catch (t) by countries in Division IIa as officially reported to ICES.

Year	Estonia	Faroe Islands	France	Fed. Rep. Germany	Greenland	Ireland	Norway	Portugal	Russia[5]	UK (England & Wales)	UK (Scotland)	Total
1984		-	138	265	-	-	3,703	-	5,459	1	-	9,566
1985		-	239	254	-	-	4,791	-	6,894	2	-	12,180
1986		6	13	97	-	-	6,389	-	5,553	5	1	12,064
1987		-	13	75	-	-	5,705	-	4,739	44	10	10,586
1988		177	67	150	-	-	7,859	-	4,002	56	2	12,313
1989		67	31	104	-	-	6,933 [2]	-	4,964	6	-	12,105
1990		133	49	12	-	-	8,224 [2]	-	1,246 [2]	1	-	9,665
1991	1,400	314	119 [1]	21	-	-	10,268 [2]	-	305 [2]	+	1	12,428
1992	-	16	108 [1]	1	13 [4]	-	4,144 [2]	15 [3]	58	1	-	4,356
1993	-	29	38 [3]	14	8 [4]	-	7,989 [2]	17	210	2	-	8,307
1994	-	68 [2]	19 [3]	23 [2]	3 [4]	4	6,390 [2]	26	67	14	-	6,614
1995 [1]	-	-	-	29 [2]	12 [2,4]	2	6,058 [2]	60 [1]	227	83	2	6,473

[1] Provisional figures.
[2] Working Group figure.
[3] As reported to Norwegian authorities.
[4] Includes Division IIb.
[5] USSR prior to 1991.

Table 8.4 GREENLAND HALIBUT in Sub-areas I and II.
Nominal catch (t) by countries in Division IIb as officially reported to ICES.

Year	Den mark	Estonia	Faroe Islands	France	Fed. rep. Germany	Ireland	Lithu ania	Norway	Portugal	Russia[4]	Spain	UK (England & Wales)	UK (Scotland)	Total
1984	-		-	-	1,900	-		80	-	9,641	-	5	-	11,626
1985	-		-	-	3,746	-		71	-	3,221	-	2	-	7,040
1986	-		36	-	2,620	-		944	-	6,032	-	+	-	9,632
1987	+		-	-	1,947	-		572	-	4,735	-	7	10	7,271
1988	-		-	-	590	-		239	-	5,008	-	19	+	5,856
1989	-		-	-	496	-		3,367 [2]	-	3,366	-	-	-	7,229
1990	-		23 [2]	-	942	-		8,707 [2]	-	3,197 [2]	-	9	-	12,878
1991	11	1,000	-	-	80	-	-	15,286 [2]	-	1,663 [2]	132	+	1	18,173
1992	-	-	-	3 [2]	12	-	-	1,892 [2]	16 [2]	193	23	6	3	2,148
1993	2 [3]	-	-	2 [3]	8	-	30 [3]	686 [2]	26	158	-	14	-	926
1994	4	-	1 [3]	8 [3]	46 [2]	1	4 [3]	775 [2]	10	41	2 [2]	62	2	956
1995	-	-	-	-	5 [1]	-	-	1,818 [2]	24 [1]	297	700	32	5	2,881

[1] Provisional figures.
[2] Working Group figure.
[3] As reported to Norwegian authorities.
[4] USSR prior to 1991.

Table 8.5 GREENLAND HALIBUT in the Sub-areas I and II. Landings by gear (tonnes).

Year	Gillnet	Longline	Trawl	Total
1980	1,189	336	11,759	13,284
1981	730	459	13,829	15,018
1982	748	679	15,362	16,789
1983	1,648	1,388	19,111	22,147
1984	1,200	1,453	19,230	21,883
1985	1,668	750	17,527	19,945
1986	1,677	497	20,701	22,875
1987	2,239	588	16,285	19,112
1988	2,815	838	15,934	19,587
1989	1,342	197	18,599	20,138
1990	1,372	1,491	20,325	23,183
1991	1,904	4,552	26,864	33,320
1992	1,679	1,787	5,787	9,253
1993	1,497	2,493	7,889	11,879
1994	1,403	2,392	5,353	9,148
1995	1,500	4,034	5,494	11,028

Table 8.6 GREENLAND HALIBUT in Sub-areas I and II.
Catch per unit effort and total effort.

Year	USSR catch/hour trawling (t)		Norway[11] catch/hour trawling (t)		Average CPUE		Total effort (in '000 hrs trawling)[6]	CPUE 7+[7]	GDR[8] (catch/day tonnage (kg)
	RT[2]	PST[3]	A[9]	B[10]	A[4]	B[5]			
1965	0.80	-	-	-	0.80	-	-	-	-
1966	0.77	-	-	-	0.77	-	-	-	-
1967	0.70	-	-	-	0.70	-	-	-	-
1968	0.65	-	-	-	0.65	-	-	-	-
1969	0.53	-	-	-	0.53	-	-	-	-
1970	0.53	-	-	-	0.53	-	169	0.50	-
1971	0.46	-	-	-	0.46	-	172	0.43	-
1972	0.37	-	-	-	0.37	-	116	0.33	-
1973	0.37	-	0.34	-	0.36	-	83	0.36	-
1974	0.40	-	0.36	-	0.38	-	100	0.36	-
1975	0.39	0.51	0.38	-	0.39	0.45	99	0.37	-
1976	0.40	0.56	0.33	-	0.37	0.45	100	0.34	-
1977	0.27	0.41	0.33	-	0.30	0.37	96	0.26	-
1978	0.21	0.32	0.21	-	0.21	0.27	123	0.17	-
1979	0.23	0.35	0.28	-	0.26	0.32	67	0.19	-
1980	0.24	0.33	0.32	-	0.28	0.33	47	0.25	-
1981	0.30	0.36	0.36	-	0.33	0.36	42	0.28	-
1982	0.26	0.45	0.41	-	0.34	0.43	39	0.37	-
1983	0.26	0.40	0.35	-	0.31	0.38	58	0.32	-
1984	0.27	0.41	0.32	-	0.30	0.37	59	0.30	-
1985	0.28	0.52	0.37	-	0.33	0.45	44	0.37	-
1986	0.23	0.42	0.37	-	0.30	0.40	57	0.32	-
1987	0.25	0.50	0.35	-	0.30	0.43	44	0.35	-
1988	0.20	0.30	0.31	-	0.26	0.31	63	0.26	4.26
1989	0.20	0.30	0.26	-	0.23	0.28	73	0.19	2.95
1990	-	0.20	0.27	-	-	0.24	95	0.16	1.66
1991	-	-	0.24	-	-	-	134	0.18	-
1992	-	-	0.46	0.72	-	-	20	0.29	-
1993 [1]	-	-	0.79	1.22	-	-	15	0.65	-
1994 [1]	-	-	0.77	1.27	-	-	11	0.70	-
1995 [1]	-	-	1.03	1.48	-	-	-	-	-
1996 [1]	-	-	1.45	1.82	-	-	-	-	-

[1] Provisional.
[2] Side trawlers, 800-1000 hp. From 1983 onwards, side trawlers (SRTM), 1,000 hp.
[3] Stern trawlers, up to 2,000 HP.
[4] Arithmetic average of CPUE from USSR RT (or SRTM trawlers) and Norwegian trawlers.
[5] Arithmetic average of CPUE from USSR PST and Norwegian trawlers.
[6] For the years 1981-1990, based on average CPUE type B. For 1991-1993, based on the Norwegian CPUE, type A.
[7] Total catch (t) of seven years and older fish divided by total effort.
[8] For the years 1988-1989, frost-trawlers 995 BRT (FAO Code 095). For 1990, factory trawlers FVS IV, 1943 BRT (FAO Code 090).
[9] Norwegian trawlers, ISSCFV-code 07, 250-499.9 GRT.
[10] Norwegian factory trawlers, ISSCFV-code 09, 1000-1999.9 GRT
[11] From 1992 based on research fishing. 1992-1993: two weeks in May/June and October; 1994-1995: 10 days in May/June

Table 8.7

Run title : Arctic Green.halibut (run: XSAOLE12/X12)

At 25-Aug-96 20:00:38

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,
3,	1,	1,	1,	1,	1,	22,
4,	34,	1,	461,	19,	276,	334,
5,	526,	80,	1109,	212,	917,	840,
6,	2792,	4486,	3521,	1117,	2519,	2337,
7,	10464,	12712,	9605,	3923,	6204,	6520,
8,	18562,	12283,	6438,	3515,	3838,	4118,
9,	10034,	6130,	2775,	2551,	1834,	2265,
10,	6671,	4339,	1734,	1919,	1942,	1654,
11,	2517,	2703,	1368,	1536,	1622,	1857,
12,	1250,	1660,	1234,	1127,	1338,	1536,
13,	616,	1044,	675,	716,	734,	1122,
14,	1104,	300,	200,	251,	531,	600,
+gp,	281,	143,	80,	126,	216,	368,
TOTALNUM,	54852,	45882,	29201,	17013,	21972,	23573,
TONSLAND,	89484,	79034,	43055,	29938,	37763,	38172,
SOPCOF %,	94,	104,	97,	92,	98,	88,

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	1,	62,	78,	88,	64,	664,	48,	314,	0,	88,
4,	98,	755,	532,	887,	275,	1146,	551,	1212,	36,	461,
5,	830,	2037,	1897,	2218,	731,	1896,	1304,	1543,	915,	1219,
6,	2982,	3255,	3589,	3155,	1138,	1917,	1494,	1864,	3698,	2874,
7,	5824,	4200,	4118,	2727,	1665,	1919,	1276,	1851,	3350,	2561,
8,	5002,	2524,	2365,	1234,	1341,	933,	1208,	2287,	1938,	1548,
9,	3000,	1610,	1509,	495,	944,	484,	1493,	1491,	1064,	972,
10,	1350,	1104,	946,	319,	473,	448,	1258,	1228,	1191,	1037,
11,	915,	1062,	934,	296,	511,	482,	838,	713,	602,	614,
12,	1212,	858,	438,	243,	275,	380,	502,	488,	340,	363,
13,	698,	595,	349,	103,	242,	384,	324,	247,	171,	161,
14,	526,	384,	147,	45,	145,	150,	108,	201,	132,	120,
+gp,	358,	180,	112,	51,	78,	62,	46,	64,	71,	63,
TOTALNUM,	22796,	18626,	17014,	11861,	7882,	10865,	10450,	13503,	13508,	12081,
TONSLAND,	36074,	28827,	24617,	17312,	13284,	15018,	16789,	22147,	21883,	19945,
SOPCOF %,	92,	100,	104,	100,	108,	102,	98,	95,	100,	98,

Table 1 Catch numbers at age Numbers*10**-3

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	0,	0,	0,	0,	0,	7,	21,	0,	0,	0,
2,	0,	0,	0,	0,	0,	67,	21,	0,	0,	0,
3,	141,	50,	5,	214,	155,	389,	98,	10,	0,	0,
4,	985,	435,	233,	924,	793,	2084,	437,	224,	72,	79,
5,	1672,	1212,	907,	2080,	2139,	3312,	1098,	1140,	622,	828,
6,	3335,	2972,	2540,	4453,	5163,	3889,	1195,	1088,	695,	932,
7,	2712,	3572,	3141,	3655,	4642,	4716,	1069,	1608,	1231,	1632,
8,	1531,	1746,	2096,	1657,	1932,	2355,	778,	1118,	803,	937,
9,	1128,	752,	1182,	801,	1221,	1031,	360,	140,	305,	381,
10,	997,	828,	860,	318,	499,	1284,	600,	976,	630,	685,
11,	530,	362,	481,	228,	264,	774,	188,	444,	408,	440,
12,	434,	202,	313,	126,	314,	673,	150,	144,	324,	344,
13,	314,	186,	133,	120,	42,	177,	79,	36,	87,	142,
14,	305,	63,	140,	140,	96,	266,	89,	20,	38,	53,
+gp,	239,	7,	47,	28,	44,	517,	56,	4,	3,	8,
TOTALNUM,	14323,	12387,	12078,	14744,	17304,	21541,	6239,	6952,	5218,	6461,
TONSLAND,	22875,	19112,	19587,	20138,	23183,	33320,	9253,	11879,	9151,	11028,
SOPCOF %,	96,	100,	99,	100,	100,	100,	100,	100,	100,	100,

Table 8.8

Run title : Arctic Green.halibut (run: XSAOLE12/X12)

At 25-Aug-96 20:00:38

Table 3 Stock weights at age (kg)

YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
4,	.4410,	.4410,	.4410,	.4410,	.4410,	.4410,
5,	.5670,	.5670,	.5670,	.5670,	.5670,	.5670,
6,	.7370,	.7370,	.7370,	.7370,	.7370,	.7370,
7,	1.0790,	1.0790,	1.0790,	1.0790,	1.0790,	1.0790,
8,	1.4210,	1.4210,	1.4210,	1.4210,	1.4210,	1.4210,
9,	1.8480,	1.8480,	1.8480,	1.8480,	1.8480,	1.8480,
10,	2.2810,	2.2810,	2.2810,	2.2810,	2.2810,	2.2810,
11,	2.8870,	2.8870,	2.8870,	2.8870,	2.8870,	2.8870,
12,	3.2470,	3.2470,	3.2470,	3.2470,	3.2470,	3.2470,
13,	4.3030,	4.3030,	4.3030,	4.3030,	4.3030,	4.3030,
14,	4.9310,	4.9310,	4.9310,	4.9310,	4.9310,	4.9310,
+gp,	5.7940,	5.8410,	6.0370,	6.0060,	5.9640,	5.9100,

Table 3 Stock weights at age (kg)

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.2000,	.2000,	.2000,	.3000,	.2000,	.2000,	.2700,	.3100,	.3000,	.3000,
4,	.4410,	.4410,	.4410,	.6000,	.4820,	.5000,	.6200,	.4500,	.4800,	.3800,
5,	.5670,	.5670,	.5670,	.9000,	.7020,	.6600,	.6900,	.7500,	.6300,	.6000,
6,	.7370,	.7370,	.7370,	1.2000,	.8720,	.8400,	.8400,	1.0400,	.9600,	.8900,
7,	1.0790,	1.0790,	1.0790,	1.5000,	1.1410,	1.1500,	1.0300,	1.3400,	1.1800,	1.2000,
8,	1.4210,	1.4210,	1.4210,	1.8000,	1.4680,	1.5600,	1.3100,	1.5700,	1.5300,	1.8500,
9,	1.8480,	1.8480,	1.8480,	2.2000,	1.7780,	2.0400,	1.7400,	1.9700,	2.3100,	2.5900,
10,	2.2810,	2.2810,	2.2810,	2.6000,	2.3020,	2.5700,	2.2400,	2.7300,	2.8700,	3.1800,
11,	2.8870,	2.8870,	2.8870,	3.0000,	2.6640,	2.9800,	2.7700,	3.2900,	3.4600,	3.6200,
12,	3.2470,	3.2470,	3.2470,	3.5000,	3.0460,	3.4300,	3.3700,	4.2200,	3.7700,	3.9500,
13,	4.3030,	4.3030,	4.3030,	4.1000,	3.3680,	4.1300,	4.3200,	4.7100,	3.9900,	4.4800,
14,	4.9310,	4.9310,	4.9310,	4.8000,	4.2850,	4.6800,	5.3500,	6.0800,	4.3500,	4.2500,
+gp,	5.9230,	6.0270,	5.9060,	6.1760,	5.3460,	5.9990,	5.8330,	6.1220,	4.5250,	4.8250,

Table 3 Stock weights at age (kg)

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.3400,	.3070,	.4140,	.3100,	.2800,	.2900,	.2200,	.3400,	.2600,	.4400,
4,	.4700,	.5740,	.5540,	.6300,	.5500,	.6000,	.4600,	.5400,	.5200,	.5600,
5,	.6200,	.7090,	.7400,	.7600,	.7100,	.7700,	.6800,	.7900,	.7200,	.7300,
6,	.9200,	1.0030,	.9620,	1.0300,	1.0600,	1.0500,	.9700,	1.0200,	.9400,	.9400,
7,	1.2800,	1.2660,	1.2490,	1.3200,	1.2900,	1.3800,	1.2700,	1.3500,	1.2700,	1.2500,
8,	1.9000,	1.6830,	1.6260,	1.8000,	1.7000,	1.7500,	1.7600,	1.8800,	1.7200,	1.7400,
9,	2.4800,	2.4820,	2.1640,	2.4200,	2.1000,	2.2000,	2.2100,	2.4600,	2.1900,	2.0900,
10,	3.1100,	2.9820,	2.8970,	3.1300,	2.6100,	2.6000,	2.5600,	2.6700,	2.5200,	2.5100,
11,	3.3500,	3.5470,	3.4060,	3.3700,	2.8700,	2.7900,	3.1100,	3.4300,	2.9700,	2.9500,
12,	3.7200,	3.8000,	3.6610,	4.0500,	3.4500,	3.2800,	3.5900,	4.2900,	3.2900,	3.3400,
13,	4.0000,	4.5600,	4.2470,	4.2900,	3.7200,	3.8900,	3.8300,	5.0800,	3.8400,	3.8300,
14,	4.1800,	5.0020,	4.1870,	4.5000,	4.0900,	4.3800,	4.2500,	6.3200,	4.9500,	4.9800,
+gp,	4.5260,	5.9530,	4.4630,	4.7200,	4.5200,	5.2900,	4.8000,	8.9100,	6.6800,	8.1500,

Table 8.9

Run title : Arctic Green.halibut (run: XSAOLE12/X12)

At 25-Aug-96 20:00:38

Table 5 Proportion mature at age

YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0500,	.0500,	.0500,	.0500,	.0500,	.0500,
5,	.2300,	.2300,	.2300,	.2300,	.2300,	.2300,
6,	.4900,	.4900,	.4900,	.4900,	.4900,	.4900,
7,	.6600,	.6600,	.6600,	.6600,	.6600,	.6600,
8,	.7800,	.7800,	.7800,	.7800,	.7800,	.7800,
9,	.8900,	.8900,	.8900,	.8900,	.8900,	.8900,
10,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,
11,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
12,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
13,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
14,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 5 Proportion mature at age

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0500,	.0500,	.0500,	.0500,	.0500,	.0500,	.0500,	.0500,	.0500,	.0500,
5,	.2300,	.2300,	.2300,	.2300,	.2300,	.2300,	.2300,	.2300,	.2300,	.2300,
6,	.4900,	.4900,	.4900,	.4900,	.4900,	.4900,	.4900,	.4900,	.4900,	.4900,
7,	.6600,	.6600,	.6600,	.6600,	.6600,	.6600,	.6600,	.6600,	.6600,	.6600,
8,	.7800,	.7800,	.7800,	.7800,	.7800,	.7800,	.7800,	.7800,	.7800,	.7800,
9,	.8900,	.8900,	.8900,	.8900,	.8900,	.8900,	.8900,	.8900,	.8900,	.8900,
10,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,	.9500,
11,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
12,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
13,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
14,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 5 Proportion mature at age

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0500,	.0500,	.0200,	.0300,	.0500,	.0500,	.0500,	.1000,	.1000,	.1000,
5,	.2300,	.2300,	.1100,	.1400,	.2000,	.2000,	.2000,	.3800,	.3800,	.3800,
6,	.4900,	.4900,	.5100,	.5300,	.5900,	.5900,	.5900,	.5100,	.5100,	.5100,
7,	.6600,	.6600,	.6700,	.6600,	.7000,	.7000,	.7000,	.6500,	.6500,	.6500,
8,	.7800,	.7800,	.6800,	.6900,	.7200,	.7200,	.7200,	.7300,	.7300,	.7300,
9,	.8900,	.8900,	.8000,	.7300,	.7600,	.7600,	.7600,	.8200,	.8200,	.8200,
10,	.9500,	.9500,	.9200,	.8600,	.8500,	.8500,	.8500,	.9100,	.9100,	.9100,
11,	.9900,	.9900,	.9800,	.9600,	.9400,	.9400,	.9400,	.9700,	.9700,	.9700,
12,	.9900,	.9900,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.9800,	.9800,	.9800,
13,	.9900,	.9900,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
14,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 8.10

The SAS System 14:35 Saturday, August 24, 1996

GHL-ARCT: Greenland halibut in the North-East Arctic (Fishing Areas I & II)

FLT09: Norwegian Svalbard Trawl Survey, Autumn (Catch: Number)

Year	Fishing effort	Catch, age 1	Catch, age 2	Catch, age 3	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8
1984	1	550	3042	2924	8573	6847	5657	4345	2796
1985	1	884	3921	4294	6674	8793	8622	3920	1817
1986	1	49	1005	1967	7314	4671	1754	2301	372
1987	1	630	1014	3076	4409	4786	3141	964	364
1988	1	818	4298	6191	6696	12289	2396	6015	338
1989	1	712	3232	8158	7493	7069	2374	1753	353
1990	1	115	336	5050	7130	7730	4490	2330	918
1991	1	71	877	3080	6720	9270	5450	2800	1660
1992	1	33	30	338	1190	3520	4420	2280	1280
1993	1	25	60	51	1049	2369	2056	2772	1114
1994	1	4	238	296	652	2775	2371	2593	531
1995	1	35	1	70	259	798	1225	1953	434

TEST: Russian bottom trawl survey (Catch: Number)

Year	Fishing effort	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8	Catch, age 9
1990	1	8360	16251	15621	11393	4120	1911
1991	1	8455	25408	21842	15234	9419	2369
1992	1	7461	33341	25498	17272	10178	2720
1993	1	2166	13317	19751	16527	10305	3370
1994	1	1604	9868	17550	11533	7746	3401
1995	1	467	5759	18222	15296	11539	4393

FLT11: Norwegian Svalbard Shrimp Survey (Catch: Number)

Year	Fishing effort	Catch, age 1	Catch, age 2	Catch, age 3	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8
1988	1	4163	14278	8259	8354	2594	0	0	0
1989	1	4653	9777	9943	4855	4057	1054	542	83
1990	1	247	1569	8324	9800	6910	2148	295	245
1991	1	25	577	2465	4969	5362	2541	1380	158
1992	1	95	57	505	1780	2914	1129	713	333
1993	1	39	54	50	814	1572	433	589	395
1994	1	0	13	43	446	2214	1218	1764	485
1995	1	24	26	31	407	1081	592	521	151

FLT12: Experimental CPUE (Catch: Number)

Year	Fishing effort	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8	Catch, age 9	Catch, age 10	Catch, age 11	Catch, age 12	Catch, age 13	Catch, age 14
1992	1	80	97	109	56	7	29	12	7	2	1
1993	1	176	130	191	87	5	52	22	7	3	1
1994	1	198	191	215	90	8	47	19	5	2	1
1995	1	218	218	292	106	26	64	19	11	3	2

FLT13: Nor bot surv Barents (ABCD) winter (adj to autumn previous year) (Catch: Number)

Year	Fishing effort	Catch, age 1	Catch, age 2	Catch, age 3	Catch, age 4	Catch, age 5	Catch, age 6	Catch, age 7	Catch, age 8	Catch, age 9	Catch, age 10	Catch, age 11	Catch, age 12
1988	1	788	1056	2284	3655	2655	864	971	210	0	19	76	56
1989	1	907	2071	1716	1996	2262	1046	365	175	0	30	119	165
1990	1	279	755	1323	1257	1526	2440	906	450	457	0	55	127
1991	1	128	719	897	1554	543	1069	791	0	648	135	40	53
1992	1	17	168	502	1730	868	1490	758	88	655	382	31	35
1993	1	16	142	1178	2259	1644	1750	885	0	506	38	25	0
1994	1	0	0	168	786	749	1331	760	359	486	60	199	0
1995	1	0	28	40	709	1510	2964	1000	307	808	154	152	45

Table 8.11

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Lowestoft VPA Version 3.1

  25-Aug-96  16:36:40

Extended Survivors Analysis

Arctic Green.halibut (run: XSAOLE11/X11)

CPUE data from file /users/fish/ifad/ifapwork/afwg/ghl_arct/FLEET.X11

Catch data for  26 years. 1970 to 1995. Ages  1 to  15.

     Fleet,           First, Last, First, Last, Alpha,  Beta
                ,      year, year,  age ,  age
FLT09: Norwegian Sva,  1984, 1995,   1,     8,   .650,   .750
FLT11: Norwegian Sva,  1988, 1995,   1,     8,   .500,   .600
FLT12: Experimental ,  1992, 1995,   5,    14,   .000,  1.000
FLT13: Nor bot surv ,  1988, 1995,   1,    12,   .100,   .200
TEST: Russian bottom,  1990, 1995,   4,     9,   .850,   .950


Time series weights :

     Tapered time weighting applied
     Power =    3 over  20 years


Catchability analysis :

     Catchability independent of stock size for all ages

     Catchability independent of age for ages >=   10


Terminal population estimation :

     Survivor estimates shrunk towards the mean F
     of the final   2 years or the   5 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  185 iterations




Regression weights
      ,  .751,  .820,  .877,  .921,  .954,  .976,  .990,  .997, 1.000, 1.000


Fishing mortalities
   Age,  1986,  1987,  1988,  1989,  1990,  1991,  1992,  1993,  1994,  1995

     1,  .000,  .000,  .000,  .000,  .000,  .001,  .009,  .000,  .000,  .000
     2,  .000,  .000,  .000,  .000,  .000,  .006,  .004,  .000,  .000,  .000
     3,  .005,  .002,  .000,  .008,  .007,  .023,  .010,  .002,  .000,  .000
     4,  .046,  .017,  .009,  .044,  .037,  .116,  .030,  .026,  .019,  .055
     5,  .095,  .070,  .042,  .101,  .128,  .201,  .079,  .098,  .089,  .288
     6,  .253,  .231,  .193,  .279,  .366,  .342,  .098,  .099,  .076,  .176
     7,  .354,  .444,  .384,  .439,  .493,  .632,  .139,  .175,  .147,  .242
     8,  .351,  .382,  .480,  .338,  .414,  .472,  .185,  .201,  .118,  .151
     9,  .202,  .274,  .456,  .320,  .421,  .383,  .113,  .043,  .073,  .071
    10,  .314,  .212,  .543,  .199,  .318, 1.023,  .378,  .474,  .264,  .220
    11,  .272,  .169,  .173,  .251,  .239, 1.124,  .361,  .503,  .349,  .281
    12,  .380,  .149,  .205,  .059,  .610, 1.605,  .631,  .489,  .809,  .526
    13,  .602,  .261,  .131,  .107,  .024,  .801,  .782,  .281,  .585, 1.006
    14,  .355,  .214,  .303,  .188,  .110,  .196, 1.261,  .429,  .508,  .828
```

Table 8.11 (Cont'd)

XSA population numbers (Thousands)

YEAR	AGE 1	2	3	4	5	6	7	8
1986	3.64E+04	3.70E+04	3.30E+04	2.36E+04	1.99E+04	1.61E+04	9.81E+03	5.58E+03	6.65E+03	3.99E+03
1987	3.74E+04	3.14E+04	3.19E+04	2.82E+04	1.94E+04	1.55E+04	1.07E+04	5.93E+03	3.38E+03	4.68E+03
1988	3.23E+04	3.22E+04	2.70E+04	2.74E+04	2.39E+04	1.56E+04	1.06E+04	5.93E+03	3.48E+03	2.21E+03
1989	2.53E+04	2.78E+04	2.77E+04	2.32E+04	2.34E+04	1.97E+04	1.11E+04	6.23E+03	3.16E+03	1.90E+03
1990	1.50E+04	2.17E+04	2.39E+04	2.37E+04	1.91E+04	1.82E+04	1.28E+04	6.14E+03	3.83E+03	1.97E+03
1991	6.68E+03	1.29E+04	1.87E+04	2.04E+04	1.96E+04	1.45E+04	1.09E+04	6.75E+03	3.50E+03	2.16E+03
1992	2.54E+03	5.74E+03	1.10E+04	1.57E+04	1.56E+04	1.38E+04	8.86E+03	4.96E+03	3.63E+03	2.05E+03
1993	9.82E+02	2.16E+03	4.92E+03	9.42E+03	1.31E+04	1.25E+04	1.08E+04	6.63E+03	3.55E+03	2.79E+03
1994	4.94E+02	8.45E+02	1.86E+03	4.23E+03	7.90E+03	1.03E+04	9.71E+03	7.80E+03	4.67E+03	2.93E+03
1995	2.01E+03	4.25E+02	7.28E+02	1.60E+03	3.57E+03	6.22E+03	8.18E+03	7.21E+03	5.97E+03	3.74E+03

Estimated population abundance at 1st Jan 1996

.00E+00, 1.73E+03, 3.66E+02, 6.26E+02, 1.31E+03, 2.30E+03, 4.49E+03, 5.53E+03, 5.34E+03, 4.78E+03,

Taper weighted geometric mean of the VPA populations:

9.59E+03, 1.04E+04, 1.28E+04, 1.48E+04, 1.54E+04, 1.40E+04, 1.06E+04, 6.80E+03, 4.38E+03, 2.92E+03,

Standard error of the weighted Log(VPA populations) :

1.6229, 1.5875, 1.2541, .8851, .5480, .3070, .1496, .1878, .2711, .3288,

YEAR	AGE 11	12	13	14
1986	2.40E+03	1.48E+03	7.49E+02	1.10E+03
1987	2.51E+03	1.57E+03	8.72E+02	3.53E+02
1988	3.26E+03	1.82E+03	1.17E+03	5.78E+02
1989	1.11E+03	2.36E+03	1.28E+03	8.82E+02
1990	1.34E+03	7.41E+02	1.91E+03	9.89E+02
1991	1.24E+03	9.08E+02	3.46E+02	1.61E+03
1992	6.69E+02	3.46E+02	1.57E+02	1.34E+02
1993	1.21E+03	4.01E+02	1.58E+02	6.18E+01
1994	1.49E+03	6.30E+02	2.12E+02	1.03E+02
1995	1.93E+03	9.07E+02	2.41E+02	1.01E+02

Estimated population abundance at 1st Jan 1996

2.58E+03, 1.26E+03, 4.61E+02, 7.60E+01,

Taper weighted geometric mean of the VPA populations:

1.70E+03, 1.03E+03, 5.64E+02, 3.74E+02,

Standard error of the weighted Log(VPA populations) :

.4624, .6146, .9037, 1.0815,

Table 8.11 (Cont'd)

Log catchability residuals.

Fleet : FLT09: Norwegian Sva

Age	1984	1985
1	-.04	.47
2	.95	1.03
3	.08	.46
4	.57	.32
5	.18	.32
6	.61	.99
7	.17	.57
8	1.04	.47
9	No data for this fleet at this age	
10	No data for this fleet at this age	
11	No data for this fleet at this age	
12	No data for this fleet at this age	
13	No data for this fleet at this age	
14	No data for this fleet at this age	

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	-2.26	.27	.68	.79	-.52	-.19	.02	.68	-.46	.30
2	-.30	-.12	1.29	1.16	-.86	.62	-1.94	-.28	2.04	-2.75
3	-.50	-.02	.84	1.10	.77	.53	-1.17	-2.25	.48	-.03
4	.42	-.28	.16	.47	.39	.54	-1.00	-.61	-.29	-.22
5	-.29	-.26	.46	-.03	.28	.48	-.34	-.55	.11	-.20
6	-.69	-.09	-.39	-.58	.20	.61	.27	-.39	-.07	-.16
7	-.02	-.92	.88	-.35	-.18	.27	-.08	-.06	-.04	-.08
8	-.48	-.54	-.55	-.65	.37	.91	.75	.34	-.62	-.72
9	No data for this fleet at this age									
10	No data for this fleet at this age									
11	No data for this fleet at this age									
12	No data for this fleet at this age									
13	No data for this fleet at this age									
14	No data for this fleet at this age									

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

Age	1	2	3	4	5	6	7	8
Mean Log q	-4.2491	-3.2032	-2.2097	-1.4609	-.9872	-1.2407	-1.0763	-1.8752
S.E(Log q)	.7977	1.4705	.9995	.5210	.3493	.4952	.4397	.6773

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
1	1.04	-.218	4.07	.80	12	.87	-4.25
2	.76	1.115	4.63	.71	12	1.10	-3.20
3	.83	.815	3.42	.73	12	.84	-2.21
4	.81	1.347	2.99	.86	12	.41	-1.46
5	.84	.976	2.37	.81	12	.29	-.99
6	1.00	.002	1.25	.29	12	.52	-1.24
7	1.17	-.146	-.32	.08	12	.54	-1.08
8	.77	.228	3.47	.10	12	.55	-1.88

Table 8.11 (Cont'd)

Fleet : FLT11: Norwegian Sva

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	99.99	99.99	1.47	1.83	-.59	-2.07	.24	.29	99.99	-.91
2	99.99	99.99	2.09	1.86	.28	-.20	-1.70	-.78	-1.27	.11
3	99.99	99.99	1.34	1.51	1.48	.51	-.55	-2.06	-1.24	-.63
4	99.99	99.99	.47	.11	.79	.30	-.51	-.78	-.59	.31
5	99.99	99.99	-.71	-.20	.54	.30	-.15	-.58	.27	.45
6	99.99	99.99	99.99	-.44	.40	.78	-.11	-.97	.25	.08
7	99.99	99.99	99.99	-.28	-1.01	.78	.05	-.32	.87	-.13
8	99.99	99.99	99.99	-.94	.20	-.30	.60	.48	.48	-.59
9	No data for this fleet at this age									
10	No data for this fleet at this age									
11	No data for this fleet at this age									
12	No data for this fleet at this age									
13	No data for this fleet at this age									
14	No data for this fleet at this age									

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

Age	1	2	3	4	5	6	7	8
Mean Log q	-3.4343	-2.8242	-2.4442	-1.5691	-1.4076	-2.2549	-2.4094	-3.1126
S.E(Log q)	1.3520	1.3508	1.3632	.5723	.4696	.5776	.6560	.5998

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
1	.72	.936	4.93	.70	7	.98	-3.43
2	.67	1.766	4.70	.84	8	.79	-2.82
3	.58	2.579	5.20	.87	8	.58	-2.44
4	.86	.709	2.64	.82	8	.51	-1.57
5	1.47	-1.185	-2.36	.53	8	.67	-1.41
6	1.05	-.070	1.90	.29	7	.67	-2.25
7	-1.32	-.980	18.25	.04	7	.87	-2.41
8	8.54	-.480	-39.62	.00	7	5.50	-3.11

Table 8.11 (Cont'd)

Fleet : FLT12: Experimental

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	No data for this fleet at this age									
2	No data for this fleet at this age									
3	No data for this fleet at this age									
4	No data for this fleet at this age									
5	99.99	99.99	99.99	99.99	99.99	99.99	-1.29	-.32	.30	1.29
6	99.99	99.99	99.99	99.99	99.99	99.99	-.75	-.36	.21	.89
7	99.99	99.99	99.99	99.99	99.99	99.99	-.52	-.14	.07	.59
8	99.99	99.99	99.99	99.99	99.99	99.99	-.10	.06	-.11	.15
9	99.99	99.99	99.99	99.99	99.99	99.99	-.08	-.43	-.22	.72
10	99.99	99.99	99.99	99.99	99.99	99.99	-.13	.19	-.05	-.01
11	99.99	99.99	99.99	99.99	99.99	99.99	.10	.18	-.25	-.54
12	99.99	99.99	99.99	99.99	99.99	99.99	.34	.13	-.52	-.22
13	99.99	99.99	99.99	99.99	99.99	99.99	-.06	.12	-.44	.01
14	99.99	99.99	99.99	99.99	99.99	99.99	-.39	.03	-.44	.40

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

Age	5	6	7	8	9	10	11	12	13	14
Mean Log q	-3.8740	-4.0837	-3.7339	-4.2222	-6.0442	-3.8778	-3.8778	-3.8778	-3.8778	-3.8778
S.E(Log q)	1.0829	.7157	.4643	.1257	.5002	.1373	.3624	.3871	.2652	.4144

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
5	-1.76	-4.797	18.25	.60	4	.66	-3.87
6	-1.04	-5.955	14.58	.81	4	.21	-4.08
7	-1.65	-.640	18.05	.03	4	.85	-3.73
8	.83	.469	4.99	.80	4	.12	-4.22
9	.36	2.292	7.53	.87	4	.12	-6.04
10	.84	.498	4.52	.84	4	.13	-3.88
11	2.37	-1.798	-.25	.47	4	.59	-4.00
12	3.03	-1.731	-.79	.27	4	.89	-3.94
13	1.72	-.560	3.05	.23	4	.48	-3.97
14	1.93	-.598	3.43	.17	4	.87	-3.98

Fleet : FLT13: Nor bot surv

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	99.99	99.99	.32	.70	.05	.08	-.97	-.09	99.99	99.99
2	99.99	99.99	-.39	.43	-.33	.14	-.50	.31	99.99	.31
3	99.99	99.99	.15	-.16	-.27	-.41	-.47	1.19	.22	-.28
4	99.99	99.99	-.02	-.45	-.93	-.56	-.21	.57	.32	1.19
5	99.99	99.99	.14	.01	-.18	-1.23	-.55	.27	-.01	1.51
6	99.99	99.99	-.74	-.77	.17	-.43	-.09	.18	.10	1.41
7	99.99	99.99	.20	-.82	-.05	.01	.09	.06	.01	.47
8	99.99	99.99	-.01	-.26	.71	99.99	-.75	99.99	.20	.12
9	99.99	99.99	99.99	99.99	-.13	.30	.23	-.01	-.32	-.06
10	99.99	99.99	-1.23	-.68	99.99	.82	1.82	-.78	-.41	.29
11	99.99	99.99	-.29	1.25	.29	.18	.43	-.36	1.48	.94
12	99.99	99.99	-.01	.79	1.77	.84	1.25	99.99	99.99	.52
13	No data for this fleet at this age									
14	No data for this fleet at this age									

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

Age	1	2	3	4	5	6	7	8	9	10
Mean Log q	-4.0086	-3.0069	-2.6008	-1.9735	-2.3098	-2.1051	-2.5083	-3.2350	-1.9059	-3.4199
S.E(Log q)	.5636	.3895	.5512	.6917	.7888	.6981	.3615	.4916	.2333	1.0656

Age	11	12
Mean Log q	-3.4199	-3.4199
S.E(Log q)	.8634	1.1338

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
1	.79	1.714	5.05	.95	6	.37	-4.01
2	1.10	-.901	2.40	.94	7	.44	-3.01
3	1.09	-.487	2.05	.85	8	.64	-2.60
4	2.44	-4.180	-8.60	.60	8	.91	-1.97
5	7.88	-2.529	-47.19	.02	8	4.63	-2.31
6	-1.61	-3.961	21.35	.29	8	.63	-2.11
7	-3.26	-1.434	31.17	.02	8	1.10	-2.51
8	.36	1.404	6.77	.56	6	.16	-3.24
9	2.38	-1.235	-6.96	.17	6	.53	-1.91
10	2.46	-.298	-3.01	.01	7	2.86	-3.42
11	1.30	-.370	1.63	.21	8	.95	-2.92
12	2.07	-1.393	-2.08	.31	6	1.14	-2.55

Table 8.11 (Cont'd)

Fleet : TEST: Russian bottom

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	No data for this fleet at this age									
2	No data for this fleet at this age									
3	No data for this fleet at this age									
4	99.99	99.99	99.99	99.99	.01	.24	.30	-.43	.06	-.17
5	99.99	99.99	99.99	99.99	-.44	.04	.43	-.29	-.09	.34
6	99.99	99.99	99.99	99.99	-.49	.05	.03	-.12	-.06	.57
7	99.99	99.99	99.99	99.99	-.30	.28	.17	-.04	-.32	.22
8	99.99	99.99	99.99	99.99	-.52	.26	.39	.13	-.39	.11
9	99.99	99.99	99.99	99.99	-.14	.13	-.01	.16	-.08	-.07
10	No data for this fleet at this age									
11	No data for this fleet at this age									
12	No data for this fleet at this age									
13	No data for this fleet at this age									
14	No data for this fleet at this age									

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

Age	4	5	6	7	8	9
Mean Log q	-.8806	.5308	.8028	.7621	.6273	-.0399
S.E(Log q)	.2704	.3450	.3405	.2648	.3671	.1209

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
4	.90	.914	1.68	.96	6	.25	-.88
5	1.28	-.903	-3.26	.73	6	.45	.53
6	5.22	-3.670	-43.74	.16	6	.94	.80
7	6.26	-1.177	-53.28	.01	6	1.60	.76
8	-33.80	-.968	326.91	.00	6	12.49	.63
9	1.44	-1.264	-3.61	.68	6	.16	-.04

Table 8.11 (Cont'd)

Terminal year survivor and F summaries :

Age 1 Catchability constant w.r.t. time and dependent on age

Year class = 1994

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	2344.,	.835,	.000,	.00,	1, .751,	.000
FLT11: Norwegian Sva,	696.,	1.449,	.000,	.00,	1, .249,	.000
FLT12: Experimental ,	1.,	.000,	.000,	.00,	0, .000,	.000
FLT13: Nor bot surv ,	1.,	.000,	.000,	.00,	0, .000,	.000
TEST: Russian bottom,	1.,	.000,	.000,	.00,	0, .000,	.000
F shrinkage mean ,	0.,	2.00,,,,			.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
1732.,	.72,	.53,	2,	.726,	.000

Age 2 Catchability constant w.r.t. time and dependent on age

Year class = 1993

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	137.,	.734,	.957,	1.30,	2, .230,	.000
FLT11: Norwegian Sva,	409.,	1.436,	.000,	.00,	1, .060,	.000
FLT12: Experimental ,	1.,	.000,	.000,	.00,	0, .000,	.000
FLT13: Nor bot surv ,	498.,	.417,	.000,	.00,	1, .710,	.000
TEST: Russian bottom,	1.,	.000,	.000,	.00,	0, .000,	.000
F shrinkage mean ,	0.,	2.00,,,,			.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
366.,	.35,	.41,	4,	1.161,	.000

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

Year class = 1992

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	1207.,	.601,	.473,	.79,	3, .283,	.000
FLT11: Norwegian Sva,	365.,	.834,	.453,	.54,	3, .147,	.000
FLT12: Experimental ,	1.,	.000,	.000,	.00,	0, .000,	.000
FLT13: Nor bot surv ,	520.,	.423,	.096,	.23,	2, .571,	.000
TEST: Russian bottom,	1.,	.000,	.000,	.00,	0, .000,	.000
F shrinkage mean ,	0.,	2.00,,,,			.000,	.000

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
626.,	.32,	.23,	8,	.725,	.000

Table 8.11 (Cont'd)

Age 4 Catchability constant w.r.t. time and dependent on age

Year class = 1991

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	1225.,	.404,	.143,	.35,	4, .176,	.058
FLT11: Norwegian Sva,	1300.,	.492,	.326,	.66,	4, .119,	.055
FLT12: Experimental ,	1.,	.000,	.000,	.00,	0, .000,	.000
FLT13: Nor bot surv ,	1524.,	.276,	.373,	1.35,	4, .378,	.047
TEST: Russian bottom,	1104.,	.300,	.000,	.00,	1, .320,	.064
F shrinkage mean ,	3253.,	2.00,,,,			.008,	.022

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
1306.,	.17,	.13,	14,	.786,	.055

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

Year class = 1990

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	1525.,	.271,	.287,	1.06,	5, .246,	.408
FLT11: Norwegian Sva,	1704.,	.351,	.442,	1.26,	5, .147,	.372
FLT12: Experimental ,	8364.,	1.211,	.000,	.00,	1, .012,	.088
FLT13: Nor bot surv ,	2960.,	.263,	.376,	1.43,	5, .259,	.231
TEST: Russian bottom,	2743.,	.234,	.136,	.58,	2, .330,	.247
F shrinkage mean ,	7827.,	2.00,,,,			.006,	.094

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
2305.,	.13,	.16,	19,	1.188,	.288

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

Year class = 1989

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	3721.,	.241,	.169,	.70,	6, .239,	.209
FLT11: Norwegian Sva,	3965.,	.306,	.195,	.64,	6, .149,	.197
FLT12: Experimental ,	9259.,	.668,	.265,	.40,	2, .033,	.089
FLT13: Nor bot surv ,	5566.,	.249,	.240,	.96,	6, .217,	.144
TEST: Russian bottom,	4360.,	.198,	.298,	1.51,	3, .358,	.181
F shrinkage mean ,	9449.,	2.00,,,,			.004,	.088

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
4489.,	.12,	.10,	24,	.851,	.176

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

Year class = 1988

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	4078.,	.215,	.185,	.86,	7, .216,	.316
FLT11: Norwegian Sva,	4702.,	.282,	.208,	.74,	7, .124,	.279
FLT12: Experimental ,	8282.,	.411,	.205,	.50,	3, .064,	.168
FLT13: Nor bot surv ,	6223.,	.211,	.164,	.78,	7, .222,	.218
TEST: Russian bottom,	6030.,	.166,	.128,	.77,	4, .370,	.224
F shrinkage mean ,	8641.,	2.00,,,,			.004,	.161

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
5529.,	.10,	.08,	29,	.790,	.242

Table 8.11 (Cont'd)

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

Year class = 1987

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	4735.,	.208,	.166,	.80,	8, .182,	.169
FLT11: Norwegian Sva,	5140.,	.261,	.282,	1.08,	8, .117,	.156
FLT12: Experimental ,	5615.,	.243,	.157,	.65,	4, .161,	.144
FLT13: Nor bot surv ,	5611.,	.200,	.109,	.55,	8, .197,	.144
TEST: Russian bottom,	5472.,	.155,	.136,	.88,	5, .340,	.147
F shrinkage mean ,	5026.,	2.00,,,,			.003,	.160

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
5338.,	.09,	.07,	34,	.761,	.151

Age 9 Catchability constant w.r.t. time and dependent on age

Year class = 1986

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	5823.,	.210,	.153,	.73,	8, .138,	.059
FLT11: Norwegian Sva,	6521.,	.269,	.204,	.76,	7, .088,	.053
FLT12: Experimental ,	4792.,	.228,	.218,	.96,	4, .157,	.071
FLT13: Nor bot surv ,	4274.,	.177,	.111,	.63,	8, .245,	.079
TEST: Russian bottom,	4438.,	.141,	.061,	.43,	6, .369,	.077
F shrinkage mean ,	5887.,	2.00,,,,			.003,	.058

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
4783.,	.09,	.06,	34,	.689,	.071

Age 10 Catchability constant w.r.t. time and dependent on age

Year class = 1985

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	3071.,	.216,	.206,	.95,	8, .125,	.188
FLT11: Norwegian Sva,	3987.,	.280,	.131,	.47,	6, .078,	.148
FLT12: Experimental ,	2428.,	.188,	.099,	.53,	4, .274,	.233
FLT13: Nor bot surv ,	2160.,	.205,	.091,	.44,	7, .205,	.258
TEST: Russian bottom,	2577.,	.159,	.089,	.56,	5, .315,	.220
F shrinkage mean ,	1416.,	2.00,,,,			.003,	.371

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
2581.,	.09,	.06,	31,	.636,	.220

Age 11 Catchability constant w.r.t. time and age (fixed at the value for age) 10

Year class = 1984

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	1646.,	.233,	.106,	.45,	8, .089,	.222
FLT11: Norwegian Sva,	1927.,	.312,	.164,	.53,	5, .059,	.192
FLT12: Experimental ,	1000.,	.181,	.121,	.67,	4, .358,	.342
FLT13: Nor bot surv ,	1196.,	.207,	.148,	.71,	8, .230,	.294
TEST: Russian bottom,	1501.,	.183,	.134,	.73,	4, .259,	.241
F shrinkage mean ,	764.,	2.00,,,,			.005,	.428

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
1256.,	.10,	.07,	30,	.667,	.281

Table 8.11 (Cont'd)

Age 12 Catchability constant w.r.t. time and age (fixed at the value for age) 10

Year class = 1983

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	519.,	.228,	.195,	.85,	8, .078,	.480
FLT11: Norwegian Sva,	263.,	.333,	.155,	.47,	4, .043,	.795
FLT12: Experimental ,	423.,	.211,	.111,	.53,	4, .446,	.562
FLT13: Nor bot surv ,	617.,	.243,	.209,	.86,	7, .211,	.417
TEST: Russian bottom,	454.,	.205,	.130,	.64,	3, .210,	.533
F shrinkage mean ,	346.,	2.00,,,,			.012,	.653

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
461.,	.12,	.07,	27,	.610,	.526

Age 13 Catchability constant w.r.t. time and age (fixed at the value for age) 10

Year class = 1982

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	69.,	.237,	.144,	.61,	7, .039,	1.065
FLT11: Norwegian Sva,	79.,	.500,	.230,	.46,	2, .012,	.984
FLT12: Experimental ,	71.,	.210,	.113,	.54,	4, .732,	1.045
FLT13: Nor bot surv ,	90.,	.228,	.276,	1.21,	6, .107,	.903
TEST: Russian bottom,	73.,	.247,	.288,	1.17,	2, .080,	1.035
F shrinkage mean ,	241.,	2.00,,,,			.029,	.436

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
76.,	.17,	.08,	22,	.464,	1.006

Age 14 Catchability constant w.r.t. time and age (fixed at the value for age) 10

Year class = 1981

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, Scaled, Weights,	Estimated F
FLT09: Norwegian Sva,	41.,	.248,	.251,	1.01,	6, .025,	.791
FLT11: Norwegian Sva,	15.,	.669,	.000,	.00,	1, .005,	1.457
FLT12: Experimental ,	37.,	.214,	.216,	1.01,	4, .829,	.847
FLT13: Nor bot surv ,	41.,	.276,	.152,	.55,	5, .072,	.788
TEST: Russian bottom,	33.,	.307,	.000,	.00,	1, .035,	.910
F shrinkage mean ,	93.,	2.00,,,,			.034,	.423

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
38.,	.19,	.10,	18,	.516,	.828

Table 8.12

Run title : Arctic Green.halibut (run: XSAOLE11/X11)

At 25-Aug-96 16:39:10

Terminal Fs derived using XSA (With F shrinkage)

Table 10 Stock number at age (start of year)						Numbers*10**-3
YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	48875,	41849,	41277,	44839,	39413,	37714,
2,	49488,	42067,	36020,	35528,	38593,	33923,
3,	45406,	42595,	36208,	31003,	30579,	33217,
4,	36770,	39080,	36661,	31163,	26683,	26319,
5,	41138,	31617,	33636,	31127,	26805,	22711,
6,	47172,	34920,	27139,	27922,	26594,	22220,
7,	45303,	38011,	25894,	20092,	22996,	20553,
8,	41622,	29284,	20923,	13376,	13654,	14037,
9,	25223,	18604,	13810,	12036,	8252,	8191,
10,	17387,	12400,	10325,	9312,	7992,	5401,
11,	7546,	8777,	6648,	7278,	6234,	5077,
12,	3813,	4160,	5046,	4453,	4840,	3861,
13,	1577,	2122,	2040,	3199,	2787,	2924,
14,	2991,	786,	858,	1130,	2089,	1718,
+gp,	756,	372,	342,	565,	845,	1046,
TOTAL,	415067,	346644,	296826,	273020,	258357,	238913,

Table 10 Stock number at age (start of year)							Numbers*10**-3			
YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	36728,	37468,	44579,	36097,	34597,	36928,	36981,	37218,	44483,	43021,
2,	32461,	31612,	32249,	38370,	31069,	29778,	31784,	31830,	32034,	38287,
3,	29198,	27939,	27209,	27757,	33025,	26742,	25630,	27357,	27396,	27572,
4,	28570,	25130,	23990,	23347,	23809,	28366,	22401,	22015,	23255,	23580,
5,	22343,	24499,	20929,	20155,	19272,	20237,	23351,	18769,	17824,	19982,
6,	18768,	18461,	19197,	16254,	15290,	15909,	15659,	18889,	14723,	14493,
7,	16957,	13387,	12869,	13193,	11063,	12104,	11915,	12092,	14529,	9242,
8,	11641,	9192,	7626,	7256,	8826,	7977,	8638,	9071,	8691,	9397,
9,	8261,	5379,	5570,	4370,	5101,	6352,	6001,	6314,	5686,	5682,
10,	4949,	4327,	3136,	3394,	3302,	3515,	5018,	3780,	4051,	3907,
11,	3114,	3007,	2700,	1822,	2625,	2403,	2609,	3152,	2114,	2382,
12,	2647,	1832,	1603,	1458,	1293,	1786,	1621,	1468,	2052,	1261,
13,	1898,	1154,	780,	973,	1029,	858,	1184,	930,	811,	1450,
14,	1476,	986,	441,	348,	742,	661,	382,	719,	571,	540,
+gp,	998,	459,	334,	393,	398,	272,	162,	228,	306,	282,
TOTAL,	220010,	204833,	203214,	195187,	191441,	193888,	193337,	193832,	198525,	201077,

Table 10 Stock number at age (start of year)								Numbers*10**-3				
YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	1996,	GMST
AGE												
1,	36428,	37434,	32262,	25255,	14995,	6675,	2535,	982,	494,	2012,	0,	262
2,	37028,	31354,	32220,	27768,	21737,	12906,	5739,	2163,	845,	425,	1732,	267
3,	32954,	31870,	26987,	27732,	23900,	18710,	11046,	4920,	1861,	728,	366,	263
4,	23650,	28233,	27385,	23223,	23670,	20427,	15743,	9417,	4225,	1602,	626,	246
5,	19868,	19442,	23897,	23354,	19131,	19638,	15648,	13144,	7897,	3570,	1306,	221
6,	16068,	15549,	15609,	19727,	18171,	14482,	13830,	12450,	10256,	6220,	2305,	188
7,	9808,	10736,	10626,	11078,	12848,	10850,	8857,	10795,	9706,	8182,	4489,	144
8,	5578,	5925,	5926,	6232,	6144,	6751,	4964,	6631,	7799,	7212,	5529,	94
9,	6652,	3381,	3480,	3156,	3827,	3496,	3626,	3550,	4670,	5968,	5338,	61
10,	3989,	4679,	2212,	1899,	1974,	2161,	2053,	2787,	2926,	3737,	4783,	42
11,	2401,	2508,	3259,	1106,	1339,	1236,	669,	1210,	1493,	1934,	2581,	27
12,	1481,	1574,	1823,	2359,	741,	908,	346,	401,	630,	907,	1256,	17
13,	749,	872,	1168,	1279,	1913,	346,	157,	158,	212,	241,	461,	10
14,	1099,	353,	578,	882,	989,	1608,	134,	62,	103,	101,	76,	7
+gp,	857,	39,	193,	176,	452,	3114,	83,	12,	8,	15,	44,	
TOTAL,	198608,	193950,	187624,	175226,	151833,	123308,	85428,	68683,	53127,	42856,	30892,	

Table 8.13

Run title : Arctic Green.halibut (run: XSAOLE11/X11)

At 25-Aug-96 16:39:10

Terminal Fs derived using XSA (With F shrinkage)

Table 8 Fishing mortality (F) at age YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0007,
4,	.0010,	.0000,	.0136,	.0007,	.0112,	.0138,
5,	.0139,	.0027,	.0362,	.0074,	.0376,	.0407,
6,	.0659,	.1490,	.1506,	.0441,	.1077,	.1203,
7,	.2863,	.4470,	.5105,	.2363,	.3436,	.4185,
8,	.6553,	.6017,	.4030,	.3330,	.3610,	.3801,
9,	.5600,	.4388,	.2441,	.2594,	.2739,	.3539,
10,	.5337,	.4735,	.1997,	.2512,	.3037,	.4006,
11,	.4456,	.4034,	.2508,	.2581,	.3291,	.5012,
12,	.4360,	.5624,	.3060,	.3186,	.3538,	.5600,
13,	.5463,	.7557,	.4410,	.2761,	.3339,	.5337,
14,	.5072,	.5298,	.2894,	.2737,	.3202,	.4724,
+gp,	.5072,	.5298,	.2894,	.2737,	.3202,	.4724,
FBAR 6-10,	.4202,	.4220,	.3016,	.2248,	.2780,	.3347,

Table 8 Fishing mortality (F) at age YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
3,	.0000,	.0024,	.0031,	.0034,	.0021,	.0271,	.0020,	.0124,	.0000,	.0034,
4,	.0037,	.0329,	.0242,	.0418,	.0125,	.0445,	.0269,	.0612,	.0017,	.0213,
5,	.0409,	.0939,	.1028,	.1263,	.0417,	.1065,	.0621,	.0928,	.0569,	.0680,
6,	.1879,	.2108,	.2250,	.2347,	.0836,	.1391,	.1085,	.1125,	.3157,	.2405,
7,	.4624,	.4127,	.4230,	.2520,	.1770,	.1874,	.1227,	.1803,	.2857,	.3548,
8,	.6220,	.3509,	.4069,	.2025,	.1789,	.1348,	.1634,	.3171,	.2749,	.1955,
9,	.4966,	.3895,	.3453,	.1302,	.2225,	.0857,	.3122,	.2938,	.2253,	.2038,
10,	.3482,	.3216,	.3932,	.1068,	.1677,	.1478,	.3150,	.4311,	.3811,	.3370,
11,	.3808,	.4791,	.4665,	.1925,	.2355,	.2436,	.4249,	.2795,	.3667,	.3255,
12,	.6802,	.7031,	.3489,	.1981,	.2603,	.2606,	.4061,	.4435,	.1968,	.3715,
13,	.5047,	.8112,	.6578,	.1211,	.2923,	.6585,	.3494,	.3375,	.2578,	.1274,
14,	.4848,	.5441,	.4447,	.1501,	.2365,	.2803,	.3632,	.3587,	.2866,	.2741,
+gp,	.4848,	.5441,	.4447,	.1501,	.2365,	.2803,	.3632,	.3587,	.2866,	.2741,
FBAR 6-10,	.4234,	.3371,	.3587,	.1853,	.1659,	.1390,	.2044,	.2669,	.2965,	.2663,

Table 8 Fishing mortality (F) at age YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	FBAR 93-95
AGE											
1,	.0000,	.0000,	.0000,	.0000,	.0000,	.0011,	.0090,	.0000,	.0000,	.0000,	.0000,
2,	.0000,	.0000,	.0000,	.0000,	.0000,	.0056,	.0040,	.0000,	.0000,	.0000,	.0000,
3,	.0046,	.0017,	.0002,	.0084,	.0070,	.0227,	.0096,	.0022,	.0000,	.0000,	.0007,
4,	.0459,	.0167,	.0092,	.0438,	.0368,	.1165,	.0304,	.0260,	.0185,	.0546,	.0330,
5,	.0951,	.0696,	.0418,	.1009,	.1284,	.2006,	.0786,	.0981,	.0887,	.2877,	.1582,
6,	.2532,	.2307,	.1929,	.2788,	.3657,	.3417,	.0978,	.0989,	.0758,	.1761,	.1170,
7,	.3539,	.4442,	.3836,	.4395,	.4934,	.6320,	.1394,	.1750,	.1470,	.2421,	.1880,
8,	.3507,	.3822,	.4800,	.3377,	.4139,	.4716,	.1851,	.2006,	.1176,	.1509,	.1564,
9,	.2019,	.2741,	.4558,	.3196,	.4215,	.3825,	.1132,	.0434,	.0730,	.0713,	.0626,
10,	.3139,	.2116,	.5430,	.1991,	.3182,	1.0230,	.3784,	.4739,	.2641,	.2201,	.3194,
11,	.2718,	.1691,	.1733,	.2512,	.2389,	1.1243,	.3611,	.5033,	.3488,	.2813,	.3778,
12,	.3798,	.1488,	.2046,	.0593,	.6104,	1.6048,	.6310,	.4894,	.8089,	.5257,	.6080,
13,	.6018,	.2614,	.1310,	.1066,	.0239,	.8006,	.7816,	.2813,	.5854,	1.0057,	.6241,
14,	.3554,	.2137,	.3028,	.1877,	.1105,	.1964,	1.2615,	.4286,	.5082,	.8282,	.5883,
+gp,	.3554,	.2137,	.3028,	.1877,	.1105,	.1964,	1.2615,	.4286,	.5082,	.8282,	
FBAR 6-10,	.2947,	.3086,	.4111,	.3149,	.4025,	.5702,	.1828,	.1984,	.1355,	.1721,	

Table 8.14

Run title : Arctic Green.halibut (run: XSAOLE11/X11)

At 25-Aug-96 16:39:10

Terminal Fs derived using XSA (With F shrinkage)

Table 12 Stock biomass at age (start of year) Tonnes						
YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,
3,	9081,	8519,	7242,	6201,	6116,	6643,
4,	16216,	17234,	16167,	13743,	11767,	11607,
5,	23325,	17927,	19071,	17649,	15198,	12877,
6,	34766,	25736,	20001,	20578,	19600,	16376,
7,	48882,	41014,	27940,	21679,	24813,	22177,
8,	59145,	41613,	29731,	19007,	19402,	19947,
9,	46612,	34380,	25521,	22242,	15250,	15137,
10,	39661,	28285,	23552,	21240,	18231,	12320,
11,	21785,	25338,	19192,	21013,	17999,	14659,
12,	12380,	13507,	16385,	14457,	15714,	12537,
13,	6788,	9131,	8779,	13763,	11992,	12582,
14,	14751,	3877,	4230,	5571,	10300,	8470,
+gp,	4380,	2173,	2062,	3392,	5043,	6184,
TOTALBIO,	337769,	268732,	219873,	200536,	191423,	171515,

Table 12 Stock biomass at age (start of year) Tonnes										
YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	5840,	5588,	5442,	8327,	6605,	5348,	6920,	8481,	8219,	8272,
4,	12599,	11082,	10580,	14008,	11476,	14183,	13888,	9907,	11162,	8960,
5,	12668,	13891,	11867,	18139,	13529,	13357,	16112,	14077,	11229,	11989,
6,	13832,	13606,	14148,	19505,	13333,	13364,	13154,	19645,	14134,	12898,
7,	18297,	14445,	13886,	19790,	12623,	13920,	12272,	16204,	17144,	11090,
8,	16542,	13062,	10836,	13062,	12956,	12445,	11316,	14242,	13297,	17384,
9,	15267,	9941,	10293,	9613,	9069,	12959,	10441,	12438,	13135,	14717,
10,	11288,	9871,	7154,	8825,	7600,	9032,	11241,	10318,	11627,	12424,
11,	8991,	8681,	7796,	5465,	6994,	7161,	7228,	10371,	7314,	8623,
12,	8596,	5947,	5205,	5102,	3939,	6125,	5463,	6197,	7735,	4981,
13,	8169,	4966,	3358,	3991,	3467,	3544,	5117,	4378,	3236,	6498,
14,	7278,	4864,	2177,	1670,	3180,	3095,	2045,	4371,	2483,	2293,
+gp,	5908,	2765,	1973,	2428,	2126,	1633,	945,	1394,	1383,	1361,
TOTALBIO,	145275,	118709,	104715,	129925,	106897,	116164,	116142,	132021,	122099,	121490,

Table 12 Stock biomass at age (start of year) Tonnes										
YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	11204,	9784,	11172,	8597,	6692,	5426,	2430,	1673,	484,	320,
4,	11115,	16206,	15171,	14630,	13019,	12256,	7242,	5085,	2197,	897,
5,	12318,	13784,	17684,	17749,	13583,	15121,	10641,	10384,	5686,	2606,
6,	14782,	15596,	15016,	20318,	19262,	15206,	13415,	12699,	9640,	5847,
7,	12554,	13591,	13272,	14624,	16573,	14973,	11248,	14573,	12327,	10228,
8,	10599,	9972,	9636,	11218,	10446,	11815,	8736,	12467,	13415,	12550,
9,	16497,	8392,	7531,	7638,	8036,	7692,	8014,	8734,	10228,	12473,
10,	12405,	13952,	6409,	5943,	5151,	5618,	5255,	7442,	7374,	9379,
11,	8042,	8897,	11100,	3729,	3844,	3448,	2079,	4151,	4435,	5705,
12,	5507,	5983,	6674,	9553,	2556,	2978,	1240,	1721,	2071,	3029,
13,	2994,	3975,	4960,	5486,	7117,	1347,	601,	804,	813,	924,
14,	4594,	1765,	2419,	3968,	4046,	7042,	569,	391,	509,	505,
+gp,	3877,	233,	861,	830,	2045,	16475,	398,	110,	54,	123,
TOTALBIO,	126490,	122131,	121906,	124282,	112369,	119397,	71868,	80232,	69233,	64587,

Table 8.15

Run title : Arctic Green.halibut (run: XSAOLE11/X11)

At 25-Aug-96 16:39:10

Terminal Fs derived using XSA (With F shrinkage)

Table 13 Spawning stock biomass at age (spawning time) Tonnes

YEAR,	1970,	1971,	1972,	1973,	1974,	1975,
AGE						
1,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,
4,	811,	862,	808,	687,	588,	580,
5,	5365,	4123,	4386,	4059,	3496,	2962,
6,	17035,	12611,	9801,	10083,	9604,	8024,
7,	32262,	27069,	18440,	14308,	16376,	14637,
8,	46133,	32458,	23190,	14826,	15133,	15558,
9,	41484,	30598,	22713,	19795,	13572,	13472,
10,	37678,	26871,	22374,	20178,	17319,	11704,
11,	21567,	25084,	19000,	20803,	17819,	14512,
12,	12256,	13372,	16222,	14313,	15557,	12412,
13,	6720,	9039,	8692,	13626,	11872,	12457,
14,	14751,	3877,	4230,	5571,	10300,	8470,
+gp,	4380,	2173,	2062,	3392,	5043,	6184,
TOTSPBIO,	240441,	188137,	151918,	141641,	136678,	120971,

Table 13 Spawning stock biomass at age (spawning time) Tonnes

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,	1985,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	630,	554,	529,	700,	574,	709,	694,	495,	558,	448,
5,	2914,	3195,	2729,	4172,	3112,	3072,	3706,	3238,	2583,	2758,
6,	6778,	6667,	6933,	9557,	6533,	6548,	6445,	9626,	6926,	6320,
7,	12076,	9534,	9165,	13061,	8331,	9187,	8100,	10694,	11315,	7319,
8,	12903,	10188,	8452,	10188,	10106,	9707,	8826,	11109,	10371,	13560,
9,	13588,	8847,	9161,	8556,	8072,	11533,	9292,	11070,	11690,	13098,
10,	10724,	9377,	6796,	8384,	7220,	8581,	10679,	9802,	11045,	11803,
11,	8901,	8595,	7718,	5410,	6924,	7089,	7156,	10267,	7241,	8536,
12,	8510,	5887,	5153,	5051,	3900,	6064,	5408,	6135,	7658,	4931,
13,	8087,	4917,	3325,	3951,	3432,	3508,	5065,	4334,	3204,	6433,
14,	7278,	4864,	2177,	1670,	3180,	3095,	2045,	4371,	2483,	2293,
+gp,	5908,	2765,	1973,	2428,	2126,	1633,	945,	1394,	1383,	1361,
TOTSPBIO,	98295,	75390,	64111,	73129,	63510,	70726,	68362,	82535,	76458,	78859,

Table 13 Spawning stock biomass at age (spawning time) Tonnes

YEAR,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,
AGE										
1,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
2,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
3,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
4,	556,	810,	303,	439,	651,	613,	362,	509,	220,	90,
5,	2833,	3170,	1945,	2485,	2717,	3024,	2128,	3946,	2161,	990,
6,	7243,	7642,	7658,	10769,	11364,	8971,	7915,	6476,	4917,	2982,
7,	8285,	8970,	8892,	9652,	11601,	10481,	7873,	9472,	8013,	6648,
8,	8267,	7778,	6553,	7740,	7521,	8507,	6290,	9101,	9793,	9161,
9,	14682,	7469,	6025,	5576,	6107,	5846,	6091,	7162,	8387,	10228,
10,	11785,	13255,	5897,	5111,	4378,	4776,	4467,	6772,	6710,	8535,
11,	7961,	8808,	10878,	3580,	3613,	3241,	1955,	4026,	4302,	5534,
12,	5452,	5923,	6674,	9553,	2556,	2978,	1240,	1686,	2030,	2968,
13,	2964,	3935,	4960,	5486,	7117,	1347,	601,	804,	813,	924,
14,	4594,	1765,	2419,	3968,	4046,	7042,	569,	391,	509,	505,
+gp,	3877,	233,	861,	830,	2045,	16475,	398,	110,	54,	123,
TOTSPBIO,	78502,	69759,	63065,	65187,	63717,	73301,	39889,	50454,	47907,	48690,

Table 8.16

Run title : Arctic Green.halibut (run: XSAOLE11/X11)

At 27-Aug-96 10:51:31

Table 16 Summary (without SOP correction) Edited

Terminal Fs derived using XSA (With F shrinkage)

	RECRUITS, Age 3	TOTALBIO,	TOTSPBIO,	LANDINGS,	YIELD/SSB,	FBAR 6-10,
1970,	45406,	337770,	240441,	89484,	.3722,	.4202,
1971,	42595,	268733,	188137,	79034,	.4201,	.4220,
1972,	36208,	219873,	151918,	43055,	.2834,	.3016,
1973,	31003,	200536,	141641,	29938,	.2114,	.2248,
1974,	30579,	191423,	136678,	37763,	.2763,	.2780,
1975,	33217,	171515,	120971,	38172,	.3155,	.3347,
1976,	29198,	145275,	98295,	36074,	.3670,	.4234,
1977,	27939,	118709,	75390,	28827,	.3824,	.3371,
1978,	27209,	104715,	64111,	24617,	.3840,	.3587,
1979,	27757,	129925,	73129,	17312,	.2367,	.1853,
1980,	33025,	106897,	63510,	13284,	.2092,	.1659,
1981,	26742,	116164,	70726,	15018,	.2123,	.1390,
1982,	25630,	116142,	68362,	16789,	.2456,	.2044,
1983,	27357,	132021,	82535,	22147,	.2683,	.2669,
1984,	27396,	122099,	76458,	21883,	.2862,	.2965,
1985,	27572,	121490,	78859,	19945,	.2529,	.2663,
1986,	32954,	126490,	78502,	22875,	.2914,	.2947,
1987,	31870,	122131,	69759,	19112,	.2740,	.3086,
1988,	26987,	121906,	63065,	19587,	.3106,	.4111,
1989,	27732,	124282,	65187,	20138,	.3089,	.3149,
1990,	23900,	112369,	63717,	23183,	.3638,	.4025,
1991,	18710,	119397,	73301,	33320,	.4546,	.5702,
1992,	11046,	71868,	39889,	9253,	.2320,	.1828,
1993,	4920,	80232,	50454,	11879,	.2354,	.1984,
1994,	1861,	69233,	47907,	9151,	.1910,	.1355,
1995,	728,	64587,	48690,	11028,	.2265,	.1721,
Arith. Mean	26136,	139068,	89678,	27418,	.2928,	.2929,
Units,	(Thousands),	(Tonnes),	(Tonnes),	(Tonnes),		

Table 8.17

Greenland halibut in the North-East Arctic (Fishing Areas I & II)

Prediction with management option table: Input data

Year: 1996								
Age	Stock size	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
3	366.000	0.1500	0.0000	0.0000	0.0000	0.347	0.0007	0.347
4	626.000	0.1500	0.1000	0.0000	0.0000	0.540	0.0337	0.540
5	1306.000	0.1500	0.3800	0.0000	0.0000	0.747	0.1614	0.747
6	2305.000	0.1500	0.5100	0.0000	0.0000	0.967	0.1194	0.967
7	4489.000	0.1500	0.6500	0.0000	0.0000	1.290	0.1918	1.290
8	5529.000	0.1500	0.7300	0.0000	0.0000	1.780	0.1596	1.780
9	5338.000	0.1500	0.8200	0.0000	0.0000	2.247	0.0639	2.247
10	4783.000	0.1500	0.9100	0.0000	0.0000	2.567	0.3259	2.567
11	2581.000	0.1500	0.9700	0.0000	0.0000	3.117	0.3855	3.117
12	1256.000	0.1500	0.9800	0.0000	0.0000	3.640	0.6203	3.640
13	461.000	0.1500	1.0000	0.0000	0.0000	4.250	0.6368	4.250
14	76.000	0.1500	1.0000	0.0000	0.0000	5.417	0.6002	5.420
15+	44.000	0.1500	1.0000	0.0000	0.0000	7.913	0.6002	7.913
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1997								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
3	1491.000	0.1500	0.0000	0.0000	0.0000	0.347	0.0007	0.347
4	.	0.1500	0.1000	0.0000	0.0000	0.540	0.0337	0.540
5	.	0.1500	0.3800	0.0000	0.0000	0.747	0.1614	0.747
6	.	0.1500	0.5100	0.0000	0.0000	0.967	0.1194	0.967
7	.	0.1500	0.6500	0.0000	0.0000	1.290	0.1918	1.290
8	.	0.1500	0.7300	0.0000	0.0000	1.780	0.1596	1.780
9	.	0.1500	0.8200	0.0000	0.0000	2.247	0.0639	2.247
10	.	0.1500	0.9100	0.0000	0.0000	2.567	0.3259	2.567
11	.	0.1500	0.9700	0.0000	0.0000	3.117	0.3855	3.117
12	.	0.1500	0.9800	0.0000	0.0000	3.640	0.6203	3.640
13	.	0.1500	1.0000	0.0000	0.0000	4.250	0.6368	4.250
14	.	0.1500	1.0000	0.0000	0.0000	5.417	0.6002	5.420
15+	.	0.1500	1.0000	0.0000	0.0000	7.913	0.6002	7.913
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1998								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
3	1491.000	0.1500	0.0000	0.0000	0.0000	0.347	0.0007	0.347
4	.	0.1500	0.1000	0.0000	0.0000	0.540	0.0337	0.540
5	.	0.1500	0.3800	0.0000	0.0000	0.747	0.1614	0.747
6	.	0.1500	0.5100	0.0000	0.0000	0.967	0.1194	0.967
7	.	0.1500	0.6500	0.0000	0.0000	1.290	0.1918	1.290
8	.	0.1500	0.7300	0.0000	0.0000	1.780	0.1596	1.780
9	.	0.1500	0.8200	0.0000	0.0000	2.247	0.0639	2.247
10	.	0.1500	0.9100	0.0000	0.0000	2.567	0.3259	2.567
11	.	0.1500	0.9700	0.0000	0.0000	3.117	0.3855	3.117
12	.	0.1500	0.9800	0.0000	0.0000	3.640	0.6203	3.640
13	.	0.1500	1.0000	0.0000	0.0000	4.250	0.6368	4.250
14	.	0.1500	1.0000	0.0000	0.0000	5.417	0.6002	5.420
15+	.	0.1500	1.0000	0.0000	0.0000	7.913	0.6002	7.913
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : MANOLE01
Date and time: 26AUG96:18:54

Table 8.18

Greenland halibut in the North-East Arctic (Fishing Areas I & II)

Prediction with management option table

(cont.)

Year: 1996					Year: 1997					Year: 1998	
F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	Stock biomass	Sp.stock biomass
1.0000	0.1721	58905	48497	12107	0.0000	0.0000	48944	42228	0	51660	46632
.	.	.	.	.	0.1000	0.0172	.	42228	1384	50105	45140
.	.	.	.	.	0.2000	0.0344	.	42228	2711	48616	43712
.	.	.	.	.	0.3000	0.0516	.	42228	3985	47188	42345
.	.	.	.	.	0.4000	0.0688	.	42228	5208	45819	41035
.	.	.	.	.	0.5000	0.0861	.	42228	6383	44505	39779
.	.	.	.	.	0.6000	0.1033	.	42228	7510	43245	38576
.	.	.	.	.	0.7000	0.1205	.	42228	8594	42036	37422
.	.	.	.	.	0.8000	0.1377	.	42228	9636	40875	36316
.	.	.	.	.	0.9000	0.1549	.	42228	10637	39760	35254
.	.	.	.	.	1.0000	0.1721	.	42228	11600	38689	34235
.	.	.	.	.	1.1000	0.1893	.	42228	12526	37659	33257
.	.	.	.	.	1.2000	0.2065	.	42228	13418	36670	32318
.	.	.	.	.	1.3000	0.2238	.	42228	14276	35719	31417
.	.	.	.	.	1.4000	0.2410	.	42228	15102	34804	30550
.	.	.	.	.	1.5000	0.2582	.	42228	15898	33924	29717
.	.	.	.	.	1.6000	0.2754	.	42228	16665	33077	28916
.	.	.	.	.	1.7000	0.2926	.	42228	17404	32261	28146
.	.	.	.	.	1.8000	0.3098	.	42228	18116	31476	27406
.	.	.	.	.	1.9000	0.3270	.	42228	18803	30719	26693
.	.	.	.	.	2.0000	0.3442	.	42228	19466	29990	26007
-	-	Tonnes	Tonnes	Tonnes	-	-	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

(cont.)

Table 9.1 Landings of Coastal cod in:

A) Norway in Division IIa -areas 00, 05, 06 and 07 (in '000 tonnes).

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
43	32	30	40	46	24	29	33	47	52
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
49	*)	*)	*)	*)	*)	*)	*)	*)	*)
1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
40	49	42	38	33	28	26	31	22	17
1990	1991	1992	1993	1994	1995		*) No data		
24	25	35	44	48**)	40**)		**) Provisional data		

B) Russian/USSR data in Division I (in '000 tonnes)(Anon 1974).

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
71	108	114	127	63	52	73	79	118	122
1970	1971	1972	1973	1974					
70	48	23	122	99					

Table 9.2 Length (cm) at age (year) for Norwegian coastal cod from the survey during the autumn 1995.

Area	Age (year)													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
03 East Finnmark	10.4	18.9	29.2	39.2	50.1	55.8	63.5	71.2	98.0	77.0				
04 West Finnmark/Troms	7.0	21.7	33.7	41.9	51.5	57.5	61.2	71.7	78.9	89.6	81.0			
05 Lofoten/Vesterålen		23.2	30.4	44.2	53.7	62.5	63.1	71.5	83.7				123.5	
00 Vestfjord			32.1	45.9	51.7	61.4	74.3	84.8	90.0	94.0				
06 Nordland		22.8	34.3	42.3	54.8	61.6	65.7	81.0	93.9			100.0	117.0	
07 Møre		26.0	36.0	44.7	53.8	63.4	52.0	81.5	93.0	87.0				
Average	**10.0**	**20.8**	**32.0**	**42.0**	**51.7**	**58.4**	**63.8**	**74.7**	**86.8**	**87.0**	**81.0**	**100.0**	**119.6**	

Table 9.3 Weight (gram) at age (year) for Norwegian coastal cod from the survey during the autumn 1995.

Area	Age (year)													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
03 East Finnmark	9	56	214	551	1,188	1,705	2,521	3,553	10,560	4,430				
04 West Finnmark/Troms	3	90	350	684	1,332	1,834	2,254	3,563	4,983	6,808	6,425			
05 Lofoten/Vesterålen		114	249	834	1,513	2,512	2,662	3,676	6,655				17,490	
00 Vestfjord			363	980	1,398	2,460	4,339	6,057	7,120	9,145				
06 Nordland		112	370	714	1,666	2,217	2,659	5,377	8,776			11,040	18,580	
07 Møre		150	445	867	1,491	2,490	1,340	5,180	7,690	5,670				
Average	**8**	**80**	**298**	**702**	**1,346**	**1,975**	**2,642**	**4,164**	**7,051**	**6,414**	**6,425**	**11,040**	**18,144**	

Table 9.4 Percent maturity at age for Norwegian Coastal cod from the survey during the autumn 1995.

Area	Age year													
	-	1	2	3	4	5	6	7	8	9	10	11	12	13+
03 East Finnmark	-	-	-	-	8	52	71	80	87	100	100	100	100	100
04 West Finnmark/Troms	-	-	-	1	12	33	44	65	86	100	100	100	100	100
05 Lofoten/Vesterålen	-	-	-	-	20	65	89	100	100	100	100	100	100	100
00 Vestfjord	-	-	-	-	24	48	76	95	83	100	100	100	100	100
06 Nordland	-	-	-	4	43	73	100	92	100	100	100	100	100	100
07 Møre	-	-	-	-	45	65	82	100	50	100	100	100	100	100
Average	-	-	-	1	21	50	64	78	88	96	100	100	100	100

Table 9.5 Number (x1000) of Norwegian coastal cod at age from the survey during the autumn 1995.

	Age (year)														
Area	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13+**	**totalt**
03 East Finnmark	700	6,113	2,405	1,172	2,353	1,786	760	296	42	13	-	-	-	-	**15,640**
04 West Finnmark/Troms	89	14,233	6,458	4,071	5,729	8,127	4,370	1,022	417	467	130	16	-	-	**45,128**
05 Lofoten/Vesterålen	1,368	3,487	2,806	2,091	2,995	3,039	1,000	479	113	-	76	-	115	-	**17,570**
00 Vestfjord	-	-	343	1,175	1,861	1,130	1,319	222	22	63	-	-	-	-	**6,135**
06 Nordland	-	4,284	7,262	2,036	928	739	1,899	706	362	36	14	16	212	-	**18,494**
07 Møre	-	590	917	3,088	1,770	1,398	202	449	202	202	-	-	-	-	**8,818**
Total	**2,157**	**28,707**	**20,191**	**13,633**	**15,636**	**16,219**	**9,550**	**3,174**	**1,158**	**781**	**220**	**32**	**327**	-	**111,785**

Table 9.6 Biomass (tonnes) of Norwegian coastal cod at age from the survey during the autumn 1995.

	Age (year)														
Area	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13+**	**totalt**
03 East Finnmark	6	247	530	745	2,936	2,990	1,636	877	198	92	-	-	-	-	**10,257**
04 West Finnmark/Troms	1	895	2,327	2,938	8,504	16,784	10,283	3,734	2,370	2,886	1,457	131	-	-	**52,310**
05 Lofoten/Vesterålen	8	307	706	1,689	5,160	7,998	2,920	2,290	630	-	694	-	2,019	-	**24,421**
00 Vestfjord	-	-	124	1,197	2,596	2,353	5,227	1,407	159	551	-	-	-	-	**13,614**
06 Nordland	-	805	3,730	1,410	1,582	1,945	7,098	3,992	3,927	203	103	177	3,198	-	**28,170**
07 Møre	-	83	451	2,807	3,068	3,969	351	2,145	1,477	1,201	-	-	-	-	**15,552**
Total	**15**	**2,337**	**7,868**	**10,786**	**23,846**	**36,039**	**27,515**	**14,445**	**8,761**	**4,933**	**2,254**	**308**	**5,217**	-	**144,324**

Table 9.7 Spawning stock number (x1000) of Norwegian coastal cod at age from the survey during the autumn 1995.

	Age year														
Area	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13+**	**TOTAL**
03 East Finnmark	-	-	-	-	188	927	537	237	36	13	-	-	-	-	**1,938**
04 West Finnmark/Troms	-	-	-	53	676	2,682	1,910	660	360	467	130	16	-	-	**6,954**
05 Lofoten/Vesterålen	-	-	-	-	587	1,981	886	479	113	-	76	-	115	-	**4,237**
00 Vestfjord	-	-	-	-	437	546	1,008	211	18	63	-	-	-	-	**2,283**
06 Nordland	-	-	-	83	398	537	1,899	652	362	36	14	16	212	-	**4,209**
07 Møre	-	-	-	-	800	905	165	449	101	202	-	-	-	-	**2,622**
Total	-	-	-	**136**	**3,086**	**7,578**	**6,405**	**2,688**	**990**	**781**	**220**	**32**	**327**	-	**22,243**

Table 9.8 Spawning stock biomass (tonnes) of Norwegian coastal cod at age from the survey during the autumn 1995.

	Age year														
Area	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13+**	**Total**
03 East Finnmark	-	-	-	-	235	1,552	1,155	702	172	92	-	-	-	-	**3,908**
04 West Finnmark/Troms	-	-	-	38	1,003	5,539	4,494	2,412	2,048	2,886	1,457	131	-	-	**20,008**
05 Lofoten/Vesterålen	-	-	-	-	1,011	5,215	2,587	2,290	630	-	694	-	2,019	-	**14,446**
00 Vestfjord	-	-	-	-	610	1,136	3,993	1,339	132	551	-	-	-	-	**7,761**
06 Nordland	-	-	-	58	679	1,414	7,098	3,685	3,927	203	103	177	3,198	-	**20,542**
07 Møre	-	-	-	-	1,387	2,568	287	2,145	739	1,201	-	-	-	-	**8,327**
Total	-	-	-	**96**	**4,925**	**17,424**	**19,614**	**12,573**	**7,648**	**4,933**	**2,254**	**308**	**5,217**	-	**74,992**

Table 9.9 Number at age of Norwegian coastal cod in each area from the Norwegian coastal surveys from 1992-1995

03 East Finnmark

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	-	3,641	3,990	9,139	5,633	4,801	3,318	625	266	653	439	302	-	33	-	-	32,840
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	700	6,113	2,405	1,172	2,353	1,786	760	296	42	13	-	-	-	-	-	-	15,640

04 West Finnmark/Troms

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	-	1,953	4,658	6,797	5,210	8,987	3,994	387	508	494	97	178	-	-	-	6	33,269
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	89	14,233	6,458	4,071	5,729	8,127	4,370	1,022	417	467	130	16	-	-	-	-	45,129

05 Lofoten/Vesterålen

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	1,091	695	2,221	3,952	4,828	5,151	2,659	1,323	203	35	188	320	325	93	-	-	23,085
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	1,368	3,487	2,806	2,091	2,995	3,039	1,000	479	113	-	76	-	115	-	-	-	17,569

00 Vestfjord

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	1,608	571	544	1,452	3,215	4,726	2,642	1,651	683	208	140	96	41		4	34	17,613
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	343	1,175	1,861	1,130	1,319	222	22	63	-	-	-	-	-	-	6,135

06 Nordland

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	125	726	1,355	1,723	4,158	3,994	1,585	973	168	48	96	105	35	109	72	4	15,276
1995	-	4,284	7,262	2,036	928	739	1,899	706	362	36	14	16	212	-	-	-	18,494

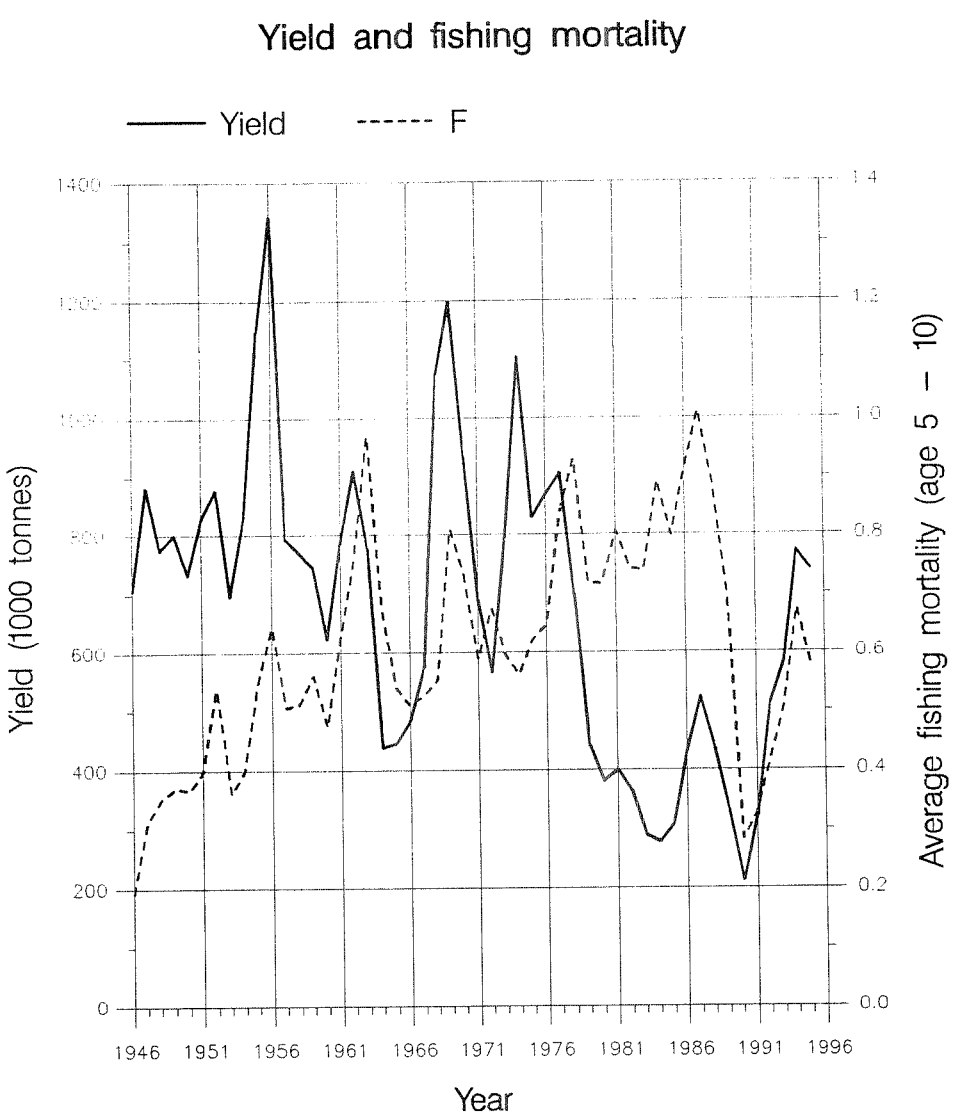
07 Møre

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	5	10	416	502	1,676	1,817	944	312	139	44	12	-	17	24	-	-	5,913
1995	-	590	917	3,088	1,770	1,398	202	449	202	202	-	-	-	-	-	-	8,818

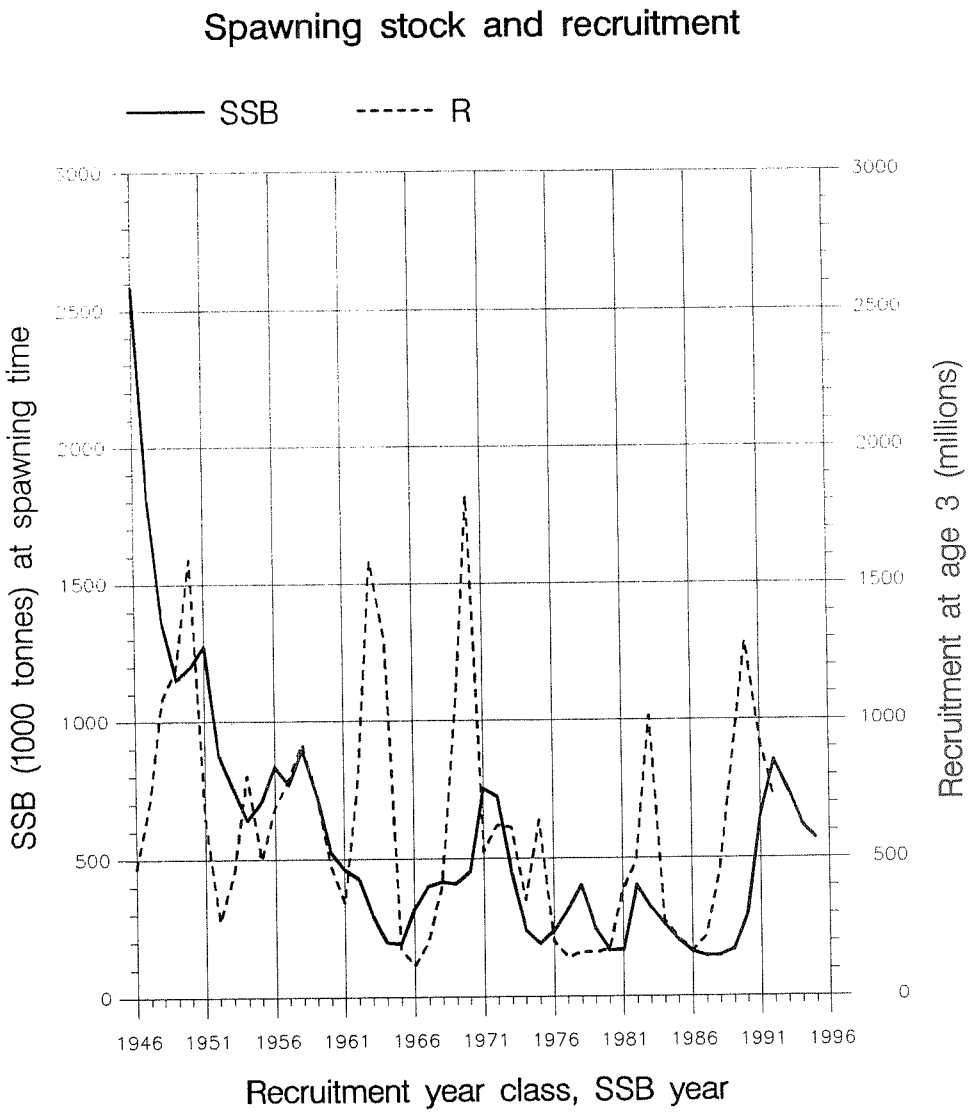
E:\acfm\afwg97\T-9-9.xls

Figure 3.1 A and B

Fish Stock Summary
Cod in the North–East Arctic (Fishing Areas I and II)
28–8–1996



(run: SVPBB03) A

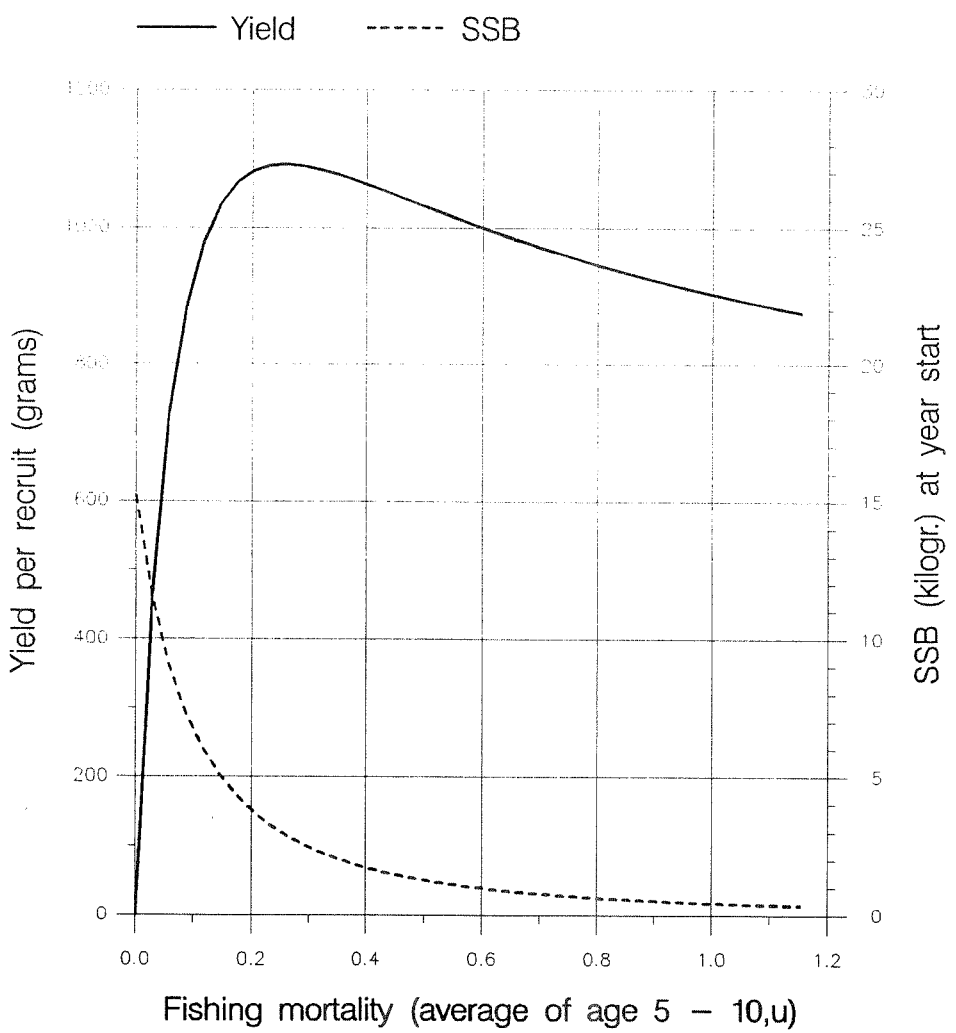


(run: SVPBB03) B

Figure 3.1 C and D

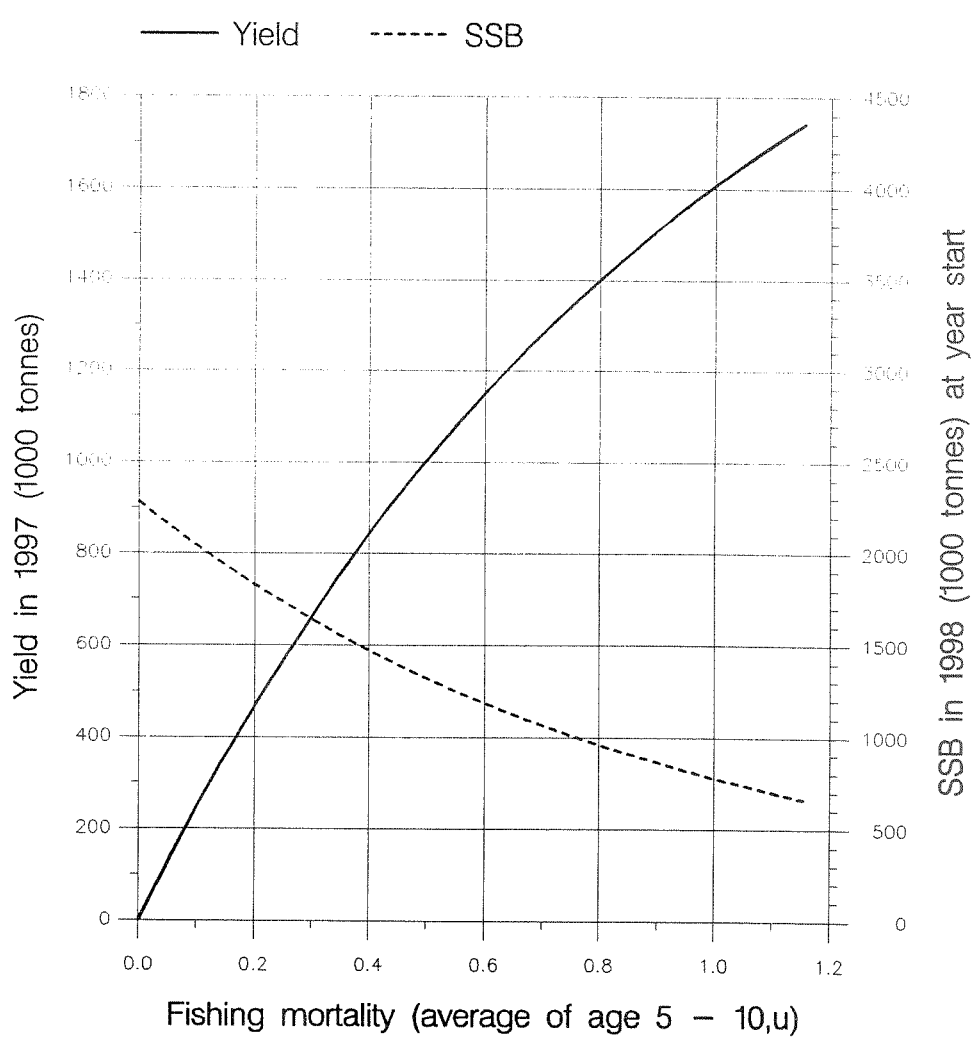
Fish Stock Summary
Cod in the North – East Arctic (Fishing Areas I and II)
28 – 8 – 1996

Long term yield and spawning stock biomass



(run: YLDBB03) C

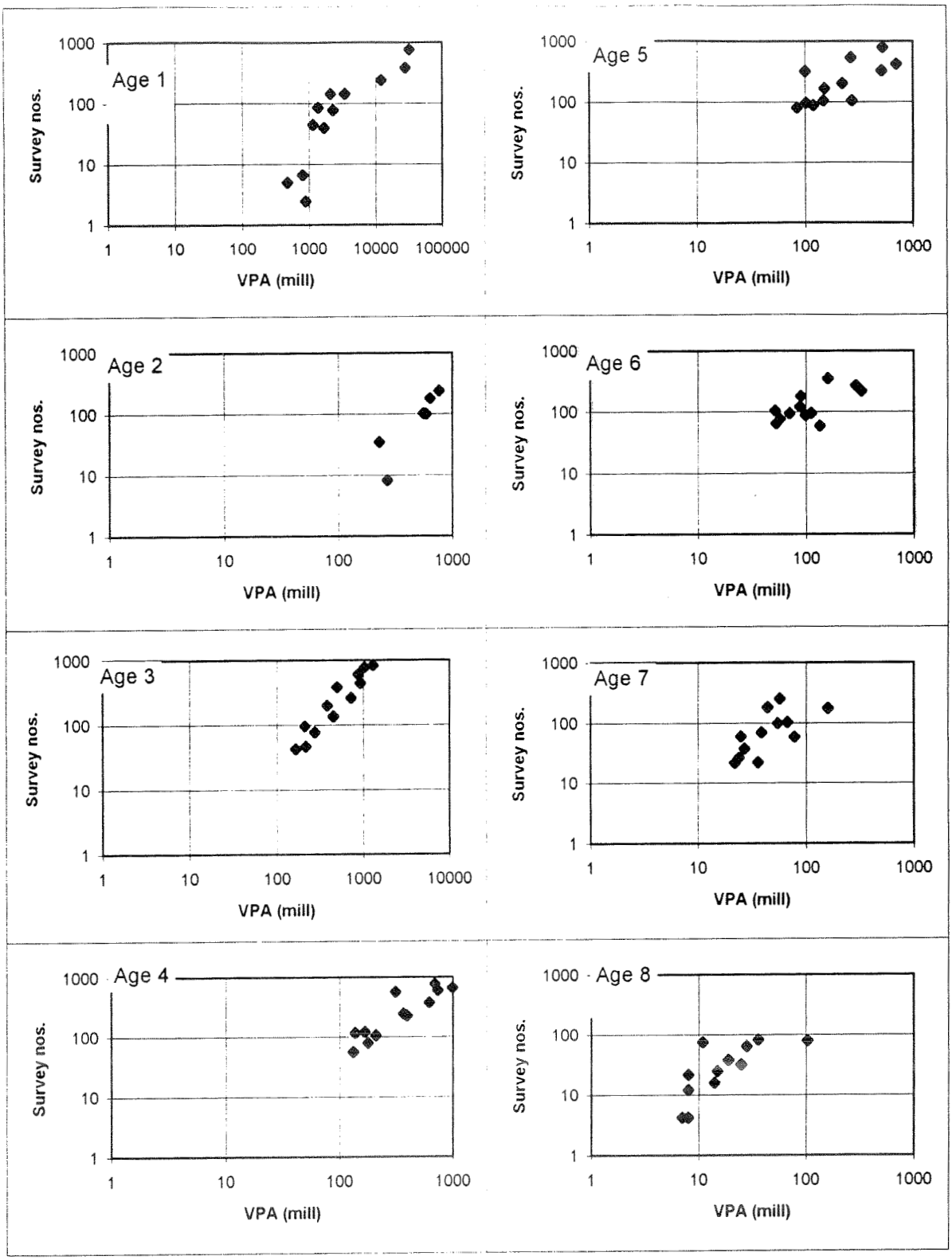
Short term yield and spawning stock biomass



(run: MANBB02) D

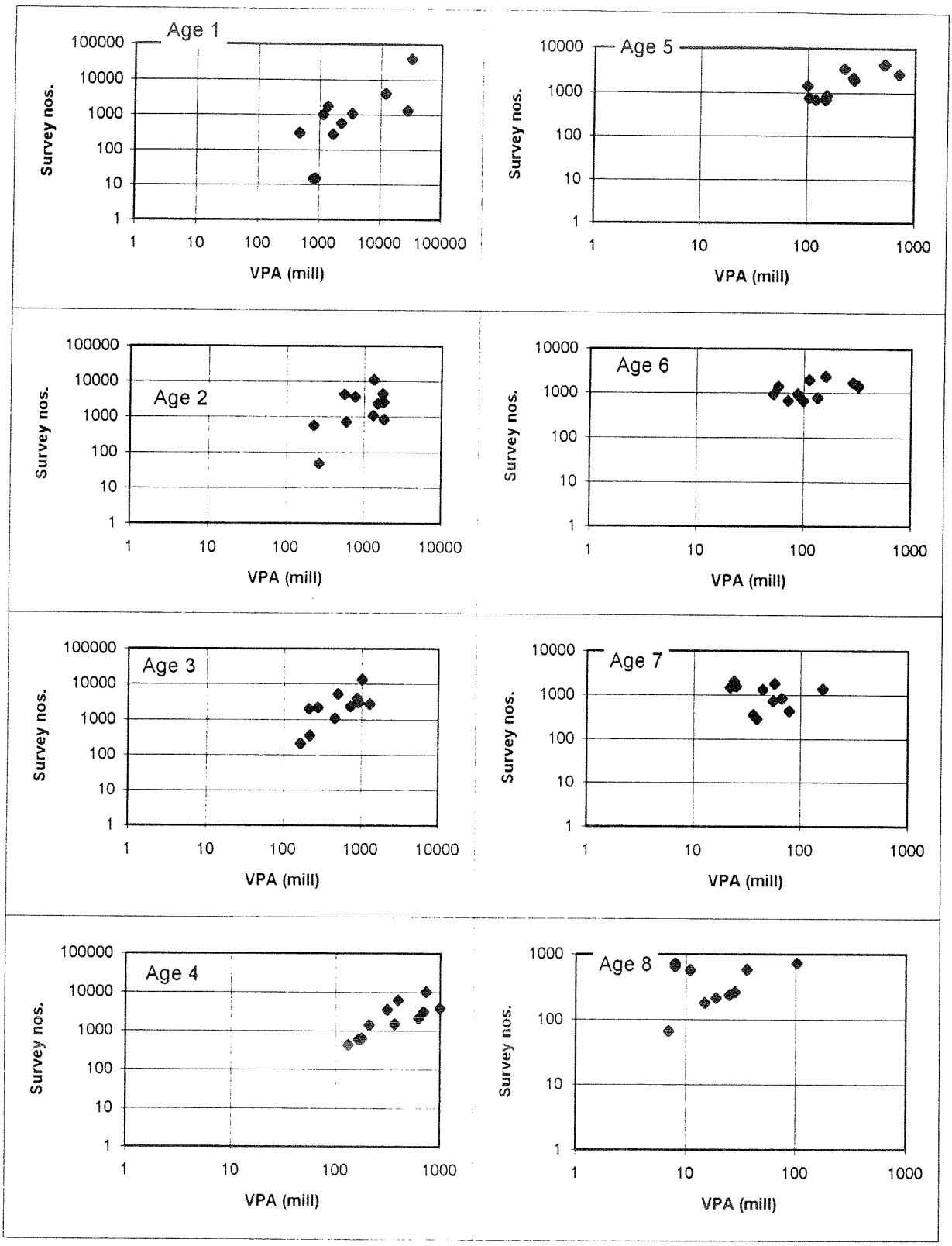
Figure 3.2 A

RTA



(FLT43) NE Arctic Cod abundance index from the Russian trawl acoustic survey plotted against VPA results on stock number at age

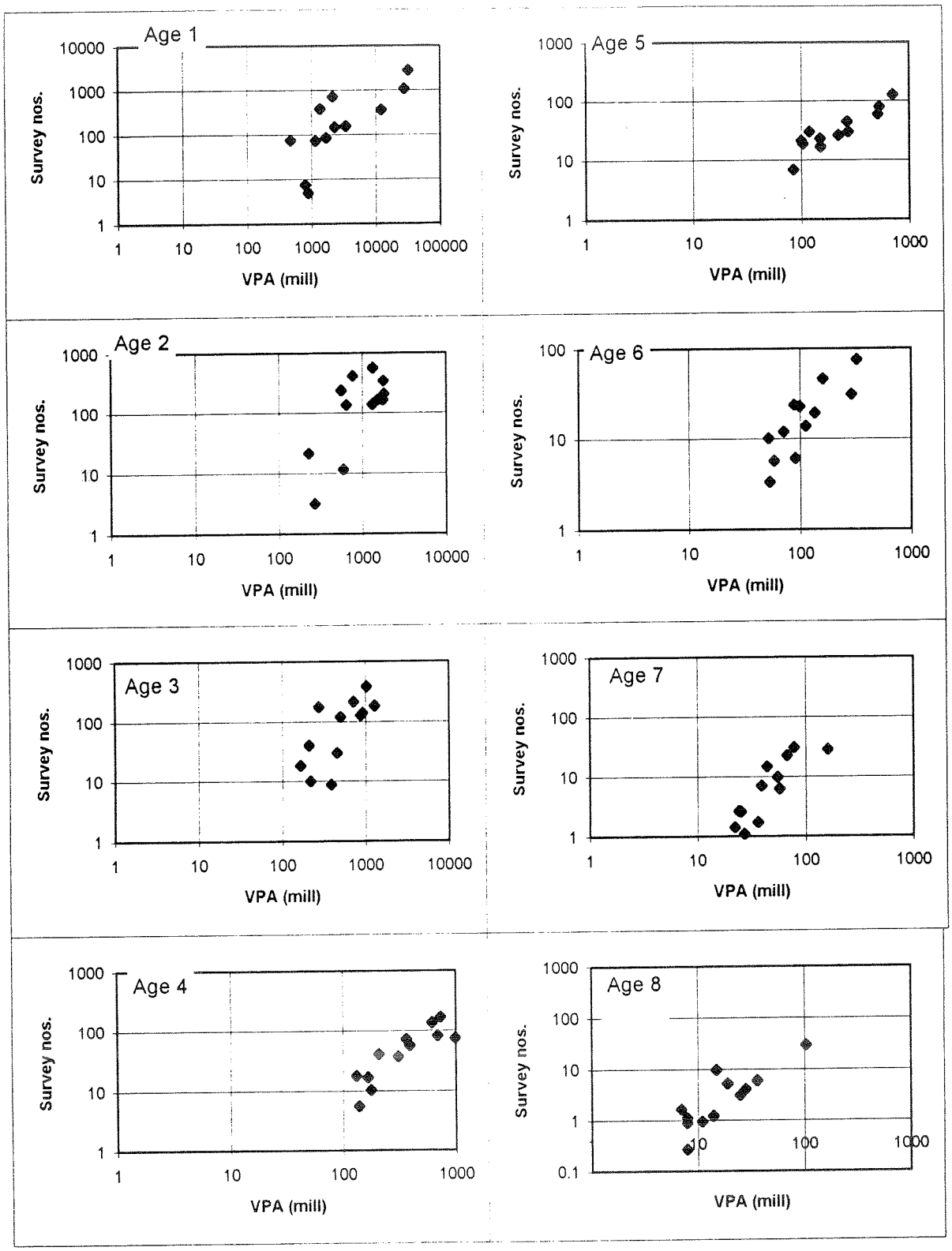
RAS



(FLT44) NE Arctic Cod abundance index from the Russian acoustic survey plotted against VPA results on stock number at age

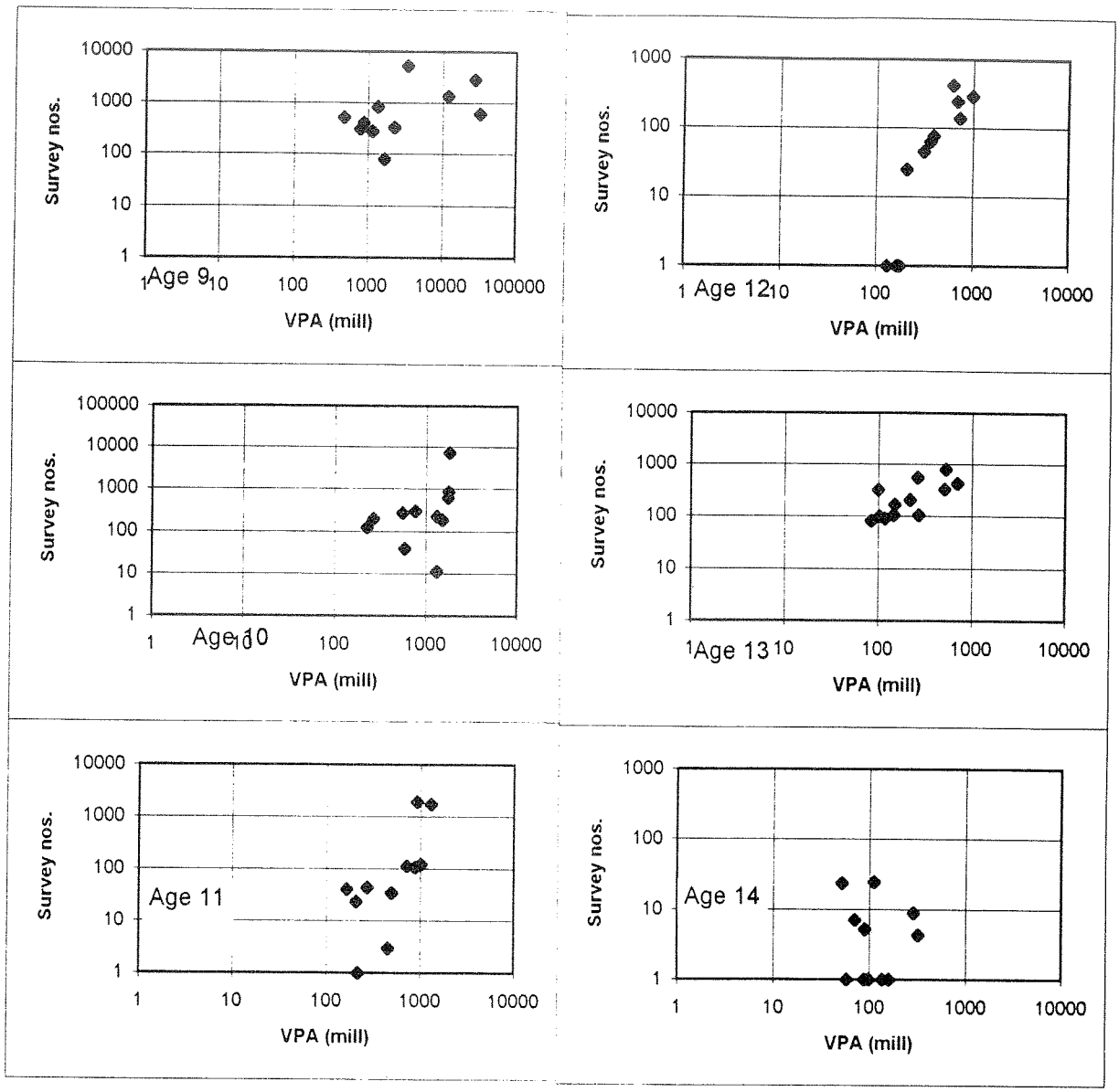
Figure 3.2.C

NSB



(FLT45) NE Arctic Cod abundance index from the Norwegian Svalbard bottom trawl survey plotted against VPA results on stock number at age

NTCE

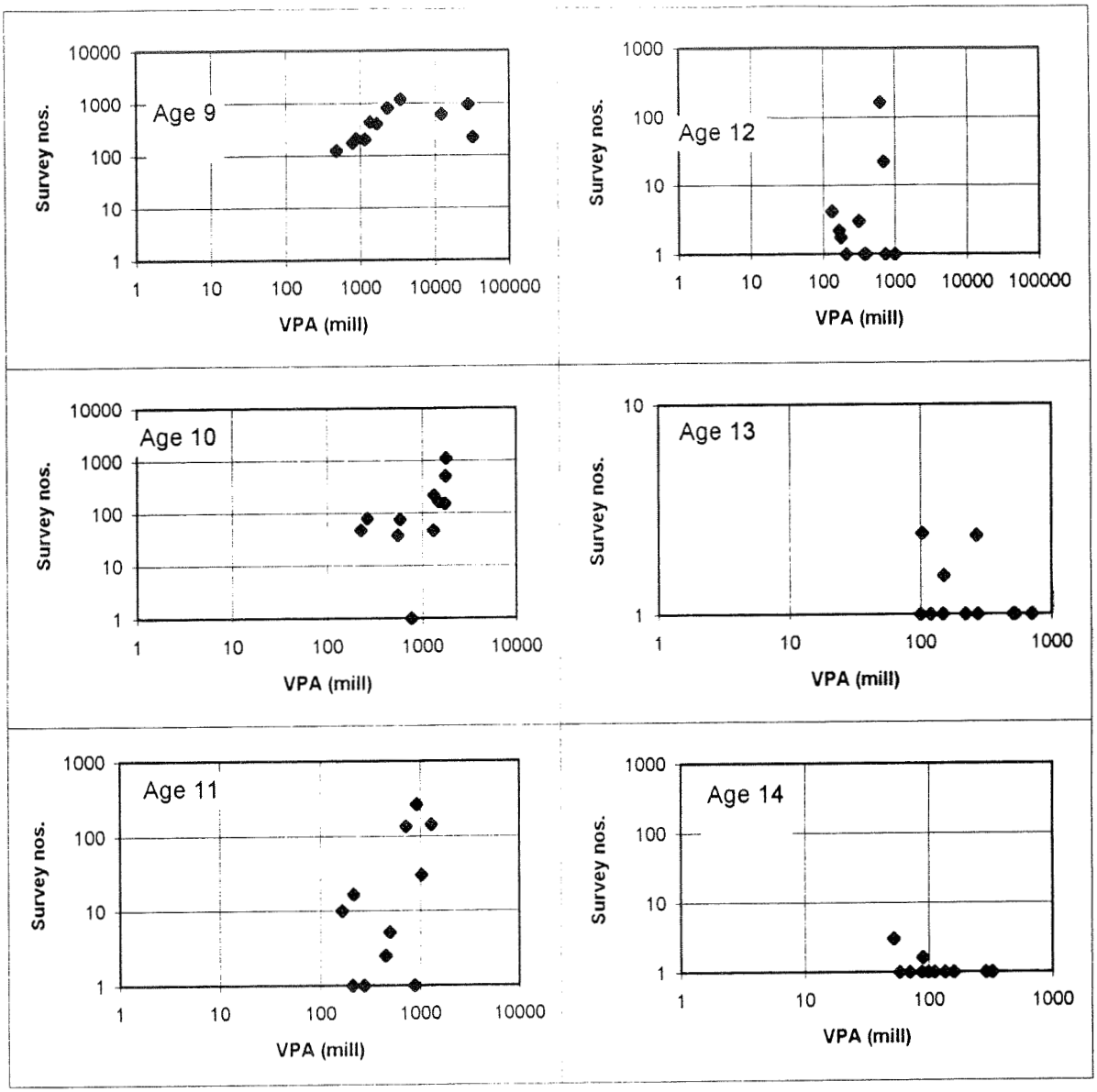


(FLT 52)

NE Arctic Cod abundance index from the Norwegian trawl ,
catch and effort plotted against VPA results on stock number at age

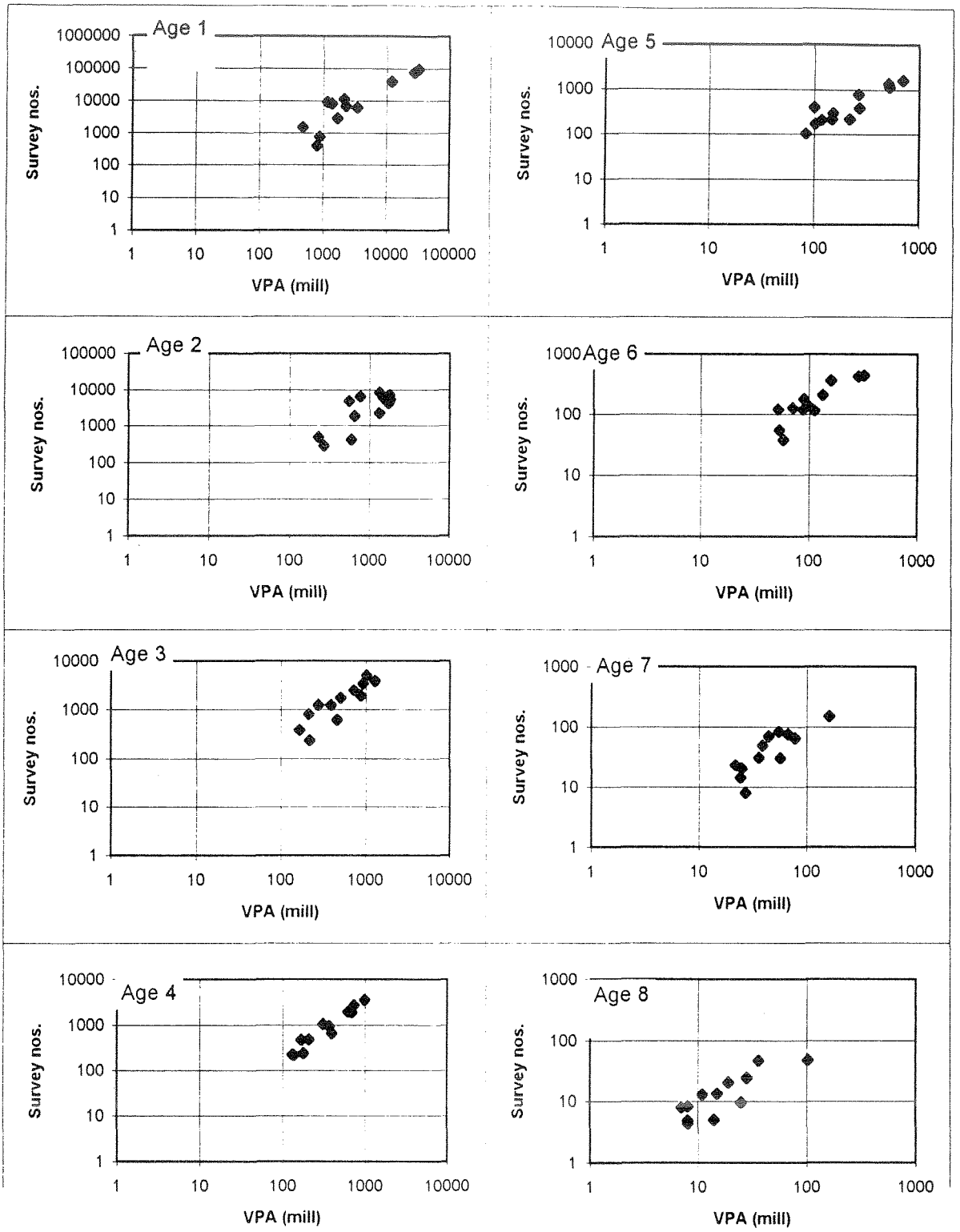
Figure 3.2 E

RTCE



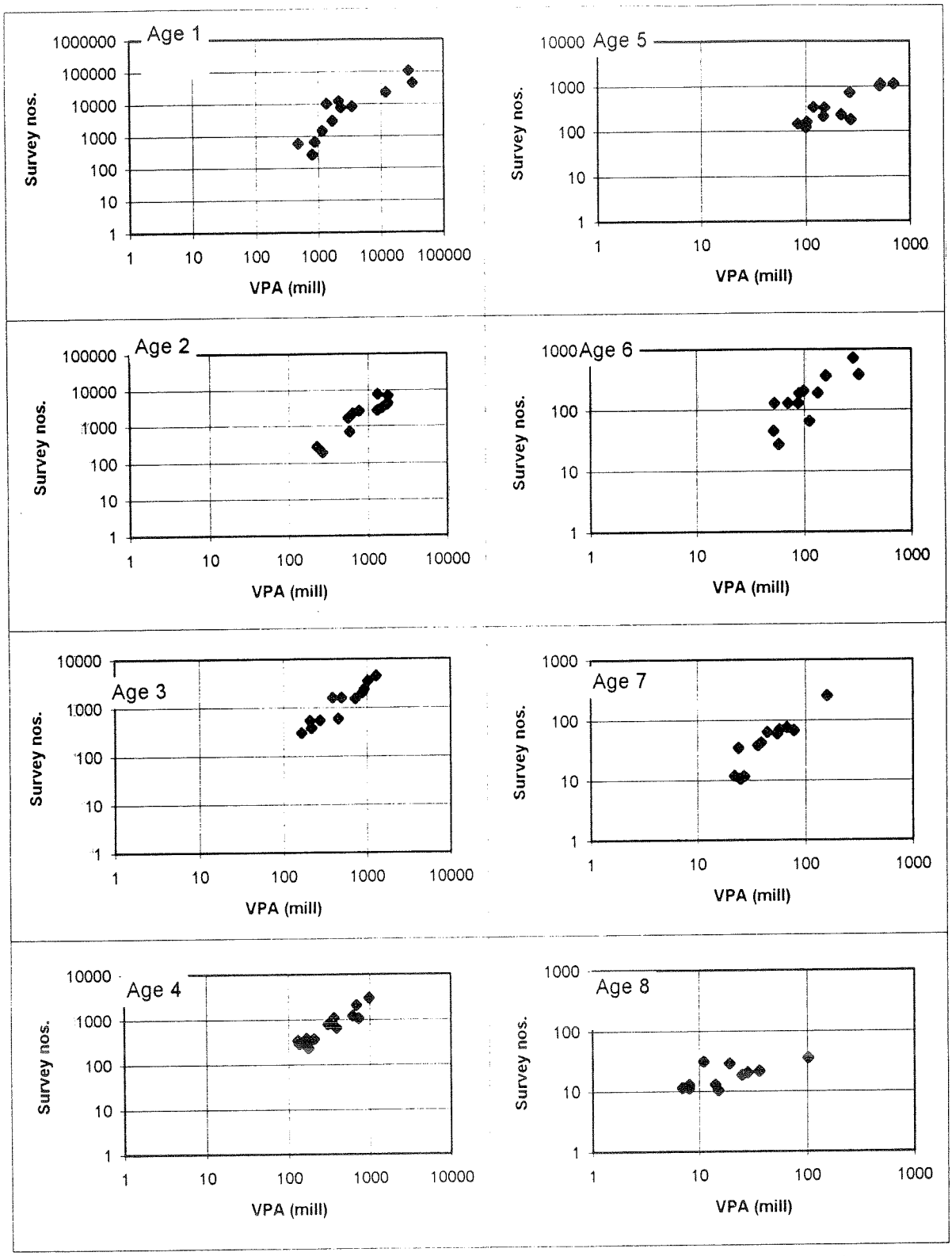
(FLT 53) NE Arctic Cod abundance index from the Russian trawl,
catch and effort commercial fleet plotted against VPA results on stock number at age

NBST



(FLT 54) NE Arctic Cod abundance index from the Norwegian Barents Sea trawl survey, shifted swpt area correctin plotted against VPA results on stock number at age

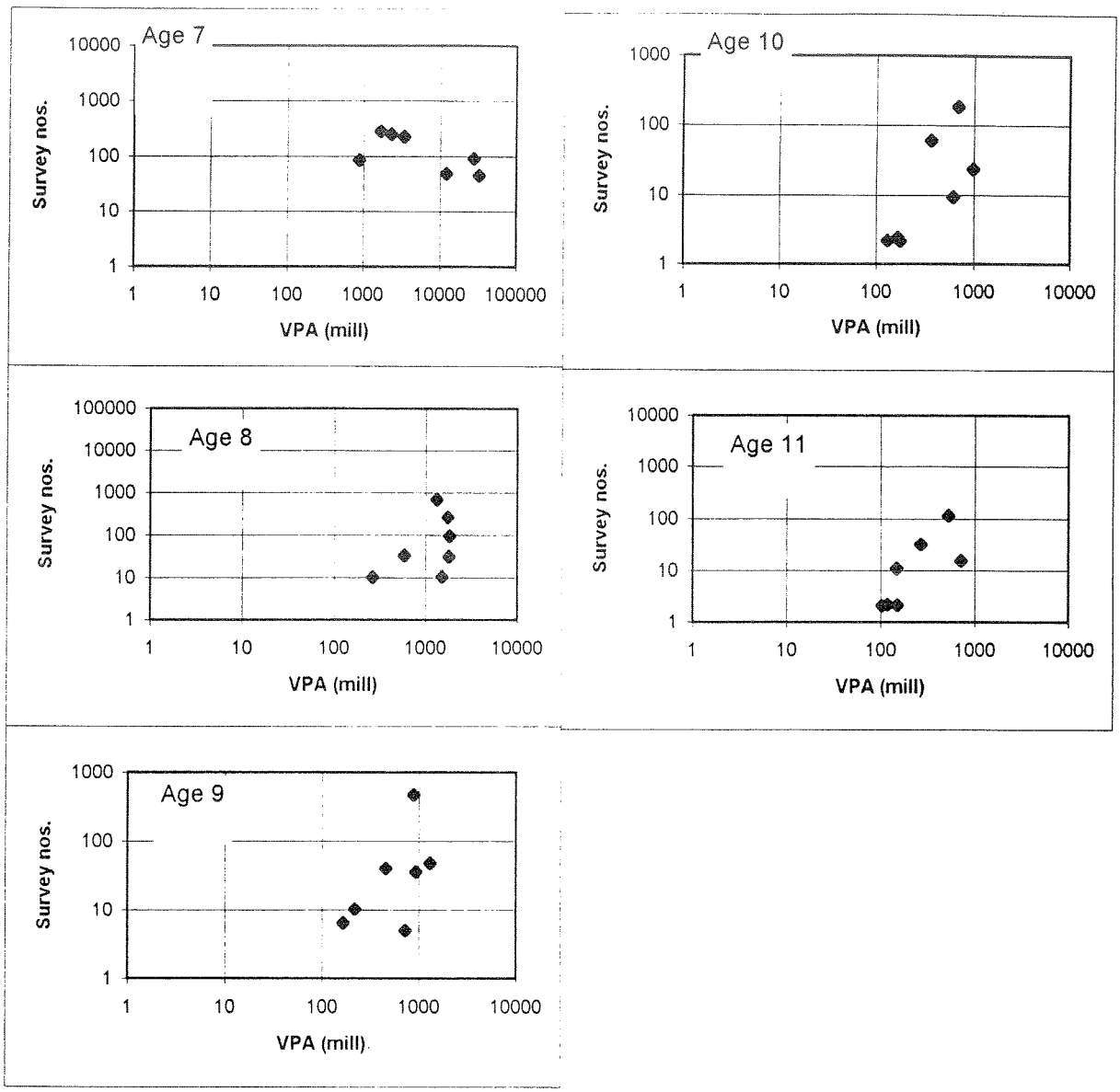
NBSAS



(FLT 55) NE Arctic Cod abundance index from the Norwegian Barents Sea acoustic survey, swept area corrected plotted against VPA results on stock number at age

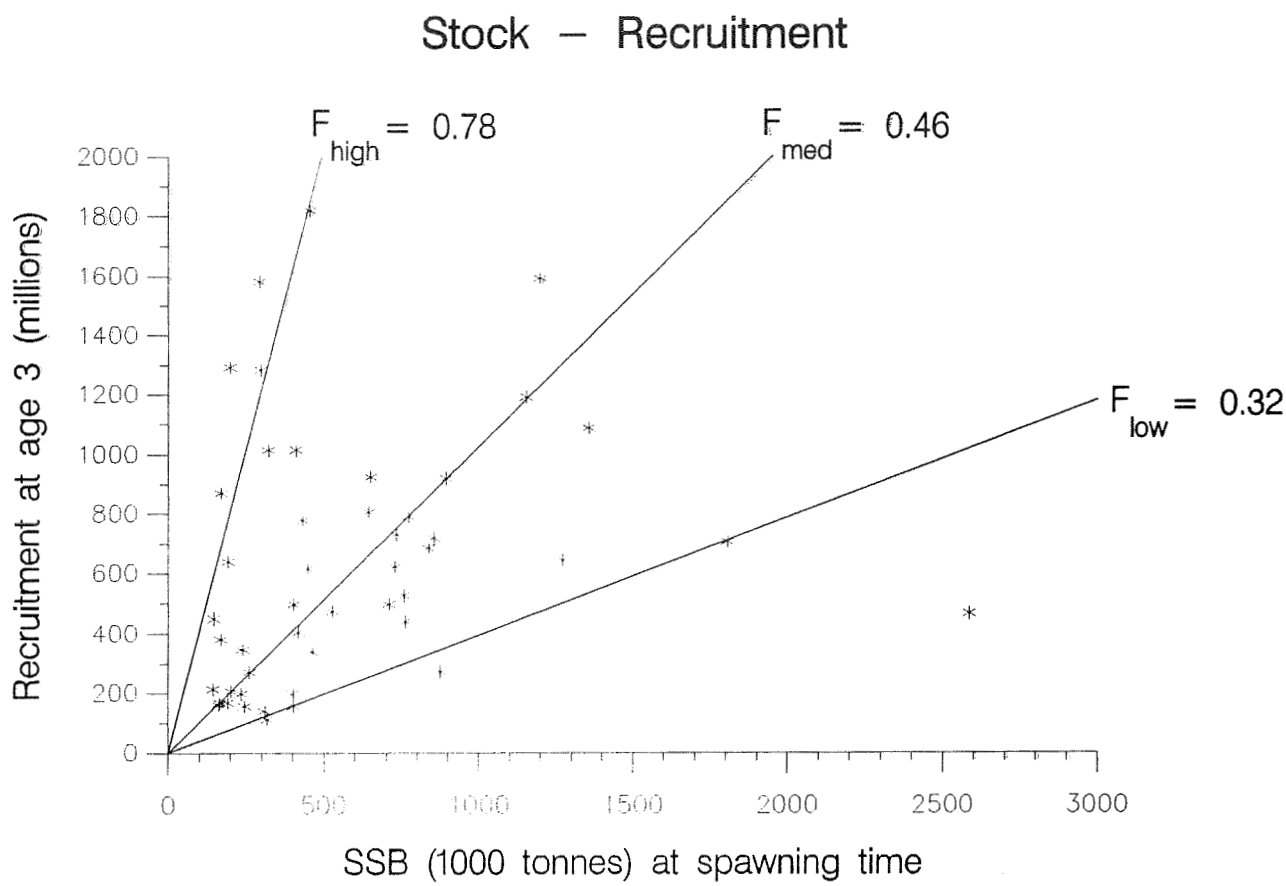
Figure 3.2 H

NLAS



(FLT56) NE Arctic Cod abundance index from the Norwegian Lofoten acoustic survey plotted against VPA results on stock number at age

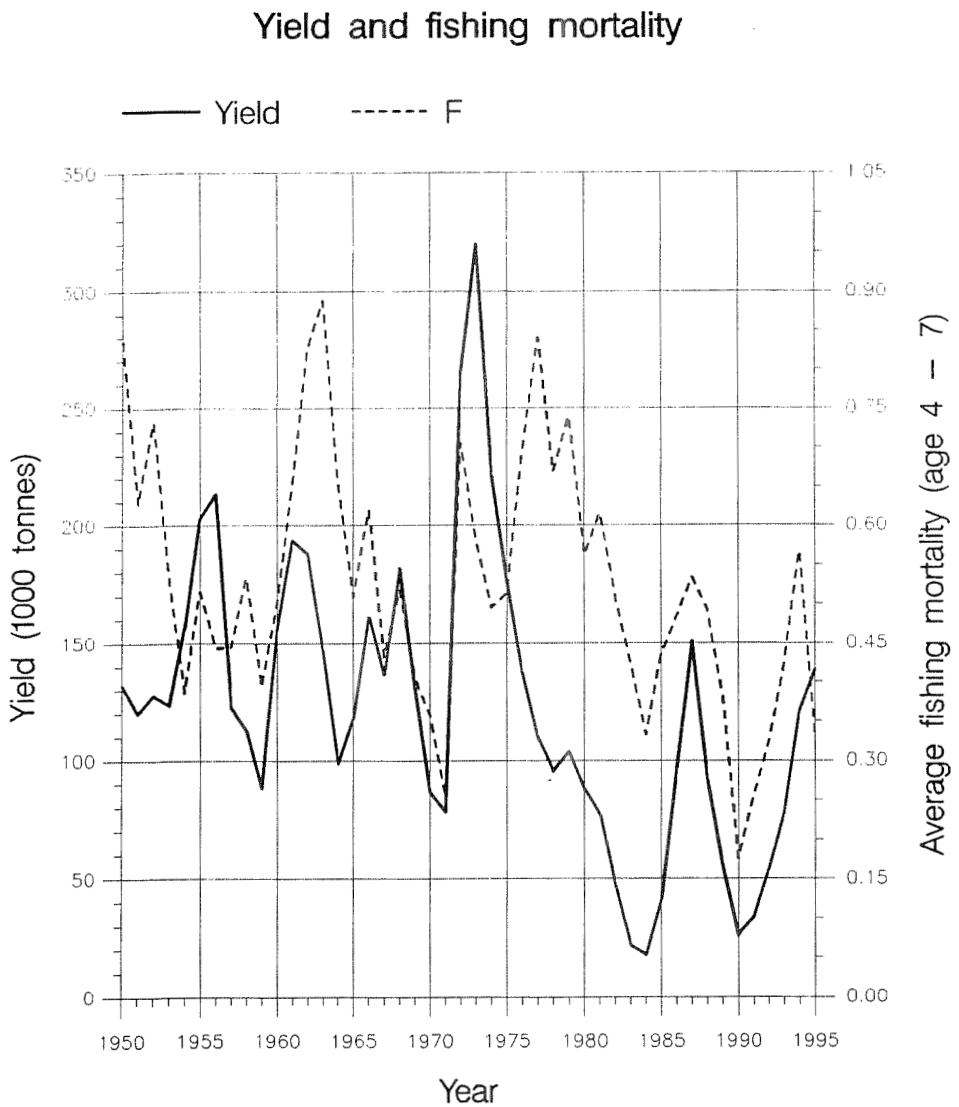
Figure 3.3 Cod in the North – East Arctic (Fishing Areas I and II)
28 – 8 – 1996



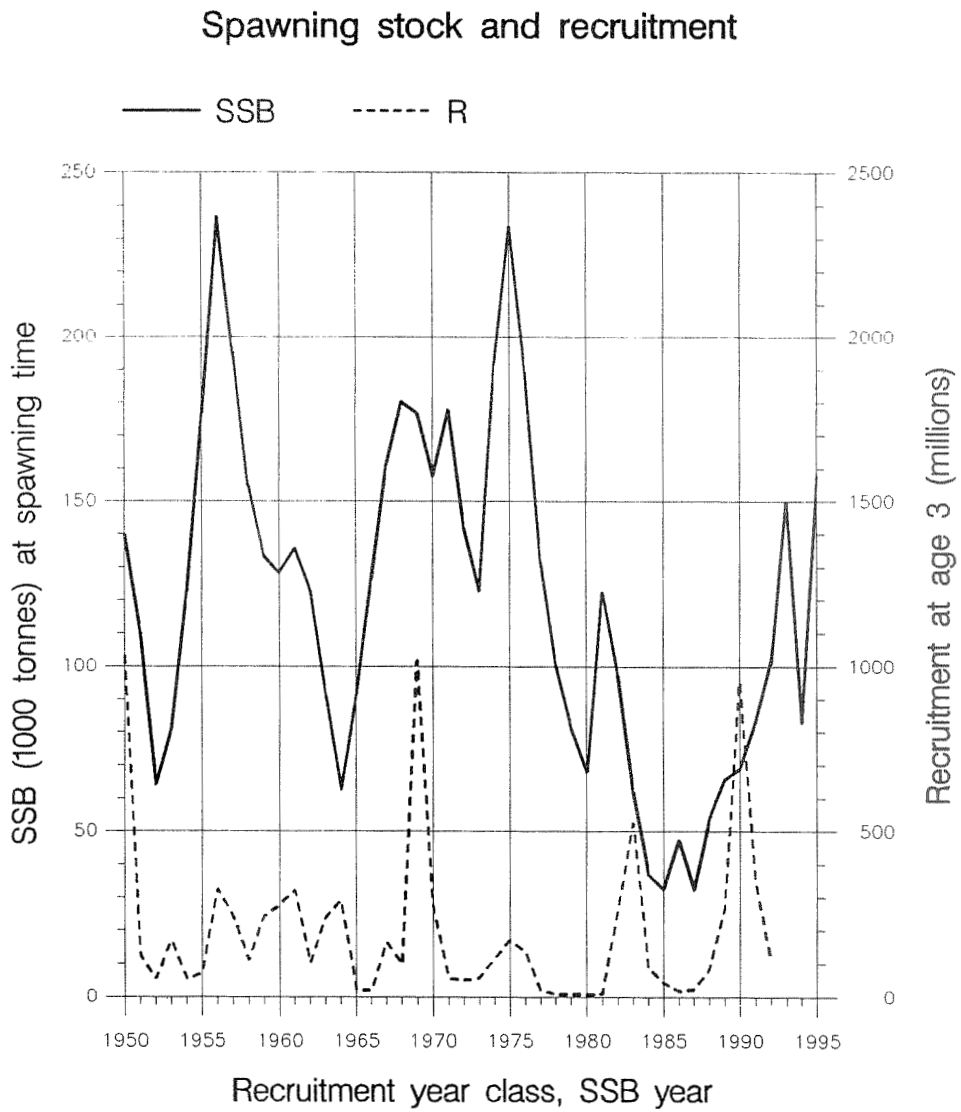
(run: SVPBB03)

Figure 4.1 A and B

Fish Stock Summary
Haddock in the North – East Arctic (Fishing Areas I and II)
28 – 8 – 1996



(run: SVPLOR07) A

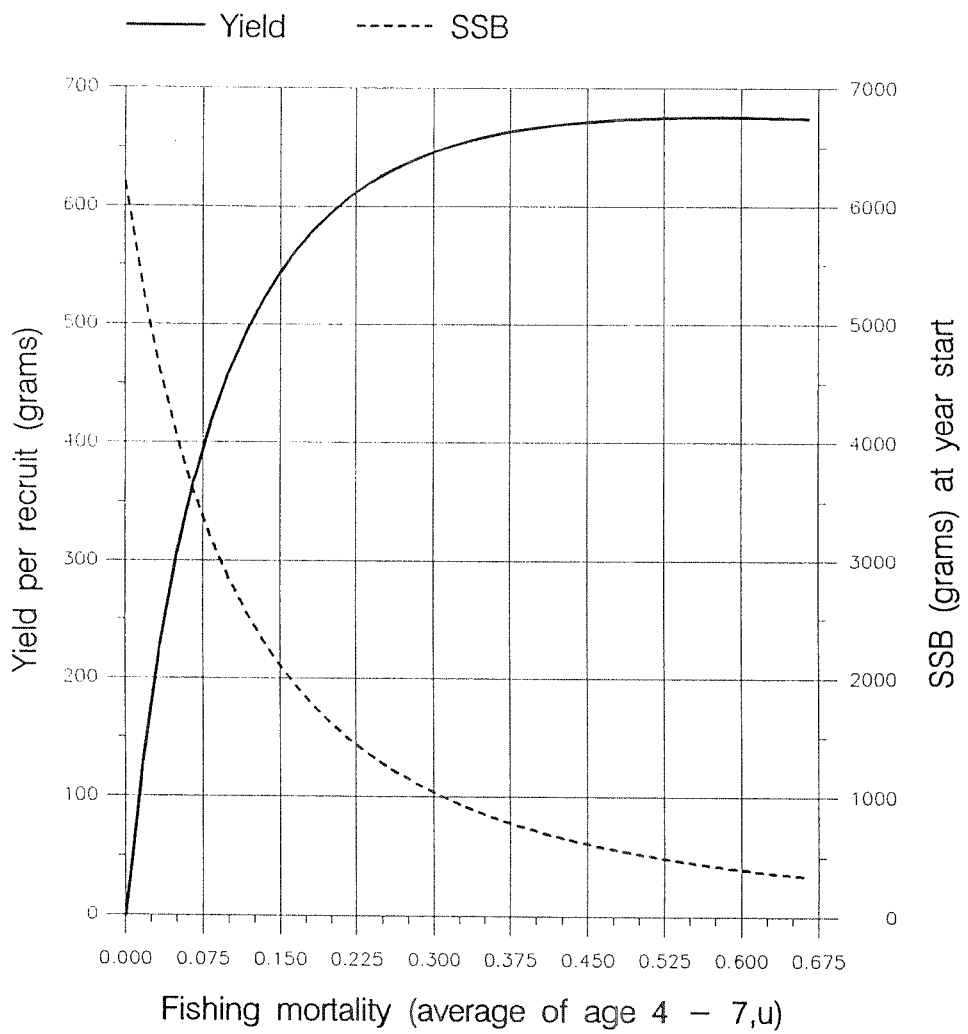


(run: SVPLOR07) B

Figure 4.1 C and D

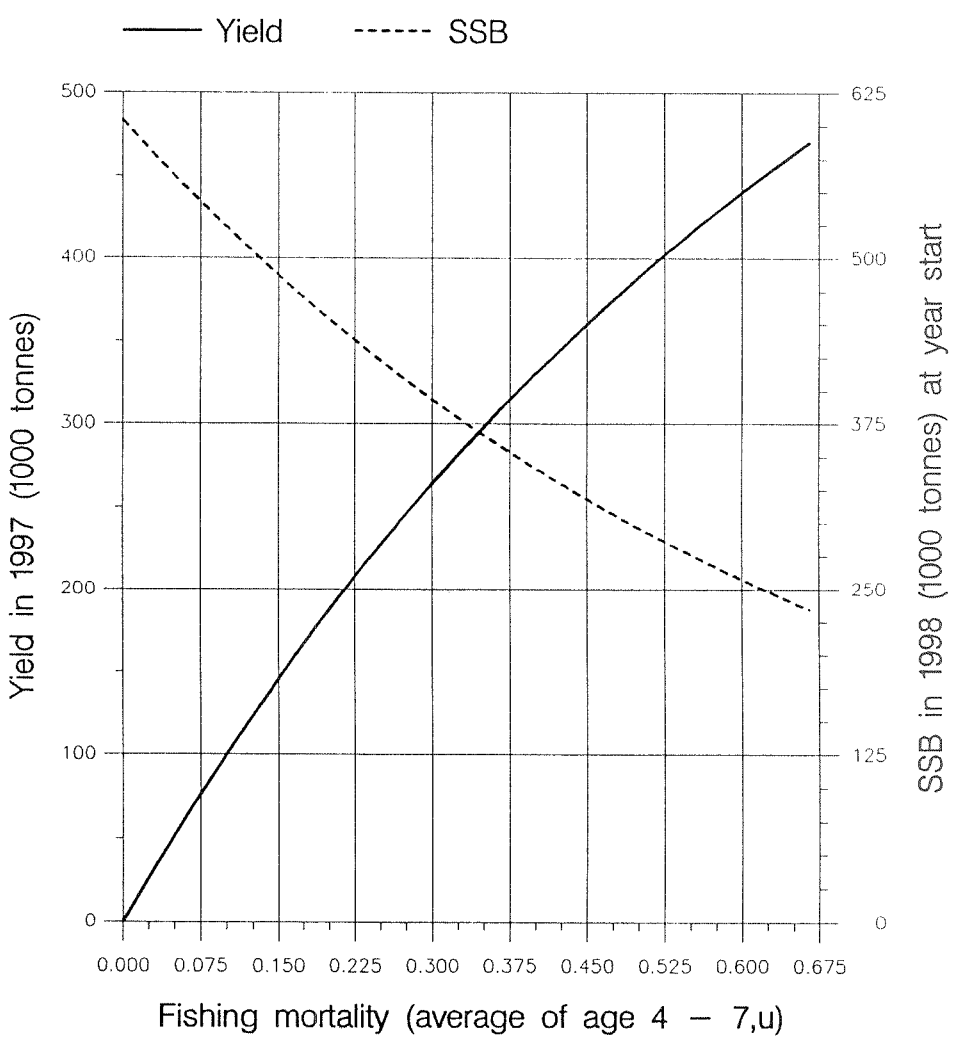
Fish Stock Summary
Haddock in the North – East Arctic (Fishing Areas I and II)
28 – 8 – 1996

Long term yield and spawning stock biomass



(run: YLDLOR01) C

Short term yield and spawning stock biomass



(run: MANLOR01) D

Figure 4.2

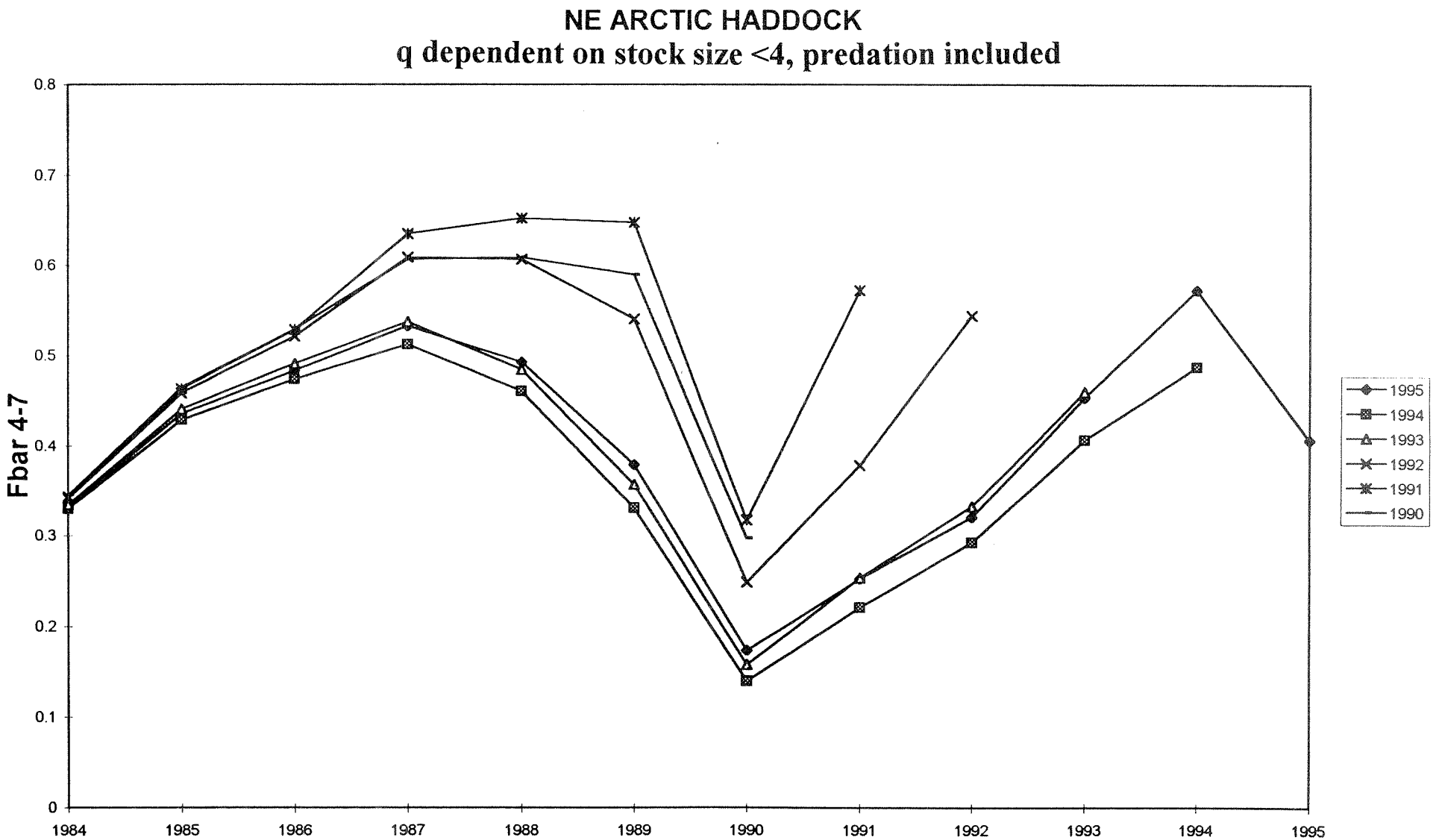
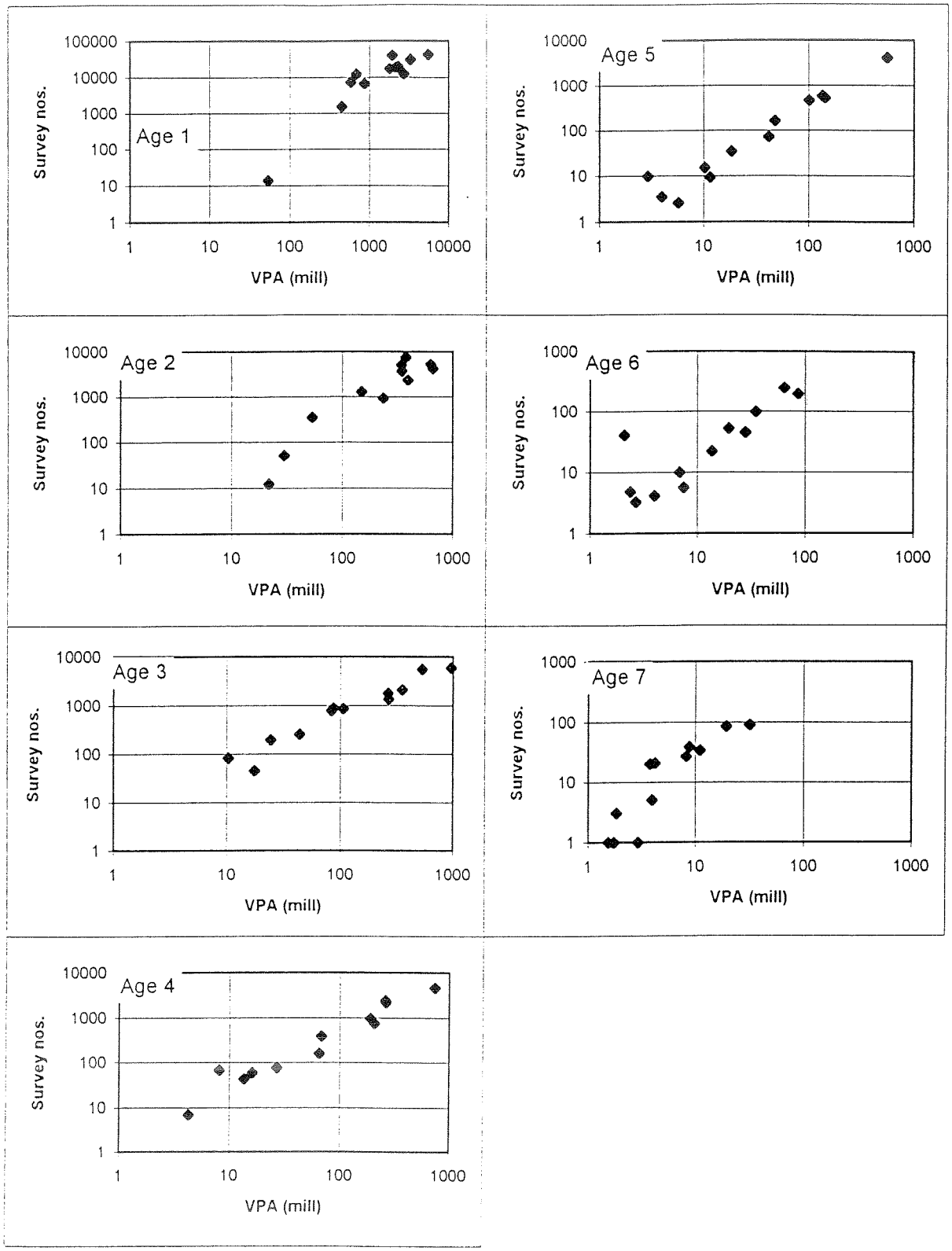
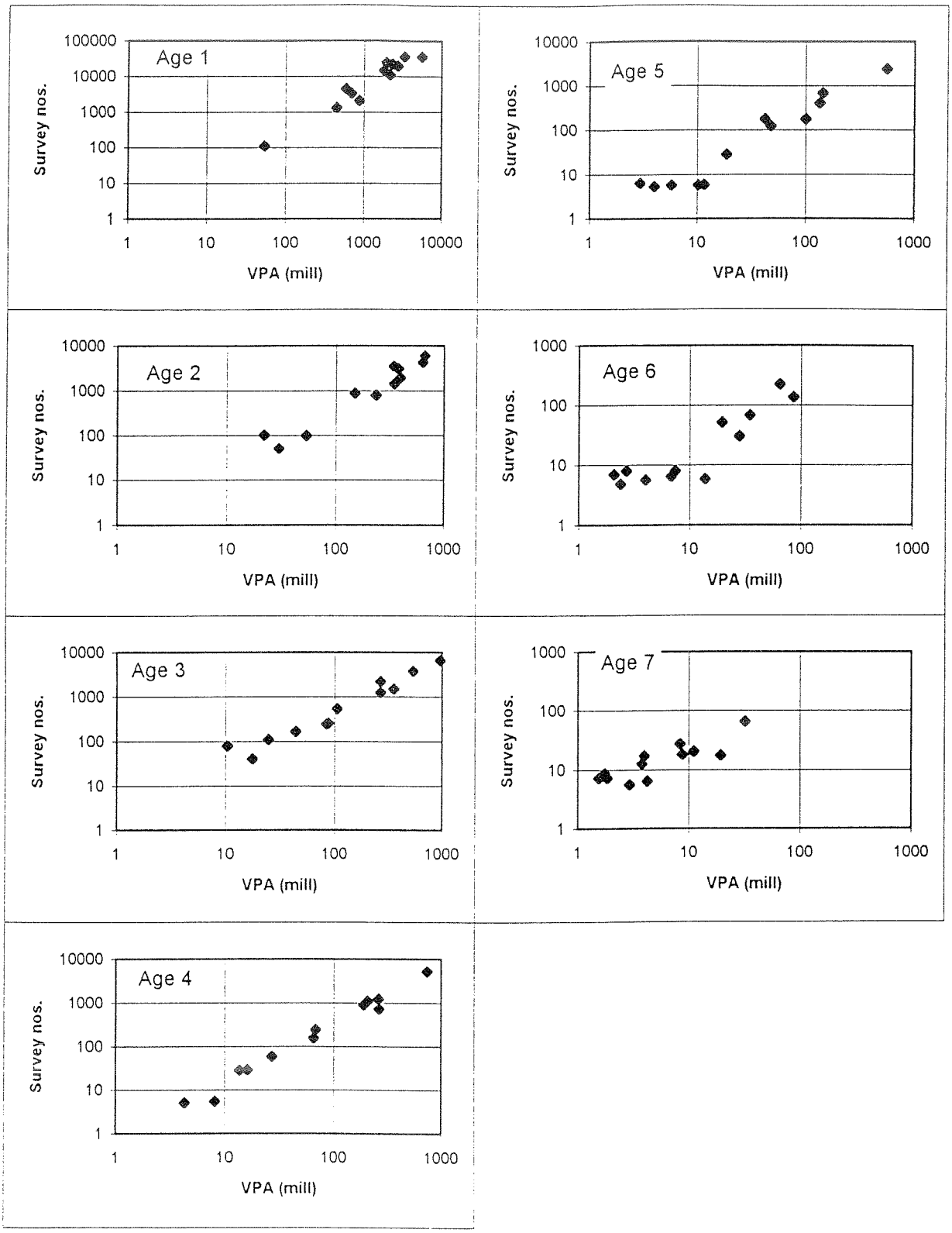

NE ARCTIC HADDOCK
q dependent on stock size <4, predation included
Fbar 4-7
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1995
1994
1993
1992
1991
1990
* q<45,pred Chart 2
29/08/96 09:58

Figure 4.3 A

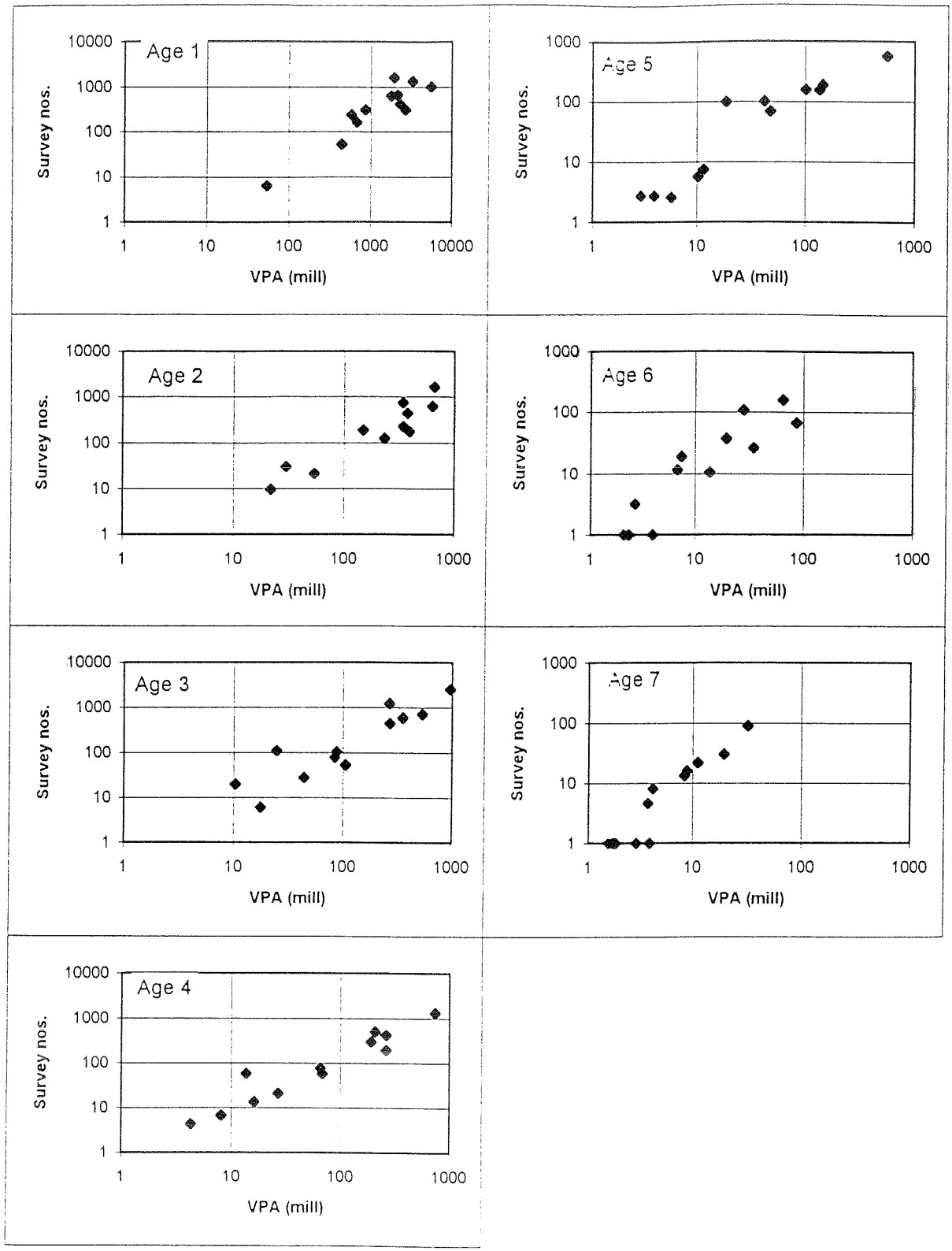


NE Arctic Haddock abundance index from the Norwegian bottom trawl survey plotted again VPA results on stock number

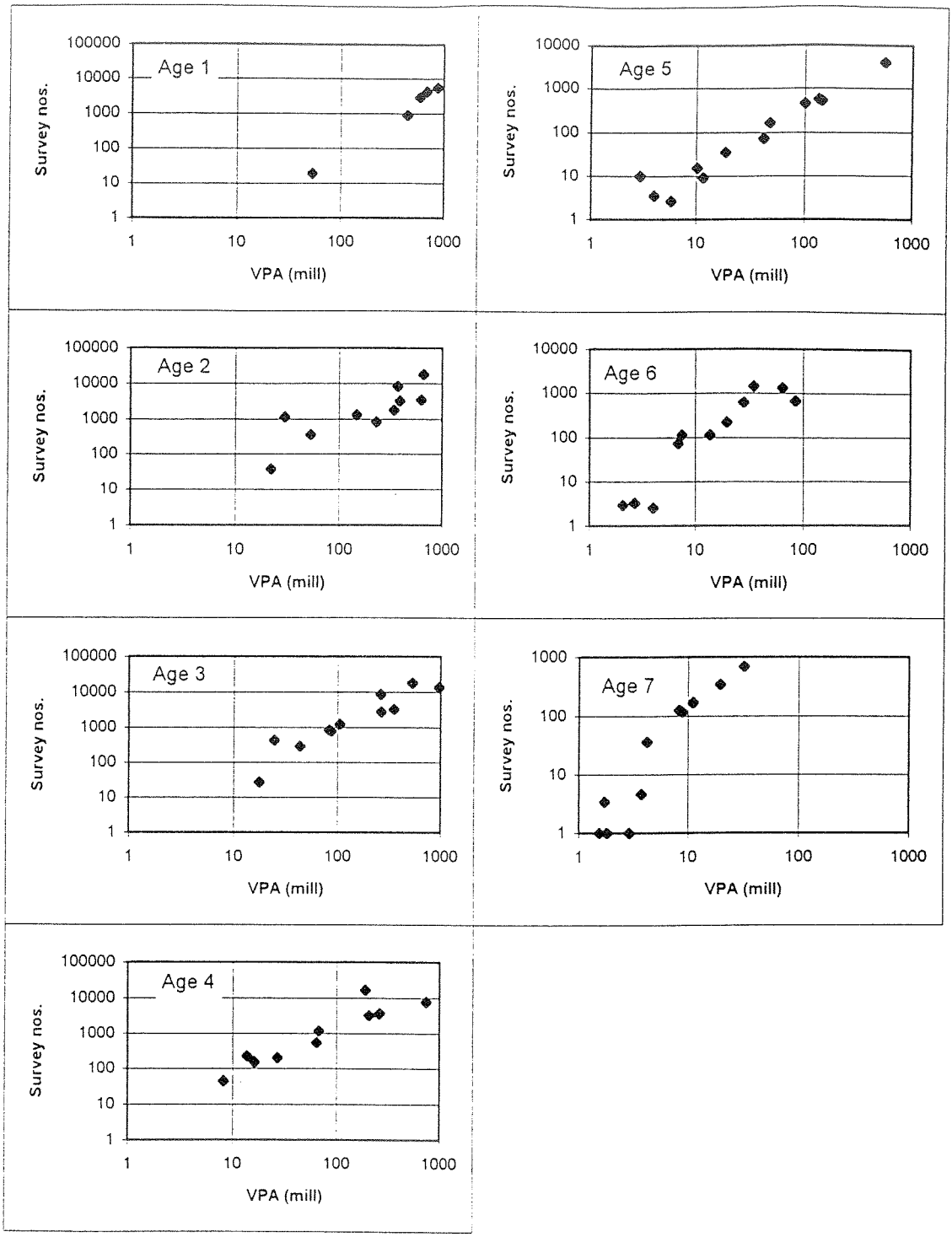


NE Arctic Haddock abundance index from the Norwegian acoustic survey plotted again VPA results on stock number at age

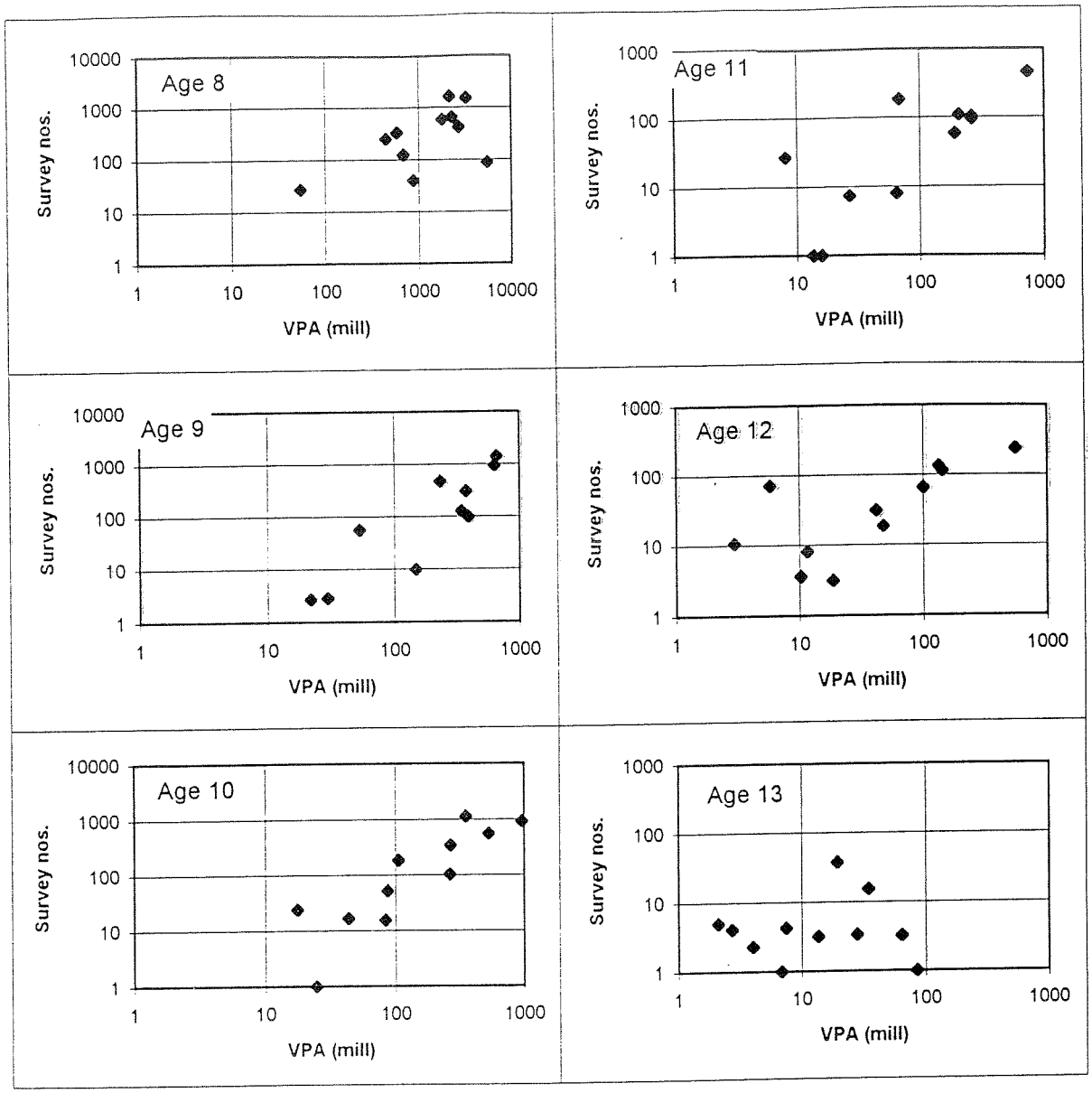
Figure 4.3 C RBT



NE Arctic Haddock abundance index from the Russian bottom trawl survey plotted again VPA results on stock number at



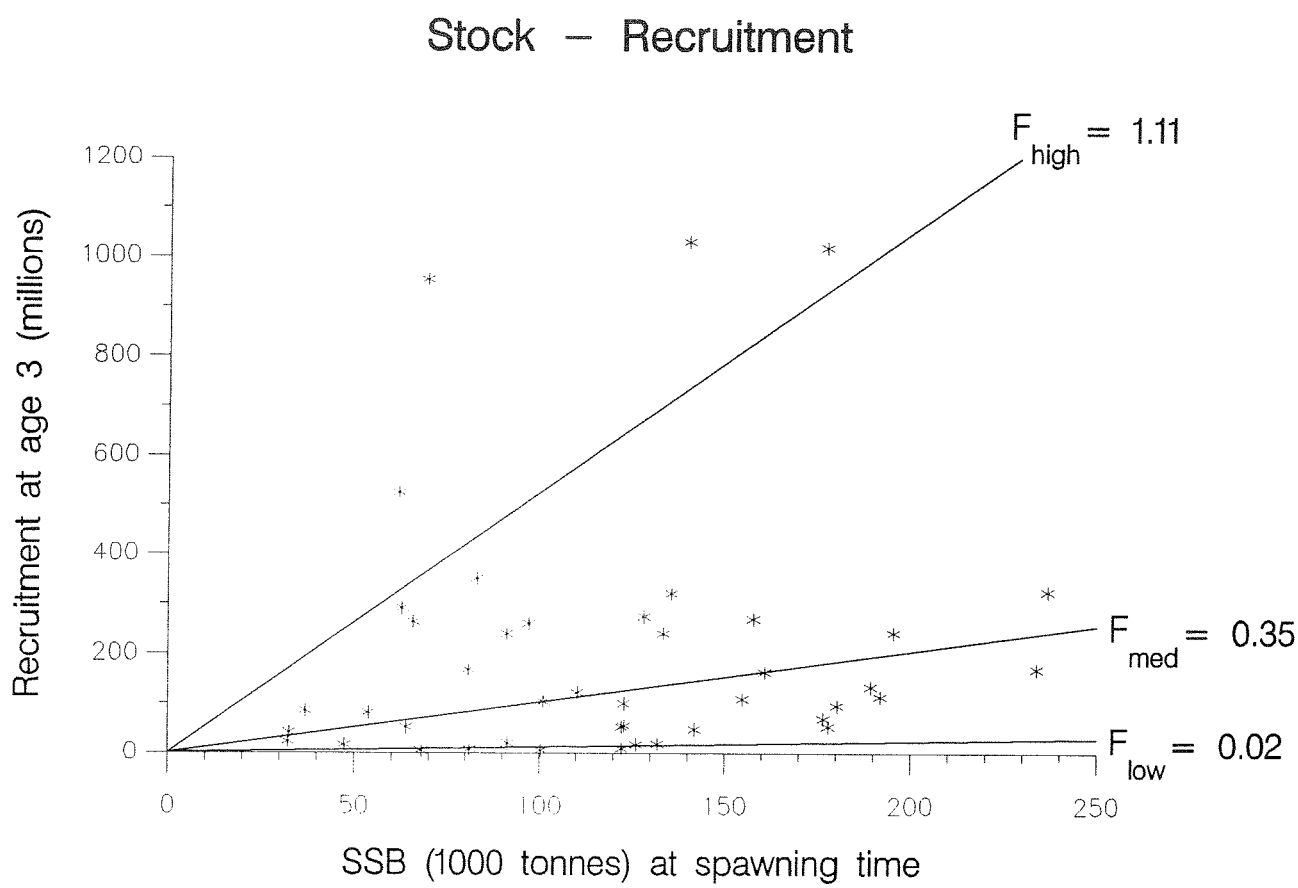
NE Arctic Haddock abundance index from the Russian acoustic survey plotted again VPA results on stock number at age



NE Arctic Haddock abundance index from the Norwegian bottom trawl commercial fleet plotted again VPA results on stock number

Figure 4.4

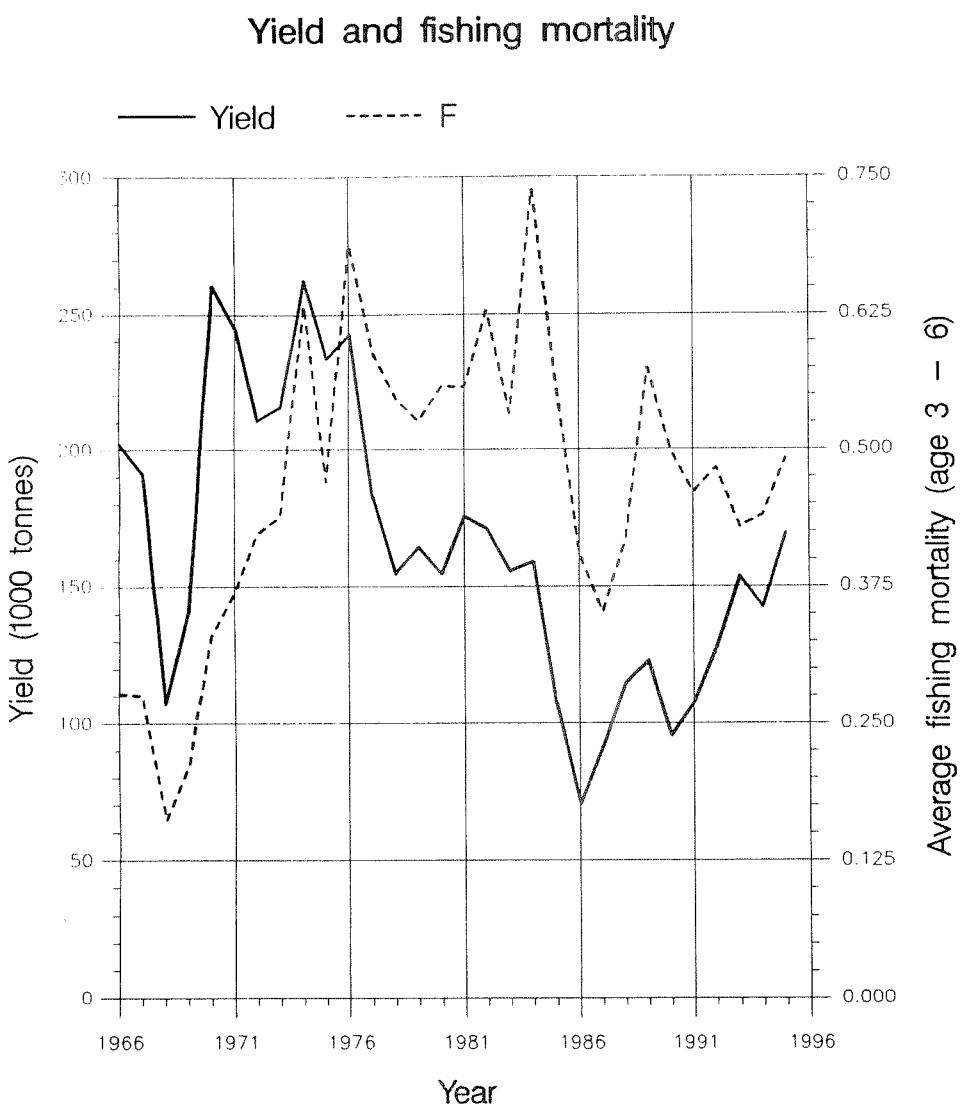
Haddock in the North – East Arctic (Fishing Areas I and II)
28 – 8 – 1996



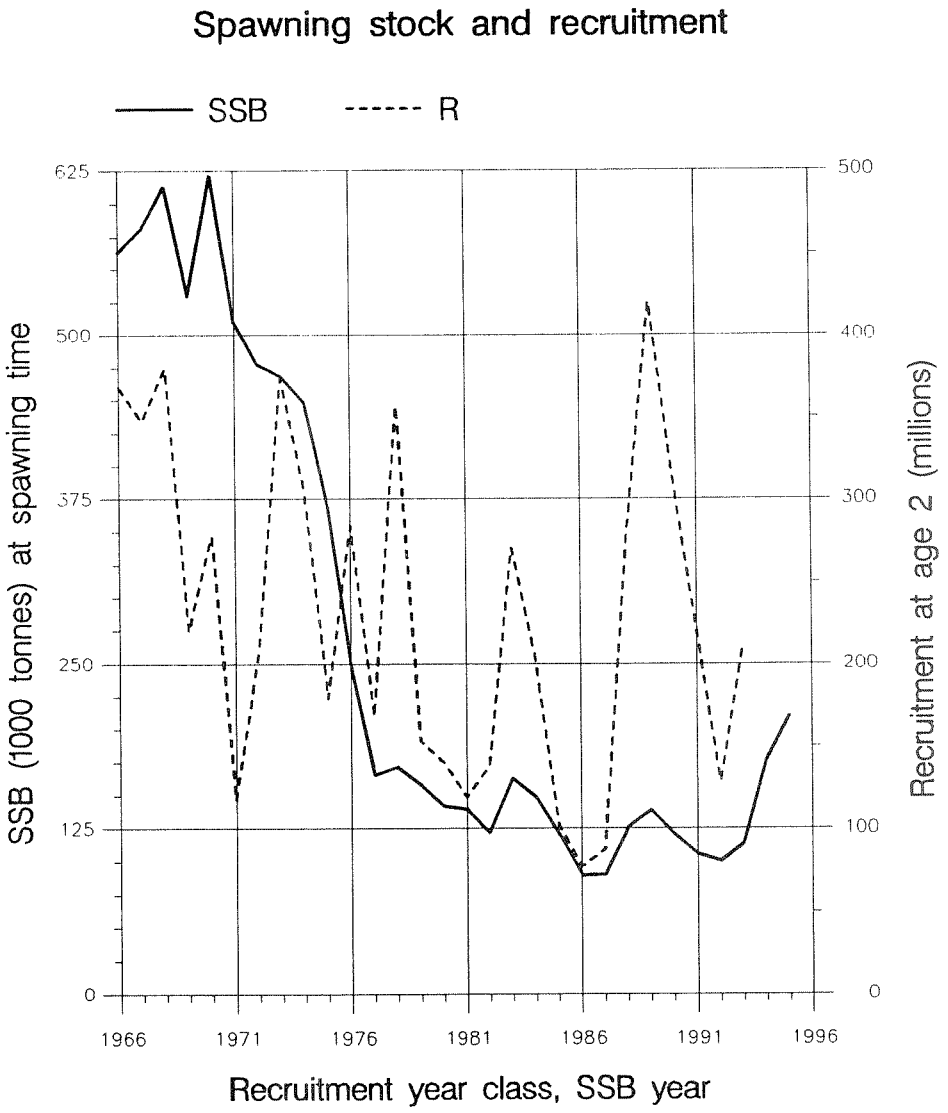
(run: SVPLOR07)

Figure 5.1 A and B

Fish Stock Summary
Saithe in the North – East Arctic (Fishing Areas I and II)
23 – 8 – 1996



(run: XSASME05) A

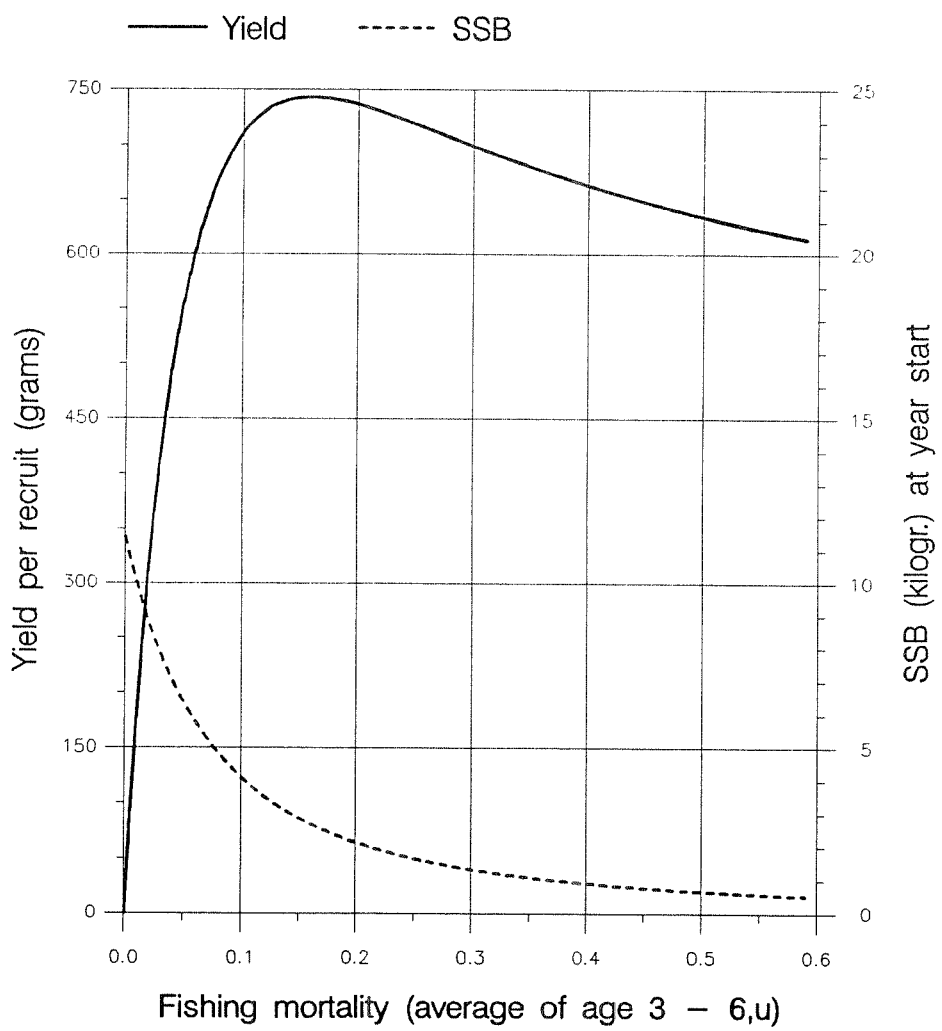


(run: XSASME05) B

Figure 5.1 C and D

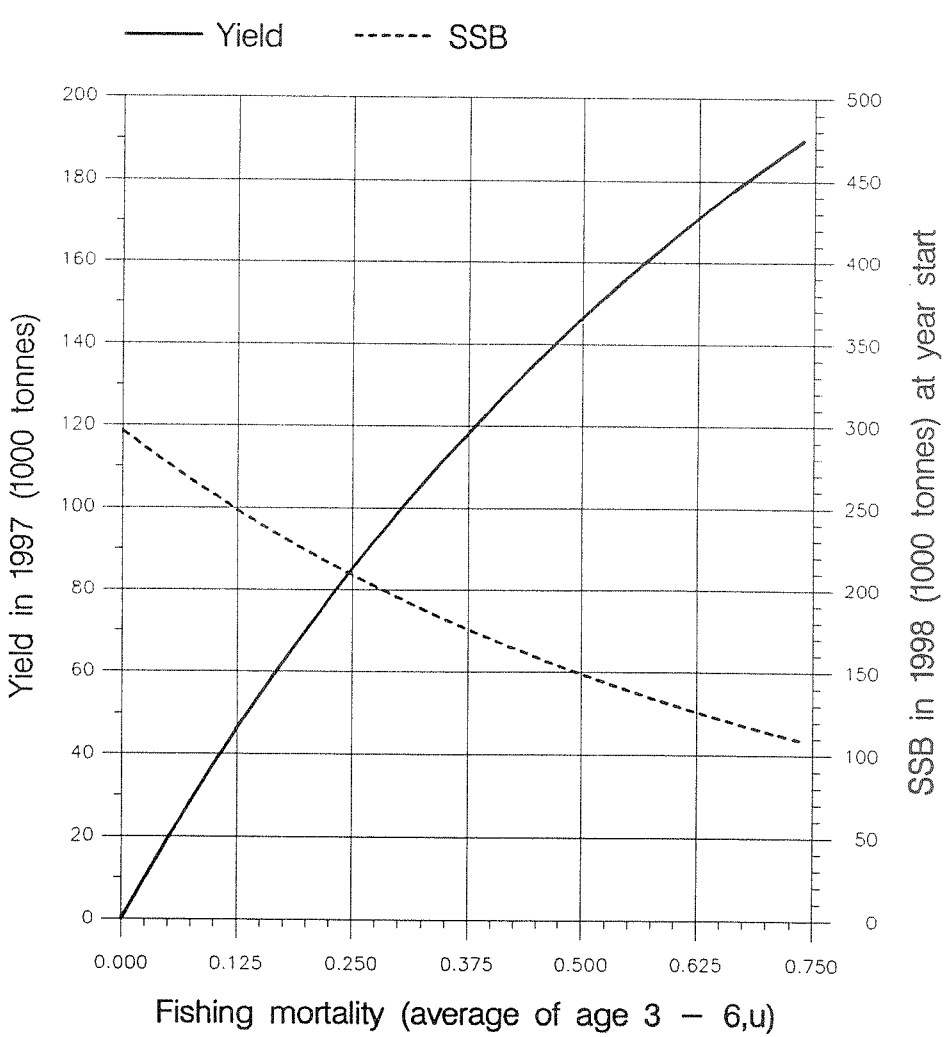
Fish Stock Summary
Saithe in the North – East Arctic (Fishing Areas I and II)
29 – 8 – 1996

Long term yield and spawning stock biomass



(run: YLDSME01) C

Short term yield and spawning stock biomass



(run: MANHS01) D

Figure 5.2A. North-East Arctic Saithe - Acoustic survey vs VPA

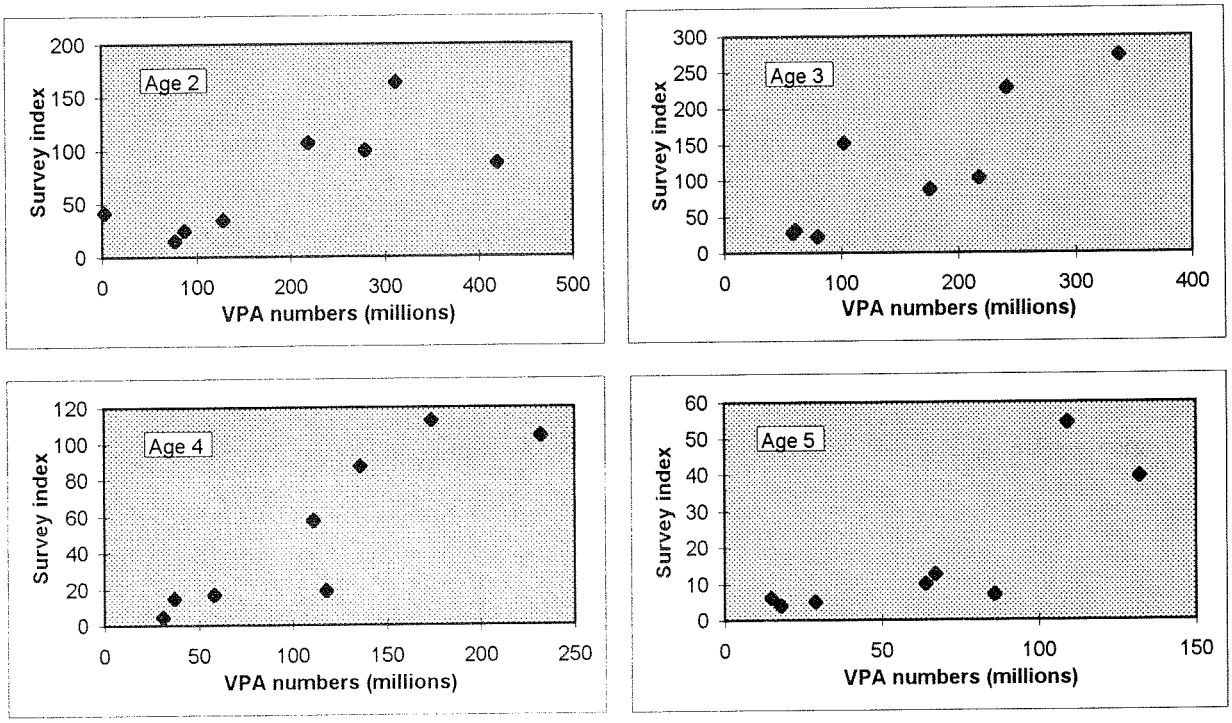


Figure 5.2B. North-East Arctic Saithe - Norwegian purse seine vs VPA

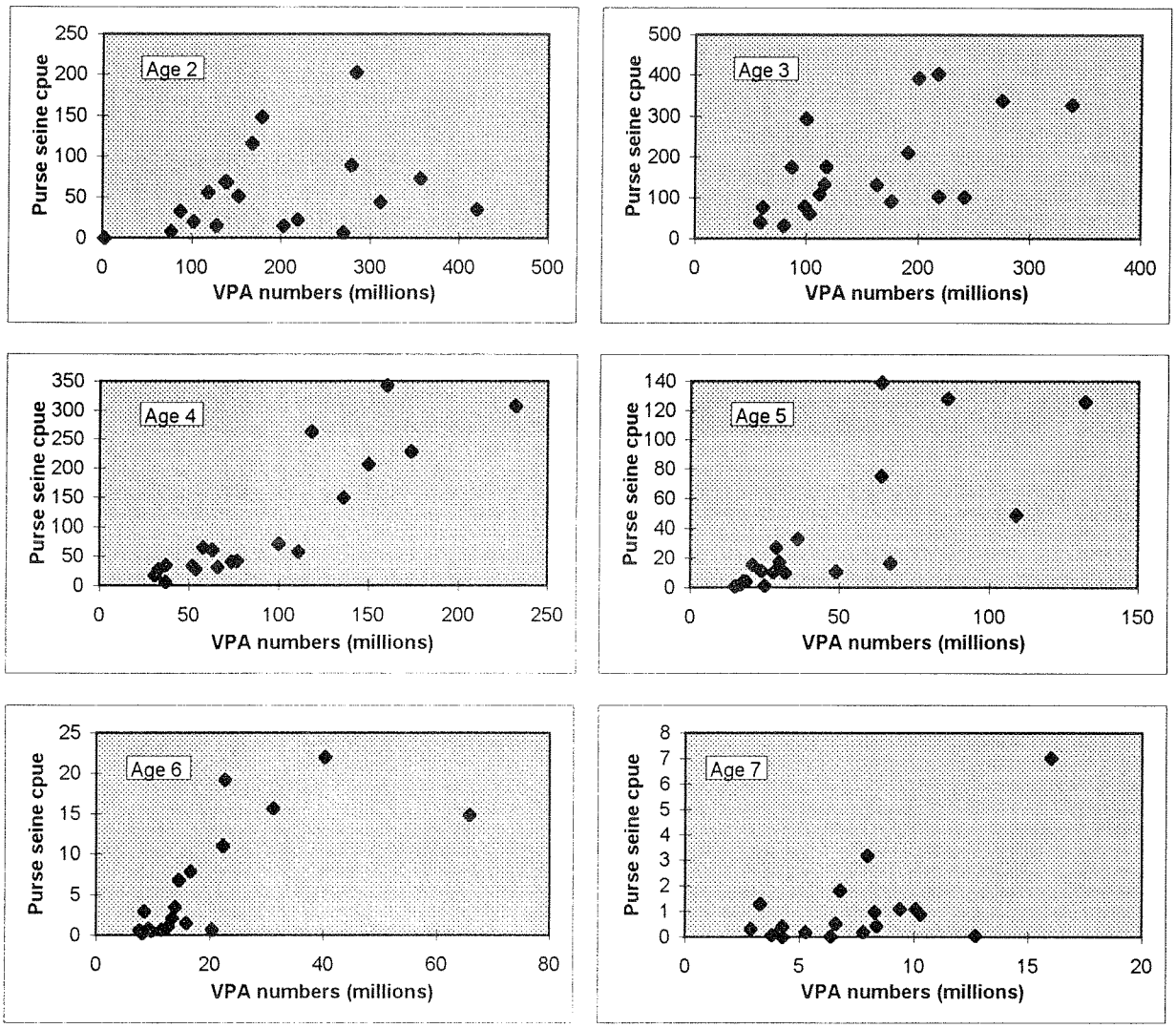


Figure 5.2C. North-East Arctic Saithe - Norwegian trawl vs VPA

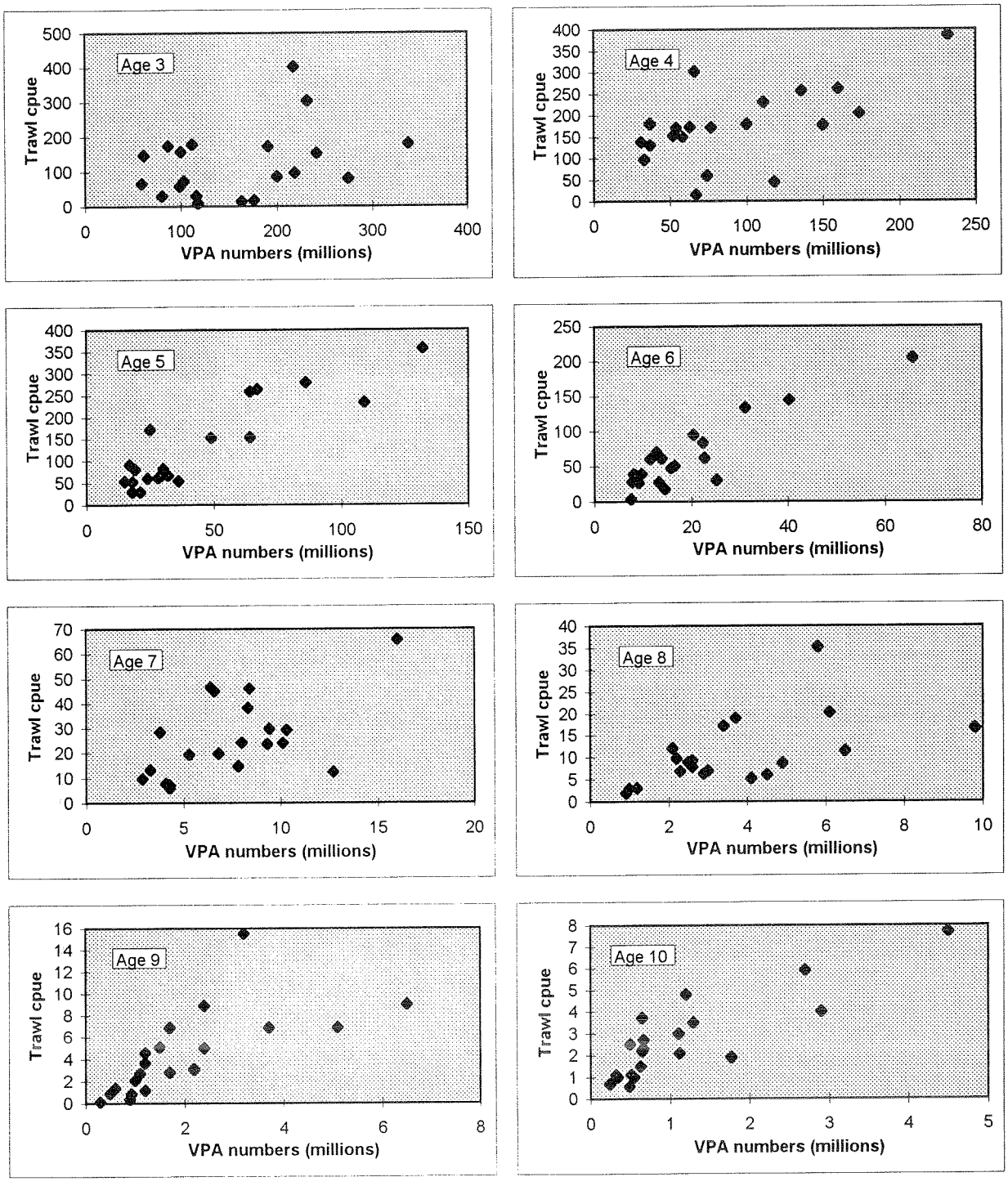


Figure 5.3A. North-East Arctic Saithe - Retrospective analysis

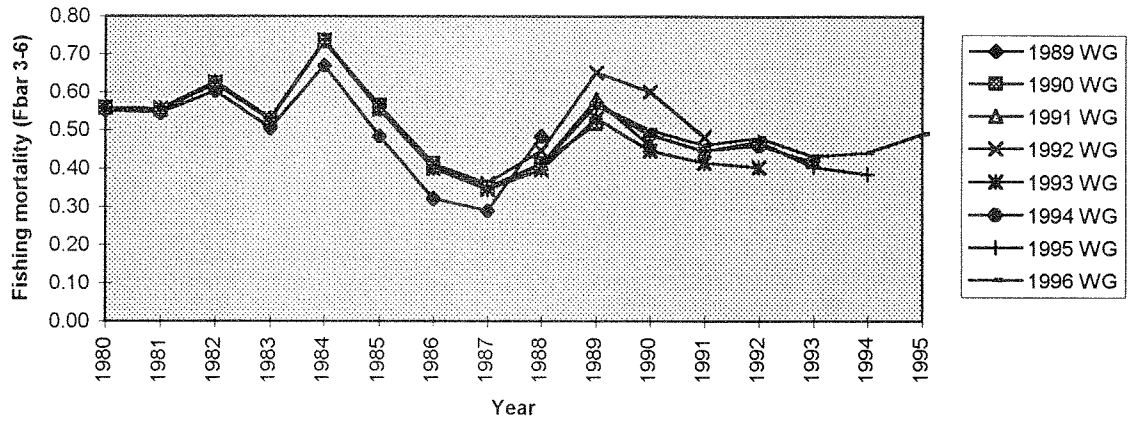


Figure 5.3B. North-East Arctic Saithe - Retrospective analysis

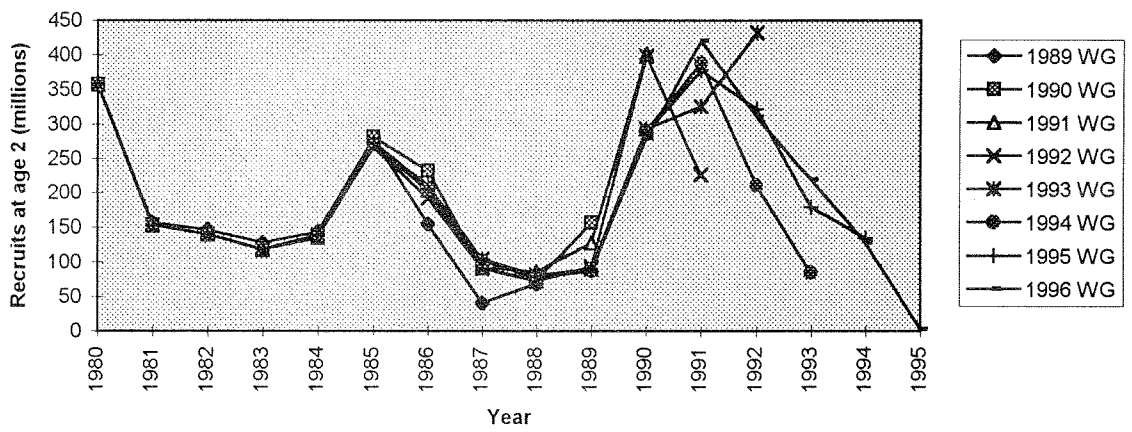


Figure 5.3C. North-East Arctic Saithe - Retrospective analysis

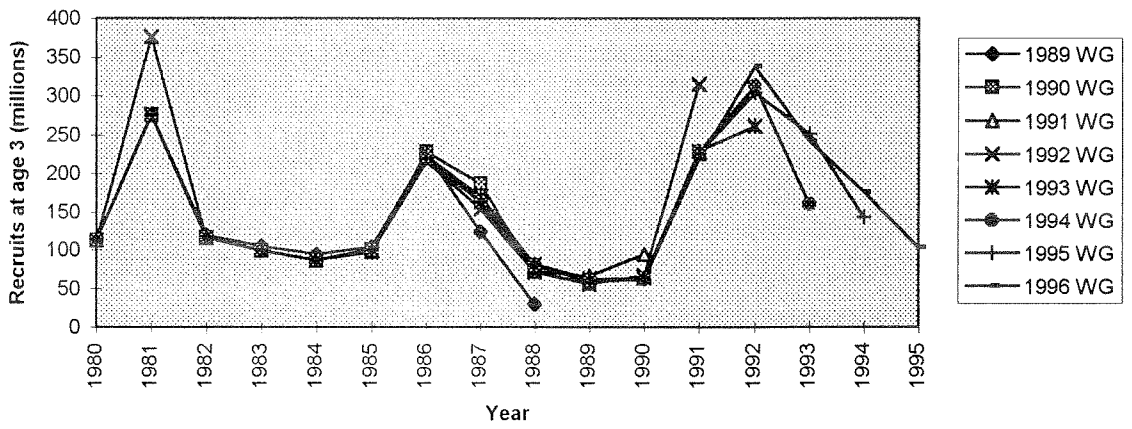
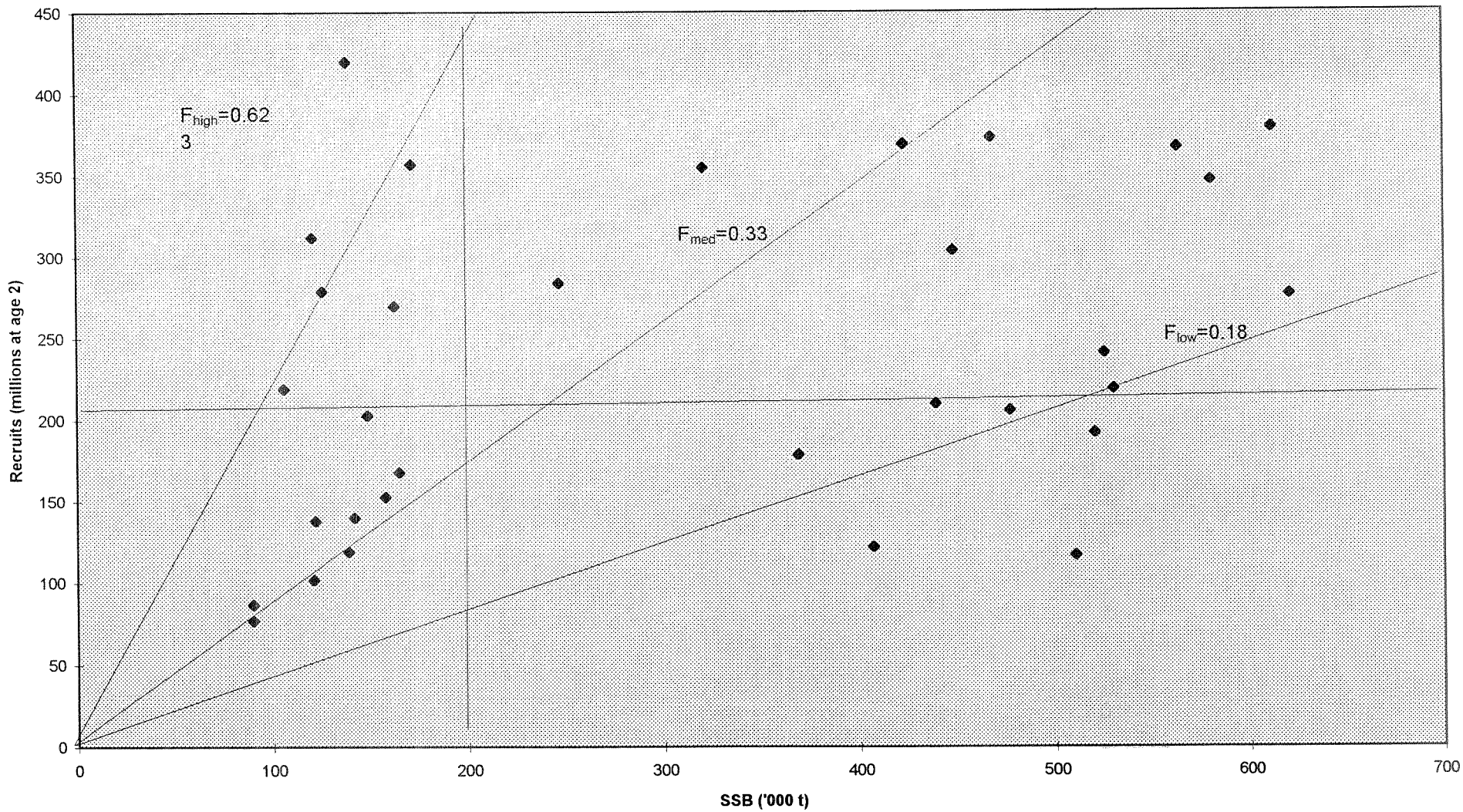


Figure 5.4. North-East Arctic Saithe - SSB vs Recruitment



g:\acfm\afwg\sai_arct*

Figure 5.5A Quantiles of the SSB distribution, F_{01} = 0.09

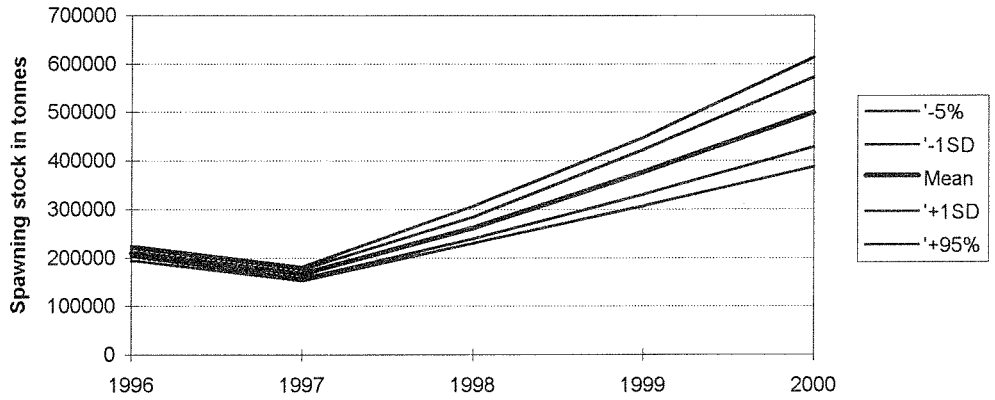


Figure 5.5B Quantiles of the SSB distribution, F_{max} = 0.16

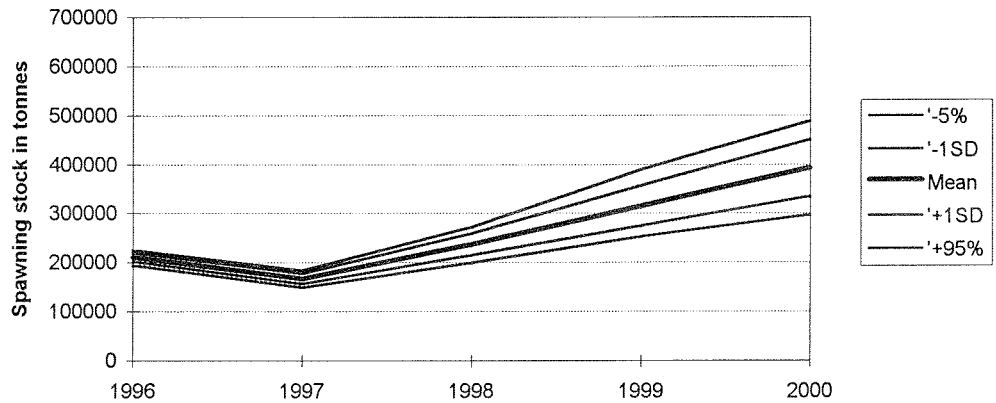


Figure 5.5C Quantiles of the SSB distribution, F_{med} = 0.33

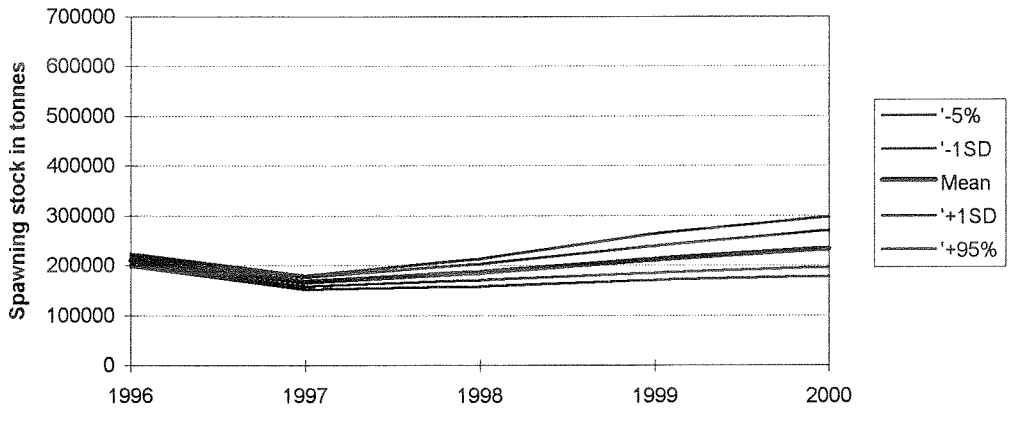


Figure 5.5D Quantiles of SSB distribution, $0.8F_{sq}$ = 0.39

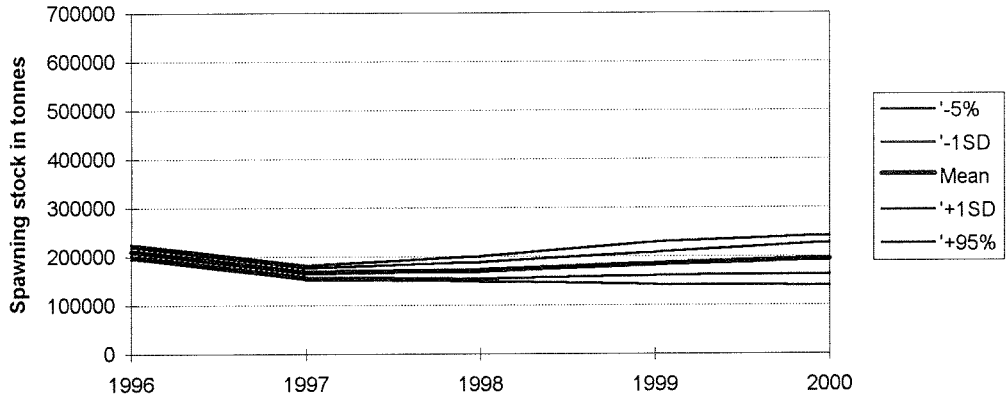


Figure 5.5E Quantiles of the SSB distribution, F_{sq} = 0.49

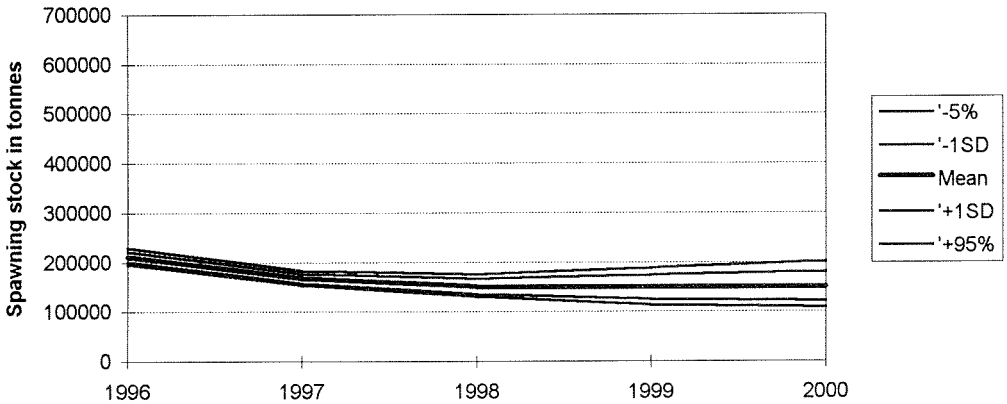


Figure 5.5F Quantiles of the SSB distribution, F_{high}= 0.62

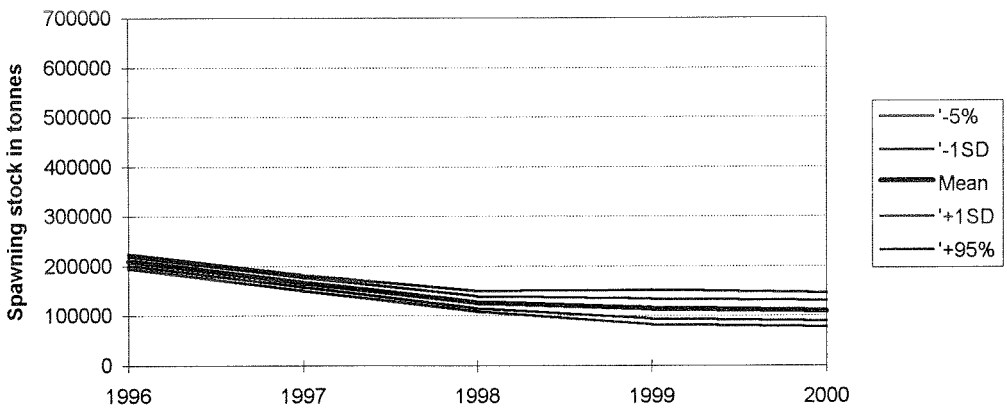


Figure 5.6A Quantiles of the catch distribution, F_{01} = 0.09

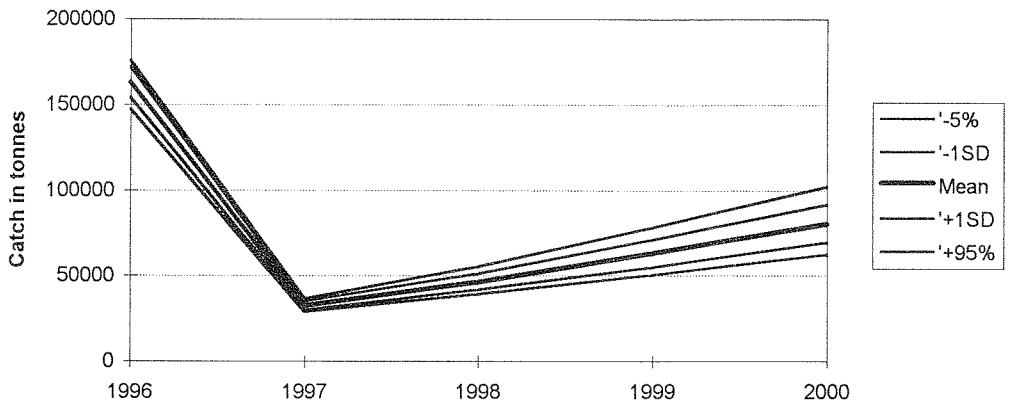


Figure 5.6B Quantiles of the catch distribution, F_{max} = 0.16

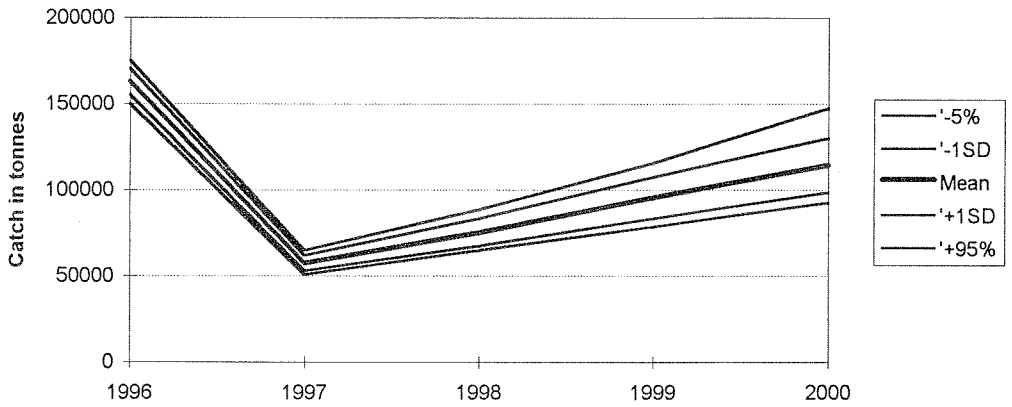


Figure 5.6C Quantiles of the catch distribution, F_{med} = 0.33

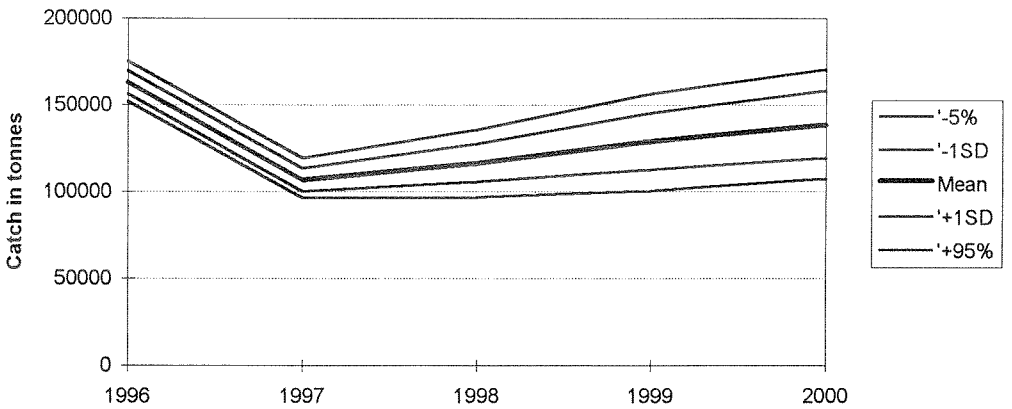


Figure 5.6D Quantiles of catch distribution, $0.8F_{sq}$ = 0.39

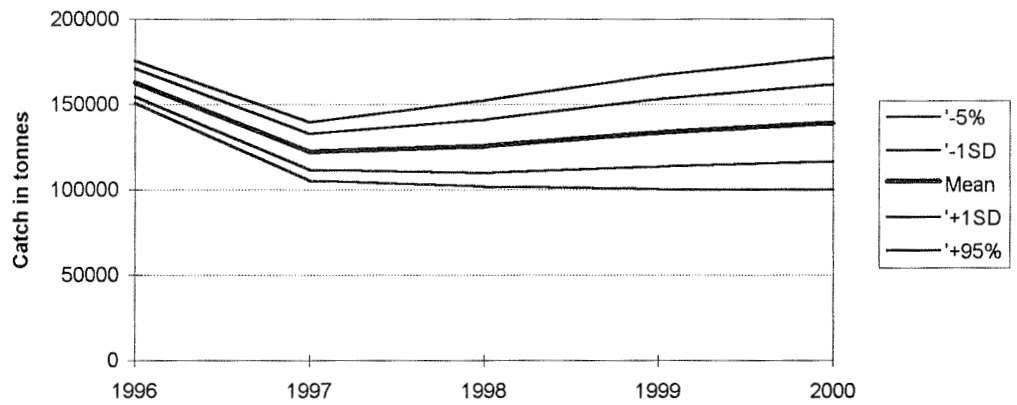


Figure 5.6E Quantiles of the catch distribution, F_{sq} = 0.49

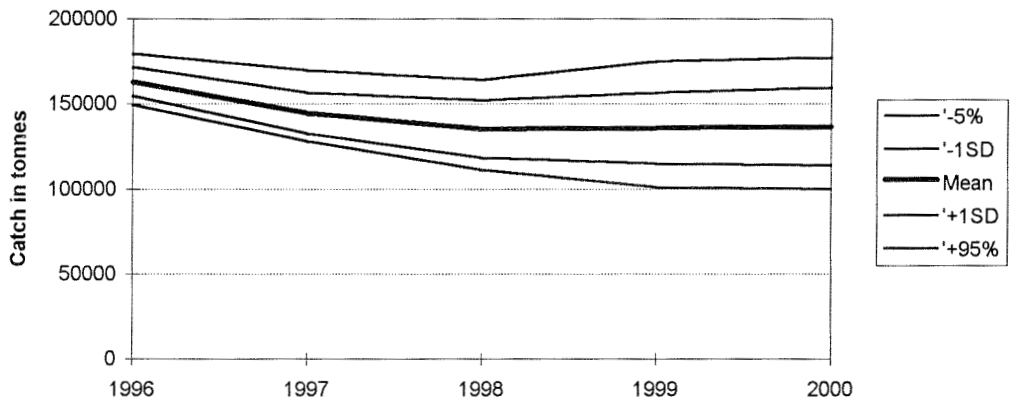


Figure 5.6F Quantiles of the catch distribution, F_{high} = 0.62

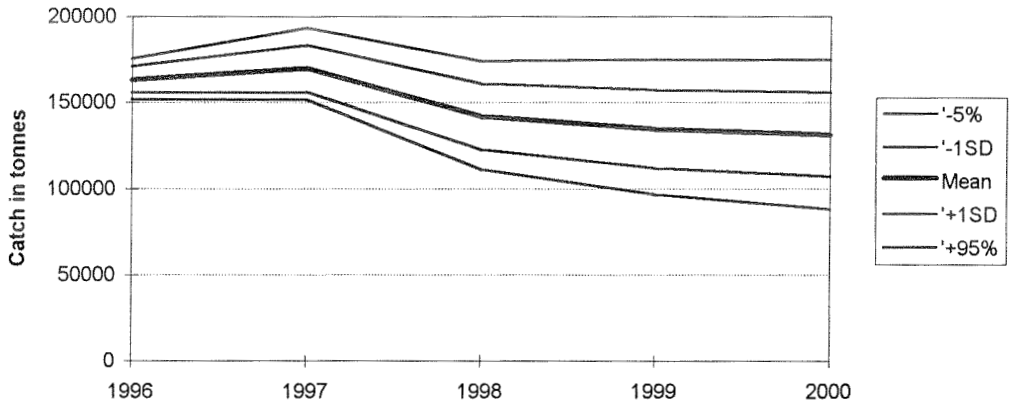
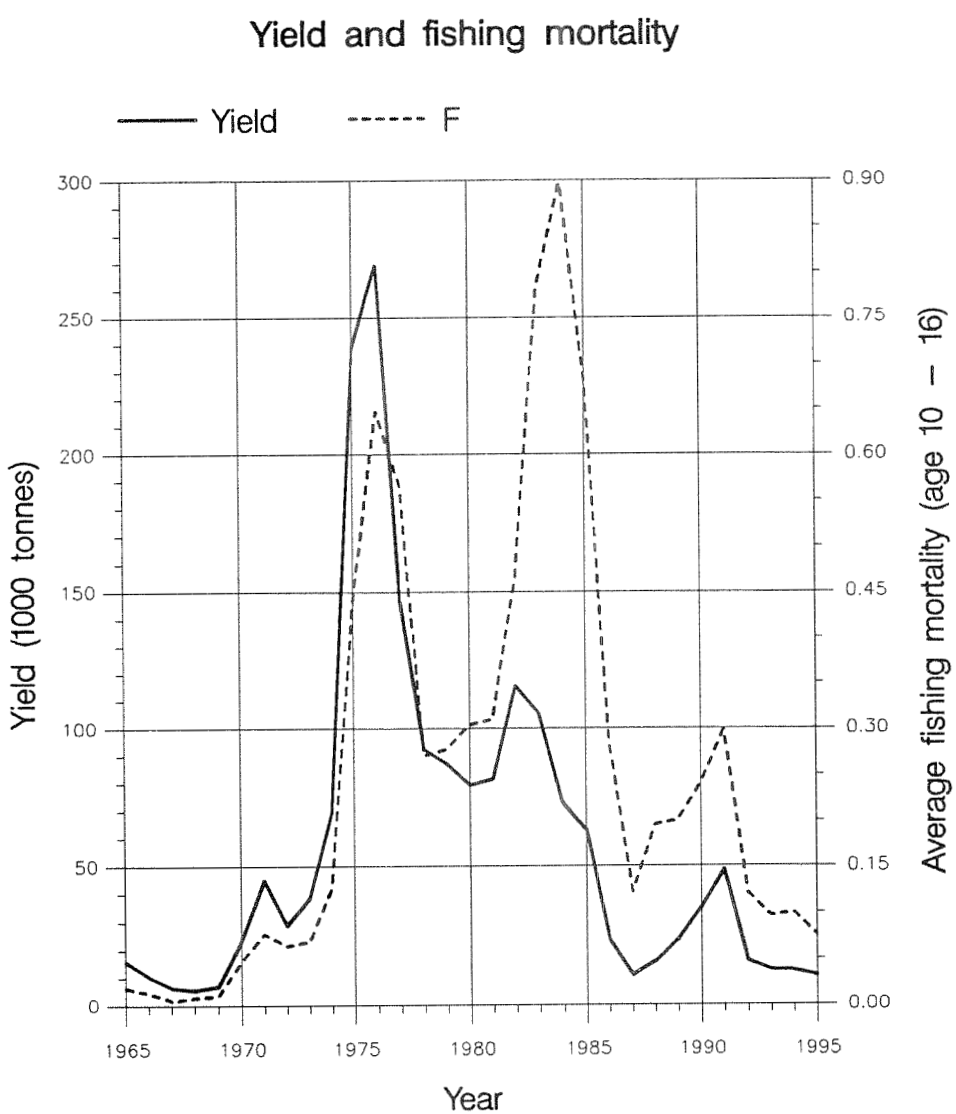


Figure 6.1 A and B

Fish Stock Summary
Sebastes mentella in the North – East Arctic (Fishing Areas I & II)
9 – 9 – 1996



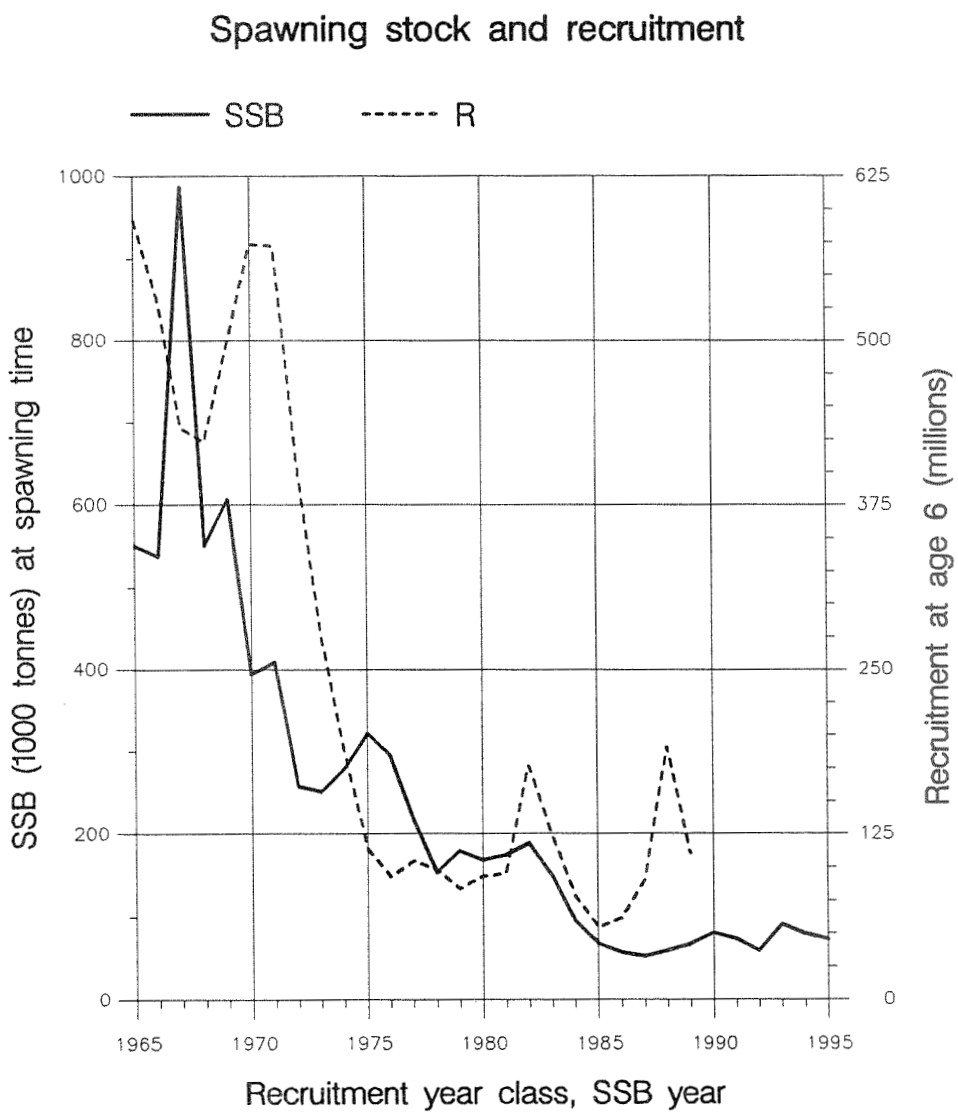
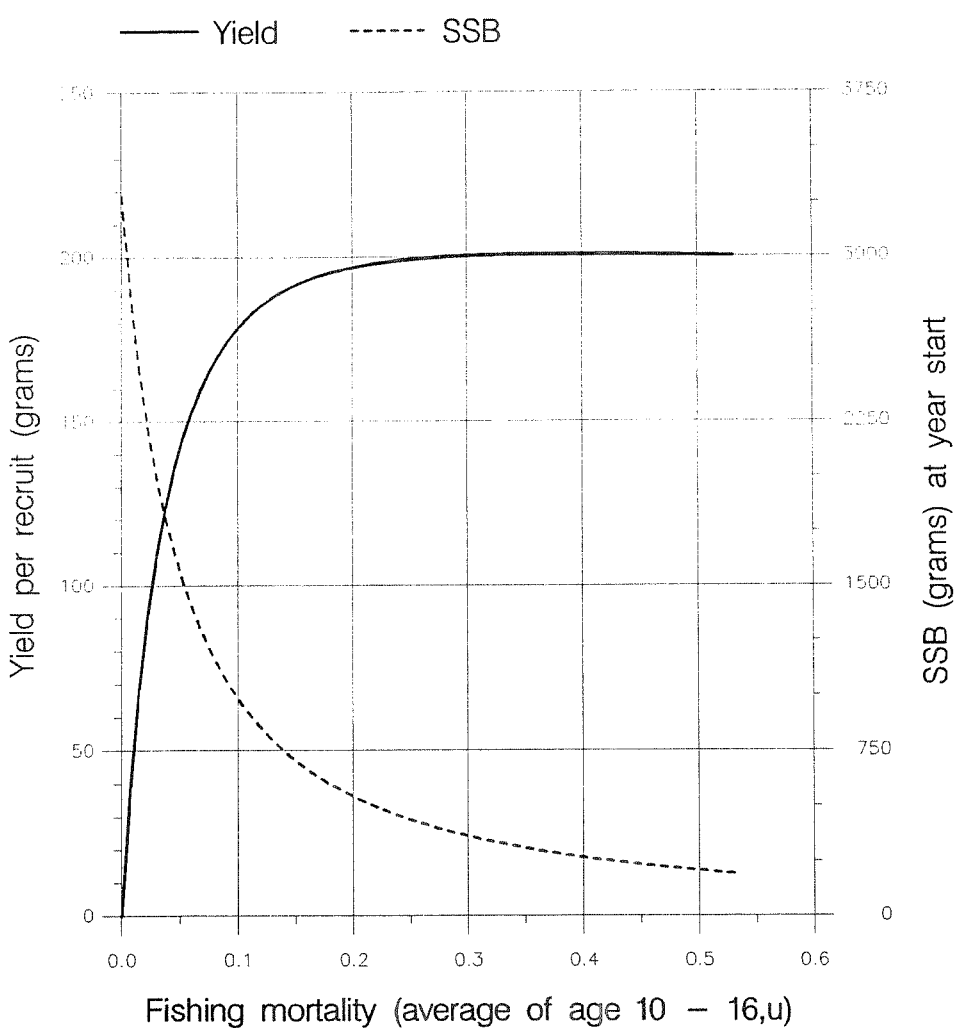


Figure 6.1 C and D

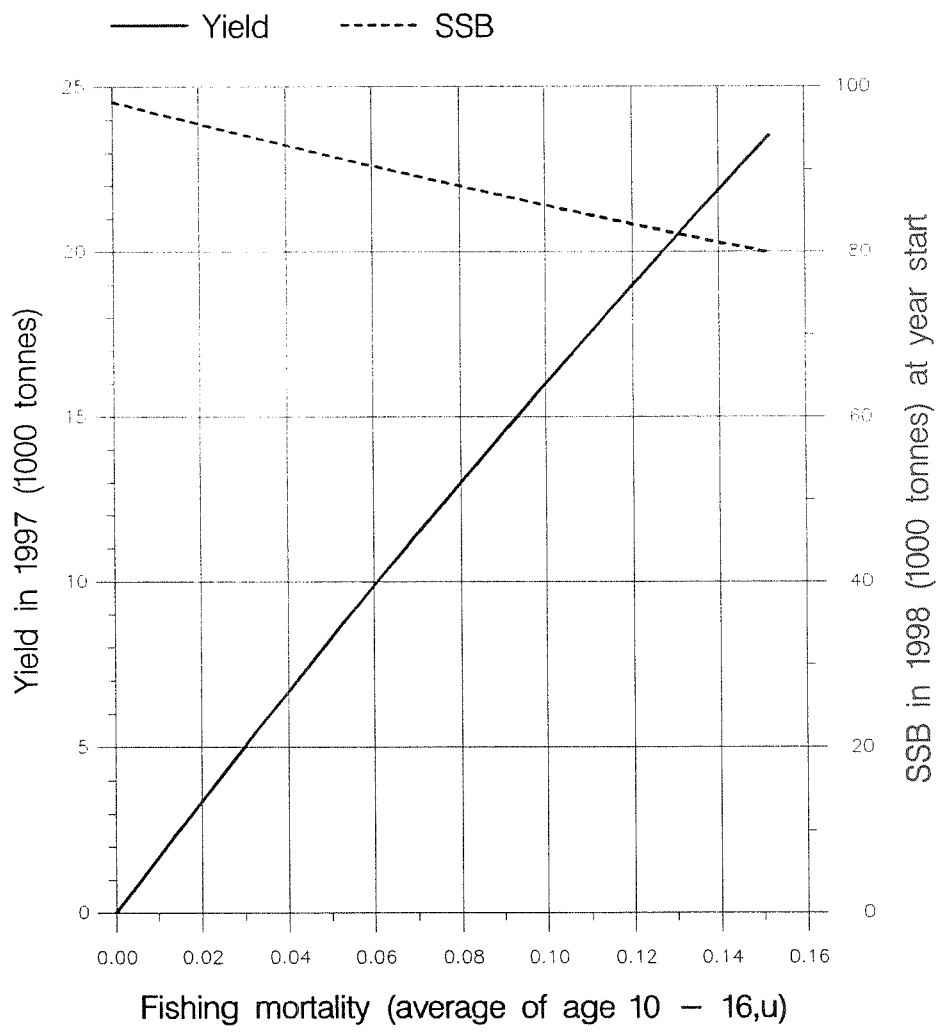
Fish Stock Summary
Sebastes mentella in the North – East Arctic (Fishing Areas I & II)
29 – 8 – 1996

Long term yield and spawning stock biomass



(run: YLDTJA04) C

Short term yield and spawning stock biomass



(run: MANTJA01) D

Figure 6.2. Sebastes mentella in Sub-areas I and II - Retrospective analysis

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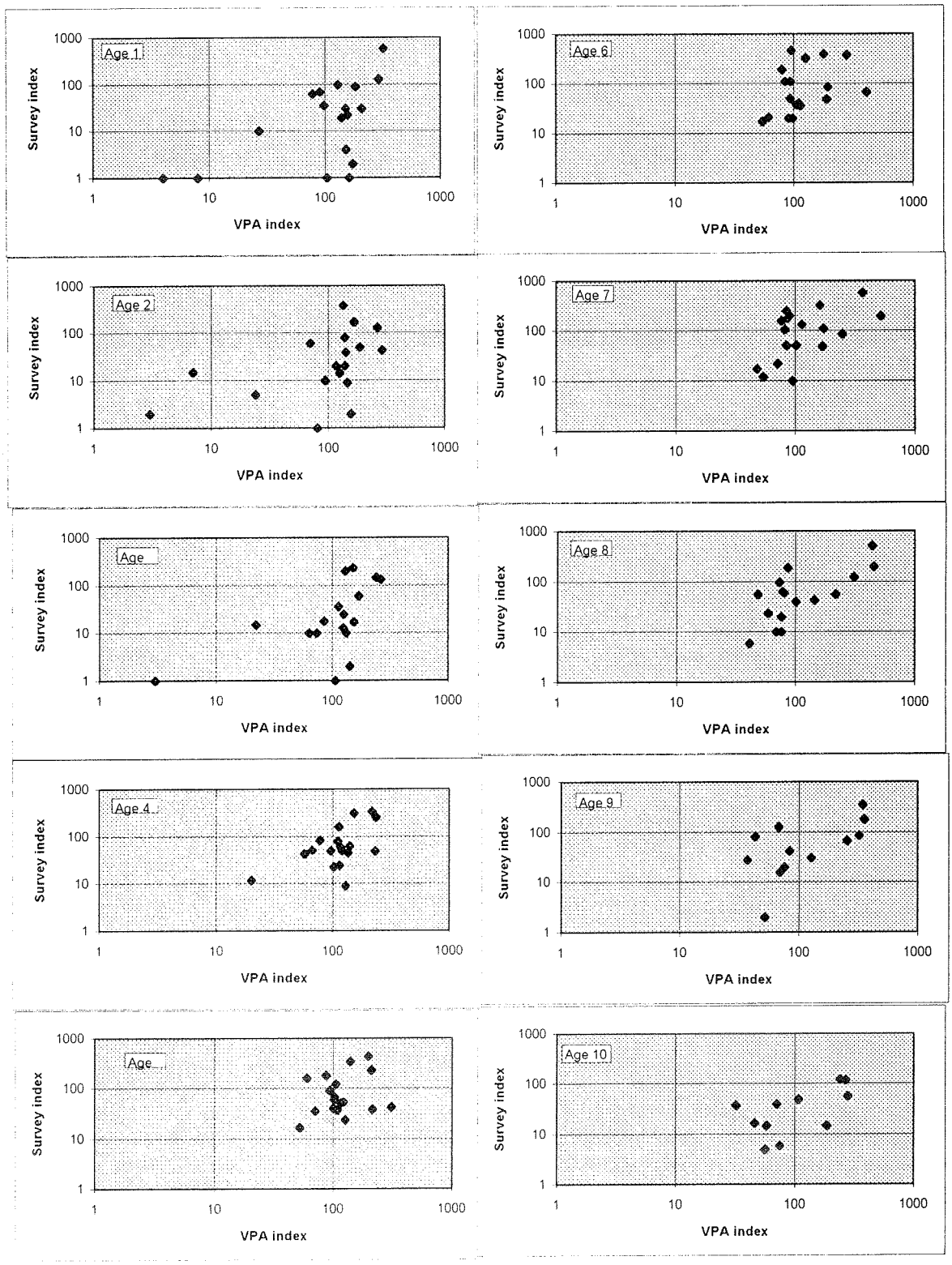
Figure 6.3A. Sebastes mentella in Sub-areas I and II. Russian bottom trawl survey vs VPA Logarithmic scale.



Continued....

Figure 6.3A. Sebastes mentella in Sub-areas I and II. Russian PST trawl survey cpue vs VPA
Logarithmic scale.

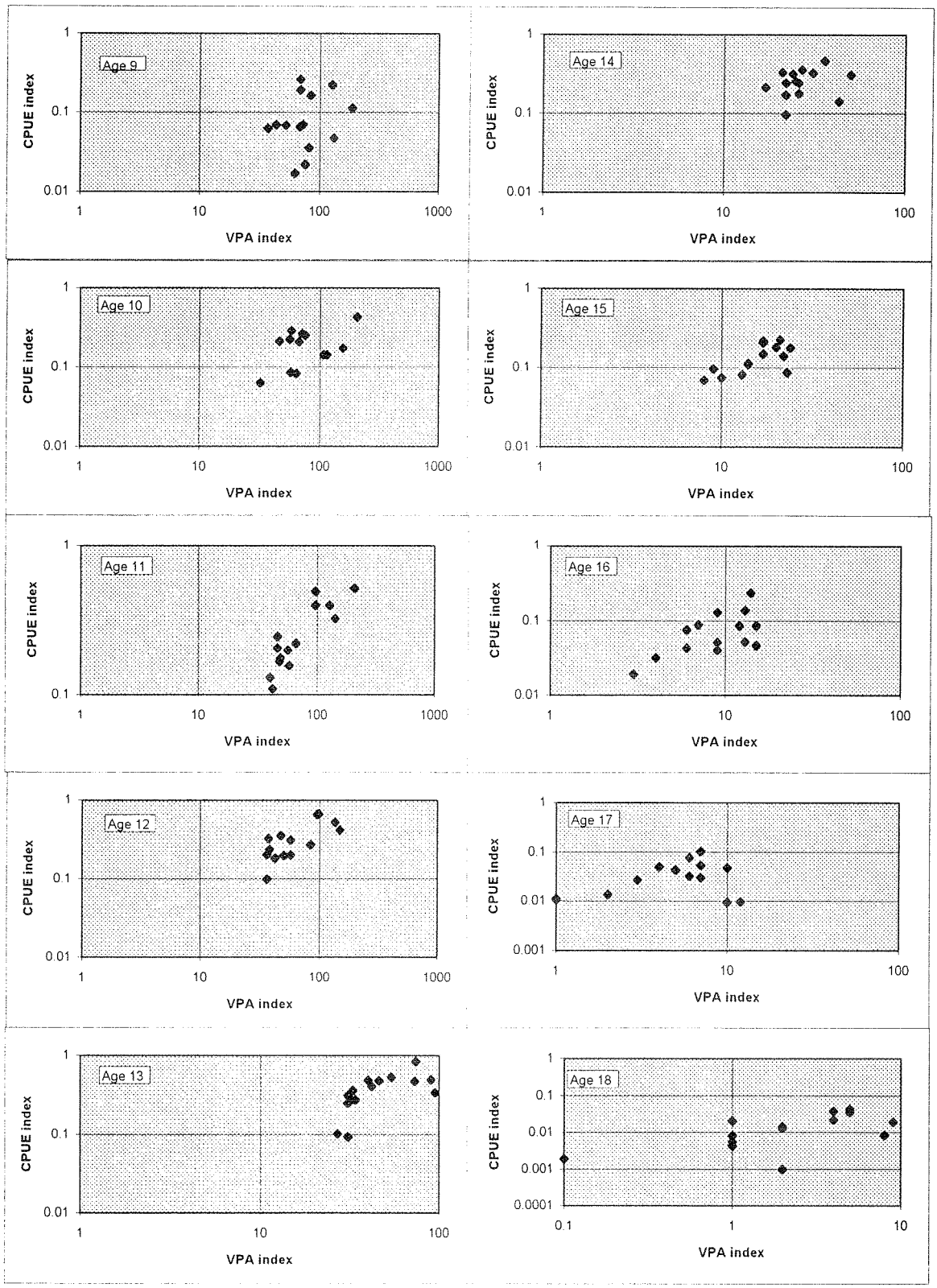


Figure 6.4. Sebastes mentella. Stock and recruitment plot.

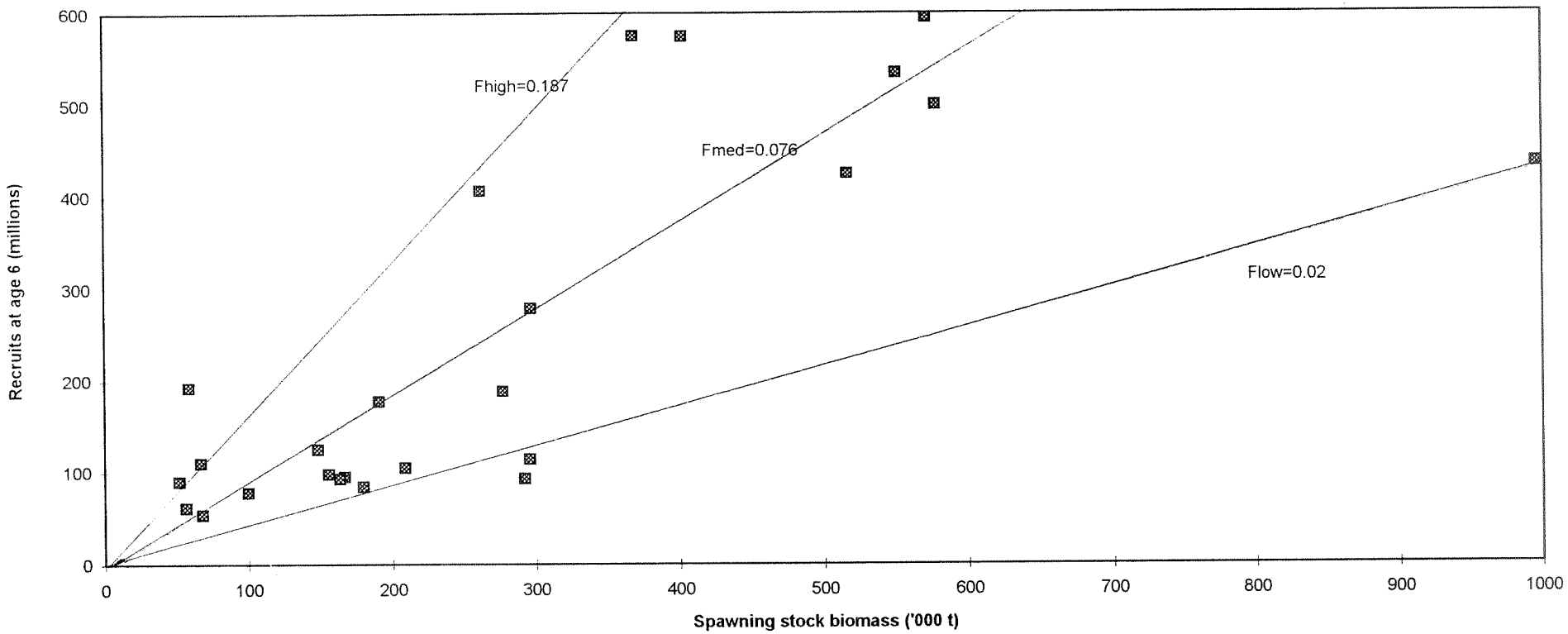


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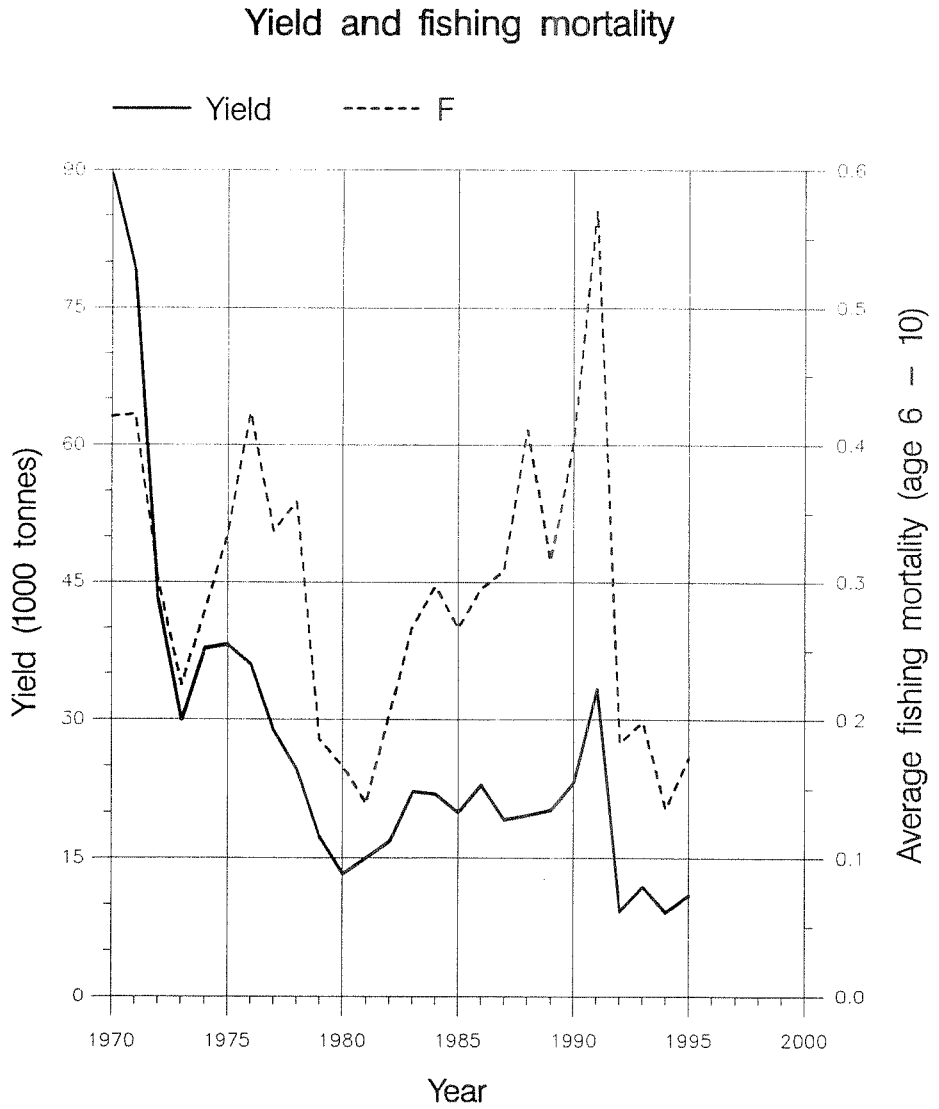
Figure 8.1 A and B

Fish Stock Summary
Greenland halibut in the North – East Arctic (Fishing Areas I & II)
25 – 8 – 1996



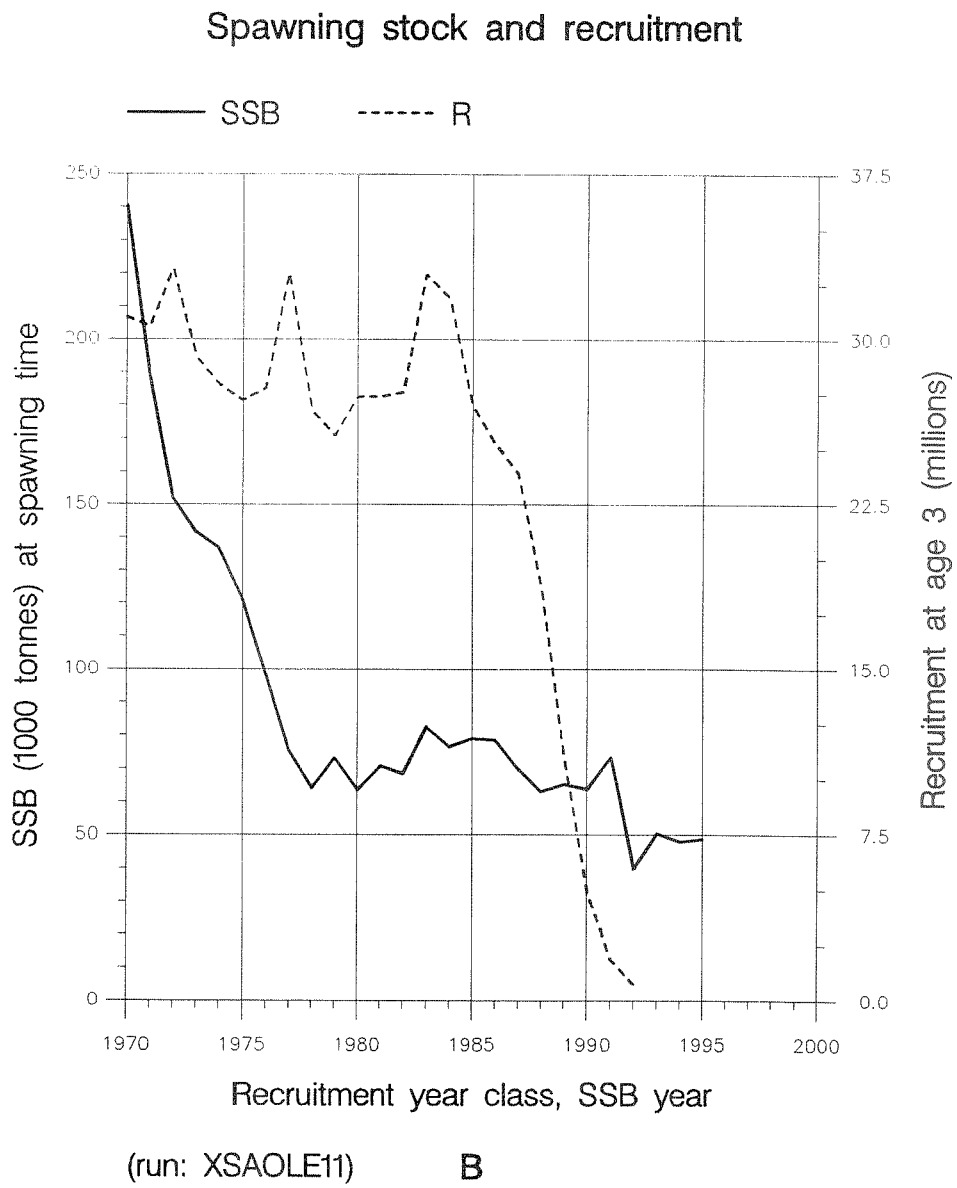
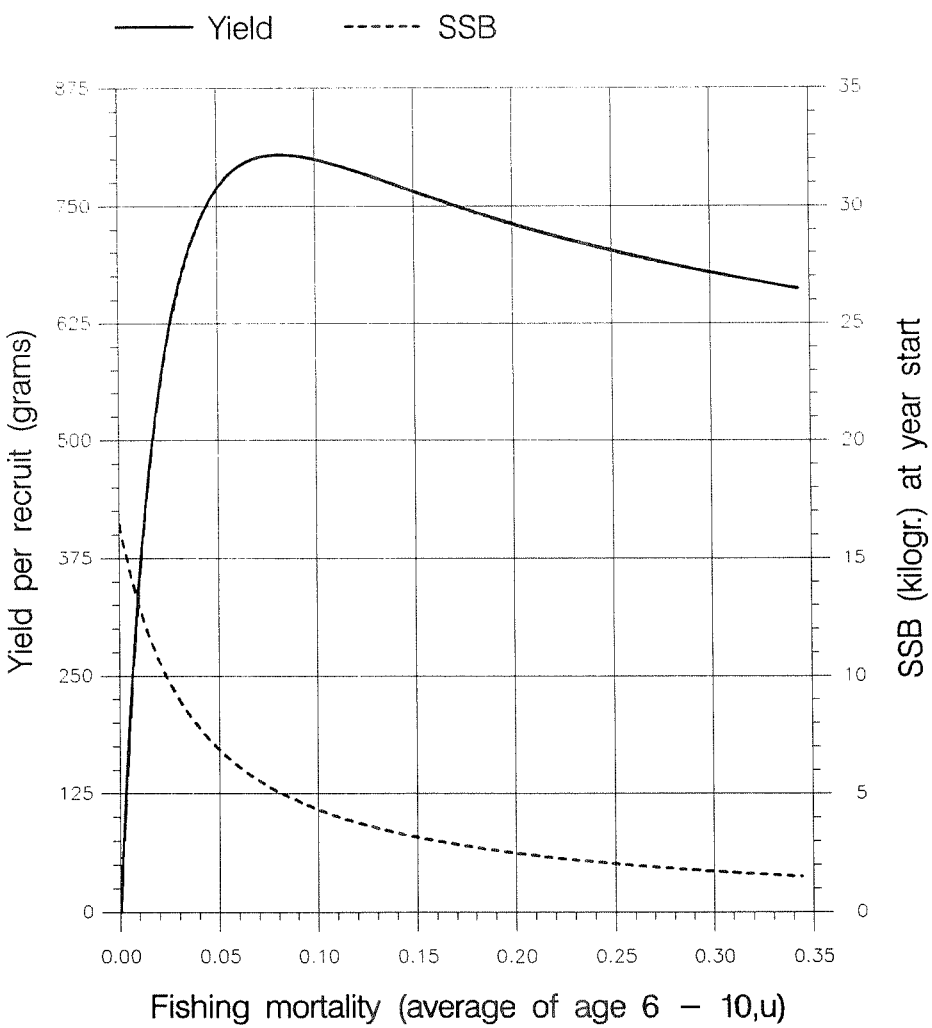


Figure 8.1 C and D

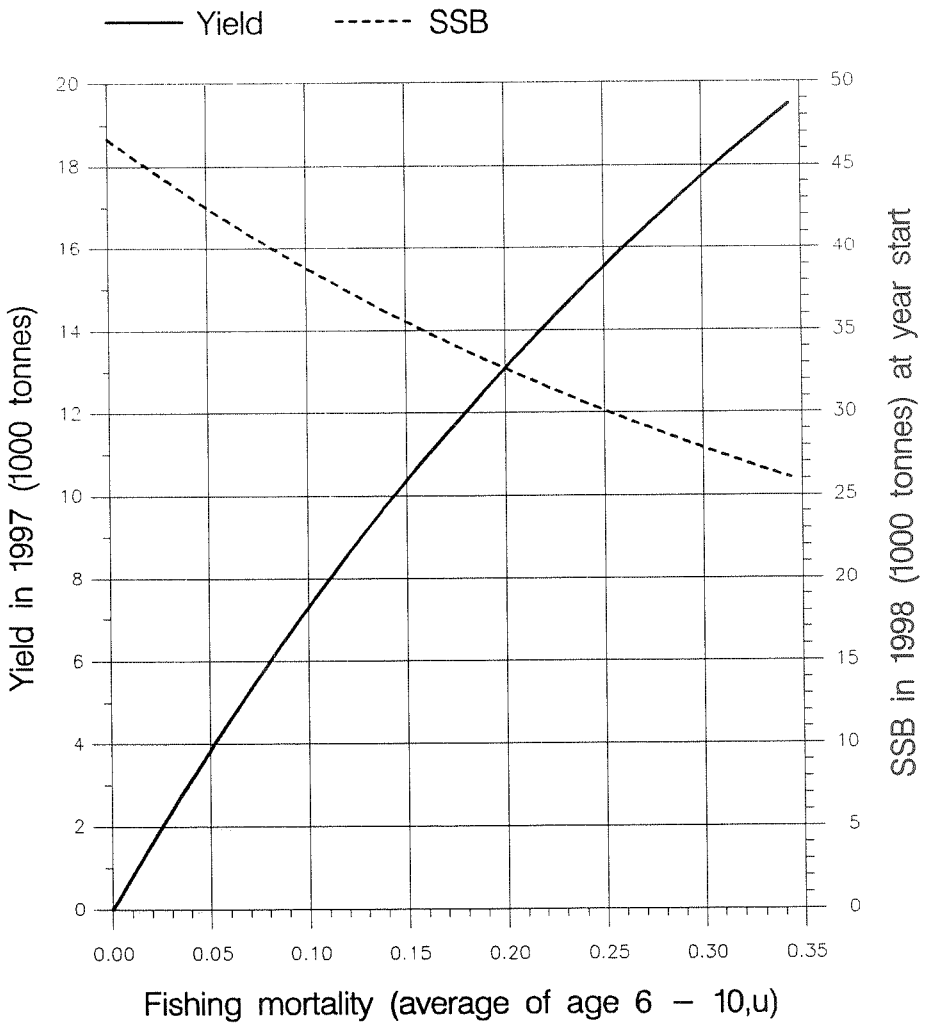
Fish Stock Summary
Greenland halibut in the North – East Arctic (Fishing Areas I & II)
26 – 8 – 1996

Long term yield and spawning stock biomass



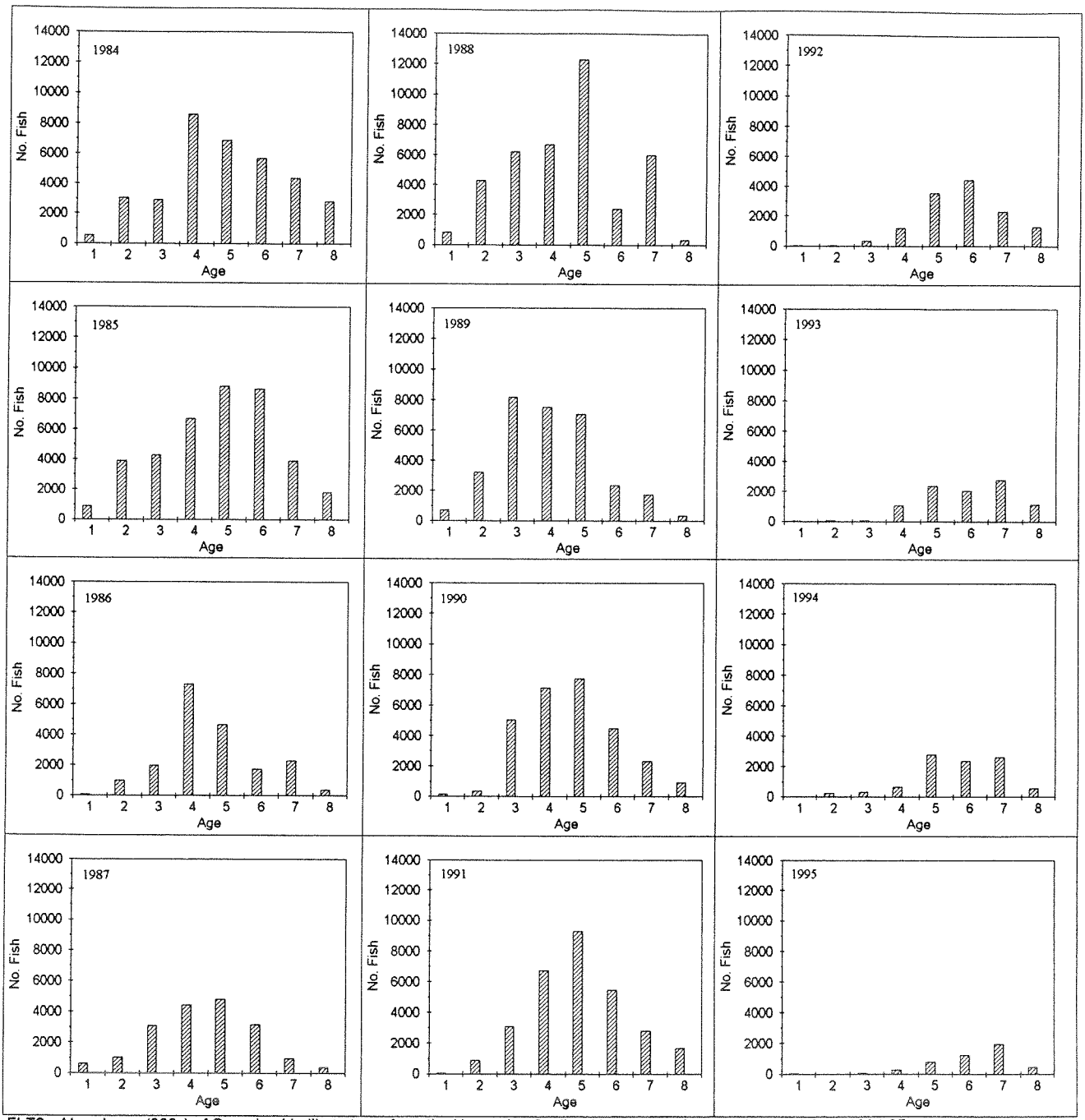
(run: YLDOLE01) C

Short term yield and spawning stock biomass



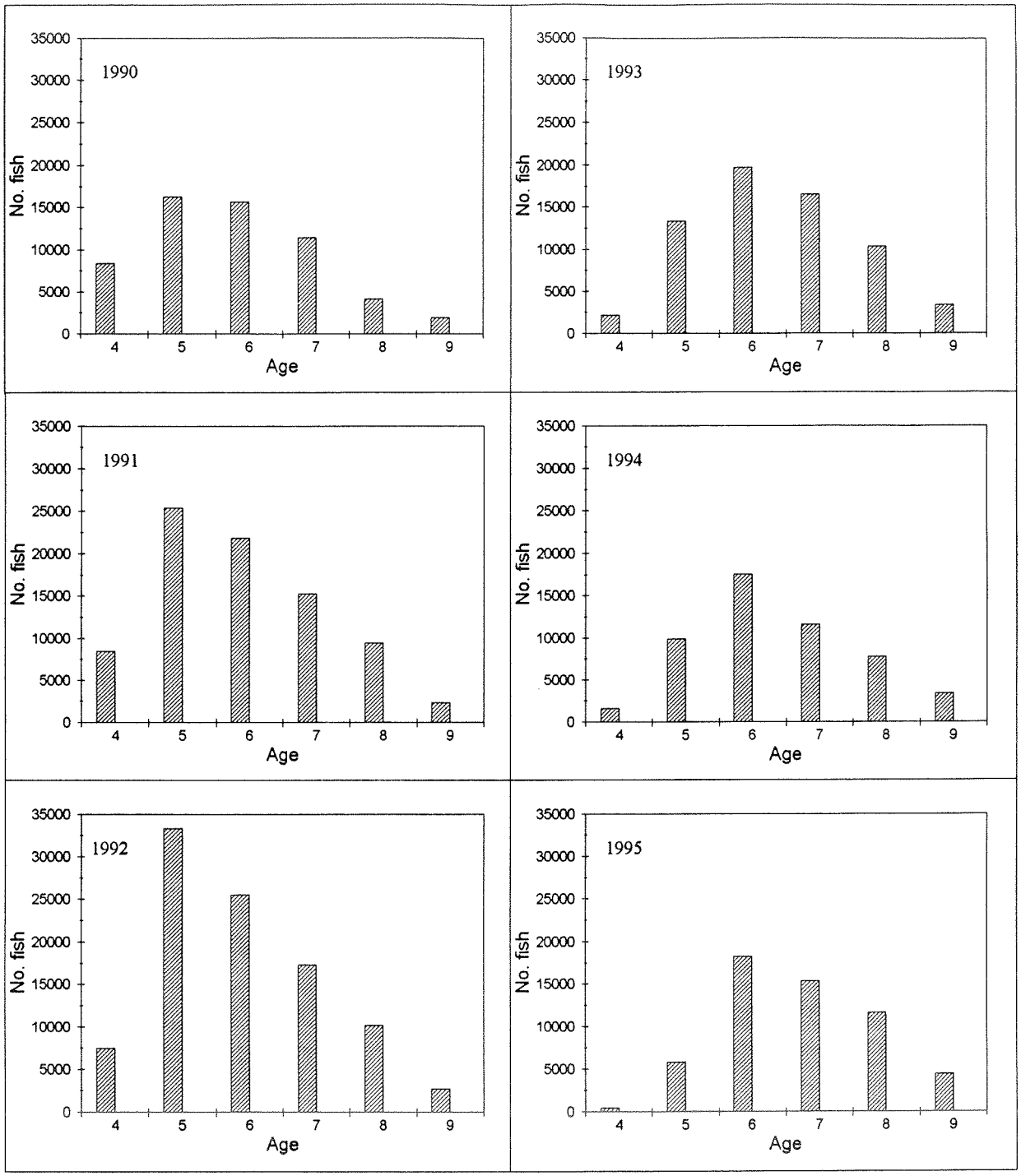
(run: MANOLE01) D

Figure 8.2 A



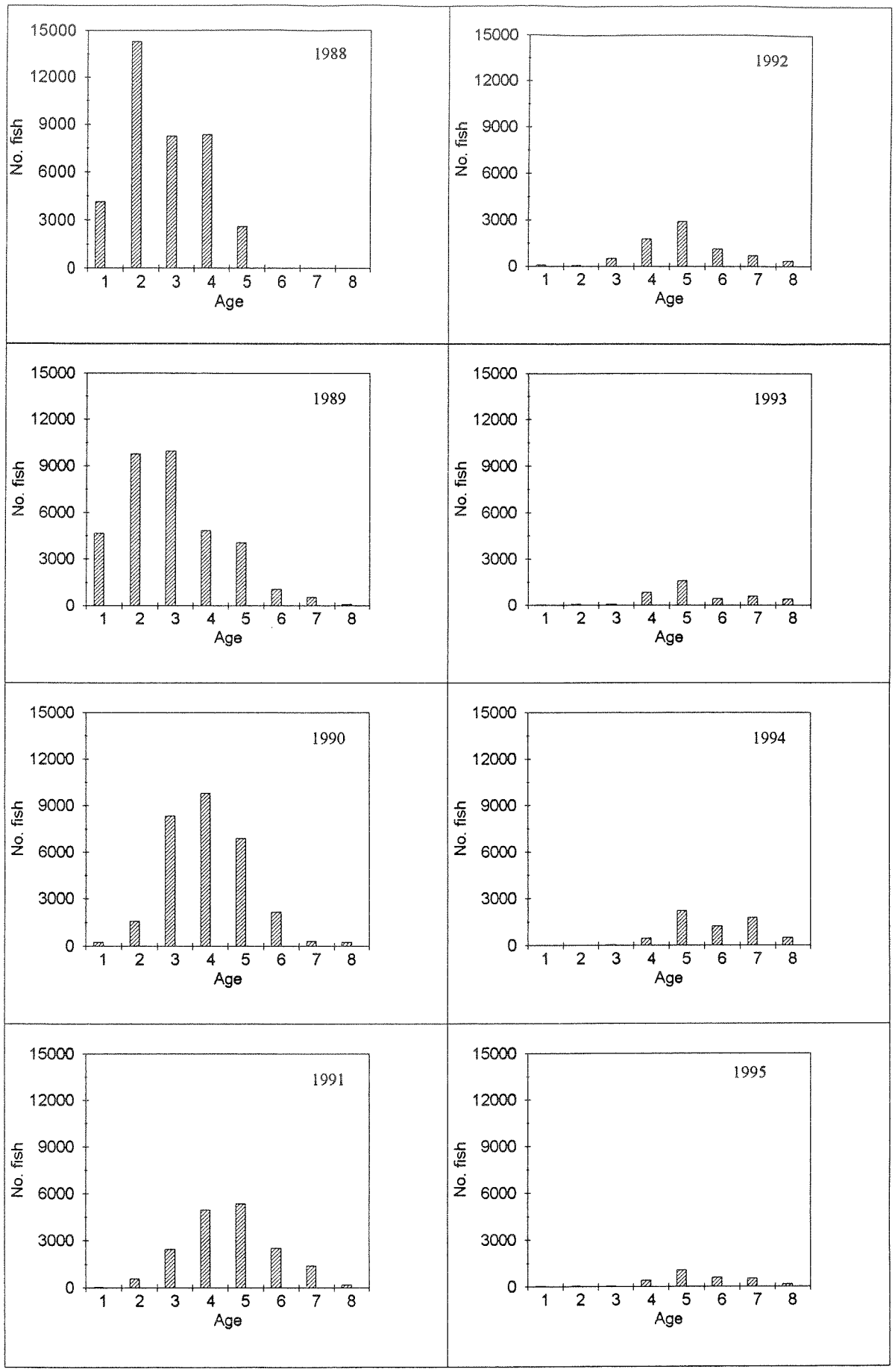
FLT9 - Abundance (000s) of Greenland halibut at age from the Norwegian Svalbard bottom trawl survey (autumn) from 1984-95.

Figure 8.2 B



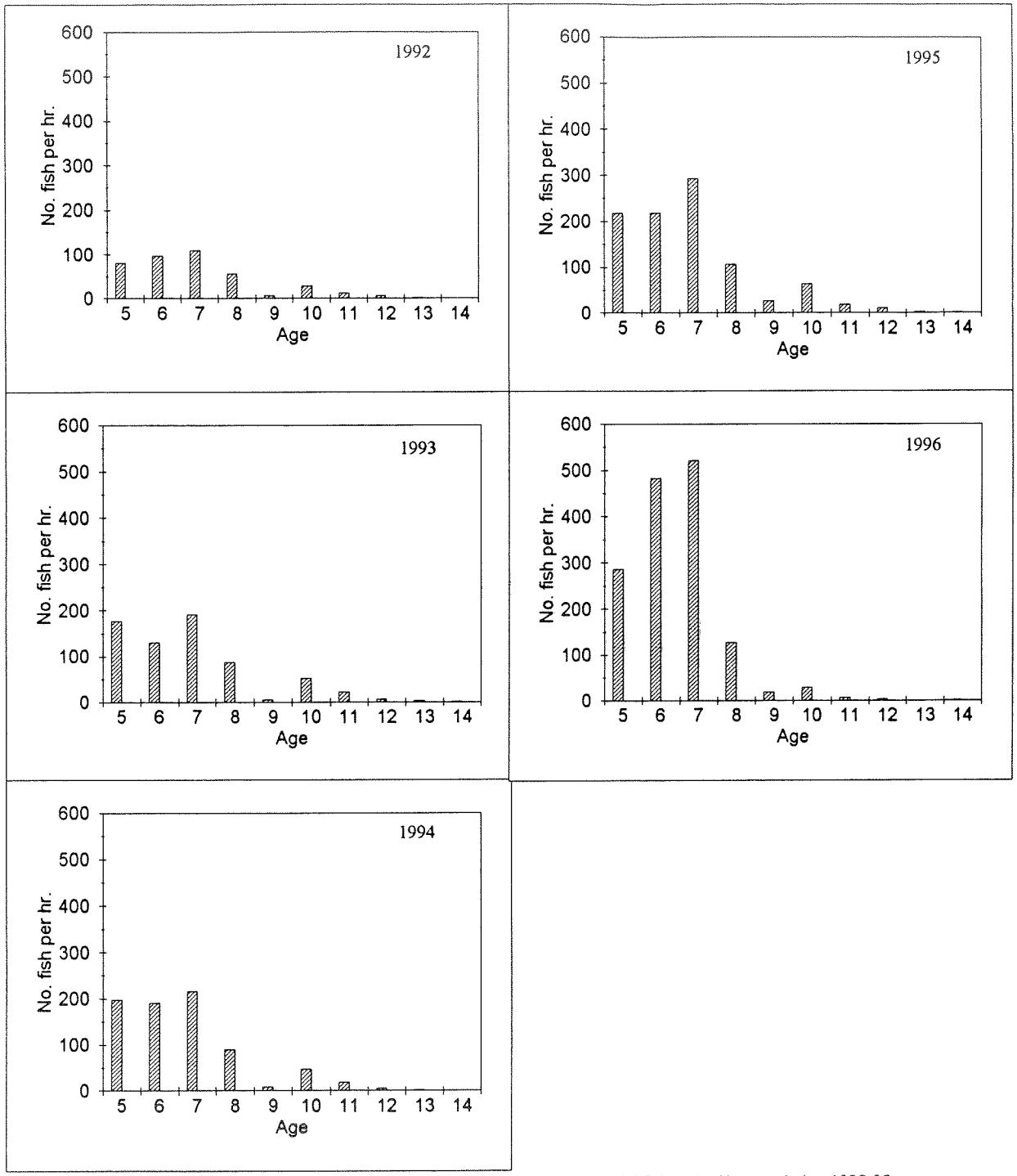
FLT10 - Abundance (000s) of Greenland halibut at age from the Russian bottom trawl survey (autumn) from 1990-95.

Figure 8.2 C



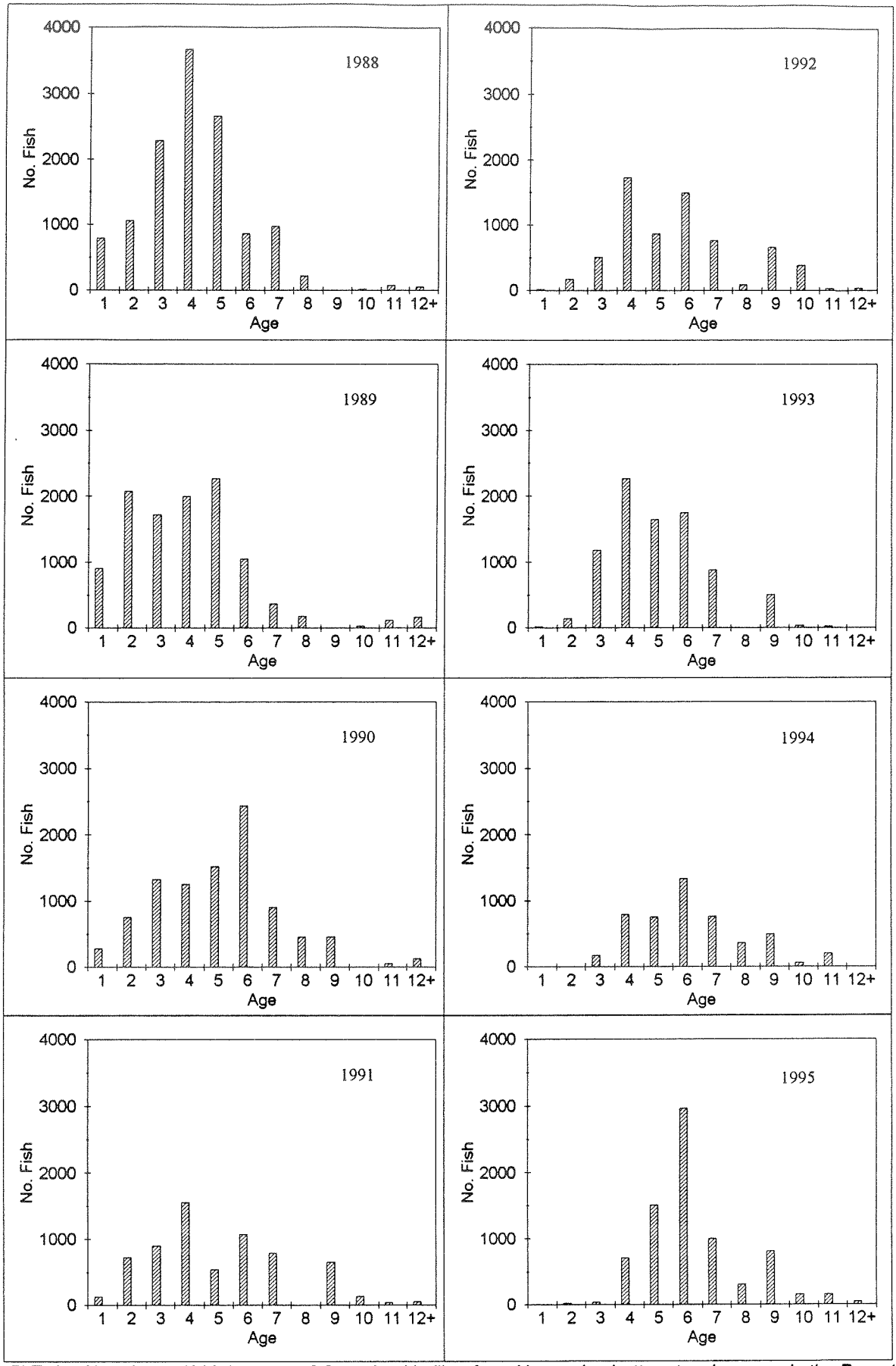
FLT11 - Abundance (000s) of Greenland halibut at age from the Norwegian Svalbard Shrimp surveys from 1988-95.

Figure 8.2 D



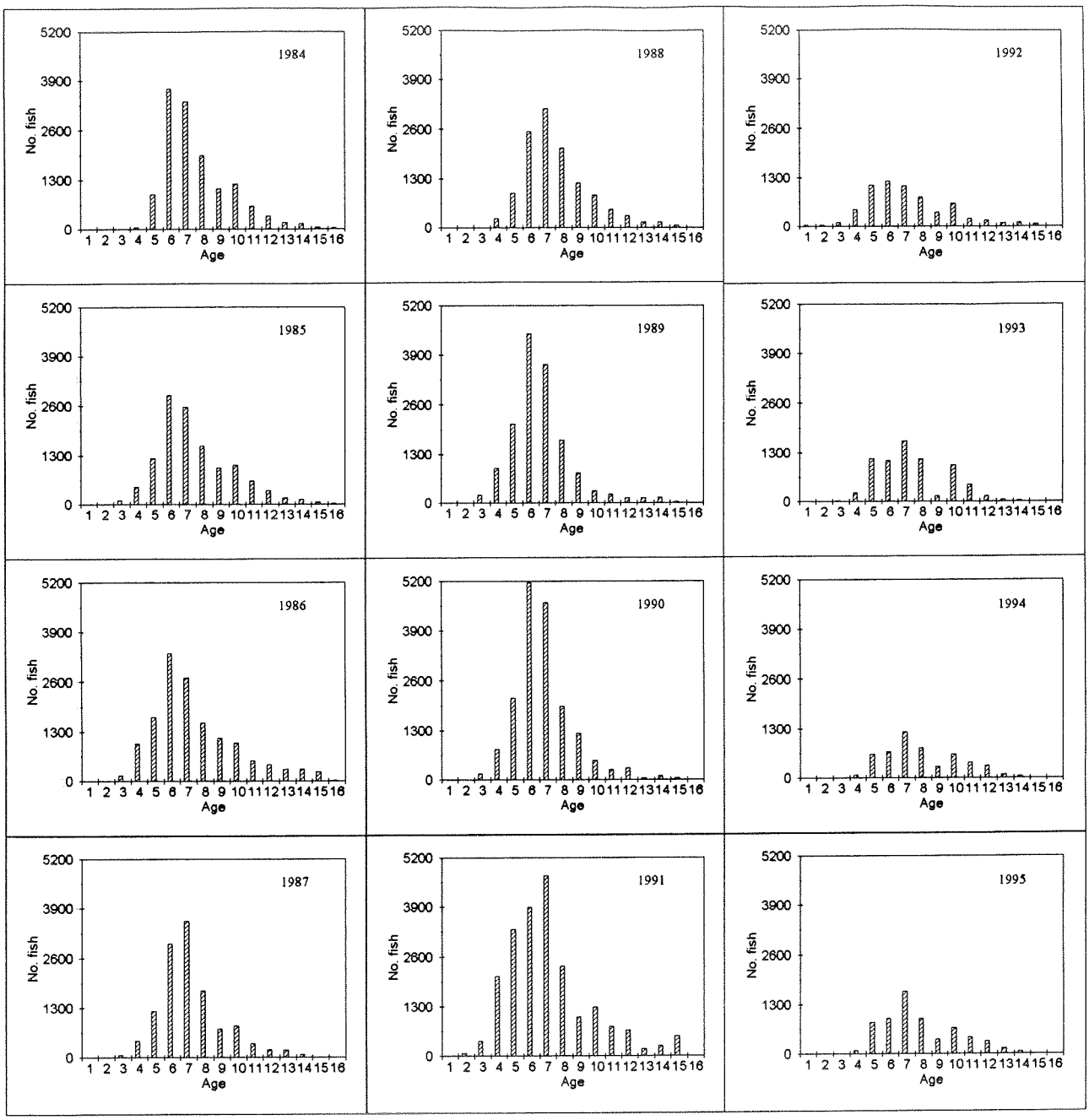
FLT12 - Greenland halibut CPUE at age from a limited experimental commercial fishery by Norway during 1992-96.

Figure 8.2 E



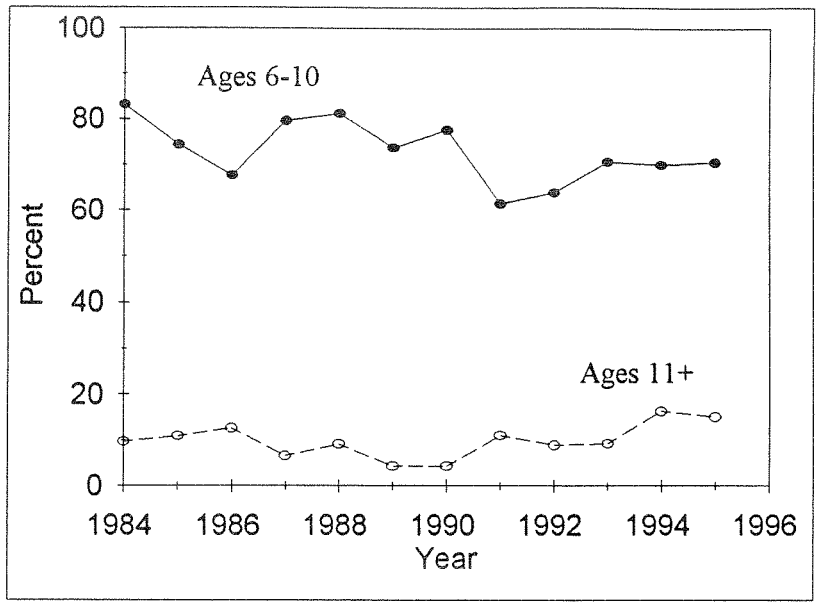
FLT13 - Abundance (000s) at age of Greenland halibut from Norwegian bottom trawl surveys in the Barents Sea in Areas A, B, C and D during the winters of 1989-96. Adjusted back by 1 year and 1 age to reflect sampling in the autumn of 1988-95.

Figure 8.3 A



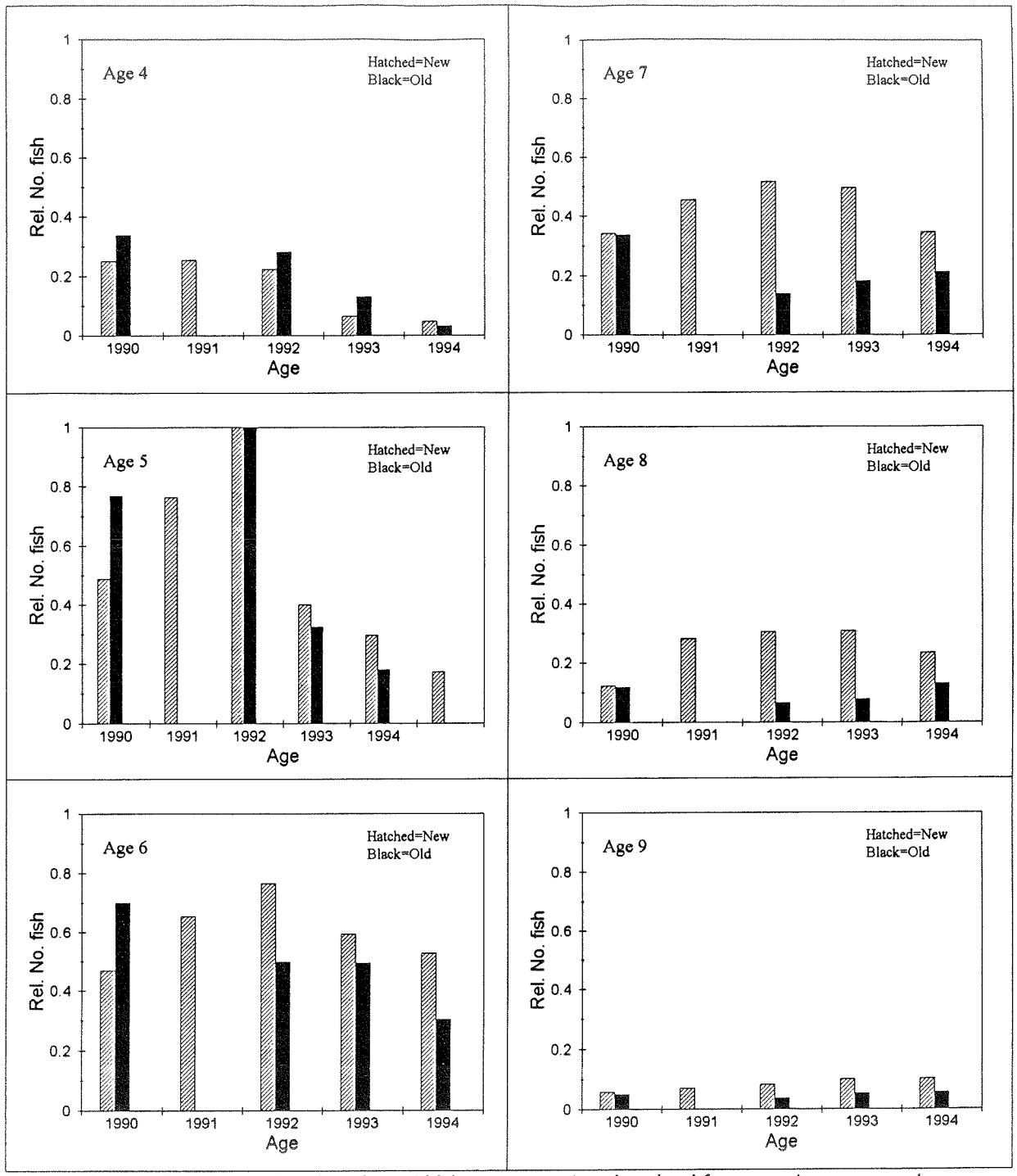
Catch numbers at age (000s) of Greenland halibut from the commercial fishery.

Figure 8.3 B



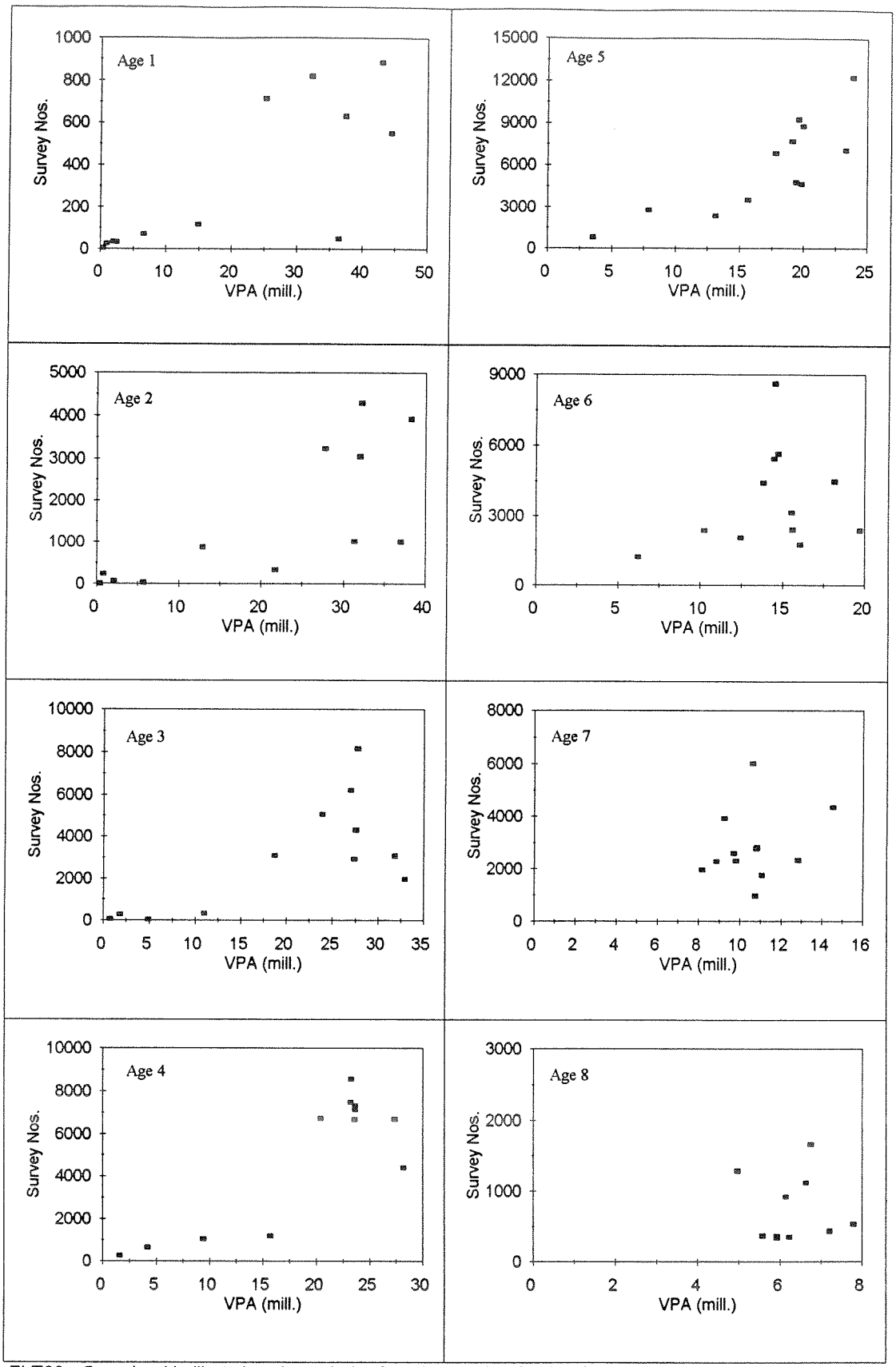
Greenland halibut catch proportions (numbers) by age grouping.

Figure 8.4



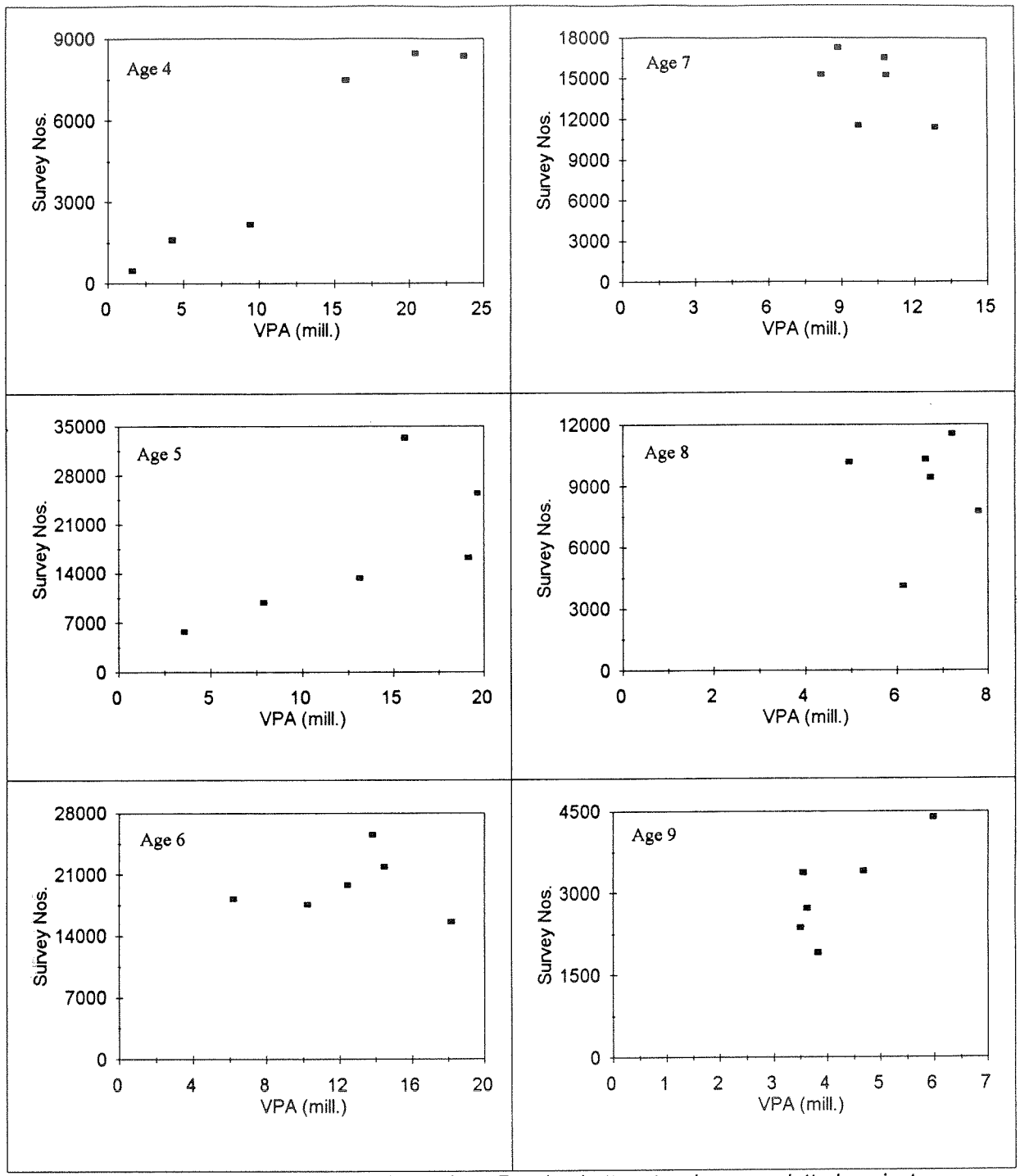
Comparison of Russian tuning data from 1994 assessment and revised for current assessment.

Figure 8.5 A



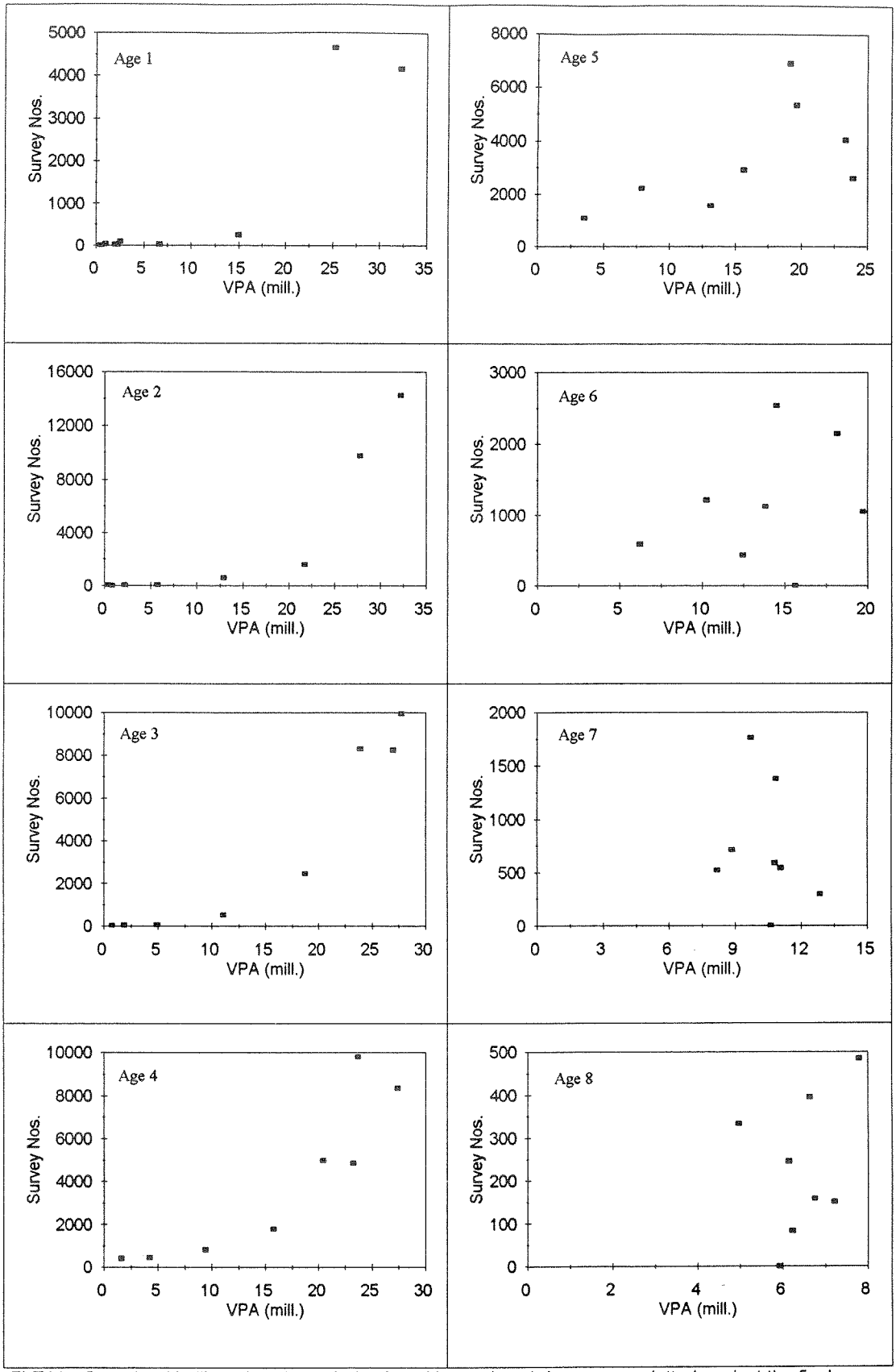
FLT09 - Greenland halibut abundance index from Norwegian Svalbard bottom trawl survey plotted against the final VPA estimate for the years 1984-95.

Figure 8.5 B



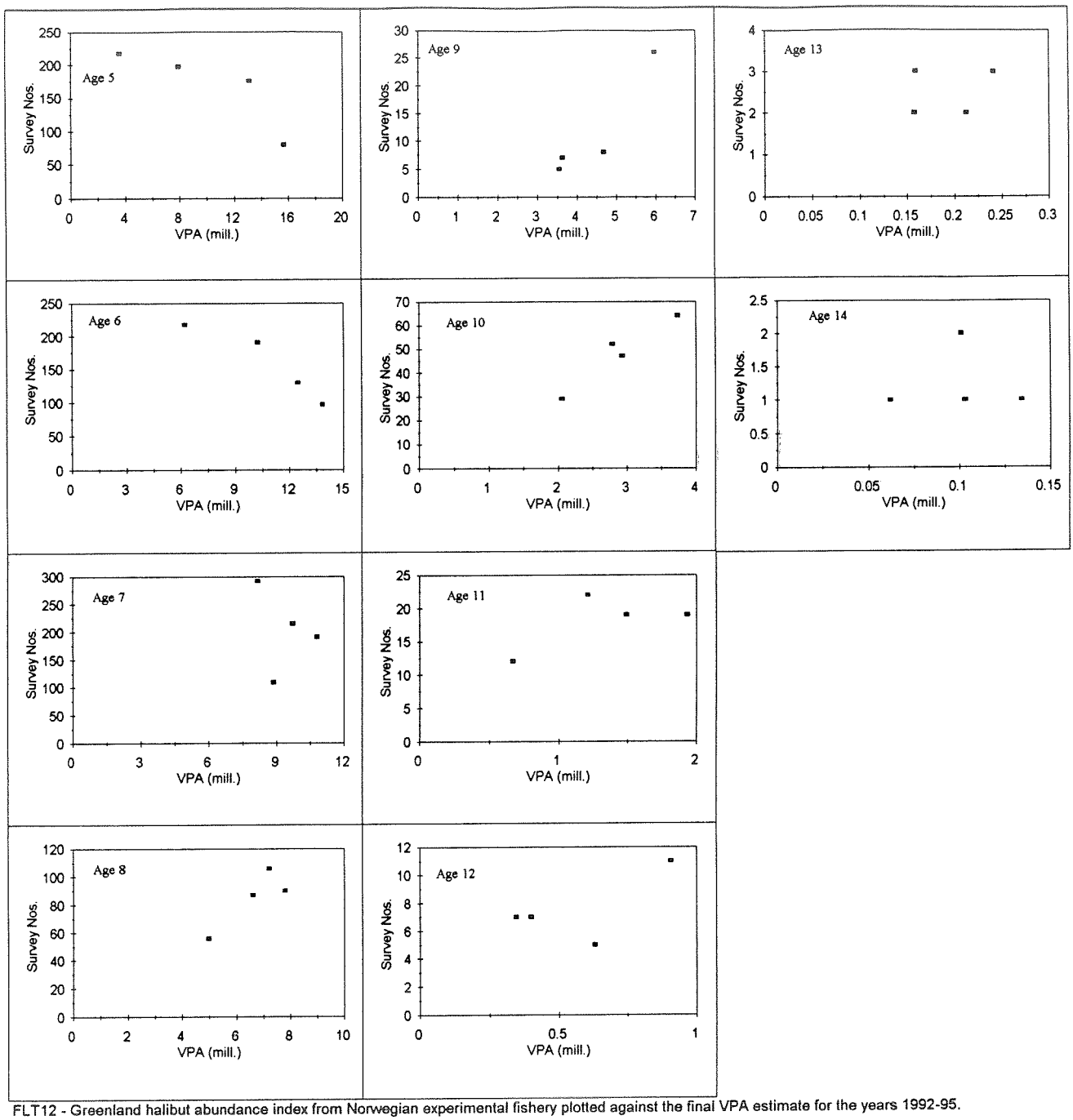
FLT10 - Greenland halibut abundance index from Russian bottom trawl survey plotted against the final VPA estimate for the years 1990-95.

Figure 8.5 C



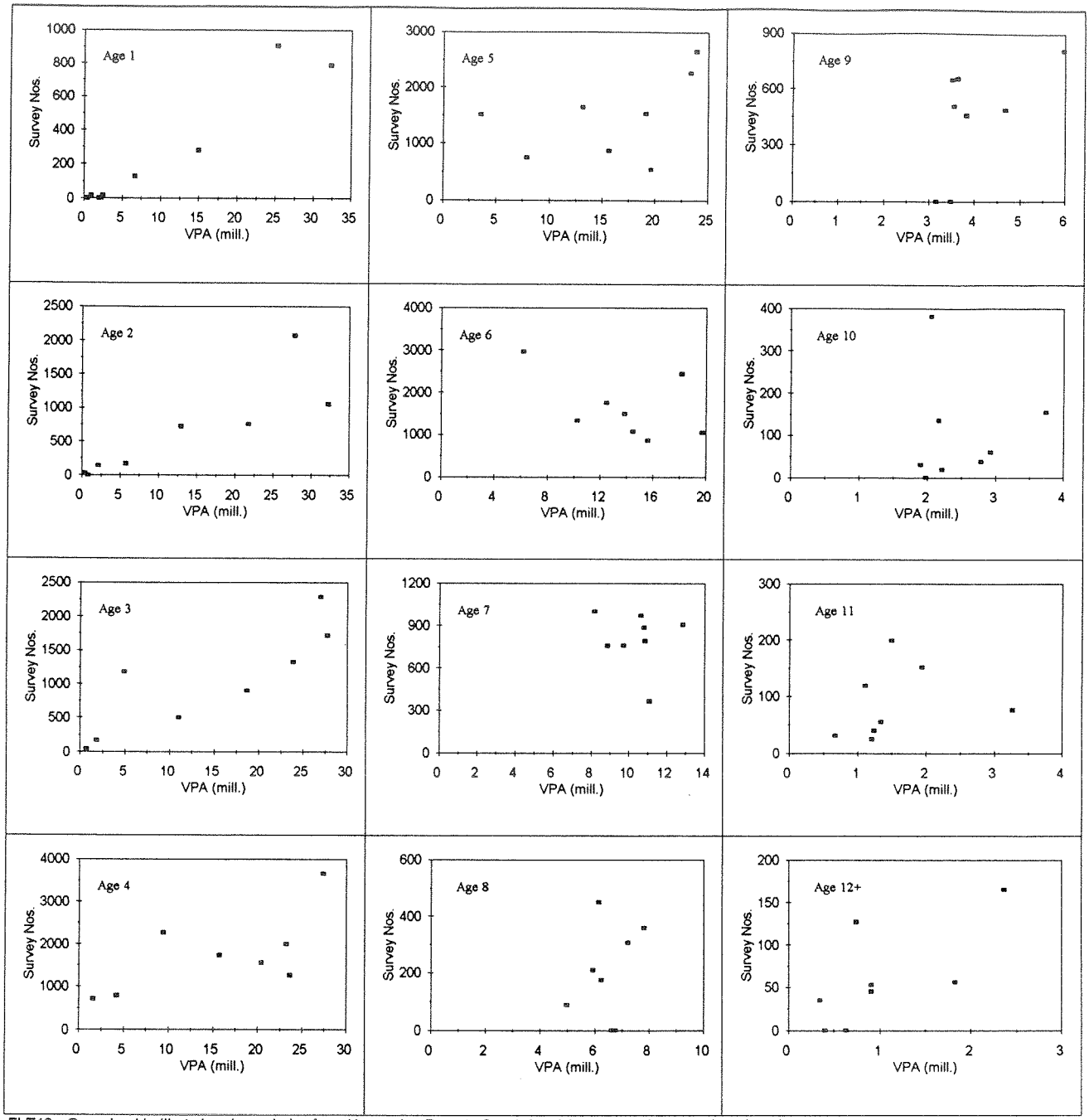
FLT11 - Greenland halibut abundance index from Norwegian shrimp survey plotted against the final VPA estimate for the years 1988-95.

Figure 8.5 D



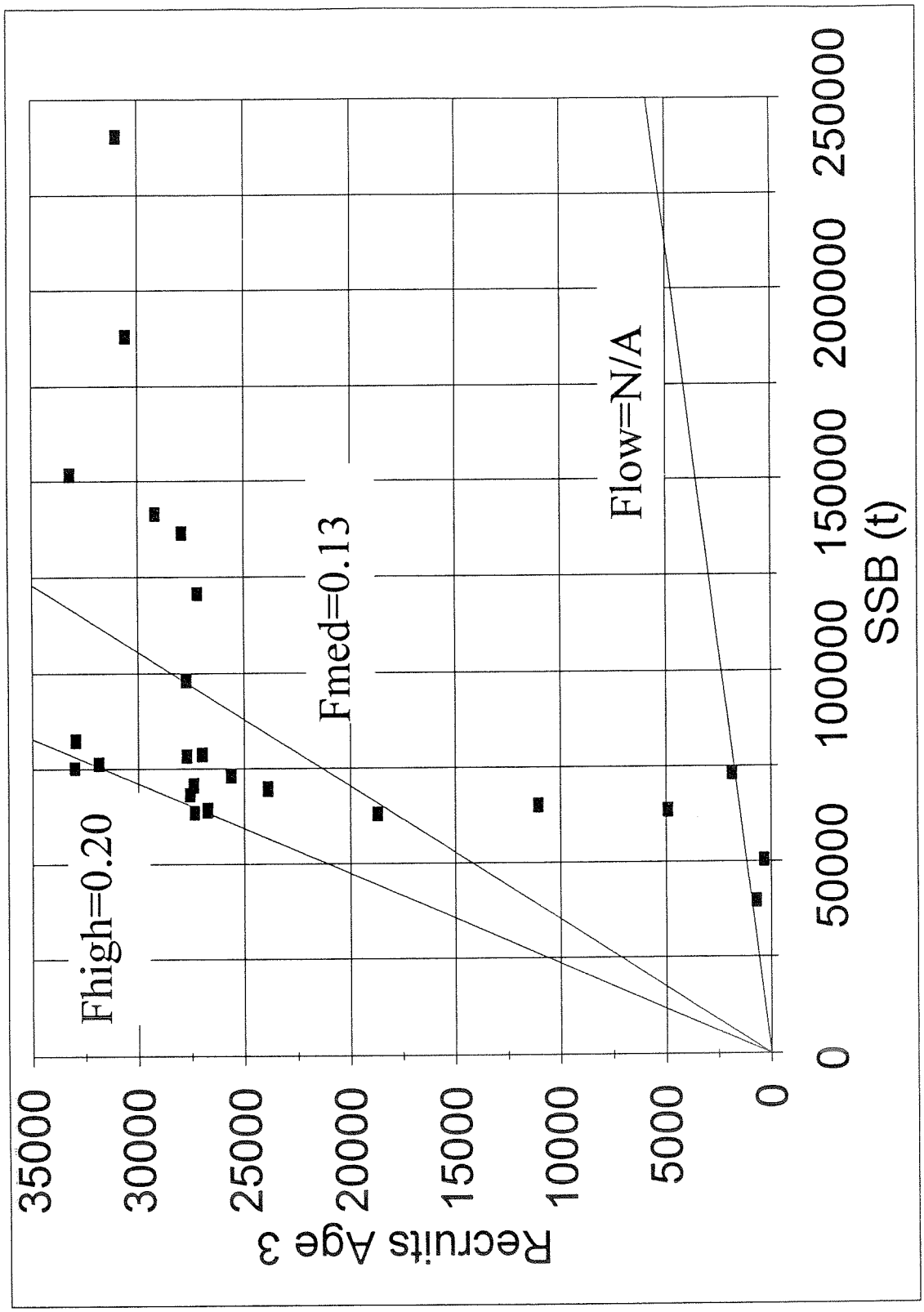
FLT12 - Greenland halibut abundance index from Norwegian experimental fishery plotted against the final VPA estimate for the years 1992-95.

Figure 8.5 E



FLT13 - Greenland halibut abundance index from Norwegian Barents Sea (winter) bottom trawl survey plotted against the final VPA estimate for the years 1988-95.

Figure 8.6


Recruits Age 3
SSB (t)
Fhigh=0.20
Fmed=0.13
Flow=N/A
35000
30000
25000
20000
15000
10000
5000
0
0
50000
100000
150000
200000
250000

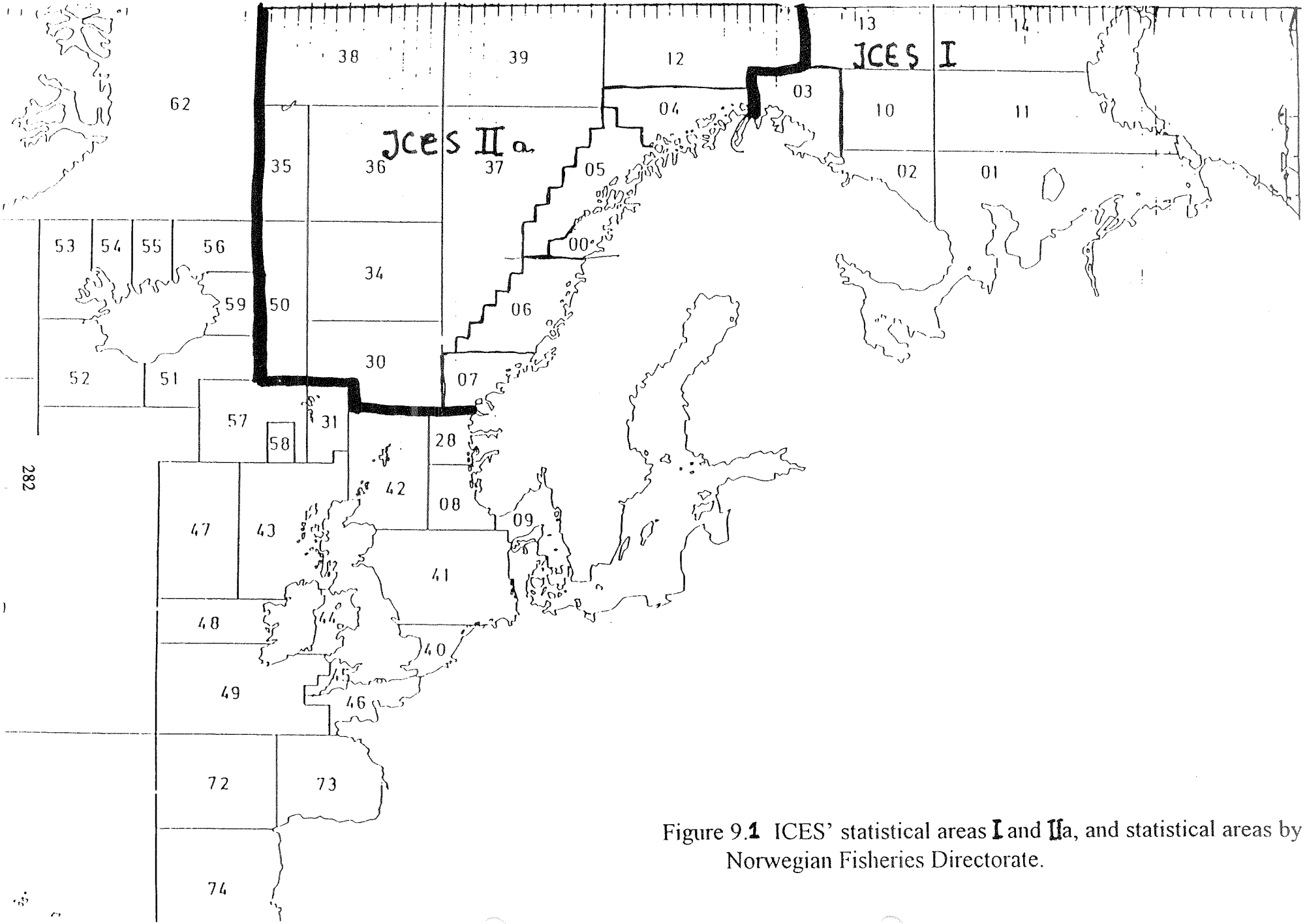


Figure 9.1 ICES' statistical areas I and IIa, and statistical areas by the Norwegian Fisheries Directorate.

Table A.1 North-East Arctic COD. Catch per unit effort.

	Sub-area I			Division IIa			Division IIb		
Year	Norway[2]	UK[3]	Russia[4]	Norway[2]	UK[3]	Norway[5]	Norway[2]	UK[3]	Russia[4]
1960	-	0.075	0.42	-	0.067	3.0	-	0.105	0.31
1961	-	0.079	0.38	-	0.058	3.7	-	0.129	0.44
1962	-	0.092	0.59	-	0.066	4.0	-	0.133	0.74
1963	-	0.085	0.60	-	0.066	3.1	-	0.098	0.55
1964	-	0.056	0.37	-	0.070	4.8	-	0.092	0.39
1965	-	0.066	0.39	-	0.066	2.9	-	0.109	0.49
1966	-	0.074	0.42	-	0.067	4.0	-	0.078	0.19
1967	-	0.081	0.53	-	0.052	3.5	-	0.106	0.87
1968	-	0.110	1.09	-	0.056	5.1	-	0.173	1.21
1969	-	0.113	1.00	-	0.094	5.9	-	0.135	1.17
1970	-	0.100	0.80	-	0.066	6.4	-	0.100	0.80
1971	-	0.056	0.43	-	0.062	10.6	-	0.071	0.16
1972	0.90	0.047	0.34	1.08	0.055	11.5	0.59	0.051	0.18
1973	1.05	0.057	0.56	0.71	0.043	6.8	0.43	0.054	0.57
1974	1.75	0.079	0.86	0.19	0.028	3.4	1.94	0.106	0.77
1975	1.82	0.077	0.94	1.36	0.033	3.4	1.67	0.100	0.43
1976	1.69	0.060	0.84	1.69	0.035	3.8	1.20	0.081	0.30
1977	1.54	0.052	0.63	1.16	0.044	5.0	0.91	0.056	0.25
1978	1.37	0.062	0.52	1.12	0.037	7.1	0.56	0.044	0.08
1979	0.85	0.046	0.43	1.06	0.042	6.4	0.62	-	0.06
1980	1.47	-	0.49	1.27	-	5.0	0.41	-	0.16
					Russia[4]			**Spain[6]**	
1981	1.42	-	0.41	1.02	0.35	6.2	(0.96)	-	0.07
1982	1.30	-	0.35	1.01	0.34	6.4	-	0.86	0.26
1983	1.58	-	0.31	1.05	0.38	7.6	(1.31)	0.92	0.36
1984	1.40	-	0.45	0.73	0.27	7.0	1.20	0.78	0.35
1985	1.86	-	1.04	0.90	0.39	5.1	1.51	1.37	0.50
1986	1.97	-	1.00	1.36	1.14	4.1	2.39	1.73	0.84
1987	1.77	-	0.97	1.73	0.67	3.3	2.00	1.82	1.05
1988	1.58	-	0.66	0.97	0.55	2.2	1.61	(1.36)	0.54
1989	1.49	-	0.71	0.78	0.43	3.6	0.41	2.70	0.45
1990	1.35	-	0.70	0.38	0.60	4.8	0.39	2.69	0.80
1991	1.38	-	0.67	0.50	0.90	-	0.29	4.96	0.76
1992	2.19	-	0.79	0.98	0.65	-	3.06	2.47	0.23
1993	2.33	-	0.85	1.74	1.03	-	2.98	3.38	1.00
1994	2.50	-	1.01	1.27	0.86	-	2.82	1.44	1.14
1995	1.57	-	0.59	1.00	1.01	-	2.73	1.65	1.10

[1] Preliminary figures.
[2] Norwegian data - t per 1,000 tonnage*hrs fishing.
[3] United Kingdom data - t per 100 tonnage*hrs fishing.
[4] Russia data - t per hr fishing.
[5] Norwegian data - t per gillnet boat week in Lofoten.
[6] Spanish data - t per hr fishing.

Period	Sub-area I	Divisions IIa and IIb
1960–1973	RT	RT
1974–1980	PST	RT
1981–	PST	PST

Vessel type:
RT = side trawlers, 800–1000 HP.
PST = stern trawlers, up to 2000 HP.

Table A2 North-East Arctic COD. Results from the Norwegian acoustic survey in the Barents Sea in January–March. Stock numbers in millions. New TS and rock-hopper gear (1981–1988 back-calculated from bobbins gear). Have corrected for length dependent effective spread of trawl.

Year	Age										Total
	1	2	3	4	5	6	7	8	9	10+	
1981	8	82	40	63	106	103	16	3	1	1	423
1982	4	5	49	43	40	26	28	2	+	0	197
1983	0	19	13	23	27	14	7	4	1	+	108
1984	1,807	150	31	11	7	5	2	+	+	0	2,013
1985	108	768	179	127	21	9	6	+	+	+	1,218
1986	1,302	590	595	124	56	7	2	+	+	0	2,676
1987	3	72	96	256	46	12	1	1	+	0	487
1988	2	29	64	42	75	9	2	+	+	0	224
1989	9	9	20	43	27	57	8	1	+	0	174
1990	350	45	16	24	27	22	40	3	1	0	526
1991	187	234	55	31	27	25	14	16	1	0	591
1992	348	579	182	48	18	11	8	4	2	0	1,201
1993	1,686	432	300	163	80	14	7	3	1	3	2,688
1994	1,083	686	358	343	159	43	9	2	1	1	2,685
1995	2,644	280	181	161	214	69	18	2	1	1	3,570
1996	2,404	335	96	70	86	75	21	3	+	+	3,090

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Table A3 North-East Arctic COD. Results from the Norwegian bottom trawl survey in the Barents Sea in January–March. Index of number of fish at each age. Rock-hopper gear[1]. Have corrected for length dependent effective spread of trawl.

Year	Age										Total
	1	2	3	4	5	6	7	8	9	10	
1981	4.6	34.3	16.4	23.3	40.0	38.4	4.8	1.0	0.3	0.0	163.1
1982	0.8	2.9	28.3	27.7	23.6	15.5	16.0	1.4	0.2	0.0	116.5
1983	341.9	19.0	22.3	37.1	33.3	13.5	4.6	3.0	0.6	0.2	474.4
1984	2864.4	393.2	115.9	26.2	18.9	10.6	3.2	0.5	0.2	0.1	3433.1
1985	51.5	727.6	144.4	99.5	15.7	6.4	2.5	0.2	0.1	0.1	1047.8
1986	741.8	461.5	657.1	137.1	75.0	23.3	5.5	0.6	0.2	0.1	2102.2
1987	33.4	457.4	233.4	365.5	46.1	11.3	1.4	0.4	+	0.0	1148.9
1988	5.0	72.9	185.2	95.3	189.5	19.1	3.6	0.6	0.1	0.0	571.3
1989	9.4	13.6	36.5	64.9	35.2	77.9	8.7	0.8	0.2	0.2	247.4
1990	161.0	50.8	23.3	30.1	33.6	19.7	23.9	1.3	0.4	0.1	344.1
1991	470.8	224.7	32.3	19.1	17.5	16.1	9.3	9.7	0.5	0.1	800.1
1992	131.6	528.9	149.6	49.5	18.4	11.8	7.5	4.0	2.7	0.2	904.3
1993[2]	534.1	331.0	311.8	152.6	69.0	14.2	6.9	4.2	2.2	2.1	1430.2
1994[2]	861.8	496.8	276.3	297.6	145.9	46.9	8.8	2.3	1.2	1.2	2138.8
1995[2]	4892.4	503.8	288.2	231.2	249.2	70.4	18.0	2.2	0.7	1.0	6256.8
1996[2]	5788.8	715.5	177.6	116.0	136.9	107.5	24.5	2.9	0.4	0.5	7060.5

[1] 1981-1988 back-calculated from bobbins gear.
[2] Survey covered a larger area.

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Table A4 North-East Arctic COD. Abundance at age (millions) from the Norwegian survey on the cod spawning grounds in Lofoten in March-April.

Year	Age								
	5	6	7	8	9	10	11	12	Total
1990[1]	1.8	3.9	27.6	6.7	0.7	0.4	-	-	40.7
1991[1]	3.9	10.9	13.1	24.8	2.8	0.8	-	-	56.3
1992	0.6	4.0	14.2	20.7	60.1	3.4	-	-	103.9
1993	7.7	10.2	14.1	18.6	22.1	40.0	5.1	0.9	112.9
1994	19.8	23.6	8.2	7.3	7.9	3.9	14.8	2.4	82.7
1995	4.8	28.7	8.9	3.5	2.3	2.8	1.7	8.3	58.2
1996	1.5	15.3	21.5	3.6	0.7	0.3	0.7	1.1	39.6

[1] Recalculated from TS=21.8logL-74.9 using average length at age.

Table A5 North-East Arctic COD. Results from the Norwegian Bottom trawl survey in the Svalbard Area in September-October. Index of number of fish at each age. Rock-hopper gear[1].

Year	Age										Total
	1	2	3	4	5	6	7	8	9	10	
1983	145.0	26.8	10.7	9.5	2.4	1.9	1.0	1.3	0.3	-	210.4
1984	499.0	113.0	7.3	4.3	4.7	1.8	0.4	0.4	0.3	0.1	631.1
1985	239.0	452.0	99.1	28.4	13.6	5.4	1.0	0.4	0.1	0.2	839.2
1986	40.9	181.0	297.0	2.8	15.3	2.6	1.0	0.3	0.1	0.1	581.1
1987	41.5	108.0	141.0	125.0	17.1	5.4	0.5	0.1	0.1	+	438.7
1988	3.1	16.6	33.2	31.8	37.1	9.5	0.6	0.6	0.6	-	133.3
1989	3.6	2.7	15.4	12.8	11.9	19.2	3.2	0.4	0.2	-	69.4
1990	70.1	9.4	8.6	14.6	23.4	16.5	20.0	2.0	0.3	-	164.9
1991	116.0	101.0	25.3	8.5	13.9	16.0	13.5	19.0	1.5	-	314.2
1992	91.8	130.0	105.0	56.0	16.2	7.3	5.7	3.3	8.9	-	424.2
1993	122.3	120.9	148.6	65.6	29.6	3.4	3.8	2.4	1.6	3.4	501.6
1994	68.6	166.5	102.4	56.4	54.1	25.9	5.9	2.3	1.2	0.5	483.8
1995	350.3	62.8	115.7	101.3	93.6	46.9	16.0	3.9	0.8	0.6	793.9

[1]1983-1988 back-calculated from bobbins gear.

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Table A6 North-East Arctic COD. Length at age (cm) from Norwegian surveys in January–March.

Year	1	2	3	4	5	6	7	8	9	10
1978	14.2	23.1	32.1	45.9	54.2	64.6	67.6	76.9	-	-
1979	12.8	22.9	33.1	40.0	52.3	64.4	74.7	83.0	-	-
1980	17.6	24.8	34.2	40.5	52.5	63.5	73.6	83.6	-	-
1981	17.0	26.1	35.5	44.7	52.0	61.3	69.6	77.9	-	-
1982	14.8	25.8	37.6	46.3	54.7	63.1	70.8	82.9	-	-
1983	-	26.1	34.8	46.8	56.0	64.5	73.3	80.4	-	-
1984	13.8	26.2	35.8	49.2	57.9	67.4	79.6	82.2	-	-
1985	14.5	23.5	40.3	50.8	62.2	71.1	81.8	88.7	-	-
1986	13.3	22.6	34.4	50.4	60.0	70.2	82.3	95.2	-	-
1987	14.5	21.0	31.8	41.1	55.7	67.2	81.8	94.5	-	-
1988	14.7	22.5	29.7	37.0	46.4	58.0	70.1	81.1	-	-
1989	12.7	25.7	34.7	40.6	47.5	57.1	68.5	84.0	-	-
1990	14.3	29.0	39.4	47.4	53.9	60.9	70.9	87.5	-	-
1991	13.8	27.6	41.6	52.6	60.2	68.2	73.8	79.0	94.2	-
1992	13.4	24.7	41.3	50.7	59.9	69.2	77.0	82.7	85.3	106.8
1993	11.4	20.7	35.9	50.9	59.2	68.8	76.2	84.5	90.0	92.8
1994	12.0	18.5	30.5	44.8	55.0	64.6	73.5	84.0	89.4	96.4
1995	12.7	18.8	29.9	42.5	54.2	63.9	76.0	82.0	94.2	98.6
1996	12.6	19.6	28.1	40.9	49.3	61.4	72.3	85.3	-	-

Table A7 North-East Arctic COD. Weight (g) at age from Norwegian surveys in January-March.

Year	Age											
	1	2	3	4	5	6	7	8	9	10	11	12
1985	-	-	670	1,070	2,230	3,650	4,920	5,060	-	-	-	-
1986	-	-	390	1,090	1,850	3,110	4,320	5,509	-	-	-	-
1987	21	65	230	490	1,380	2,300	3,970	-	-	-	-	-
1988	20	80	203	410	793	1,473	2,706	4,613	-	-	-	-
1989	10	150	380	590	930	1,570	2,640	4,940	-	-	-	-
1990	28	229	570	1,030	1,460	1,930	2,890	4,370	-	-	-	-
1991	20	190	720	1,370	2,040	2,850	3,660	4,630	8,380	-	-	-
1992	20	130	640	1,120	1,850	2,830	3,980	4,990	6,040	11,200	-	-
1993	11	76	430	1,196	1,766	2,774	3,894	5,519	6,150	7,450	8,910	-
1994	12	59	261	797	1,452	2,273	3,369	5,062	7,060	8,214	8,685	8,600
1995	16	56	250	675	1,347	2,192	3,606	4,974	7,562	8,526	-	-
1996	15	61	206	633	1,059	1,995	3,352	5,512	-	-	-	-

Table A8 North-East Arctic COD. Length at age (cm) from the Norwegian survey on the cod spawning grounds in Lofoten in March-April.

	Age							
Year	5	6	7	8	9	10	11	12
1990	59.0	64.7	69.0	76.2	84.9	100.3		
1991	60.9	68.6	72.6	80.2	89.2	97.9	95.1	
1992	63.8	71.0	77.5	82.4	89.3	90.2	97.2	127.0
1993	58.8	66.1	74.9	83.6	87.4	91.9	94.7	104.1
1994	64.6	70.4	81.0	89.1	90.6	93.9	92.1	94.0
1995	62.0	70.3	77.4	84.0	92.0	96.5	95.9	97.1
1996	63.0	66.6	75.5	82.4	92.9	99.5	97.9	101.2

Table A9 North-East Arctic COD. Weight at age (g) from the Norwegian survey on the cod spawning grounds in Lofoten in March-April.

	Age							
Year	5	6	7	8	9	10	11	12
1990	1,740	2,220	2,570	3,460	4,920	9,020		
1991	2,080	2,760	3,310	4,660	6,920	10,390	8,690	
1992	2,320	3,270	3,940	5,190	6,320	7,540	8,070	17,800
1993	1,770	2,610	3,880	5,380	6,180	7,480	8,950	11,190
1994	2,320	3,230	4,910	6,660	6,750	7,430	7,580	7,900
1995	2,230	3,360	4,780	6,210	8,080	9,730	9,150	9,910
1996	2,280	2,670	4,000	5,860	7,800	9,590	10,550	10,870

Table A10 North-East Arctic COD. Results from the Russian acoustic trawl survey in the Barents Sea and adjacent waters in the autumn. Stock numbers in millions.

Year	Age										Older	Total
	0	1	2	3	4	5	6	7	8	9		
1985[1]	45	105	895	422	255	83	44	50	21	2	16	1,939
1986[1]	60	53	141	980	444	183	56	62	19	-	2	2,000
1987[2]	8	15	170	170	738	99	67	42	20	9	5	1,344
1988[2]	+	+	43	161	106	245	34	10	2	+	+	602
1989[1]	2	1	4	17	44	56	99	82	20	6	4	335
1990[1]	29	22	57	29	35	52	46	89	14	2	1	376
1991[1]	33	44	75	89	51	53	61	45	43	+	+	494
1992[1]	228	61	333	317	110	45	37	38	29	22	3	1,223
1993[1]	9	10	45	215	243	136	43	14	14	8	11	783
1994[1]	215	58	110	208	282	277	120	44	8	4	3	1,332
1995[1]	2950	331	75	112	150	180	81	20	6	1	1	3,907

[1]October-December.
[2]September-October.

Table A11 North-East Arctic COD. Results from the Russian bottom trawl survey in the Barents Sea and adjacent waters in November–December (numbers per hour trawling).

Year	Age										Older	Total
	0	1	2	3	4	5	6	7	8	9		
Sub-area I												
1982	1.4	0.2	6.9	13.2	7.4	1.9	2.8	0.4	-	-	-	34.2
1983	4.3	8.0	5.1	4.6	5.4	5.9	2.7	0.7	1.2	0.1	-	38.0
1984	0.7	12.3	11.6	25.5	13.7	6.5	4.0	1.6	0.6	0.3	-	76.8
1985	3.3	2.9	51.3	35.2	53.1	25.2	4.4	1.8	0.8	0.1	0.1	178.2
1986	0.3	2.2	7.0	60.4	15.8	8.2	1.8	0.6	0.1	0.1	-	96.5
1987	+	0.1	3.6	4.0	35.9	6.3	3.6	0.6	0.1	0.1	+	54.4
1988	0.2	0.1	1.7	5.7	5.2	17.2	2.6	0.6	0.2	0.1	+	33.4
1989	0.4	0.1	1.0	3.5	11.2	15.4	20.8	16.1	3.7	0.7	0.3	73.4
1990	6.8	4.8	12.7	5.3	6.0	9.4	8.2	14.6	2.2	0.2	+	70.2
1991	3.1	5.9	10.9	14.0	7.5	7.7	8.1	5.5	4.2	0.3	0.1	67.3
1992	10.3	2.9	26.4	42.3	22.4	8.5	4.6	5.6	3.3	2.7	0.6	129.6
1993	1.7	1.1	7.8	67.9	89.5	47.2	16.0	4.6	4.2	2.0	3.2	245.3
1994	15.8	2.8	10.9	28.4	45.0	52.4	17.9	6.3	1.4	0.7	1.1	182.6
1995	24.8	7.3	3.8	13.1	30.4	40.5	13.8	3.1	1.1	0.3	0.3	138.5
Division IIa												
1982	0.1	+	11.7	10.6	4.7	1.1	4.1	2.0	0.2	0.3	0.2	35.0
1983	0.7	0.4	0.3	1.5	6.4	5.0	2.1	1.3	1.2	0.1	0.2	19.2
1984	0.4	0.7	0.6	3.7	4.0	6.7	4.7	1.1	0.3	0.1	0.2	22.5
1985	0.2	0.2	1.4	3.7	9.5	12.6	6.4	2.5	0.6	0.1	0.1	37.6
1986	-	+	0.1	2.5	2.9	3.2	1.5	0.5	0.4	-	0.2	11.3
1987	-	-	-	-	3.0	1.7	2.3	0.9	0.1	-	0.1	8.1
1988	0.2	+	0.1	0.2	1.2	10.0	2.4	0.7	0.2	0.1	+	15.1
1989	-	+	0.1	0.3	0.9	1.3	3.9	3.9	1.2	0.5	0.2	12.3
1990	-	+	0.3	1.1	1.6	2.2	1.9	4.4	0.9	0.1	+	12.5
1991	1.0	0.1	0.5	1.3	1.9	2.2	2.5	1.9	1.7	0.2	0.1	13.3
1992	0.4	0.3	0.3	2.7	3.8	3.0	2.2	2.1	1.8	1.3	0.1	18.0
1993	0.2	0.1	0.1	3.5	9.9	13.1	4.5	1.3	1.2	0.7	0.8	35.4
1994	0.2	0.1	0.3	4.0	28.3	46.2	22.4	6.3	1.4	0.8	1.6	116.6
1995	4.8	1.3	1.0	1.6	6.1	19.6	8.8	2.7	0.7	0.1	0.2	46.9
Division IIb												
1982	9.9	1.7	42.5	17.8	1.1	0.2	1.5	0.5	-	-	-	75.2
1983	9.7	14.9	5.0	9.4	11.0	2.6	0.7	0.8	0.7	0.1	0.1	55.0
1984	1.4	7.7	22.7	7.4	2.7	2.4	1.3	0.4	0.2	0.2	-	46.4
1985	9.1	9.4	45.2	32.3	32.8	11.5	5.3	1.8	0.3	-	0.1	147.8
1986	1.6	2.9	14.8	67.2	19.9	16.4	5.4	1.3	0.6	0.1	-	127.1
1987	-	0.2	5.6	11.0	64.4	4.0	2.2	0.5	0.1	-	-	88.0
1988	0.1	0.4	4.8	13.7	15.1	25.0	2.5	0.6	0.1	0.2	-	62.8
1989	0.6	0.1	0.3	3.8	6.4	6.1	9.2	5.4	0.2	0.4	0.2	33.7
1990	0.1	0.7	1.3	2.3	2.9	3.7	3.9	8.6	1.6	0.3	+	25.4
1991	6.4	7.1	10.1	8.4	5.2	6.3	8.2	6.5	5.9	0.5	0.1	64.7
1992	60.5	15.1	60.5	60.8	13.8	5.2	6.5	5.0	5.1	3.4	0.5	236.4
1993	4.7	5.9	23.8	60.3	44.6	24.7	5.6	3.2	3.4	2.5	3.6	182.3
1994	3.0	6.0	19.5	44.3	61.4	45.3	16.3	5.6	1.5	1.0	1.9	205.6
1995	36.0	8.6	7.7	18.3	35.5	21.7	13.6	2.3	0.5	0.1	0.3	144.6
Total (Sub-area I and Divisions IIa and IIb)												
1982	3.7	0.6	18.1	14.1	5.1	1.3	2.6	0.7	-	0.1	-	46.3
1983	5.4	8.9	4.3	5.6	7.3	4.7	2.0	0.8	1.1	0.1	-	40.2
1984	0.9	9.2	14.2	16.2	8.6	5.0	3.1	1.1	0.4	0.3	0.1	59.1
1985	5.0	4.9	43.0	30.3	40.5	18.8	4.9	1.9	0.6	-	-	150.0
1986	0.7	2.2	9.1	56.5	16.1	10.6	3.0	0.8	0.3	0.1	-	99.4
1987	-	0.2	4.0	5.9	42.6	5.4	3.1	0.6	0.1	+	-	61.9
1988	0.1	0.2	2.5	7.7	7.8	19.0	2.5	0.6	0.1	0.2	-	40.8
1989	0.4	0.1	0.6	3.4	8.8	11.8	15.5	11.4	2.6	0.5	0.3	54.8
1990	4.0	3.1	7.8	3.8	4.4	6.6	6.0	11.3	1.8	0.2	+	49.0
1991	4.2	5.9	9.8	11.0	6.2	5.8	7.7	5.6	4.6	0.4	0.1	62.3
1992	30.6	7.8	39.5	48.5	18.2	6.9	5.3	5.2	4.0	2.9	0.5	169.4
1993	2.8	2.8	13.1	64.7	59.7	33.4	9.1	3.4	3.3	2.1	2.9	197.4
1994	11.2	3.3	12.0	30.0	47.5	50.0	18.0	6.1	1.4	0.8	1.3	181.5
1995	24.9	6.4	4.6	12.4	26.7	28.7	12.6	2.7	0.8	0.2	0.3	120.3

Table A12 North-East Arctic COD. Length at age (cm) from Russian surveys in November–December

Year	Age									
	0	1	2	3	4	5	6	7	8	9
1984	15.7	22.3	30.7	44.3	51.7	63.6	73.4	82.5	88.4	97.0
1985	15.0	21.1	30.6	43.2	53.7	61.2	72.8	83.0	92.8	101.3
1986	15.2	19.7	28.3	39.0	51.8	62.2	70.9	83.0	91.3	104.0
1987	-	19.2	27.9	33.4	41.4	59.1	69.2	80.1	95.7	102.6
1988	11.3	21.3	28.7	36.2	43.9	53.3	65.3	79.5	85.0	-
1989	-	20.8	28.8	34.8	46.0	53.9	61.8	69.8	78.7	88.6
1990	16.0	24.0	30.4	46.5	54.9	62.5	69.7	77.6	87.8	102.0
1991	11.5	22.4	30.6	43.0	55.9	64.6	72.8	78.5	87.9	101.8
1992	11.3	21.3	31.9	50.1	59.8	69.1	78.6	84.0	90.8	97.5
1993	12.1	17.4	29.1	43.4	52.7	64.3	73.9	81.2	89.1	91.8
1994	12.2	20.3	26.3	33.7	47.4	58.7	70.6	80.8	90.1	96.1
1995	11.6	19.8	27.6	33.8	45.2	60.5	71.1	83.5	92.9	99.1

Table A13 North-East Arctic COD. Weight (g) at age from Russian surveys in November–December.

Year	Age										
	0	1	2	3	4	5	6	7	8	9	10
1984	26	90	250	746	1,187	2,234	3,422	5,027	6,479	9,503	-
1985	26	80	245	762	1,296	1,924	3,346	5,094	7,360	6,833	11,167
1986	25	63	191	506	1,117	1,940	2,949	4,942	7,406	9,300	-
1987	-	54	182	316	672	1,691	2,688	3,959	8,353	10,583	13,107
1988	15	78	223	435	789	1,373	2,609	4,465	5,816	-	-
1989	-	73	216	401	928	1,427	2,200	3,133	4,649	6,801	8,956
1990	28	106	230	908	1,418	2,092	2,897	4,131	6,359	10,078	13,540
1991	26	93	260	743	1,629	2,623	3,816	4,975	7,198	11,165	15,353
1992	10	76	273	1,165	1,895	2,971	4,377	5,596	7,319	9,452	12,414
1993	11	46	211	717	1,280	2,293	3,509	4,902	6,621	7,339	8,494
1994	12	69	153	316	919	1,670	2,884	4,505	6,520	8,207	9,812
1995	10	60	180	340	860	1,990	3,300	5,430	7,610	9,790	10,760

Table A14 Abundance indices of 0-group fish in the Barents Sea and adjacent waters in 1965–1995.

Year	Cod	Haddock	Polar cod		Redfish	Greenland halibut	Long rough dab
			West	East			
1965	6	7		0	159		66
1966	1	1		129	236		97
1967	34	42		165	44		73
1968	25	8		60	21		17
1969	93	82		208	295		26
1970	606	115		197	247	1	12
1971	157	73		181	172	1	81
1972	140	46		140	177	8	65
1973	684	54		(26)	385	3	67
1974	51	147		227	468	13	83
1975	343	170		75	315	21	113
1976	43	112		131	447	16	96
1977	173	116	157	70	472	9	72
1978	106	61	107	144	460	35	76
1979	94	69	23	302	980	22	69
1980	49	54	79	247	651	12	108
1981	65	30	149	73	861	38	95
1982	114	90	14	50	694	17	150
1983	386	184	48	39	851	16	80
1984	486	255	115	16	732	40	70
1985	742	156	60	334	795	36	86
1986	434	160	111	366	702	55	755
1987	102	72	17	155	631	41	174
1988	133	86	144	120	849	8	72
1989	202	112	206	41	698	5	92
1990	465	227	144	48	670	2	35
1991	766	472	90	239	200	1	28
1992	1,159	313	195	118	150	3	32
1993	910	240	171	156	162	11	55
1994	899	282	50	448	414	20	272
1995	1,069	148	6	-	220	15	66

Table A15 Estimated logarithmic indices with 90% confidence limits of year class abundance for 0-group herring, cod and haddock in the Barents Sea and adjacent waters 1965–1995.

Year	Herring[1]			Cod			Haddock		
	Index	Confidence limits		Index	Confidence limits		Index	Confidence limits	
1965				+					
1966	0.14	0.04	0.31	0.02	0.01	0.04	0.01	0.00	0.03
1967	0.00	-	-	0.04	0.02	0.08	0.08	0.03	0.13
1968	0.00	-	-	0.02	0.01	0.04	0.00	0.00	0.02
1969	0.01	0.00	0.04	0.25	0.17	0.34	0.29	0.20	0.41
1970	0.00	-	-	2.51	2.02	3.05	0.64	0.42	0.91
1971	0.00	-	-	0.77	0.57	1.01	0.26	0.18	0.36
1972	0.00	-	-	0.52	0.35	0.72	0.16	0.09	0.27
1973	0.05	0.03	0.08	1.48	1.18	1.82	0.26	0.15	0.40
1974	0.01	0.01	0.01	0.29	0.18	0.42	0.51	0.39	0.68
1975	0.00	-	-	0.90	0.66	1.17	0.60	0.40	0.85
1976	0.00	-	-	0.13	0.06	0.22	0.38	0.24	0.51
1977	0.01	0.00	0.03	0.49	0.36	0.65	0.33	0.21	0.48
1978	0.02	0.01	0.05	0.22	0.14	0.32	0.12	0.07	0.19
1979	0.09	0.01	0.20	0.40	0.25	0.59	0.20	0.12	0.28
1980	-	-	-	0.13	0.08	0.18	0.15	0.10	0.20
1981	0.00	-	-	0.10	0.06	0.18	0.03	0.00	0.05
1982	0.00	-	-	0.59	0.43	0.77	0.38	0.30	0.52
1983	1.77	1.29	2.33	1.69	1.34	2.08	0.62	0.48	0.77
1984	0.34	0.20	0.52	1.55	1.18	1.98	0.78	0.60	0.99
1985	0.23	0.18	0.28	2.46	2.22	2.71	0.27	0.23	0.31
1986	0.00	-	-	1.37	1.06	1.70	0.39	0.28	0.52
1987	0.00	0.00	0.03	0.17	0.01	0.40	0.10	0.00	0.25
1988	0.32	0.16	0.53	0.33	0.22	0.47	0.13	0.05	0.34
1989	0.59	0.49	0.76	0.38	0.30	0.48	0.14	0.10	0.20
1990	0.31	0.16	0.50	1.23	1.04	1.34	0.61	0.48	0.75
1991	1.19	0.90	1.52	2.30	1.97	2.65	1.17	0.98	1.37
1992	1.06	0.69	1.50	2.94	2.53	3.39	0.87	0.71	1.06
1993	0.75	0.45	1.14	2.09	1.70	2.51	0.64	0.48	0.82
1994	0.28	0.17	0.42	2.27	1.83	2.76	0.64	0.49	0.81
1995	0.16	0.07	0.29	2.40	1.97	2.88	0.25	0.13	0.40

[1]Assessment for 1965–1984 made by Toresen (1985).

Table A16. Consumption by cod of various prey species 1984-1995, in thousand tonnes.

Year	Amphipods	Krill	Shrimp	Capelin	Herring	Polar cod	Cod	Haddock	Redfish	G. halibut	Others	Total
1984	27	112	439	734	77	15	23	51	370	0	511	2359
1985	169	57	154	1617	180	3	33	47	225	0	1152	3635
1986	1216	107	140	828	132	140	82	109	313	+	660	3727
1987	1061	65	187	225	32	199	24	4	313	+	666	2778
1988	1246	313	130	336	8	91	9	3	225	0	411	2772
1989	835	247	132	593	3	33	8	11	233	0	744	2838
1990	143	94	202	1679	7	6	20	17	250	0	1620	4038
1991	82	94	209	3093	8	12	27	21	326	8	1202	5083
1992	128	239	405	2909	351	115	55	110	214	5	1146	5679
1993	316	820	386	3637	195	327	327	86	113	2	979	7187
1994	800	957	694	1259	201	888	277	63	110	+	762	6012
1995	1059	287	401	801	221	379	509	175	275	6	1130	5295

Table B1 North-East Arctic HADDOCK. Results from the Norwegian bottom trawl survey in the Barents Sea in January-March. Index of number of fish at age. Backcalculated from bobbins gear to rockhopper gear. Corrected for length dependent effective spread of the trawl.

Year	Age								
	1	2	3	4	5	6	7	8	Total
1981	3.1	7.3	2.3	7.8	1.8	5.3	0.5	0.2	28.3
1982	3.9	1.5	1.7	1.8	1.9	4.8	2.4	0.2	18.2
1983	2776.8	6.6	2.7	2.7	1.3	1.3	2.8	1.3	2795.3
1984	5382.0	683.4	14.9	1.6	0.7	0.2	0.3	0.3	6083.3
1985	1421.2	1362.2	384.8	6.3	0.4	0.2	0.3	0.3	3175.5
1986	649.0	360.2	339.8	126.8	4.5	0.5	0.1	0.1	1480.9
1987	134.3	95.2	174.1	272.3	50.6	0.1	2.0	0.0	728.5
1988	44.6	16.1	28.8	67.4	110.7	15.7	0.2	0.0	283.6
1989	80.8	7.0	9.0	15.4	26.9	27.4	2.9	0.0	169.5
1990	555.4	51.4	4.1	3.4	5.2	9.4	12.1	1.7	642.8
1991	1526.0	420.9	72.4	12.6	3.1	2.4	3.0	5.6	2046.0
1992	1282.2	1191.2	283.5	59.9	4.1	0.9	1.3	5.1	2828.3
1993[1]	717.5	585.1	467.8	105.6	10.3	0.5	0.5	2.2	1889.5
1994[1]	587.5	200.3	296.0	448.2	50.8	3.2	0.2	1.1	1587.3
1995[1]	1271.8	182.0	42.6	153.4	341.6	31.3	2.0	0.5	2025.3
1996[1]	312.7	265.9	53.2	48.9	149.4	255.9	11.6	1.0	1098.5

[1] Extended survey area.

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Table B2 North-East Arctic HADDOCK. Results from the Russian trawl survey in the Barents Sea and adjacent waters in November-December (numbers per hour trawling).

Year	Age										Older	Total
	0	1	2	3	4	5	6	7	8	9		
					Sub-area 1							
1983	39.9	97.3	16.5	0.8	0.7	+					1.1	156.3
1984	9.7	100.2	110.6	2.8	0.4	0.2	+				0.7	224.6
1985	3.9	19.1	213.4	168.8	0.8	0.2	0.1	-			0.3	406.6
1986	0.2	2.3	16.6	58.1	27.6	0.1	+	+	+		-	105.0
1987	0.4	1.4	2.5	12.5	34.2	8.6	+	+	-	+	-	59.8
1988	1.9	0.4	1.1	2.8	6.2	11.6	1.1	+	+	+	-	25.2
1989	3.3	3.0	3.6	0.7	2.5	7.1	13.9	1.8	0.1	+	-	36.0
1990	71.7	22.2	18.6	13.2	7.5	13.2	13.3	10.3	0.6	0.1	-	170.7
1991	15.9	61.5	27.5	10.8	1.6	0.6	1.0	3.3	2.6	0.3	-	125.1
1992	19.6	44.2	180.6	52.1	8.4	0.7	1.0	1.6	1.3	0.2	-	309.7
1993	5.5	8.1	69.2	371.5	78.4	10.2	1.4	0.7	0.8	1.8	-	547.7
1994	13.5	6.7	8.0	65.9	146.0	15.9	1.7	0.1	0.2	0.7	-	258.8
1995	9.9	12.7	6.5	4.0	26.8	77.6	7.3	1.0	0.1	0.5	-	146.3
					Division IIa							
1983	5.4	5.5	0.1	0.2	0.3	0.1					1.0	12.6
1984	4.9	14.4	5.6	0.1	0.1	0.1	-				0.2	25.4
1985	3.8	7.0	11.7	4.1	0.1	-	+	-			0.1	26.8
1986	0.4	0.3	3.5	10.4	2.9	0.1	+	+	-		-	17.6
1987	-	-	-	-	0.3	0.3	-	-	-	-	-	0.6
1988	1.0	0.1	-	+	0.2	0.5	0.2	-	-	-	-	2.1
1989	0.1	0.7	2.7	+	0.1	0.1	0.1	-	-	-	-	3.8
1990	6.1	0.9	0.9	0.1	0.1	0.1	0.1	0.1	-	-	-	8.4
1991	5.7	3.8	0.6	0.1	+	-	-	-	-	-	-	10.2
1992	1.2	2.3	5.6	2.3	3.0	0.3	0.3	0.4	0.4	-	-	15.9
1993	1.8	1.1	1.5	4.5	2.5	0.8	0.2	0.1	0.2	0.2	-	12.8
1994	1.0	0.6	0.5	3.1	15.9	4.4	1.5	+	0.1	0.1	-	27.2
1995	5.0	8.5	6.3	5.3	6.2	23.9	4.1	0.6	+	0.2	-	60.1
					Division IIb							
1983	22.1	9.9	0.2	0.1	+	+					0.1	32.4
1984	2.2	14.3	1.8	-	-	-	-				+	18.3
1985	1.4	10.2	61.4	5.1	+	+	+	-			+	78.1
1986	+	0.2	3.1	7.2	1.4	-	-	+	+		-	12.0
1987	-	-	0.1	0.7	1.4	0.5	+	-	-	-	-	2.8
1988	0.2	-	-	+	0.3	1.1	0.2	-	+	-	-	1.9
1989	0.7	0.1	0.2	+	0.1	0.3	0.6	0.1	+	-	-	2.1
1990	12.9	5.4	0.8	+	+	0.2	0.1	0.1	+	-	-	19.5
1991	20.0	22.9	6.2	0.4	0.1	0.1	0.1	+	+	-	-	49.8
1992	13.3	9.1	69.8	13.9	0.5	+	+	0	+	+	-	106.6
1993	0.7	0.9	1.9	24.7	1.9	0.2	+	+	+	+	-	30.4
1994	0.4	1.7	1.7	2.3	15.7	2.7	0.8	0.2	+	+	-	25.5
1995	0.1	0.4	0.4	0.8	0.6	1.6	0.4	+	+	+	-	4.4
					Total - Sub-area I and Divisions IIa and IIb							
1983	29.8	59.2	9.5	0.5	0.4	+					0.8	100.2
1984	6.4	58.6	58.4	1.5	0.2	0.1	+				0.3	125.5
1985	3.0	14.4	134.3	90.0	0.4	0.1	0.1	-			0.2	242.7
1986	0.2	1.4	10.7	36.3	16.4	0.1	+	+	+		+	65.1
1987	0.3	0.9	1.7	8.3	22.5	5.7	+	+	-	+	-	39.4
1988	1.3	0.3	0.7	1.7	4.0	7.6	0.8	+	+	+	-	16.4
1989	2.2	1.8	2.4	0.4	1.4	4.1	8.1	1.1	0.1	+	-	21.6
1990	44.8	14.3	10.6	7.3	4.2	7.3	7.4	5.7	0.3	0.1	-	102.0
1991	16.7	42.9	17.6	6.2	0.9	0.3	0.6	1.8	1.5	0.2	-	88.7
1992	16.4	28.2	128.6	34.6	5.0	0.4	0.6	0.9	0.8	0.1	-	215.6
1993	3.5	4.8	35.7	198.5	35.6	4.8	0.8	0.4	0.4	-	-	285.3
1994	9.1	4.9	5.8	44.2	101.4	11.6	1.5	0.1	0.1	0.5	-	179.1
1995	6.4	7.2	4.2	3.1	12.3	37.0	4.0	0.5	0.1	0.3	-	73.9

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Table B3 North-East Arctic HADDOCK. Results from the Norwegian acoustic survey in the Barents Sea in January-March. Stock numbers in millions. New TS and rock-hopper gear (1981-1988 back-calculated from bobbins gear). Corrected for length dependent effective spread of the trawl.

Year	Age										Total
	1	2	3	4	5	6	7	8	9	10+	
1981	7	14	5	21	60	18	1	+	+	+	125
1982	9	2	3	4	4	10	6	+	+	+	38
1983	0	5	2	3	1	1	4	2	+	+	18
1984	1685	173	6	2	1	+	+	+	+	+	1866
1985	1809	839	274	6	+	+	+	1	+	+	2928
1986	680	312	488	162	+	+	+	+	+	+	1644
1987	111	26	71	190	47	+	+	+	0	+	446
1988	20	5	8	20	38	6	+	+	0	+	97
1989	58	6	8	10	17	19	2	+	0	+	119
1990	493	44	4	3	4	7	11	1	+	+	568
1991	1938	265	49	7	2	2	2	4	+	0	2269
1992	859	685	110	19	2	+	+	1	2	+	1714
1993	1424	690	565	99	10	+	+	1	+	2	2790
1994	848	228	240	506	77	8	+	+	+	+	1908
1995	1380	285	36	113	391	40	2	+	+	1	2247
1996	249	229	44	31	76	150	8	1	0	+	788

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Table B4 North-East Arctic HADDOCK. Results from the Russian trawl acoustic survey in the Barents Sea and adjacent waters in the autumn 1985-1995. Index of number of fish at age.

Year	Age											Total
	0	1	2	3	4	5	6	7	8	9	Older	
1985[1]	194	434	1,468	636	3	1	+	-	-	-	1	2,737
1986[1]	34	37	208	917	910	2	+	+	+	-	+	2,109
1987[2]	6	16	29	62	197	61	+	-	-	+	12	383
1988[2]	2	1	3	18	83	301	46	-	-	-	+	454
1989[1]	41	32	94	2	14	35	67	9	1	+	-	295
1990[1]	594	176	75	28	17	23	43	44	4	1	-	1,004
1991[1]	240	368	143	65	11	4	7	21	17	2	+	878
1992[1]	199	245	758	218	35	3	4	7	6	+	+	1,475
1993[1]	20	26	199	1,076	228	31	5	2	3	2	3	1,595
1994[1]	118	51	39	252	591	76	9	+	1	1	3	1,141
1995[1]	163	170	79	72	230	404	41	5	1	1	3	1,168

[1]October-December.
[2]September-October.

Table B5 North-East Arctic HADDOCK. Length data (cm) from Norwegian surveys in January-March and Russian surveys in November-December

Year	Age									
	1	2	3	4	5	6	7	8	9	10
Norway										
1987	13.9	21.6	30.2	39.2	47.0	62.5	-	-	-	-
1988	13.5	24.3	29.3	36.2	42.7	50.1	56.6	-	-	-
1989	16.3	22.5	32.0	36.8	43.0	47.3	53.6	-	-	-
1990	16.3	24.9	33.8	44.2	46.9	50.7	53.0	-	-	-
1991	16.9	25.0	37.0	42.7	54.3	55.2	53.8	56.8	63.7	-
1992	15.6	25.4	36.5	45.9	53.9	61.6	62.9	59.8	66.9	77.5
1993	14.4	21.8	32.2	42.6	50.6	58.4	57.9	-	-	-
1994	14.8	21.5	29.7	38.7	47.4	54.2	57.4	-	-	-
1995	15.4	19.9	27.9	34.0	42.6	51.3	55.9	-	-	-
1996	15.4	21.6	28.6	38.0	42.1	46.8	55.3	-	-	-
	0+[1]	1+	2+	3+	4+	5+	6+	7+	8+	9+
Russia										
1984	-	24.1	35.8	44.4	56.4	62.8	64.8	-	-	-
1985	16.5	22.4	30.9	44.1	53.8	61.3	64.7	-	-	-
1986	17.0	20.7	28.1	35.4	46.7	62.0	-	68.0	-	-
1987	12.1	21.5	27.8	32.3	37.3	48.6	-	-	-	-
1988	13.7	23.2	29.7	33.7	39.3	46.2	51.2	-	-	-
1989	14.9	22.2	26.5	38.5	44.5	49.3	53.0	57.7	64.1	-
1990	17.0	24.5	30.9	40.4	50.6	53.2	55.7	59.7	63.8	67.7
1991	17.2	24.2	30.5	39.7	53.4	55.4	58.3	60.5	62.7	70.2
1992	16.0	22.8	31.1	44.6	53.8	63.8	61.2	66.4	69.0	69.6
1993	15.3	21.7	28.7	38.3	48.3	54.3	60.9	64.2	63.2	65.0
1994	15.7	22.5	28.1	33.0	44.1	54.9	61.5	67.5	67.7	67.8
1995	15.5	22.5	28.5	33.3	39.7	49.9	58.2	63.1	66.3	69.5

[1] Revised

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Table B6 North-East Arctic HADDOCK. Weight data (g) from Norwegian surveys in January-March and Russian surveys in November-December.

Year	Age										
	1	2	3	4	5	6	7	8	9	10	
Norway											
1987	24	91	273	542	934	2,197	-	-	-	-	
1988	25	120	350	450	730	1,140	1,560	-	-	-	
1989	40	100	320	490	780	1,040	1,440	-	-	-	
1990	42	148	370	827	988	1,247	1,425	-	-	-	
1991	40	140	490	840	1,630	1,710	1,600	1,860	2,480	-	
1992	30	150	450	940	1,510	2,280	2,510	2,170	2,980	4,870	
1993	27	98	329	788	1,331	2,030	2,324	-	-	-	
1994	25	91	251	555	1,026	1,578	1,813	-	-	-	
1995	30	71	207	374	750	1,278	1,650	-	-	-	
1996	30	92	224	557	745	1,017	1,783	-	-	-	
[1]	0+	1+	2+	3+	4+	5+	6+	7+	8+	9+	10+
Russia											
1984	36	127	438	815	1,777	2,395	2,688	-	-	-	
1985	37	105	282	817	1,530	2,262	2,263	-	-	-	
1986	38	88	209	419	919	2,240	-	3,100	-	-	
1987	-	95	196	330	497	1,055	-	-	-	-	
1988	35	106	248	398	627	997	1,431	-	-	-	
1989	52	105	181	606	903	1,287	1,587	2,004	2,716	-	
1990	62	143	288	667	1,337	1,533	1,778	2,233	2,731	3,092	
1991	57	133	292	690	1,570	1,863	2,206	2,320	2,568	3,525	
1992	40	108	279	850	1,542	2,199	2,363	3,045	3,391	3,400	4,200
1993	31	96	217	535	1,077	1,493	2,094	2,509	2,374	2,621	3,160
1994	27	106	205	337	841	1,602	2,256	2,913	2,934	3,033	3,163
1995	28	95	196	345	628	1,234	1,908	2,430	2,815	3,323	3,479

[1] The "+"s mark that the data are from the late autumn, therefore are comparable to age y + 1 of the Norwegian data.

Table B7 Landings of Coastal haddock in:

A) Norway in Division IIa -areas 06 and 07 (in '000 tonnes). Data from the Norwegian Directorate of Fisheries and Bulletin Statistique (Anon.1973).

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
6	4	3	4	6	6	5	3	3	2
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
*)	*)	*)	*)	10	6	2	2	2	6
1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
5	5	2	3	4	4	4	3	4	5
1990	1991	1992	1993	1994	1995				
3	*)	6	5	6	7				

*) No data

B) Russian/USSR data in Division I (in '000 tonnes)(Anon. 1975)

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
17	24	27	20	14	13	15	17	22	9
1970	1971	1972	1973	1974					
10	7	47	50	9					

Table B8 Length (cm) at age (year) for haddock from the Norwegian coastal survey during the autumn 1995.

Area	Age (year)													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
03 East Finnmark		21.6	29.4	37.3	45.6	49.2	59.2	64.8	65.0	70.0				
04 West Finnmark/Troms		23.1	32.8	41.7	48.8	52.3	59.5	63.4						
05 Lofoten/Vesterålen		25.8	33.7	40.6	48.2	52.7	56.3	57.5	58.3	63.0	65.3			
00 Vestfjord		19.0	30.3	38.3	45.2	49.3	53.5	58.3	57.0	54.7	68.0			
06 Nordland		22.9	31.9	38.3	44.8	50.1	52.4	63.5	53.0	55.0	55.0			
07 Møre		23.3	31.8	39.8	42.7	48.4	53.2	49.0		55.0		66.0		
Average		**22.7**	**31.5**	**39.3**	**46.2**	**50.6**	**56.1**	**58.7**	**56.1**	**59.2**	**63.8**	**66.0**		

Table B9 Weight (g) at age (year) for haddock from the Norwegian coastal survey during the autumn 1995.

Area	Age (year)													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
03 East Finnmark		96	245	519	927	1,176	1,916	2,625	2,320	3,360				
04 West Finnmark/Troms		121	360	776	1,205	1,453	2,089	2,643						
05 Lofoten/Vesterålen		187	407	692	1,143	1,499	1,863	1,933	1,893	2,603	2,782			
00 Vestfjord		65	283	593	968	1,224	1,424	2,032	1,987	2,060	3,060			
06 Nordland		115	329	581	945	1,321	1,513	2,535	1,436	1,755	1,650			
07 Møre		115	326	659	835	1,229	1,658	1,193		1,250		2,920		
Average		**114**	**316**	**637**	**991**	**1,310**	**1,798**	**2,098**	**1,737**	**2,262**	**2,611**	**2,920**		

Table B10 Percent maturity at age for haddock from the Norwegian coastal survey during the autumn 1995.

Area	Age year 0	1	2	3	4	5	6	7	8	9	10	11	12	13+
03 East Finnmark	0	0	0	1	13	45	64	100	100	100	100	100	100	100
04 West Finnmark/Troms	0	0	1	1	20	61	82	100	80	100	100	100	100	100
05 Lofoten/Vesterålen	0	0	0	10	32	74	84	92	83	100	100	100	100	100
00 Vestfjord	0	0	0	0	16	42	60	100	100	100	100	100	100	100
06 Nordland	0	0	0	3	40	77	81	90	100	100	100	100	100	100
07 Møre	0	0	0	9	18	40	55	55	80	100	100	100	100	100
Average	0	0	1	2	22	51	72	89	88	92	100	100	100	100

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Table B11 Number (x1000) of haddock at age from the survey during the autumn 1995

	Age (year)														
Area	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	Total
03 East Finnmark	373	13,172	6,142	5,884	17,428	9,608	296	97	25	16	-	-	-	-	53,041
04 West Finnmark/Troms	317	18,662	9,825	6,387	8,145	6,739	550	122	-	-	-	-	-	-	50,748
05 Lofoten/Vesterålen	207	4,849	10,517	15,623	12,037	13,813	2,626	686	563	255	190	-	-	-	61,365
00 Vestfjord	-	83	1,768	4,220	2,870	1,736	507	206	214	218	44	-	-	-	11,866
06 Nordland	582	11,613	31,400	25,329	5,405	3,990	97	55	333	22	-	-	-	-	78,826
07 Møre	1,173	1,258	7,249	23,920	6,483	4,884	1,947	1,110	-	172	-	155	-	-	48,351
Total	2,652	49,637	66,901	81,363	52,368	40,770	6,023	2,276	1,135	683	234	155	-	-	304,197

Table B12 Biomass (tonnes) of haddock at age from the survey during the autumn 1995

	Age (year)														
Area	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	Total
03 East Finnmark	5	998	1,319	3,214	15,817	10,491	576	248	58	55	-	-	-	-	32,781
04 West Finnmark/Troms	6	1,827	3,000	4,566	9,816	9,179	1,153	310	-	-	-	-	-	-	29,858
05 Lofoten/Vesterålen	5	661	3,639	10,433	13,321	19,408	4,455	1,085	801	608	459	-	-	-	54,874
00 Vestfjord	-	6	471	2,413	2,824	2,065	755	386	406	350	126	-	-	-	9,802
06 Nordland	16	1,462	10,161	13,030	4,130	5,015	216	59	482	40	-	-	-	-	34,611
07 Møre	27	134	2,577	15,483	5,307	5,704	3,031	1,331	-	299	-	452	-	-	34,345
Total	59	5,088	21,167	49,139	51,215	51,862	10,186	3,419	1,747	1,352	585	452	-	-	196,271

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Table B13 Spawning stock number (x1000) of haddock at age from the survey during the autumn 1995

	Age (year)														
Area	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	Total
03 East Finnmark	-	-	-	41	2,213	4,343	191	97	25	16	-	-	-	-	6,926
04 West Finnmark/Troms	-	-	49	38	1,605	4,138	450	122	-	-	-	-	-	-	6,402
05 Lofoten/Vesterålen	-	-	-	1,562	3,840	10,180	2,195	629	469	255	190	-	-	-	19,320
00 Vestfjord	-	-	-	-	471	724	304	206	214	218	44	-	-	-	2,181
06 Nordland	-	-	-	811	2,173	3,084	79	50	333	22	-	-	-	-	6,552
07 Møre	-	-	-	2,057	1,160	1,929	1,075	606	-	172	-	155	-	-	7,154
Total	-	-	49	4,509	11,462	24,398	4,294	1,710	1,041	683	234	155	-	-	48,535

Table B14 Spawning stock biomass (tonnes) of haddock at age from the survey during the autumn 1995

	Age (year)														
Area	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	Total
03 East Finnmark	-	-	-	22	2,009	4,742	371	248	58	55	-	-	-	-	7,505
04 West Finnmark/Troms	-	-	15	27	1,934	5,636	943	310	-	-	-	-	-	-	8,865
05 Lofoten/Vesterålen	-	-	-	1,043	4,249	14,304	3,724	995	667	608	459	-	-	-	26,049
00 Vestfjord	-	-	-	-	463	861	453	386	406	350	126	-	-	-	3,045
06 Nordland	-	-	-	417	1,660	3,877	175	53	482	40	-	-	-	-	6,704
07 Møre	-	-	-	1,332	950	2,253	1,673	727	-	299	-	452	-	-	7,686
Total	-	-	15	2,841	11,265	31,673	7,339	2,719	1,613	1,352	585	452	-	-	59,854

Table C.1 North-East Arctic SAITHE. Norwegian purse seiners taking part in the saithe fishery. Data given are: number of vessels, catch in tonnes, catch per vessel.

	Vessel length (m)								
	-19.9			20.0-24.9			25.0-		
Year	Number	Catch	C/V	Number	Catch	C/V	Number	Catch	C/V
1977	208	21,398	103	66	25,324	384	19	5,655	298
1978	184	16,288	89	72	21,224	295	19	6,094	321
1979	250	21,224	85	72	27,057	376	25	9,122	365
1980	269	21,243	79	96	27,551	287	39	10,234	262
1981	312	25,984	83	89	29,108	327	23	7,354	320
1982	308	30,228	98	98	35,969	367	23	9,303	404
1983	222	19,925	90	80	28,348	354	12	5,524	460
1984	168	8,834	53	69	20,668	300	15	6,713	448
1985	90	4,150	46	57	18,328	322	16	8,391	524
1986	55	1,281	23	43	3,581	83	21	2,643	126
1987	106	9,084	86	46	16,766	364	15	8,185	546
1988	120	13,111	109	48	20,413	425	13	8,981	691
1989	195	14,993	77	61	23,000	377	13	10,466	805
1990	89	2,533	28	53	13,360	257	19	8,406	442
1991	122	8,726	72	56	20,378	364	19	9,797	516
1992	100	7,076	71	49	14,783	302	20	5,020	251
1993	48	6,110	127	45	19,502	433	19	7,433	391
1994	76	9,086	120	39	14,579	374	18	5,672	315
1995 [1]	69	3,491	51	34	8,291	244	24	10,101	427

[1] Preliminary

Table C.2 North-East Arctic SAITHE. Catch, effort, and catch per unit effort for Norwegian trawlers directing for saithe.

Year	Catch[1] (t)	Effort[1] (h)	CPUE[1] (kg/h)
1976	12,982	21,615	601
1977	15,583	29,308	532
1978	12,506	27,094	462
1979	16,609	24,258	685
1980	27,618	39,290	703
1981	43,682	49,191	888
1982	30,358	33,164	915
1983	38,846	37,856	1,026
1984	56,128	60,282	931
1985	29,260	39,894	733
1986	20,897	25,037	835
1987	8,631	11,860	728
1988	16,589	21,034	789
1989	28,753	40,813	705
1990	28,445	42,689	666
1991	26,362	35,680	739
1992	42,785	43,885	975
1993	47,468	46,613	1,018
1994	54,402	57,612	944
1995 [2]	71,801	75,525	951

[1] Including only days with more than 50% saithe on trips with more than 50% saithe in the catches.
[2] Preliminary.

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Table C.3 North-East Arctic SAITHE. Norwegian effort indices.

Year	Purse seine[1]	Trawl[2]	Combined[3]
1976	-	36.8	-
1977	206	52.7	351
1978	214	51.3	355
1979	199	42.7	316
1980	215	57.4	373
1981	203	71.0	398
1982	213	58.2	373
1983	161	57.7	320
1984	124	85.5	359
1985	98	63.7	273
1986	96	45.2	220
1987	94	30.1	177
1988	103	50.4	242
1989	131	59.8	295
1990	96	60.4	262
1991	107	51.5	249
1992	90	57.6	248
1993	76	68.0	266
1994	78	78.7	294
1995	90	106.3	382

[1] No. of vessels 20-24.9 m. length.
[2] Hours trawling ('000).
[3] Trawl indices scaled up to give the same average for 1977-1990 as the purse seine indices (i.e. x 2.75) before adding the two.

Effort indices for both categories where raised to represent total Norwegian landings for the gear.

Table D1 REDFISH in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I, Divisions IIa and IIb combined as offically reported to ICES.

Year	Canada	Denmark	Faroe Islands	France	Ger-many[4]	Green-land	Iceland	Ireland	Nether-lands	Norway	Portugal	Russia[5]	Spain	UK (E & W)	UK (Scotl)	Total
1984	-	-	-	2,970	7,457	-	-	-	-	18,650	1,806	69,689	25	716	-	101,313
1985	-	-	-	3,326	6,566	-	-	-	-	20,456	2,056	59,943	38	167	-	92,552
1986	-	-	29	2,719	4,884	-	-	-	-	23,255	1,591	20,694	-	129	14	53,315
1987	-	+	450[3]	1,611	5,829	-	-	-	-	18,051	1,175	7,215	25	230	9	34,595
1988	-	-	973	3,349	2,355	-	-	-	-	24,662	500	9,139	26	468	2	41,494
1989	-	-	338	1,849[1]	4,245	-	-	-	-	25,295	340	14,344	5[2]	259	13	46,716
1990	-	37[3]	386	1,821[1]	6,741	-	-	-	-	34,090	830	18,918	-	332	1	63,161
1991	-	23	639	804[1]	981	-	-	-	-	49,463	166	15,354	1	285	64	67,780
1992	-	9	58	1,301[1]	530	614	-	-	-	23,451	977	4,335	16	447	34	31,777
1993	8[3]	4	152	956[1]	685	15	-	-	-	17,755	1,040	7,573	65	733	1	28,987
1994[1]	-	28	26	721[3]	1026	6	4	3	-	19,783	985	6,220	34	259	13	28,387
1995[1]	-	-	30	651[3]	630[2]	6[2]	1	5	1	15,620	936	6,985	67	252	13	24,610

[1] Provisional figures.
[2]Working Group figure.
[3]As reported to Norwegian authorities.
[4]Includes former GDR prior to 1991.
[5]USSR prior to 1991.

Table D2 REDFISH in Sub-area IV (North Sea). Nominal catch (t) by countries as officially reported to ICES. Not included in the assessment.

Year	Belgium	Denmark	Faroe Islands	France	Germany	Nether-lands	Norway	UK (England & Wales)	UK (Scotl)	Total
1986	-	24	-	578	183	-	1,048	35	1	1,869
1987	-	16	3	833	70	-	411	16	55	1,404
1988	-	32	90	915	188	-	696	125	9	2,055
1989	1	23	13	554[1]	111	-	500[2]	134	6	1,342
1990	+	41	25	554[1]	47	-	483[2]	369	6	1,525
1991	5	29	144	914[1]	213	2	415[2]	43	38	1,803
1992	4	22	23	1,960[1]	170	1	232[2]	65	122	2,599
1993	28	14	4	1,211[1]	33	1	281[2]	138	70	1,780
1994[1]	4	13	1	n/a	324	8	306[2]	38	66	760
1995[1]	16	14	65	n/a	80	16	268	46	241	746

[1] Provisional figures.
[2] Working Group figure.
n/a = not available.

Table D3 *Sebastes mentella.* Maturity ogives from Russian research vessels. Sexes combined. Data collected during April-June in the Kopytov area (western Barents Sea) and adjacent waters.

Age	1986	1987	1988	1989	1990	1991	1992	1993	1995
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.046	0.000	0.000	0.000
9	0.006	0.083	0.000	0.000	0.012	0.139	0.013	0.033	0.000
10	0.017	0.182	0.028	0.074	0.131	0.174	0.092	0.133	0.055
11	0.132	0.278	0.125	0.178	0.300	0.138	0.169	0.364	0.111
12	0.377	0.616	0.297	0.473	0.688	0.358	0.396	0.480	0.368
13	0.822	0.821	0.562	0.684	0.714	0.470	0.452	0.696	0.587
14	0.795	0.926	0.760	0.716	0.824	0.637	0.761	0.925	0.696
15	0.862	0.938	0.855	0.794	0.848	0.762	0.939	0.962	0.729
16	0.875	1.000	1.000	1.000	1.000	1.000	0.886	0.953	0.789
17	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.977	1.000
18	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table D4 *Sebastes mentella* in Divisions IIa and IIb. Catch per unit effort and calculated total international effort.

	USSR/Russia		German Dem.Rep.		Total effort	
	catch/hour trawling (t/hr)		catch/day (t/day)		(USSR units)	
Year	RT[1]	PST[2]	Freezer trawler	Factory trawler FVS IV (FAO code 090)	RT[1]	PST[2]
1965	0.38	-	-	-	41,216	-
1966	0.39	-	-	-	26,008	-
1967	0.37	-	-	-	16,862	-
1968	0.45	-	-	-	12,029	-
1969	0.48	-	-	-	14,242	-
1970	0.46	-	-	-	49,817	-
1971	0.38	-	-	-	118,587	-
1972	0.38	-	-	-	75,953	-
1973	0.45	-	-	-	85,289	-
1974	0.69	-	-	-	100,539	-
1975	0.95	1.01	-	-	251,653	-
1976	0.99	1.26	-	-	271,653	-
1977	0.77	1.00	-	-	190,084	-
1978	0.63	0.86	-	-	147,002	-
1979	0.56	0.93	-	-	155,616	-
1980	0.70	0.91	-	-	113,363	87,202
1981	0.63	0.95	8.71	-	129,438	85,338
1982	0.63	1.05	9.58	-	183,148	109,889
1983	0.80	1.09	17.12	-	131,591	96,581
1984	0.70	1.30	13.62	-	104,191	56,103
1985	0.60	1.00	9.89	-	105,113	63,068
1986	0.43	0.68	7.90	-	53,749	33,988
1987	-	0.70	-	7.30	-	15,026
1988	-	0.70	-	11.78	-	22,266
1989	-	0.90	-	12.96	-	26,104
1990	-	1.00	-	14.77	-	35,070
1991	-	0.80	-	-	-	60,919
1992	-	0.60	-	-	-	25,978
1993	-	1.00	-	-	-	12,471
1994		0.74		-	-	16,539
1995[3]	-	0.80	-	-	-	12,949

[1]Side trawlers, 800-1000 HP.
[2]Stern trawlers.
[3]Provisional figure.

Table D5 *Sebastes mentella.* Average catch (no. of specimens) of different year classes per hour trawling in the USSR survey in the Barents and Norwegian Sea (1976–1983 published in "Annales Biologiques"). These data are used as input for the tuning and recruitment estimation (ref. Table 6.13b).

Year class	0	1	2	3	4	5	6	7	8	9	10	11
1965	-	-	-	-	-	-	-	-	-	-	-	0.4
1966	-	-	-	-	-	-	-	-	-	-	3.0	-
1967	-	-	-	-	-	-	-	-	-	11.7	-	0.3
1968	-	-	-	-	-	-	-	-	16.2	-	1.5	0.3
1969	-	-	-	-	-	-	-	43.4	-	8.7	12.2	3.1
1970	-	-	-	-	-	-	85.8	-	19.8	34.9	11.9	-
1971	-	-	-	-	-	22.7	-	19.5	51.9	18.0	5.7	-
1972	-	-	-	-	9.4	-	6.7	57.6	12.3	6.7	-	-
1973	-	-	-	0.6	-	4.3	37.3	8.6	5.6	-	-	-
1974	-	-	4.8	-	4.9	22.8	4.8	4.8	-	-	-	3.0
1975	-	7.4	-	1.7	6.4	2.4	3.5	5.0	-	-	4.0	-
1976	7.0	-	8.1	1.2	2.5	6.8	4.9	5.0	1.0	13.0	-	-
1977	-	0.2	0.2	0.2	0.9	5.1	3.7	1.0	19.0	2.0	-	-
1978	0.8	0.02	0.9	1.0	5.0	3.8	2.0	20.0	6.0	-	-	-
1979	-	1.9	1.4	3.6	2.3	9.0	11.0	16.0	1.0	-	-	0.1
1980	0.3	0.4	2.0	2.5	16.0	6.0	11.0	25.0	2.0	-	1.5	2.0
1981	-	2.2	3.9	20.0	6.0	12.0	47.0	18.0	6.3	1.6	0.5	1.0
1982	19.8	13.2	13.0	15.0	34.0	44.0	39.0	32.6	4.3	3.1	4.9	+
1983	12.5	3.0	5.0	6.0	31.0	34.0	32.3	13.3	4.0	4.2	0.6	1.1
1984	-	10.0	2.0	-	5.0	18.3	19.0	2.2	2.4	0.2	1.7	2.4
1985	107.0	7.0	-	1.0	5.2	16.2	1.7	1.7	0.6	2.8	3.8	-
1986	2.0	-	1.0	1.8	8.4	3.6	2.1	1.2	5.6	8.2	-	-
1987	-	3.0	37.9	1.3	8.0	4.1	2.0	10.6	9.6	-	-	-
1988	4.0	58.1	4.3	13.3	25.8	3.9	8.6	11.2	-	-	-	-
1989	8.7	9.0	17.0	23.4	4.6	5.4	4.0	-	-	-	-	-
1990	2.5	6.3	6.1	1.0	4.3	1.7	-	-	-	-	-	-
1991	0.3	1.0	0.5	1.5	1.2	-	-	-	-	-	-	-
1992	0.6	+	0.2	0.1	-	-	-	-	-	-	-	-
1993	-	+	1.5	-	-	-	-	-	-	-	-	-
1994	0.3	3.5	-	-	-	-	-	-	-	-	-	-
1995	2.8	-	-	-	-	-	-	-	-	-	-	-

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Table D6 *Sebastes mentella* in Sub-areas I and II. Preliminary Norwegian bottom trawl survey indices (numbers in millions) in the Svalbard area (Division IIb).

	Age														
Year	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	283	419	484	131	58	45	14	8	5	2	7	2	1	3	1,462
1993	2	527	117	202	142	8	23	6	13	1	7	1	1	+	1,050
1994	7	280	290	202	235	42	94	1	1	3	4	1	1	+	1,161

Table D7 *Sebastes mentella*[1]. Abundance indices from the bottom trawl surveys in the Barents Sea in the winter 1986-1996 (numbers in millions). The area coverage was extended from 1993.

Year	Length group (cm)									Total
	5.0-9.9	10.0-14.9	15.0-19.9	20.0-24.9	25.0-29.9	30.0-34.9	35.0-39.9	40.0-44.9	>45.0	
1986	81.3	151.9	205.4	87.7	169.2	129.8	87.5	23.6	13.8	950.2
1987	71.8	25.1	227.4	56.1	34.6	11.4	5.3	1.1	0.1	432.9
1988	587.0	25.2	132.6	182.1	39.6	50.1	47.9	3.6	0.1	1068.2
1989	622.9	55.0	28.4	177.1	58.0	9.4	8.0	1.9	0.3	961.0
1990	323.6	304.5	36.4	55.9	80.2	12.9	12.5	1.5	0.2	827.7
1991	395.2	448.8	86.2	38.9	95.6	34.8	24.3	2.5	0.2	1126.5
1992	139.0	366.5	227.1	34.6	55.2	34.4	7.5	1.8	0.5	866.6
1993	30.8	592.7	320.2	116.3	24.2	25.0	6.3	1.0	+	1116.5
1994	6.9	258.6	289.4	284.3	51.4	69.8	19.9	1.4	0.1	981.8
1995	263.7	71.4	637.8	505.8	90.8	68.8	31.3	3.9	0.5	1674.0
1996	213.1	100.2	191.2	337.6	134.3	41.9	16.6	1.4	0.3	1036.6

[1)] Includes unidentified *Sebastes* speciemens, mostly less than 15 cm.

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Table D8 *Sebastes **mentella*** in Sub-areas I and II.
Results of the Russian trawl/acoustic redfish survey in the western Barents Sea in April-May 1992-1995. Stock numbers in millions.

Year	Period of survey	Age																		Total			
		1-4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+	Numbers	Biomass $t\ 10^3$	SSN	SSB
1992	April	29	27	27	37	36	50	78	39	34	40	44	43	28	17	13	4	7	3	566	218	191	114
1993	April	31	15	13	6	6	20	56	56	38	28	29	27	19	12	7	3	1	2	369	150	151	90
1994												No Data											
1995	May	+	32	51	83	90	41	31	31	41	94	73	48	30	10	9	4	1	+	669	202	211	102

Table D9 *Sebastes marinus* in Sub-areas I and II. Preliminary Norwegian bottom trawl survey indices (numbers in thousands) in the Svalbard area (Division IIb).

	Age														
Year	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	284	12,378	5,576	2,279	371	2,064	3,687	5,704	9,215	6,413	1,454	1,387	696	22	51,530
1993	32	10,704	5,710	5,142	1,855	1,052	1,314	3,520	2,847	2,757	2,074	1,245	844	119	39,215
1994	429	1,150	3,418	2,393	1,723	1,106	1,714	1,256	1,938	1,596	2,039	484	550	319	20,115

Table D10 *Sebastes marinus* in Sub-areas I and II. Preliminary Norwegian bottom trawl indices (numbers in thousands) from the annual Barents Sea survey in winter.

	Age													
Year	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1992	2,295	4,261	10,760	2,043	1,474	13,178	4,230	6,302	8,251	3,751	3,865	3,064	3,568	67,042
1993	468	1,218	1,424	2,020	979	5,048	2,968	4,230	2,142	4,634	3,338	2,951	9,148	40,568
1994	2,951	4,485	2,573	3,801	8,338	3,254	1,297	7,231	6,443	248	10,192	6,341	2,612	59,766

Table D11 *Sebastes marinus*. Abundance indices from the bottom trawl surveys in the Barents Sea in the winter 1986-1996 (numbers in millions). The area coverage was extended from 1993.

Year	Length group (cm)									Total
	5.0-9.9	10.0-14.9	15.0-19.9	20.0-24.9	25.0-29.9	30.0-34.9	35.0-39.9	40.0-44.9	>45.0	
1986	3.0	11.7	26.4	34.3	17.7	21.0	12.8	4.4	2.6	133.9
1987	7.7	12.7	32.8	7.7	6.4	3.4	3.8	3.8	4.2	82.5
1988	1.0	5.6	5.5	14.2	12.6	7.3	5.2	4.1	3.7	59.2
1989	48.7	4.9	4.3	11.8	15.9	12.2	6.6	4.8	3.0	112.2
1990	9.2	5.3	6.5	9.4	15.5	14.0	8.0	4.0	3.4	75.3
1991	4.2	13.6	8.4	19.4	18.0	16.1	14.8	6.0	4.0	104.5
1992	1.8	3.9	7.7	20.6	19.7	13.7	10.5	6.6	5.8	90.3
1993	0.1	1.2	3.5	6.9	10.3	14.5	12.5	8.6	6.3	63.9
1994	0.7	6.5	9.3	11.7	11.5	19.4	9.1	4.4	2.8	75.4
1995	0.6	5.0	13.1	11.5	9.1	15.9	17.2	10.9	4.7	88.0
1996	+	0.7	3.5	6.4	9.4	11.7	16.6	7.9	3.9	60.1

Table D12 *Sebastes marinus*. Catch and catch per unit effort for Norwegian stern trawlers (ISSCFV - Code 07, 250-499,9 GRT), and total international effort (Norwegian trawl units).[1]

Year	Catch (t)	% of total international catch	CPUE (t/hour)	Effort hours trawling
1981	1,315	6.3	0.30	69,420
1982	2,014	12.3	0.35	46,760
1983	1,590	8.3	0.42	45,857
1984	3,963	14.0	0.40	70,948
1985	3,080	10.5	0.32	92,138
1986	4,500	14.9	0.42	71,912
1987	2,168	9.0	0.34	70,814
1988	4,349	16.8	0.54	47,978
1989	3,044	13.1	0.23	100,965
1990	3,826	13.6	0.60	46,819
1991[2]	10,693	56.1	0.71	26,832
1992[2]	4,094	25.3	0.43	37,651
1993[2]	1,982	12.9	0.43	35,712
1994[2]	1,446	8.6	0.43	39,109

[1] Only including trips with more than 50% *S. marinus* in the catches, and put into a GLIM-analysis.
[2] Provisional figures.

Table E1 GREENLAND HALIBUT in Sub-area I and II. Norwegian bottom-trawl survey indices (numbers in thousands) in the Svalbard area (Division IIb

Year	Fish[2] <20 cm	Age									Total
		1	2	3	4	5	6	7	8	9+	
1981	2.1	No age data									20,100
1982	0.7										26,000
1983	5.9										26,690
1984	3.2	550	3,042	2,924	8,573	6,847	5,657	4,345	2,796	1,896	36,630
1985	1.6	884	3,921	4,294	6,674	8,793	8,622	3,920	1,817	525	39,450
1986	0.1	49	1,005	1,967	7,314	4,671	1,754	2,301	372	37	19,470
1987	1.0	630	1,014	3,076	4,409	4,786	3,141	964	364	116	18,500
1988	2.5	818	4,298	6,191	6,696	12,289	2,396	6,015	338	1,277	39,300
1989[1]	1.4	712	3,232	8,158	7,493	7,069	2,374	1,753	353	744	31,888
1990[1]	0.4	115	336	5,050	7,130	7,730	4,490	2,330	918	544	28,643
1991[1]	0.1	71	877	3,080	6,720	9,270	5,450	2,800	1,660	524	30,452
1992[1]	+	33	30	338	1,190	3,520	4,420	2,280	1,280	474	13,565
1993[1]	+	25	60	51	1,049	2,369	2,056	2,772	1,114	665	10,161
1994[1]	+	4	238	296	652	2,775	2,371	2,593	531	844	10,304
1995[1]	+	35	+	70	259	798	1,225	1,953	434	504	5,299

[1] New standard trawl equipment (rockhopper gear and 40 meter sweep length).
[2] In millions.

Table E2. GREENLAND HALIBUT in Sub-area I and II. Abundance indices from bottom trawl surveys in the Barents Sea in winter 1989-1996 (in thousands). A: Restricted area surveyed every year; B: Enlarged area (includes the restricted one) surveyed since 1993.

A

Year	Age													
	1	2	3	4	5	6	7	8	9	10	11	12	13+	Total
1989	1078	788	1056	2284	3655	2655	864	971	210	-	19	76	56	13712
1990	66	907	2071	1716	1996	2262	1046	365	175	-	30	119	165	10918
1991	-	279	755	1323	1257	1526	2440	906	450	457	-	55	127	9575
1992	63	128	719	897	1554	543	1069	791	-	648	135	40	53	6640
1993	-	17	168	502	1730	868	1490	758	88	655	382	31	35	6724
1994	-	16	142	1178	2259	1644	1750	885	-	506	38	25	-	8443
1995	-	-	-	168	786	749	1331	760	359	486	60	199	-	4898
1996	1816	-	28	40	709	1510	2964	1000	307	808	154	152	45	9533

B

Year	Age													
	1	2	3	4	5	6	7	8	9	10	11	12	13+	Total
1993	-	17	279	1002	3129	2818	3895	1632	309	1406	616	31	35	15169
1994	-	16	152	1482	3768	2698	3420	1615	-	1171	135	25	-	14482
1995	-	-	-	216	2824	6229	10624	2727	1250	1902	172	718	57	26761
1996	3149	-	28	102	1547	3043	4991	1599	472	1211	317	250	72	16782

Table E3. GREENLAND HALIBUT in Sub-area I and II. Russian autumn bottom trawl surveys: Abundance of males and females at different age (numbers in thousands).

Age	1990		1991*		1992		1993**		1994		1995	
	males	females	males	females	males	females	males	females	males	females	males	females
≤3	2289	531	1078	344	451	234	78	36	38	11		19
4	4455	3905	3799	4656	4991	2470	1488	678	841	763	284	183
5	7775	8476	11236	14172	20425	12916	9832	3485	6814	3054	4556	1203
6	9069	6552	10821	11021	15456	10042	15040	4711	12136	5414	13743	4479
7	5988	5405	6067	9167	9001	8271	11759	4768	7505	4028	11483	3813
8	1599	2521	2107	7312	4724	5454	5827	4478	3575	4171	7297	4242
9	529	1382	415	1954	808	1912	1144	2226	791	2610	1359	3034
10	331	827	174	1037	139	1123	393	1475	325	1551	428	985
11		307	38	617	45	893	154	749	79	526		529
12		198		142		318	127	392	63	331		312
13		58		95		67		103		114		84
14		36		16				111		114		11
≥15				26				111		57		32
Total	32035	30198	35735	50559	56040	43700	45842	23323	32167	22744	39150	18926
Mean age	5.64	6.11	5.73	6.28	5.82	6.40	6.37	7.29	6.33	7.26	6.68	7.55

* Age distribution based on length distribution from 1991 and length-at-age data from 1990 and 1992 combined.

** Age distribution based on length distribution from 1993 and length-at-age data from 1992 and 1994 combined.

Table E4 GREENLAND HALIBUT in Sub-area I and II. Abundance indices on age from the Norwegian trawl survey for shrimp at Svalbard. July-August 1988-1992 and June 1993-1994. Numbers in thousands.

Year	Age									Total
	1	2	3	4	5	6	7	8	9+	
1988[1]	4,163	14,278	8,259	8,354	2,594	144				37,792
1989[2]	4,653	9,777	9,943	4,855	4,057	1,054	542	83	372	35,336
1990	247	1,569	8,324	9,800	6,910	2,148	295	245	175	29,713
1991	25	577	2,465	4,969	5,362	2,541	1,380	158	278	17,755
1992	95	57	505	1,780	2,914	1,129	713	333	200	7,726
1993[3]	39	54	50	814	1,572	433	589	395	512	4,458
1994[3]	0	13	43	446	2,214	1,218	1,764	485	797	6,980
1995[3]	24	26	31	407	1,081	592	521	151	159	2,992

[1]The length distribution was split on age according to Macdonald and Pitcher (1979).

[2]An age-length key from the bottom trawl survey for cod at Svalbard in September 1989 was used to convert the indices from length to age.

[3]An age-length key from the bottom trawl survey for cod at Svalbard in September the same year was used to convert the indices from length to age.

Table E5 GREELAND HALIBUT in Sub-areas I and II
Results from a research programme using trawlers in a limited commercial fishery 1992-1995. All areas combined. Spring and autumn combined

Catch in number on age (%)

	1992	1993	1994*	1995*	1996*
1					
2					
3	0.1			0.1	
4	4.6	4.2	3.2	0.7	0.5
5	19.1	25.0	24.7	22.5	19.5
6	23.0	18.4	23.8	22.6	31.6
7	25.9	27.1	26.8	30.2	35.6
8	13.3	12.4	11.2	11.0	8.7
9	1.7	0.7	1.0	2.7	1.3
10	6.8	7.4	5.9	6.6	2.0
11	2.9	3.1	2.4	2.0	0.5
12	1.7	1.0	0.6	1.1	0.2
13	0.5	0.4	0.2	0.3	0.0
14	0.2	0.2	0.1	0.2	0.1
15	0.1				

CPUE (N) on age

	1992	1993	1994*	1995*	1996*
1					
2					
3	0			1	0
4	19	30	26	7	7
5	80	176	198	218	286
6	97	130	191	218	463
7	109	191	215	292	521
8	56	87	90	106	127
9	7	5	8	26	19
10	29	52	47	64	29
11	12	22	19	19	7
12	7	7	5	11	3
13	2	3	2	3	0
14	1	1	1	2	1
15	0				

Mean individual weight (kg)

	1992	1993	1994*	1995*	1996*
1					
2					
3	0.26			0.40	
4	0.50	0.53	0.52	0.47	0.48
5	0.71	0.76	0.73	0.70	0.74
6	0.96	0.98	0.95	0.94	0.94
7	1.29	1.33	1.28	1.24	1.23
8	1.77	1.85	1.79	1.71	1.66
9	2.00	2.28	2.23	2.03	2.00
10	2.46	2.65	2.55	2.50	2.50
11	3.10	3.43	3.37	3.28	3.16
12	3.86	4.32	4.22	3.71	3.70
13	4.44	5.18	5.01	4.62	
14	6.00	6.44	6.29	5.59	
15	5.22				

CPUE (kg) on age

	1992	1993	1994*	1995*	1996*
1					
2					
3	0			0	0
4	10	16	13	3	4
5	57	134	145	152	211
6	93	127	182	205	435
7	140	254	276	362	641
8	99	162	161	182	211
9	14	11	18	53	38
10	70	138	121	160	73
11	38	75	65	63	23
12	28	30	20	39	11
13	9	15	8	13	0
14	5	9	5	11	0
15	2				

	1992	1993	1994*	1995*	1996*
Overall mean individual weight (kg)	1.35	1.38	1.27	1.29	1.12
CPUE (kg round weight per trawlhour)**	567	973	1020	1247	1640
CPUE (number fish per trawlhour)**	420	705	803	967	1464
Catch (in tonnes)	695	862	811	368	436

*) Only in spring
**) Average for freezer- and factorytrawler

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Table E6 GREENLAND HALIBUT in Sub-area I and II Proportion of mature fissh by age. Data from Russia for the years 1983–1995.

Age years	Average 1983-1987	1988[1]	1989[2]	1990[2]	1992[3]	1994[4]	1995[4]
3	-	-	-	-	-	-	0.00
4	0.05	-	0.01	0.09	0.03	-	0.10
5	0.23	0.04	0.10	0.29	0.14	0.34	0.41
6	0.49	0.40	0.66	0.52	0.22	0.47	0.54
7	0.66	0.57	0.74	0.66	0.26	0.63	0.66
8	0.78	0.63	0.68	0.75	0.34	0.71	0.76
9	0.89	0.67	0.81	0.71	0.55	0.77	0.88
10	0.95	0.89	0.92	0.77	0.95	0.97	0.86
11	0.99	1.00	0.94	0.93	0.83	0.93	1.00
12	0.99	1.00	1.00	1.00	1.00	0.96	1.00
13	0.99	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	-	1.00	1.00
15	1.00	1.00	1.00	1.00	-	1.00	1.00

[1]The specimens analysed were sampled through the whole year.
[2]The specimens analysed were sampled in August-February.
[3]The specimens analysed were sampled in October-December.
[4]The specimens analysed were sampled in November-January.

Table E7 GREENLAND HALIBUT in ICES Sub-area IV (North Sea. Nominal catch (t) by countries as officially reported to ICES. Not included in the assessment .

Year	Denmark	Faroe Islands	France	Germany	Norway	Russia	UK England & Wales	UK Scotland	Total
1973	-	-	-	4	9	8	28	-	49
1974	-	-	-	2	2	-	30	-	34
1975	-	-	-	1	4	-	12	-	17
1976	-	-	-	1	2	-	18	-	21
1977	-	-	-	2	2	-	8	-	12
1978	-	-	2	30	-	-	1	-	33
1979	-	-	2	16	2	-	1	-	27
1980	-	177	-	34	5	-	-	-	216
1981	-	-	-	-	7	-	-	-	7
1982	-	-	2	26	17	-	-	-	45
1983	-	-	1	64	89	-	-	-	154
1984	-	-	3	50	32	-	-	-	85
1985	-	1	2	49	12	-	-	-	64
1986	-	-	30	2	34	-	-	-	66
1987	-	28	16	1	35	-	-	-	80
1988	-	71	62	3	19	-	1	-	156
1989	-	21	14[1]	1	197	-	5	-	224
1990	-	10	30[1]	3	29	-	4	-	46
1991	-	48	291[1]	1	216	-	2	-	267
1992	1	15	416[1]	3	625[1]	-	-	1	645
1993	1	-	78[1]	1	863[1]	-	10	+	875
1994	+	103	-	4	724	-	6	-	833
1995	+	706	-	2[1]	460[1]	-	52	283	1503

[1] Provisional figures