PART 2

REPORT OF THE NORTH WESTERN WORKING GROUP

ICES Headquarters, Copenhagen, Denmark
3-10 May 1995

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 4.1.1 Abundance indices of O-group cod from International and Icelandic O-group surveys in the East-Greenland/Iceland area, 1971-1993 (except 1972).

Year Class	Dohrn Bank East Greenland	SE Iceland	SW Iceland	W Iceland	N Iceland	E Iceland	Total
1971	+	-	-	60	214	-	283
1973	135	10	107	96	757	86	1,191
1974	2	-	-	22	30	+	54
1975	+	-	2	50	73	5	130
1976	5	9	30	102	2,015	584	2,743
1977	7	2	+	26	305	94	435
1978	2	-	+	169	335	47	552
1979	2	+	1	22	345	+	370
1980	1	2	+	38	507	10	557
1981	19	-	-	41	19	-	78
1982	+	-	+	7	4	-	11
1983	+	-	+	85	66	2	153
1984	372	5	+	200	826	369	1,772
1985	32	+	+	581	197	2	812
1986	+	1	2	15	32	+	50
1987	7	-	1	2	61	10	81
1988	0	-	1	7	12	+	20
1989	1	-	3	7	30	+	41
1990	3	-	+	2	30	2	37
1991	+	-	-	+	5	+	6
1992	0	-	+	15	21	5	42
1993	1	-	+	36	116	2	155
1994	0	-	0	1	71	2	74

Table 5.1.1 Specification of the strata as used for the German survey.

Stratum	geographic boundaries				depth	area
	south	north	east	west	(m)	(nm^2)
1.1	64°15'N	67°00'N	50°00'W	57°00'W	1-200	6805
1.2	64°15'N	67°00'N	50°00'W	57°00'W	201-400	1881
2.1	62°30'N	64°15'N	50°00'W	55°00'W	1-200	2350
2.2	62°30'N	64°15'N	50°00'W	55°00'W	201-400	1018
3.1	60°45'N	62°30'N	48°00'W	53°00'W	1-200	1938
3.2	60°45'N	62°30'N	48°00'W	53°00'W	201-400	742
4.1	59°00'N	60°45'N	44°00'W	50°00'W	1-200	2568
4.2	59°00'N	60°45'N	44°00'W	50°00'W	201-400	971
5.1	59°00'N	63°00'N	40°00'W	44°00'W	1-200	2468
5.2	59°00'N	63°00'N	40°00'W	44°00'W	201-400	3126
6.1	63°00'N	66°00'N	35°00'W	41°00'W	1-200	1120
6.2	63°00'N	66°00'N	35°00'W	41°00'W	201-400	7795
7.1	64°45'N	67°00'N	29°00'W	35°00'W	1-200	92
7.2	64°45'N	67°00'N	29°00'W	35°00'W	201-400	4589
Sum						37463

Table 5.1.2 Trawl parameters of the German survey.

Gear	140-feet bottom trawl
Horizontal net opening	22 m
Standard trawling speed	4.5 kn
Towing time	30 minutes
Coefficient of catchability	1.0

Table 5.1.3 Numbers of valid hauls carried out during the German survey by stratum and total, 1982-94.

Year	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	6.1	6.2	7.1	7.2	Sum
1982	20	11	16	7	9	6	13	2	1	10	3	12	1	25	136
1983	26	11	25	11	17	5	18	4	3	19	10	36	0	18	203
1984	25	13	26	8	18	6	21	4	5	4	2	8	0	5	145
1985	10	8	26	10	17	5	21	4	5	21	14	50	0	28	219
1986	27	9	21	9	16	7	18	3	3	15	14	37	1	34	214
1987	25	11	21	4	18	3	21	3	19	16	13	40	0	18	212
1988	34	21	28	5	18	5	18	2	21	8	13	39	0	26	238
1989	26	14	30	9	8	3	25	3	17	18	12	29	0	11	205
1990	19	7	23	8	16	3	21	6	18	19	6	15	0	13	174
1991	19	11	23	7	12	6	14	5	8	11	10	28	0	16	170
1992	6	6	6	5	6	6	7	5	0	0	0	0	0	6	53
1993	9	6	9	6	10	8	7	0	9	6	6	18	0	14	108
1994	16	13	13	8	10	6	7	5	0	0	0	0	0	6	84

Table 5.1.4 Cod abundance indices (1000) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

YEAR	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	WESTGR.
1982	5092	729	47957	1888	15114	3706	17790		92276
1983	431	467	16013	5170	14881	2326	10916		50204
1984	377	179	4714	171	5201	689	5353		16684
1985	19630	2428	13222	4395	10531	1638	7499		59343
1986	32438	1236	50908	229	37446	1321	22104		145682
1987	330944	1651	248002		154681		51114		786392
1988	92024	2423	338740	84935	47336	89	60946		626493
1989	2497	920	27930	673	261502		65203		358725
1990	965	513	4155	362	6014		10303	12213	34525
1991	268	205	180	152	1027	611	1839	523	4805
1992	552	622	117	137	121	74	151	269	2043
1993	566	457	176	127	80	31	0		1437
1994	206	103	33	33	72	23	82	22	574

Table 5.1.4 cont'd

YEAR	5.1	5.2	6.1	6.2	7.1	7.2	EASTGR.	TOTAL	CI
1982		468		6173		1449	8090	100366	28
1983		2228	1274	2276		2213	7991	58195	25
1984	4063			1750		790	(6603)	(23286)	32
1985	3564	373	3978	3348		1141	12404	71747	33
1986		780	6950	6676		828	15234	160915	32
1987	18317	9832	6527	6081		878	41635	828026	59
1988	7985	8085	2060	4375		1083	23588	650080	48
1989	30906	38407	11600	9383		1436	91732	450459	59
1990	4956	2524	4533	9041		4200	25254	59777	43
1991	2343	1786	779	1958		3541	10407	15213	29
1992						658	(658)	(2700)	50
1993	1252	98	922	502		527	3301	4738	36
1994						801	(801)	(1375)	36

Table 5.1.5 Cod biomass indices (tons) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

YEAR	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	WESTGR.
1982	2378	307	63684	2632	20319	8745	30426		128491
1983	353	205	20215	7827	22806	9594	21374		82374
1984	824	234	7508	234	7218	1055	8493		25566
1985	2528	251	12869	2351	10731	990	5952		35672
1986	10641	484	26098	80	28510	1423	19483		86719
1987	283591	545	200632		116610		37210		638588
1988	94175	1367	333848	77967	44593	93	55945		607988
1989	727	228	25829	441	231239		75386		333850
1990	224	114	3552	190	5778		13185	11388	34431
1991	91	72	73	45	1208	589	2621	451	5150
1992	135	195	23	36	21	14	81	102	607
1993	135	88	49	33	44	10	0		359
1994	27	33	6	23	23	11	4	13	140

Table 5.1.5 cont'd

YEAR	5.1	5.2	6.1	6.2	7.1	7.2	EASTGR.	TOTAL	CI
1982		1927		14563		7127	23617	152107	25
1983		6147	3512	11344		13154	34157	116531	25
1984	10397			4110		5237	(19744)	(45309)	34
1985	7073	1356	9955	9437		5744	33565	69236	39
1986		2645	18631	16543		3366	41185	127902	26
1987	10315	9054	9291	17616		5316	51592	690181	63
1988	8750	18204	6162	16258		3572	52946	660935	46
1989	40614	127865	34957	31324		4786	239546	573395	46
1990	9229	6813	12954	24408		12560	65964	100395	34
1991	4236	5779	1263	7467		14006	32751	37901	36
1992						1216	(1216)	(1823)	69
1993	862	60	1742	1076		1860	5600	5959	41
1994						2792	(2792)	(2930)	68

Table 5.1.6 Cod off West Greenland. Age disaggregate abundance indices (1000) as derived form the German survey, 1982-1994. *) calculated proportionally using age compositions reported by the ICES Working Group on Cod Stocks off East Greenland (Anon., 1984).

YEAR	0	1	2	3	4	5	6	7	8	9	10	11+	TOTAL
1982	0	176	884	33472	11368	32504	9525	2610	574	928	91	124	92256
*1983	0	0	1469	2815	26619	4960	10969	1882	992	317	168	13	50204
1984	186	5	38	2094	1541	9648	850	1983	90	201	29	0	16665
1985	890	39277	1531	898	5958	2616	7184	375	600	18	19	0	59366
1986	0	10575	114823	4374	1033	7837	2250	4167	107	449	23	35	145673
1987	0	317	45474	692566	24230	5929	11813	1637	4006	0	366	30	786368
1988	434	254	3290	101820	511473	5435	616	1134	662	1310	34	39	626501
1989	12	204	2583	7618	170469	174532	2868	0	259	40	141	5	358731
1990	158	47	1014	2900	1272	22120	6964	47	0	0	0	5	34527
1991	0	245	208	435	1260	160	2102	356	6	0	0	0	4772
1992	0	189	1473	227	48	89	0	28	0	0	0	0	2054
1993	0	10	832	546	20	28	6	0	0	0	0	0	1442
1994	0	286	45	199	38	5	0	5	0	0	0	0	578

Table 5.1.7 Cod off East Greenland. Age disaggregate abundance indices (1000) as derived from the German survey, 1982-1994. *) calculated proportionally using age compositions reported by the ICES Working Group on Cod Stocks off East Greenland (Anon., 1984). () incomplete sampling.

YEAR	0	1	2	3	4	5	6	7	8	9	10	11+	TOTAL
1982	0	0	236	837	1758	1993	1222	377	130	1370	73	87	8083
*1983	0	0	411	605	1008	1187	2125	1287	302	265	703	101	7994
(1984)	0	18	73	1339	659	1403	853	1619	408	102	36	95	6605
1985	232	1932	559	117	2496	2035	1853	779	1989	284	53	79	12408
1986	0	1398	3346	1693	550	2419	1121	2187	566	1594	116	201	15191
1987	0	13	13785	17789	3890	1027	1767	452	1562	180	1023	131	41619
1988	12	25	160	6975	11092	2011	478	1410	150	653	94	501	23561
1989	0	8	177	494	17396	63169	2990	294	4746	396	1560	498	91728
1990	0	37	79	552	463	5132	17998	265	71	238	0	411	25246
1991	0	101	374	388	697	148	3524	5046	82	37	12	20	10429
(1992)	29	29	73	69	59	54	47	143	52	0	0	25	580
1993	0	17	45	1860	370	279	278	88	263	95	0	9	3304
(1994)	0	87	0	29	261	143	87	145	0	29	0	0	781

Table 5.1.8 Cod off Greenland (total). Age disaggregate abundance indices (1000) as derived from the German survey, 1982-1994. *) calculated proportionally using age compositions reported by the ICES Working Group on Cod Stocks off East Greenland (Anon., 1984). () incomplete sampling.

YEAR	0	1	2	3	4	5	6	7	8	9	10	11+	TOTAL
1982	0	176	1120	34309	13126	34497	10747	2987	704	2298	164	211	100339
*1983	0	0	1880	3420	27627	6147	13094	3169	1294	582	871	114	58198
(1984)	186	23	111	3433	2200	11051	1703	3602	498	303	65	95	23270
1985	1122	41209	2090	1015	8454	4651	9037	1154	2589	302	72	79	71774
1986	0	11973	118169	6067	1583	10256	3371	6354	673	2043	139	236	160864
1987	0	330	59259	710355	28120	6956	13580	2089	5568	180	1389	161	827987
1988	446	279	3450	108795	522565	7446	1094	2544	812	1963	128	540	650062
1989	12	212	2760	8112	187865	237701	5858	294	5005	436	1701	503	450459
1990	158	84	1093	3452	1735	27252	24962	312	71	238	0	416	59773
1991	0	346	582	823	1957	308	5626	5402	88	37	12	20	15201
(1992)	29	218	1546	296	107	143	47	171	52	0	0	25	2634
1993	0	27	877	2406	390	307	284	88	263	95	0	9	4746
(1994)	0	373	45	228	299	148	87	150	0	29	0	0	1359

Table 5.1.9 Cod off West Greenland. Weighted mean weight (g., by stratum abundance) at age 1-10 years as derived from the German surveys, 1982, 1984-1994.

YEAR	1	2	3	4	5	6	7	8	9	10
1982	45	191	570	921	1770	2163	2962	4080	5083	7008
1983										
1984	68	137	384	799	1359	2010	2922	3611	4498	6208
1985	97	168	571	987	1481	2023	2941	3315	4531	3909
1986	74	332	504	1130	1669	2182	2696	3713	3880	4147
1987	36	223	699	925	1195	2163	2250	3035	0	3563
1988	38	218	457	1021	1148	1948	2986	2779	3711	4122
1989	36	170	454	699	1248	1192		2947	3292	5346
1990	40	115	340	598	906	1373	1111			
1991	52	142	354	659	954	1379	1768	920		
1992	80	235	371	632	935		2057			
1993	41	133	406	501	921	921				
1994	45	129	459	609	1111		2461			

Table 5.1.10 Cod off East Greenland. Weighted mean weight (g., by stratum abundance) at age 1-10 years as derived from the German surveys, 1982, 1984-1994. () Incomplete sampling.

YEAR	1	2	3	4	5	6	7	8	9	10
1982		424	770	1422	2333	3507	4607	5521	6584	6504
1983										
(1984)	104	351	801	1799	2216	3050	3892	4969	4639	5456
1985	112	438	1045	1772	3163	3374	4471	4745	5662	7851
1986	89	375	916	1717	2677	4229	4147	4960	5969	6731
1987	34	283	652	916	1747	3605	4519	5107	5988	7556
1988		278	741	1797	3089	4305	4720	6522	6908	7441
1989	68	255	530	1124	2558	3715	3958	4985	5652	6203
1990	53	424	517	1150	1636	2637	3899	5707	6735	
1991	87	195	411	1203	1896	2330	3382	4359	5186	10198
(1992)	22	416	683	1706	3175	3028	3271	3469		
1993	82	353	732	1363	2363	2860	3609	4739	6159	
(1994)	41		1111	2271	3054	4791	4827		5743	

Table 5.1.11 Cod off Greenland (total). Weighted mean weight (g., by stratum abundance) at age 1-10 years as derived from the German surveys, 1982, 1984-1994. () Incomplete sampling.

YEAR	1	2	3	4	5	6	7	8	9	10
1982	45	240	574	988	1803	2316	3169	4346	5978	6784
1983										
(1984)	96	277	547	1098	1468	2531	3358	4724	4545	5791
1985	97	240	626	1219	2217	2300	3974	4413	5594	6811
1986	75	333	619	1334	1907	2863	3195	4762	5510	6304
1987	36	237	698	923	1276	2351	2741	3616	5988	6504
1988	38	221	475	1037	1672	2978	3947	3470	4774	6560
1989	37	176	459	738	1596	2480	3958	4880	5436	6132
1990	46	138	369	746	1043	2284	3479	5707	6735	
1991	62	176	381	853	1407	1975	3276	4124	5186	10198
(1992)	72	244	443	1224	1781	3028	3072	3469		
1993	67	144	658	1319	2232	2819	3609	4739	6159	
(1994)	44	129	542	2060	2988	4791	4748		5743	

Table 5.1.12 Swept area abundance ('000) and biomass (tonnes) by stratum as observed from the Greenland trawl survey, 1993.

Abundance (1,000)

Year/Depth	0-200m	201-400m	401-600m	West Greenland Total	0-200m	201-400m	401-600m	East Greenland Total
1992	8.6	470.1	63.5	542.2	0.0	296.2	67.7	364.9
1993	15.4	236.5	56.7	308.6	0.0	142.6	0.0	142.6
1994	53.4	74.1	38.2	165.7	1294.9	212.2	10.9	1518.0

Biomass (tons)

Year/Depth	0-200m	201-400m	401-600m	West Greenland Total	0-200m	201-400m	401-600m	East Greenland Total
1992	1.7	171.2	41.0	213.9	0.0	56.3	37.8	94.1
1993	3.0	88.0	23.0	114.0	0.0	551.0	0.0	551.0
1994	12.9	26.2	16.2	55.3	343.8	18.1	0.0	361.9

Table 5.1.13 CPUE of age 2 cod by area as observed in the Greenland gill net survey in inshore areas off West Greenland, 1985-1994.

Year	Year Class	Sisimiut (Div. 1B)	Nuuk (Div. 1D)	Qaqortoq (Div. 1F)	Average
1985	83	0.00	0.03	0.00	0.01
1986	84	5.37	2.01	2.30	3.24
1987	85	1.24	0.20	1.52	0.99
1988	86	0.38	0.19	0.01	0.20
1989	87	0.98	0.82	0.06	0.62
1990	88	1.11	0.16	0.01	0.42
1991	89	0.03	0.02	0.02	0.02
1992	90	0.43	0.57	0.03	0.34
1993	91	0.01	0.22	0.01	0.08
1994	92	0.10	0.04	0.01	0.05

Table 5.2.1 Nominal catches of NAFO Sub-area 1 cod by fleet ('000) for 1983-1994.

Category	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Trawlers	42	18	7	1	1	40	73	39	2	0	0	0
Other	16	12	8	4	12	22	39	29	18	6	2	2
Total	58	30	15	5	13	62	112	68	20	6	2	2
TAC	62	68	28.5	12.5	12.5	53	90	110	90[1]	83[1]	82[1]	82[1]

[1] Combined TAC for East and West Greenland

Table 5.2.2 Nominal catch (tonnes) of Cod in NAFO Sub-area 1, 1981-1994 as officially reported to NAFO.

Country	1981	1982	1983	1984	1985	1986	1987
Faroe Islands	-	-	1.339	-	-	-	-
Germany	417	8.139	10.158	8.941	2.170	41	55
Greenland	53.039	47.693	44.970	24.457	12.651	6.549	12.284
Japan	-	-	-	13	54	11	33
Norway	-	-	-	5	1	2	1
United Kingdom	-	-	1174	-	-	-	-
Total	53.456	55.832	57.641	33.416	14.876	6.603	12.373

Country	1988	1989	1990	1991	1992 [1]	1993 [2]	1994 [3]
Faroe Islands	-	-	51	1	-	-	
Germany	6.574	12.892	7.515	96	-	-	
Greenland	52.135	92.152	58.816	20.238	5.723	1.924	2.115
Japan	10	-	-	-	-	-	
Norway	7	2	948	-	-	-	
Unied Kingdom	927	3780	1.631	-		-	
Total	59.653	108.826	68.961	20.335	5.723	1.924	2.115
WG estimate [4]	62.653	111.567	-	-			

[1]) Provisional data (NAFO SCS Doc. 93/22)
[2]) Provisional data (NAFO SCS Doc. 94/24)
[3]) Provisional data as reported to Greenland authorities.
[4]) Includes 3,000 t in 1988 and 2,741 t in 1989 reported to be from ICES Sub-area XIV.

Table 5.2.3 Nominal catch (tonnes) of cod in ICES Sub-area XIV, 1981-1994 as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Faroe Islands	292	-	368	-	-	86	-
Germany	7.367	8.940	8.238	7.035	2.006	4.063	5.358
Greenland	890	898	438	1.051	106	606	1.550
Iceland	1	-	-	-	-	-	1
Norway	-	-	-	794	-	-	-
UK (Engl. and Wales)	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-
Total	8.550	9.838	9.044	8.880	2.112	4.755	6.909
WG estimate [1]	16.000	27.000	13.378	8.914			

Country	1988	1989	1990	1991	1992	1993	1994 [6]
Faroe Islands	12	40	-	-	-	-	1
Germany	12.049	10.613	26.419	8.434	5.893	164	
Greenland	345	3.715	4.442	6.677	1.283	241	73
Iceland	9	-	-	-	22	-	-
Norway	-	-	17	828	1.030 [6]	183 [6]	43
Russia	-	-	-	-	126	-	
UK (Engl. and Wales)	-	1.158	2.365	5.832	2.532	162	
UK (Scotland)	-	135	93	29	463	46	
Unied Kingdom	-	-	-	-	-	-	296
Total	12.415	15.661	33.336	21.800	11.349	796	413
WG estimate	9.457 [2]	14.669 [3]	33.513 [4]	21.818 [5]			437 [7]

[1]) Includes estimates of discards and catches reported in Sub-area XII
[2]) Excluding 3,000 t assumed to be from NAFO Division 1F and including 42 t taken by Japan.
[3]) Excluding 2,741 t assumed to be from NAFO Division 1F and including 1,500 t reported from other areas assumed to be from Sub-area XIV and including 94 t by Japan and 155 t by Greenland (Horsted, 1994).
[4]) Includes 129 t by Japan and 48 t additional catches by Greenland (Horsted, 1994).
[5]) Includes 18 t by Japan.
[6]) Provisional data.
[7]) Includes 24 t by Germany reported to Greenland authorities.

Table 5.3.1 Inshore cod off West Greenland, NAFO Sub-area 1. Catch at age and mean weight-at-age by division, 1994.

Catch at age by division (000)

Age	1A	1B	1C	1D	1E	1F	NAFO 1
3	0,6	1,0	1,8	10,1	1,8	10,4	25,7
4	169,5	275,1	490,3	691,4	5,6	31,7	1663,6
5	31,0	50,3	89,7	167,8	2,5	13,8	355,1
6	2,7	4,3	7,7	40,3	0,3	1,8	57,1
7	0,0	0,0	0,0	2,8	0,4	2,3	5,5
8	0,0	0,0	0,0	4,6	0,2	1,0	5,8
+9	0,0	0,0	0,0	0,9	0,2	1,1	2,2
total	204	331	590	917	11	62	2115

Mean weight at age (kg) by division

Age	1B	1C	1D	1E	1F	Mean
3	0,8	0,58	0,45	0,71	0,76	0,62
4	0,77	0,67	0,91	0,77	1,31	0,88
5	1,05	0,81	1,56	1,54	1,94	1,46
6	1,62	0,82	2,35	1,7	2,62	2,27
7	2,21	2,95	2,23	2,12	3,78	2,87
8	4,2	3,21	3,07	3,31	2,85	3,04
9	4,75		3,77	3,64	6,39	5,04
10	5,72		5,76	6,39	9,27	5,86

Table 5.3.2 Inshore Cod off West Greenland. Catch at ages from 3 to 9+ years, 1982-94.

Age	3	4	5	6	7	8	9+	total
1982	7069	4430	7909	130	141	28	18	19723
1983	217	17770	1174	3535	266	105	83	23149
1984	851	5829	8423	226	282	6	5	15621
1985	0	5631	1981	1217	17	66	16	8928
1986	1895	343	2016	206	202	2	12	4677
1987	10257	1151	87	64	15	15	0	11591
1988	643	17235	127	43	9	13	8	18078
1989	0	8355	23696	140	6	1	20	32218
1990	566	3338	19043	3144	5	0	3	26098
1991	181	6957	4984	4424	159	0	0	16705
1992	75	4498	1545	137	65	6	0	6327
1993	73	804	671	181	17	5	2	1752
1994	42	1891	244	25	2	2	0	2206

Table 5.3.3 Cod off West Greenland, NAFO Sub-area 1. Catch at age from 1967 to 1994. Data 1987-92 revised according to Horsted (1994).

Year	3	4	5	6	7	8	9	10	11	12	13	14	15
1967	1727	15091	30457	61848	24562	2700	1996	5237	352	93	166	453	85
1968	3764	7976	36670	29824	34591	10005	1725	833	2348	187	37	42	303
1969	662	12399	8709	27433	14664	12411	4784	513	237	704	41	62	8
1970	49	2768	10342	6465	13985	4365	2810	1280	149	85	201	27	41
1971	272	2519	10172	9283	5237	9158	2077	1841	953	78	51	134	56
1972	51	10039	9786	12020	4081	2550	2660	624	954	709	130	57	122
1973	131	2302	16378	3065	2605	1406	1203	552	165	237	93	37	44
1974	343	1079	2384	6938	1135	1806	800	194	177	152	272	147	11
1975	275	3595	2677	1803	5855	1388	619	291	84	38	9	12	10
1976	10760	4026	2243	1216	302	1594	139	148	53	27	17	14	26
1977	634	46649	6053	1515	618	425	446	168	79	88	22	1	1
1978	287	5494	30039	1004	509	83	41	13	7	7	7	1	1
1979	286	10656	12505	18970	709	400	78	52	55	80	5	5	16
1980	2999	4513	4580	1978	8014	125	60	24	1	16	3	1	2
1981	12	16864	6374	2391	1053	3382	45	65	1	1	0	0	7
1982	1204	1210	17960	2965	2078	807	610	45	88	9	4	1	13
1983	77	12356	2011	17228	1581	995	344	343	3	22	0	2	19
1984	595	2018	10384	688	3656	106	365	97	69	0	3	0	0
1985	456	1266	1303	4915	161	750	42	140	15	8	0	0	14
1986	12	113	706	318	1193	12	332	80	13	35	0	0	0
1987	5705	1636	274	662	424	686	7	30	1	14	0	0	0
1988	839	50189	1069	501	652	524	751	21	85	0	0	0	0
1989	31	8294	74268	570	84	161	253	525	0	72	0	0	0
1990	78	3390	24749	30633	69	0	8	2	41	12	0	0	0
1991	101	5399	4748	7131	690	0	0	0	0	0	0	0	0
1992	40	3802	1711	198	117	13	1	0	0	0	0	0	0
1993	22	615	683	228	17	56	19	6	0	0	0	0	0
1994	26	1664	355	57	6	6	2	0	0	0	0	0	0

Table 5.3.4 Cod off East Greenland, ICES Sub-area XIV. Catch at age from 1965 to 1993. No update because of lack of data for 1994. Data 1987-93 revised according to Horsted (1994).

Year	2	3	4	5	6	7	8	9	10	11	12	13	14
1965	0	0	131	35	91	879	661	1484	59	27	139	29	178
1966	0	28	21	470	89	137	1071	359	418	23	3	27	36
1967	0	0	145	302	2346	564	210	1292	492	371	37	17	81
1968	0	0	104	630	502	2505	238	62	144	69	27	5	25
1969	0	0	31	252	849	770	2103	170	38	82	68	24	86
1970	0	0	66	76	500	1539	1060	1715	237	32	63	48	27
1971	0	0	25	171	159	1051	3785	1580	1326	171	19	4	14
1972	0	0	27	85	254	295	1299	3184	818	470	136	26	53
1973	0	4	25	197	126	250	82	710	959	222	72	19	7
1974	0	4	63	22	488	176	185	52	329	259	65	11	2
1975	0	57	57	339	86	783	155	82	21	66	52	16	4
1976	0	257	175	162	590	228	1546	158	116	53	13	30	2
1977	0	0	4635	1205	513	652	208	424	164	77	29	9	1
1978	0	0	427	6808	1828	188	205	111	278	130	93	56	19
1979	0	5	145	1184	4700	2755	797	121	51	18	11	1	1
1980	0	14	78	235	223	2330	695	77	9	2	5	1	6
1981	0	0	5	72	252	378	2898	231	22	9	5	5	3
1982	0	0	0	458	1335	2012	1605	2123	146	18	6	3	0
1983	0	0	104	593	2376	962	321	116	229	10	2	2	0
1984	0	14	107	368	481	1638	320	103	43	61	1	1	0
1985	0	0	34	111	242	105	196	19	12	4	4	0	0
1986	0	68	50	432	287	738	66	122	5	4	0	0	0
1987	33	765	150	61	314	154	676	58	305	12	27	0	0
1988	0	415	3868	174	41	389	50	234	10	118	23	0	0
1989	0	19	1872	6554	153	34	239	57	165	2	41	0	0
1990	0	6	32	2220	10843	121	9	106	3	42	11	0	0
1991	0	0	322	293	4463	5328	50	22	17	7	27	0	0
1992	0	2	122	255	156	2482	1172	28	4	0	1	0	0
1993	0	1	11	13	43	7	88	57	1	0	1	0	0

Table 5.3.5 Cod off Greenland, NAFO Sub-area 1 and ICES Sub-area XIV (combined). Catch at age from 1975-1993. No update because of lack of data for 1994. Data 1987-93 revised according to Horsted (1994).

Year	3	4	5	6	7	8	9	10	11	12
1975	332	3652	3016	1889	6638	1543	701	312	150	181
1976	11017	5201	2405	1806	530	3140	297	264	106	129
1977	634	51284	7258	2028	1270	633	870	332	156	151
1978	287	5921	36847	2832	697	288	152	291	137	184
1979	291	10801	13689	23670	3464	1197	199	103	73	119
1980	3013	4591	4815	2201	10344	820	137	33	3	34
1981	12	16869	6446	2643	1431	6280	276	87	10	21
1982	1204	1210	18418	4300	4090	2412	2733	191	106	15
1983	77	12460	2604	19604	2543	1316	460	572	13	24
1984	609	2125	10752	1169	5294	426	468	140	130	1
1985	456	1300	1414	5157	266	946	61	152	19	12
1986	80	163	1138	605	1931	78	454	85	17	35
1987	6470	1786	335	976	578	1362	65	335	13	41
1988	1254	54057	1243	542	1041	574	985	31	203	23
1989	50	10166	80822	723	118	400	310	690	2	113
1990	84	3422	26969	41476	190	9	114	5	83	23
1991	101	5721	5041	11594	6118	50	22	17	7	27
1992	42	3924	1966	354	2599	1185	29	4	0	1
1993	23	626	696	271	24	144	76	7	0	1

Table 5.3.6 Cod off West Greenland, NAFO Sub-area 1. Mean weight (kg)) at age in the catch from 1966 to 1994.

Year	3	4	5	6	7	8	9	10	11	12	13	14	15
1966	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1967	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1968	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1969	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1970	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1971	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1972	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1973	0.580	1.280	1.720	2.510	3.520	4.660	5.070	5.680	5.370	8.650	9.580	9.600	9.600
1974	0.650	0.990	1.680	2.770	3.840	4.720	5.340	5.340	5.480	5.390	8.700	10.190	10.740
1975	0.710	1.300	1.850	2.670	3.990	4.430	5.060	5.600	7.920	5.160	6.110	8.510	10.110
1976	0.850	1.210	2.030	2.710	3.420	4.580	4.490	5.880	7.020	6.460	5.140	9.030	12.870
1977	0.740	1.238	1.714	2.118	3.614	4.580	4.812	5.600	6.000	6.600	7.700	9.900	10.500
1978	0.650	1.150	2.180	2.890	3.690	4.580	5.060	5.600	6.000	6.600	7.700	9.000	10.500
1979	0.720	1.230	2.020	2.710	3.780	4.900	6.400	7.800	9.000	9.700	10.200	10.400	10.500
1980	0.870	1.330	2.060	3.000	4.280	5.840	6.400	7.800	9.000	9.700	10.200	10.400	10.500
1981	0.830	1.110	1.700	2.350	3.200	4.300	6.500	9.020	9.320	9.320	9.320	9.320	9.320
1982	0.830	1.110	1.700	2.350	3.200	4.300	6.500	9.020	9.320	9.320	9.320	9.320	9.320
1983	0.780	0.980	1.380	2.080	2.950	3.850	4.780	5.580	6.000	6.000	6.000	6.000	6.000
1984	0.780	0.980	1.380	2.080	2.950	3.850	4.780	5.580	6.000	6.000	6.000	6.000	6.000
1985	0.780	0.980	1.380	2.080	2.950	3.850	4.780	5.580	6.000	6.000	6.000	6.000	6.000
1986	0.660	0.980	1.790	2.240	2.430	3.080	3.620	3.170	3.170	3.170	3.170	3.170	3.170
1987	0.900	1.070	1.800	2.120	2.610	3.240	4.300	4.700	4.700	4.700	4.700	4.700	4.700
1988	0.550	1.080	1.370	2.000	2.750	3.500	3.940	4.920	4.920	4.920	-1.000	-1.000	-1.000
1989	0.520	0.720	1.270	1.670	2.310	3.710	4.210	4.670	4.070	3.120	-1.000	-1.000	-1.000
1990	0.860	0.910	1.020	1.360	2.040	2.120	2.200	2.890	3.790	7.950	-1.000	-1.000	-1.000
1991	0.780	1.030	1.120	1.160	1.610	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
1992	0.630	0.820	1.160	1.710	1.790	2.260	3.500	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
1993	0.532	0.812	1.164	1.650	1.990	2.924	3.640	6.390	-1.000	-1.000	-1.000	-1.000	-1.000
1994	0.620	0.880	1.460	2.270	2.870	3.040	5.040	5.860	-1.000	-1.000	-1.000	-1.000	-1.000

Table 5.3.7 Cod off East Greenland, ICES Sub-area XIV. Mean weight (kg) at age in the catch from 1965 to 1993. No update because of lack of data for 1994.

Year	3	4	5	6	7	8	9	10	11	12	13	14
1965	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1966	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1967	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1968	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1969	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1970	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1971	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1972	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1973	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1974	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1975	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1976	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1977	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1978	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1979	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1980	0.400	1.130	1.390	2.260	3.210	4.380	5.520	7.090	8.200	8.700	9.300	9.700
1981	0.316	0.776	1.455	1.823	2.890	4.246	5.948	8.698	9.787	12.483	13.426	13.728
1982	0.359	0.727	1.258	1.968	2.874	3.990	5.328	6.901	8.721	10.799	13.145	15.769
1983	0.352	0.700	1.273	2.158	3.071	3.713	4.680	6.234	5.350	6.806	7.555	8.304
1984	0.352	0.700	1.273	2.158	3.071	3.713	4.680	6.234	5.350	6.806	7.555	8.304
1985	0.290	0.810	1.520	2.330	3.150	3.940	4.670	5.330	5.890	6.380	6.790	-1.000
1986	0.250	0.780	1.580	2.600	3.730	4.910	6.090	7.210	8.270	9.230	10.110	11.000
1987	0.300	0.930	1.790	2.750	3.700	4.580	5.360	6.030	6.590	7.050	7.420	-1.000
1988	0.320	0.900	1.740	2.760	3.880	5.020	6.140	7.200	8.170	9.450	-1.000	-1.000
1989	0.240	0.780	1.730	3.030	3.580	4.970	5.240	6.590	7.080	9.480	-1.000	-1.000
1990	0.600	1.060	1.660	2.400	3.270	4.270	5.410	6.690	8.100	10.500	-1.000	-1.000
1991	-1.000	1.040	1.240	1.610	2.570	3.330	5.410	7.480	8.340	10.810	-1.000	-1.000
1992	1.326	1.770	1.807	2.071	2.217	3.586	4.143	7.660	-1.000	10.198	7.758	-1.000
1993	0.790	1.470	1.160	2.380	2.770	3.870	5.660	8.080	-1.000	-1.000	-1.000	-1.000

Table 5.3.8 Cod off Greenland, NAFO Sub-area 1 and ICES Sub-area XIV (combined). Mean weight (kg) at age in the catch from 1975-1993. No update because of lack of data for 1994.

Year	3	4	5	6	7	8	9	10	11	12
1975	0.830	1.110	1.693	2.312	3.195	4.258	6.216	9.059	9.383	12.371
1976	0.830	1.110	1.693	2.312	3.195	4.258	6.216	9.059	9.383	12.371
1977	0.830	1.110	1.693	2.290	3.137	3.909	5.086	6.890	8.646	8.314
1978	0.780	0.977	1.324	2.139	3.121	4.106	4.914	6.127	8.288	6.725
1979	0.770	0.905	1.375	2.128	2.866	3.822	4.088	5.038	5.840	6.380
1980	0.830	1.110	1.693	2.312	3.195	4.258	6.216	9.059	9.383	12.371
1981	0.830	1.110	1.693	2.312	3.195	4.258	6.216	9.059	9.383	12.371
1982	0.830	1.110	1.693	2.290	3.137	3.909	5.086	6.890	8.646	8.314
1983	0.780	0.977	1.324	2.139	3.121	4.106	4.914	6.127	8.288	6.725
1984	0.770	0.905	1.375	2.128	2.866	3.822	4.088	5.038	5.840	6.380
1985	0.500	0.819	1.119	1.666	2.834	3.396	4.644	4.594	6.320	7.410
1986	0.353	1.006	1.833	2.403	3.088	4.362	4.797	4.788	5.152	4.710
1987	0.834	1.056	1.789	2.321	2.939	4.107	5.936	6.969	7.903	7.534
1988	0.470	1.070	1.420	2.060	3.170	3.630	4.460	5.660	6.800	9.450
1989	0.410	0.730	1.310	1.950	2.680	4.460	4.400	5.120	7.080	5.430
1990	0.840	0.910	1.070	1.640	2.830	4.270	5.180	5.170	5.970	9.170
1991	0.780	1.030	1.130	1.340	2.460	3.330	5.410	7.480	8.340	10.810
1992	0.663	0.850	1.246	1.871	2.198	3.572	4.121	7.660	-1.000	10.198
1993	0.554	0.829	1.164	1.804	2.279	3.577	5.276	6.813	-1.000	-1.000

Table 6.1 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Sub-areas V and XIV 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Denmark	-	-	-	-	-	-	6
Faroe Islands	767	1,532	1,146	2,502	1,052	853	1,096
France	8	27	236	489	845	52	19
Germany	3,007	2,581	1,142	936	863	858	565
Greenland	+	1	5	15	81	177	154
Iceland	15,457	28,300	28,360	30,080	29,231	31,044	44,780
Norway	-	-	2	2	3	+	2
Russia	-	-	-	-	-	-	-
UK (Engl. and Wales)	-	-	-	-	-	-	-
Total	19,239	32,441	30,891	34,024	32,075	32,984	46,622
Working Group estimate	-	-	-	-	-	-	-

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Denmark	+	-	-	-	-	-	-
Faroe Islands	1,378	2,319	1,803	1,566	2,128	4,233	6,241
France	25	-	-	-	3	-	-
Germany	637	493	336	303	382	415	-
Greenland	37	11	40	66	437	289	866
Iceland	49,040	58,330	36,557	34,883	31,954	34,359	27,260
Norway	1	3	50	34	273	642	1,571
Russia	-	-	-	-	5	-	-
UK (Engl. and Wales)	-	-	27	38	127	809	597
Total	51,118	61,156	38,813	36,890	35,309	40,747	36,535
Working Group estimate [2]	-	61,936	39,326	37,950	35,487	41,247	37,187

1) Provisional data

2) Working Group estimate as in Tables 6.2-6.4

Table 6.2 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Division Vb 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Denmark	-	-	-	-	-	-	6
Faroe Islands	442	863	1,112	2,456	1,052	775	907
France	8	27	236	489	845	52	19
Germany	114	142	86	118	227	113	109
Greenland	-	-	-	-	-	-	-
Norway	2	+	2	2	2	+	2
UK (Engl. and Wales)	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-
Total	566	1,032	1,436	3,065	2,126	940	1,043
Working Group estimate	-	-	-	-	-	-	-

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Denmark	+	-	-	-	-	-	-
Faroe Islands	901	1,513	1,064	1,293	2,105	4,058	5,163
France[7]	25	...	...	...	3	...	...
Germany	42	73	43	24	71	24	-
Greenland	-	-	-	-	-	-	-
Norway	1	3	42	16	25 [1]	371 [1]	53
UK (Engl. and Wales)	-	-	-	-	1	15	-
UK (Scotland)	-	-	-	-	1	-	-
Total	969	1,589	1,149	1,333	2,206	4,468	5,216
Working Group estimate	-	1,606 [2]	1,282 [3]	1,662 [4]	2,269 [5]	-	5,224 [6]

1) Provisional data

2) Includes 17 t taken by France

3) Includes 133 t taken in Division IIa (Faroese waters).

4) Includes 317 t taken in Division IIa (Faroese waters) + France 12 t.

5) Includes 63 t taken in Division IIa (Faroese waters).

6) Includes 8 t taken by Germany as reported to Faroe Islands.

7) Quantity unknown 1989-1991 and 1993-1994.

Table 6.3 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Division Va 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Faroe Islands	325	669	33	46	-	-	15
Iceland	15,455	28,300	28,359	30,078	29,195	31,027	44,644
Norway	-	-	+	+	2	-	-
Total	15,780	28,969	28,392	30,124	29,197	31,027	44,659
Working Group estimate	-	-	-	-	-	-	-

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Faroe Islands	379	719	739	273	23	166	910
Iceland	49,000	58,330	36,557	34,883	31,954	34,340	27,192
Norway	-	-	-	-	3	-	-
Total	49,379	59,049	37,296	35,156	31,980	34,506	28,102
Working Group estimate	-	59,272 [2]	37,308 [3]	35,413 [4]	-	-	28,781 [5]

1) Provisional data

2) Includes 223 t catch by Norway.

3) Includes 12 t catch by Norway.

4) Includes additional catch of 257 t by Iceland.

5) Includes additional catches of 677 t by Iceland, 1 t by Greenland, and 1 t by Germany.

Table 6.4 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Sub-area XIV 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Faroe Islands	-	-	-	-	-	78	74
Germany	2,893	2,439	1,054	818	636	745	456
Greenland	+	1	5	15	81	177	154
Iceland	-	-	1	2	36	17	136
Norway	-	-	-	+	-	-	-
Russia	-	-	-	-	-	-	-
UK (Engl. and Wales)	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-	-
Total	2,893	2,440	1,060	835	753	1,017	820
Working Group estimate	-	-	-	-	-	-	-

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Faroe Islands	98	87	-	-	-	181	168
Germany	595	420	293	279	311	391	-
Greenland	37	11	40	66	437	288	866
Iceland	40	+	-	-	-	19	68
Norway	-	-	8	18	248 [1]	537 [1]	1,518
Russia	-	+	-	-	5	-	-
UK (Engl. and Wales)	-	-	27	38	108	796	...
UK (Scotland)	-	-	-	-	18	26	...
United Kingdom	-	-	-	-	-	-	597
Total	770	518	368	401	1,127	2,238	3,217
Working Group estimate	-	-	736 [2]	875 [3]	1,240 [4]	2,275 [5]	3,182 [6]

1) Provisional data

2) Includes 370 t catches taken by Japan

3) Includes 315 t catch taken by Japan and 159 t by other countries as reported to Greenland.

4) Indicates additional catches taken by Germany (96 t) and UK (17 t) as reported to Greenland.

5) Indicates additional catches taken by Germany (37 t), Norway (238 t), UK (182 t) and Japan (62 t) as reported to Greenland.

6) Total reported to Greenlandic authorities are used in assessment.

Table 6.5 Greenland Halibut. CPUE and total effort based on data from Icelandic trawlers.

Year	Total catch (t)	CPUE	Total effort (hr)
1985	32,075	1.00	32,075
1986	32,984	1.03	32,023
1987	46,622	1.00	46.622
1988	51,118	1.16	40,067
1989	61,396	1.13	54,332
1990	39,326	0.82	47,960
1991	37,950	0.86	44,130
1992	35,487	0.69	51,430
1993	41,247	0.61	67,618
1994	37,187	0.48	77,472

Table 6.6

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:45

Table 1 Catch numbers at age Numbers*10**-3 YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,
AGE									
5,	43,	0,	23,	29,	47,	26,	8,	10,	83,
6,	296,	34,	91,	197,	502,	158,	300,	240,	277,
7,	584,	671,	347,	1605,	1536,	580,	1140,	1611,	891,
8,	621,	1727,	1037,	2253,	2630,	1160,	2451,	2651,	2139,
9,	431,	2289,	1214,	3090,	3126,	1430,	2646,	3060,	3568,
10,	240,	834,	848,	1693,	2324,	1764,	2456,	2443,	2800,
11,	121,	420,	567,	880,	1739,	1299,	1803,	1693,	1825,
12,	86,	423,	312,	394,	849,	664,	963,	978,	1134,
13,	37,	174,	232,	246,	578,	435,	609,	424,	588,
14,	32,	120,	218,	189,	306,	252,	331,	174,	363,
15,	14,	28,	114,	147,	143,	176,	195,	37,	92,
+gp,	9,	141,	204,	125,	116,	159,	132,	47,	20,
TOTALNUM,	2514,	6861,	5207,	10848,	13896,	8103,	13034,	13368,	13780,
TONSLAND,	6045,	16578,	14349,	23616,	31252,	19239,	32441,	30888,	34024,
SOPCOF %,	100,	100,	100,	101,	99,	100,	100,	101,	99,

Table 1 Catch numbers at age Numbers*10**-3 YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,
AGE										
5,	125,	245,	182,	129,	499,	188,	289,	17,	44,	78,
6,	441,	612,	3123,	742,	1657,	463,	1225,	421,	394,	674,
7,	1018,	1033,	4863,	2068,	4485,	1513,	1797,	2023,	1881,	2204,
8,	2295,	1942,	2586,	2985,	5961,	3515,	2866,	3262,	4985,	3827,
9,	3454,	2983,	2156,	3166,	5763,	4186,	2935,	2646,	4290,	3660,
10,	2749,	3097,	3476,	2966,	3246,	3143,	2074,	3019,	2837,	2338,
11,	1452,	1683,	1847,	1848,	1601,	1224,	1130,	1962,	1527,	1721,
12,	627,	820,	1829,	1761,	1458,	959,	1072,	1278,	1401,	993,
13,	423,	550,	886,	1851,	1237,	568,	924,	509,	571,	423,
14,	137,	202,	243,	701,	506,	358,	554,	144,	135,	372,
15,	36,	59,	31,	216,	362,	137,	342,	36,	134,	169,
+gp,	46,	34,	5,	246,	145,	61,	82,	56,	14,	178,
TOTALNUM,	12803,	13260,	21227,	18679,	26920,	16315,	15290,	15373,	18213,	16637,
TONSLAND,	32075,	32984,	46622,	51118,	61396,	39326,	37950,	35487,	40840,	37188,
SOPCOF %,	103,	101,	98,	101,	100,	100,	101,	101,	101,	100,

Table 6.7

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:45

Table 2 Catch weights at age (kg) YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,
AGE									
5,	1.1570,	1.1570,	.9680,	.9110,	1.1250,	1.0710,	1.0100,	.9840,	.9420,
6,	1.5850,	1.0460,	1.1990,	.9420,	1.2830,	1.2570,	1.3680,	1.3380,	1.2750,
7,	1.7680,	1.4290,	1.4230,	1.2780,	1.4870,	1.4400,	1.6180,	1.5770,	1.5920,
8,	2.1800,	1.7940,	1.8540,	1.6760,	1.7560,	1.6600,	1.9050,	1.8480,	1.8170,
9,	2.5700,	2.2280,	2.2560,	2.0720,	2.1530,	1.9670,	2.1870,	2.1590,	2.2400,
10,	3.0180,	2.6870,	2.6070,	2.3330,	2.2790,	2.2580,	2.5160,	2.4340,	2.4610,
11,	3.7300,	3.0170,	3.0810,	2.7230,	2.4980,	2.5150,	2.7610,	2.6030,	2.8350,
12,	4.0520,	3.9140,	3.5910,	3.2970,	3.0590,	2.9500,	3.1290,	3.0340,	3.2620,
13,	4.8150,	4.0400,	4.6040,	3.9850,	3.7830,	3.4500,	3.7850,	3.7840,	3.9620,
14,	5.3480,	4.7140,	4.6950,	4.6680,	4.5070,	4.0330,	4.4750,	4.4460,	4.9360,
15,	5.7520,	5.4010,	5.1510,	4.7920,	5.1390,	4.6520,	4.9850,	4.7510,	5.2300,
+gp,	7.0940,	5.5970,	6.4500,	5.3870,	5.9830,	5.3300,	6.0880,	6.3850,	7.1920,
SOPCOFAC,	1.0024,	1.0008,	.9993,	1.0124,	.9902,	1.0024,	.9997,	1.0110,	.9937,

Table 2 Catch weights at age (kg) YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,
AGE										
5,	.9950,	1.0300,	1.0300,	1.1290,	.8420,	1.0290,	1.0010,	1.0160,	.9910,	1.1630,
6,	1.2300,	1.2380,	1.2180,	1.3040,	1.0470,	1.2100,	1.2470,	1.2560,	1.2490,	1.2540,
7,	1.6300,	1.4990,	1.5330,	1.5410,	1.4250,	1.5720,	1.4720,	1.4010,	1.4010,	1.4880,
8,	1.9510,	1.9370,	1.8240,	1.7700,	1.7270,	1.7900,	1.8100,	1.7180,	1.6850,	1.7360,
9,	2.3670,	2.3630,	2.1870,	2.2360,	2.1250,	2.1260,	2.0880,	2.0490,	1.9820,	2.1500,
10,	2.6370,	2.6310,	2.6660,	2.6830,	2.6370,	2.5360,	2.4400,	2.4360,	2.4250,	2.3520,
11,	2.8290,	2.8480,	2.9960,	3.0820,	3.2200,	3.2140,	2.9350,	2.8680,	2.9520,	2.7360,
12,	3.3530,	3.3350,	3.5950,	3.6240,	3.7330,	3.6930,	3.7370,	3.4780,	3.4290,	3.0820,
13,	4.0060,	4.0390,	4.4310,	4.3120,	4.1350,	4.4480,	4.4010,	4.5100,	4.4790,	3.6070,
14,	4.7920,	4.9250,	5.1400,	5.0980,	5.3800,	5.1970,	5.0220,	4.6810,	6.0430,	4.2420,
15,	5.2310,	5.4660,	5.7640,	5.2130,	6.5690,	5.8910,	5.9910,	6.0100,	5.8320,	5.2930,
+gp,	6.3230,	5.9850,	7.2670,	5.7640,	6.4970,	6.0490,	6.4120,	5.1280,	2.7560,	6.0870,
SOPCOFAC,	1.0258,	1.0060,	.9785,	1.0063,	.9999,	.9998,	1.0097,	1.0051,	1.0094,	1.0030,

Table 6.8

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:45

Table 5 Proportion mature at age

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,
AGE									
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0400,	.0000,
6,	.0300,	.0300,	.0300,	.0300,	.0300,	.0300,	.0500,	.0700,	.0800,
7,	.1000,	.1000,	.1000,	.1000,	.1000,	.1000,	.2000,	.1500,	.1900,
8,	.3500,	.3500,	.3500,	.3500,	.3500,	.3500,	.3300,	.2800,	.3200,
9,	.7700,	.7700,	.7700,	.7700,	.7700,	.7700,	.5000,	.3800,	.4200,
10,	.9600,	.9600,	.9600,	.9600,	.9600,	.9600,	.7000,	.6000,	.6400,
11,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.8500,	.8500,	.7500,
12,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.9400,	.9800,	.9300,
13,	1.0000,	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,
15,	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,

Table 5 Proportion mature at age

YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,
AGE										
5,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0200,	.0300,	.0300,
6,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,	.0600,	.0400,	.1200,	.1200,
7,	.2100,	.2100,	.2100,	.2100,	.2100,	.2100,	.2900,	.1100,	.2700,	.2700,
8,	.3500,	.3500,	.3500,	.3500,	.3500,	.3500,	.4800,	.2500,	.4000,	.4000,
9,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.5600,	.4700,	.4500,	.4500,
10,	.6400,	.6400,	.6400,	.6400,	.6400,	.6400,	.6200,	.6800,	.5400,	.5400,
11,	.8200,	.8200,	.8200,	.8200,	.8200,	.8200,	.8500,	.8500,	.6500,	.6500,
12,	.9600,	.9600,	.9600,	.9600,	.9600,	.9600,	1.0000,	.9600,	.7800,	.7800,
13,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.8300,	.8300,
14,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.9700,	.9700,
15,	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,

Continued

Table 6.8 Continued

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:45

Table 6 Proportion of M before Spawning

YEAR,	1976,	1977,	1978,	1979,	1980,	1981,	1982,	1983,	1984,
AGE									
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
9,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
10,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
11,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
12,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
13,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
14,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
15,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 6 Proportion of M before Spawning

YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,
AGE										
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,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
9,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
10,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
11,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
12,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
13,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
14,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
15,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 6.9

```
Lowestoft VPA Version 3.1

   9-May-95  14:05:05

Extended Survivors Analysis

Greenland halibut in (run: XSARES95/GRH)

CPUE data from file /users/fish/ifad/ifapwork/wg_109/ghl_grn/FLEET.GRH

Catch data for  19 years. 1976 to 1994. Ages  5 to  16.

     Fleet,            First, Last, First, Last, Alpha,  Beta
                     ,   year, year,  age ,  age
FLT02: TRW CPU       ,   1985, 1994,    7,    14,   .000,  1.000


Time series weights :

     Tapered time weighting applied
     Power =    3 over  20 years


Catchability analysis :

     Catchability dependent on stock size for ages <    7

        Regression type = C
        Minimum of   5 points used for regression
        Survivor estimates shrunk to the population mean for ages <  7


     Catchability independent of age for ages >=   13


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   14 iterations
```

Continued

Table 6.9 Continued

Regression weights

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

Fishing mortalities

Age,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994
5,	.003,	.006,	.005,	.004,	.018,	.006,	.012,	.001,	.002,	.003
6,	.018,	.018,	.096,	.026,	.069,	.019,	.047,	.021,	.020,	.027
7,	.054,	.051,	.183,	.081,	.204,	.079,	.093,	.097,	.114,	.140
8,	.130,	.130,	.166,	.154,	.333,	.230,	.199,	.230,	.346,	.336
9,	.230,	.235,	.198,	.298,	.468,	.389,	.289,	.270,	.503,	.436
10,	.265,	.314,	.445,	.431,	.533,	.476,	.319,	.512,	.487,	.534
11,	.277,	.243,	.296,	.424,	.412,	.369,	.294,	.534,	.499,	.584
12,	.315,	.235,	.427,	.480,	.662,	.439,	.605,	.595,	.879,	.671
13,	.751,	.473,	.405,	.984,	.699,	.554,	.959,	.613,	.549,	.682
14,	.537,	.970,	.372,	.613,	.758,	.416,	1.822,	.344,	.302,	.807
15,	.431,	.440,	.345,	.627,	.709,	.442,	.849,	.497,	.587,	.718

Continued

Table 6.9 Continued

XSA population numbers (Thousands)

YEAR	AGE 5	6	7	8	9	10	11	12	13
1985	4.33E+04	2.63E+04	2.10E+04	2.03E+04	1.81E+04	1.27E+04	6.47E+03	2.50E+03	8.63E+02	3.55E+02,
1986	4.28E+04	3.71E+04	2.22E+04	1.71E+04	1.53E+04	1.24E+04	8.41E+03	4.22E+03	1.57E+03	3.51E+02,
1987	3.65E+04	3.66E+04	3.14E+04	1.82E+04	1.29E+04	1.04E+04	7.78E+03	5.67E+03	2.87E+03	8.43E+02,
1988	3.12E+04	3.13E+04	2.86E+04	2.25E+04	1.33E+04	9.13E+03	5.76E+03	4.98E+03	3.19E+03	1.65E+03,
1989	3.06E+04	2.68E+04	2.62E+04	2.27E+04	1.66E+04	8.47E+03	5.11E+03	3.24E+03	2.65E+03	1.03E+03,
1990	3.35E+04	2.59E+04	2.15E+04	1.84E+04	1.40E+04	8.95E+03	4.28E+03	2.91E+03	1.44E+03	1.13E+03,
1991	2.62E+04	2.86E+04	2.18E+04	1.71E+04	1.26E+04	8.18E+03	4.78E+03	2.55E+03	1.62E+03	7.12E+02,
1992	2.51E+04	2.23E+04	2.35E+04	1.71E+04	1.21E+04	8.12E+03	5.11E+03	3.07E+03	1.20E+03	5.33E+02,
1993	3.14E+04	2.16E+04	1.88E+04	1.84E+04	1.17E+04	7.93E+03	4.19E+03	2.58E+03	1.46E+03	5.59E+02,
1994	2.89E+04	2.70E+04	1.82E+04	1.44E+04	1.12E+04	6.10E+03	4.19E+03	2.19E+03	9.23E+02	7.24E+02,

Estimated population abundance at 1st Jan 1995

, .00E+00, 2.48E+04, 2.26E+04, 1.36E+04, 8.88E+03, 6.22E+03, 3.08E+03, 2.01E+03, 9.63E+02, 4.02E+02,

Taper weighted geometric mean of the VPA populations:

, 3.21E+04, 2.79E+04, 2.33E+04, 1.87E+04, 1.35E+04, 8.66E+03, 5.08E+03, 2.92E+03, 1.49E+03, 6.79E+02,

Standard error of the weighted Log(VPA populations) :

, .1682, .1737, .1755, .1633, .1803, .2206, .2482, .3262, .4262, .4574,

YEAR	AGE 15
1985	1.11E+02,
1986	1.79E+02,
1987	1.14E+02,
1988	5.00E+02,
1989	7.68E+02,
1990	4.14E+02,
1991	6.44E+02,
1992	9.91E+01,
1993	3.25E+02,
1994	3.56E+02,

Estimated population abundance at 1st Jan 1995

, 2.78E+02,

Taper weighted geometric mean of the VPA populations:

, 2.79E+02,

Standard error of the weighted Log(VPA populations) :

, .7382,

Continued

Table 6.9 Continued

Log catchability residuals.

Fleet : FLT02: TRW CPU

Age	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
7	-.24	-.28	.61	-.14	.57	-.24	.13	-.11	-.22	-.10
8	-.11	-.11	-.24	-.26	.30	.07	.13	-.01	.13	.02
9	.07	.09	-.46	.00	.25	.20	.11	-.24	.10	-.12
10	-.08	.10	.07	.09	.10	.12	-.08	.11	-.21	-.20
11	.07	-.06	-.24	.18	-.05	-.03	-.06	.26	-.08	-.01
12	-.08	-.37	-.15	.02	.13	-.14	.38	.08	.20	-.15
13	.55	.09	-.44	.50	-.04	-.14	.61	-.12	-.50	-.37
14	.22	.81	-.52	.03	.04	-.43	1.24	-.69	-1.10	-.20

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

Age	7	8	9	10	11	12	13	14
Mean Log q	-13.0693	-12.3112	-11.9175	-11.6363	-11.7403	-11.4561	-11.2262	-11.2262
S.E(Log q)	.3316	.1754	.2162	.1340	.1408	.2160	.4134	.7140

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
7	.45	2.276	11.40	.70	10	.12	-13.07
8	1.00	.009	12.30	.39	10	.19	-12.31
9	.61	1.389	10.97	.63	10	.12	-11.92
10	.78	1.387	11.07	.84	10	.10	-11.64
11	1.11	-.474	12.09	.72	10	.16	-11.74
12	1.31	-1.005	12.51	.59	10	.28	-11.46
13	.93	.210	10.97	.58	10	.41	-11.23
14	1.22	-.328	12.33	.24	10	.91	-11.31

Continued

Table 6.9 Continued

```
Fleet disaggregated estimates of survivors :

Age  5   Catchability dependent on age and year class strength

Year class = 1989

FLT02: TRW CPU
        Age,          5,
  Survivors,          0.,
Raw Weights,       .000,



Fleet,                  Estimated,    Int,        Ext,     Var,     N, Scaled,  Estimated
      ,                 Survivors,    s.e,        s.e,     Ratio,     , Weights,     F
FLT02: TRW CPU      ,         1.,     .000,       .000,     .00,     0,  .000,      .000

  P shrinkage mean  ,      27858.,     .17,,,,                              .892,      .003

  F shrinkage mean  ,       9473.,     .50,,,,                              .108,      .008

Weighted prediction :

Survivors,          Int,       Ext,     N,     Var,      F
at end of year,     s.e,       s.e,       ,    Ratio,
    24804.,         .16,     10.12,     2,   61.718,    .003
```

Table 6.9 Continued

```
Age  6   Catchability dependent on age and year class strength

Year class = 1988

FLT02: TRW CPU
       Age,          6,          5,
  Survivors,         0.,         0.,
Raw Weights,       .000,       .000,



Fleet,                  Estimated,    Int,       Ext,    Var,    N, Scaled,  Estimated
      ,                 Survivors,    s.e,       s.e,    Ratio,   , Weights,    F
FLT02: TRW CPU      ,         1.,    .000,       .000,    .00,   0,  .000,     .000

  P shrinkage mean  ,     23346.,    .18,,,,                          .890,     .026

  F shrinkage mean  ,     17415.,    .50,,,,                          .110,     .035

Weighted prediction :

Survivors,        Int,      Ext,    N,    Var,     F
at end of year,   s.e,      s.e,     ,   Ratio,
    22607.,       .17,    10.03,    2,  60.549,   .027
```

Continued

Table 6.9 Continued

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

Year class = 1987

FLT02: TRW CPU
        Age,          7,          6,          5,
  Survivors,    12323.,          0.,          0.,
Raw Weights,     7.139,       .000,       .000,



Fleet,                  Estimated,    Int,       Ext,    Var,     N, Scaled,  Estimated
                        Survivors,    s.e,       s.e,    Ratio,     , Weights,    F
FLT02: TRW CPU      ,     12323.,    .349,       .000,     .00,   1,  .641,     .154

  F shrinkage mean  ,     16380.,    .50,,,,                             .359,     .118

Weighted prediction :

Survivors,        Int,       Ext,     N,     Var,      F
at end of year,   s.e,       s.e,       ,    Ratio,
    13649.,       .29,       .17,     2,     .595,    .140
```

Continued

Table 6.9 Continued

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

Year class = 1986

FLT02: TRW CPU

Age,	8,	7,	6,	5,
Survivors,	9029.,	7095.,	0.,	0.,
Raw Weights,	7.937,	5.229,	.000,	.000,

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT02: TRW CPU ,	8205.,	.228,	.118,	.52,	2,	.767,	.360
F shrinkage mean ,	11520.,	.50,,,,				.233,	.269

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
8880.,	.21,	.14,	3,	.652,	.336

Continued

Table 6.9 Continued

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

Year class = 1985

FLT02: TRW CPU
        Age,        9,        8,        7,        6,        5,
  Survivors,   5519.,    7051.,    5576.,       0.,       0.,
Raw Weights,   7.188,    5.082,    3.397,     .000,     .000,



Fleet,                  Estimated,    Int,      Ext,    Var,    N, Scaled,  Estimated
,                       Survivors,    s.e,      s.e,    Ratio,   , Weights,    F
FLT02: TRW CPU      ,       5989.,   .185,      .080,    .43,   3,  .797,     .449

  F shrinkage mean  ,       7219.,   .50,,,,                          .203,     .386

Weighted prediction :

Survivors,        Int,      Ext,    N,    Var,     F
at end of year,   s.e,      s.e,     ,    Ratio,
     6221.,       .18,      .08,    4,    .425,    .436
```

Continued

Table 6.9 Continued

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

Year class = 1984

FLT02: TRW CPU

Age,	10,	9,	8,	7,	6,	5,
Survivors,	2521.,	3407.,	3048.,	3487.,	0.,	0.,
Raw Weights,	6.517,	3.941,	3.123,	2.088,	.000,	.000,

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT02: TRW CPU ,	2949.,	.164,	.081,	.49,	4,	.797,	.551
F shrinkage mean ,	3635.,	.50,,,,				.203,	.468

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
3077.,	.17,	.08,	5,	.471,	.534

Continued

Table 6.9 Continued

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

Year class = 1983

FLT02: TRW CPU
       Age,       11,
 Survivors,   2002.,
Raw Weights,  6.198,


       Age,       10,        9,        8,        7,        6,        5,
 Survivors,   1631.,   1577.,   2288.,   1583.,      0.,      0.,
Raw Weights,  3.807,   2.899,   2.359,   1.588,   .000,   .000,



Fleet,                 Estimated,   Int,      Ext,    Var,     N, Scaled,  Estimated
,                      Survivors,   s.e,      s.e,    Ratio,   , Weights,    F
FLT02: TRW CPU    ,      1828.,    .149,     .068,    .46,    5,  .808,     .628

  F shrinkage mean  ,      3027.,    .50,,,,                        .192,     .424

Weighted prediction :

Survivors,      Int,      Ext,     N,    Var,     F
at end of year, s.e,      s.e,     ,     Ratio,
     2014.,     .15,      .11,     6,    .733,    .584
```

Continued

Table 6.9 Continued

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

Year class = 1982

FLT02: TRW CPU

Age,	12,	11,
Survivors,	827.,	887.,
Raw Weights,	5.677,	3.445,

Age,	10,	9,	8,	7,	6,	5,
Survivors,	1077.,	1070.,	1033.,	1706.,	0.,	0.,
Raw Weights,	2.059,	1.531,	1.200,	.706,	.000,	.000,

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT02: TRW CPU	946.,	.149,	.077,	.51,	6,	.785,	.680
F shrinkage mean	1027.,	.50,,,,				.215,	.640

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N,	Var, Ratio,	F
963.,	.16,	.06,	7,	.402,	.671

Continued

Table 6.9 Continued

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

Year class = 1981

FLT02: TRW CPU

Age,	13,	12,	11,
Survivors,	278.,	488.,	520.,
Raw Weights,	2.672,	2.332,	1.364,

Age,	10,	9,	8,	7,	6,	5,
Survivors,	372.,	490.,	544.,	349.,	0.,	0.,
Raw Weights,	.984,	.658,	.461,	.303,	.000,	.000,

Fleet, ,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N, ,	Scaled, Weights,	Estimated F
FLT02: TRW CPU ,	401.,	.168,	.108,	.65,	7,	.687,	.683
F shrinkage mean ,	404.,	.50,,,,				.313,	.679

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
402.,	.19,	.08,	8,	.428,	.682

Continued

Table 6.9 Continued

Age 14 Catchability constant w.r.t. time and age (fixed at the value for age) 13

Year class = 1980

FLT02: TRW CPU						
Age,	14,	13,	12,	11,		
Survivors,	228.,	168.,	302.,	263.,		
Raw Weights,	.790,	1.361,	1.574,	1.165,		
Age,	10,	9,	8,	7,	6,	5,
Survivors,	313.,	357.,	215.,	513.,	0.,	0.,
Raw Weights,	.714,	.437,	.361,	.212,	.000,	.000,

Fleet,	Estimated, Survivors,	Int, s.e,	Ext, s.e,	Var, Ratio,	N,	Scaled, Weights,	Estimated F
FLT02: TRW CPU ,	256.,	.161,	.102,	.64,	8,	.623,	.853
F shrinkage mean ,	319.,	.50,,,,				.377,	.734

Weighted prediction :

Survivors, at end of year,	Int, s.e,	Ext, s.e,	N, ,	Var, Ratio,	F
278.,	.21,	.09,	9,	.418,	.807

Continued

Table 6.9 Continued

```
Age 15   Catchability constant w.r.t. time and age (fixed at the value for age) 13

Year class = 1979

FLT02: TRW CPU
        Age,        15,        14,        13,        12,        11,
  Survivors,        0.,       50.,      132.,      218.,      145.,
Raw Weights,      .000,      .638,     1.029,     1.174,      .801,

        Age,        10,         9,         8,         7,         6,         5,
  Survivors,      164.,      150.,      118.,      113.,        0.,        0.,
Raw Weights,      .459,      .329,      .265,      .174,      .000,      .000,


Fleet,                  Estimated,    Int,       Ext,     Var,     N, Scaled,  Estimated
      ,                 Survivors,    s.e,       s.e,     Ratio,     , Weights,     F
FLT02: TRW CPU      ,       135.,    .167,      .166,     1.00,    8,  .549,      .769

  F shrinkage mean  ,       168.,    .50,,,,                              .451,      .660

Weighted prediction :

Survivors,        Int,       Ext,     N,     Var,      F
at end of year,   s.e,       s.e,       ,    Ratio,
      149.,       .24,       .13,     9,     .517,    .718
```

Continued

Table 6.9 Continued

FLT02: TRW CPU

CPUE adjusted to start of year

	AGE								
YEAR	5,	6,	7,	8,	9,	10,	11,	12,	13,	14,
1985	.0000E+00,	.0000E+00,	.3495E-01,	.8172E-01,	.1290E+00,	.1043E+00,	.5541E-01,	.2435E-01,	.1993E-01,	.5883E-02,
1986	.0000E+00,	.0000E+00,	.3549E-01,	.6930E-01,	.1118E+00,	.1205E+00,	.6334E-01,	.3075E-01,	.2300E-01,	.1045E-01,
1987	.0000E+00,	.0000E+00,	.1222E+00,	.6450E-01,	.5459E-01,	.9860E-01,	.4895E-01,	.5147E-01,	.2468E-01,	.6670E-02,
1988	.0000E+00,	.0000E+00,	.5237E-01,	.7827E-01,	.8880E-01,	.8841E-01,	.5492E-01,	.5367E-01,	.6996E-01,	.2266E-01,
1989	.0000E+00,	.0000E+00,	.9812E-01,	.1385E+00,	.1424E+00,	.8254E-01,	.3857E-01,	.3924E-01,	.3382E-01,	.1419E-01,
1990	.0000E+00,	.0000E+00,	.3565E-01,	.8899E-01,	.1140E+00,	.8905E-01,	.3304E-01,	.2672E-01,	.1666E-01,	.9873E-02,
1991	.0000E+00,	.0000E+00,	.5216E-01,	.8750E-01,	.9346E-01,	.6697E-01,	.3606E-01,	.3933E-01,	.3943E-01,	.3274E-01,
1992	.0000E+00,	.0000E+00,	.4444E-01,	.7630E-01,	.6305E-01,	.8033E-01,	.5271E-01,	.3528E-01,	.1416E-01,	.3551E-02,
1993	.0000E+00,	.0000E+00,	.3169E-01,	.9364E-01,	.8649E-01,	.5680E-01,	.3074E-01,	.3322E-01,	.1175E-01,	.2484E-02,
1994	.0000E+00,	.0000E+00,	.3472E-01,	.6610E-01,	.6613E-01,	.4414E-01,	.3322E-01,	.1991E-01,	.8520E-02,	.7904E-02,

	AGE
YEAR	15,
1985	.0000E+00,
1986	.0000E+00,
1987	.0000E+00,
1988	.0000E+00,
1989	.0000E+00,
1990	.0000E+00,
1991	.0000E+00,
1992	.0000E+00,
1993	.0000E+00,
1994	.0000E+00,

Table 6.10

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:27

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,
AGE									
5,	.0018,	.0000,	.0009,	.0009,	.0013,	.0007,	.0003,	.0004,	.0029,
6,	.0153,	.0017,	.0044,	.0091,	.0187,	.0049,	.0096,	.0090,	.0122,
7,	.0426,	.0415,	.0198,	.0940,	.0865,	.0257,	.0422,	.0621,	.0399,
8,	.0688,	.1619,	.0791,	.1636,	.2077,	.0826,	.1366,	.1240,	.1041,
9,	.0857,	.3640,	.1549,	.3353,	.3375,	.1576,	.2592,	.2387,	.2311,
10,	.0803,	.2245,	.2095,	.3168,	.4278,	.3055,	.4165,	.3818,	.3377,
11,	.0671,	.1864,	.2217,	.3299,	.5885,	.4257,	.5521,	.5340,	.5168,
12,	.0597,	.3312,	.1946,	.2236,	.5764,	.4392,	.6108,	.6243,	.7968,
13,	.0421,	.1561,	.2879,	.2191,	.5571,	.6238,	.8858,	.5633,	.9303,
14,	.1747,	.1767,	.2822,	.3795,	.4370,	.4743,	1.4508,	.6405,	1.3962,
15,	.0849,	.2157,	.2400,	.2950,	.5203,	.4561,	.7890,	.5521,	.8015,
+gp,	.0849,	.2157,	.2400,	.2950,	.5203,	.4561,	.7890,	.5521,	.8015,
FBAR 8-12,	.0723,	.2536,	.1720,	.2738,	.4276,	.2821,	.3950,	.3806,	.3973,

Table 8 Fishing mortality (F) at age YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	FBAR 92-94
AGE											
5,	.0031,	.0062,	.0054,	.0045,	.0177,	.0061,	.0119,	.0007,	.0015,	.0029,	.0017,
6,	.0182,	.0179,	.0965,	.0259,	.0690,	.0195,	.0472,	.0206,	.0198,	.0273,	.0226,
7,	.0537,	.0514,	.1827,	.0811,	.2036,	.0788,	.0929,	.0974,	.1141,	.1396,	.1170,
8,	.1299,	.1304,	.1664,	.1542,	.3326,	.2302,	.1991,	.2299,	.3464,	.3364,	.3042,
9,	.2303,	.2351,	.1981,	.2977,	.4685,	.3886,	.2892,	.2696,	.5026,	.4356,	.4026,
10,	.2650,	.3145,	.4445,	.4310,	.5329,	.4759,	.3193,	.5120,	.4870,	.5335,	.5108,
11,	.2771,	.2431,	.2958,	.4243,	.4123,	.3687,	.2938,	.5335,	.4991,	.5838,	.5388,
12,	.3148,	.2351,	.4268,	.4801,	.6624,	.4388,	.6046,	.5955,	.8791,	.6714,	.7154,
13,	.7510,	.4734,	.4046,	.9835,	.6989,	.5538,	.9586,	.6127,	.5490,	.6816,	.6145,
14,	.5372,	.9699,	.3722,	.6132,	.7585,	.4158,	1.8225,	.3441,	.3018,	.8068,	.4842,
15,	.4312,	.4398,	.3453,	.6268,	.7089,	.4417,	.8490,	.4970,	.5871,	.7183,	.6008,
+gp,	.4312,	.4398,	.3453,	.6268,	.7089,	.4417,	.8490,	.4970,	.5871,	.7183,	
FBAR 8-12,	.2434,	.2316,	.3063,	.3575,	.4818,	.3804,	.3412,	.4281,	.5428,	.5121,	

Table 6.11

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:28

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,
AGE									
5,	25835,	26156,	27228,	33951,	40346,	39338,	33446,	28686,	30665,
6,	21006,	22196,	22513,	23414,	29195,	34683,	33835,	28780,	24681,
7,	15099,	17805,	19073,	19292,	19970,	24662,	29705,	28843,	24549,
8,	10064,	12454,	14703,	16094,	15116,	15763,	20689,	24510,	23331,
9,	5658,	8086,	9117,	11693,	11762,	10571,	12491,	15533,	18636,
10,	3352,	4470,	4836,	6721,	7197,	7224,	7772,	8296,	10531,
11,	2010,	2662,	3073,	3376,	4214,	4039,	4581,	4410,	4874,
12,	1601,	1617,	1902,	2119,	2089,	2014,	2271,	2270,	2225,
13,	967,	1298,	1000,	1348,	1459,	1010,	1117,	1061,	1047,
14,	215,	798,	956,	645,	932,	719,	466,	397,	520,
15,	185,	156,	576,	620,	380,	518,	385,	94,	180,
+gp,	119,	781,	1026,	525,	306,	465,	258,	118,	39,
TOTAL,	86110,	98479,	106002,	119797,	132965,	141005,	147016,	143000,	141277,

Table 10 Stock number at age (start of year) Numbers*10**-3												
YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,	1995,	GMST 76-92
AGE												
5,	43283,	42795,	36549,	31249,	30576,	33465,	26225,	25124,	31408,	28902,	0,	32137,
6,	26316,	37138,	36607,	31289,	26776,	25854,	28629,	22304,	21609,	26992,	24804,	27510,
7,	20986,	22241,	31397,	28610,	26243,	21509,	21823,	23505,	18807,	18233,	22607,	22831,
8,	20303,	17118,	18185,	22512,	22707,	18426,	17110,	17116,	18354,	14442,	13649,	17576,
9,	18097,	15345,	12932,	13253,	16607,	14013,	12599,	12068,	11706,	11172,	8880,	12365,
10,	12730,	12372,	10440,	9131,	8470,	8947,	8178,	8121,	7932,	6095,	6221,	7745,
11,	6466,	8407,	7775,	5761,	5107,	4278,	4785,	5115,	4189,	4195,	3077,	4487,
12,	2502,	4218,	5674,	4979,	3244,	2910,	2547,	3070,	2582,	2189,	2014,	2597,
13,	863,	1572,	2870,	3187,	2651,	1440,	1615,	1198,	1457,	923,	963,	1394,
14,	355,	351,	843,	1648,	1026,	1134,	712,	533,	559,	724,	402,	641,
15,	111,	179,	114,	500,	768,	414,	644,	99,	325,	356,	278,	275,
+gp,	141,	102,	18,	564,	305,	183,	153,	153,	34,	371,	305,	
TOTAL,	152153,	161839,	163406,	152684,	144480,	132574,	125020,	118405,	118959,	114594,	83199,	

Table 6.12

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:28

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,
AGE									
5,	0,	0,	0,	0,	0,	0,	0,	1129,	0,
6,	999,	697,	810,	662,	1124,	1308,	2314,	2696,	2517,
7,	2669,	2544,	2714,	2466,	2969,	3551,	9613,	6823,	7425,
8,	7679,	7820,	9541,	9441,	9290,	9158,	13006,	12682,	13566,
9,	11196,	13872,	15837,	18655,	19500,	16010,	13659,	12744,	17533,
10,	9712,	11530,	12103,	15052,	15746,	15659,	13687,	12116,	16586,
11,	7496,	8033,	9469,	9192,	10526,	10157,	10751,	9758,	10364,
12,	6486,	6330,	6830,	6987,	6390,	5940,	6679,	6750,	6751,
13,	4658,	5243,	4602,	5370,	5518,	3486,	4228,	4015,	4147,
14,	1151,	3764,	4487,	3012,	4199,	2900,	2085,	1763,	2567,
15,	1066,	840,	2966,	2973,	1953,	2410,	1920,	447,	941,
+gp,	844,	4369,	6621,	2828,	1830,	2478,	1571,	757,	278,
TOTSPBIO,	53955,	65041,	75979,	76637,	79045,	73057,	79514,	71680,	82676,

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

YEAR,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	1994,
AGE										
5,	431,	441,	376,	353,	257,	344,	263,	511,	934,	1008,
6,	1942,	2759,	2675,	2448,	1682,	1877,	2142,	1121,	3239,	4062,
7,	7184,	7001,	10108,	9259,	7853,	7101,	9316,	3622,	7114,	7325,
8,	13864,	11605,	11609,	13946,	13725,	11544,	14865,	7351,	12370,	10028,
9,	19704,	16680,	13010,	13631,	16233,	13705,	14731,	11621,	10440,	10809,
10,	21485,	20832,	17814,	15679,	14294,	14522,	12372,	13452,	10387,	7741,
11,	15000,	19633,	19101,	14560,	13485,	11276,	11937,	12469,	8038,	7460,
12,	8054,	13506,	19583,	17321,	11627,	10318,	9518,	10251,	6906,	5262,
13,	3459,	6349,	12717,	13743,	10963,	6404,	7109,	5401,	5416,	2762,
14,	1703,	1727,	4332,	8403,	5520,	5896,	3577,	2496,	3274,	2980,
15,	580,	977,	660,	2606,	5047,	2436,	3860,	595,	1897,	1882,
+gp,	889,	613,	133,	3254,	1980,	1107,	979,	785,	93,	2257,
TOTSPBIO,	94294,	102123,	112120,	115202,	102667,	86529,	90669,	69674,	70107,	63577,

Continued

Table 6.12 Continued

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:28

Table 16 Summary (without SOP correction)

Terminal Fs derived using XSA (With F shrinkage)

	RECRUITS, Age 5	TOTALBIO,	TOTSPBIO,	LANDINGS,	YIELD/SSB,	FBAR 8-12,
1976,	25835,	158175,	53955,	6045,	.1120,	.0723,
1977,	26156,	159870,	65041,	16578,	.2549,	.2536,
1978,	27228,	175898,	75979,	14349,	.1889,	.1720,
1979,	33951,	174882,	76637,	23616,	.3082,	.2738,
1980,	40346,	211228,	79045,	31252,	.3954,	.4276,
1981,	39338,	211882,	73057,	19239,	.2633,	.2821,
1982,	33446,	243971,	79514,	32441,	.4080,	.3950,
1983,	28686,	236594,	71680,	30888,	.4309,	.3806,
1984,	30665,	238500,	82676,	34024,	.4115,	.3973,
1985,	43283,	258971,	94294,	32075,	.3402,	.2434,
1986,	42795,	273041,	102123,	32984,	.3230,	.2316,
1987,	36549,	281187,	112120,	46622,	.4158,	.3063,
1988,	31249,	277952,	115202,	51118,	.4437,	.3575,
1989,	30576,	240081,	102667,	61396,	.5980,	.4818,
1990,	33465,	225339,	86529,	39326,	.4545,	.3804,
1991,	26225,	210391,	90669,	37950,	.4186,	.3412,
1992,	25124,	195008,	69674,	35487,	.5093,	.4281,
1993,	31408,	190933,	70107,	40840,	.5825,	.5428,
1994,	28902,	186781,	63577,	37188,	.5849,	.5121,
Arith. Mean ,	32380,	218457,	82344,	32811,	.3918,	.3410,
Units,	(Thousands),	(Tonnes),	(Tonnes),	(Tonnes),		

Continued

Table 6.12 Continued

Run title : Greenland halibut in (run: XSARES95/GRH)

At 9-May-95 14:05:28

Table 17 Summary (with SOP correction)

Terminal Fs derived using XSA (With F shrinkage)

	RECRUITS, Age 5	TOTALBIO,	TOTSPBIO,	LANDINGS,	YIELD/SSB,	SOPCOFAC,	FBAR 8-12,
1976,	25835,	158551,	54083,	6045,	.1118,	1.0024,	.0723,
1977,	26156,	159992,	65091,	16578,	.2547,	1.0008,	.2536,
1978,	27228,	175773,	75925,	14349,	.1890,	.9993,	.1720,
1979,	33951,	177048,	77586,	23616,	.3044,	1.0124,	.2738,
1980,	40346,	209155,	78270,	31252,	.3993,	.9902,	.4276,
1981,	39338,	212398,	73235,	19239,	.2627,	1.0024,	.2821,
1982,	33446,	243892,	79488,	32441,	.4081,	.9997,	.3950,
1983,	28686,	239201,	72469,	30888,	.4262,	1.0110,	.3806,
1984,	30665,	237003,	82157,	34024,	.4141,	.9937,	.3973,
1985,	43283,	265649,	96725,	32075,	.3316,	1.0258,	.2434,
1986,	42795,	274679,	102735,	32984,	.3211,	1.0060,	.2316,
1987,	36549,	275155,	109714,	46622,	.4249,	.9785,	.3063,
1988,	31249,	279708,	115930,	51118,	.4409,	1.0063,	.3575,
1989,	30576,	240057,	102657,	61396,	.5981,	.9999,	.4818,
1990,	33465,	225301,	86515,	39326,	.4546,	.9998,	.3804,
1991,	26225,	212437,	91551,	37950,	.4145,	1.0097,	.3412,
1992,	25124,	196011,	70033,	35487,	.5067,	1.0051,	.4281,
1993,	31408,	192734,	70768,	40840,	.5771,	1.0094,	.5428,
1994,	28902,	187335,	63765,	37188,	.5832,	1.0030,	.5121,
Arith. Mean ,	32380,	219057,	82563,	32811,	.3907		.3410,
Units,	(Thousands),	(Tonnes),	(Tonnes),	(Tonnes),			

Greenland halibut in the Iceland and Faroes Grounds and East Green

Prediction with management option table: Input data

Year: 1995								
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
5	33500.000	0.1500	0.0300	0.0000	0.0000	1.057	0.0029	1.057
6	24804.000	0.1500	0.1200	0.0000	0.0000	1.253	0.0273	1.253
7	22607.000	0.1500	0.2700	0.0000	0.0000	1.430	0.1336	1.430
8	13649.000	0.1500	0.4000	0.0000	0.0000	1.713	0.3364	1.713
9	8880.000	0.1500	0.4500	0.0000	0.0000	2.060	0.4356	2.060
10	6221.000	0.1500	0.5400	0.0000	0.0000	2.404	0.5335	2.404
11	3077.000	0.1500	0.6500	0.0000	0.0000	2.852	0.5838	2.852
12	2014.000	0.1500	0.7800	0.0000	0.0000	3.330	0.6714	3.330
13	963.000	0.1500	0.8300	0.0000	0.0000	4.199	0.7315	4.199
14	402.000	0.1500	0.9700	0.0000	0.0000	4.989	0.7315	4.989
15	278.000	0.1500	1.0000	0.0000	0.0000	5.712	0.7315	5.712
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1996								
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
5	33500.000	0.1500	0.0300	0.0000	0.0000	1.057	0.0029	1.057
6	.	0.1500	0.1200	0.0000	0.0000	1.253	0.0273	1.253
7	.	0.1500	0.2700	0.0000	0.0000	1.430	0.1336	1.430
8	.	0.1500	0.4000	0.0000	0.0000	1.713	0.3364	1.713
9	.	0.1500	0.4500	0.0000	0.0000	2.060	0.4356	2.060
10	.	0.1500	0.5400	0.0000	0.0000	2.404	0.5335	2.404
11	.	0.1500	0.6500	0.0000	0.0000	2.852	0.5838	2.852
12	.	0.1500	0.7800	0.0000	0.0000	3.330	0.6714	3.330
13	.	0.1500	0.8300	0.0000	0.0000	4.199	0.7315	4.199
14	.	0.1500	0.9700	0.0000	0.0000	4.989	0.7315	4.989
15	.	0.1500	1.0000	0.0000	0.0000	5.712	0.7315	5.712
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
5	33500.000	0.1500	0.0300	0.0000	0.0000	1.057	0.0029	1.057
6	.	0.1500	0.1200	0.0000	0.0000	1.253	0.0273	1.253
7	.	0.1500	0.2700	0.0000	0.0000	1.430	0.1336	1.430
8	.	0.1500	0.4000	0.0000	0.0000	1.713	0.3364	1.713
9	.	0.1500	0.4500	0.0000	0.0000	2.060	0.4356	2.060
10	.	0.1500	0.5400	0.0000	0.0000	2.404	0.5335	2.404
11	.	0.1500	0.6500	0.0000	0.0000	2.852	0.5838	2.852
12	.	0.1500	0.7800	0.0000	0.0000	3.330	0.6714	3.330
13	.	0.1500	0.8300	0.0000	0.0000	4.199	0.7315	4.199
14	.	0.1500	0.9700	0.0000	0.0000	4.989	0.7315	4.989
15	.	0.1500	1.0000	0.0000	0.0000	5.712	0.7315	5.712
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : PR95
Date and time: 09MAY95:12:16

Table 6.14

Greenland halibut in the Iceland and Faroes Grounds and East Green

12:15 Tuesday, May 9, 1995

Prediction with management option table

Year: 1995					Year: 1996					Year: 1997	
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	0.5121	178558	57006	33087	0.0000	0.0000	180005	54897	0	217339	75157
.	.	.	.	.	0.0500	0.0256	.	54897	1935	215242	73874
.	.	.	.	.	0.1000	0.0512	.	54897	3827	213192	72624
.	.	.	.	.	0.1500	0.0768	.	54897	5678	211188	71404
.	.	.	.	.	0.2000	0.1024	.	54897	7488	209229	70215
.	.	.	.	.	0.2500	0.1280	.	54897	9259	207313	69056
.	.	.	.	.	0.3000	0.1536	.	54897	10991	205439	67925
.	.	.	.	.	0.3500	0.1792	.	54897	12686	203607	66822
.	.	.	.	.	0.4000	0.2049	.	54897	14344	201815	65746
.	.	.	.	.	0.4500	0.2305	.	54897	15967	200062	64696
.	.	.	.	.	0.5000	0.2561	.	54897	17555	198347	63672
.	.	.	.	.	0.5500	0.2817	.	54897	19109	196669	62673
.	.	.	.	.	0.6000	0.3073	.	54897	20631	195027	61699
.	.	.	.	.	0.6500	0.3329	.	54897	22120	193421	60747
.	.	.	.	.	0.7000	0.3585	.	54897	23578	191849	59819
.	.	.	.	.	0.7500	0.3841	.	54897	25005	190311	58913
.	.	.	.	.	0.8000	0.4097	.	54897	26403	188806	58029
.	.	.	.	.	0.8500	0.4353	.	54897	27771	187332	57166
.	.	.	.	.	0.9000	0.4609	.	54897	29112	185890	56324
.	.	.	.	.	0.9500	0.4865	.	54897	30424	184477	55501
.	.	.	.	.	1.0000	0.5121	.	54897	31710	183095	54698
.	.	.	.	.	1.0500	0.5377	.	54897	32970	181741	53914
.	.	.	.	.	1.1000	0.5634	.	54897	34204	180415	53148
.	.	.	.	.	1.1500	0.5890	.	54897	35413	179117	52401
.	.	.	.	.	1.2000	0.6146	.	54897	36598	177845	51671
.	.	.	.	.	1.2500	0.6402	.	54897	37759	176600	50957
.	.	.	.	.	1.3000	0.6658	.	54897	38897	175380	50261
.	.	.	.	.	1.3500	0.6914	.	54897	40012	174185	49580
.	.	.	.	.	1.4000	0.7170	.	54897	41105	173013	48915
.	.	.	.	.	1.4500	0.7426	.	54897	42177	171866	48265
.	.	.	.	.	1.5000	0.7682	.	54897	43227	170742	47630
-	-	Tonnes	Tonnes	Tonnes	-	-	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

Notes: Run name : PR95
Date and time : 09MAY95:12:16
Computation of ref. F: Simple mean, age 8 - 12
Basis for 1995 : F factors

Table 6.15

12:15 Tuesday, May 9, 1995

Greenland halibut in the Iceland and Faroes Grounds and East Green

Yield per recruit: Input data

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
5	1.000	0.1500	0.0200	0.0000	0.0000	1.029	0.0043	1.029
6	.	0.1500	0.0733	0.0000	0.0000	1.239	0.0233	1.239
7	.	0.1500	0.2233	0.0000	0.0000	1.504	0.0864	1.504
8	.	0.1500	0.3767	0.0000	0.0000	1.813	0.2255	1.813
9	.	0.1500	0.4933	0.0000	0.0000	2.184	0.2822	2.184
10	.	0.1500	0.6133	0.0000	0.0000	2.528	0.4812	2.528
11	.	0.1500	0.7833	0.0000	0.0000	2.918	0.4580	2.918
12	.	0.1500	0.9133	0.0000	0.0000	3.439	0.8245	3.439
13	.	0.1500	0.9433	0.0000	0.0000	4.136	1.1758	4.136
14	.	0.1500	0.9900	0.0000	0.0000	4.860	1.1048	4.860
15	.	0.1500	1.0000	0.0000	0.0000	5.427	0.8297	5.427
Unit	Numbers	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : VYR
Date and time: 09MAY95:12:52

Table 6.16

Greenland halibut in the Iceland and Faroes Grounds and East Green 12:15 Tuesday, May 9, 19

Yield per recruit: Summary table

						1 January		Spawning time	
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
0.0000	0.0000	0.000	0.000	5.800	12864.994	2.451	7768.718	2.451	7768.718
0.0500	0.0227	0.080	271.585	5.601	12048.390	2.275	7013.586	2.275	7013.586
0.1000	0.0454	0.144	477.410	5.426	11345.181	2.122	6368.663	2.122	6368.663
0.1500	0.0681	0.196	633.273	5.271	10736.485	1.988	5815.323	1.988	5815.323
0.2000	0.0909	0.239	751.186	5.134	10206.833	1.871	5338.326	1.871	5338.326
0.2500	0.1136	0.274	840.281	5.011	9743.519	1.767	4925.174	1.767	4925.174
0.3000	0.1363	0.303	907.499	4.901	9336.089	1.675	4565.595	1.675	4565.595
0.3500	0.1590	0.328	958.118	4.801	8975.916	1.593	4251.132	1.593	4251.132
0.4000	0.1817	0.349	996.146	4.710	8655.862	1.520	3974.799	1.520	3974.799
0.4500	0.2044	0.367	1024.630	4.628	8370.010	1.454	3730.816	1.454	3730.816
0.5000	0.2271	0.383	1045.886	4.552	8113.434	1.395	3514.383	1.395	3514.383
0.5500	0.2499	0.396	1061.670	4.483	7882.029	1.341	3321.507	1.341	3321.507
0.6000	0.2726	0.409	1073.318	4.419	7672.356	1.292	3148.855	1.292	3148.855
0.6500	0.2953	0.420	1081.843	4.359	7481.530	1.247	2993.635	1.247	2993.635
0.7000	0.3180	0.429	1088.013	4.304	7307.119	1.205	2853.505	1.205	2853.505
0.7500	0.3407	0.438	1092.411	4.252	7147.068	1.167	2726.487	1.167	2726.487
0.8000	0.3634	0.446	1095.478	4.204	6999.635	1.132	2610.914	1.132	2610.914
0.8500	0.3861	0.454	1097.548	4.158	6863.336	1.100	2505.369	1.100	2505.369
0.9000	0.4089	0.461	1098.874	4.115	6736.902	1.069	2408.645	1.069	2408.645
0.9500	0.4316	0.468	1099.648	4.075	6619.247	1.041	2319.714	1.041	2319.714
1.0000	0.4543	0.474	1100.013	4.037	6509.434	1.015	2237.691	1.015	2237.691
1.0500	0.4770	0.479	1100.078	4.000	6406.653	0.990	2161.818	0.990	2161.818
1.1000	0.4997	0.485	1099.924	3.966	6310.203	0.967	2091.437	0.967	2091.437
1.1500	0.5224	0.490	1099.614	3.933	6219.472	0.945	2025.980	0.945	2025.980
1.2000	0.5451	0.495	1099.191	3.902	6133.927	0.924	1964.952	0.924	1964.952
1.2500	0.5679	0.499	1098.692	3.872	6053.098	0.905	1907.922	0.905	1907.922
1.3000	0.5906	0.504	1098.141	3.843	5976.571	0.886	1854.511	0.886	1854.511
1.3500	0.6133	0.508	1097.556	3.816	5903.984	0.869	1804.385	0.869	1804.385
1.4000	0.6360	0.512	1096.952	3.790	5835.011	0.852	1757.251	0.852	1757.251
1.4500	0.6587	0.516	1096.338	3.765	5769.364	0.837	1712.851	0.837	1712.851
1.5000	0.6814	0.520	1095.722	3.740	5706.787	0.822	1670.951	0.822	1670.951
1.5500	0.7041	0.523	1095.108	3.717	5647.048	0.807	1631.348	0.807	1631.348
1.6000	0.7268	0.527	1094.501	3.694	5589.941	0.794	1593.857	0.794	1593.857
1.6500	0.7496	0.530	1093.902	3.673	5535.279	0.781	1558.313	0.781	1558.313
1.7000	0.7723	0.533	1093.312	3.652	5482.893	0.768	1524.569	0.768	1524.569
1.7500	0.7950	0.536	1092.734	3.632	5432.631	0.756	1492.490	0.756	1492.490
1.8000	0.8177	0.539	1092.167	3.612	5384.352	0.745	1461.957	0.745	1461.957
1.8500	0.8404	0.542	1091.611	3.593	5337.931	0.734	1432.860	0.734	1432.860
1.9000	0.8631	0.545	1091.066	3.575	5293.252	0.723	1405.099	0.723	1405.099
1.9500	0.8858	0.548	1090.533	3.557	5250.208	0.713	1378.585	0.713	1378.585
2.0000	0.9086	0.550	1090.010	3.540	5208.704	0.703	1353.235	0.703	1353.235
-	-	Numbers	Grams	Numbers	Grams	Numbers	Grams	Numbers	Grams

Notes: Run name : VYR
Date and time : 09MAY95:12:52
Computation of ref. F: Simple mean, age 8 - 12
F-0.1 factor : 0.4093
F-max factor : 1.0376
F-0.1 reference F : 0.1860
F-max reference F : 0.4714
Recruitment : Single recruit

Table 7.2.1 REDFISH. Nominal catches (tonnes) by countries, 'in Division Va 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Belgium	924	283	389	291	400	423	398
Faroe Islands	1,212	1,046	1,357	686	291	144	332
Germany, Fed. Rep.	-	-	-	-	-	-	-
Iceland	93349	115,051	122,749	108,270	91,381	85,992	87,768
Norway	32	11	32	12	8	2	7
Total	95,517	116,391	124,527	109,259	92,080	86,561	88,505

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Belgium	372	190	70	146	107	96	46
Faroe Islands	372	394	624	412	389	438	
Germany, Fed. Rep.	-	-	-	-	-	-	49
Iceland	93,995	91,536	90,891	96,770	94,382	96,577	93,504
Norway	7	1	-	-	-	-	-
Total	94,746	92,121	91,585	97,328	94,878	97,111	

1) Provisional

Table 7.2.2 Landings of REDFISH (in tonnes) by countries in Division Va as used by the Working Group.

Year	Belgium	Faroes	FRG	Iceland	Norway	Total
1978	1,549	242		33,318	93	35,202
1979	1,385	629		62,253	43	64,310
1980	1,381	1,055		69,780	33	72,249
1981	924	1,212		93,349	32	95,517
1982	283	1,046		115,051	11	116,391
1983	389	1,357		122,749	32	124,527
1984	291	686		108,270	12	109,259
1985	400	291		91,381	8	92,080
1986	423	253		85,992	2	86,670
1987	398	332		87,768	7	88,505
1988	372	372		94,011	7	94,762
1989	190	394		91,488	1	92,073
1990	70	624		90,891	0	91,585
1991	146	412		96,770	0	97,328
1992	107	389		96,350 [2]	0	96,846
1993	91	438		99,180 [3]	0	99,709
1994 [1]	46	202	49	111,667 [4]	0	111,964

1 Provisional data

2 Including 1968 tonnes oceanic S. mentella.

3 Including 2603 tonnes oceanic S. mentella.

4 Including 16667 tonnes oceanic S. mentella.

Table 7.2.3 REDFISH. Nominal catches (tonnes) by countries, in Division Vb 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Denmark	-	-	-	-	-	36	176
Faroe Islands	3,232	3,999	4,642	8,770	12,634	15,224	13,477
France	59	204	439	559	1,157	752	819
Germany, Fed. Rep. [2]	3,841	4,660	4,300	4,460	5,091	5,142	3,060
Iceland	-	1	-	-	-	-	-
Norway	13	7	3	1	4	2	5
UK (Engl. and Wales)	-	-	-	-	-	-	-
USSR	-	-	-	142	-	-	-
Total	7,145	8,871	9,384	13,932	18,886	21,156	17,537

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Denmark	8	-	+	-	-	-	-
Faroe Islands	12,966	12,636	10,017	14,090	15,279	10,040	8,872
France	582	996	909	473	114		
Germany, Fed. Rep. [2]	1,595	1,191	441	447	450	239	156
Norway	5	21	21	20	35 [1]	26 [1]	31
UK (Engl. and Wales)		-	-	2	21	28	...
UK (Scotland)		-	+	1	8	1	...
United Kingdom							19
USSR/Russia [3]		-	-	-	15	44	
Total		14,844	11,388	15,032	15,899	10,333	

1) Provisional

2) Includes former GDR.

3) As from 1991.

Table 7.2.4 Landings of REDFISH (in tonnes) by countries in Division Vb 'as used by the Working Group.

Year	Denmark	Faroes	France	FRG	Iceland	Lithuania	Norway	Nederl	UK	Russia [2]	Total
1978	0	1,525	448	7,767	0		9	0	57	0	9,806
1979	0	5,693	862	6,108	0		11	0	0	0	12,674
1980	0	5,509	627	3,891	0		12	0	0	0	10,039
1981	0	3,232	59	3,841	0		13	0	0	0	7,145
1982	0	3,999	204	5,230	1		7	0	0	0	9,441
1983	0	4,642	439	4,300	0		3	0	0	0	9,384
1984	0	8,770	559	4,460	0		1	0	0	142	13,932
1985	0	12,634	1,157	5,091	0		4	0	0	868	19,754
1986	36	15,224	752	5,142	0		2	0	0	320	21,476
1987	176	13,478	819	3,060	0		5	0	0	0	17,538
1988	8	13,318	582	1,595	0		5	0	0	0	15,508
1989	0	12,860	996	1,191	0		21	0	0	0	15,068
1990	0	10,364	909	441	0		21	0	0	2	11,737
1991	0	14,090	473	447	0		20	0	3	4	15,037
1992	0	15,279	114	450	0	4	35	35	39	47	16,003
1993	0	10,040	35	239	0	0	26	22	29	44	10,435
1994 [1]	0	8,872	61	156	0	-	31	-	19	0	9,139

1 Provisional data.

2 USSR 1978-1991, Russia 1992-1994

Table 7.2.5 REDFISH. Nominal catches (tonnes) by countries, in Sub-area VI 1981-1994, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987
Faroe Islands	-	-	-	19	18	-	-
France	24	44	93	102	397	480	1,032
Germany, Fed. Rep.	983	604	359	563	76	24	-
Ireland	-	-	-	-	-	-	-
Norway	3	4	2	9	-	14	2
Spain	1	-	2	-	-	-	-
UK (Engl. and Wales)	-	2	-	1	1	2	3
UK (Scotland)	-	-	-	1	-	10	17
Total	1,011	654	456	695	492	530	1,054

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Faroe Islands	1	61	-	22	6	-	
France	1,024	726	684	483	127		
Germany, Fed. Rep.	16	1	6	8	-	77	
Ireland	-	-	-	-	1	1	
Norway	1	2	5	+	4 [1]	3 [1]	2
Spain	-						
UK (Engl. and Wales)	75	4	29	11	4	4	...
UK (Scotland)	6	4	6	39	32	94	...
United Kingdom							119
Total	1,123	798	730	563	174	179	

1) Provisional

Table 7.2.6 Landings of REDFISH (in tonnes) by countries in Sub-area VI as used by the Working Group.

Year	Faroes	France	FRG	Ireland	Norway	Spain	UK	Total
1978	0	307	18	0	4	0	2	331
1979	1	215	604	0	4	0	1	825
1980	0	202	907	0	2	0	0	1,111
1981	0	24	983	0	3	1	0	1,011
1982	0	44	604	0	4	0	2	654
1983	0	93	359	0	2	2	0	456
1984	19	102	563	0	9	0	2	695
1985	18	397	76	0	0	0	1	492
1986	0	480	24	0	14	0	12	530
1987	0	1,032	0	0	2	0	20	1,054
1988	1	1,024	16	0	1	0	81	1,123
1989	61	726	1	0	2	0	8	798
1990	0	684	6	0	5	0	35	730
1991	22	483	8	0	+	0	50	563
1992	9	127	0	1	4	0	36	177
1993	6	-	77	1	3	0	98	170
1994 [1]	-	-	87	-	2	-	119	208

1 Provisional data.

Table 7.2.7 REDFISH. Nominal catches (tonnes) by countries, in Sub-area XII 1981-1994, as officially reported to ICES and/or FAO.

Country	1981	1982	1983	1984	1985	1986	1987
Bulgaria		-	-	-	-	-	-
Estonia		-	-	-	-	-	-
Faroe Islands		-	-	-	-	-	-
Germany, Fed. Rep.		5,696	2,209	-	-	-	-
Germany, Dem. Rep.		-	-	-	-	-	-
Greenland		-	-	-	-	-	-
Iceland		-	-	-	-	-	-
Latvia		-	-	-	-	-	-
Lithuania		-	-	-	-	-	-
Norway		-	-	-	-	-	-
Poland		-	-	-	-	-	-
UK (Scotland)		-	-	-	-	-	-
Ukraine		-	-	-	-	-	-
USSR		39,783	60,079	60,643	17,300	24,131	2,948
Total		45,479	62,288	60,643	17,300	24,131	2,948

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Bulgaria	-	-	1,617	-	628	3,216	-
Estonia	-	-	-	-	1,810	6,365	-
Faroe Islands	-	-	-	-	-	4,026	-
Germany' Fed. Rep.[3]	-	353	7	62	1,084	6,459	6,353
Greenland	-	-	-	-	9	710	-
Iceland	-	567	185	95	361	8,098	19,341
Latvia	-	-	-	-	780	6,803	-
Lithuania	-	-	-	-	6,656	7,899	-
Norway	-	-	249	726	10,560 [1]	6,207 [1]	4,283
Poland	-	112	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	+	-
Ukraine	-	-	-	-	160	2,622	-
USSR/Russia [2]	9,772	15,543	4,274	6,624	2,485	4,106	10489
Total	9,772	16,575	6,332	7,507	24,533	56,511	40,466

1) Provisional

2) As from 1991.

3) Includes former GDR

Table 7.2.8 Landings of REDFISH (in tonnes) by countries in Sub-area XII as used by the Working Group.

Year	Bulgaria	Estonia	Faroes	France	FRG [4]	Greenland	Iceland	Latvia	Lithuania	Norway	Poland	Ukraine	Russia [3]	Total
1981	0	0		0	0	0	0			0	0		0	0
1982	0	0		0	0	0	0			0	0		39,783	39,783
1983	0	0		0	0	0	0			0	0		60,079	60,079
1984	0	0		0	0	0	0			0	0		60,643	60,643
1985	0	0		0	0	0	0			0	0		17,300	17,300
1986	0	0		0	0	0	0			0	0		24,131	24,131
1987	0	0		0	0	0	0			0	0		2,948	2,948
1988	0	0		0	0	0	0			0	0		9,772	9,772
1989	0	0		0	353	0	658 [5]			0	112		15,543	16,671
1990	1,617	0		0	7	0	215 [5]			926 [2]	0		4,274	7,046
1991	0	0		0	62	0	110 [5]			764 [2]	0		6,624	7,567
1992	628	1,810		2	1,084	9	419 [5]	780		369 [2]	0	160	11,266	16,534
1993	3,216	6,365	4,026	0	6,459	710	9,394 [5]	6,803	6,658	5,735 [2]	0	2,622	18,669	70,664
1994 [1]	-	-	2,896	606 [6]	6,353	0	22,436 [5]	-	7,899	4,867 [2]	-	-	10,489	55,546

1 Provisional data.

2 Area and quantum adjusted according to official log-books and raised by 5% to account for discarding.

3 USSR 1981-1991, Russia 1992-1994.

4 Includes former GDR.

5 Raised by 16% to account for discarding.

6 As reported to Greenland

Table 7.2.9 REDFISH. Nominal catches (tonnes) by countries, in Sub-area XIV 1981-1994, as officially reported to ICES and/or FAO.

Country	1981	1982	1983	1984	1985	1986	1987
Bulgaria		-	-	2,961	5,825	11,385	12,270
Denmark		11	-	-	-	-	-
Faroe Islands		-	27	-	-	5	382
Germany, Dem. Rep,		-	155	989	5,438	8,574	7,023
Germany, Fed. Rep.		37,119	28,878	14,141	5,974	5,584	4,691
Greenland		+	1	10	5,519 [2]	9,542 [2]	670
Iceland		17	-	-	+	-	-
Norway		-	-	17	-	-	-
Poland		581	-	239	135	149	25
UK (Engl. and Wales)		-	-	-	-	-	-
UK (Scotland)		-	-	-	-	-	-
United Kingdom							
USSR/Russia		20,217	-	-	42,973	60,863	68,521
Total		57,945	29,061	18,357	65,864	96,102	93,582

Country	1988	1989	1990	1991	1992	1993	1994 [1]
Bulgaria	8,455	4,546	1,073	-	-	-	
Denmark	-	-	-	-	-	-	-
Faroe Islands	1,634	226	-	115	3,765	3,095	164
Germany, Fed. Rep [4]	22,582	8,816	11,218	9,122	7,959	26,969	22,404
Greenland	42	3	24	42	962	264	422
Iceland	-	814	3,726	7,477	12,982	11,650	27,178
Norway	-	-	6,070	4,954	636 [1]	7,162 [1]	1,052
Poland	-	-	-	-	-	-	
UK (Engl. and Wales)	-	5	39	219	178	241	...
UK (Scotland)	-	-	3	+	28	8	...
United Kingdom	-	-	-	-	-	-	142
USSR/Russia [3]	55,254	7,177	3,040	2,665	1,844	6,560	13917
Total	87,967	21,587	25,193	24,594	28,354	55,949	65,279

1) Provisional data

2) Fished mainly by Japan

3) As from 1991

4) Includes former GDR

Table 7.2.10 Landings on REDFISH (in tonnes) by country in Sub-area XIV, as used by the working group.

Year	Bulgaria	Faroes	France	FRG [5]	Greenland	Iceland	Japan	Norway	Poland	UK	Russia [3]	Total
1978	0	0	0	20,711	3	151	0	2	0	13	0	20,880
1979	0	0	490	20,428	0	0	0	0	0	0	0	20,918
1980	0	0	0	32,520	0	89	0	0	0	0	0	32,609
1981	0	18	0	42,980	1	0	0	0	0	0	0	42,999
1982	0	0	0	42,815	0	17	0	0	581	0	20,217	63,630
1983	0	27	0	30,970	1	0	0	0	0	0	0	30,998
1984	2,961	0	0	15,130	10	0	0	15	239	0	0	18,355
1985	5,825	0	0	11,412	5,519	0	0	0	135	0	42,973	65,864
1986	11,385	5	0	14,158	9,542	0	0	0	149	0	60,683	95,922
1987	12,270	382	0	11,714	2,912	0	0	0	25	0	68,521	95,824
1988	8,455	1,634	0	22,582	3,751	0	0	0	0	0	55,254	91,676
1989	4,546	226	0	8,816	285	3,158 [4]	307	0	0	5	7,177	24,520
1990	1,073	0	0	11,218	24	4,322 [4]	3,450	6,159 [2]	0	42	4,973	31,261
1991	0	115	0	9,122	42	8,673 [4]	1,224	5,434 [2]	0	219	2,665	27,494
1992	0	3,765	0	7,959	3,769	13,091 [4]	0	14,322 [2]	0	206	4,467	47,579
1993	0	3,095	0	26,969	264	10,911 [4]	938	8,848 [2]	0	241	5,496	56,762
1994 [1]	-	164	-	22,404	422	14,859 [4]	-	2,711 [2]	-	-	13,917	54,477

1) Provisional data.

2) Area and quantum adjusted according to official log-books and raised by 5% to account for discards in the oceanic S. mentella fishery.

3) USSR 1978-1991; Russia 1992-1994.

4) Raised by 16% to account for discarding.

5) Includes former GDR

Table 7.2.11 Proportions used for splitting the 1992 REDFISH landings between *S.marinus* and *S.mentella* stocks.

Area	Va			Vb		VI		XII	XIV		
Species/stock	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic	*S.mar.*	*S.ment.* deep-sea	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic
Belgium	1.00	0.00						1.00			
Estonia											
Faroes	1.00	0.00		0.22	0.78	0.00	1.00		0.00	0.00	1.00
France				0.00	1.00	0.00	1.00	1.00			
Germany				0.00	1.00			1.00	0.04	0.32	0.65
Greenland								1.00	0.10	0.90	0.00
Iceland	0.53	0.45	0.02					1.00	0.00	0.00	1.00
Ireland						0.00	1.00				
Japan								1.00			
Latvia											
Lithuania				0.00	1.00						
Norway				1.00	0.00	1.00	0.00	1.00	0.003		0.997
Russia				0.00	1.00			1.00	0.00	0.00	1.00
UK				1.00	0.00	1.00	0.00		0.10	0.90	0.00

In Sub-area XIV the landings for Germany, Greenland, Japan and UK have been splitted between S.marinus and deep-sea S.mentella according to the German surveys.
For Faroe Islands, Germany, Iceland, Norway and Russia the splitting in most areas has been based on biological information presented to the Working Group and/or from log-books.

Table 7.2.12 Proportions used for splitting the 1993 REDFISH landings between *S.marinus* and *S.mentella* stocks.

Area	Va			Vb		VI		XII	XIV		
Species/stock	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic	*S.mar.*	*S.ment.* deep-sea	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic
Belgium	1.00	0.00						1.00			
Estonia											
Faroes	1.00	0.00		0.21	0.79	0.00	1.00		0.00	0.00	1.00
France					1.00						
Germany				0.00	1.00	0.00	1.00	1.00	0.06	0.51	0.43
Greenland								1.00	0.10	0.90	0.00
Iceland	0.46	0.52	0.03					1.00	0.00	0.00	1.00
Ireland						0.00	1.00				
Japan									0.10	0.90	0.00
Latvia								1.00			
Norway				1.00	0.00	1.00	0.00	1.00	0.00	0.01	0.99
Russia								1.00	0.00	0.00	1.00
UK				1.00	0.00	1.00	0.00		0.10	0.90	0.00

In Sub-area XIV the landings for Germany, Greenland, Japan and UK have been splitted between S.marinus and deep-sea S.mentella according to the German surveys.
For Faroe Islands, Germany, Iceland, Norway and Russia the splitting in most areas has been based on biological information presented to the Working Group and/or from log-books.

Table 7.2.13 Proportions used for splitting the 1994 REDFISH landings between *S.marinus* and *S.mentella* stocks.

Area	Va			Vb		VI		XII	XIV		
Species/stock	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic	*S.mar.*	*S.ment.* deep-sea	S.mar.	S.ment. deep-sea	*S.ment.* oceanic	*S.mar.*	*S.ment.* deep-sea	*S.ment.* oceanic
Belgium	1.00							1.00			
Estonia								1.00			
Faroes	1.00	0.00	0.00	0.25	0.75				0.00	1.00	0.00
France					1.00		1.00	1.00			
Germany	0.00	1.00	0.00		1.00	0.00	1.00		0.06	0.51	0.43
Greenland									0.10	0.90	
Iceland	0.34	0.51	0.15					1.00			1.00
Ireland								1.00			
Japan											
Latvia								1.00			
Nederlands											
Norway				1.00	0.00						
Russia				1.00	0.00	1.00	0.00	1.00	0.02		0.98
UK				1.00	0.00			1.00	0.00	0.47	0.53
				1.00	0.00	1.00					

In Sub-area XIV the landings for Germany, Greenland and UK have been splitted between *S.marinus* and deep-sea *S.mentella* according to the German surveys.
For Faroe Islands, Germany, Iceland, Norway and Russia the splitting in most areas has been based on biological information presented to the Working Group and/or from log-books.

Table 7.3.1 Number of 0-group REDFISH millions per nautical mile^2 from the Icelandic 0-group survey.

Year	Number
1970	8.6
1971	12.6
1972	31.1
1973	74
1974	23.6
1975	12.5
1976	5.8
1977	13
1978	6.5
1979	1.3
1980	3
1981	9
1982	2.7
1983	0.7
1984	4.3 [1]
1985	22.6 [1]
1986	12.1 [1]
1987	22.9 [1]
1988	17 [1]
1989	14.3 [1]
1990	23.5 [1]
1991	26.4 [1]
1992	11.6
1993	4
1994	5.8

[1] Reduced area.

Table 7.3.2 Sebastes spp. (<17.5cm). Abundance indices (n*1000) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

year/stratum	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	West Greenl.
1982	1057	358	121	27	8	42	22		1635
1983	3956	505	14	138	9	17	21		4660
1984	5021	3714	20	219	141	28	14		9157
1985	4889	9615	54	2712	47	67	55		17439
1986	10740	237636	113	1811	54	218	38		250610
1987	12455	113990	4		20		18		126487
1988	19679	42481	0	107	20	139	0		62426
1989	7717	13160	3071	5370	18		69		29405
1990	11256	35932	15417	1538	73		6199	848	71263
1991	51939	59845	34871	22668	13692	2508	892	1541	187956
1992	25715	19084	12691	17277	17463	13973	41	13718	119962
1993	5460	39035	664	11331	355	2773	14		59632
1994	3405	12002	9827	4013	1189	1731	10843	9867	52877

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenland	CI
1982		152		607		1553	2312	3945	44
1983		92	8	1709		859	2668	7328	56
1984	129			693		206	(1028)	(10182)	67
1985	817414	149899	210	5068		98	972689	990128	164
1986		2651	69	12312		5757	20789	271401	168
1987	2343	2580	132	8961		123715	137731	264219	87
1988	1579	2983	896	13064		18457	36979	99401	41
1989	1331	3171	150	4274		2155	11081	40486	36
1990	2267	3183	482	13708		4358	23998	95261	52
1991	45453	3051	209	1708		622	51043	238999	38
1992						1373	(1373)	(121335)	54
1993	3401243	2403634	244	810639		6009	6621769	6681402	111
1994						57889	(57889)	(110767)	95

Table 7.3.3 Sebastes spp. (<17.5cm). Biomass indices (tons) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

year/stratum	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	West Greenl.
1982	37	13	6	1	0	2	1		60
1983	103	21	1	6	0	1	1		133
1984	91	104	1	5	5	1	1		208
1985	82	367	2	58	2	3	1		515
1986	454	6645	3	77	2	6	1		7188
1987	265	5021	0		1		0		5287
1988	218	1491	0	4	1	5	0		1719
1989	111	270	22	49	0		1		453
1990	99	369	63	20	0		9	2	562
1991	198	797	73	242	29	24	2	15	1380
1992	152	385	49	111	74	220	1	65	1057
1993	72	512	17	265	6	77	1		950
1994	26	216	55	57	30	64	141	277	866

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenland	CI
1982		11		36		72	119	180	41
1983		5	0	73		17	95	229	51
1984	4			19		9	(32)	(240)	71
1985	15335	7129	6	200		5	22675	23190	142
1986	0	123	3	218		73	417	7605	168
1987	147	137	4	288		6502	7078	12367	93
1988	67	144	42	618		1414	2285	4005	56
1989	81	167	7	317		135	707	1158	42
1990	67	118	20	833		268	1306	1866	58
1991	563	94	4	63		34	758	2139	46
1992						18	(18)	(1075)	54
1993	51857	75676	12	48523		260	176328	177275	90
1994						2704	(2704)	(3570)	132

Table 7.3.4 Juvenile redfish off East Greenland. Survey biomass (tons) and abundance (million) as derived from the Greenland trawl survey, 1992. Confidence intervals (I) are calculated at the 95% level of significance

YEAR	BIOMASS	CI	ABUNDANCE	CI
1992	33143	44	725	95
1993	81428	66	1667	76
1994	48800	50	1377	54

Table 8.1.1 *S. marinus*. Landings (in tonnes) by area used by the Working Group.

Year	Va	Vb	VI	XII	XIV	Total
1978	31,300	2,039	313	0	15,477	49,129
1979	56,616	4,805	6	0	15,787	77,214
1980	62,052	4,920	2	0	22,203	89,177
1981	75,828	2,538	3	0	23,608	101,977
1982	97,899	1,810	28	0	30,692	130,429
1983	87,412	3,394	60	0	15,636	106,502
1984	84,766	6,228	86	0	5,040	96,120
1985	67,312	9,194	245	0	2,117	78,868
1986	67,772	6,300	288	0	2,988	77,348
1987	69,212	6,143	576	0	1,196	77,127
1988	80,472	5,020	533	0	3,964	89,989
1989	51,825	4,140	373	0	685	57,023
1990	63,156	2,407	382	0	687	66,632
1991	49,678	2,140	292	0	3,911	56,021
1992	51,464	3,435	40	0	1,133	56,072
1993	45,885	2,213	101	0	1,679	49,879
1994 [1]	38,632	2,268	121	0	1,362	42,383

1) Provisional data.

Table 8.2.2 *S. marinus* (>=17.5cm). Abundance indices (n*1000) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

year/stratum	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	West Greenl.
1982	7015	6340	88792	5512	5736	14876	4087		132358
1983	4025	3186	3355	6523	4043	5885	1697		28715
1984	1324	3438	460	1209	10671	2776	4214		24091
1985	4658	10451	6158	1569	3220	14441	4973		45471
1986	6327	4324	2077	3483	21503	2883	2717		43314
1987	906	653	1327		9612		659		13156
1988	831	2239	342	2255	5938	1954	731		14290
1989	421	422	776	690	6489		361		9160
1990	120	433	279	709	1038		146	2271	4996
1991	227	256	96	691	236	527	21	1671	3725
1992	126	106	73	190	193	477	192	835	2193
1993	169	481	59	267	80	132	0		1187
1994	111	325	156	167	65	46	151	247	1267

cont'd year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenland.	CI
1982		195798		312132		38899	546829	679186	55
1983		140766	453	264813		14365	420396	449110	53
1984	6888			47974		9890	(64753)	(88844)	65
1985	78118	32397	1787	141500		25944	279746	325216	52
1986		124613	470	298706		22234	446023	489338	53
1987	50961	9422	245	507387		27920	595935	609092	39
1988	3012	5015	148	132458		34352	174985	189274	54
1989	4003	33320	625	110663		76934	225545	234706	60
1990	14974	72316	391	653009		37483	778173	783168	75
1991	1385	13237	172	64692		28201	107687	111411	51
1992						32622	(32622)	(34814)	151
1993	175	6043	77	54424		4170	64887	66074	93
1994						3348	(3348)	(4615)	41

Table 8.2.3 *S. marinus* (>=17.5cm). Biomass indices (tons) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

year/stratum	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	West Greenl.
1982	1798	1354	34440	2558	3206	9794	2532		55682
1983	846	945	1572	3042	1873	4815	1084		14177
1984	308	894	196	519	4935	2284	2089		11225
1985	1020	1819	2968	472	1427	9209	2718		19633
1986	1282	1215	752	1229	10122	1705	1762		18067
1987	255	247	660		4954		438		6554
1988	146	404	118	942	2570	1342	382		5904
1989	182	137	272	249	2619		209		3668
1990	39	149	75	275	479		79	1343	2439
1991	44	83	24	226	120	273	3	1007	1780
1992	18	35	20	61	53	241	70	447	945
1993	46	112	19	114	39	55	0		385
1994	34	146	48	64	26	35	40	80	473

cont'd year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenland	CI
1982		155971		194379		30115	380465	436148	54
1983		161687	269	229541		15607	407104	421283	61
1984	3601			21281		12052	(36934)	(48159)	55
1985	8613	22453	1317	65299		23762	121444	141078	35
1986		43119	382	213268		24368	281137	299202	38
1987	9539	5346	106	230844		19327	265162	271715	38
1988	1092	4930	68	98131		48262	152483	158386	60
1989	970	14920	442	54589		34360	105281	108950	47
1990	6761	27245	154	130530		14723	179413	181853	45
1991	725	10631	120	34265		62979	108720	110497	98
1992						12076	(12076)	(13022)	130
1993	75	1377	30	20179		2899	24560	24943	68
1994						1540	(1540)	(2012)	38

1

Table 8.2.4 Icelandic ground fish survey indices, catch and effort for S. marinus in 1985 - 1994.

Year	SMB_index	Catch	Effort
85	3857	67312	17.5
86	4424	67772	15.3
87	4335	69212	16.0
88	3083	80472	26.1
89	3512	51825	14.8
90	3268	63156	19.3
91	2004	49678	24.8
92	1795	51464	28.7
93	1508	45885	30.4
94	1629	38632	23.7
95	1557		
Average 85-90			
	3747	66625	18.2

Catch 95 = **SMB** 95 * **Effort** 94

Catch 1995 ==>

Catch	Effort 1994
36925	100%
27693	75%
18462	50%

Table 8.2.5 S. *marinus*. Parameters for age-structured dynamic production model.

von Bertanlanffy:		
K	0.075	FIXED
L-inf	50 cm	FIXED
Fishing pattern:		
1/(1+exp(-Kc(L-L50c)))		
L50	32.5	ESTIMATED
Kc	0.65	ESTIMATED
Length-weight rel. :		
cond	0.01500	FIXED
power	2.973	FIXED
Recruitment :		
R0	97937	ESTIMATED

Table 9.1.1 Deep-sea *S. mentella*. Landings (in tonnes) by area used by the Working Group.

Year	Va	Vb	VI	XII	XIV	Total
1978	3,902	7,767	18	0	5,403	17,090
1979	7,694	7,869	819	0	5,131	21,513
1980	10,197	5,119	1,109	0	10,406	26,831
1981	19,689	4,607	1,008	0	19,391	44,695
1982	18,492	7,631	626	0	12,140	38,889
1983	37,115	5,990	395	0	15,207	58,707
1984	24,493	7,704	609	0	9,126	41,932
1985	24,768	10,560	247	0	9,376	44,951
1986	18,898	15,176	242	0	12,138	46,454
1987	19,293	11,395	478	0	6,407	37,573
1988	14,290	10,488	590	0	6,065	31,433
1989	40,248	10,928	425	0	2,284	53,885
1990	28,429	9,330	348	0	6,097	44,204
1991	47,652	12,897	271	0	6,514	67,334
1992	43,414	12,533	137	0	6,090	62,173
1993	51,221	8,156	84	0	15,090	74,550
1994 [1]	56,665	6,871	87	0	18,629	82,252

1) Provisional data.

Table 9.2.1 *S. mentella* (>=17.5cm). Abundance indices (n*1000) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

year/stratum	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	West Greenl.
1982	0	390	17	348	0	2360	0		3115
1983	40	1011	70	2528	0	5236	0		8885
1984	41	2967	7	1276	0	1115	0		5406
1985	0	369	31	27	55	328	0		810
1986	2141	414	38	292	5	444	0		3334
1987	987	13679	42		56		0		14764
1988	150	3187	25	777	60	4619	0		8818
1989	0	186	9	102	0		8		305
1990	0	10	4	705	50		0	3881	4650
1991	0	0	0	0	0	652	0	1773	2425
1992	0	35	0	15	0	106	0	0	156
1993	0	24	0	159	7	0	0		190
1994	0	271	20	95	94	162	0	36	678

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenland	CI
1982		9275		19370		58822	87467	90582	65
1983		15820	0	42393		28378	86591	95475	42
1984	18			34633		76541	(111192)	(116596)	93
1985	34904	16909	105	38689		81487	172094	172903	47
1986		6932	27	76655		67172	150786	154119	36
1987	0	18340	64	7182		62458	88044	102810	45
1988	22025	28158	74	176639		25344	252240	261057	58
1989	847	3067	0	72046		222281	298241	298546	60
1990	329	12453	2354	13513		16046	44695	49343	43
1991	0	10707	46	724504		234748	970005	972431	81
1992						60064	(60064)	(60222)	165
1993	62	3528	140	1258376		121927	1384033	1384220	86
1994						77891	(77891)	(78571)	168

Table 9.2.2 S. mentella (>=17.5cm). Biomass indices (tons) for West, East Greenland and total by stratum as derived from the German survey, 1982-94. Confidence intervals (CI) are given in per cent of the statified mean at 95% level of significance. () incorrect due to incomplete sampling.

year/stratum	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	West Greenl.
1982	0	96	6	114	0	893	0		1109
1983	16	213	26	1158	0	2857	0		4270
1984	6	798	4	490	0	472	0		1770
1985	0	96	15	11	27	110	0		259
1986	223	39	20	110	3	179	0		574
1987	84	1184	9		31		0		1308
1988	20	425	21	159	45	1878	0		2548
1989	0	23	7	15	0		1		46
1990	0	5	2	87	7		0	542	643
1991	0	0	0	0	0	153	0	445	598
1992	0	3	0	2	0	28	0	0	33
1993	0	5	0	23	2	0	0		30
1994	0	31	3	10	12	25	0	3	84

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenland	CI
1982		5178		4843		22795	32816	33923	68
1983		8701	0	21047		12747	42495	46765	47
1984	2			12786		35202	(47990)	(49762)	97
1985	2960	7169	40	17011		38533	65713	65972	35
1986		3943	15	29277		31333	64568	65141	36
1987	0	4891	17	2328		23264	30500	31806	46
1988	3542	10166	9	55838		11607	81162	83711	56
1989	90	655	0	21151		45452	67348	67392	63
1990	62	2741	329	1961		3275	8368	9010	44
1991	0	2959	30	211468		69454	283911	284509	80
1992						19856	(19856)	(19889)	160
1993	34	493	19	194675		34102	229323	229352	61
1994						7122	(7122)	(7208)	128

[1]**Table 9.2.3** CPUE from Iclandic trawlers, catches in Va and effort in S.mentella

Year	CPUE	Catch	Effort
1986	934.5	18898	20.2
1987	970.4	19293	19.9
1988	881.3	14290	16.2
1989	973.1	40248	41.4
1990	816.5	28429	34.8
1991	772	47652	61.7
1992	584.7	43414	74.3
1993	550.1	51221	93.1
1994	471.3	56665	120.2

Table 10.1.1 Oceanic *S. mentella.* Landings (in tonnes) by area as used by the Working Group.

Year	Va	Vb	VI	XII	XIV	Total
1978	0	0	0	0	0	0
1979	0	0	0	0	0	0
1980	0	0	0	0	0	0
1981	0	0	0	0	0	0
1982	0	0	0	39,783	20,798	60,581
1983	0	0	0	60,079	155	60,234
1984	0	0	0	60,643	4,189	64,832
1985	0	0	0	17,300	54,371	71,671
1986	0	0	0	24,131	80,976	105,107
1987	0	0	0	2,948	88,221	91,169
1988	0	0	0	9,772	81,647	91,419
1989	0	0	0	16,671	21,546	38,217
1990	0	0	0	7,046	24,470	31,516
1991	0	0	0	7,567	17,170	24,737
1992	1,968	0	0	16,534	40,768	59,270
1993	2,603	0	0	70,664	40,035	113,302
1994 [1]	16,667	0	0	55,546	34,486	106,699

1) Provisional data.

Table 10.1.2 Oceanic *S. mentella.* Landings (in tonnes) by countries used by the Working Group.

Year	Bulgaria	Estonia	Faroes	France	FRG [4]	Greenland	Iceland	Latvia	Lithuania	Norway	Poland	Russia [2]	Ukraine	Total
1981	0	0	0	0	0	0	0			0	0	0		0
1982	0	0	0	0	0	0	0			0	581	60,000		60,581
1983	0	0	0	0	155	0	0			0	0	60,079		60,234
1984	2,961	0	0	0	989	0	0			0	239	60,643		64,832
1985	5,825	0	0	0	5,438	0	0			0	135	60,273		71,671
1986	11,385	0	5	0	8,574	0	0			0	149	84,994		105,107
1987	12,270	0	382	0	7,023	0	0			0	25	71,469		91,169
1988	8,455	0	1,090	0	16,848	0	0			0	0	65,026		91,419
1989	4,546	0	226	0	6,797	0	3,816			0	112	22,720		38,217
1990	2,690	0	0	0	7,957	0	4,537			7,085	0	9,247		31,516
1991	0	0	115	0	244	0	8,891			6,198	0	9,289		24,737
1992	628	1,810 [3]	3,765	2	6,251	9	15,478	780		14,654	0	15,733	160	59,270
1993	3,216	6,365	7,121	0	18,168	710	22,908	6,803	6,658	14,566	0	24,165	2,622	113,302
1994 [1]	-	-	2,896	606	15,987	0	53,962	-	7,899	7,535	-	17,814	-	106,699

1) Provisional data.

2) USSR 1981-1991; Russia since 1992

3) Officially reported to ICES in 1993 but not in 1994.

4) Includes former GDR

Table 10.1.3 Catch per unit effort for oceanic *S. mentella* in Sub-areas XII and XIV.

Year	CPUE (t/h) Bulgaria	GDR (FVSIV)	Iceland	Norway	USSR-Russia (BMRT)
1982	-	-	-	-	1.99
1983	-	-	-	-	1.60
1984	1.25	-	-	-	1.48
1985	1.85	-	-	-	1.68
1986	2.04	-	-	-	1.35
1987	1.22	0.79	-	-	1.10
1988	0.82	1.28	-	-	1.00
1989	-	0.70	1.18	-	1.00
1990	-	0.89	1.12	1.09	0.99
1991	-	-	1.42	1.42	0.80
1992	-	-	1.62	1.79	0.63
1993	-	-	2.91	2.02	0.63
1994 [1]	-	-	-	2.83	1.70

[1] Preliminary.

Table 10.2.1 Oceanic *S.mentella*. Parameters for the age-structured dynamic production model.

von Bertanlanffy:

t0	0	FIXED
K	0.120	FIXED
L-inf	40 cm	FIXED

Fishing pattern:

1/(1+exp(-Kc(L-L50c)))

L50	29.97	ESTIMATED
Kc	2.085	ESTIMATED

Length-weight rel. :

cond	0.0068	FIXED
power	3.164	FIXED

Recruitment :

R0	412340	ESTIMATED

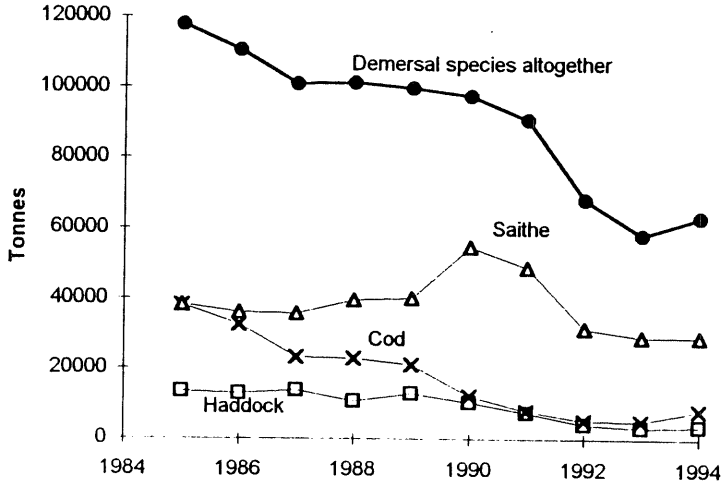


Figure 2.1.1. Faroese catches of demersal species in Vb 1985-1994. Gutted weight.

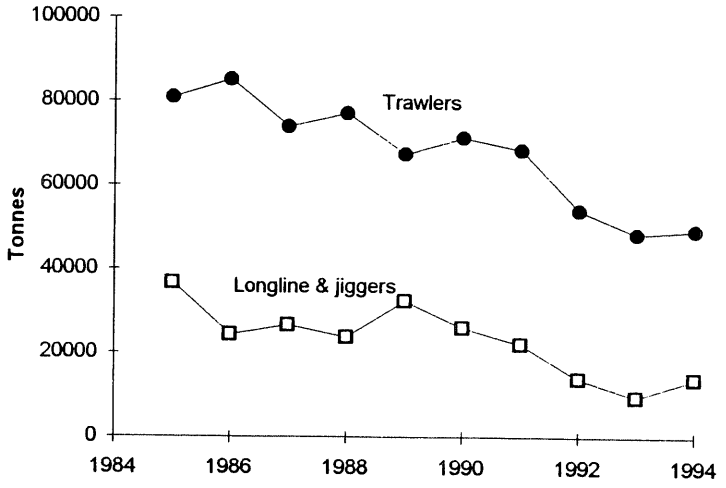


Figure 2.1.2. Faroese catches of demersal species in Vb by gear categories 1985-1994. Gutted weight.

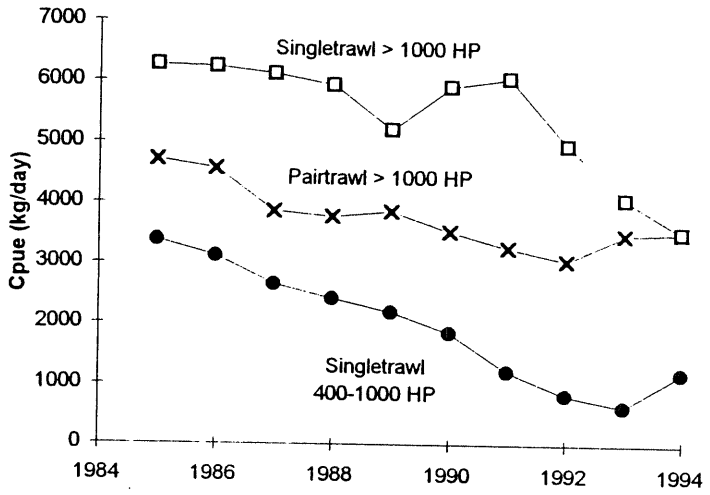


Figure 2.1.3. Faroese trawlers catch per unit effort of demersal species in Vb. Gutted weight.

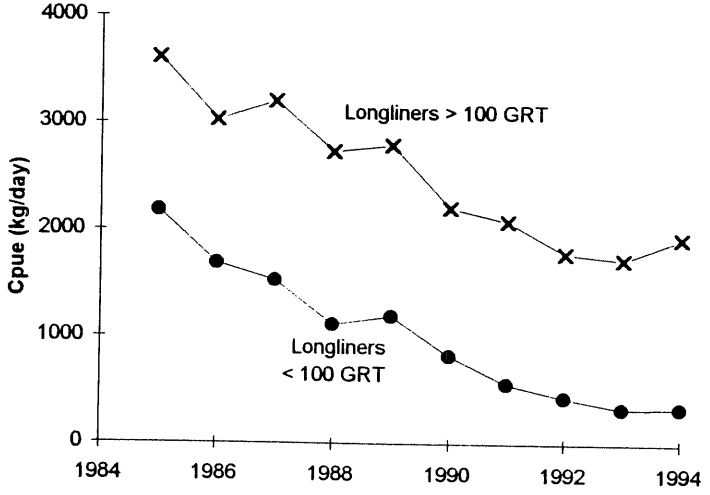
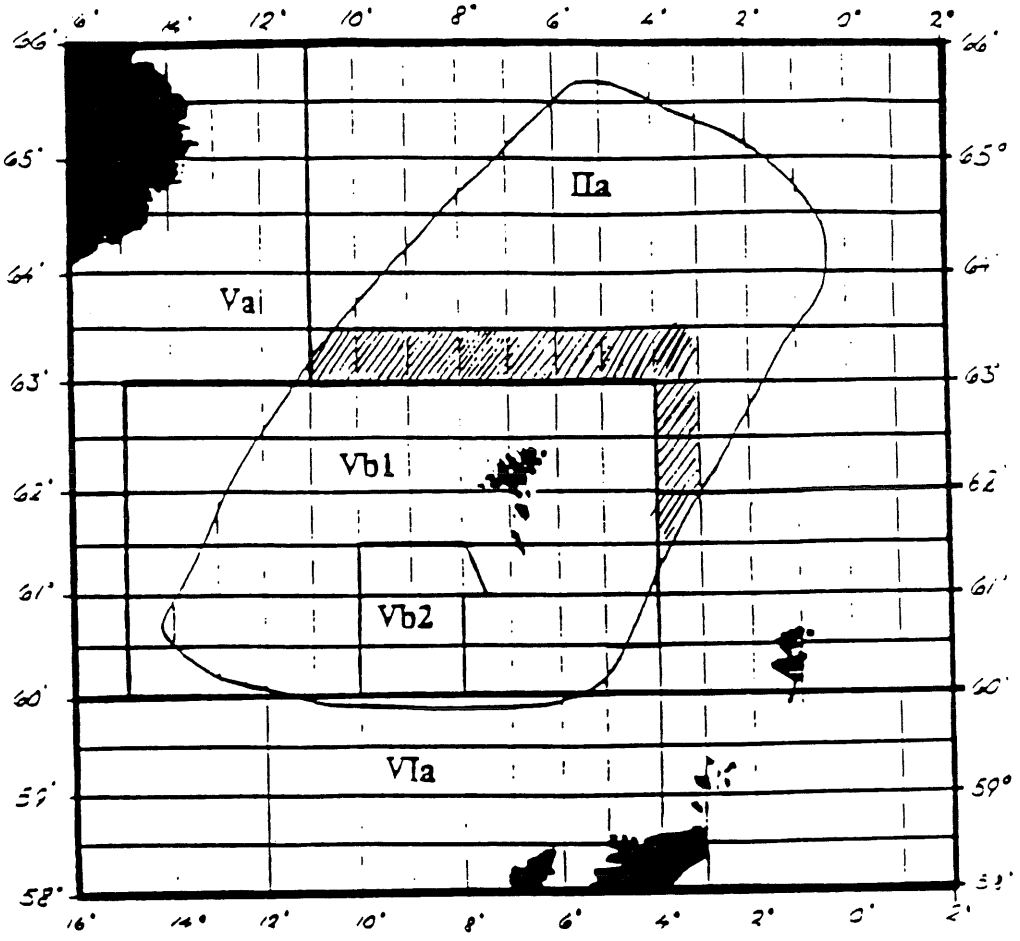


Figure 2.1.4. Faroese longliners catch per unit effort of demersal species in Vb. Gutted weight.

Figure 2.1.5 The Faroe area and adjacent areas divided into ICES divisions. The Faroese 200 miles economic zone is indicated.



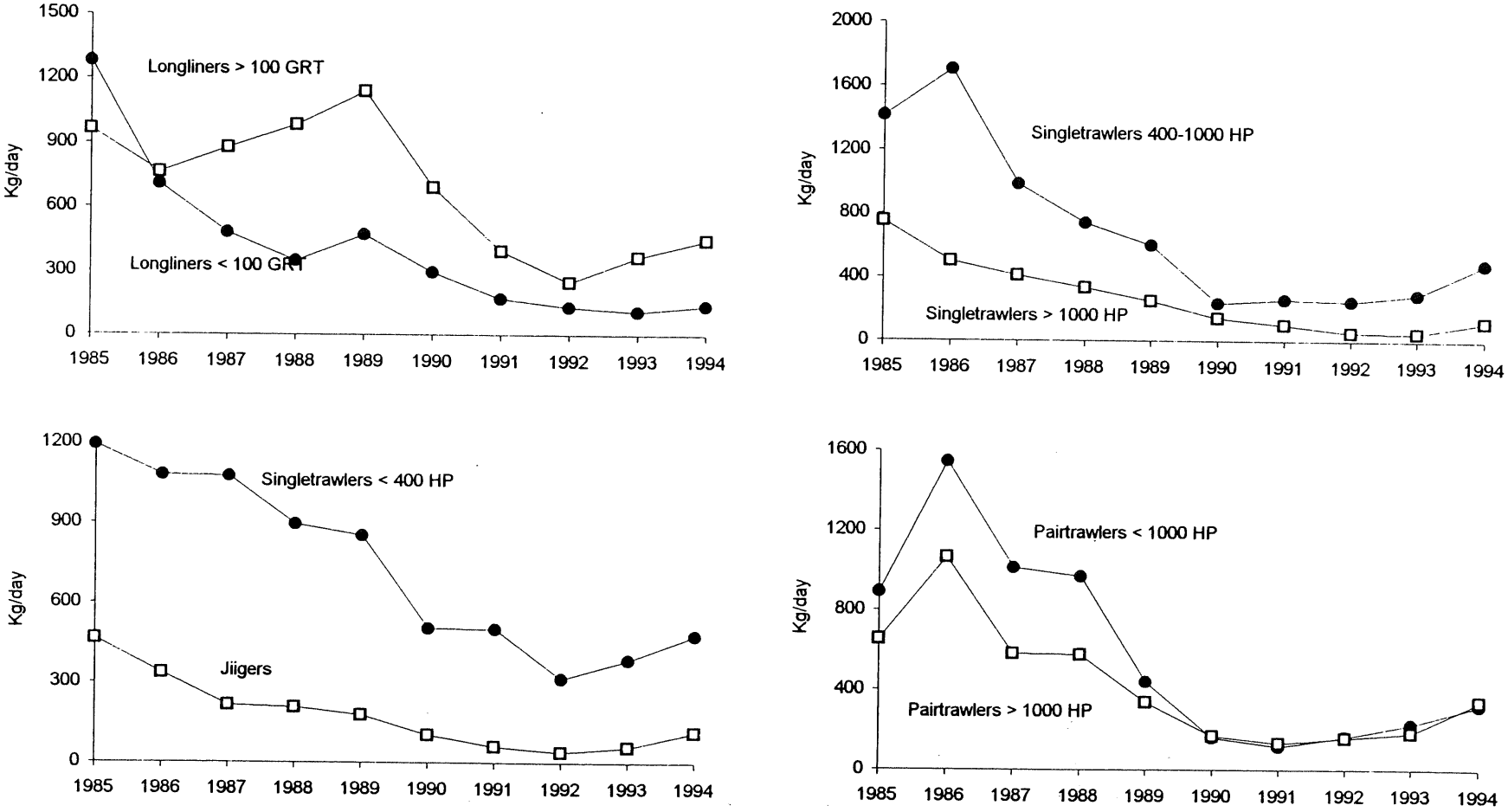


Figure 2.2.1. Catches (kg) of Faroe Plateau cod per unit effort for various fleet categories.

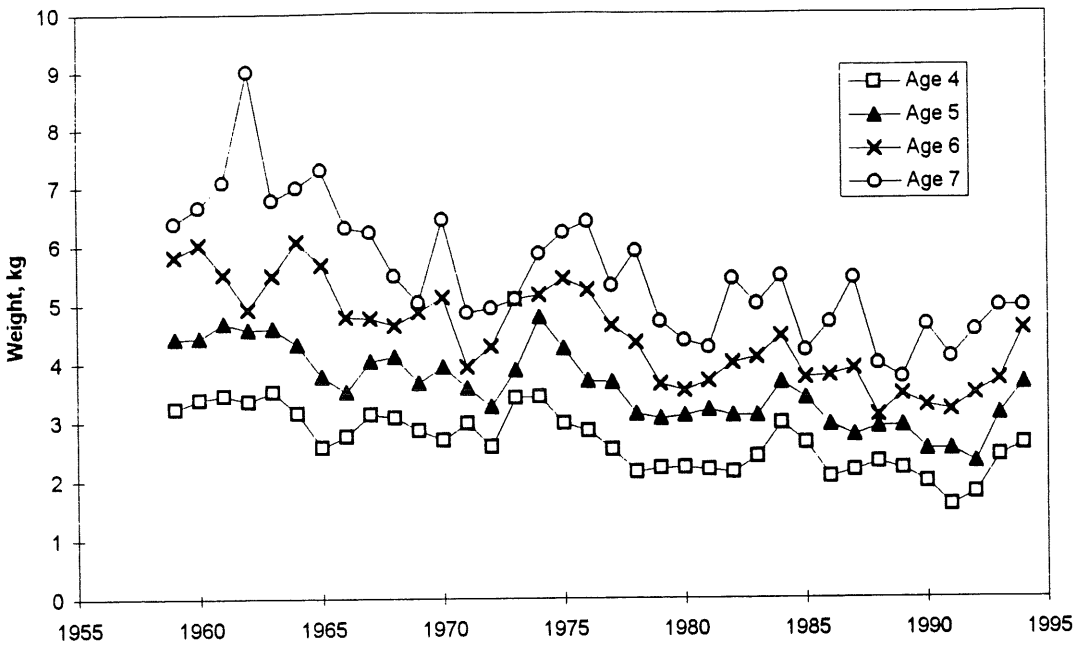


Figure 2.2.2. Mean weight at age of Faroe Plateau cod 1959-1994.

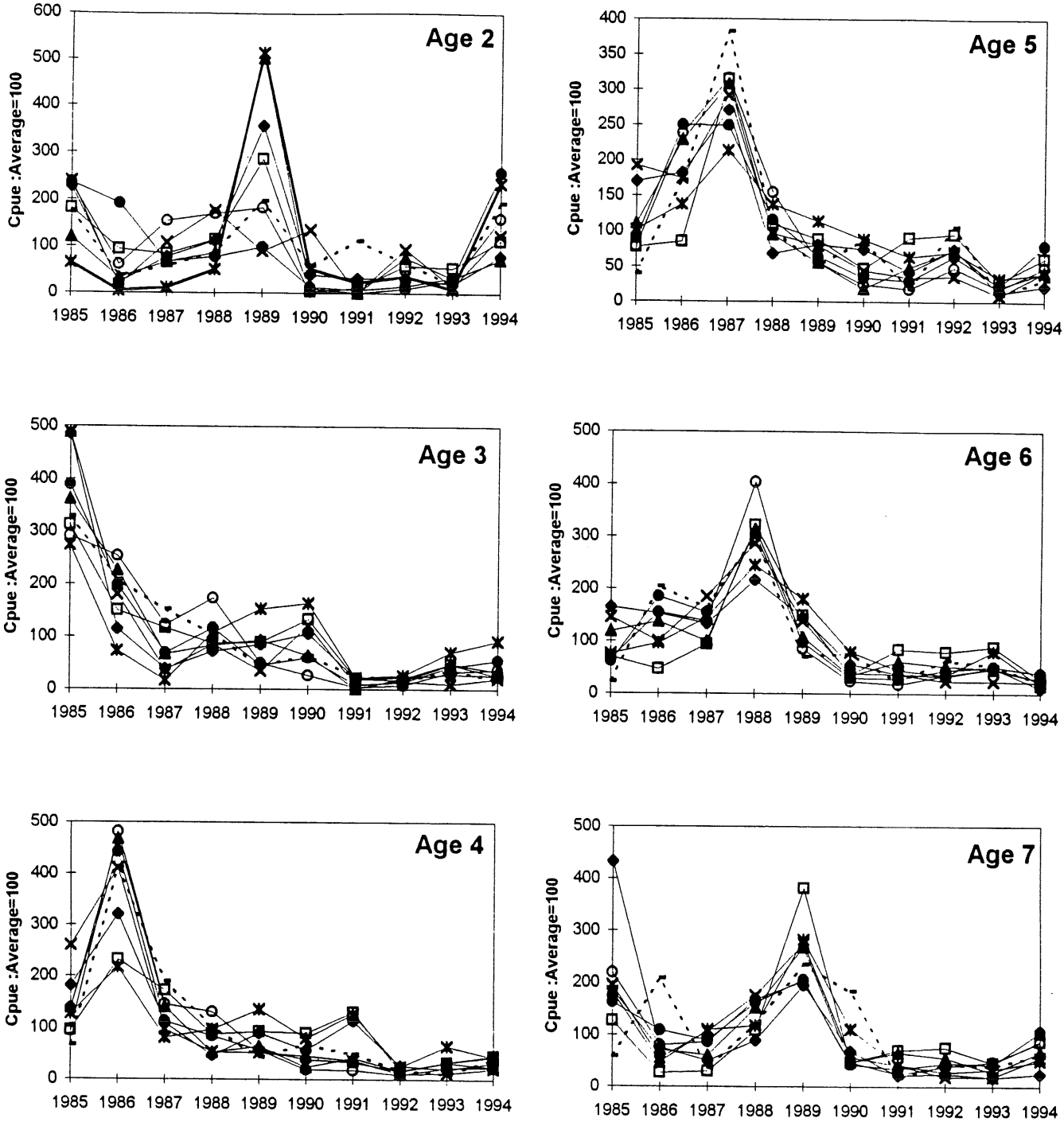


Figure 2.2.3. Cpue series available for tuning scaled to give an average of 100 on each age group for each fleet category.

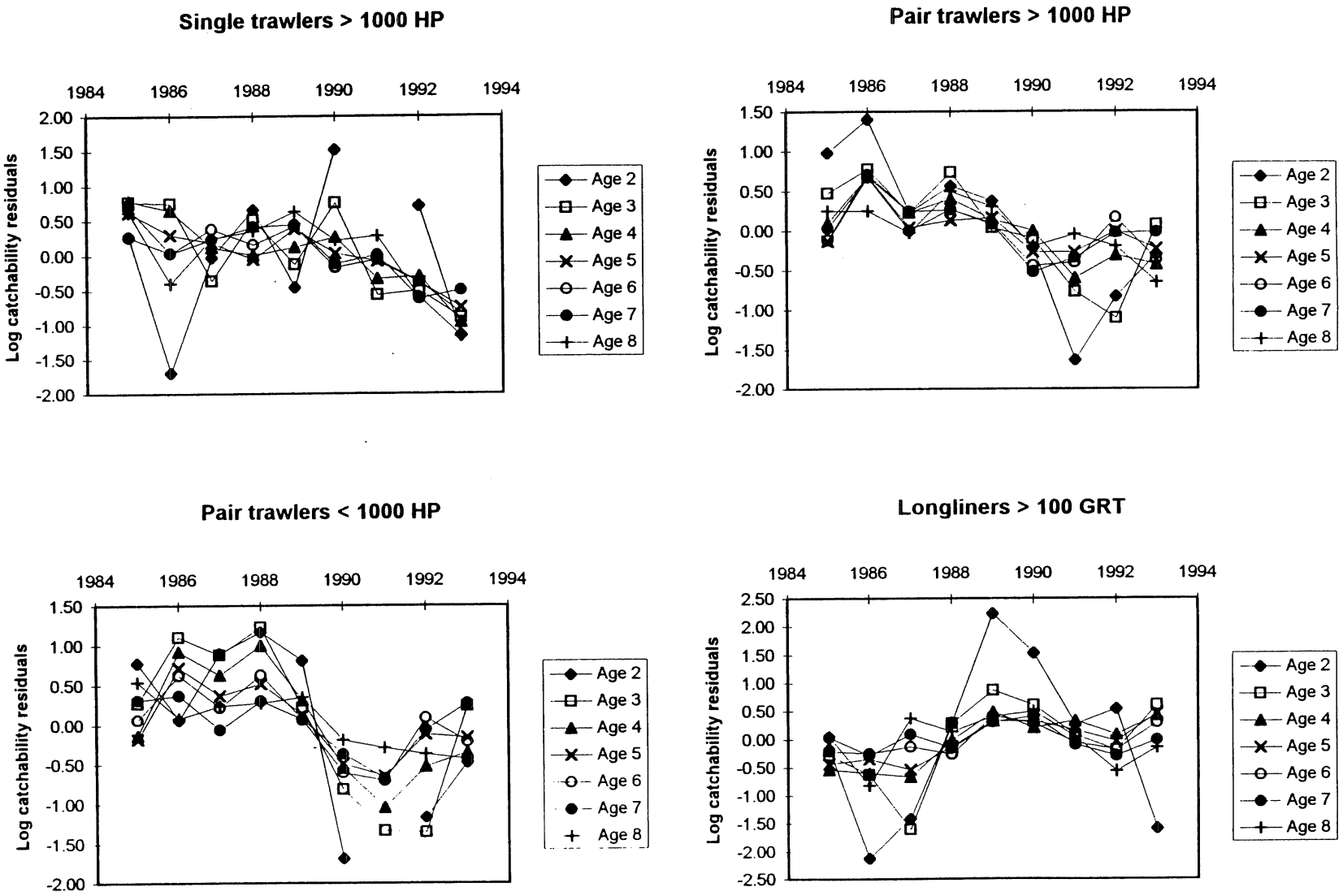


Figure 2.2.4. Plot of log catchability residuals from Laurec-Shepherd ad hoc tuning for each series independtly without shrinkage.

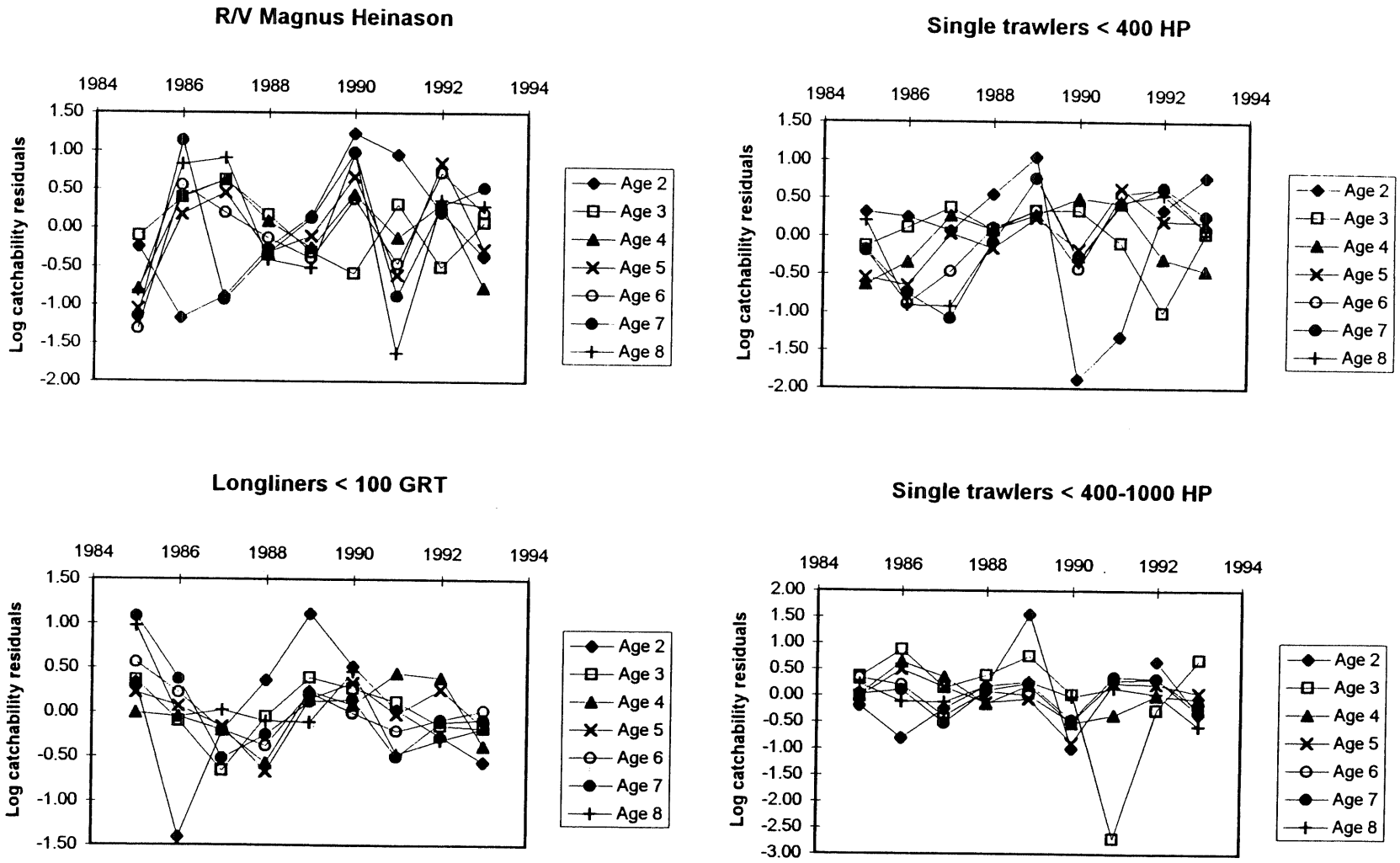
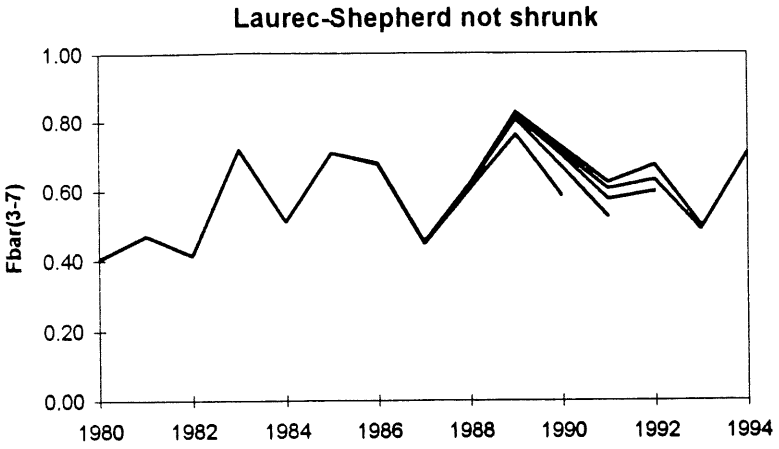
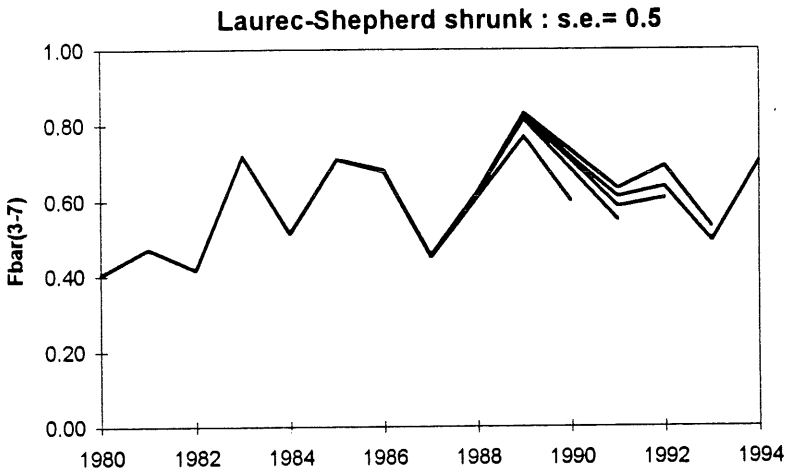


Figure 2.2.4. Plot of log catchability residuals from Laurec-Shepherd ad hoc tuning for each series independtly without shrinkage. Continue !





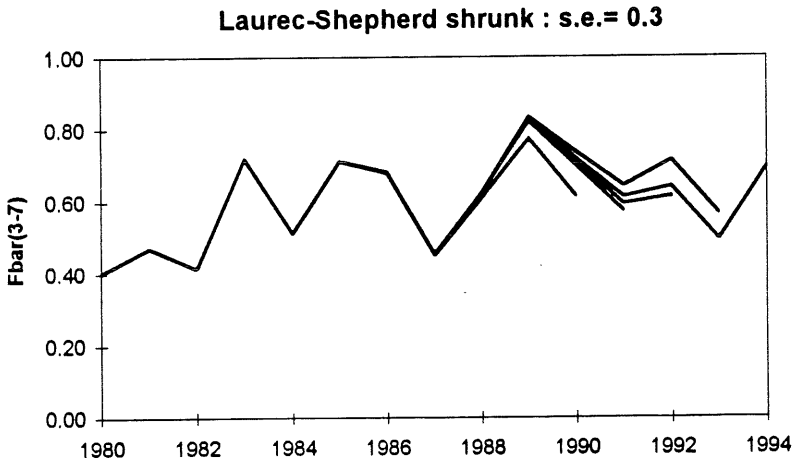


Figure 2.2.5. Retrospective analysis of Faroe Plateau cod using Laurec-Shepherd ad hoc tuning.

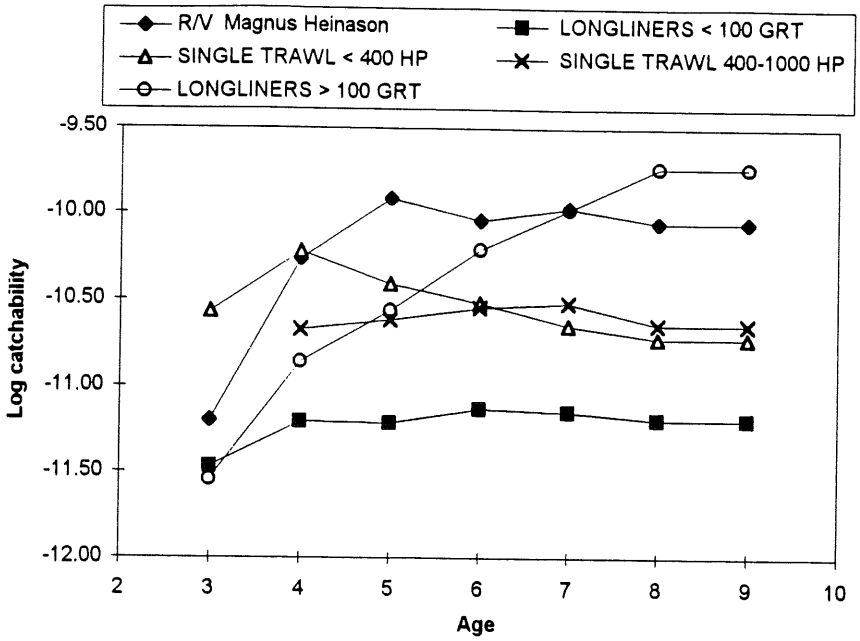


Figure 2.2.6. Estimated log catchabilities based on XSA run with default settings and catchability independent of age for ages >= 8

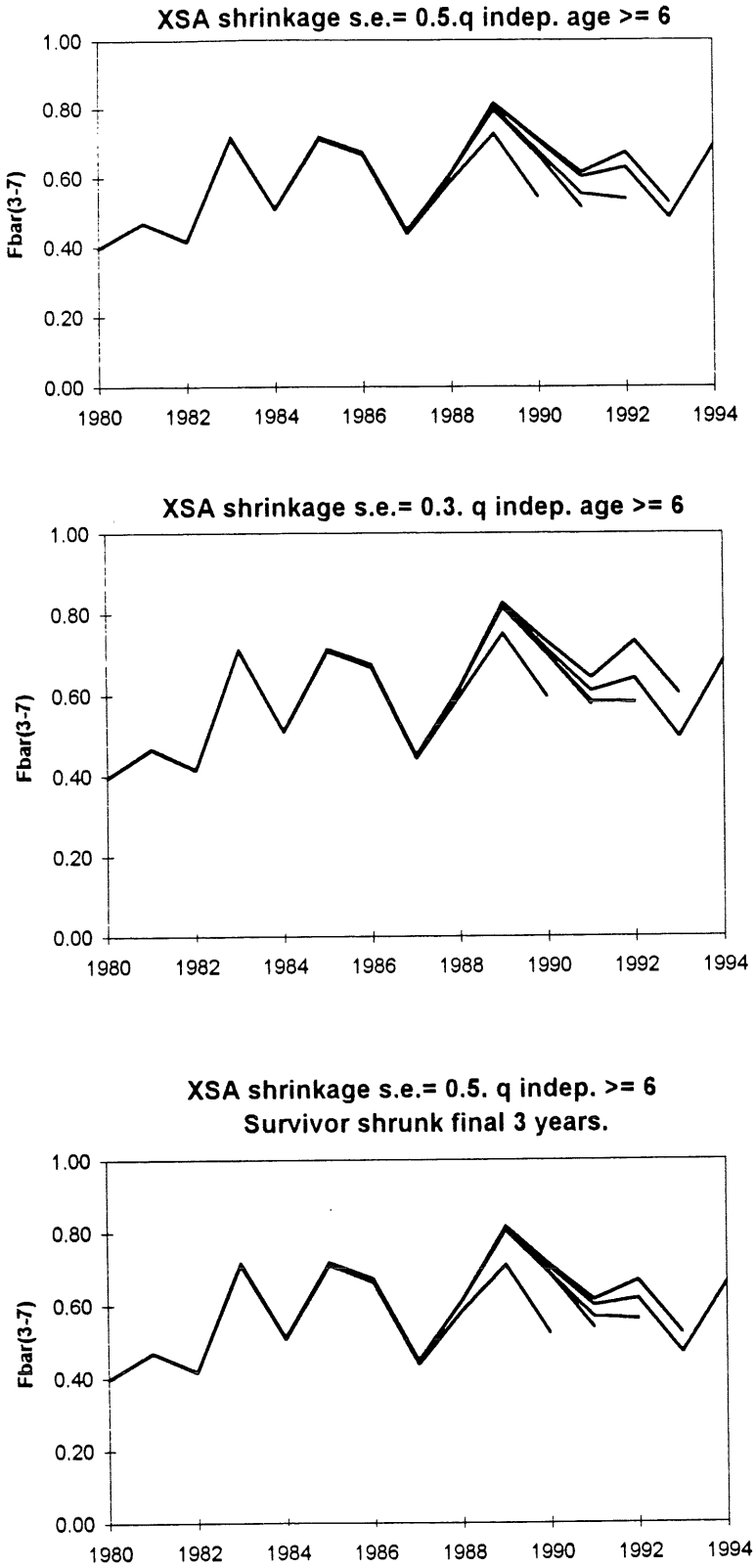


Figure 2.2.7. Retrospective analysis of Faroe Plateau cod using XSA for tuning.

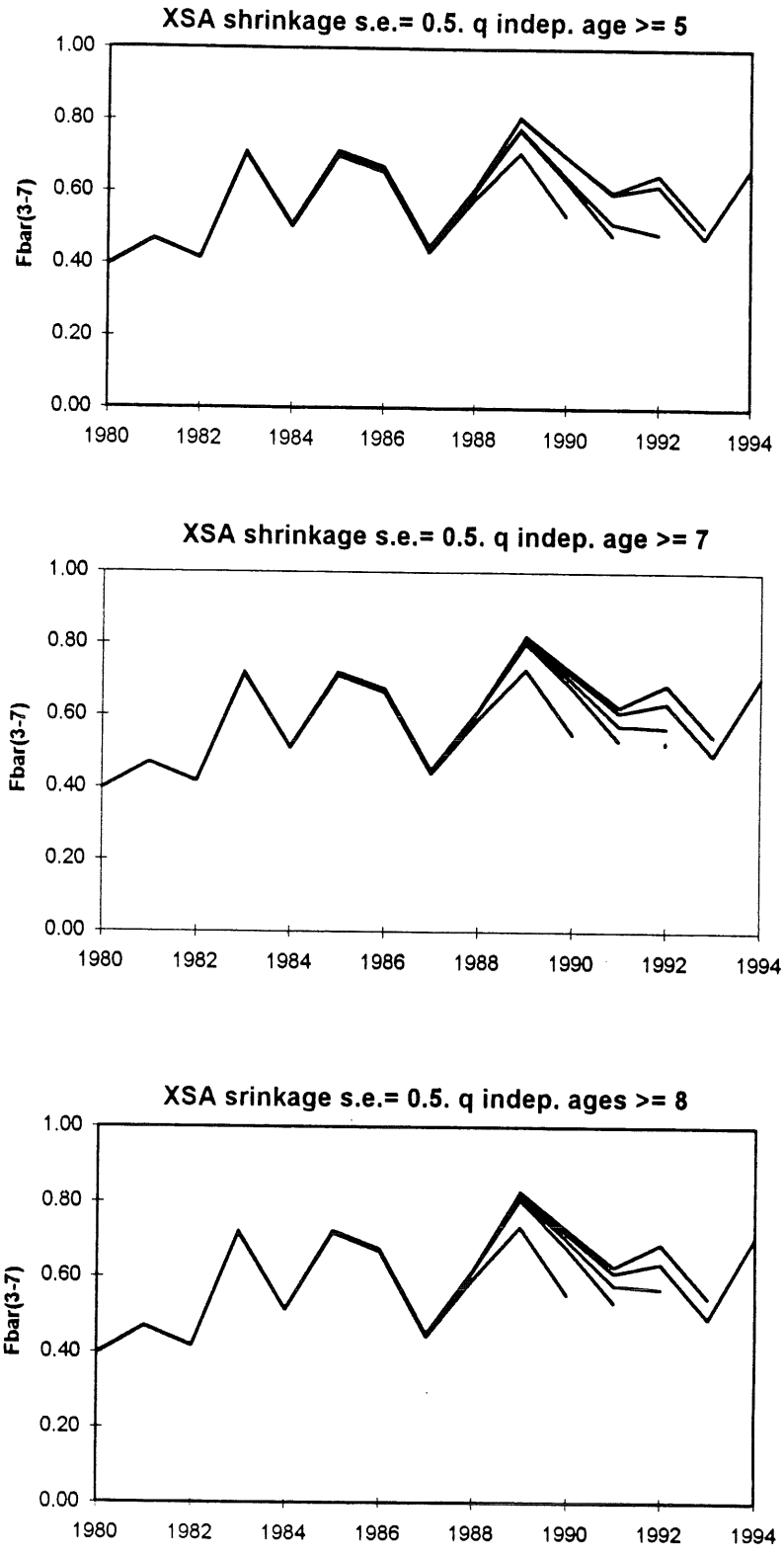
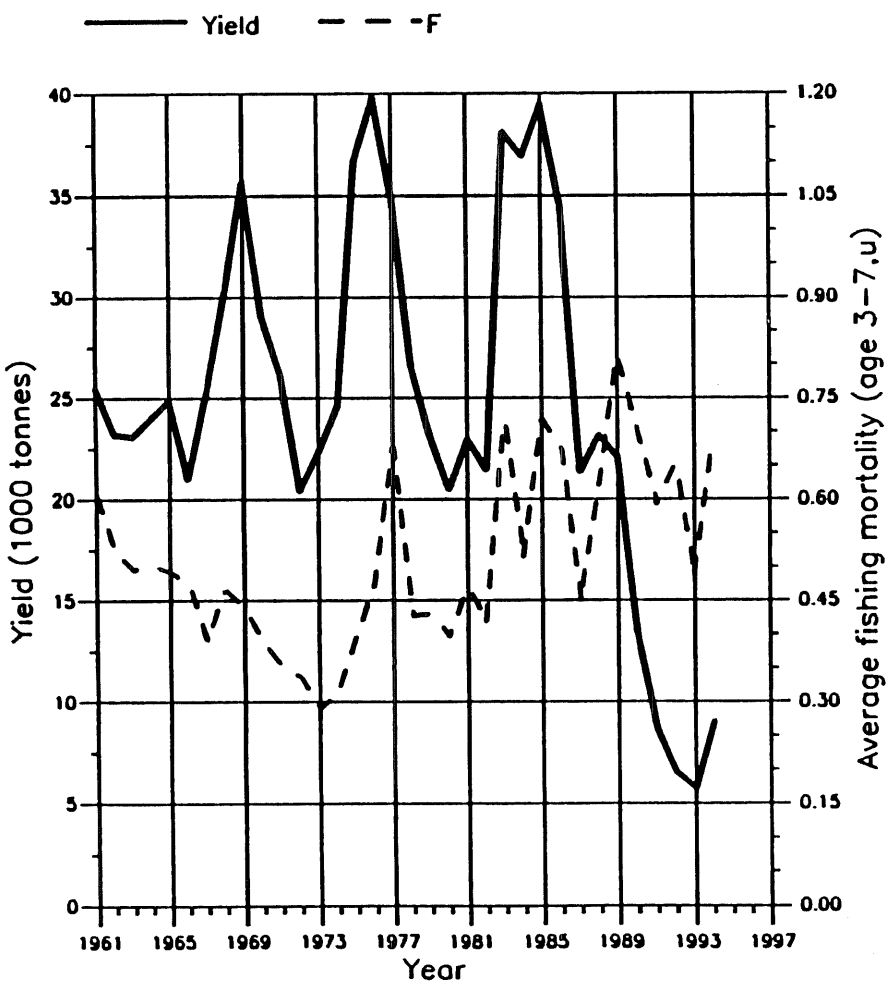


Figure 2.2.8. Retrospective analysis of Faroe Plateau cod using XSA for tuning.

Figure 2.2.9

FISH STOCK SUMMARY
STOCK: Cod in the Faroe Plateau (Fishing Area Vb1)
6–5–1995

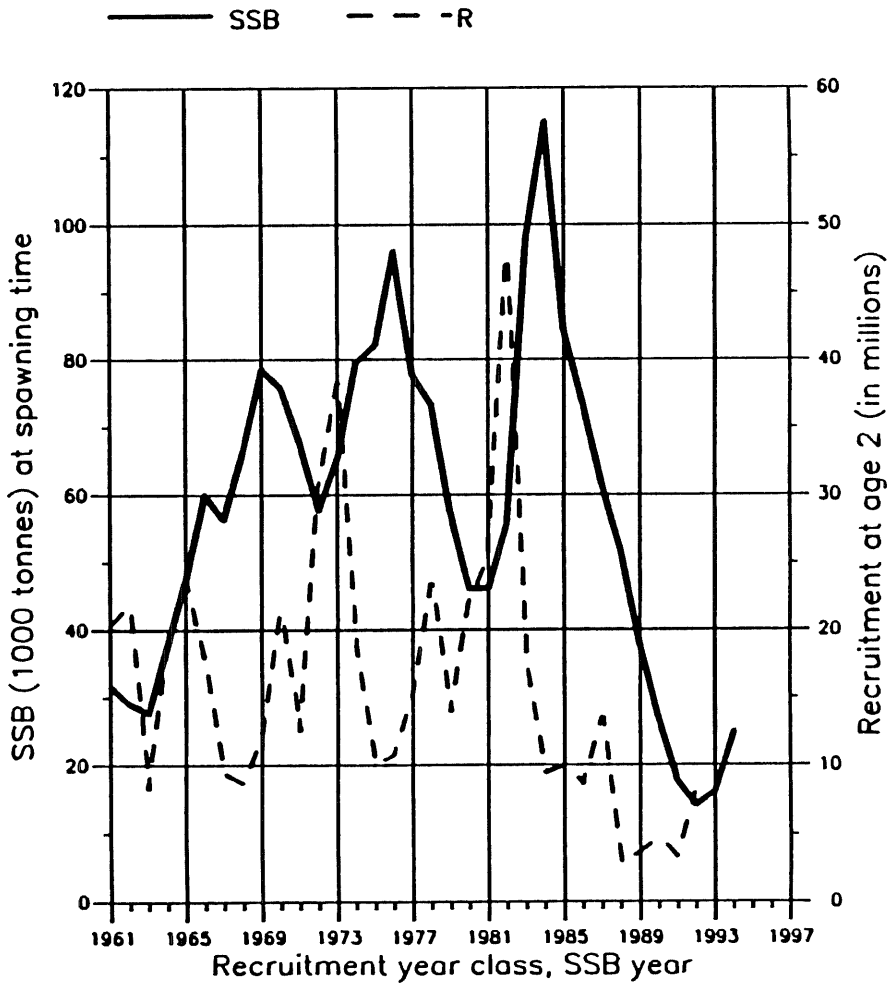
Trends in yield and fishing mortality (F)



(run: EXPLVPA)

A

Trends in spawning stock biomass (SSB) and recruitment (R)

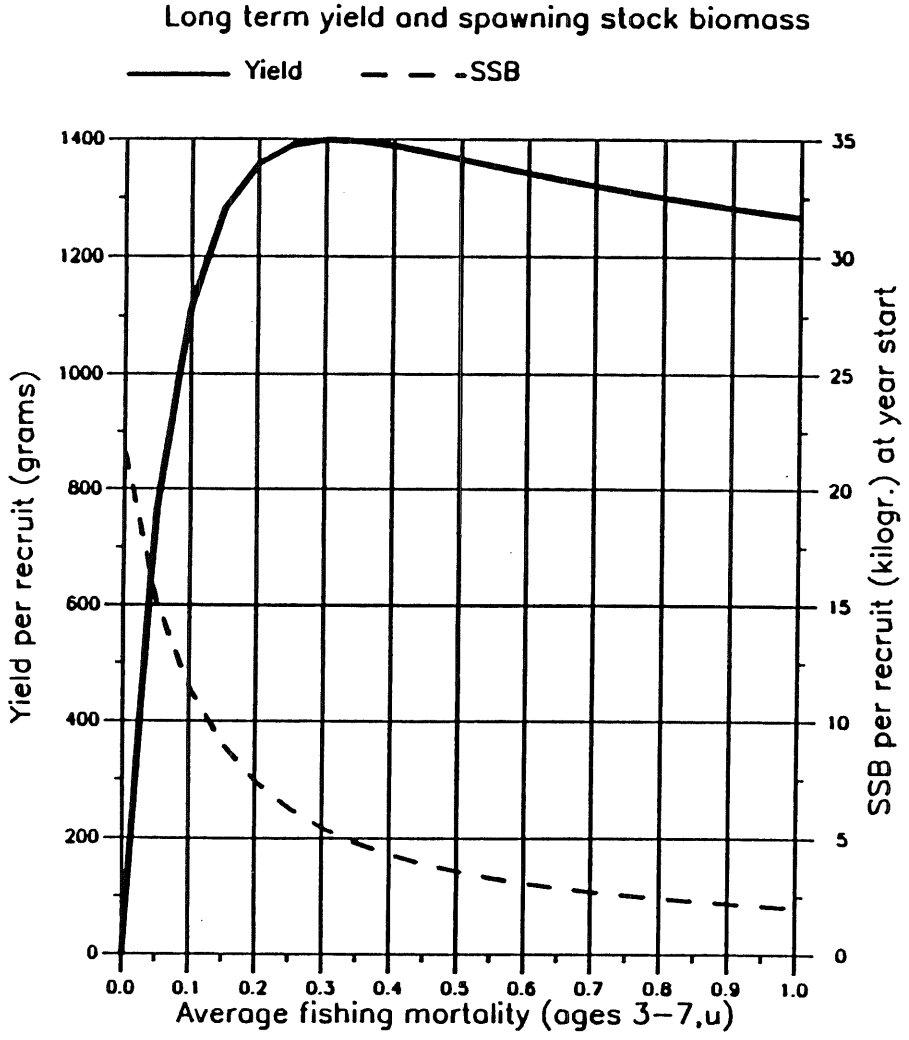


(run: EXPLVPA)

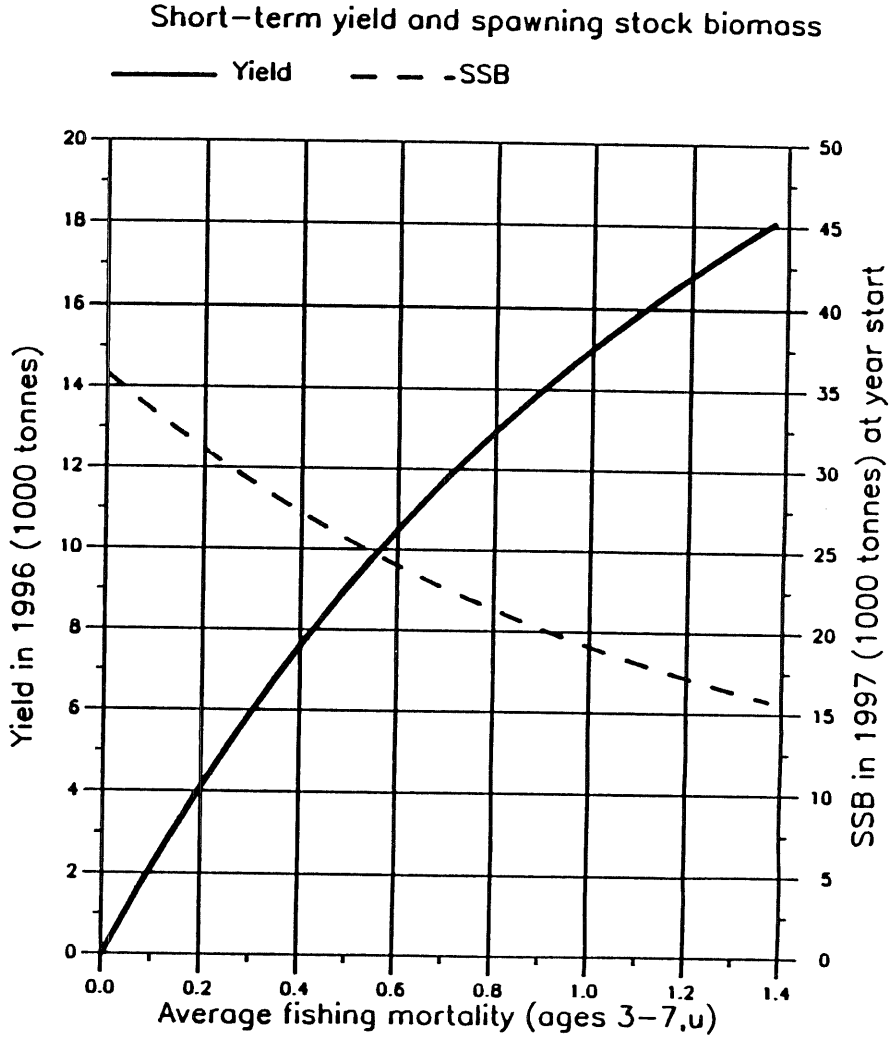
B

Figure 2.2.10

FISH STOCK SUMMARY
STOCK: Cod in the Faroe Plateau (Fishing Area Vb1)
9–5–1995



(run: YRRUN1) **C**



(run: RUN1) **D**

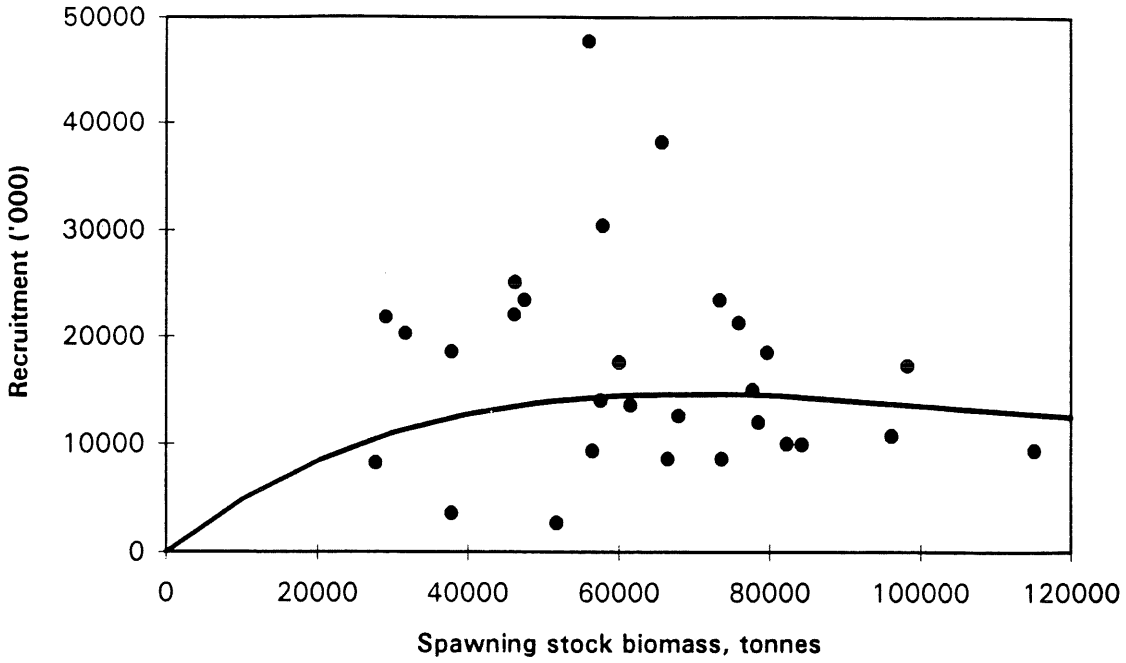


Figure 2.2.11. Faroe Plateau cod. Stock-recruitment curve used in simulations.

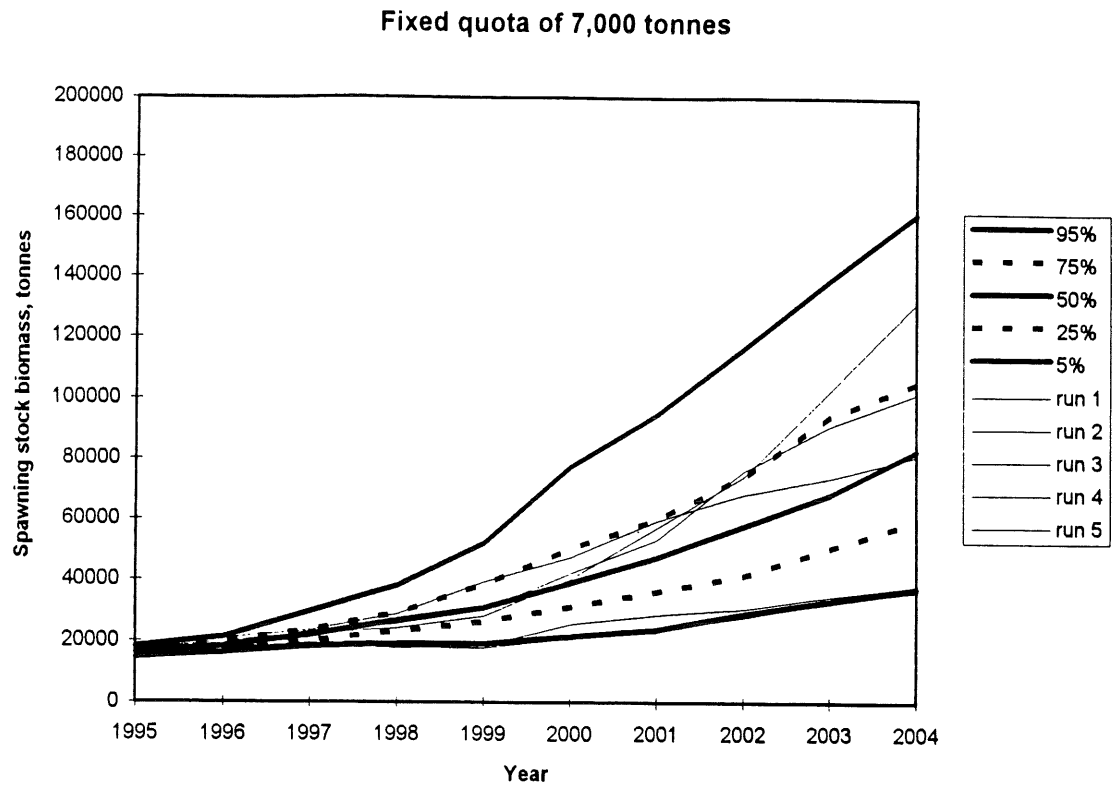


Figure 2.2.12. Faroe Plateau cod. Risk analysis with Ricker stock-recruitment relationship and a fixed quota of 7,000 tonnes.

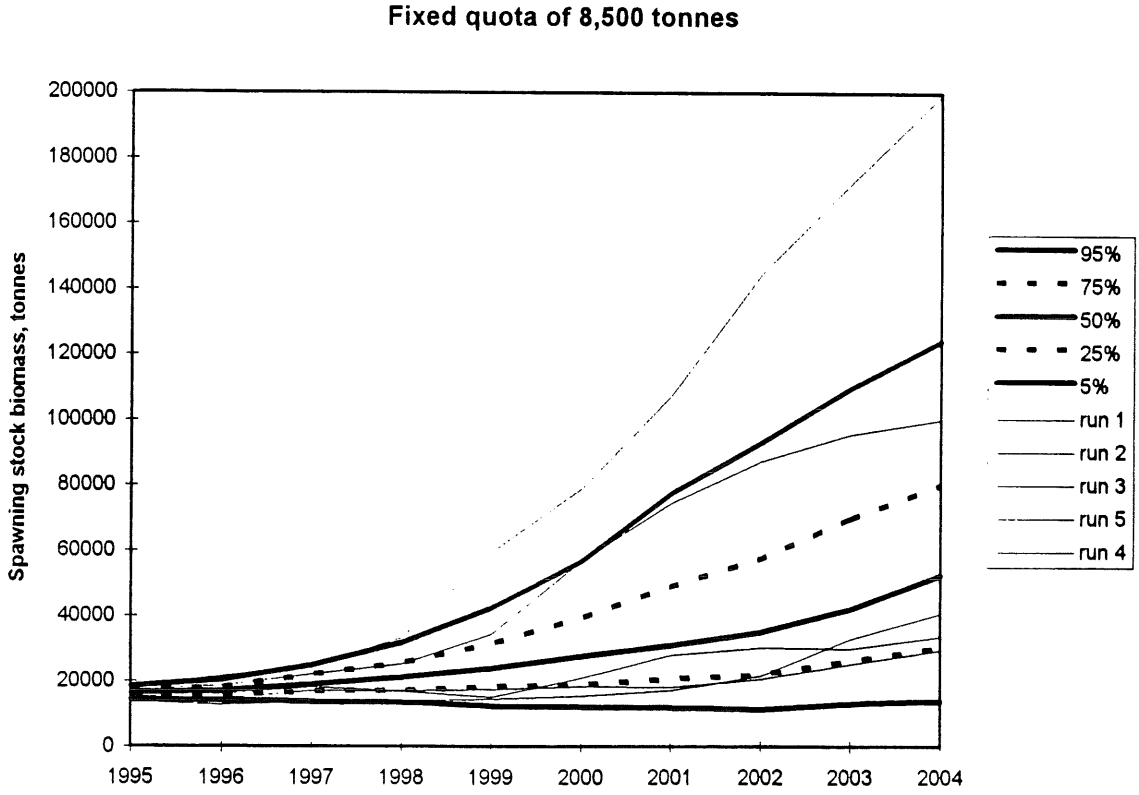


Figure 2.2.13. Faroe Plateau cod. Risk analysis with Ricker stock-recruitment relationship and a fixed quota of 8,500 tonnes.

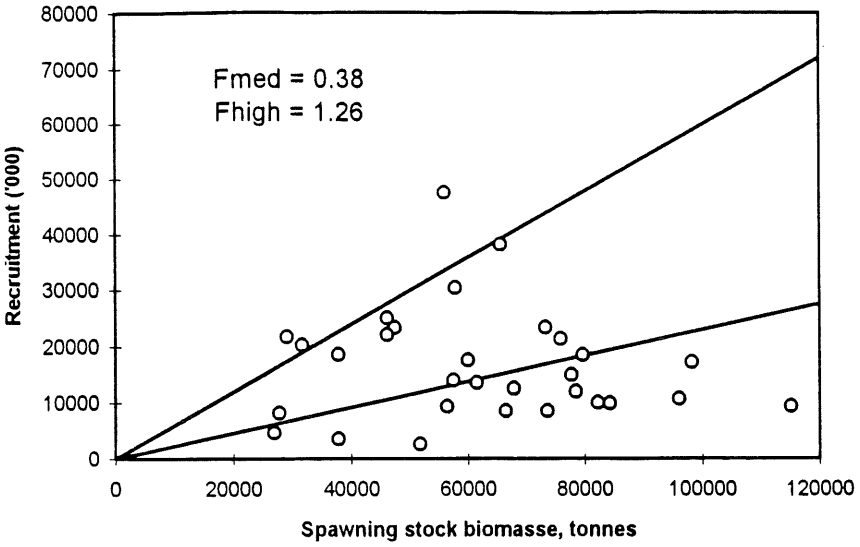


Figure 2.2.14. Faroe Plateau cod. Stock-recruitment relationship.

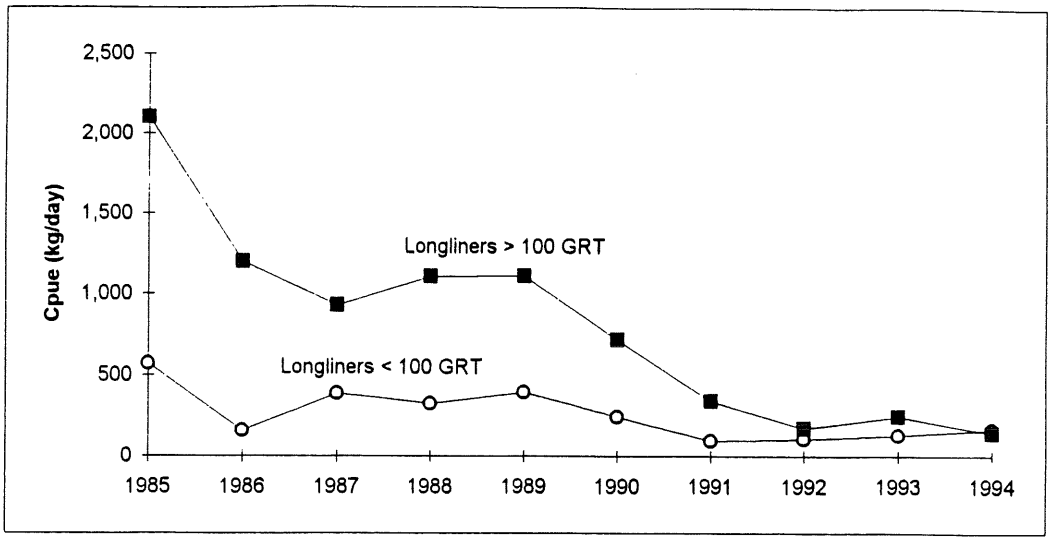


Figure 2.3.1. Catch per unit effort (kg/day) of Faroe Bank cod for longliners.

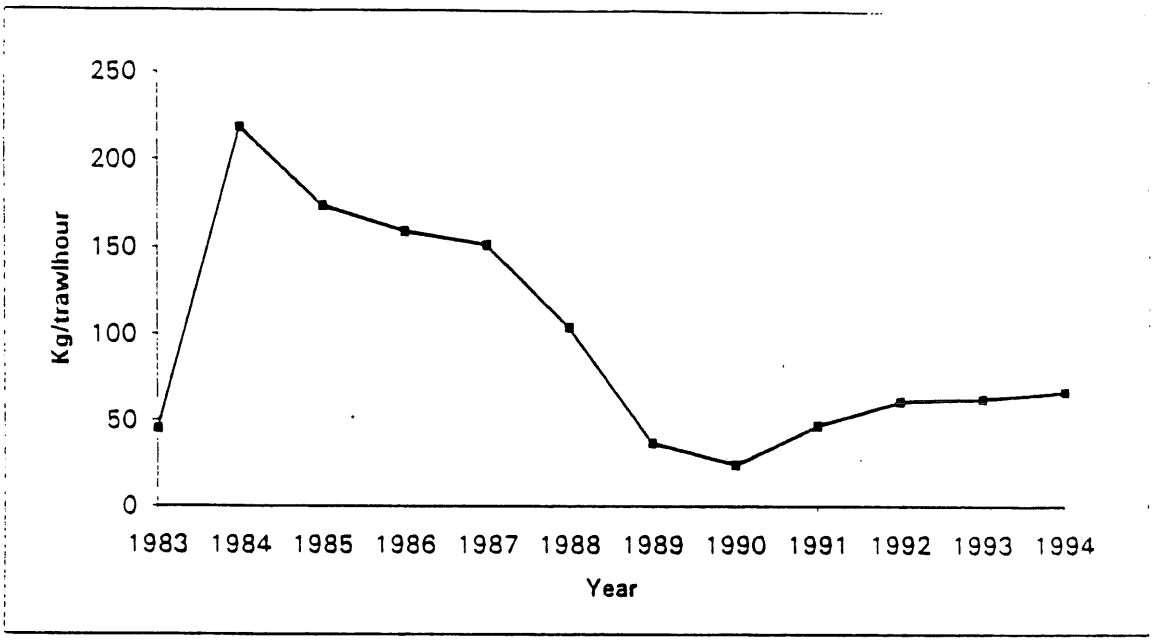


Figure 2.3.2 Catches of cod in areas lesser than 200 meter during the groundfish surveys on Faroe Bank 1983-1994.

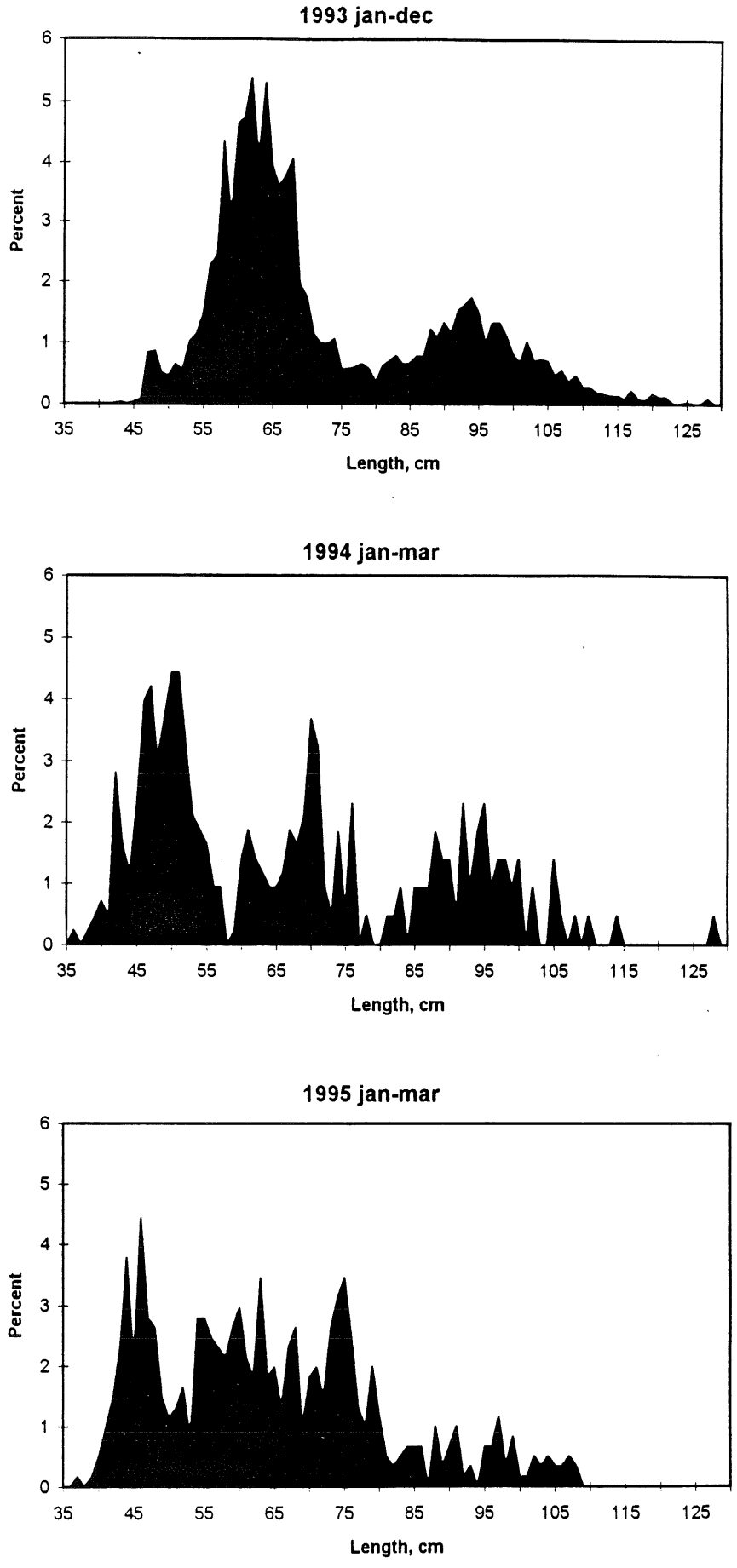


Figure 2.3.3. Length distribution in the cod catches for longliners at Faroe Bank.

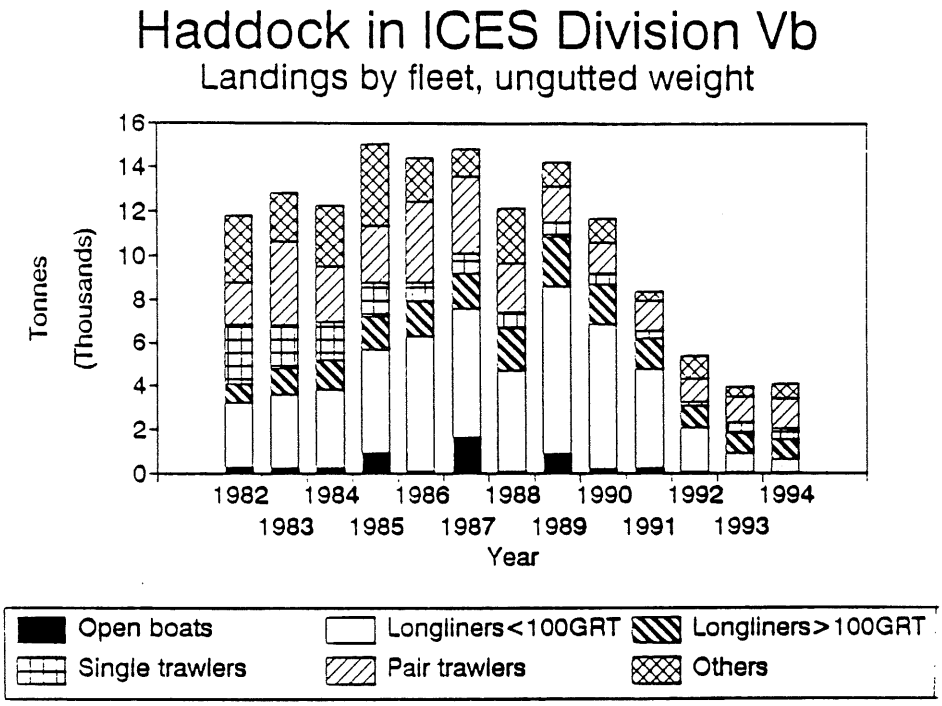


Figure 2.4.1

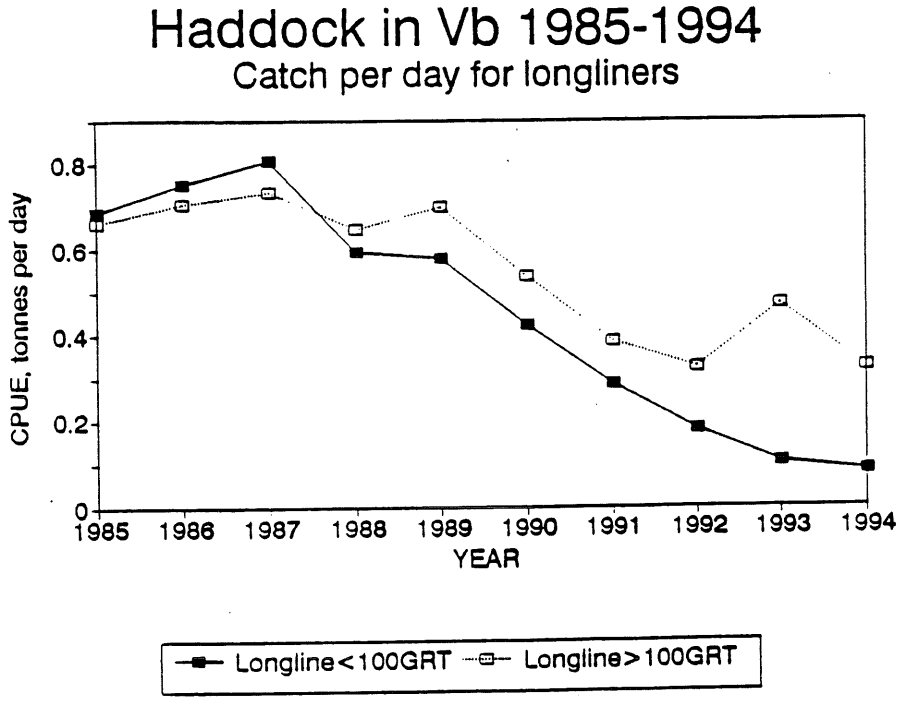


Figure 2.4.2

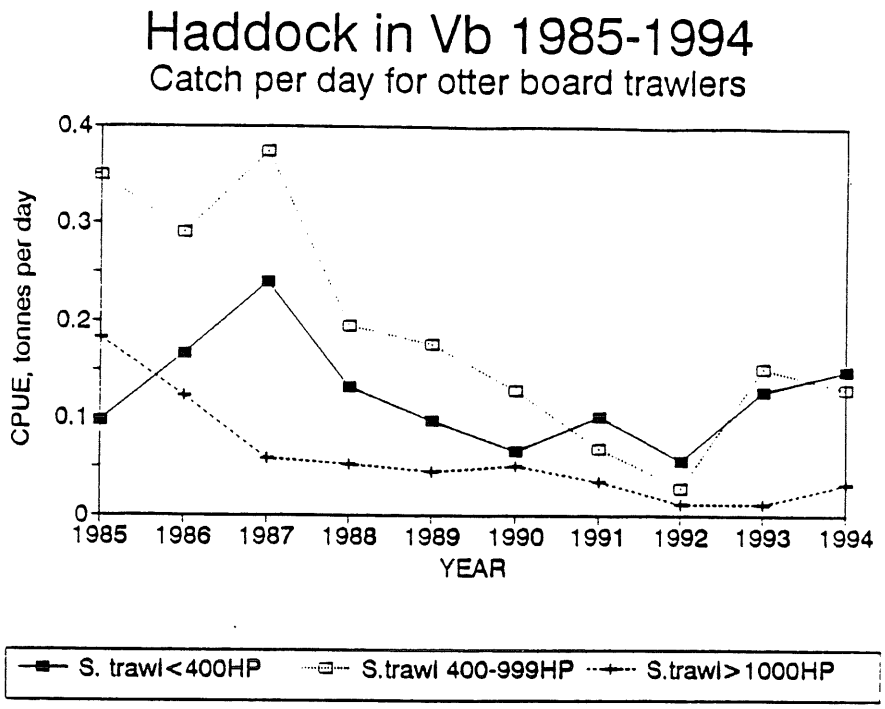


Figure 2.4.3

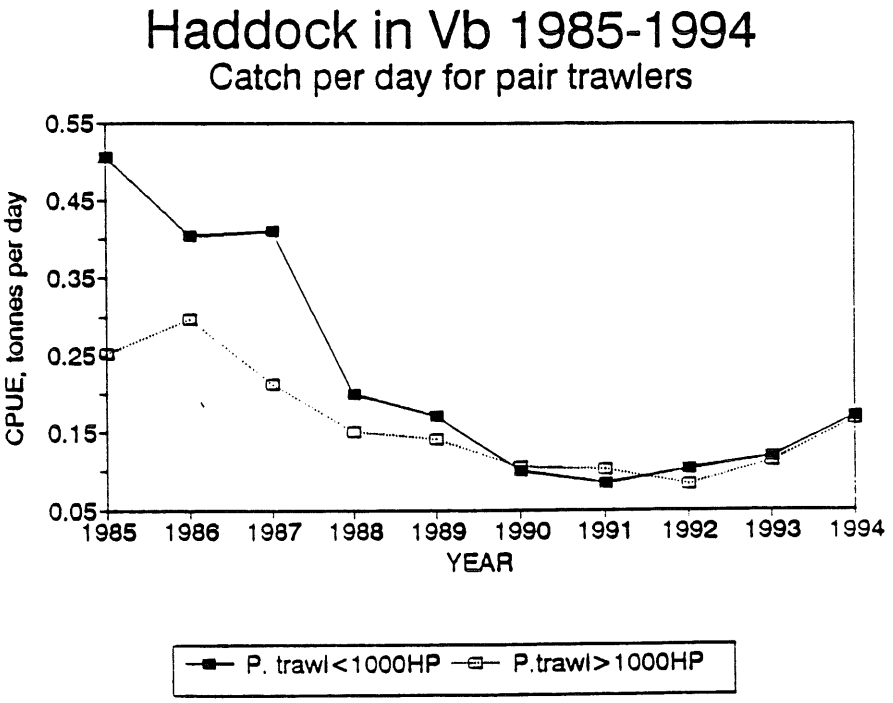


Figure 2.4.4

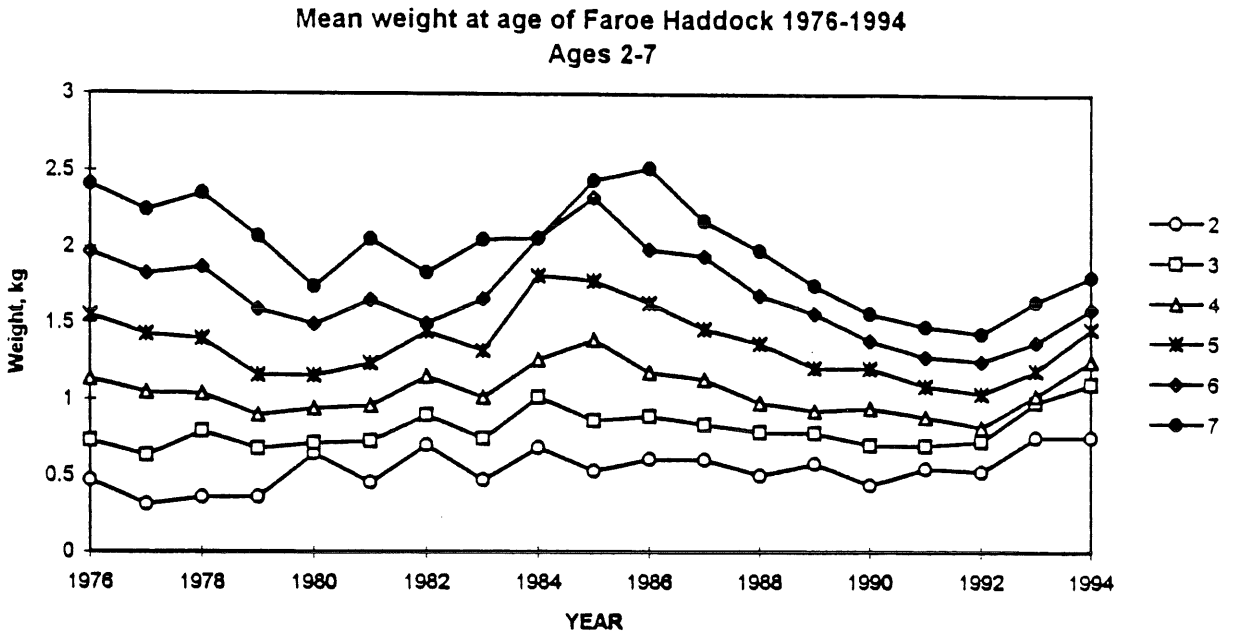


Figure 2.4.5

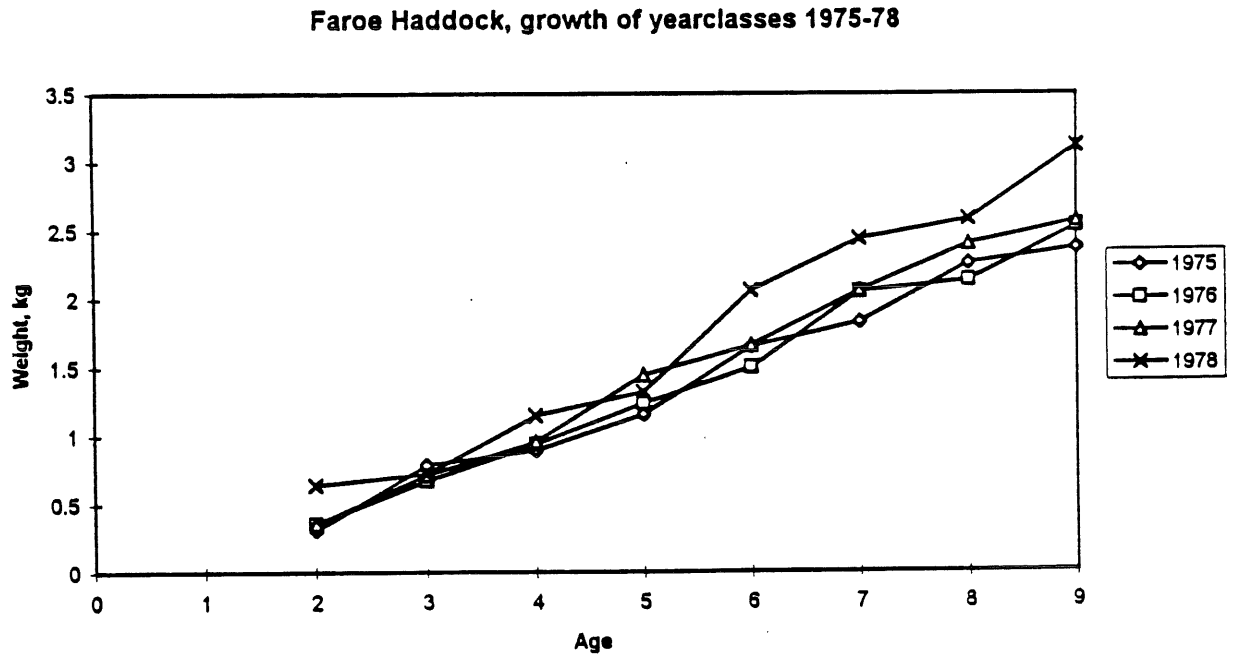


Figure 2.4.6

Figure 2.4.7 Faroe Haddock, growth of yearclasses 1979-82

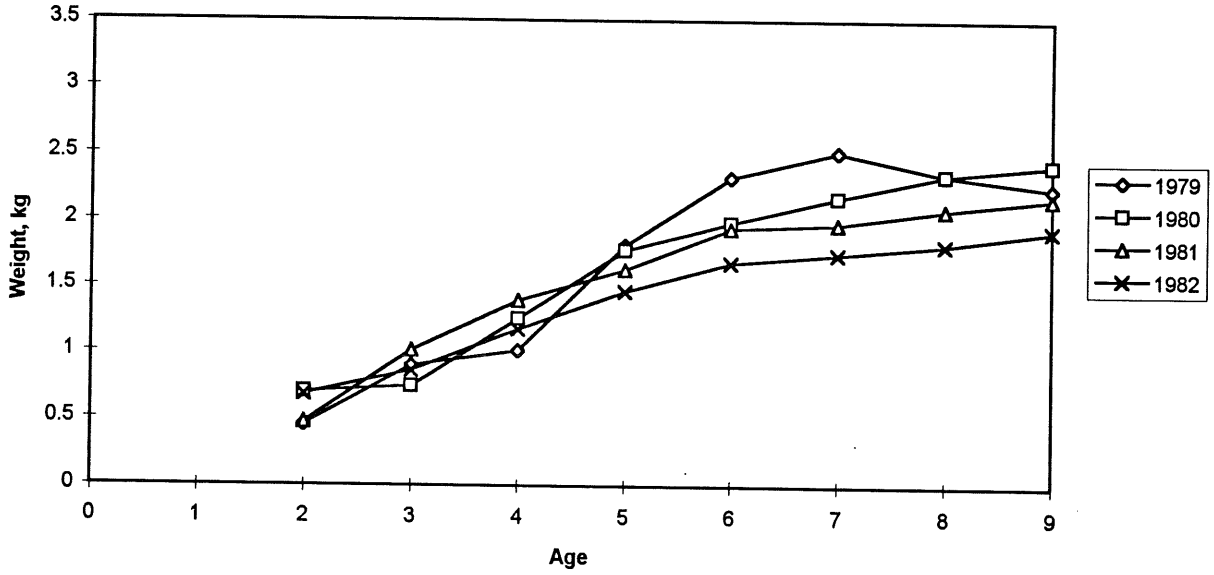


Figure 2.4.8 Faroe Haddock, growth of yearclasses 1983-87

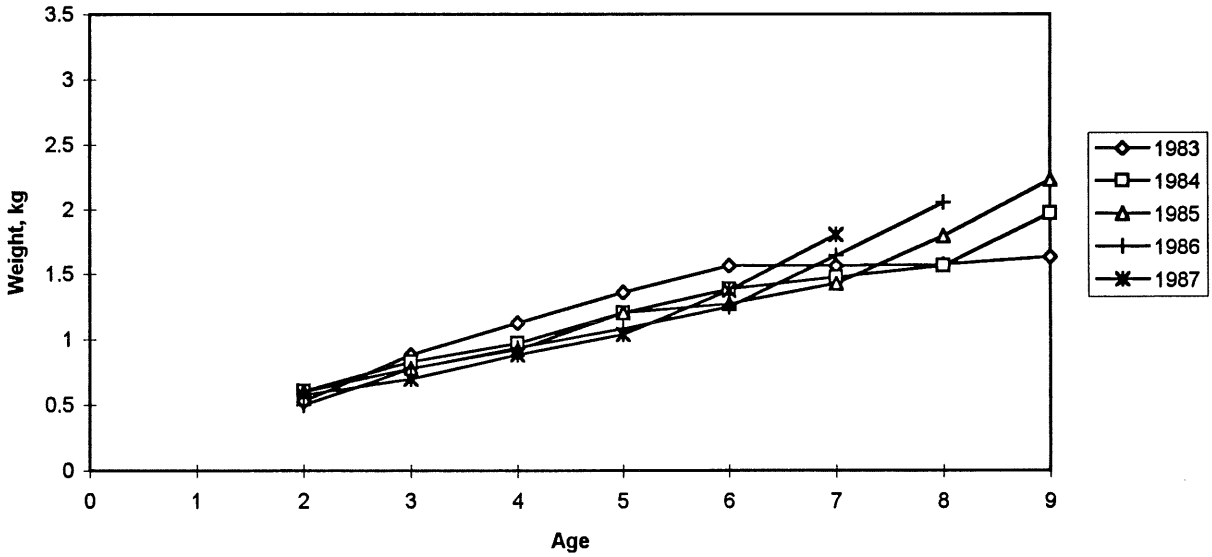


Figure 2.4.9 Faroe Haddock, growth of yearclasses 1988-92

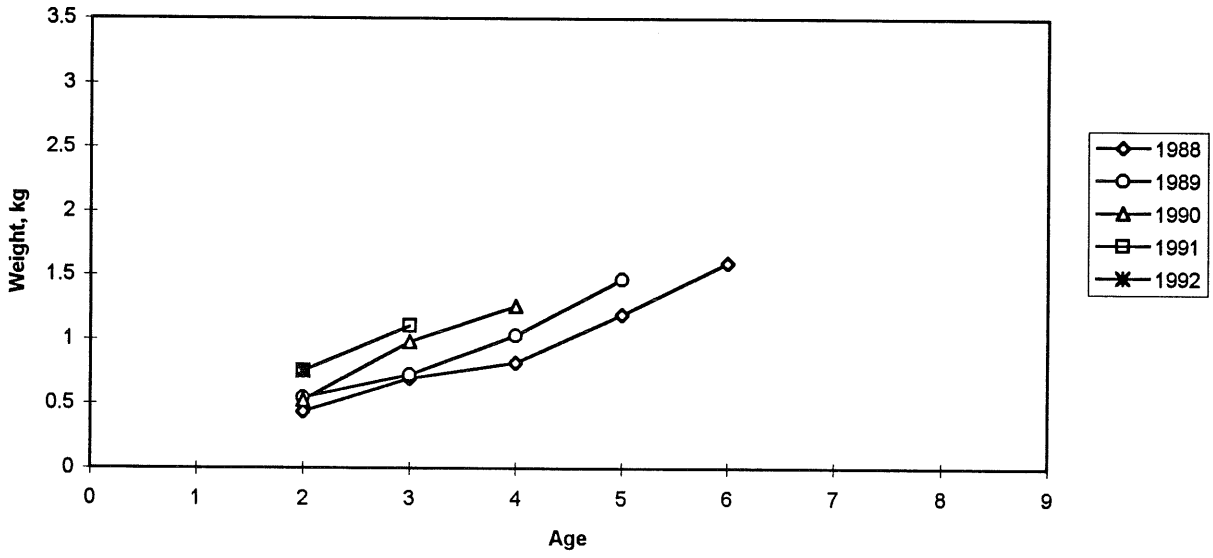


Figure 2.4.10 L-S Tuning Longliners < 100 GRT

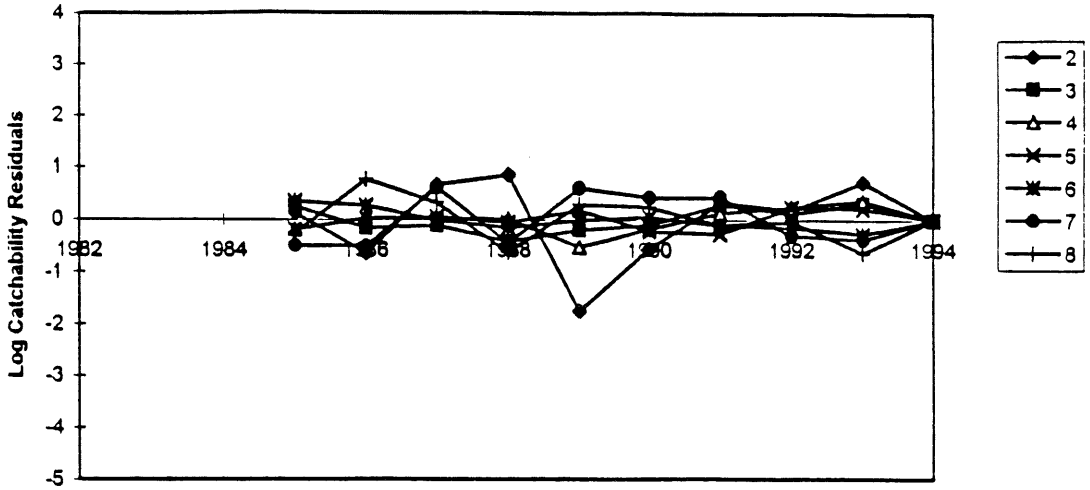


Figure 2.4.11 L-S Tuning Longliners > 100 GRT

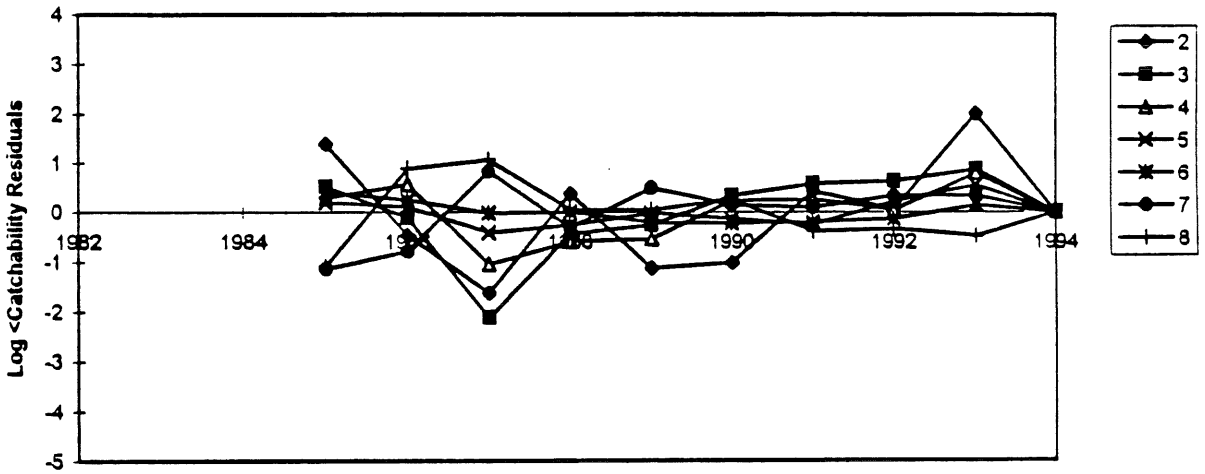


Figure 2.4.12 L-S Tuning MH Trawl Survey

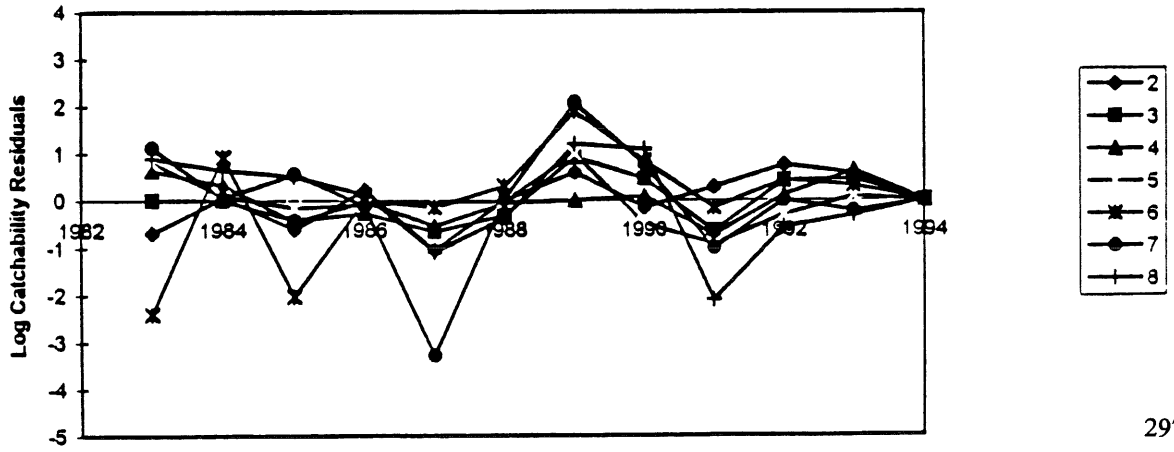


Figure 2.4.13 L-S Tuning Single Trawlers < 400 HP

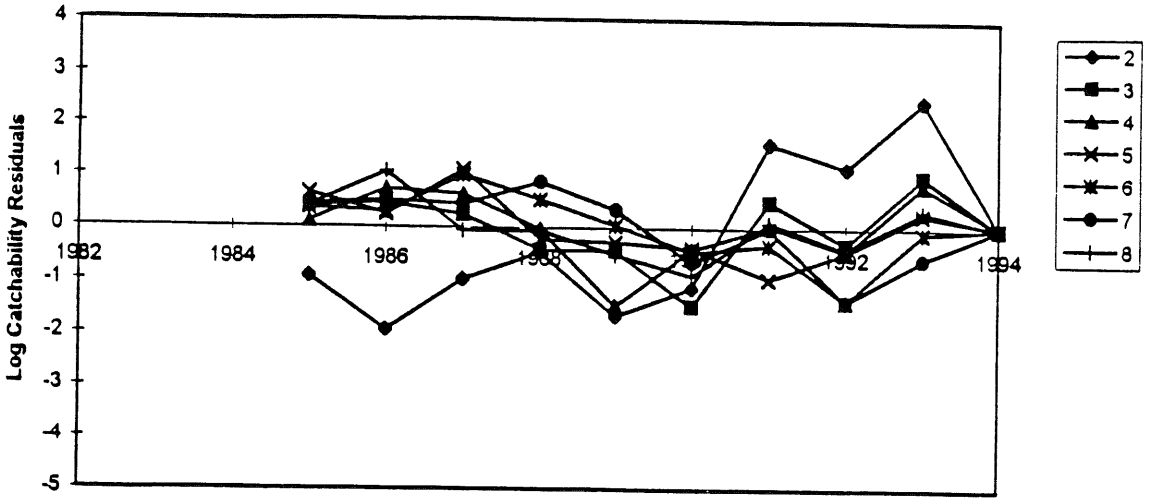


Figure 2.4.14 L-S Tuning Single Trawlers 400-1000 HP

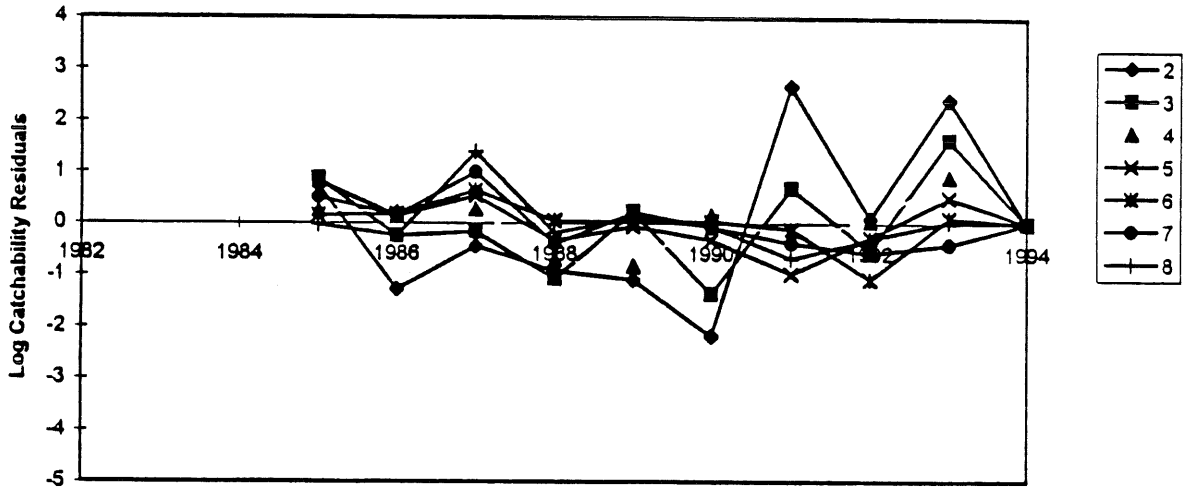


Figure 2.4.15 L-S Tuning Single Trawlers > 1000 HP

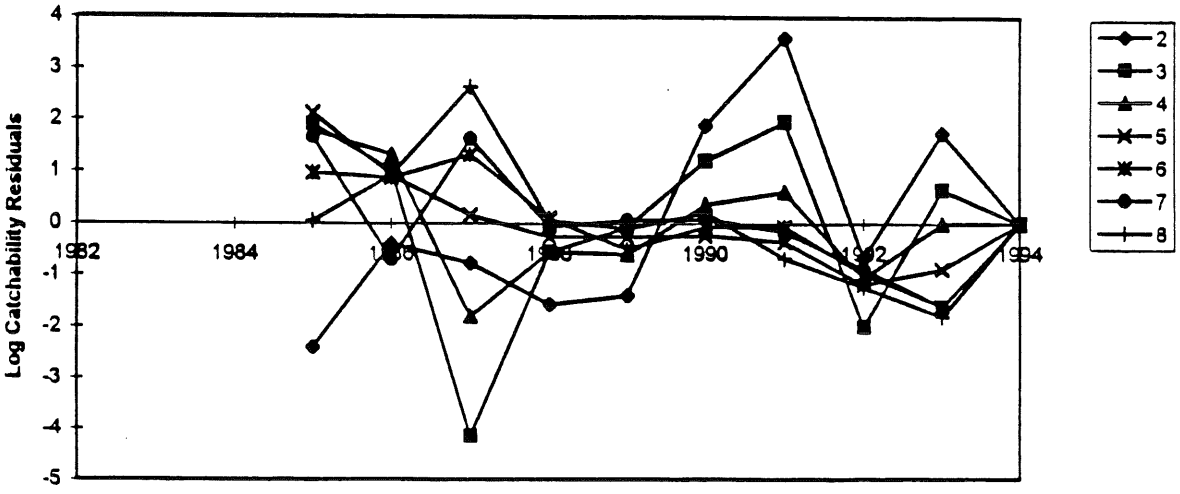


Figure 2.4.16 L-S Tuning Pair Trawlers < 1000 HP

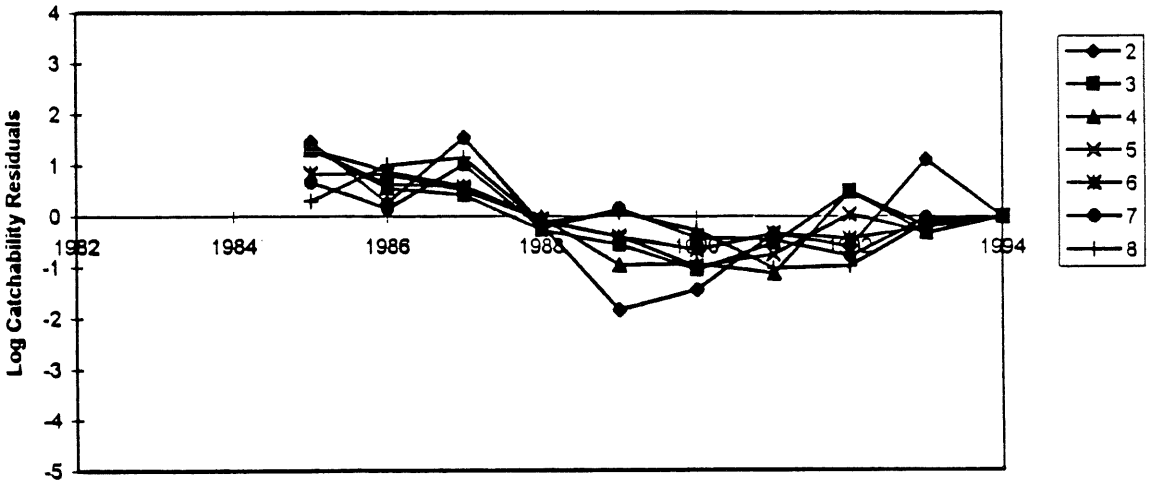
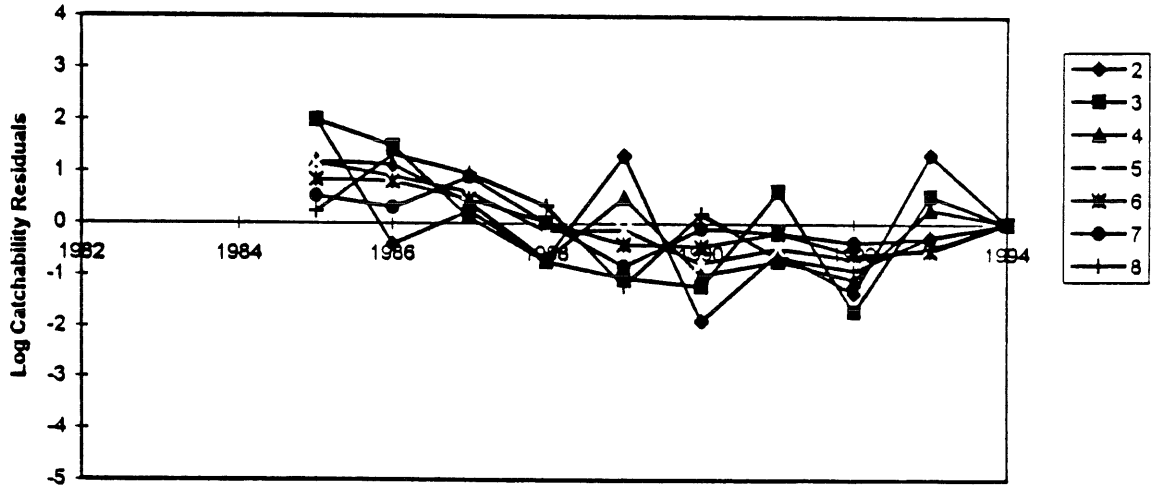


Figure 2.4.17 L-S Tuning Pair Trawlers > 1000 HP



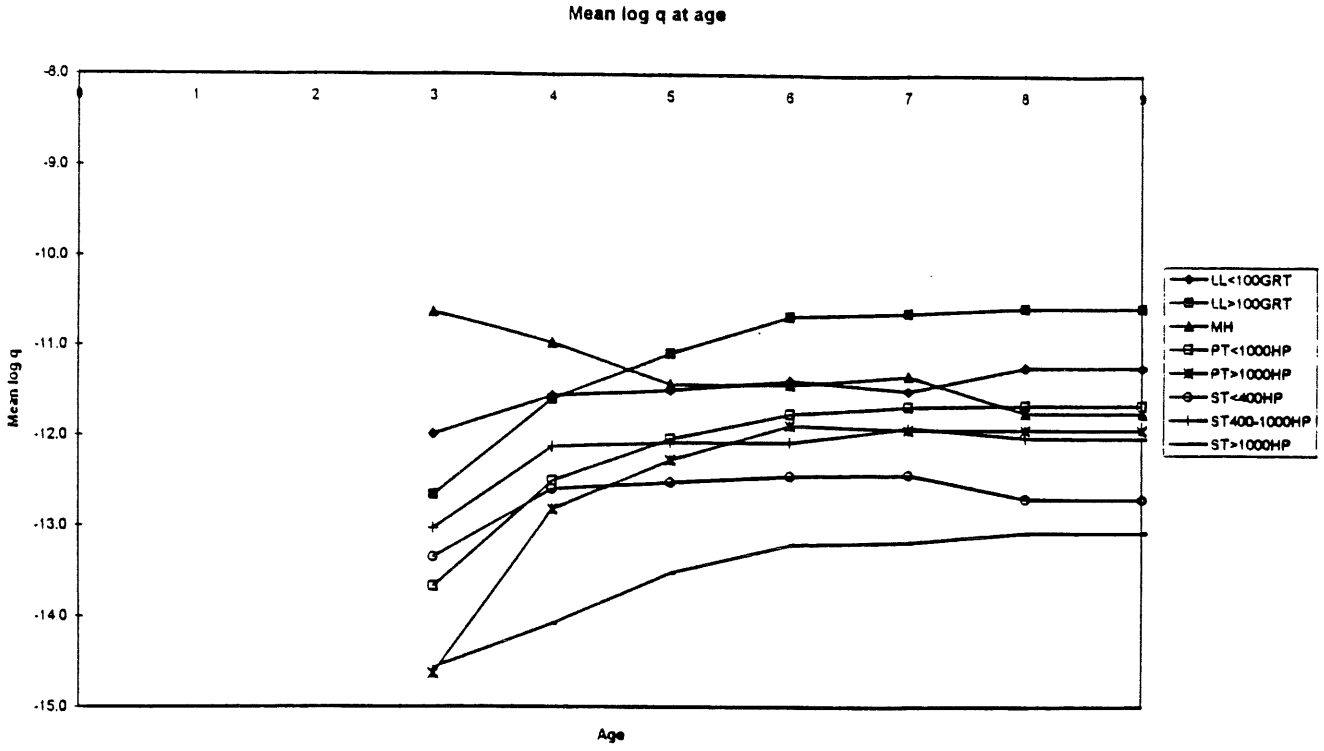

Mean log q at age
-8.0
-9.0
-10.0
-11.0
-12.0
-13.0
-14.0
-15.0
1
2
3
4
5
6
7
8
Mean log q
Age
LL<100GRT
LL>100GRT
MH
PT<1000HP
PT>1000HP
ST<400HP
ST400-1000HP
ST>1000HP
Q independent of year class strength at age 3

Figure 2.4.18

Figure 2.4.19 **Retrospective analysis Faroe Haddock L-S tuning, all fleets complete**

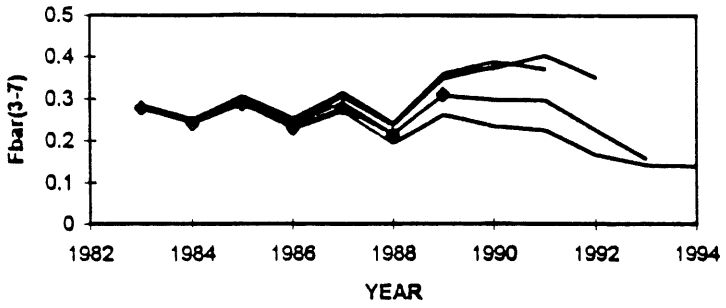


Figure 2.4.20 **Retrospective analysis Faroe Haddock, L-S tuning, 3 revised fleets**

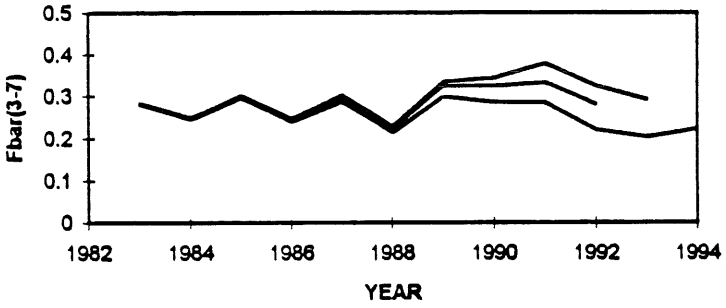


Figure 2.4.21 **Retrospective Analaysis Faroe Haddock, L-S tuning, 5 revised fleets**

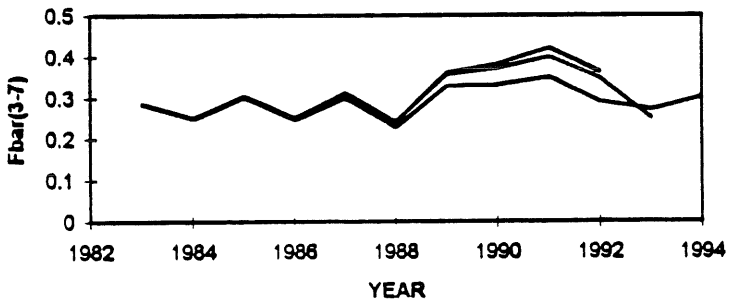


Figure 2.4.22 **Retrospective analysis Faroe Haddock, all fleets unchanged, default XSA settings**

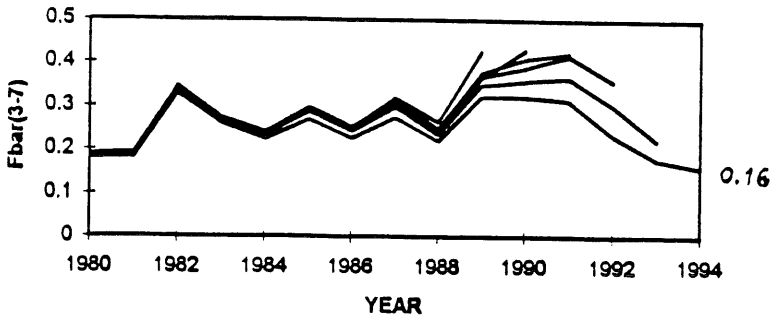


Figure 2.4.23 **Retrospective analysis, Faroe Haddock, 3 revised fleets, default XSA settings**

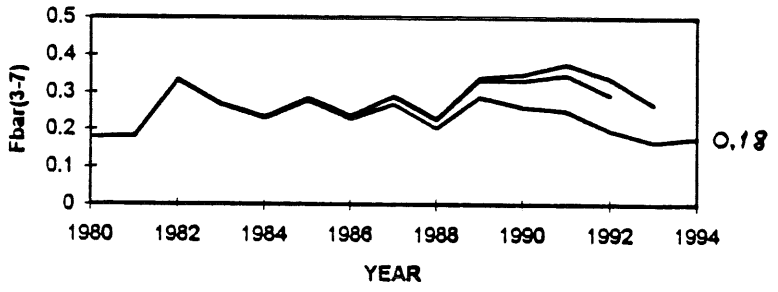


Figure 2.4.24 **Retrospective analysis, Faroe Haddock, 5 revised fleets, default XSA settings**

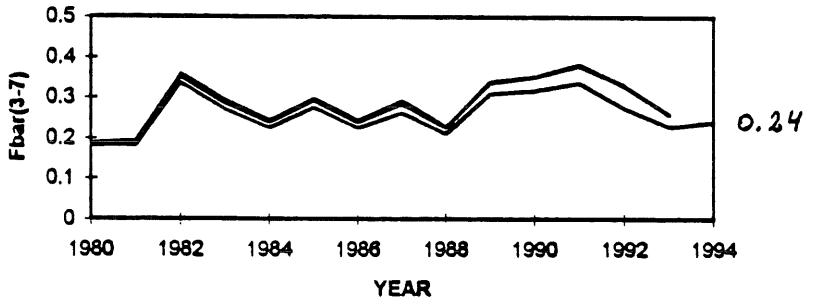


Figure 2.4.25 **Retrospective Analysis Faroe Haddock, 5 revised fleets, shrunk 0.1**

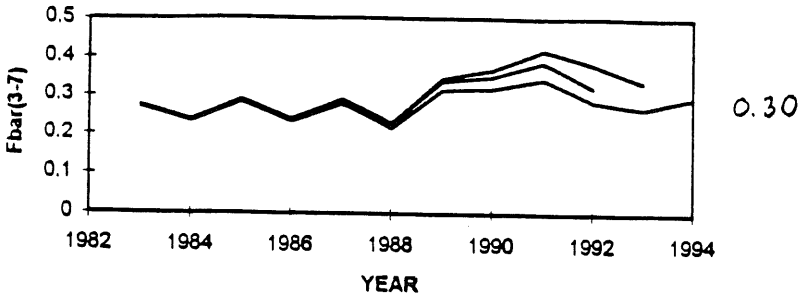


Figure 2.4.26 **Retrospective Analysis Faroe Haddock, 5 revised fleets, shrunk 0.2**

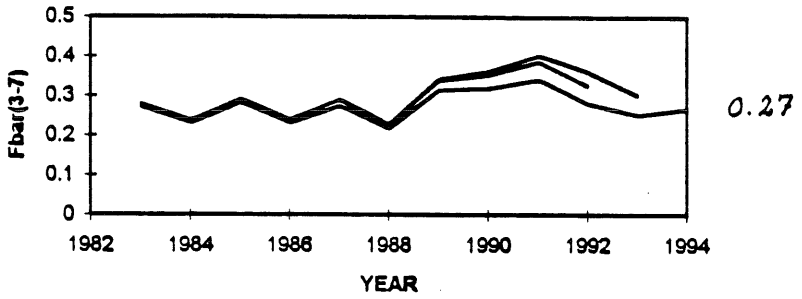


Figure 2.4.27 **Retrospective Analysis Faroe Haddock, 5 revised fleets, shrunk 0.3**

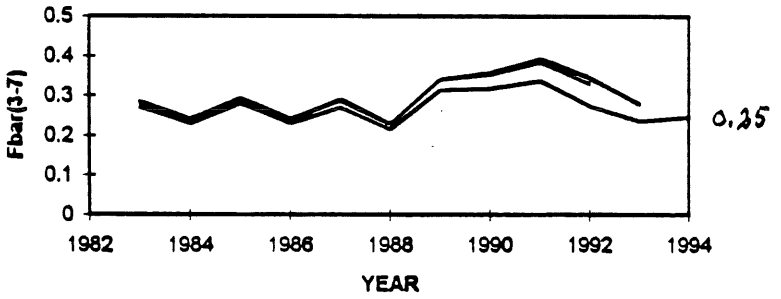


Figure 2.4.28 **Retrospective Analysis Faroe Haddock, 5 revised fleets, shrunk 0.4**

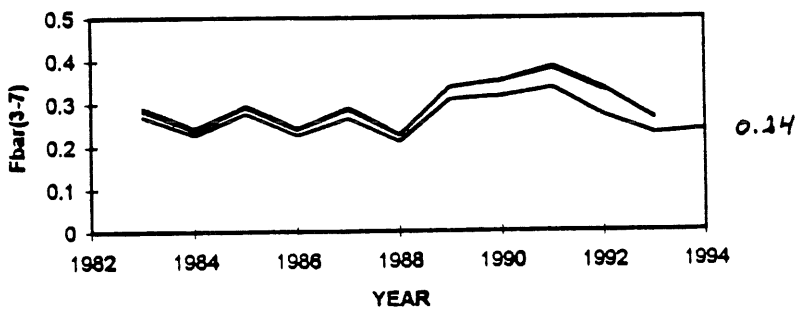


Figure 2.4.29 **Retrospective Analysis Faroe Haddock, 5 revised fleets, xsa shrunk 0.5**

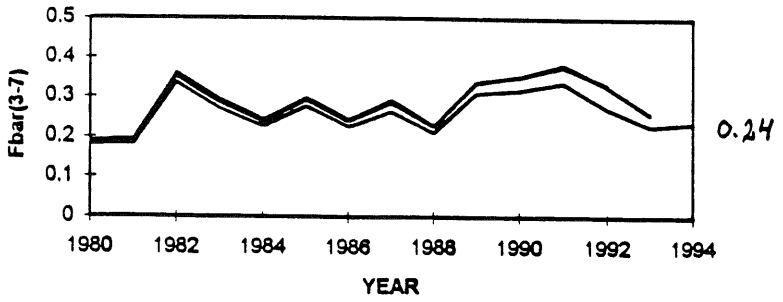


Figure 2.4.30 **Retrospective Analysis Faroe Haddock, 5 revised fleets, xsa shrunk 0.6**

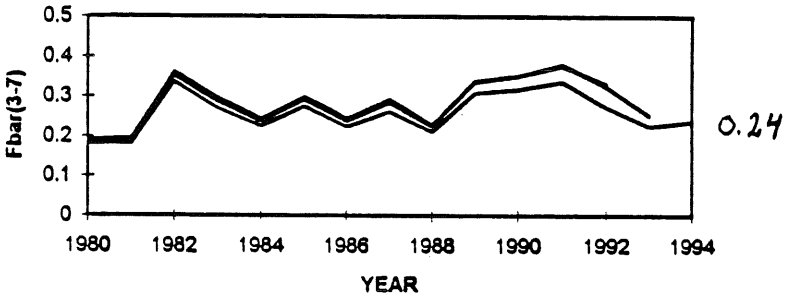


Figure 2.4.31 **Retrospective Analysis Faroe Haddock, xsa shrunk 0.7**

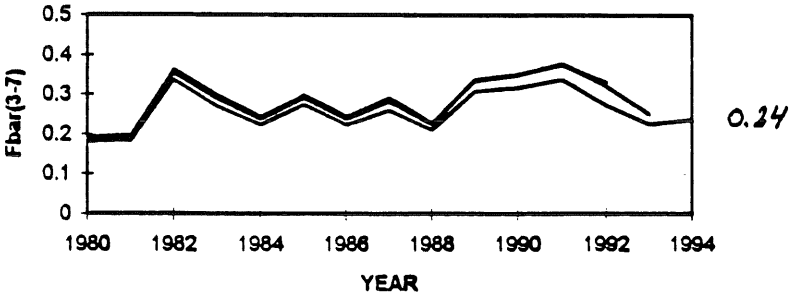
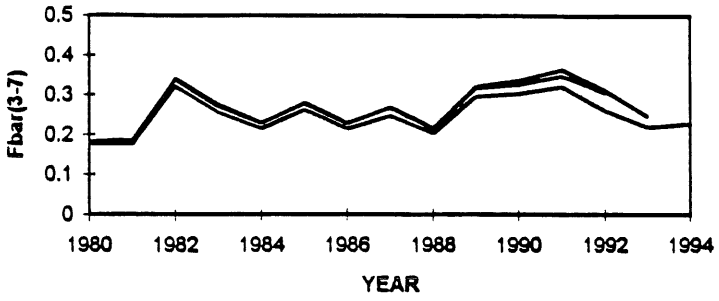
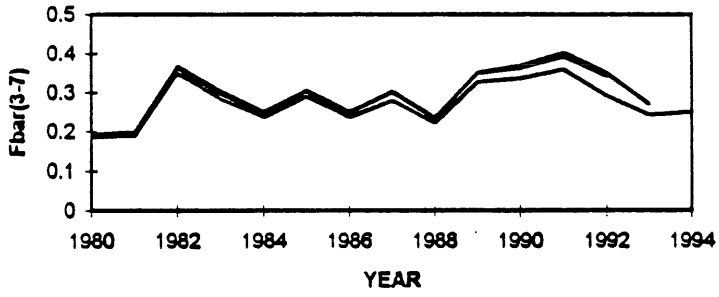


Figure 2.4.32 **Retrospective Analysis Faroe Haddock, 5 revised fleets, xsa shrunk 0.5, q ind. age = 7**



0.23

Figure 2.4.33 **Retrospective Analysis Faroe Haddock, 5 revised fleets, xsa shrunk 0.5, q ind. age = 8**

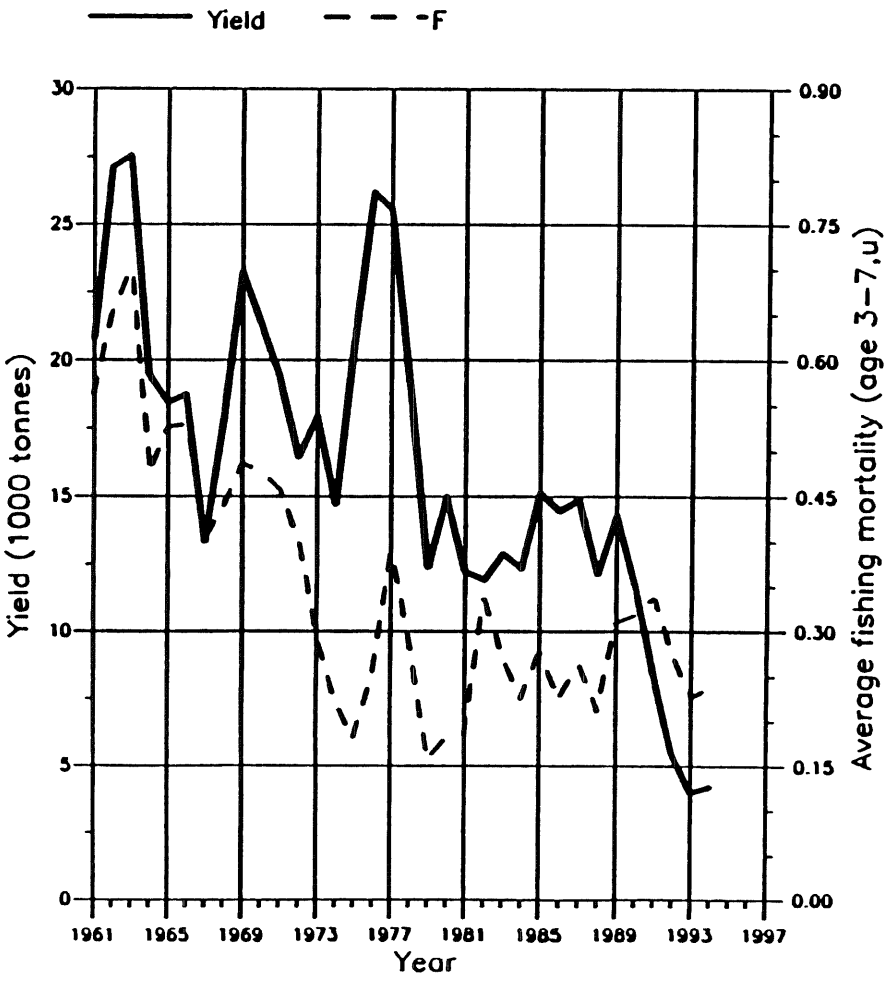


0.26

Figure 2.4.34

FISH STOCK SUMMARY
STOCK: Haddock in the Faroe Grounds (Fishing Area Vb)
6–5–1995

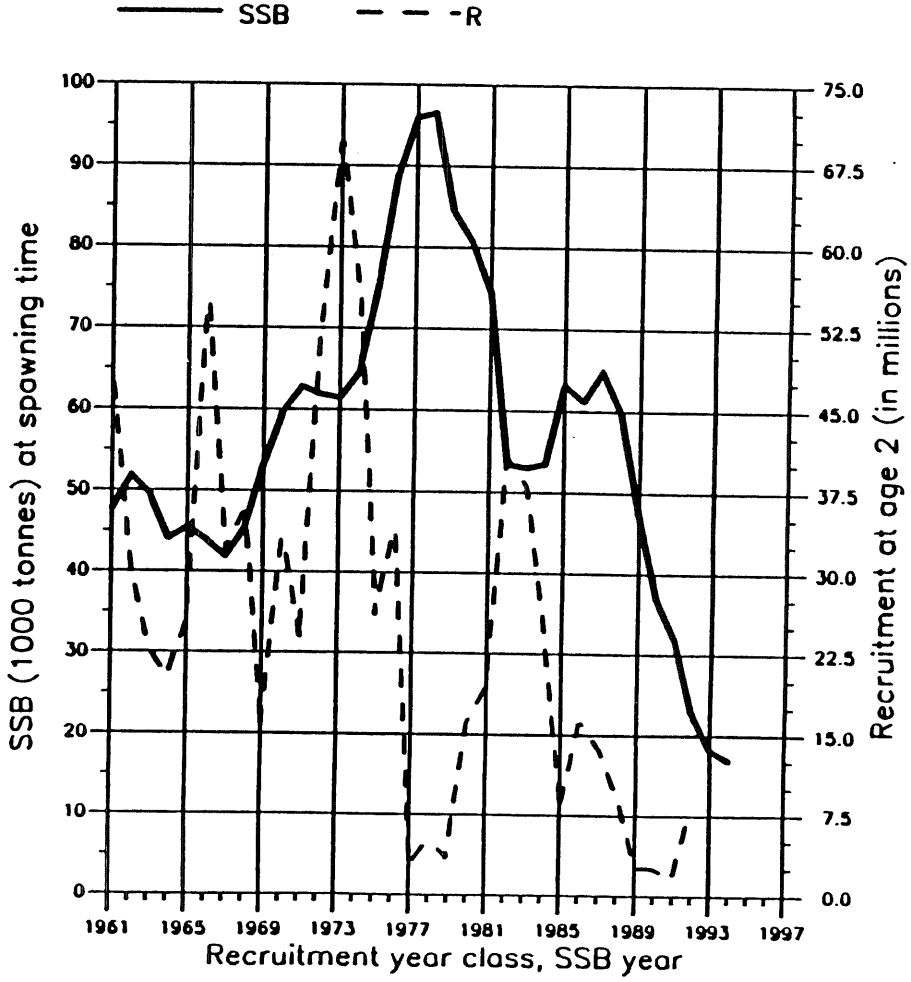
Trends in yield and fishing mortality (F)



(run: JR5)

A

Trends in spawning stock biomass (SSB) and recruitment (R)



(run: JR5)

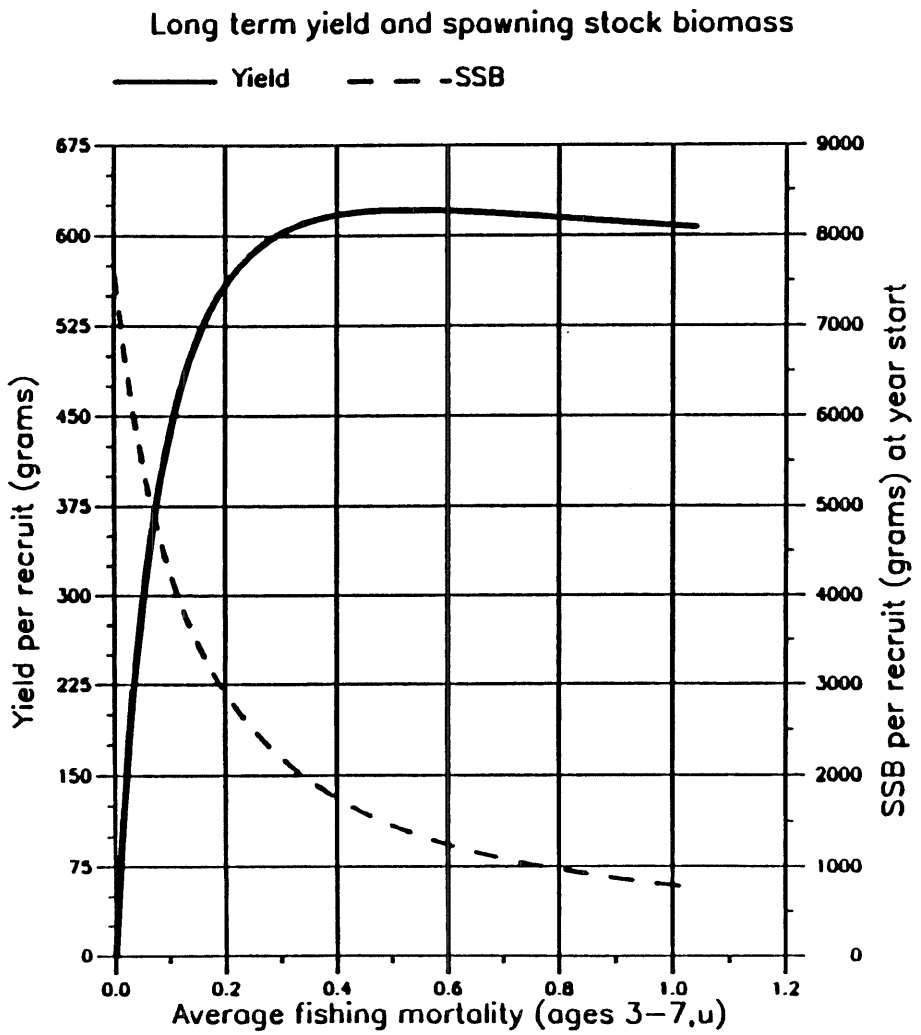
B

Figure 2.4.35

FISH STOCK SUMMARY

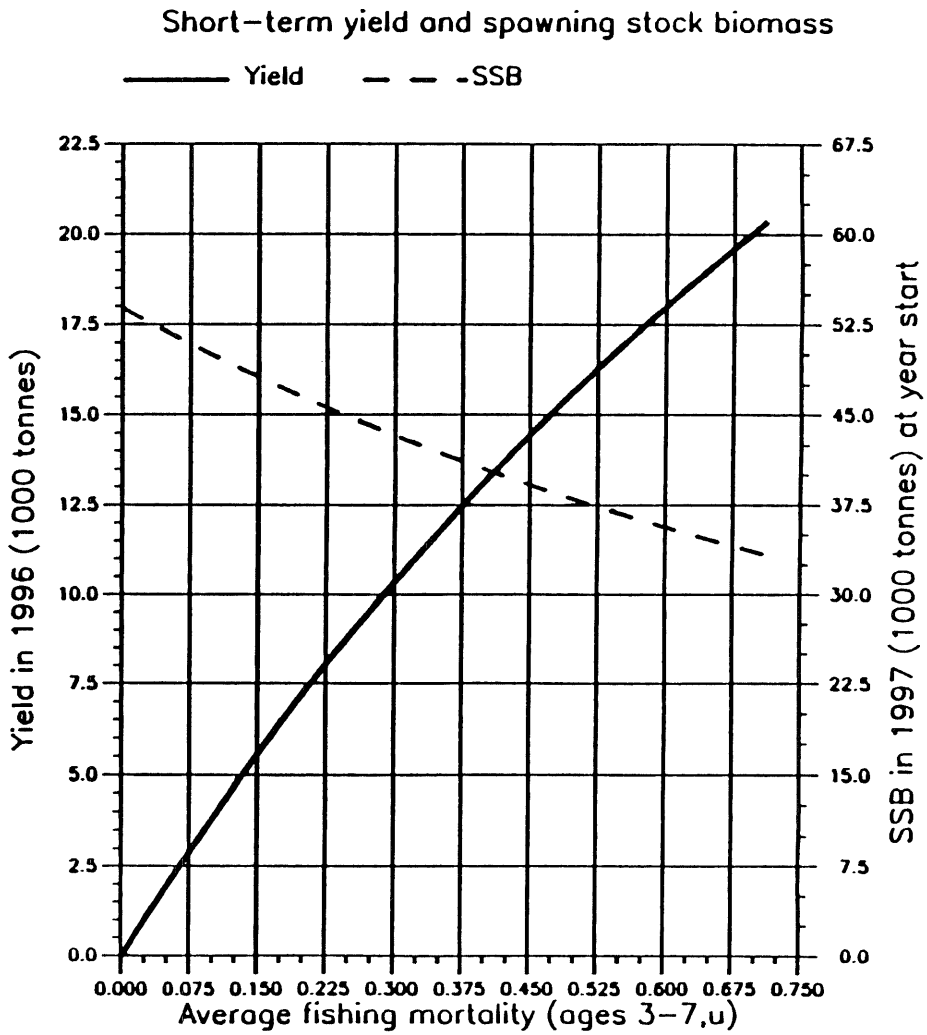
STOCK: Haddock in the Faroe Grounds (Fishing Area Vb)

6–5–1995



(run: JR5)

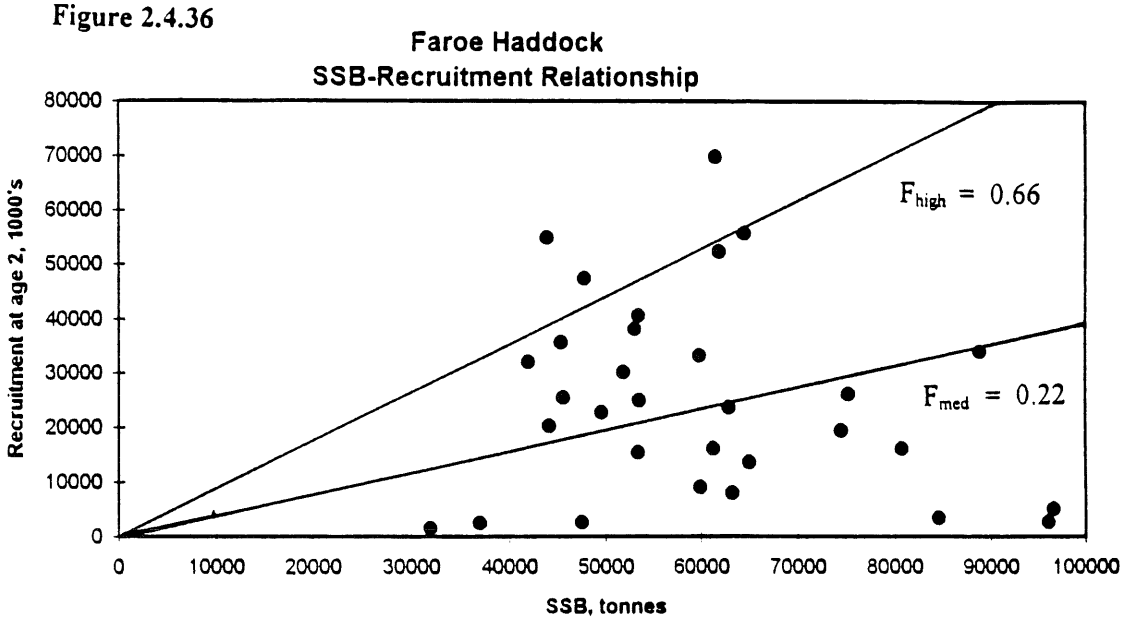
C



(run: JAK1)

D

Figure 2.4.36


Faroe Haddock
SSB-Recruitment Relationship
Recruitment at age 2, 1000's
SSB, tonnes
F_{high} = 0.66
F_{med} = 0.22
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000

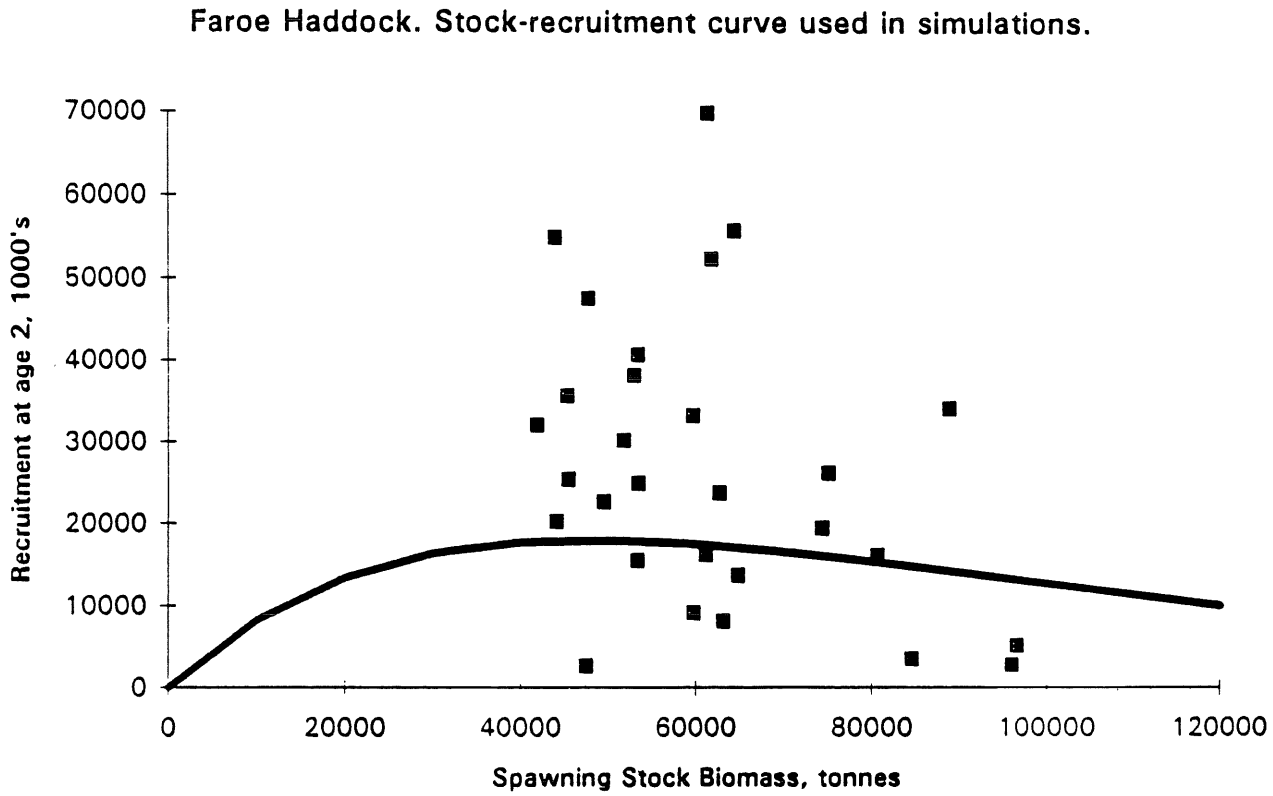

Faroe Haddock. Stock-recruitment curve used in simulations.
Recruitment at age 2, 1000's
70000
60000
50000
40000
30000
20000
10000
0
0
20000
40000
60000
80000
100000
120000
Spawning Stock Biomass, tonnes

Figure 2.4.37

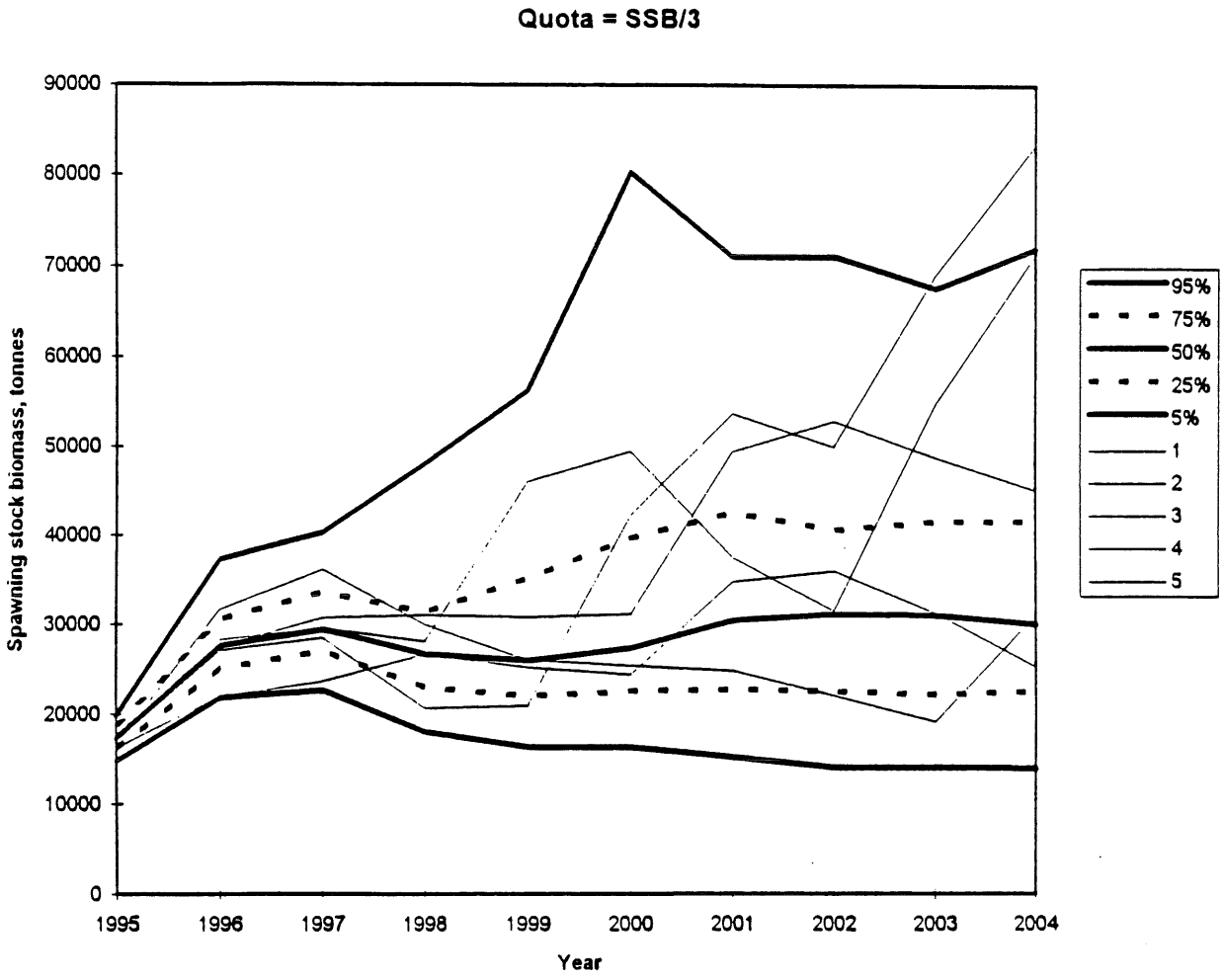

Quota = SSB/3
Spawning stock biomass, tonnes
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Year
95%
75%
50%
25%
5%
1
2
3
4
5

Figure 2.4.38

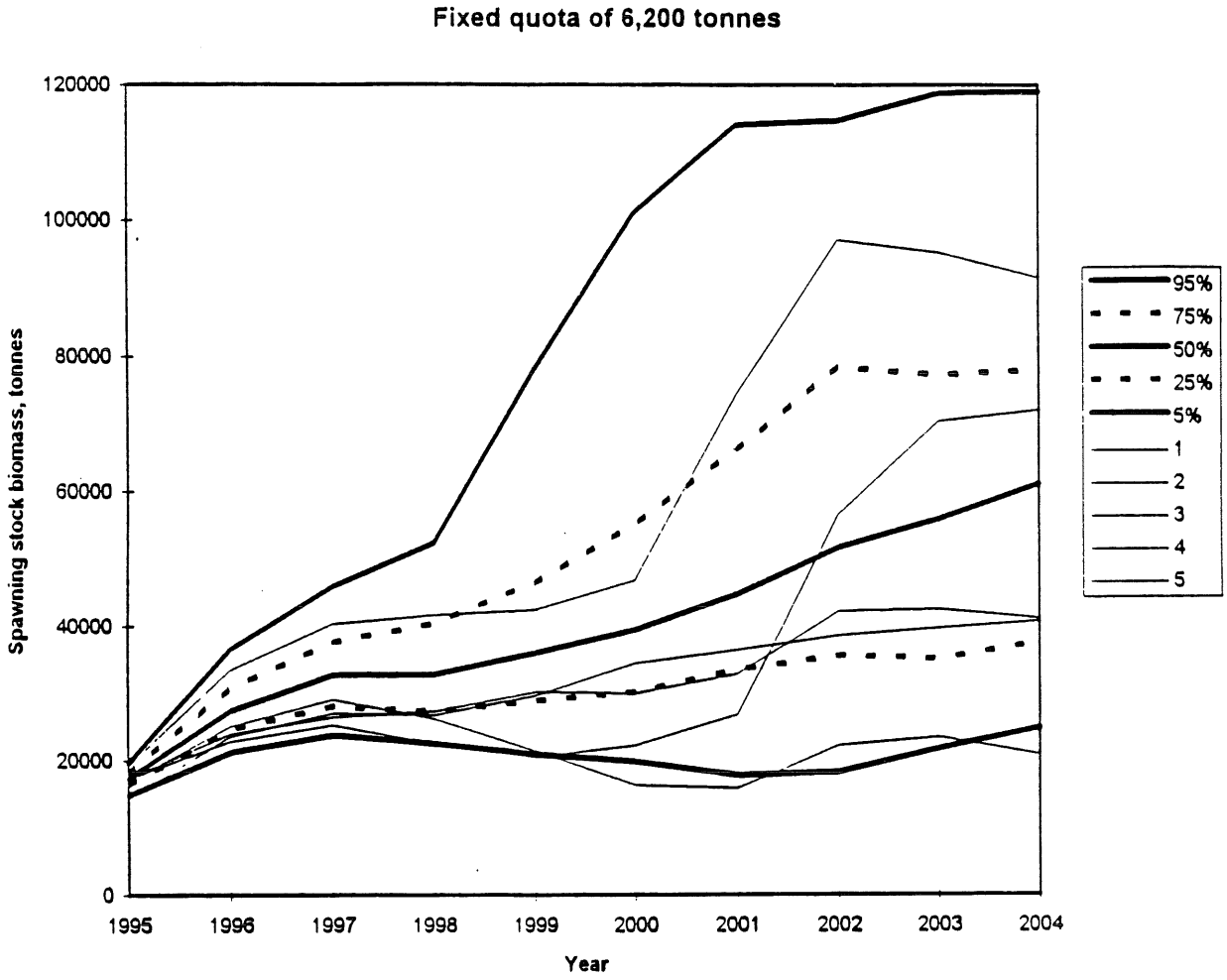

Fixed quota of 6,200 tonnes
Spawning stock biomass, tonnes
120000
100000
80000
60000
40000
20000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Year
95%
75%
50%
25%
5%
1
2
3
4
5

Figure 2.4.39

Figure 2.5.1 Saithe in the Faroes. CPUE (tons/days) by fleet categories.

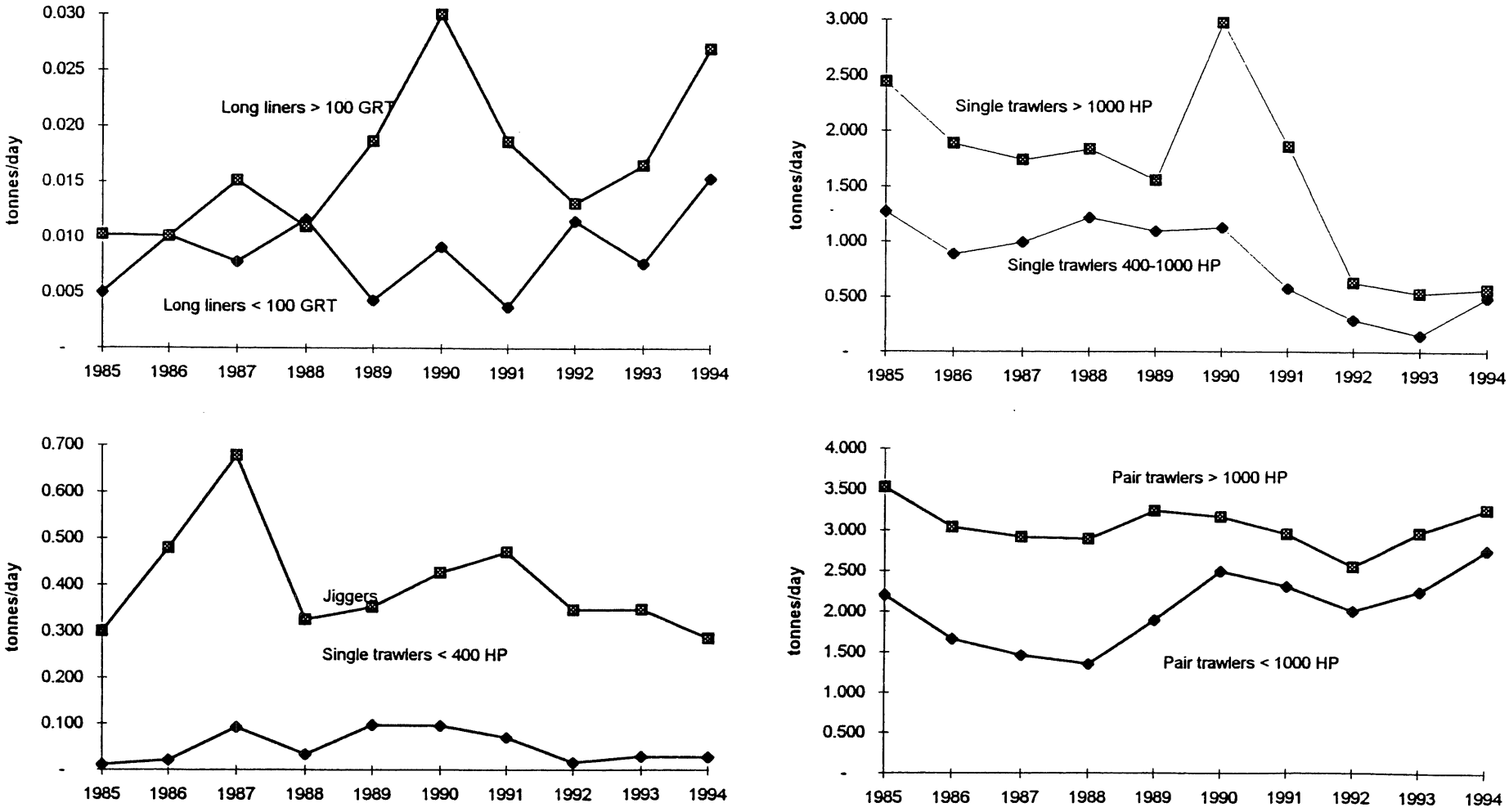


Figure 2.5.2 Saithe in the Faroes (Division Vb). Mean weight (kg) at age

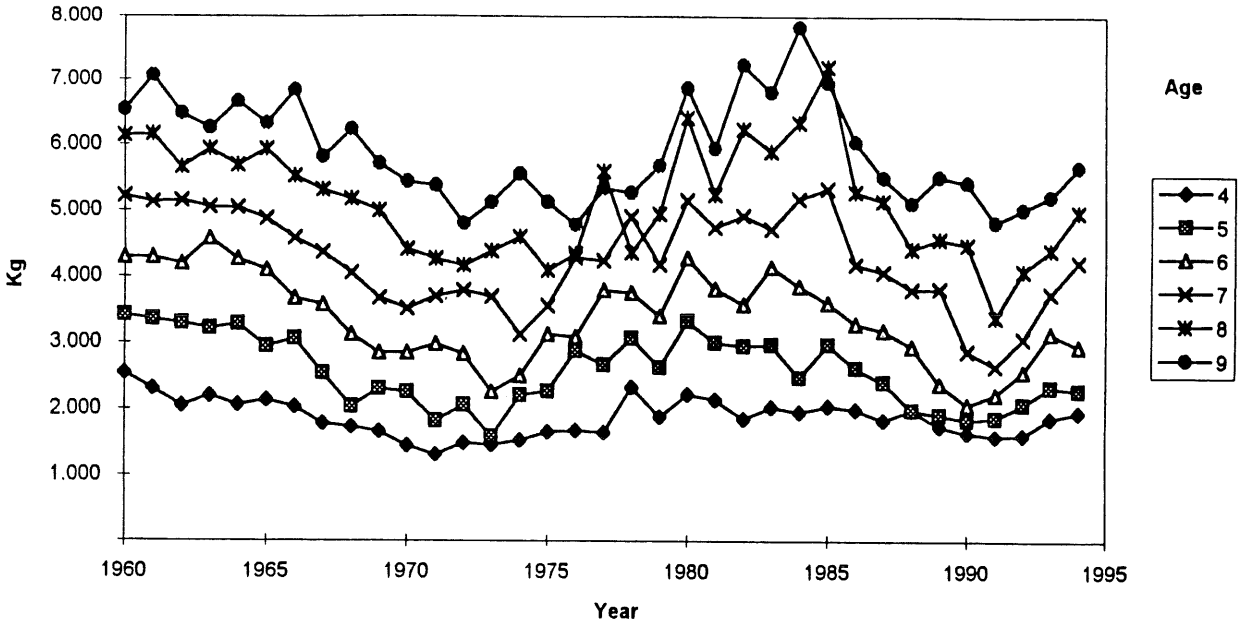


Figure 2.5.3 Saithe in the Faroes (Division Vb).
Log catchability residuals from the Laurec-Shepherd tuning

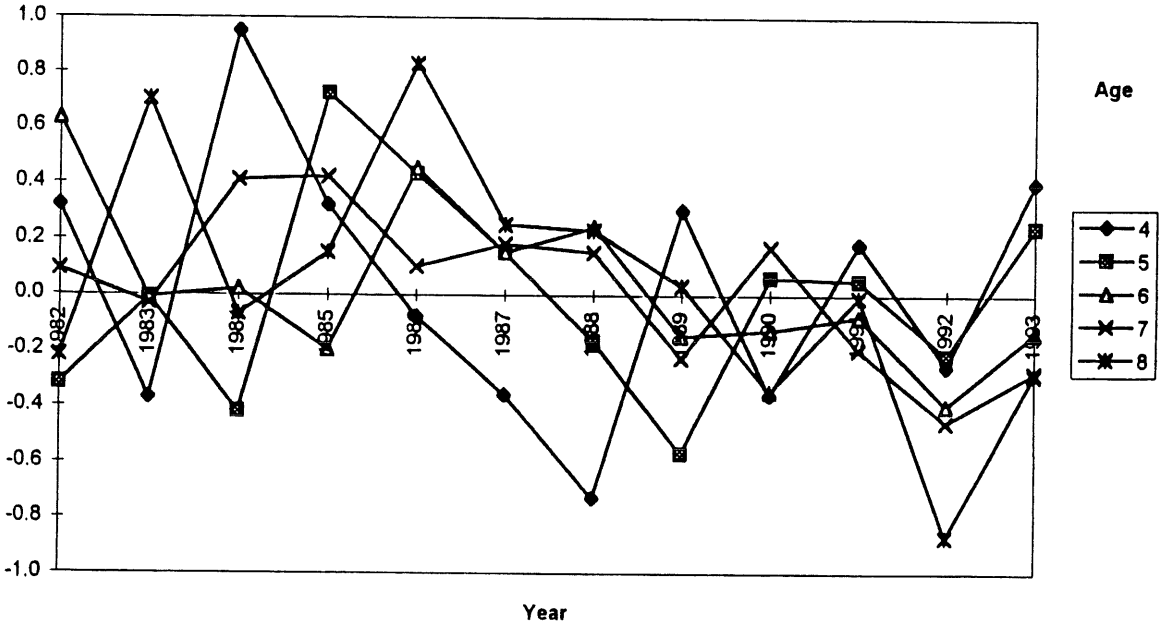


Figure 2.5.4 Saithe in the Faroes (Division Vb).
Retrospective analysis of fishing mortality from XSA

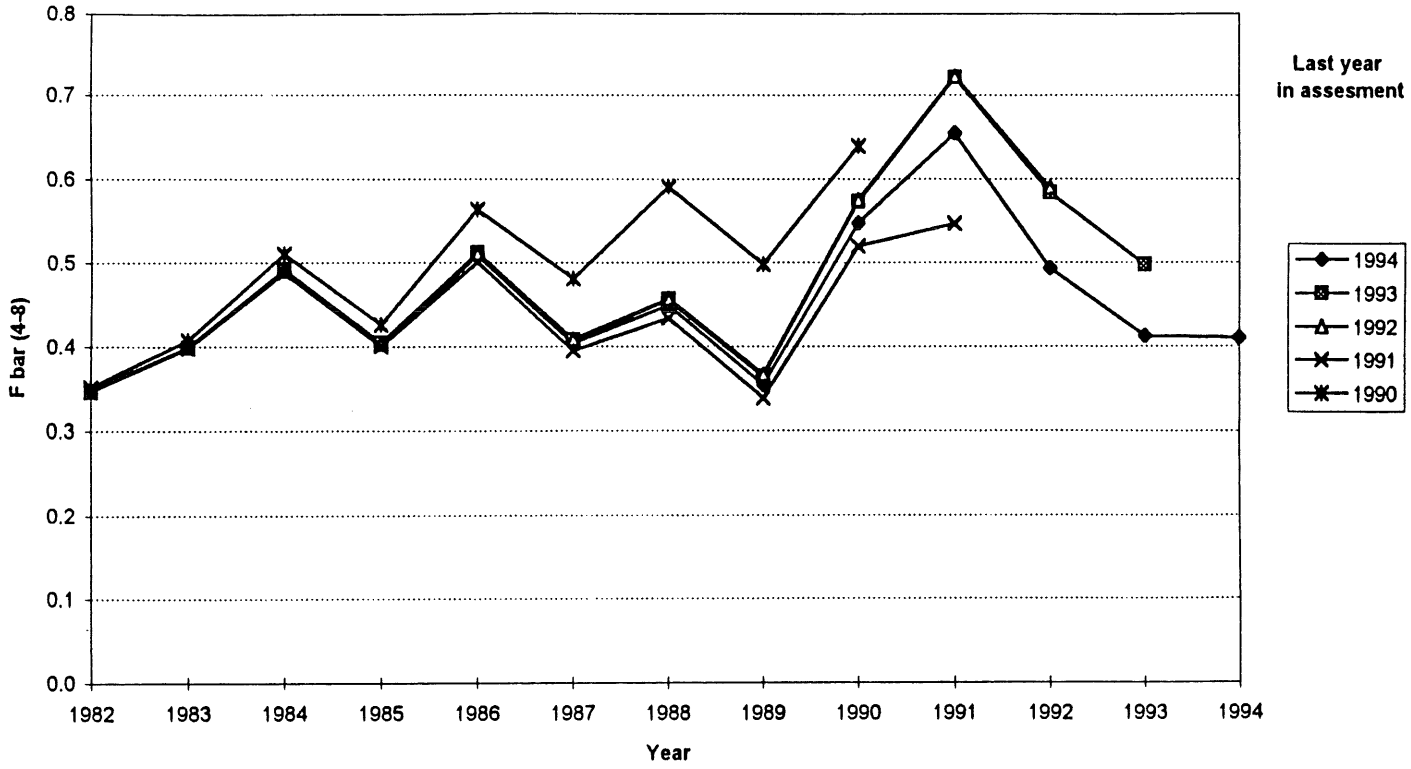
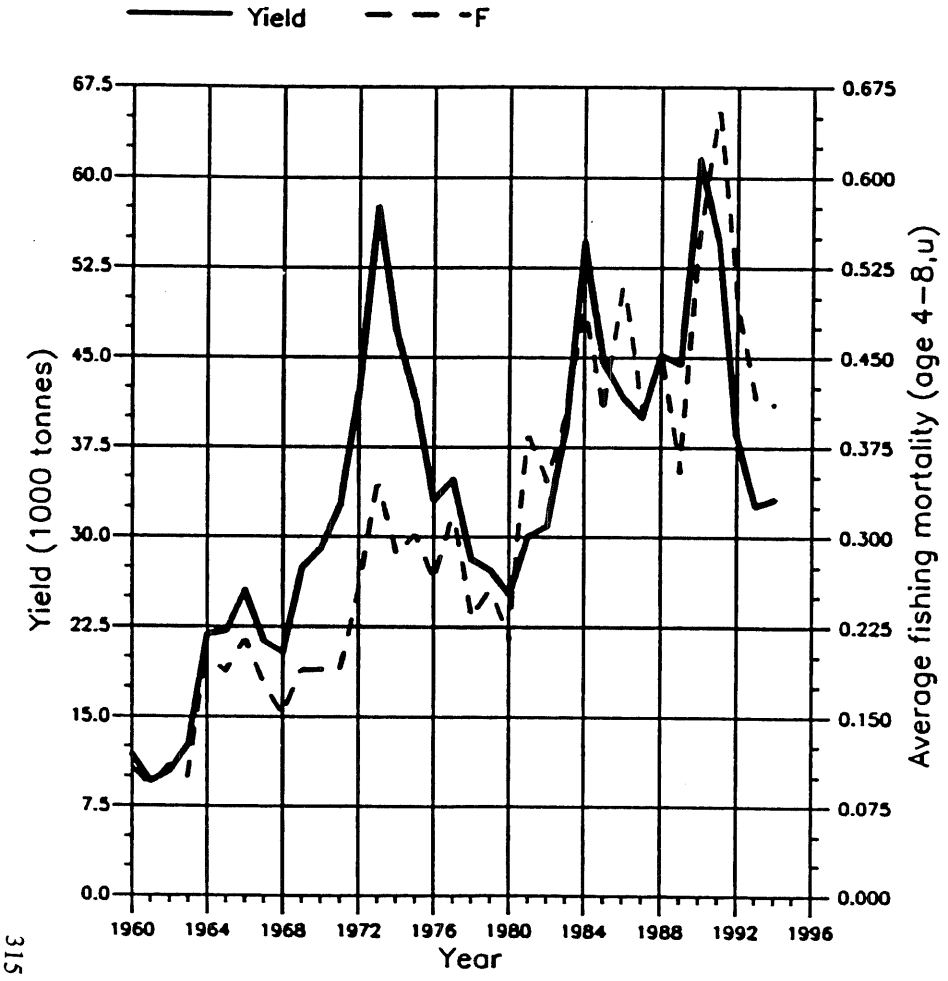


Figure 2.3.3 Saithe in the Faroes. Fish stock summary (A & B).

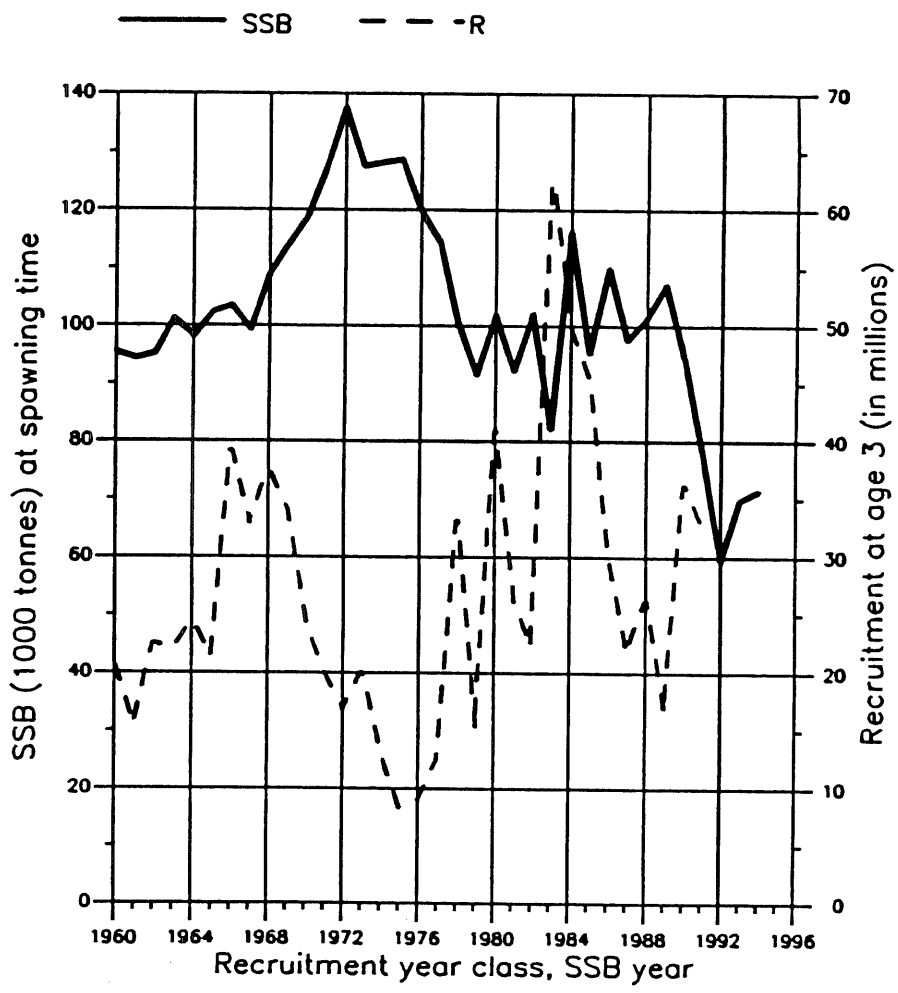
FISH STOCK SUMMARY
STOCK: Saithe in the Faroes Grounds (Fishing Area Vb)
6–5–1995

Trends in yield and fishing mortality (F)



(run: SAIFAX12) **A**

Trends in spawning stock biomass (SSB) and recruitment (R)



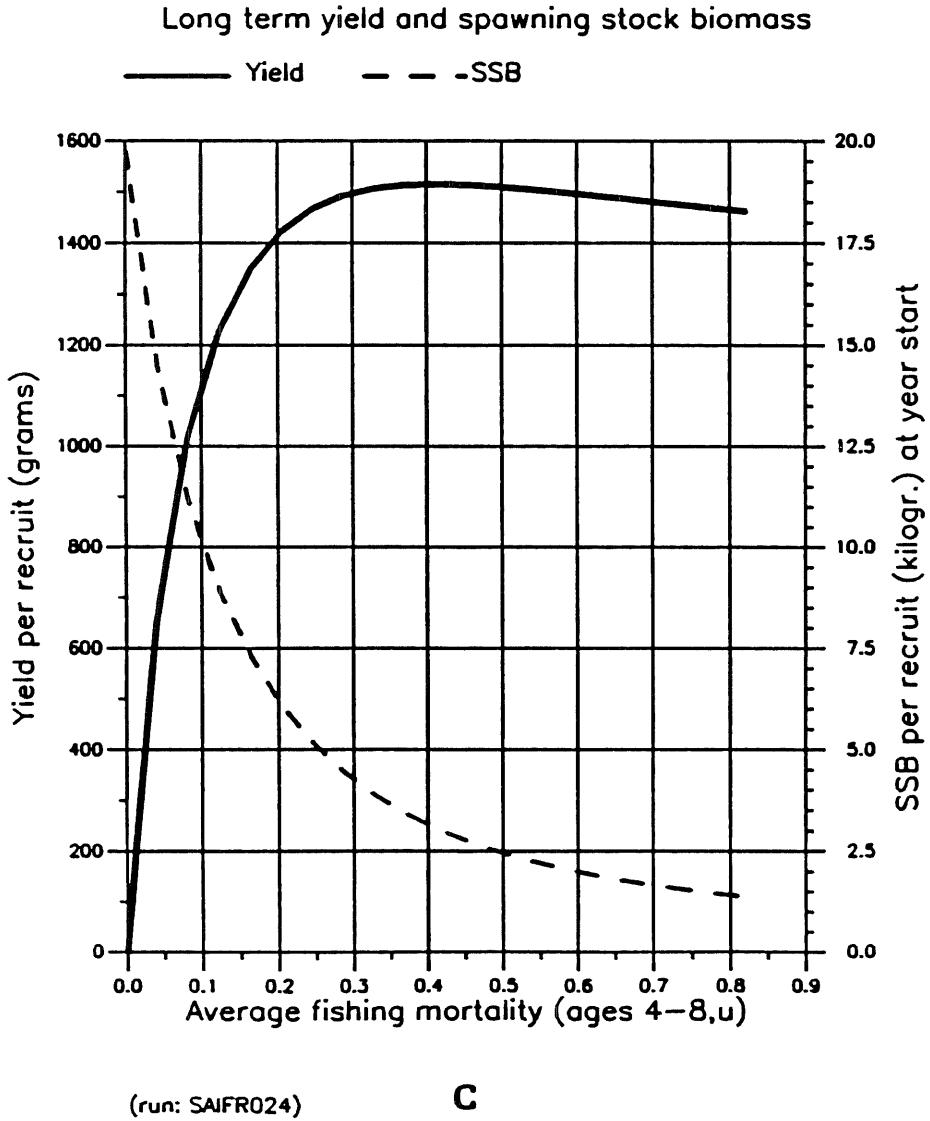
(run: SAIFAX12) **B**

Figure 2.5.6 Saithe in the Faroes. Fish stock summary (C & D).

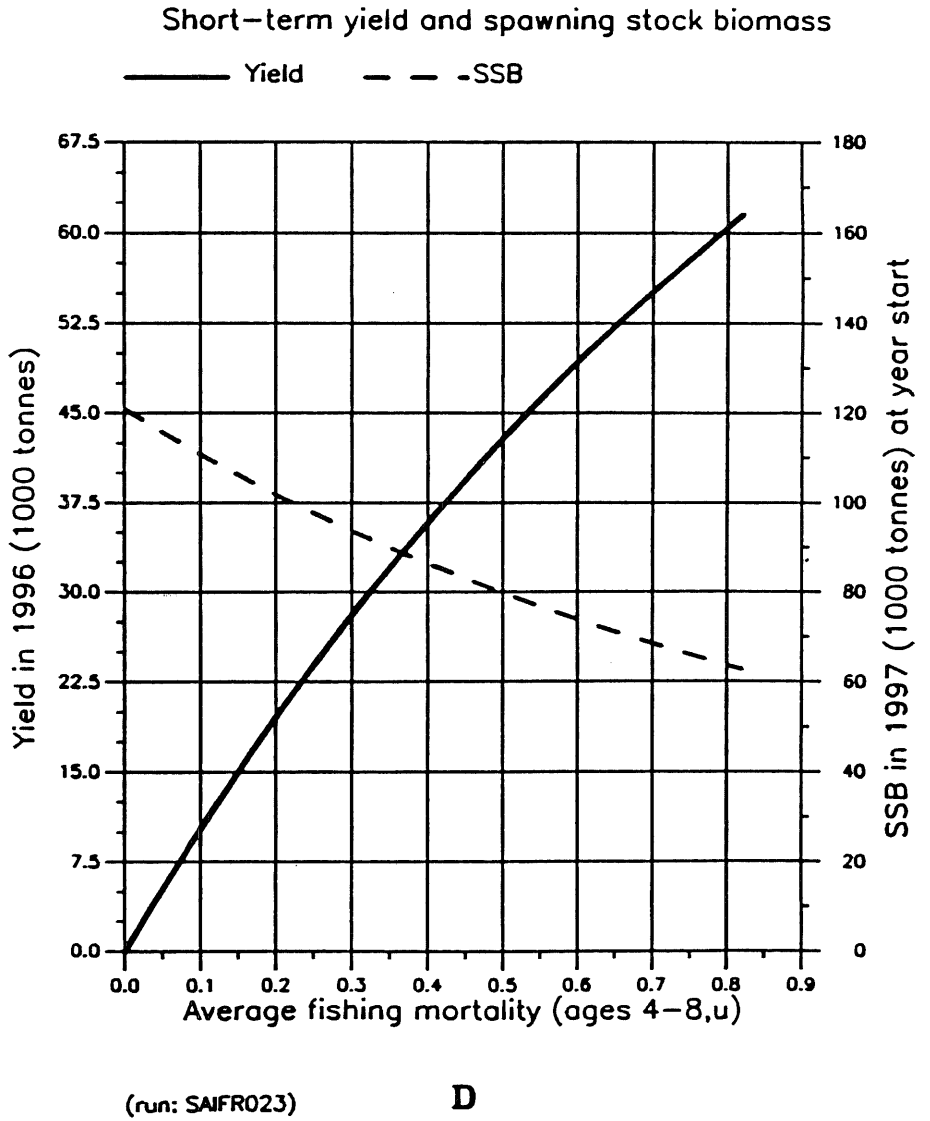
FISH STOCK SUMMARY

STOCK: Saithe in the Faroes Grounds (Fishing Area Vb)

9–5–1995



(run: SAIFR024) **C**



(run: SAIFR023) **D**

Figure 2.5.7 Saithe in the Faroes (Division Vb)
Spawning stock - Recruitment data and Fmed and Fhigh

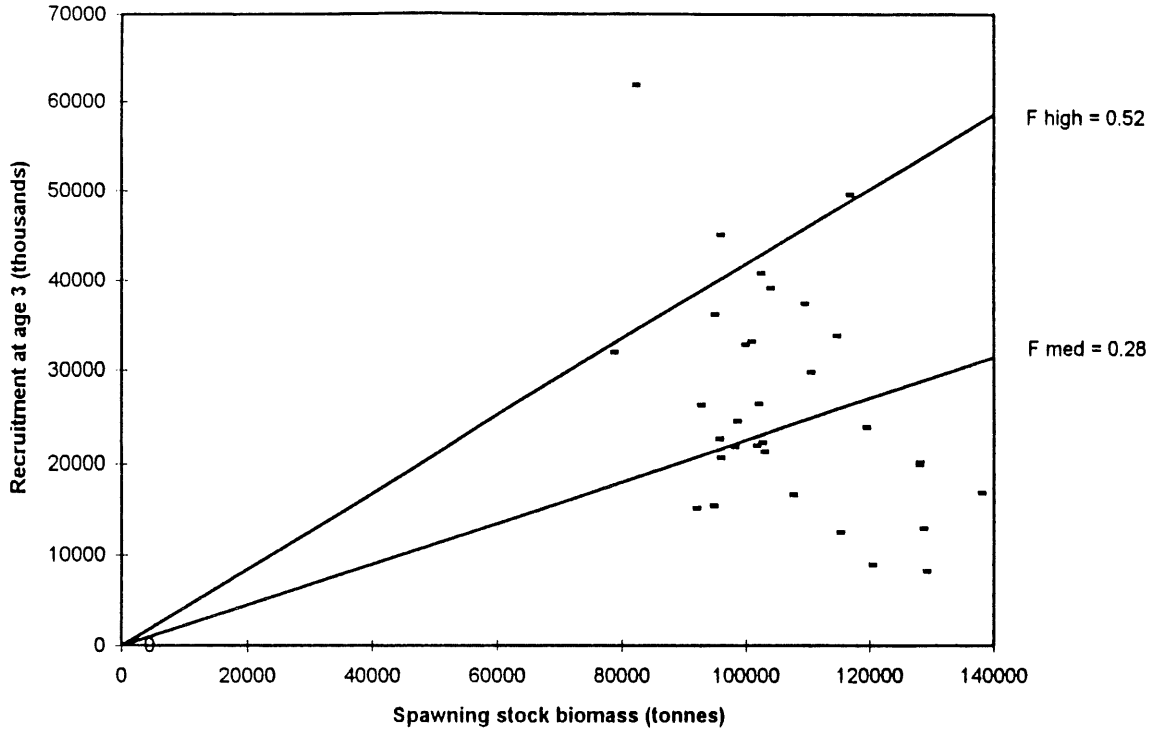


Figure 2.5.8 Saithe in the Faroes
Stock-recruitment curve used in simulations.

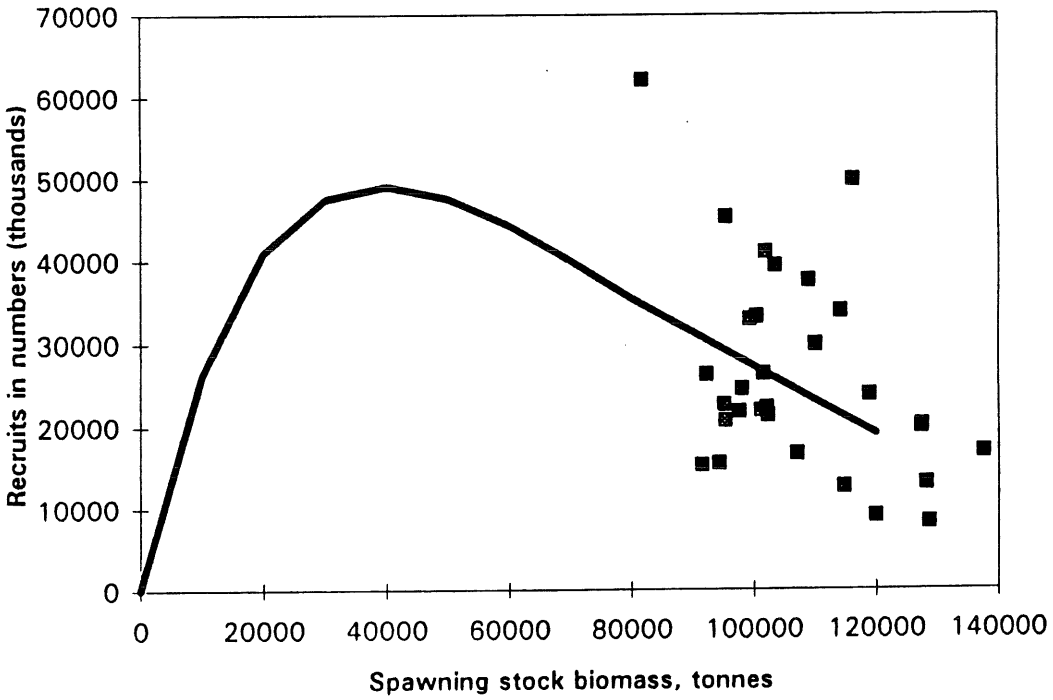


Figure 2.5.9 Saithe in the Faroes.
RISK analysis with fixed quota of 42,000 tonnes

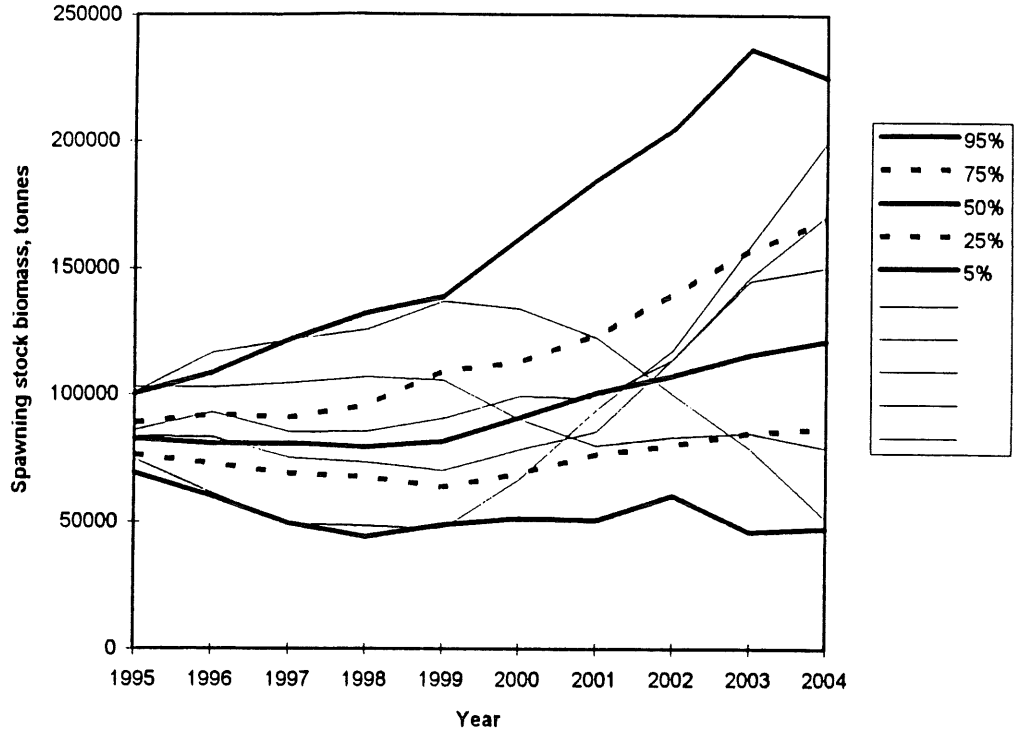


Figure 2.5.10 Saithe in the Faroes (Division Vb)
Comparison between effort of large pair trawlers and F

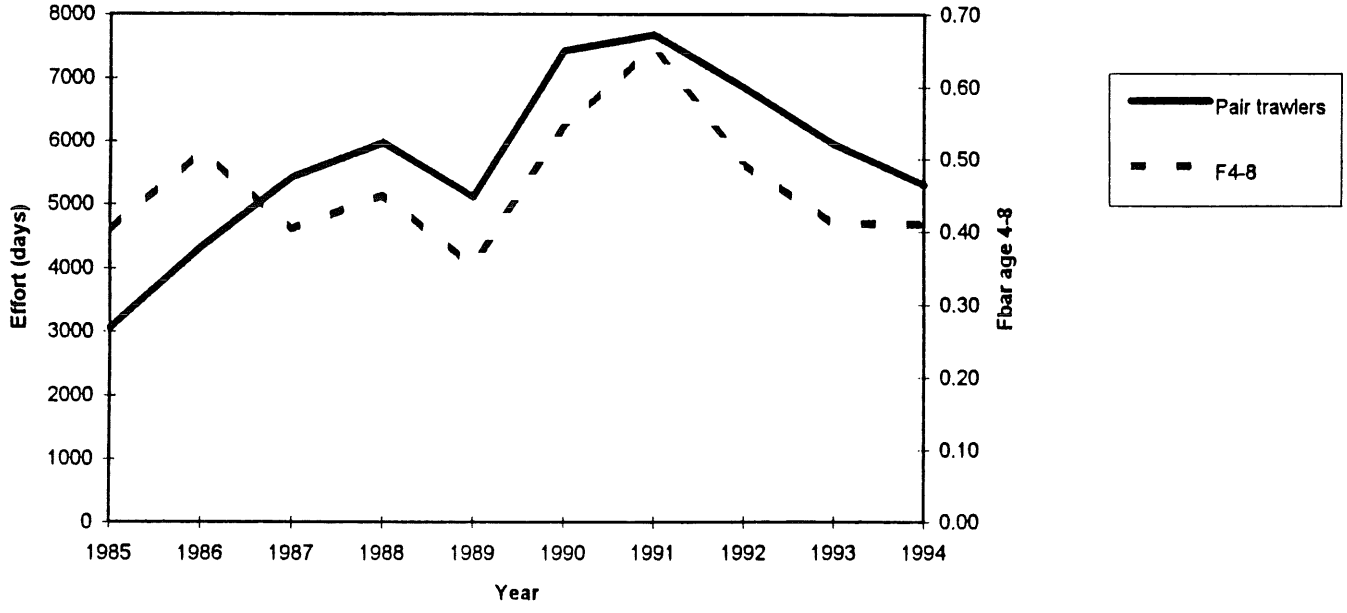


Figure 3.2.1. Icelandic Saithe. Maturity at age, data and fitted values.

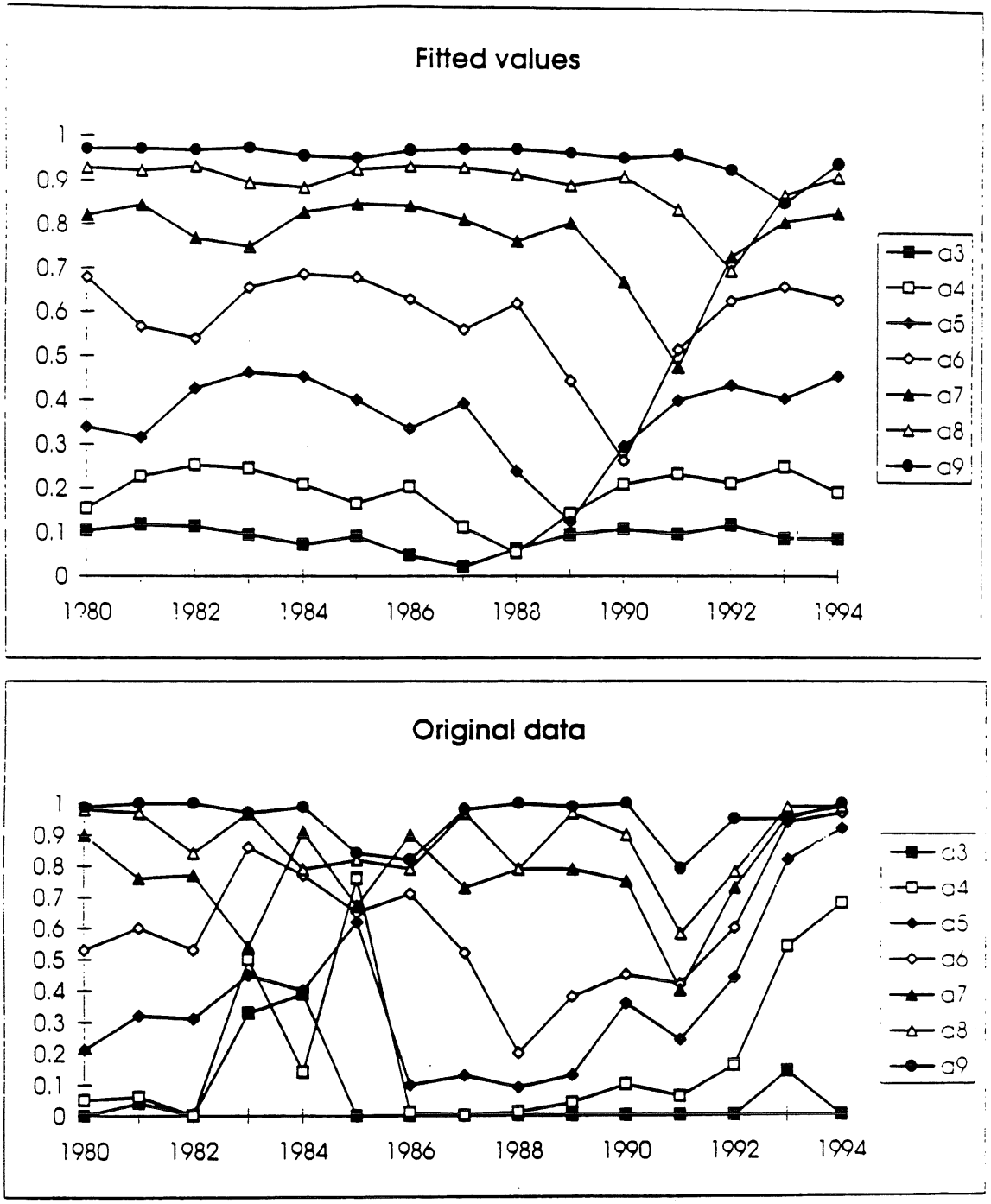
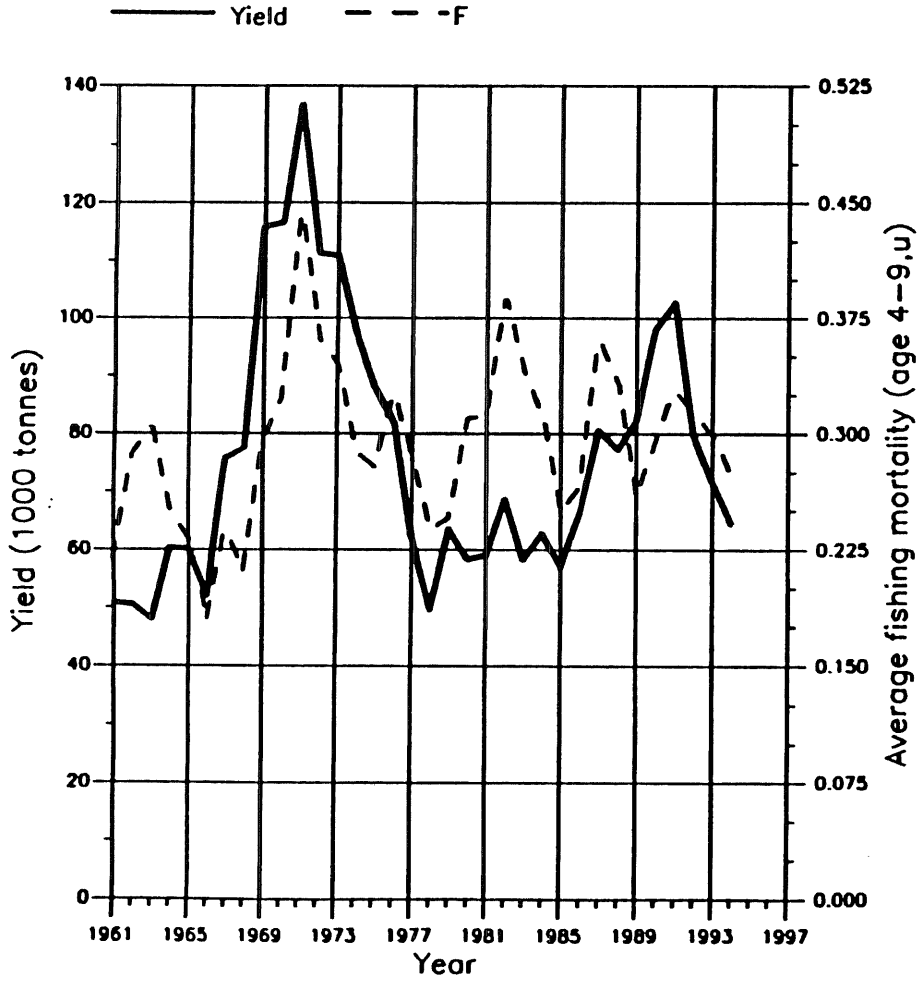


Figure 3.2.2

FISH STOCK SUMMARY
STOCK: Saithe in the Iceland Grounds (Fishing Area Va)
7–5–1995

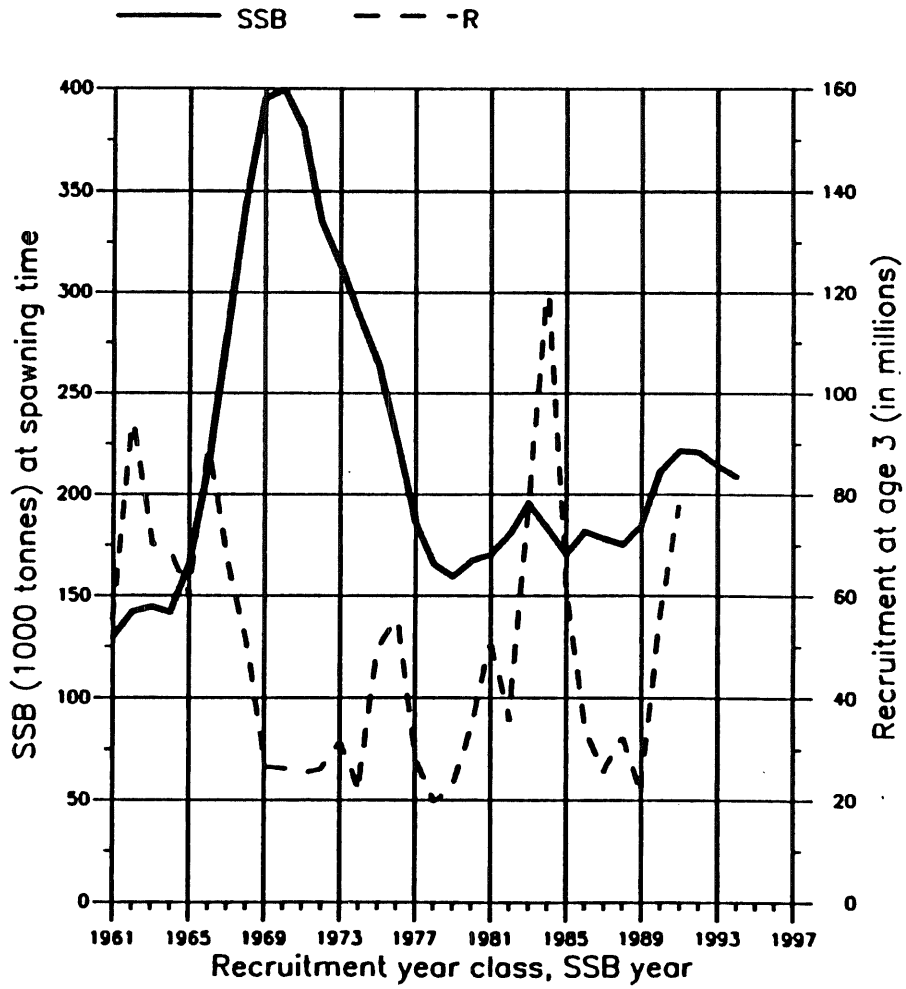
Trends in yield and fishing mortality (F)



(run: GG6)

A

Trends in spawning stock biomass (SSB) and recruitment (R)

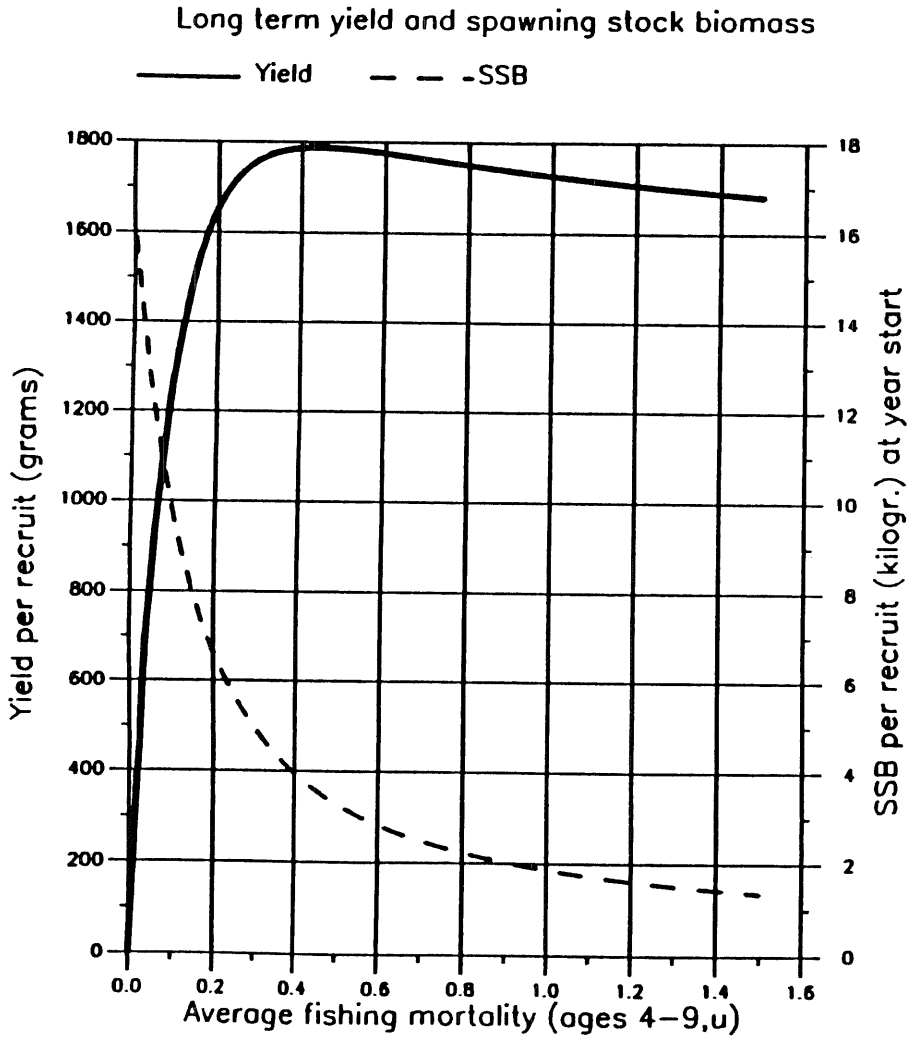


(run: GG6)

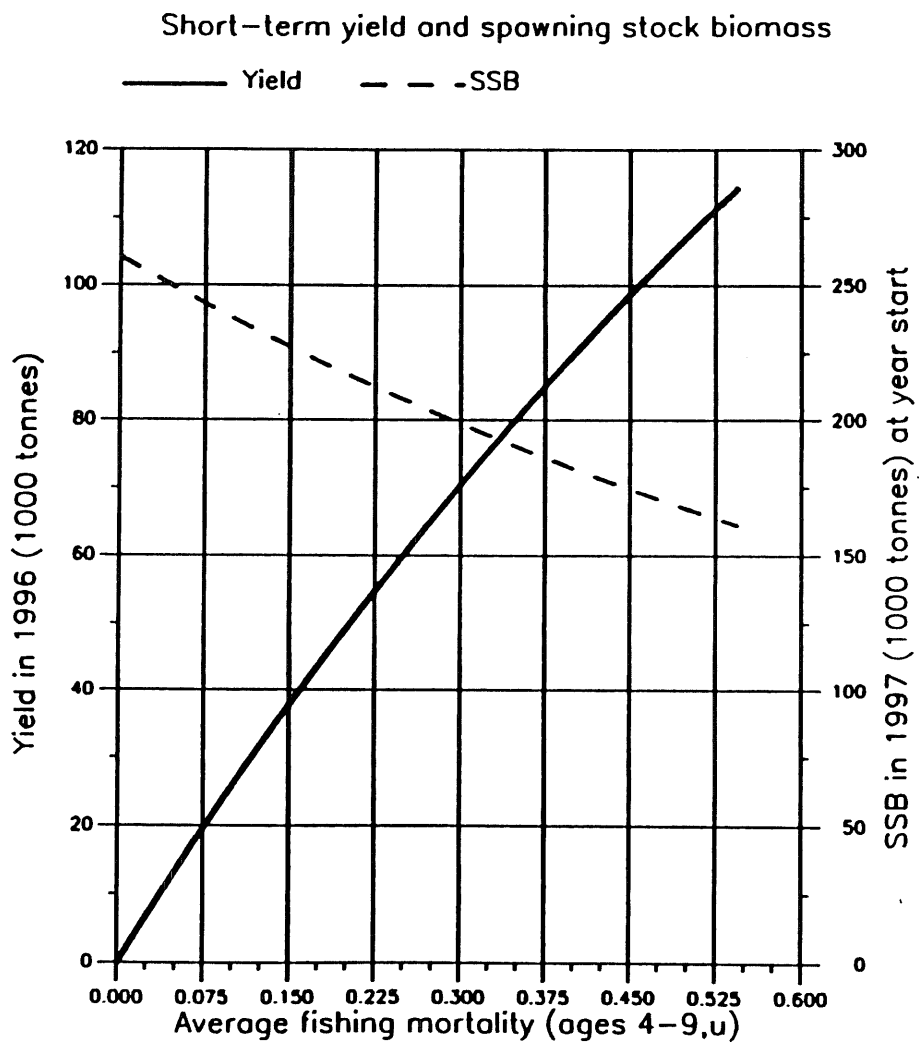
B

Figure 3.2.3

FISH STOCK SUMMARY
STOCK: Saithe in the Iceland Grounds (Fishing Area Va)
8–5–1995



(run: YIELD3) **C**



(run: PRED94) **D**

Figure 3.2.4

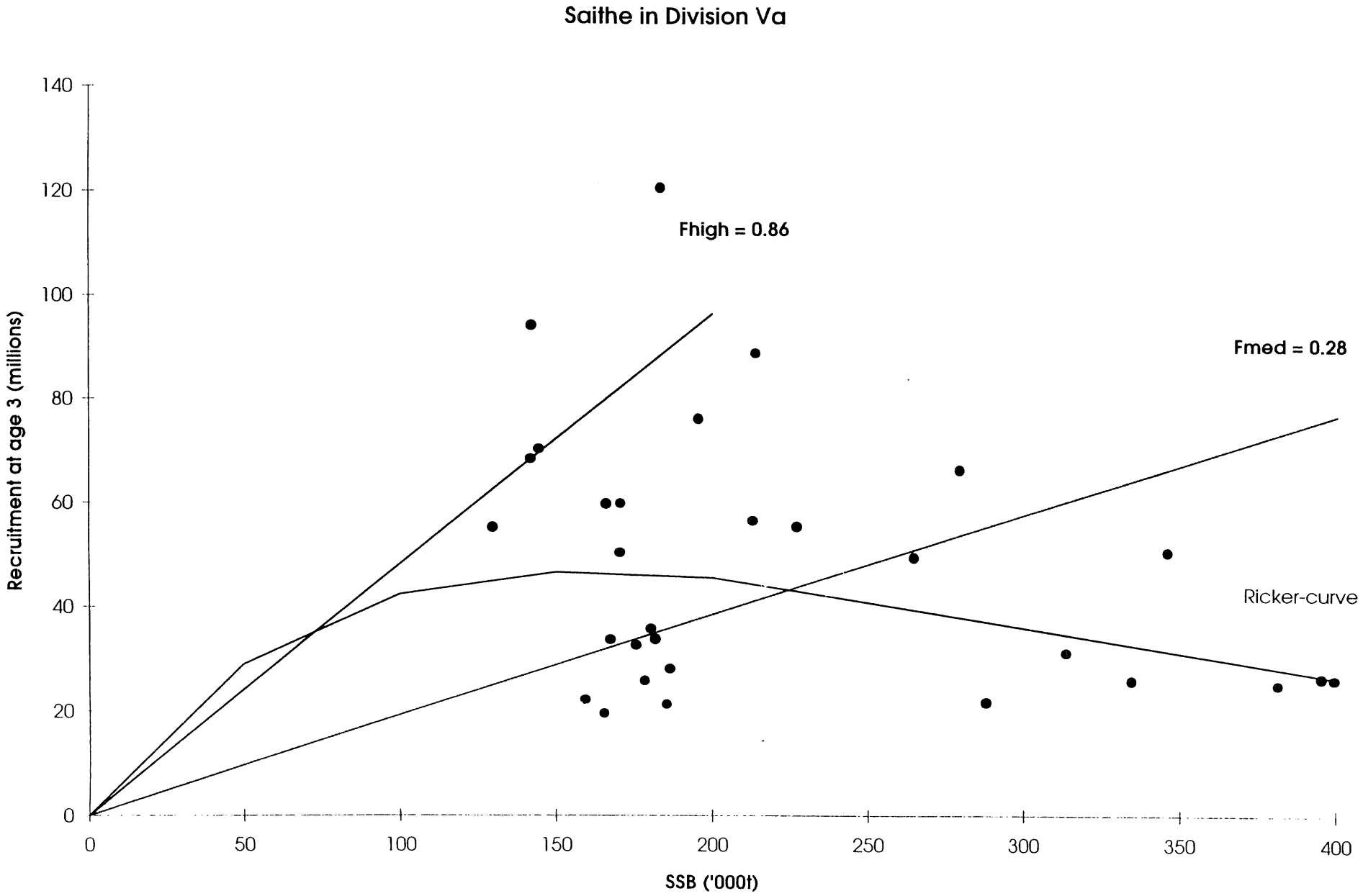
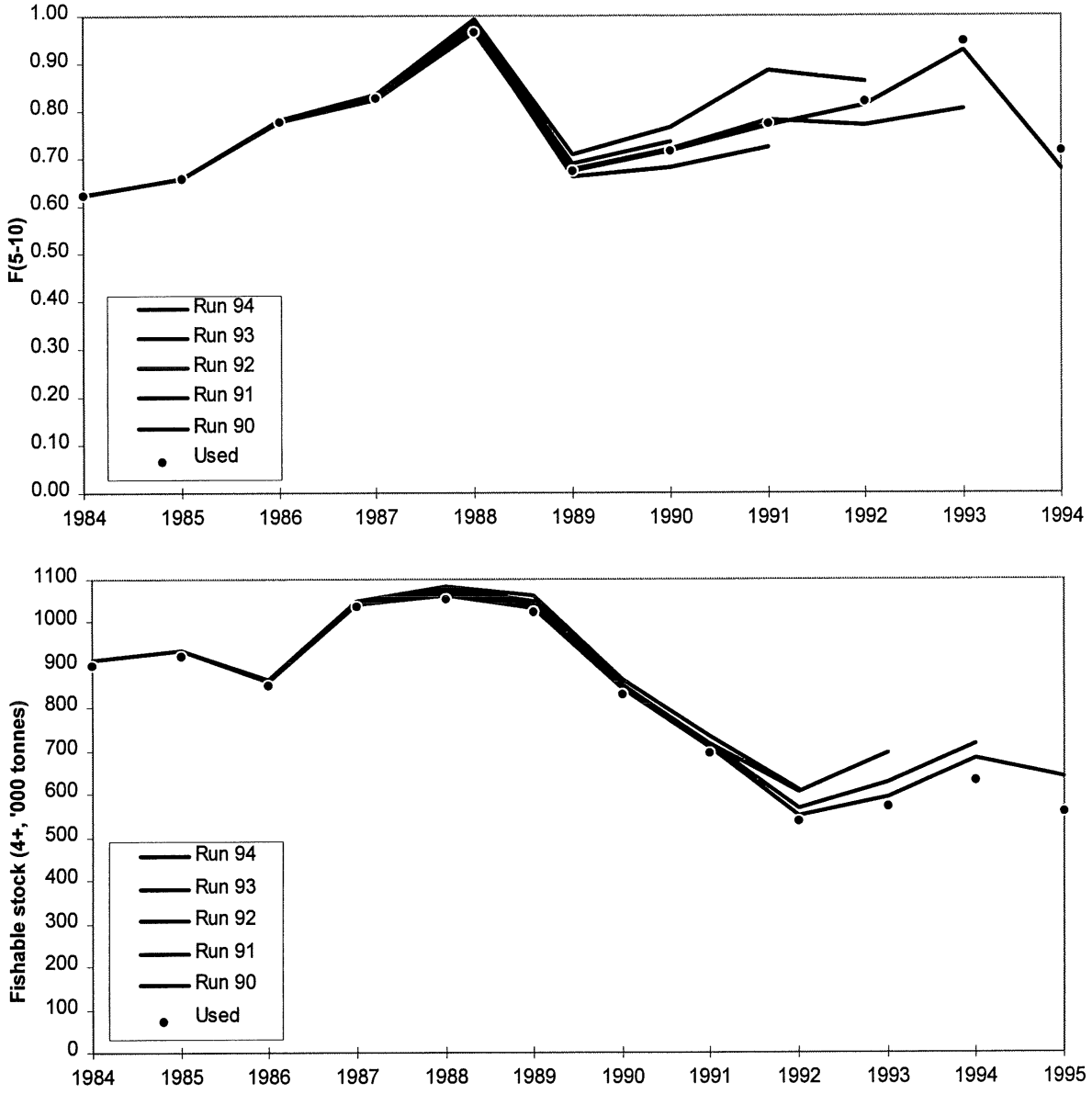

Saithe in Division Va
Fhigh = 0.86
Fmed = 0.28
Ricker-curve
Recruitment at age 3 (millions)
SSB ('000t)
0
20
40
60
80
100
120
140
0
50
100
150
200
250
300
350
400

Figure. 3.3.1: Icelandic cod, retrospective analysis.



Continued

Figure 3.3.1: Continued

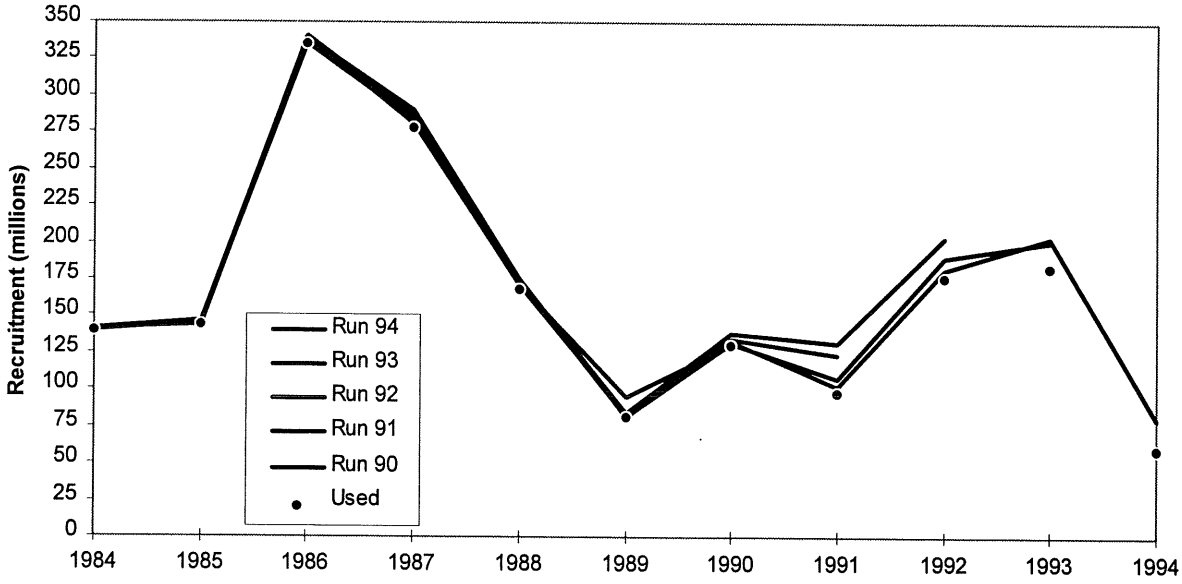


Figure. 3.3.2. Stock-recruitment plot. Historical data, lines corresp to Fmed=0.45, Fhigh=0.7 and the stock-recruitment curve used in the medium-term simulations, based on final (2017-2023) average levels of stock and recruitment.

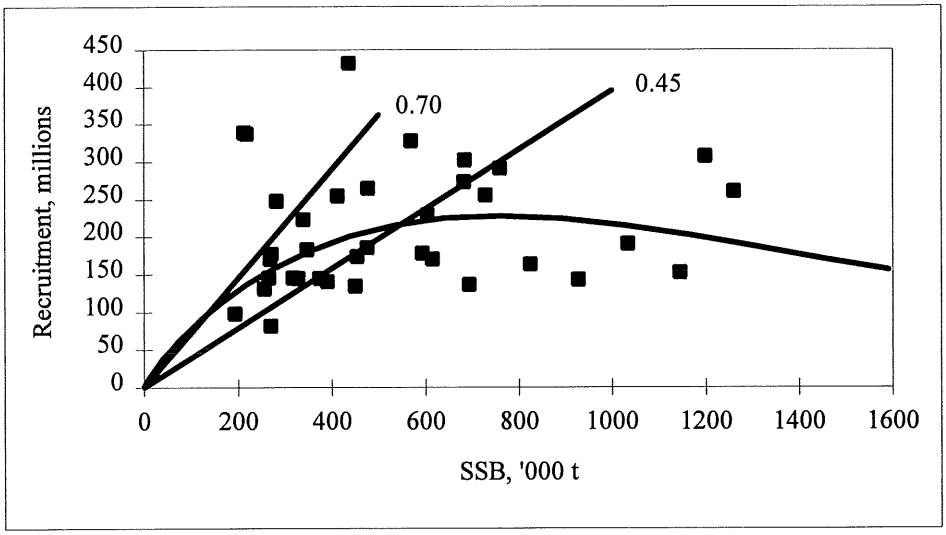


Figure 3.3.3. Catch control laws used in simulations.

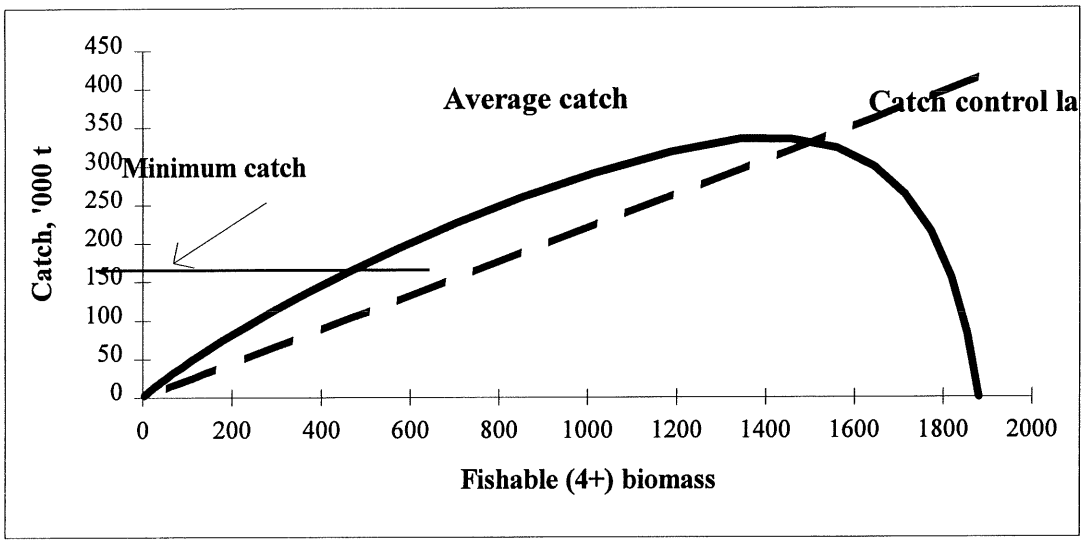


Figure 3.3.4. Probability of short-term increase in SSB and medium-term probability of stock collapse, both as functions of the minimum catch level.

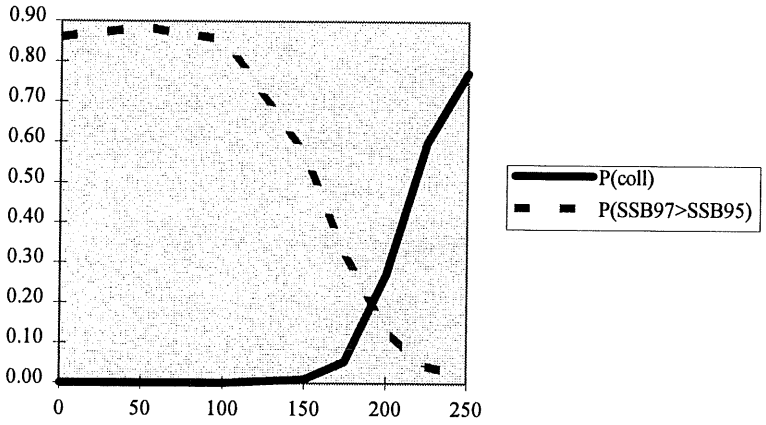


Figure 3.3.5. No minimum catch. Medium-term development of catches.

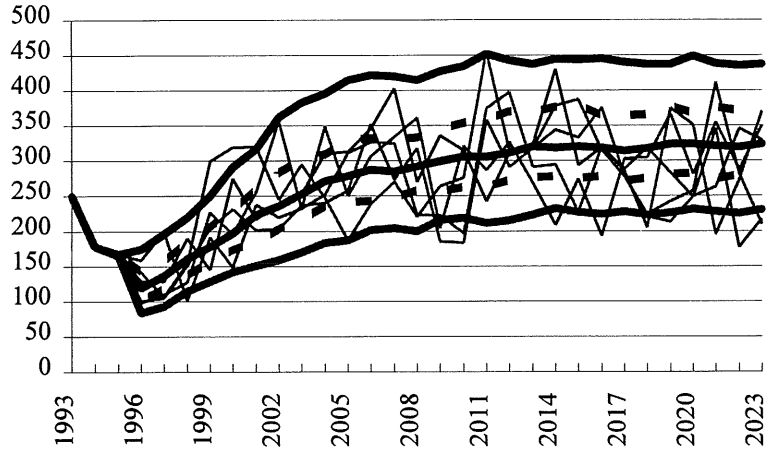


Figure 3.3.6. No minimum catch. Development of the SSB.

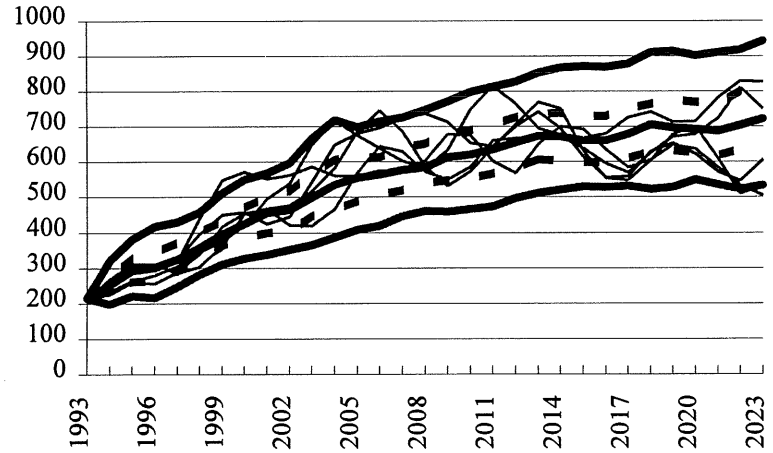


Figure 3.3.7. Min catch=175 000 t. Development of catch.

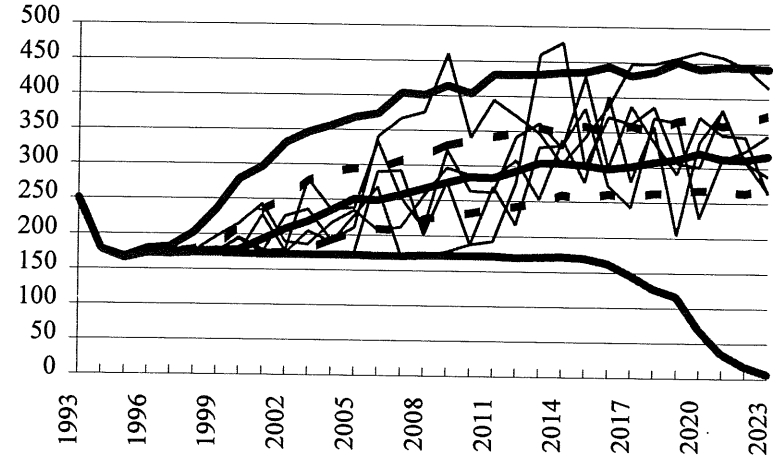


Figure 3.3.8. Min. catch =175,000 t Development of SSB.

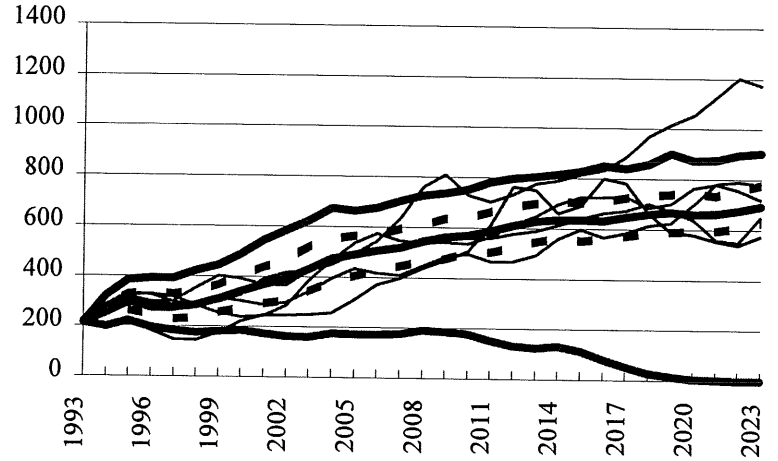


Figure 3.3.9. Yield per recruit and SSB per recruit.

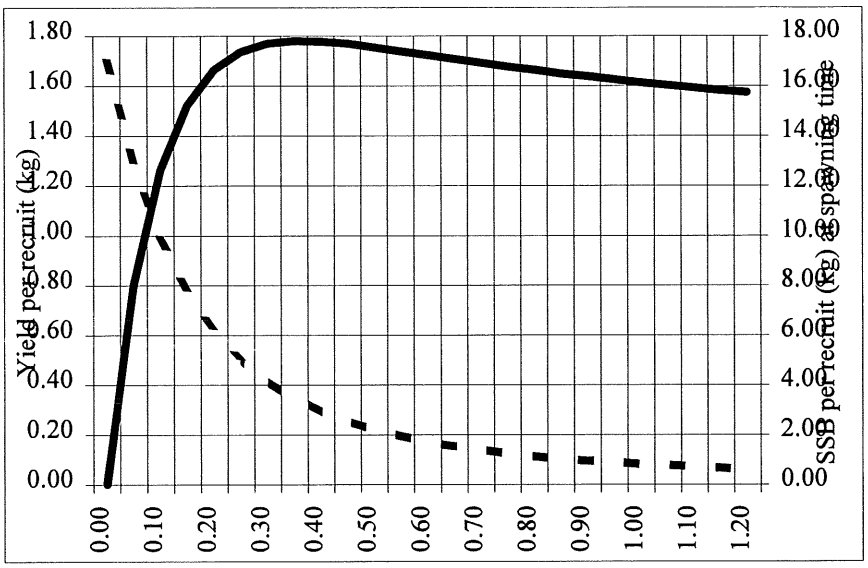


Figure 3.3.10. Development of SSB and recruitment.

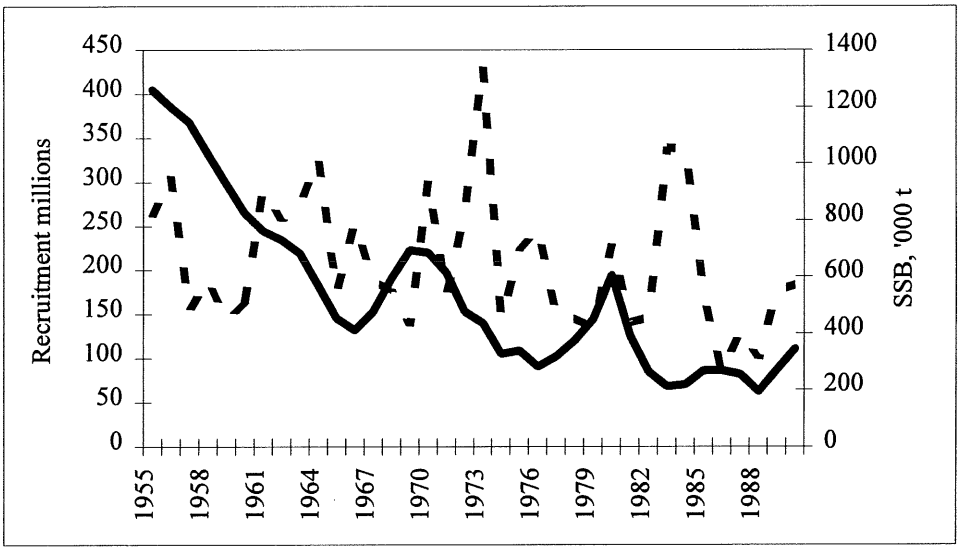


Figure 3.3.11. Relationship between historical yield and stock trend, current assessment, short-term prediction, medium-term prediction and long-term prediction.

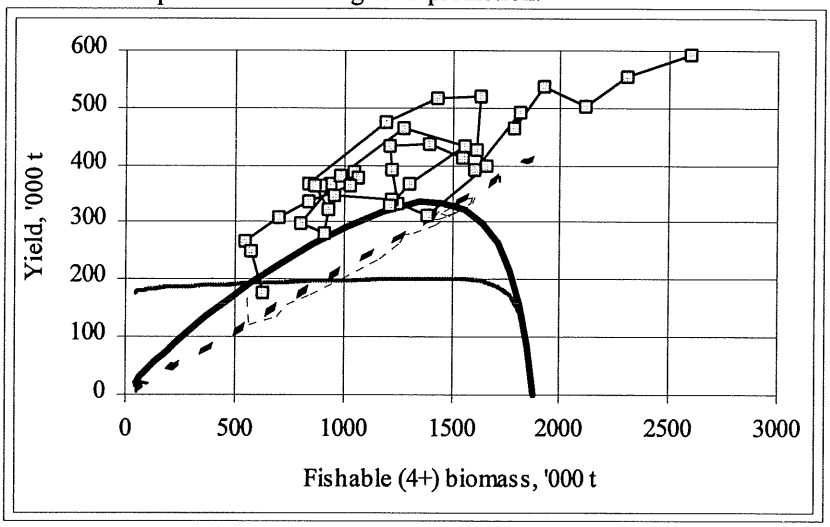
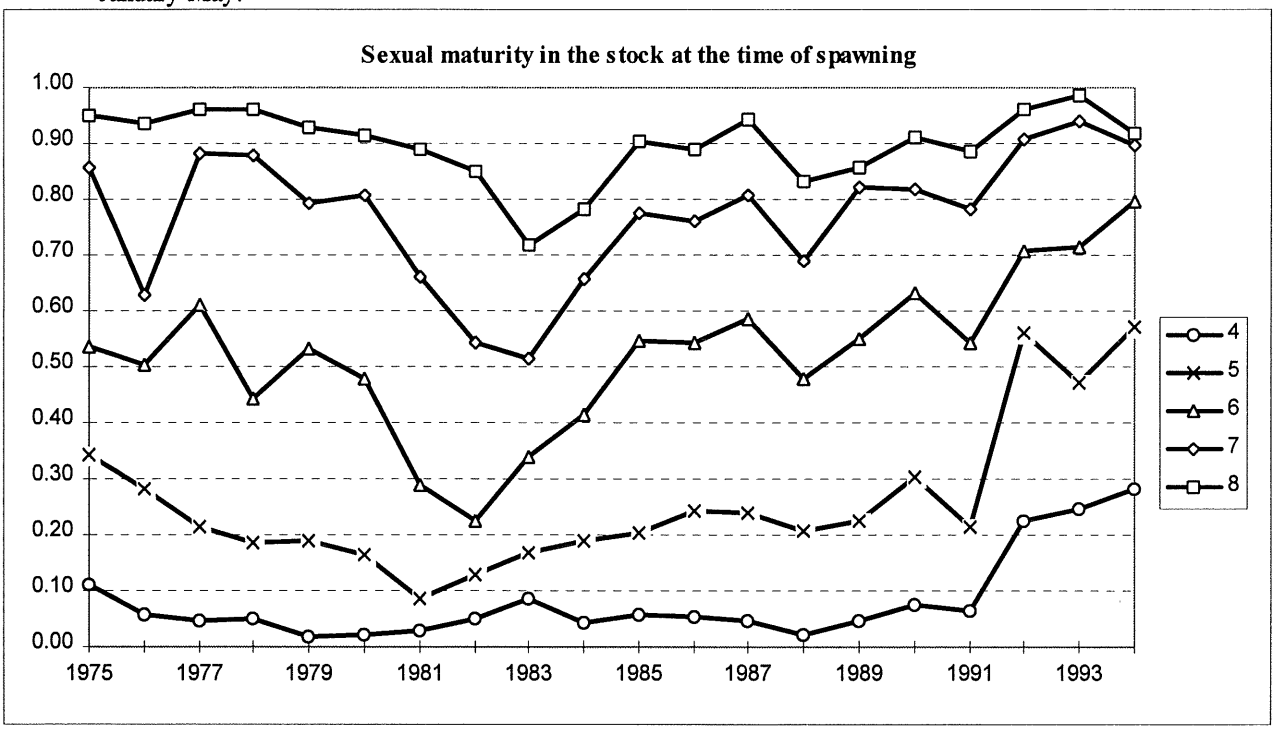


Figure 3.3.12. Proportion mature by age and year, as estimated from commercial samples taken during January-May.



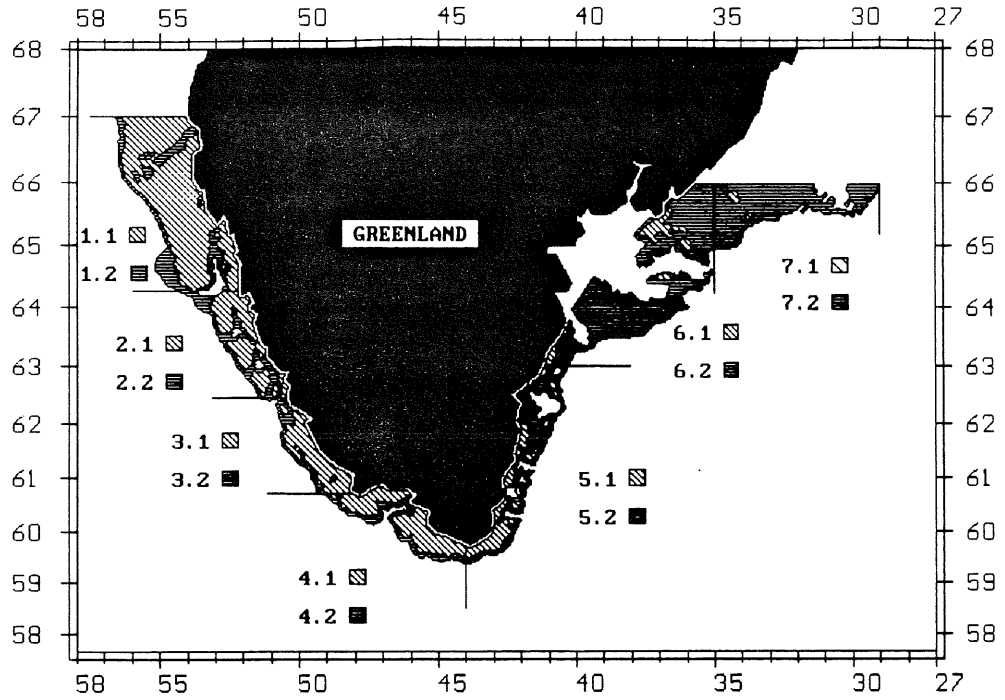


Fig. 5.1.1 Survey area. Geographic stratification scheme as specified in Table 5.1.1.

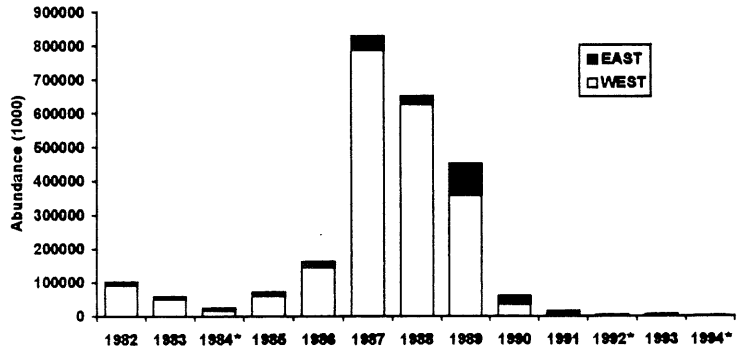


Fig. 5.1.2 Aggregated survey abundance indices for cod off West and East Greenland, 1982-94. *) incomplete survey coverage.

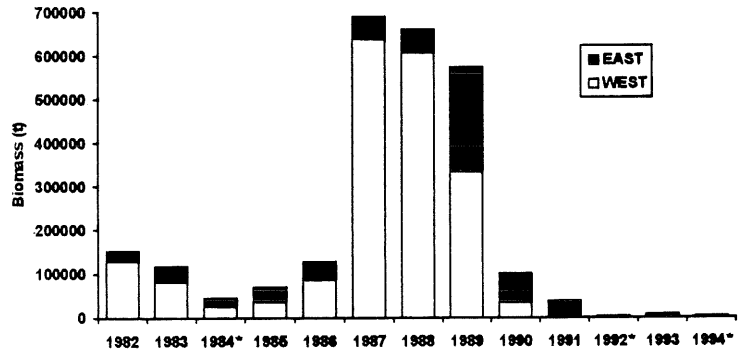


Fig. 5.1.3 Aggregated survey biomass indices for cod off West and East Greenland, 1982-94. *) incomplete survey coverage.

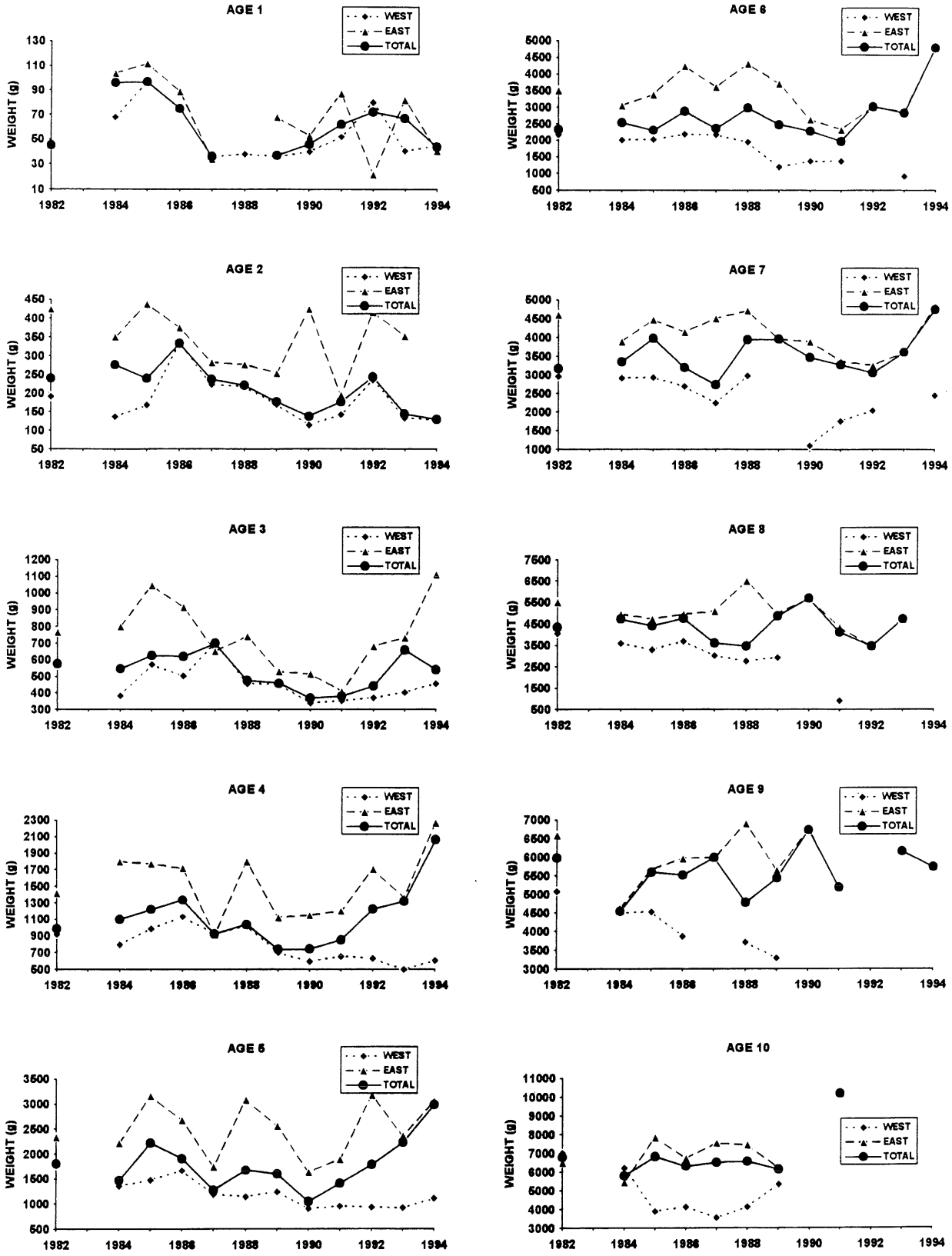


Fig. 5.1.4 Weighted mean weight at age 1-10 years for cod off West, East Greenland and total, survey 1982-94.

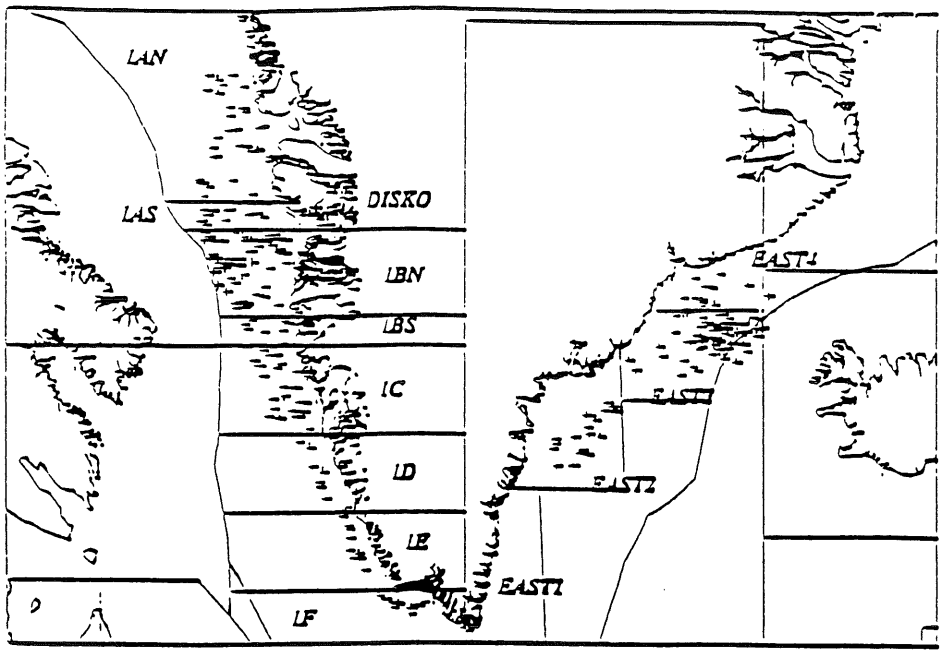


Fig. 5.1.5 Location of sub-areas and hauls in Greenland trawl survey, 1994.

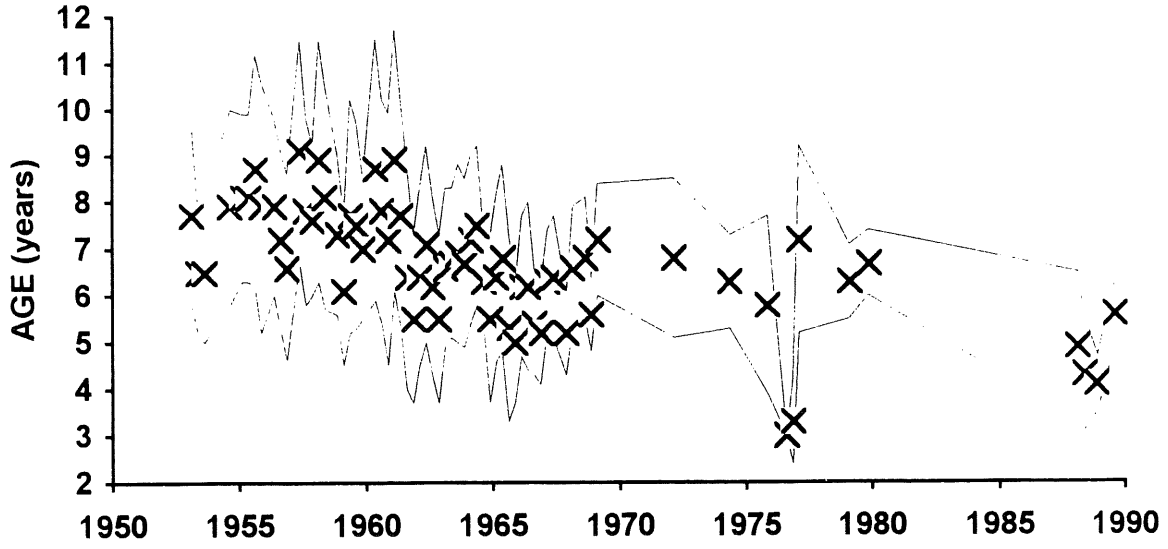


Fig. 5.3.1 Cod off West Greenland. Mean age +/- standard deviation of quaterly aggregated German landings (fish market sampling), 1953-89.

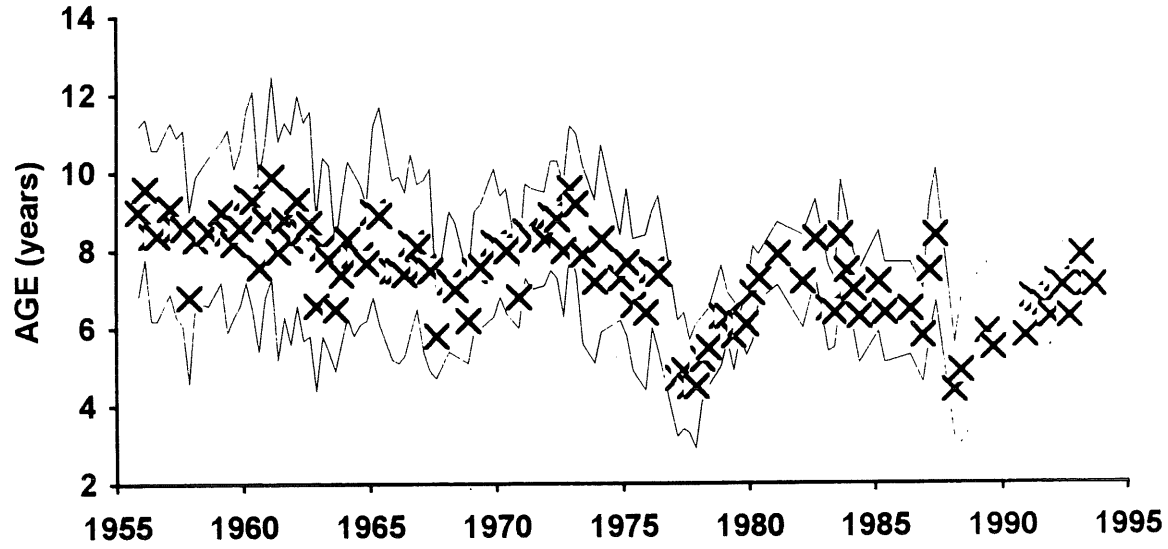


Fig. 5.3.2 Cod off East Greenland. Mean age +/- standard deviation of quaterly aggregated German landings (fish market sampling), 1955-93.

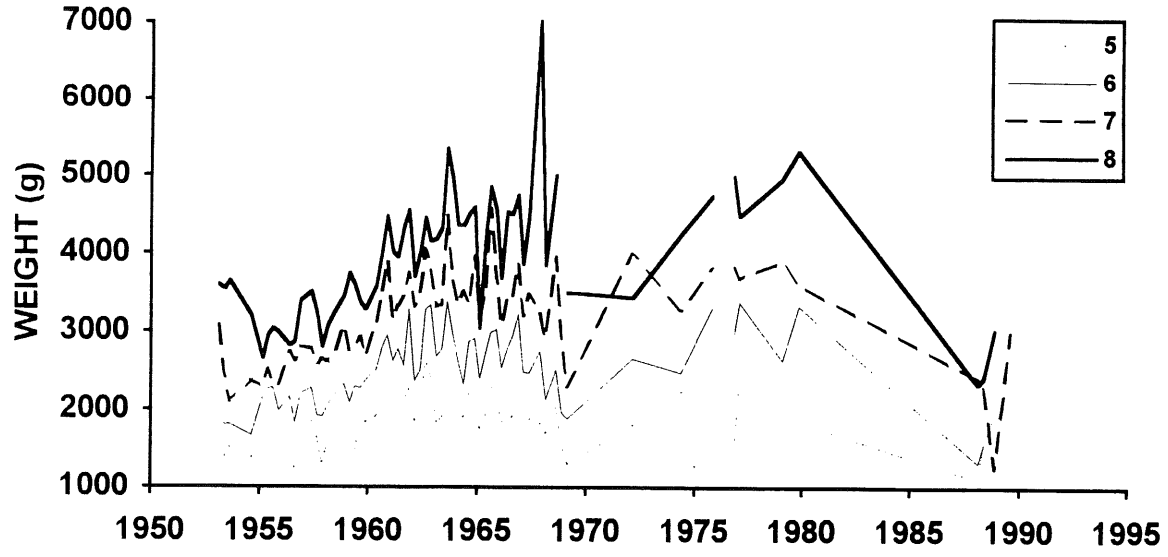


Fig. 5.3.3 Cod off West Greenland. Mean weight at ages 5-8 of quaterly aggregated German landings (fish market sampling), 1953-89.

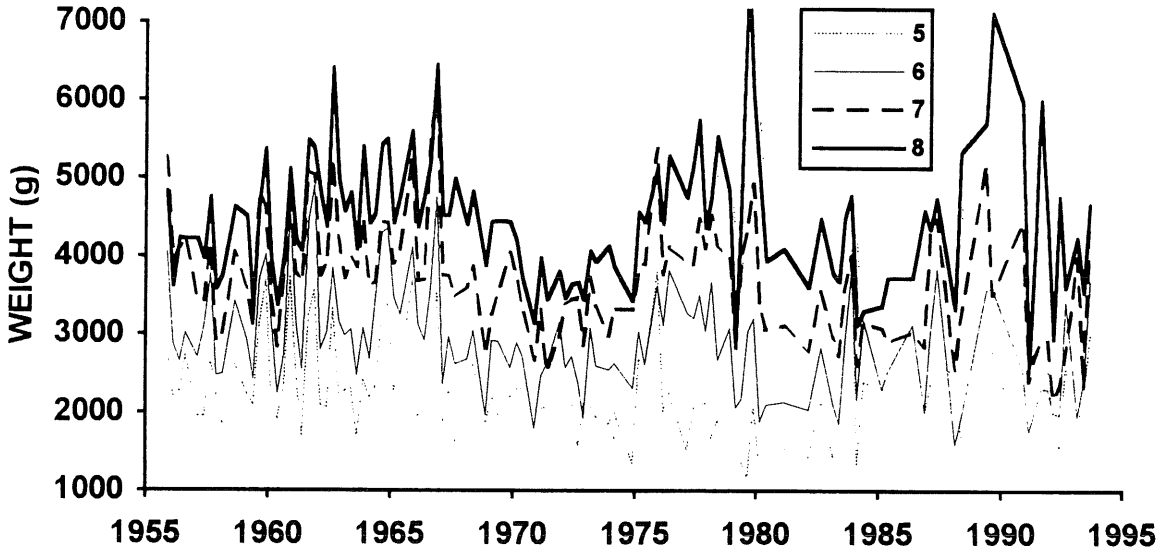


Fig. 5.3.4 Cod off East Greenland. Mean length at ages 5-8 of quaterly aggregated German landings (fish market sampling), 1955-93.

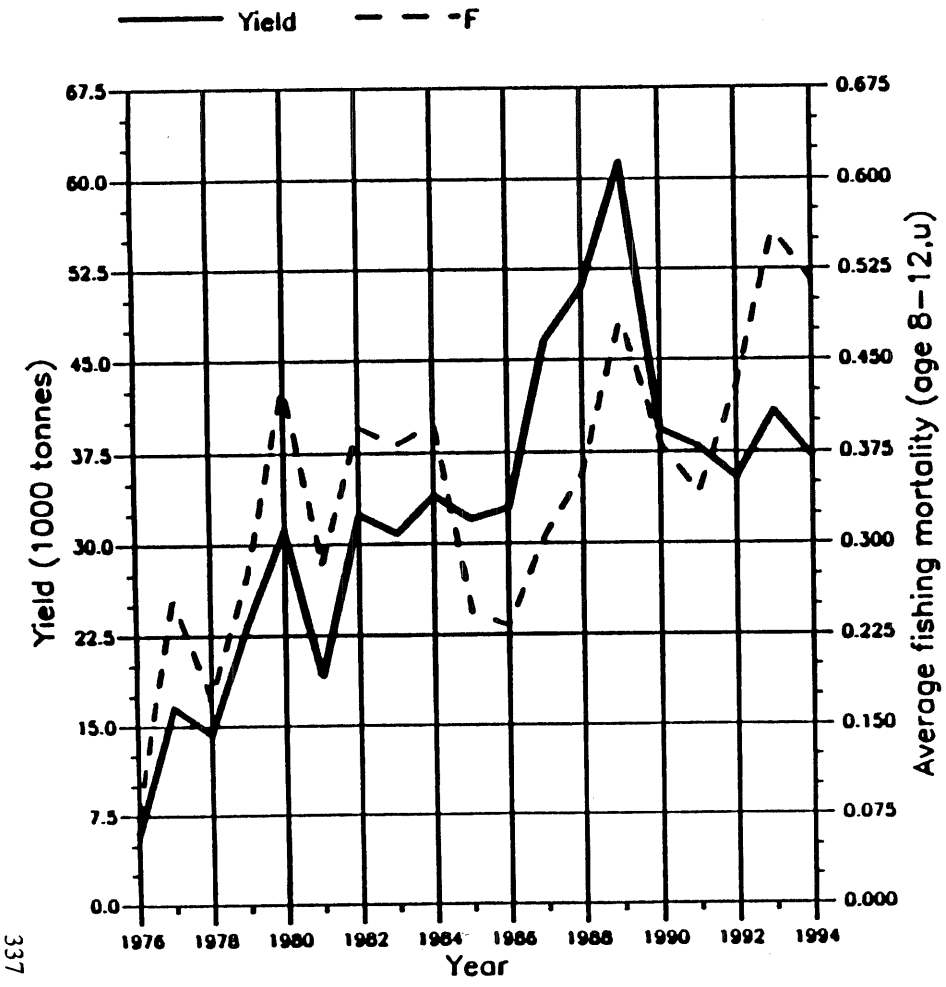
Figure 6.1

FISH STOCK SUMMARY

STOCK: Greenland halibut in the Iceland and Faroes Grounds and East Green

8–5–1995

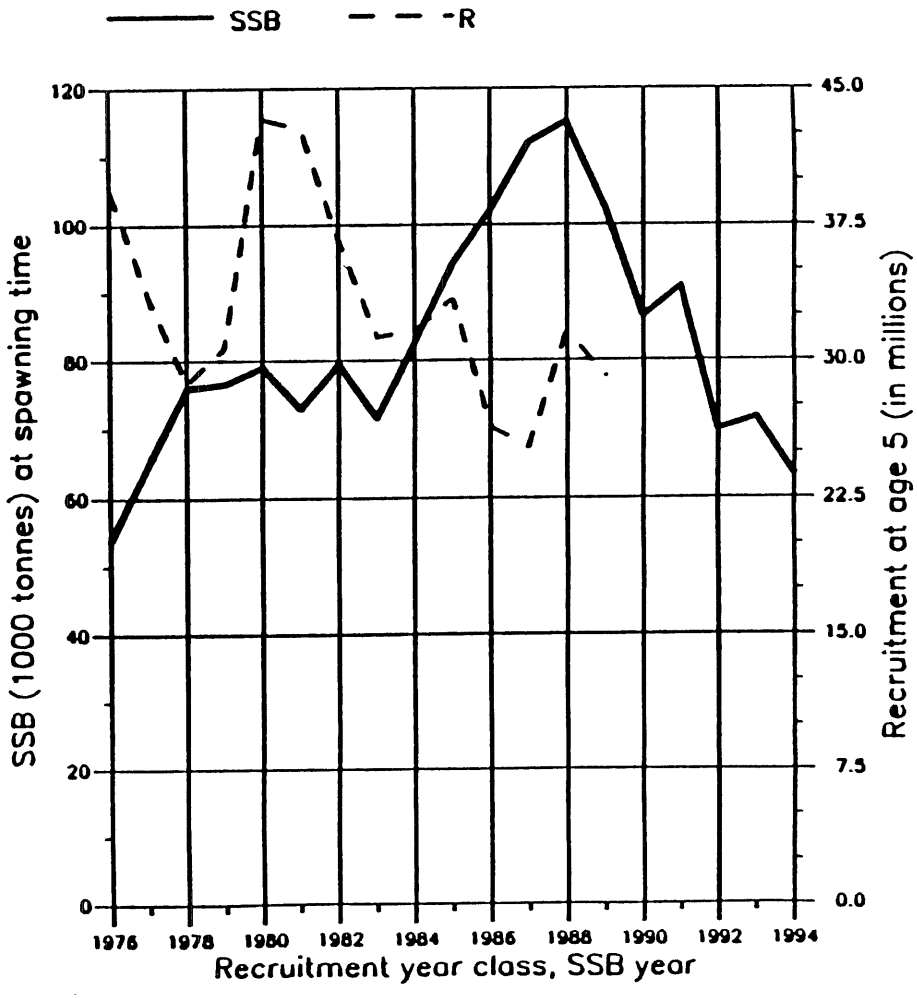
Trends in yield and fishing mortality (F)



(run: XSA5)

A

Trends in spawning stock biomass (SSB) and recruitment (R)



(run: XSA5)

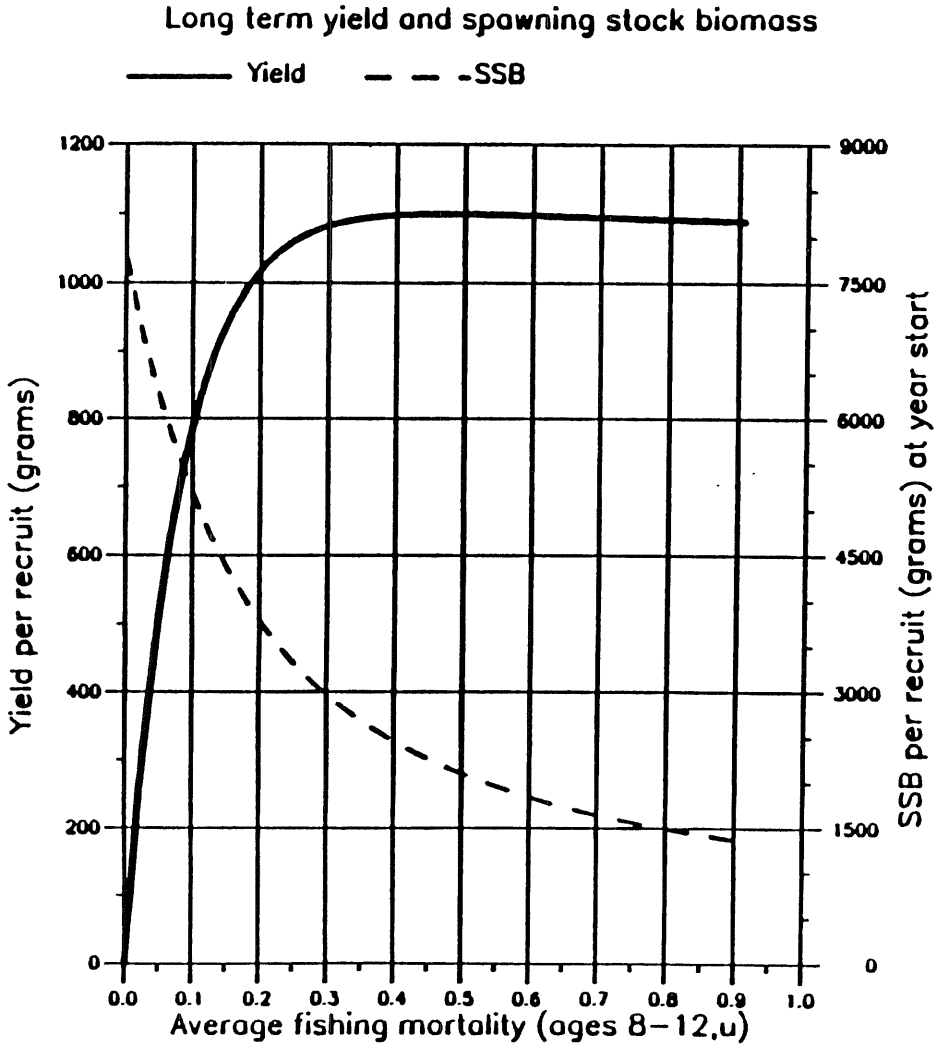
B

Figure 6.2

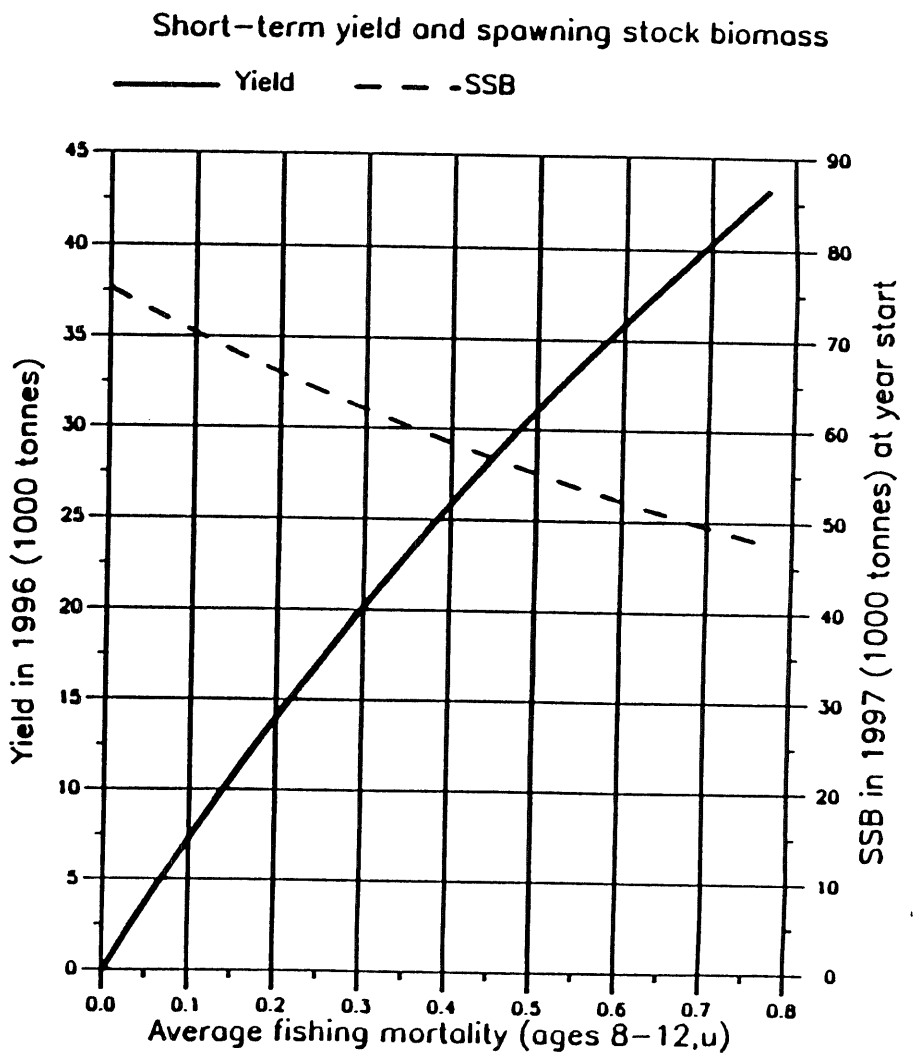
FISH STOCK SUMMARY

STOCK: Greenland halibut in the Iceland and Faroes Grounds and East Green

9-5-1995



(run: VYR) **C**



(run: PR95) **D**

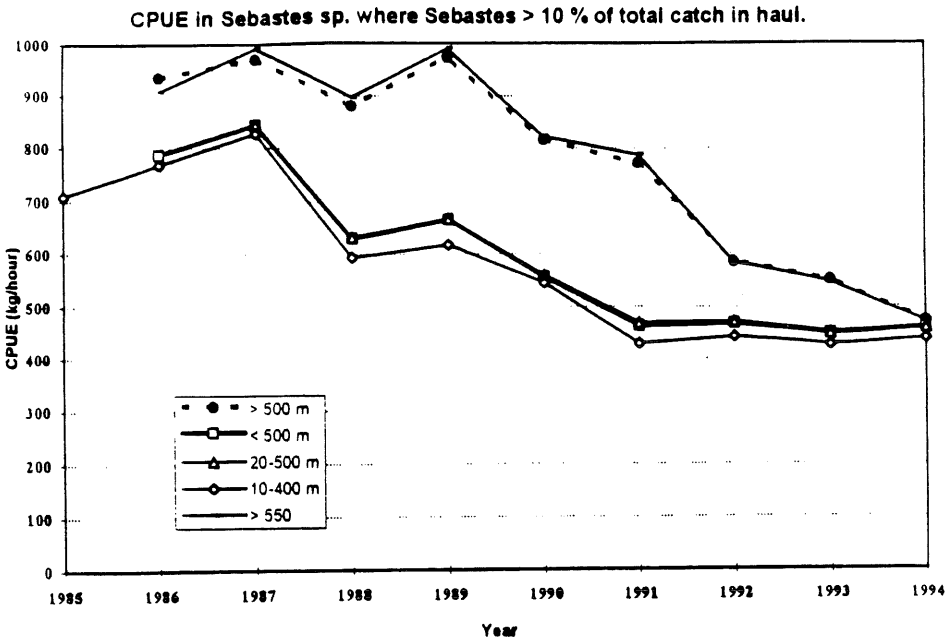


Figure 7.2.1 Results of CPUE from Icelandic trawlers data at different depths, and where redfish is more than 10% of catch in each haulþ

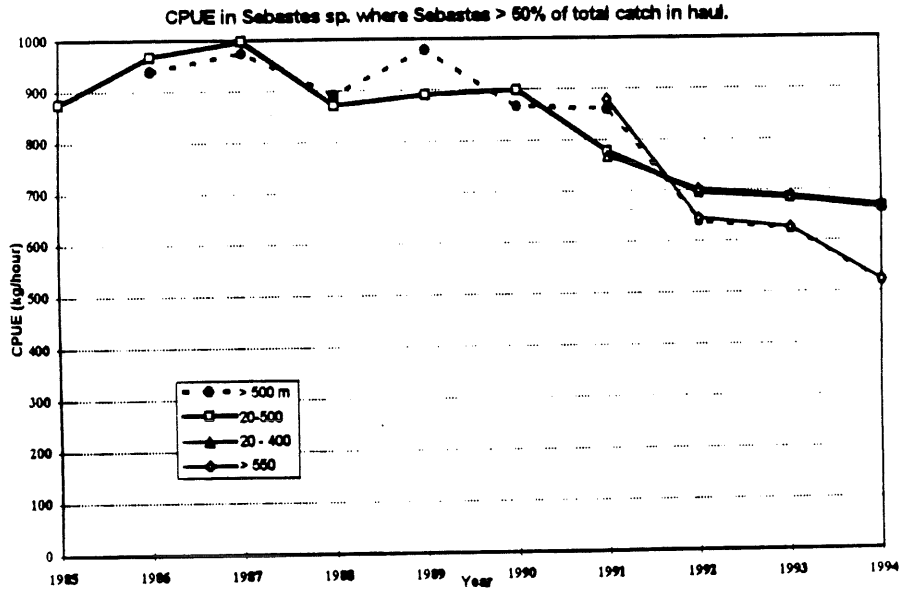


Figure 7.2.2 Results of CPUE from Icelandic trawlers data at different depths and where redfish is more than 50% of catch in each haul.

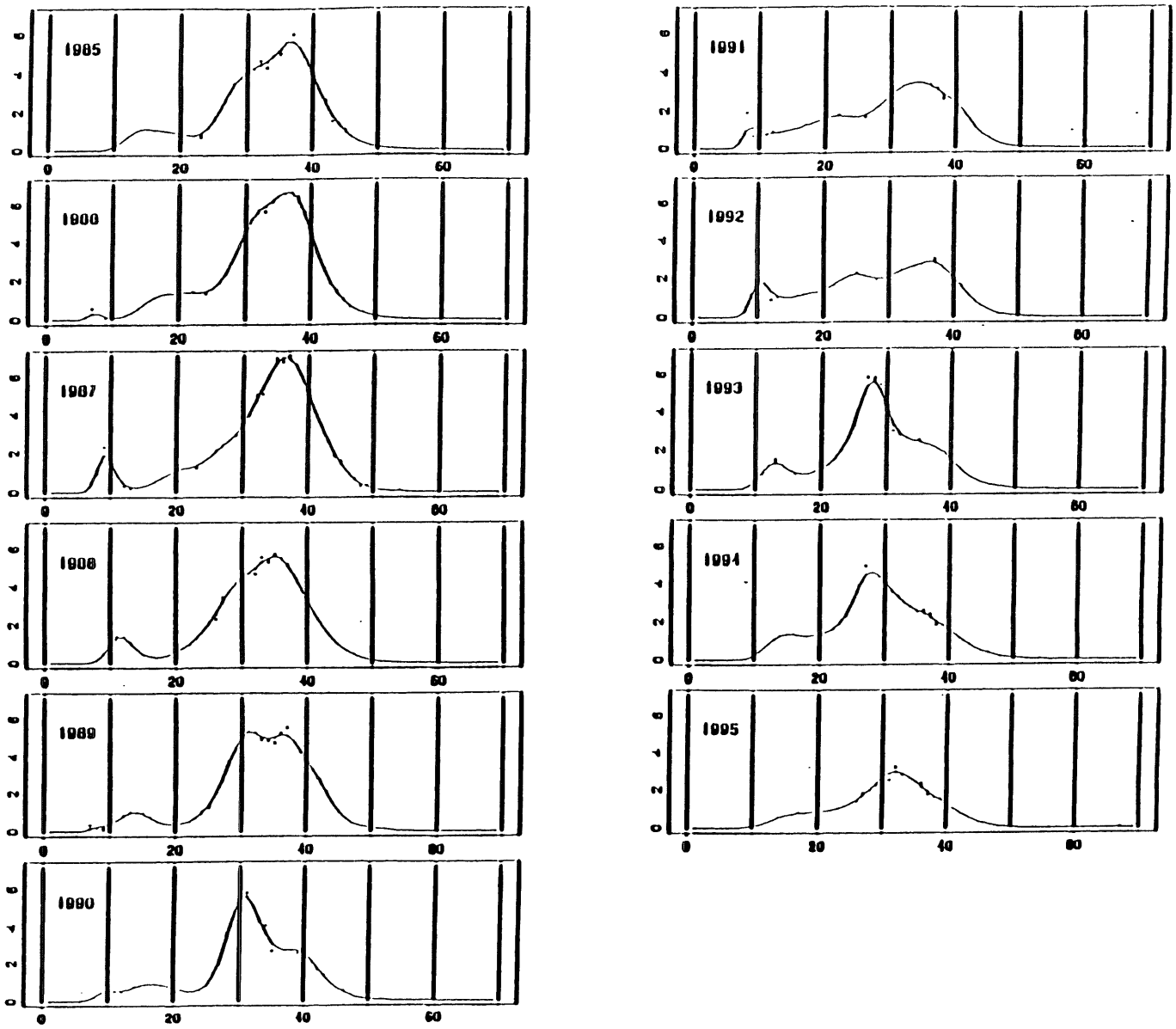


Figure 7.3.1 *S. marinus.* Length distribution from survey of 0-500 m depth range. Number of fish per towing mile by cm groups.

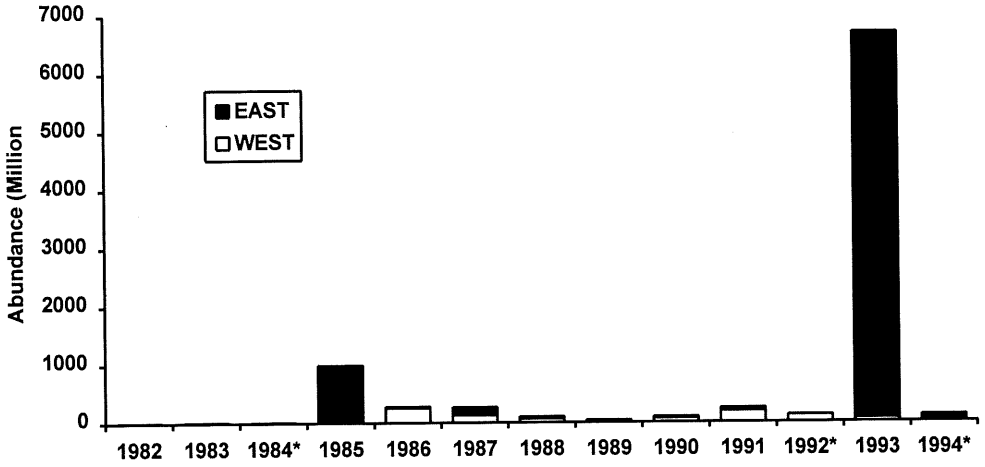


Figure 7.3.2 *Sebastes spp.* (<17.5cm). Survey abundance indices for East and West Greenland as derived from the German survey, 1982-94. *) incomplete survey coverage.

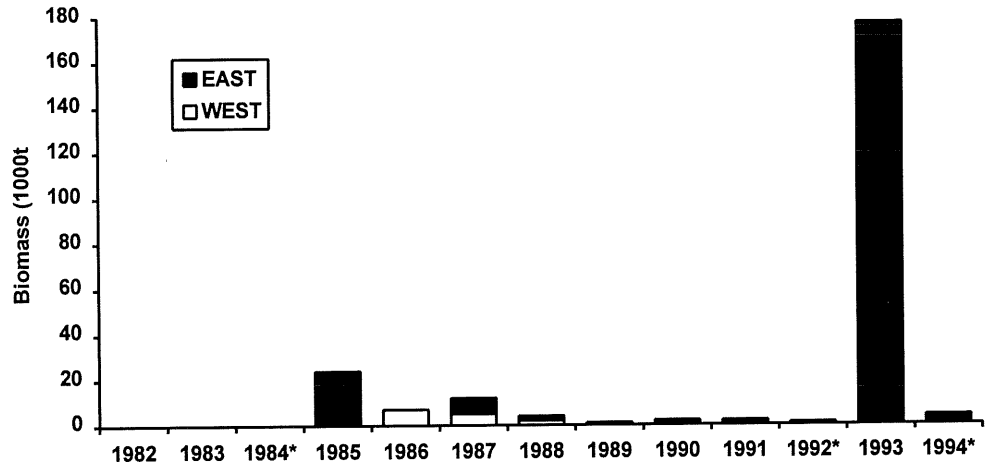


Figure 7.3.3 *Sebastes spp.* (<17.5cm). Survey biomass indices for East and West Greenland as derived from the German survey, 1982-94. *) incomplete survey coverage.

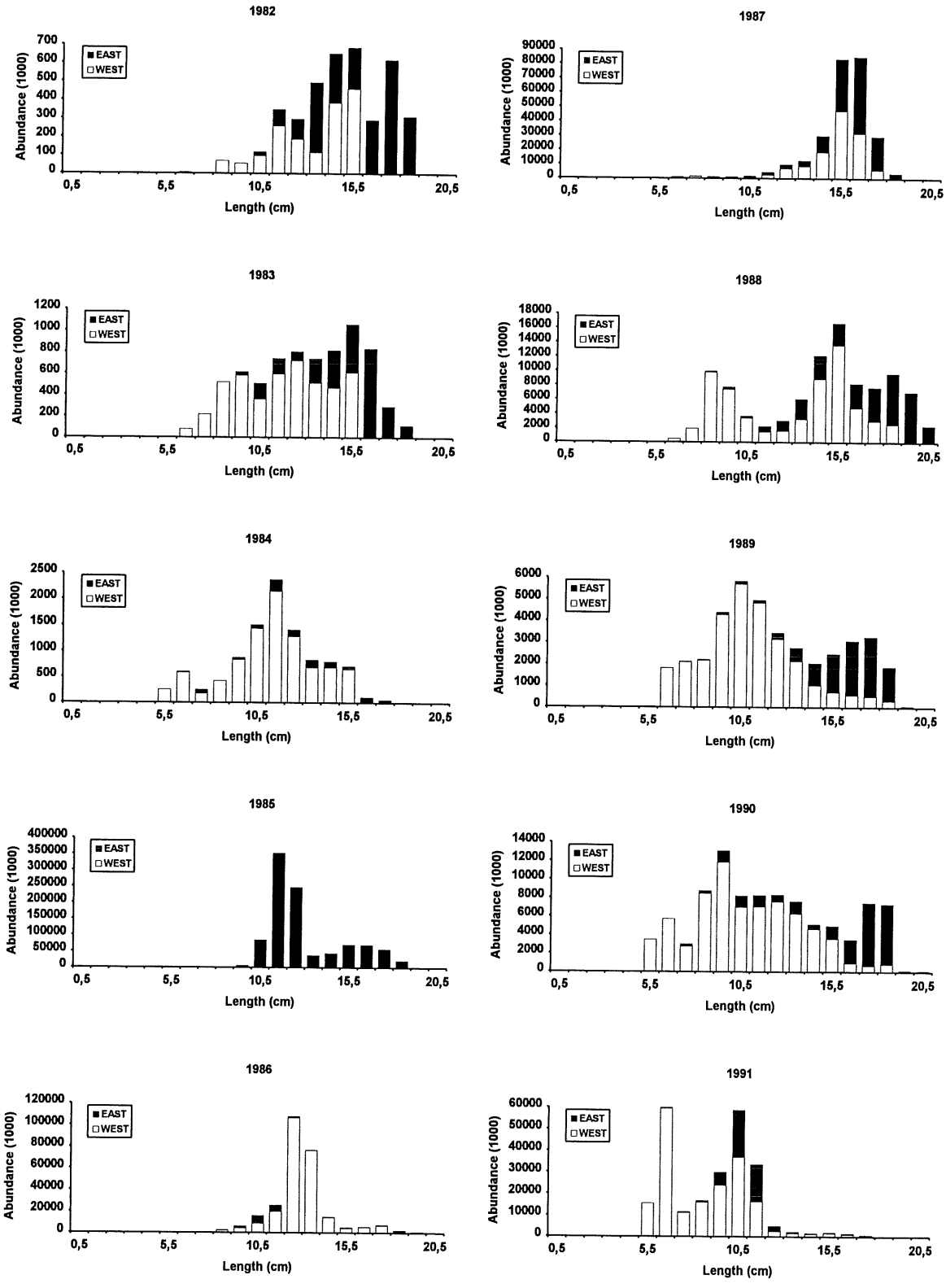


Figure 7.3.4 Sebastes spp. (<17.5cm). Length frequencies for East and West Greenland as derived from the German survey, 1982-91.

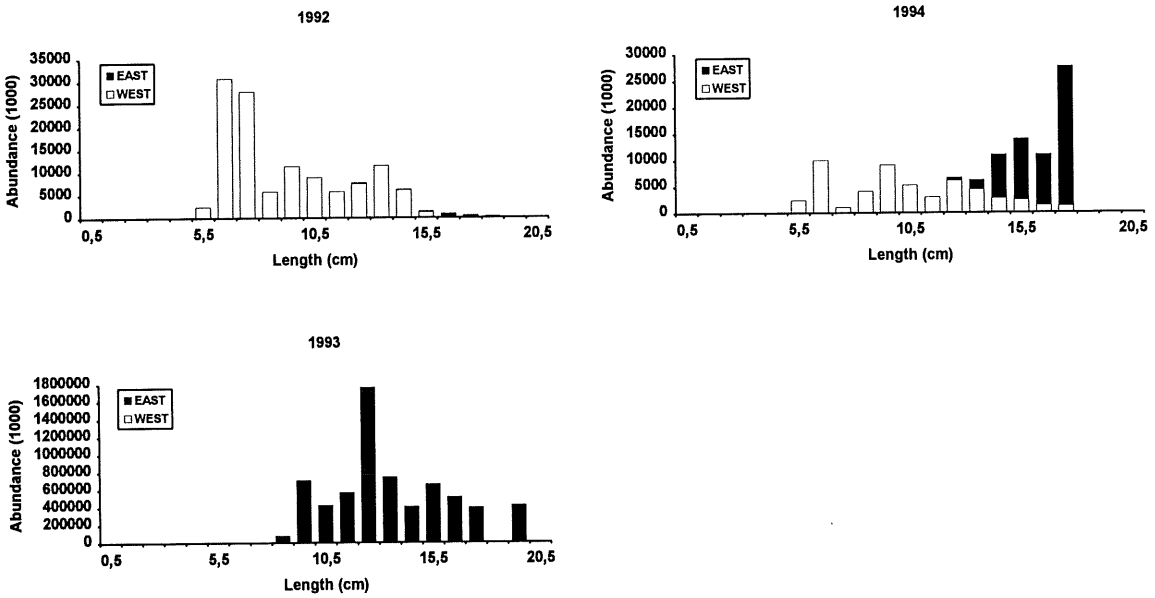


Figure 7.3.5 *Sebastes spp.* (<17.5cm). Length frequencies for East and West Greenland as derived from the German survey, 1992-94.

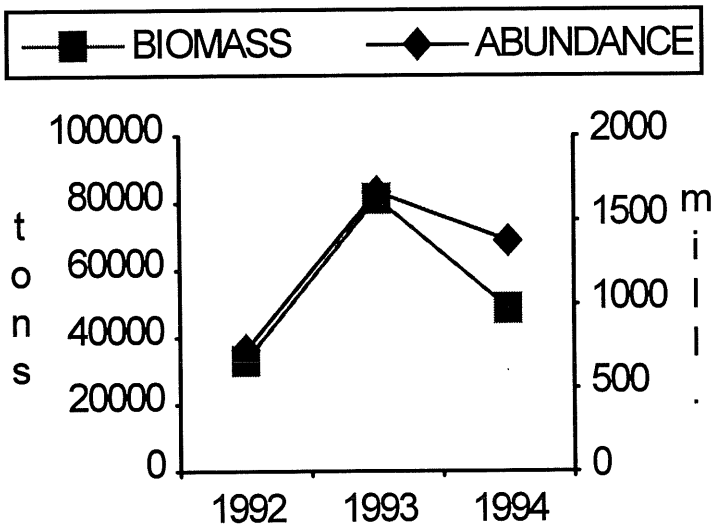


Figure. 7.3.6 Biomass and Abundance indices for juvenile redfish as derived from the Greenland trawl survey, 1992-94.

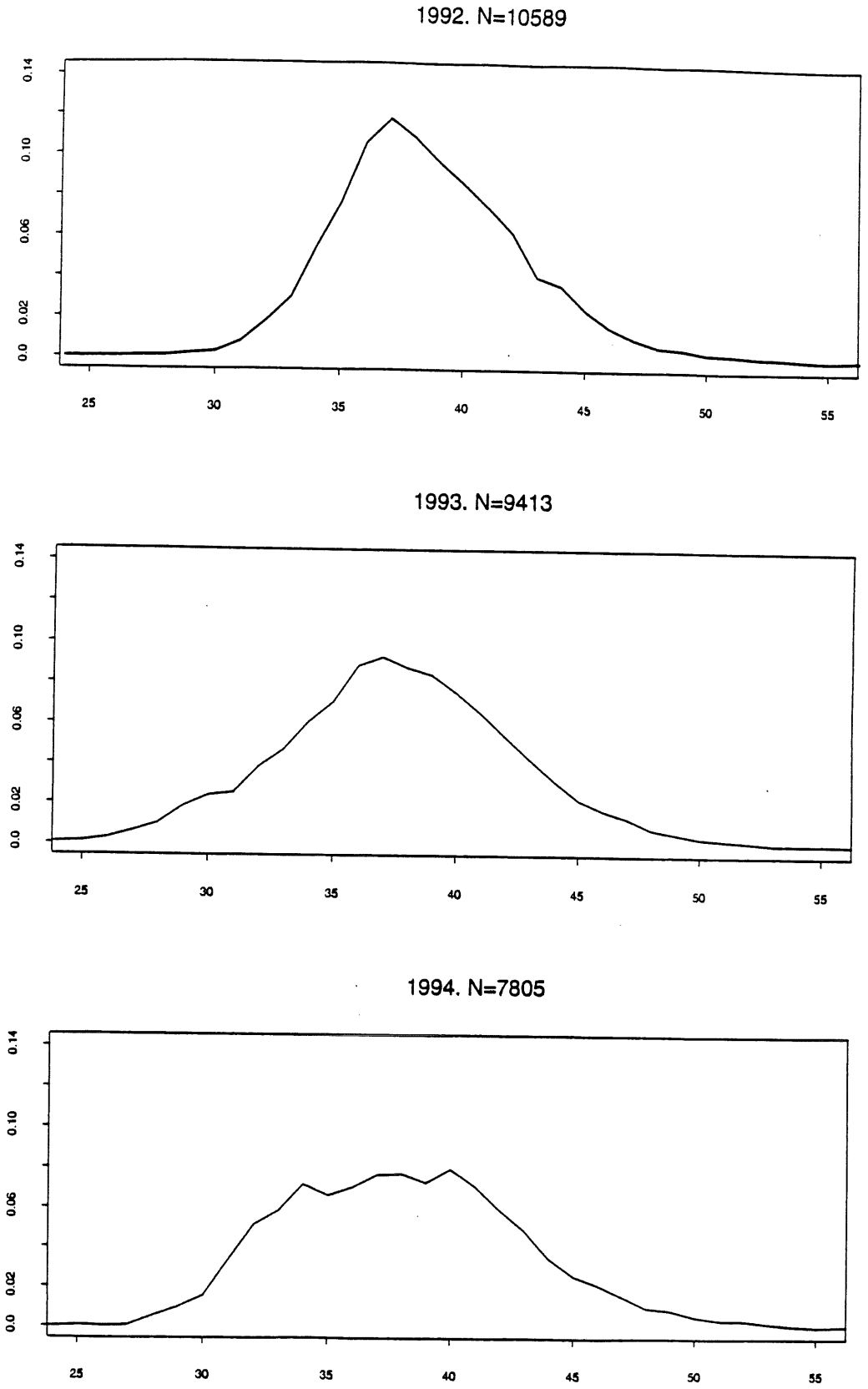


Figure 8.1.1 Length distrubution of *S. marinus* in Icelandic landings from 1992 - 1994.

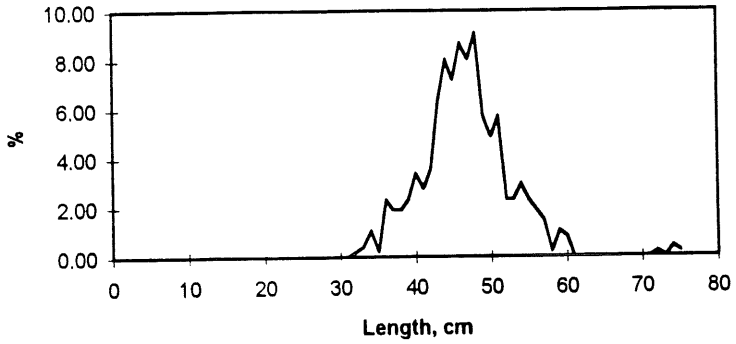


Figure 8.1.2 Length distribution of *S. marinus* in Faroese landings from Vb in 1994.

Please note - Figures 8.2.1 and 8.2.2 do not exist.

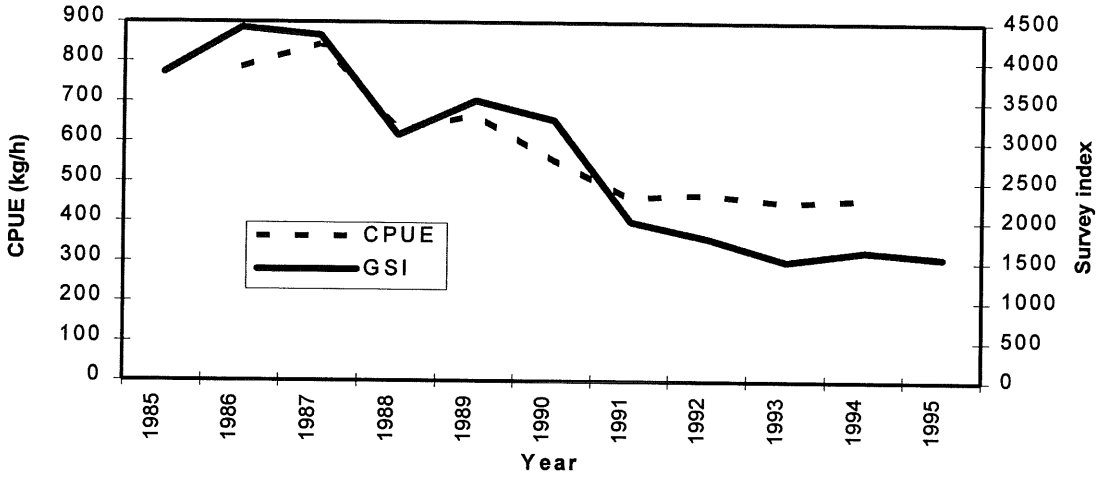


Figure 8.2.3 CPUE in *S. marinus* from Icelandic trawlers and survey indices from the ground fish survey.

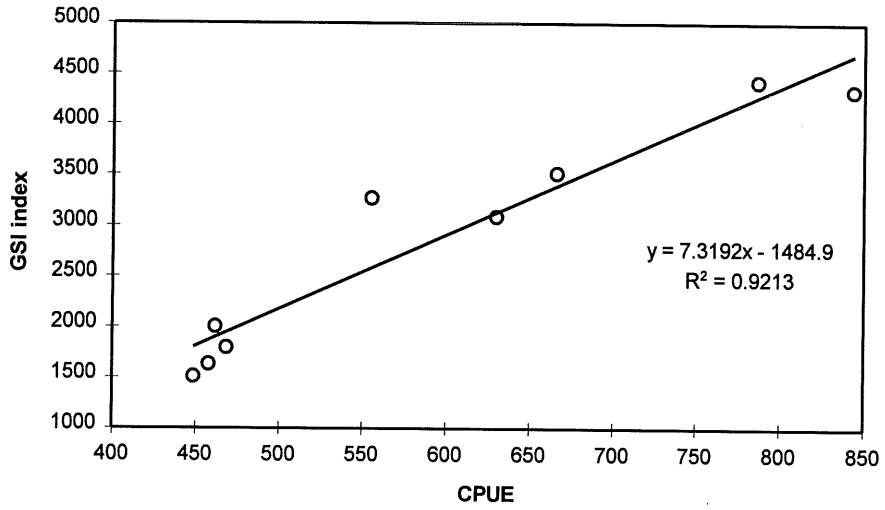


Figure 8.2.4 Correlation between CPUE in *S. marinus* from the Icelandic trawl fleet and the Icelandic ground fish survey indices.

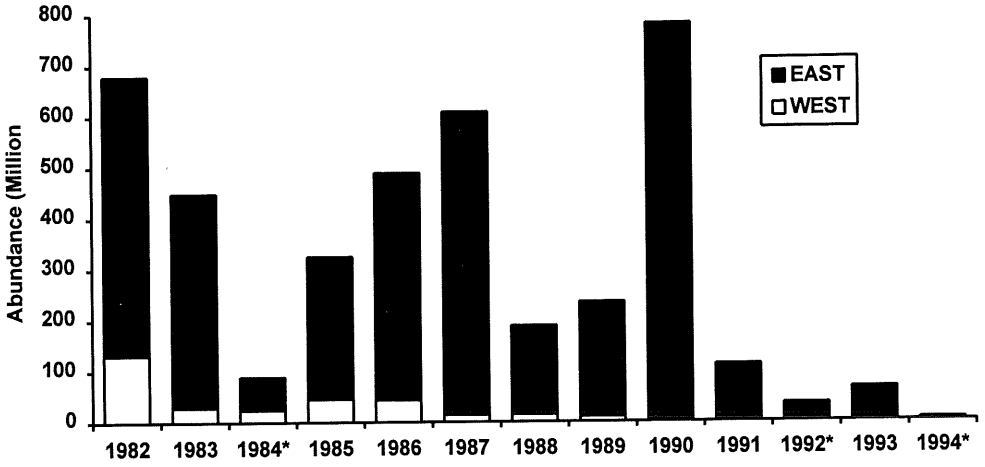


Figure. 8.2.5 *S.* marinus (>=17.5cm). Survey abundance indices for East and West Greenland as derived from the German survey, 1982-94. *) incomplete survey coverage.

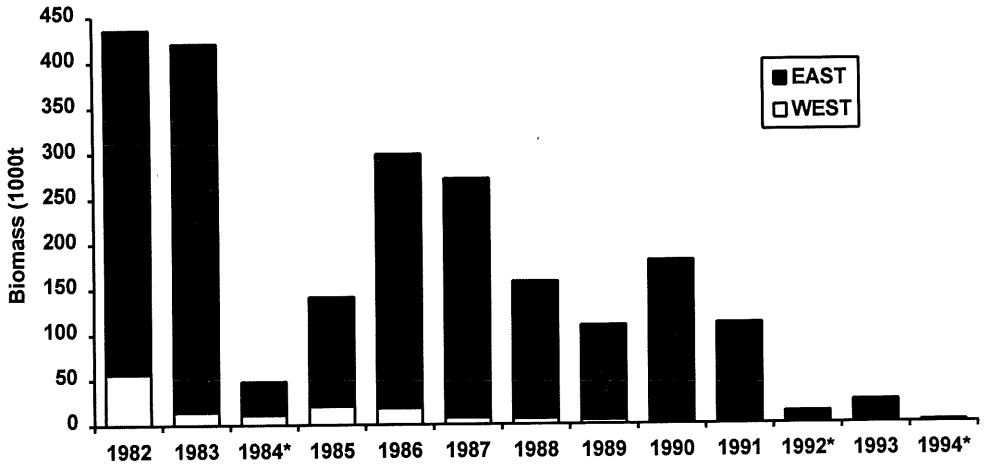


Figure 8.2.6 *S. marinus* (>=17.5cm). Survey biomass indices for East and West Greenland as derived from the German survey, 1982-94. *) incomplete survey coverage.

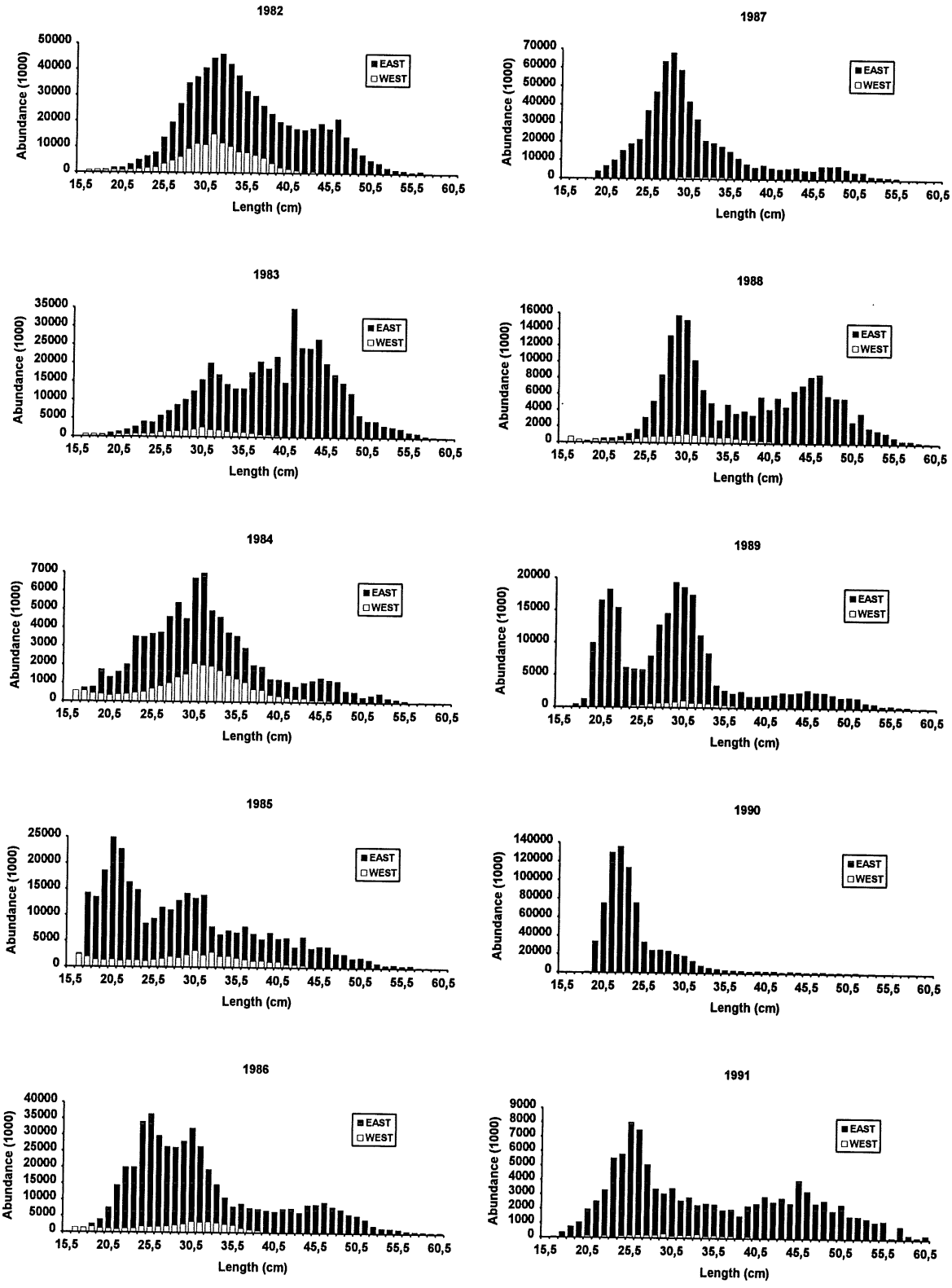


Figure 8.2.7 *S. marinus* (>=17.5cm). Length frequencies for East and West Greenland as derived from the German survey, 1982-91.

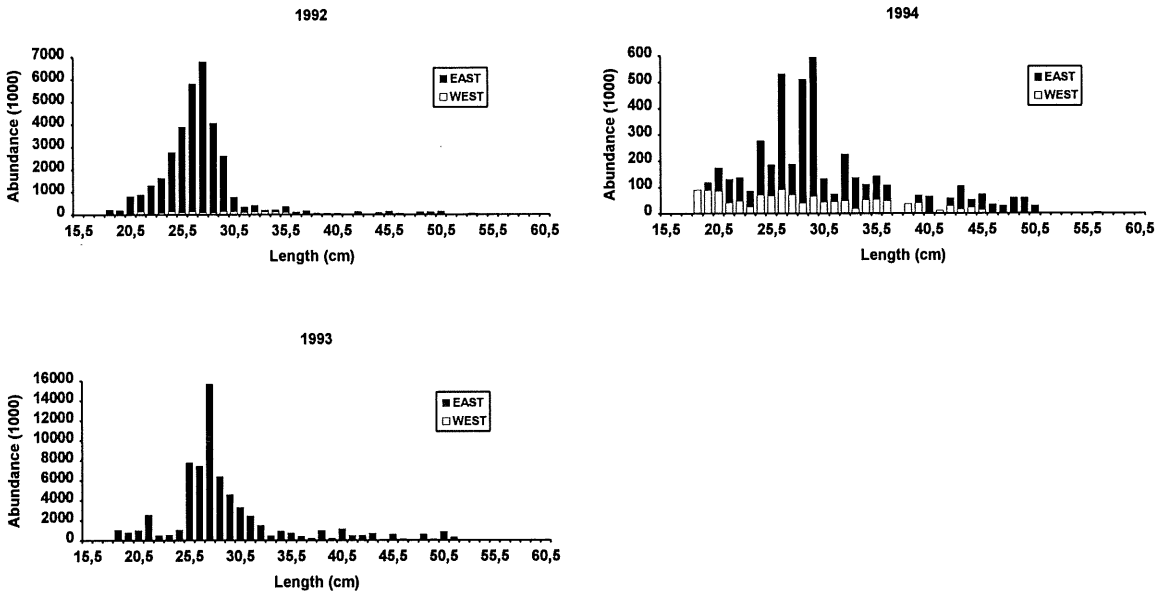


Figure 8.2.8 *S. marinus* (>=17.5cm). Length frequencies for East and West Greenland as derived from the German survey, 1992-94.

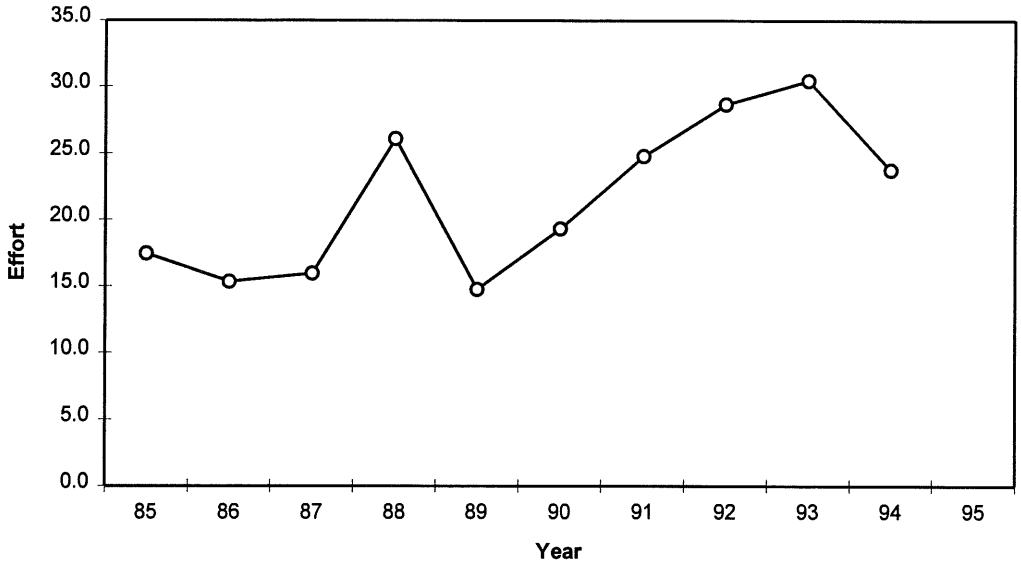
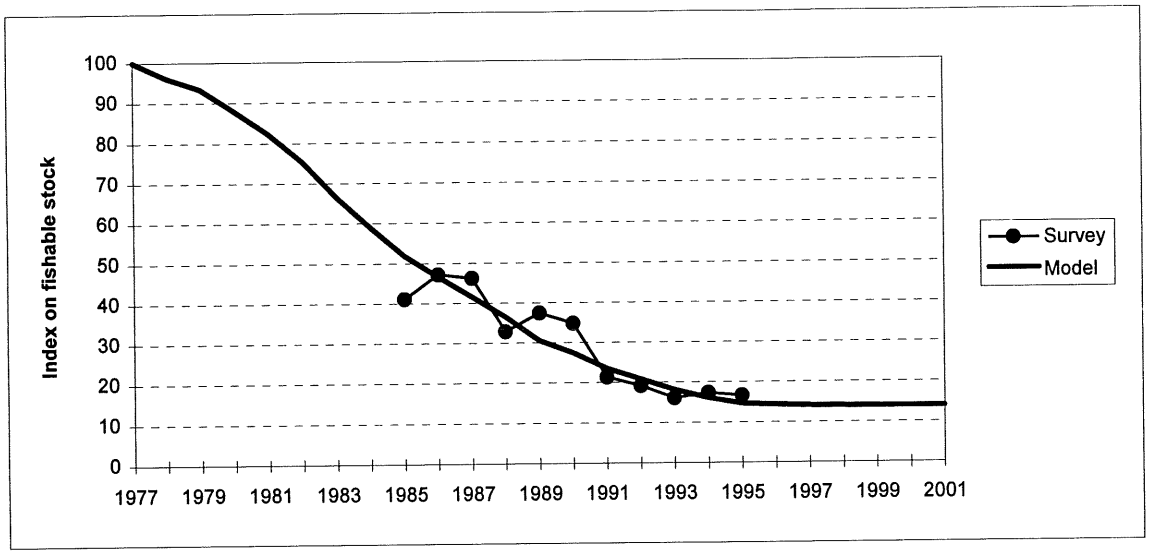
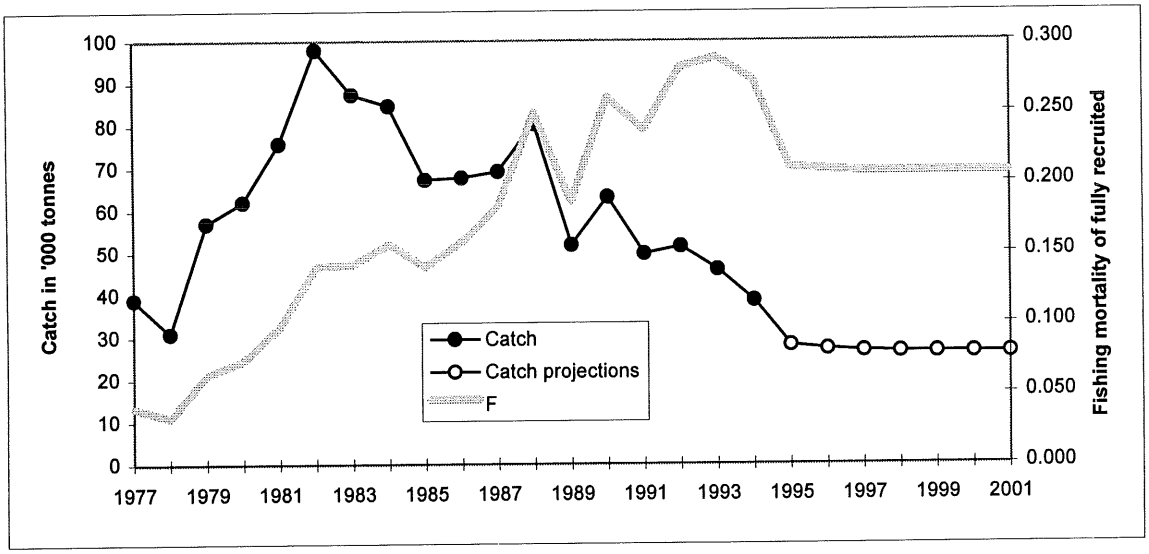


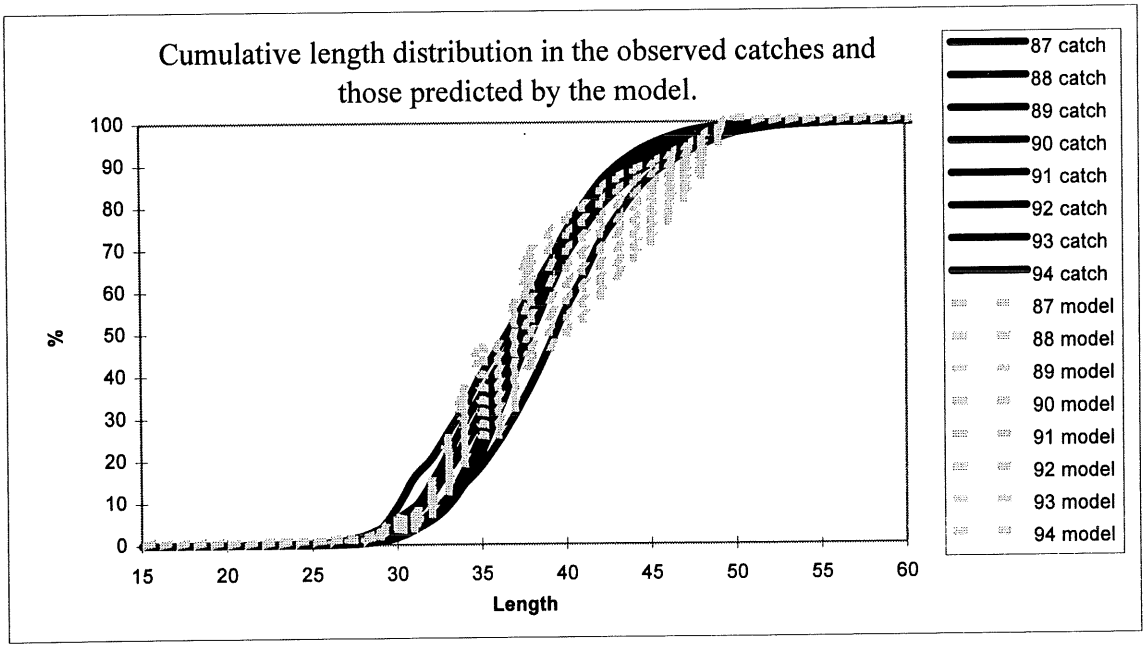
Figure 8.2.9 Effort in *S. marinus* from 1985 - 1994.

2

Figure 8.2.10. S. *marinus*. Results from age-structured dynamic production model.







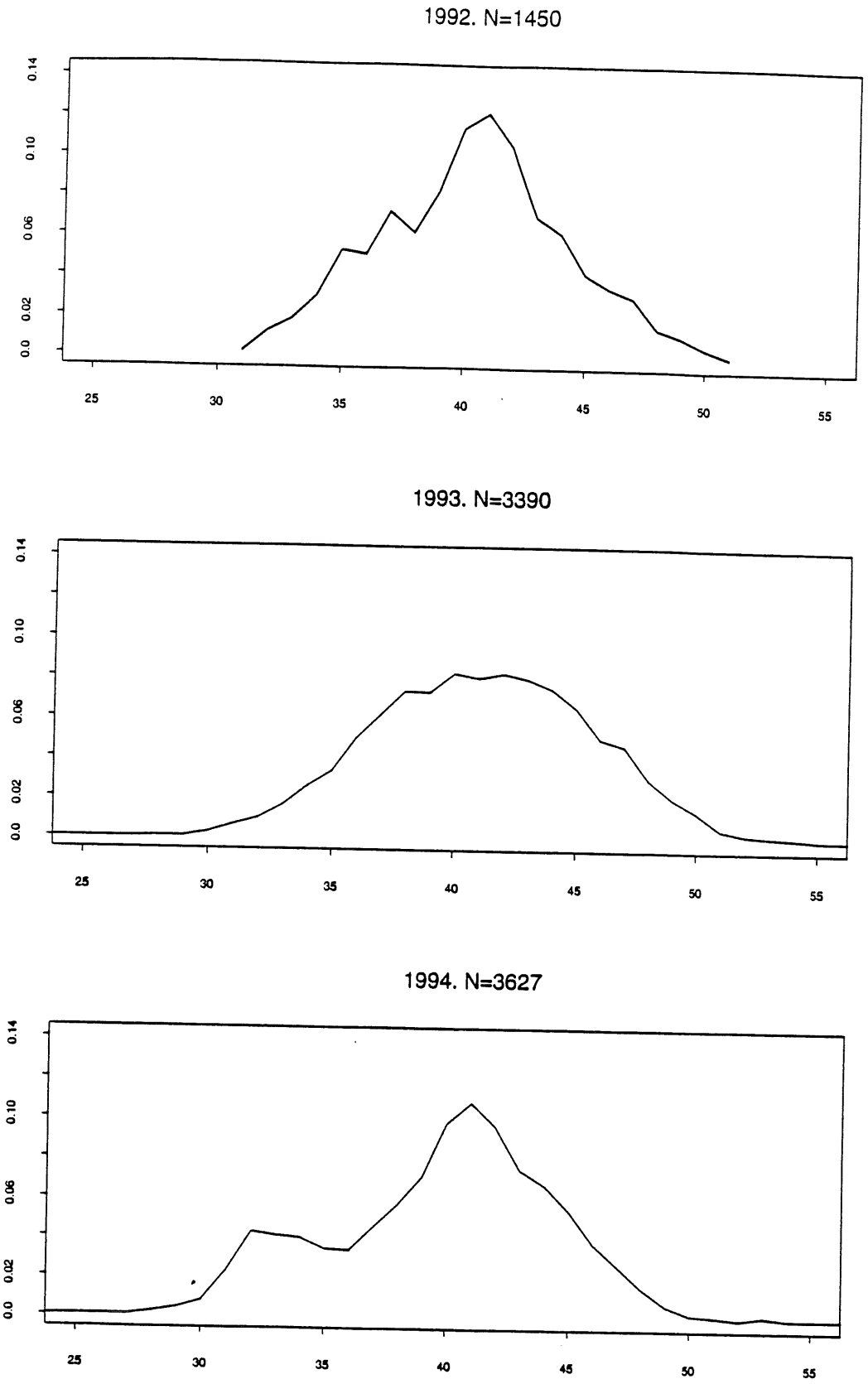


Figure 9.1.1 Length distribution of deep sea *S. mentella* in Icelandic landings from 1992-1994.

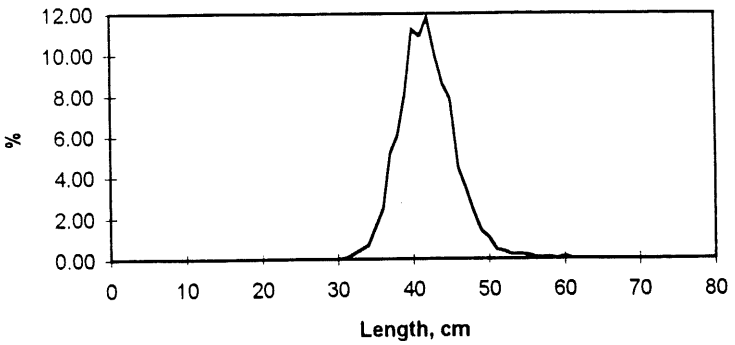


Figure 9.1.2 Length distribution of S. mentella in Faroese landings from Vb in 1994.

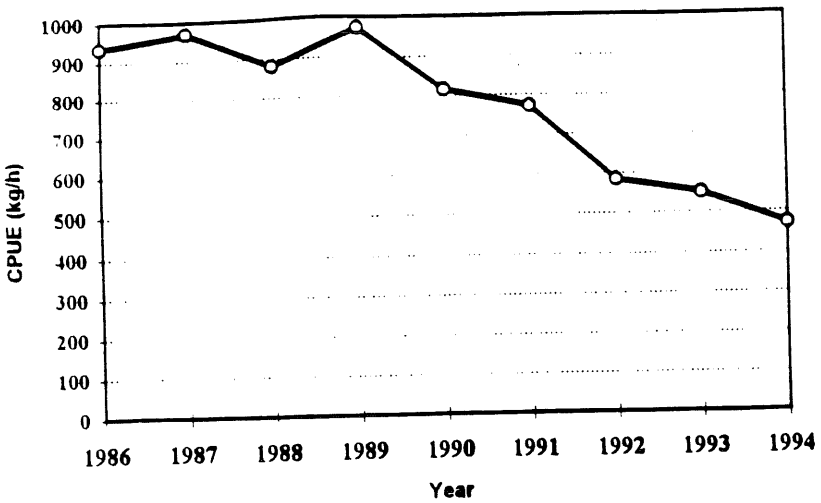


Figure 9.2.1 CPUE in *S. mentella* from Icelandic trawlers.

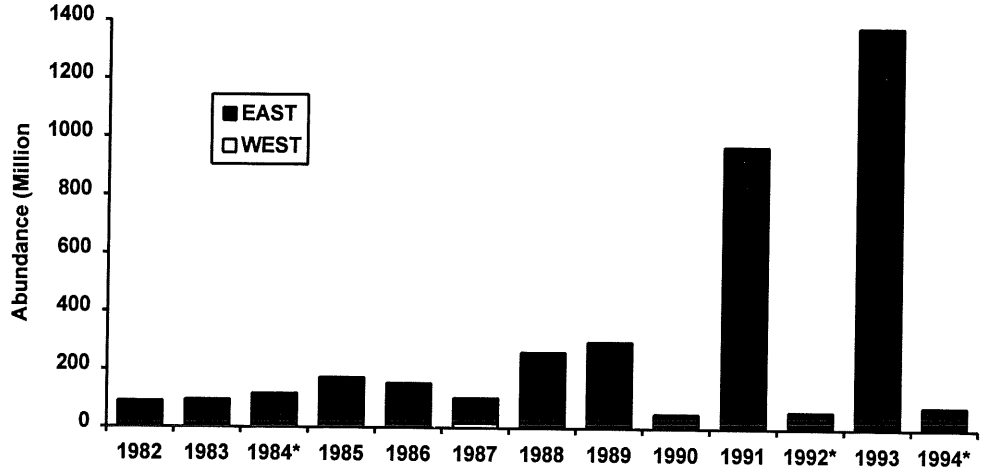


Figure 9.2.2 *S. mentella* (>=17.5cm). Survey abundance indices for East and West Greenland as derived form the German survey, 1982-94. *) incomplete survey coverage.

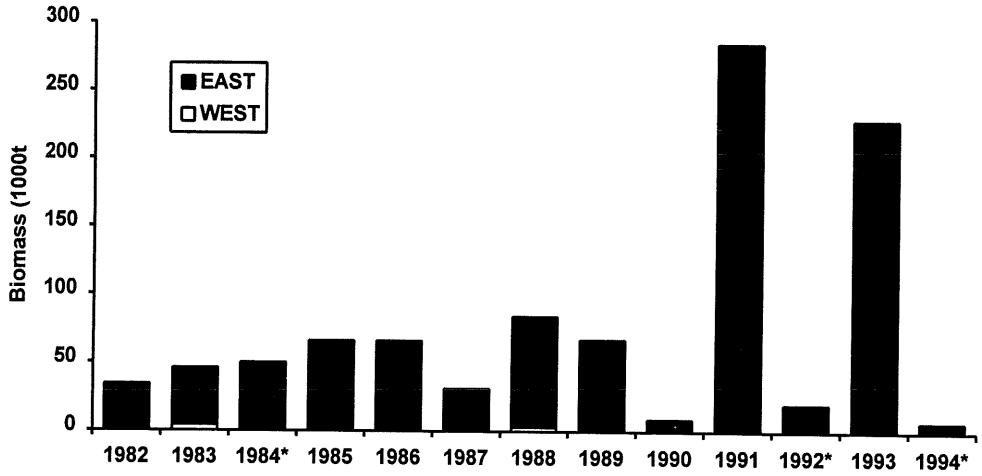


Figure 9.2.3 *S. mentella* (>=17.5cm). Survey biomass indices for East and West Greenland as derived from the German survey, 1982-94. *) incomplete survey coverage.

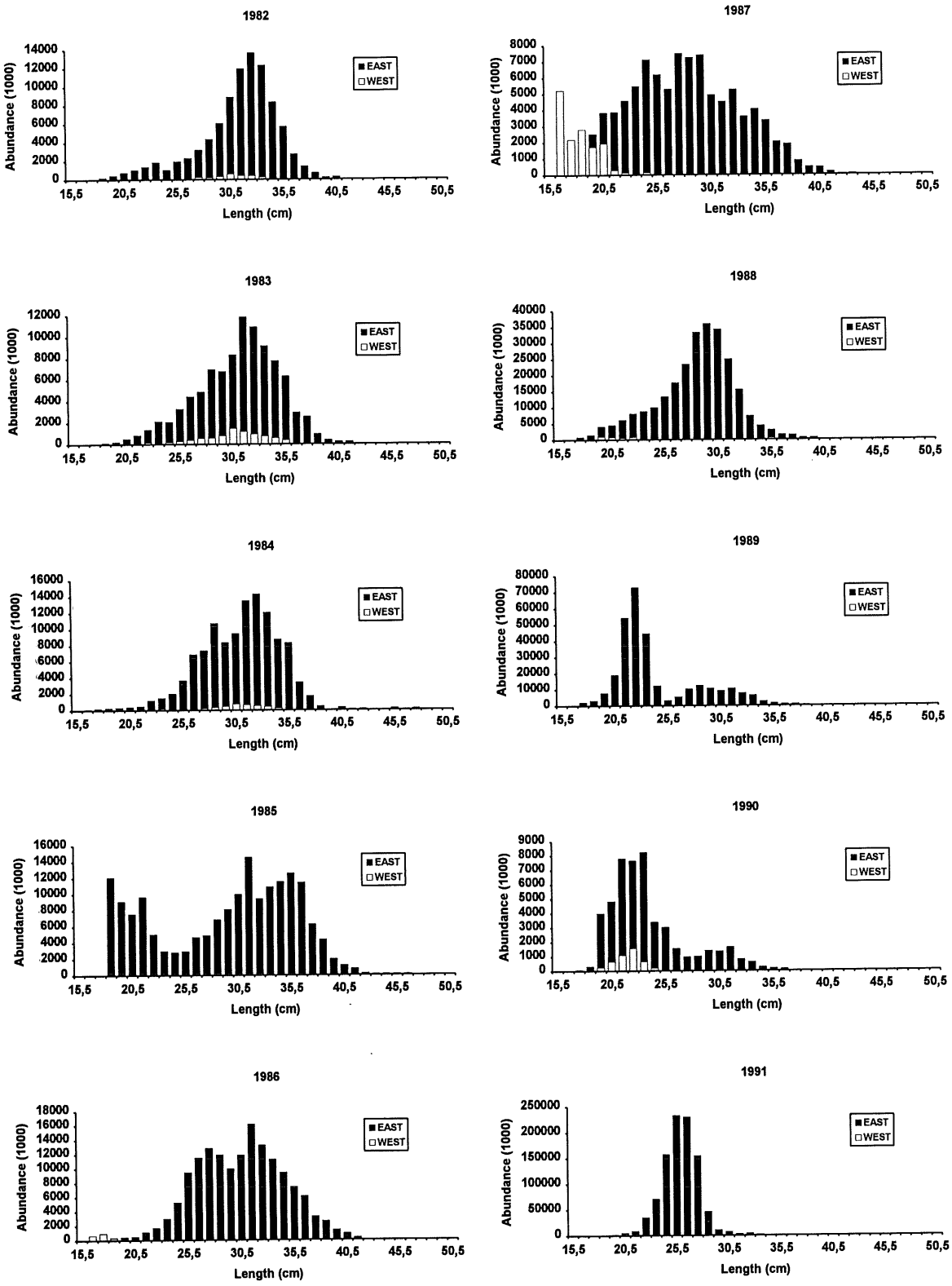


Figure 9.2.4 *S. mentella* (>=17.5cm). Length frequencies for East and West Greenland as derived from the German survey, 1982-91.

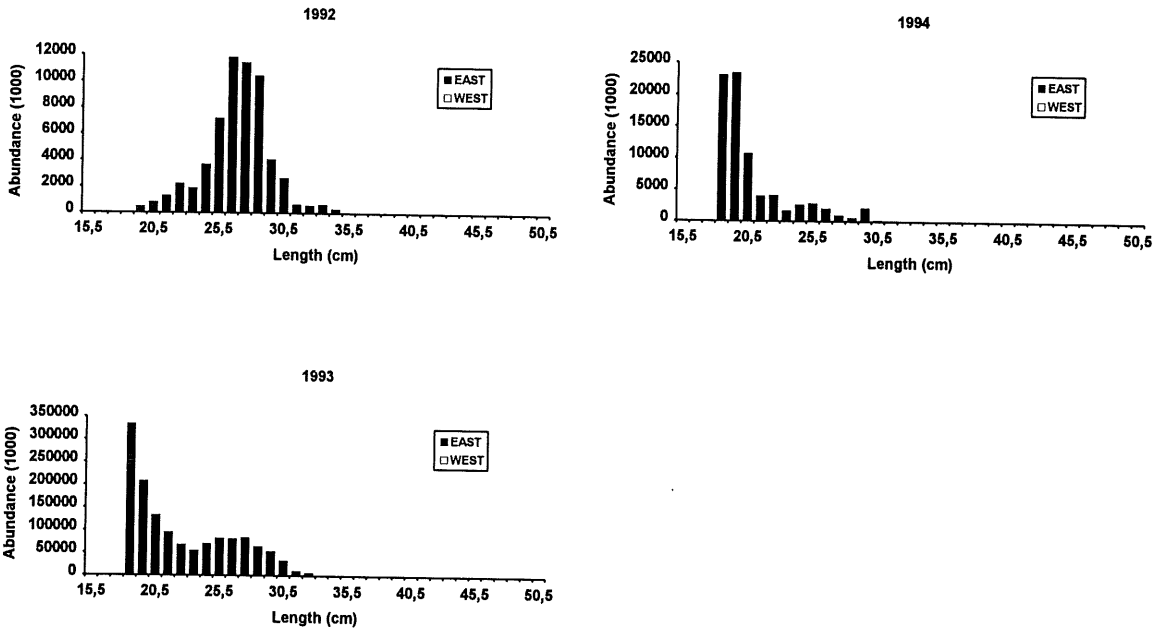


Figure 9.2.5 *S. mentella* (>=17.5cm). Length frequencies for East and West Greenland as derived from the German survey, 1992-94.

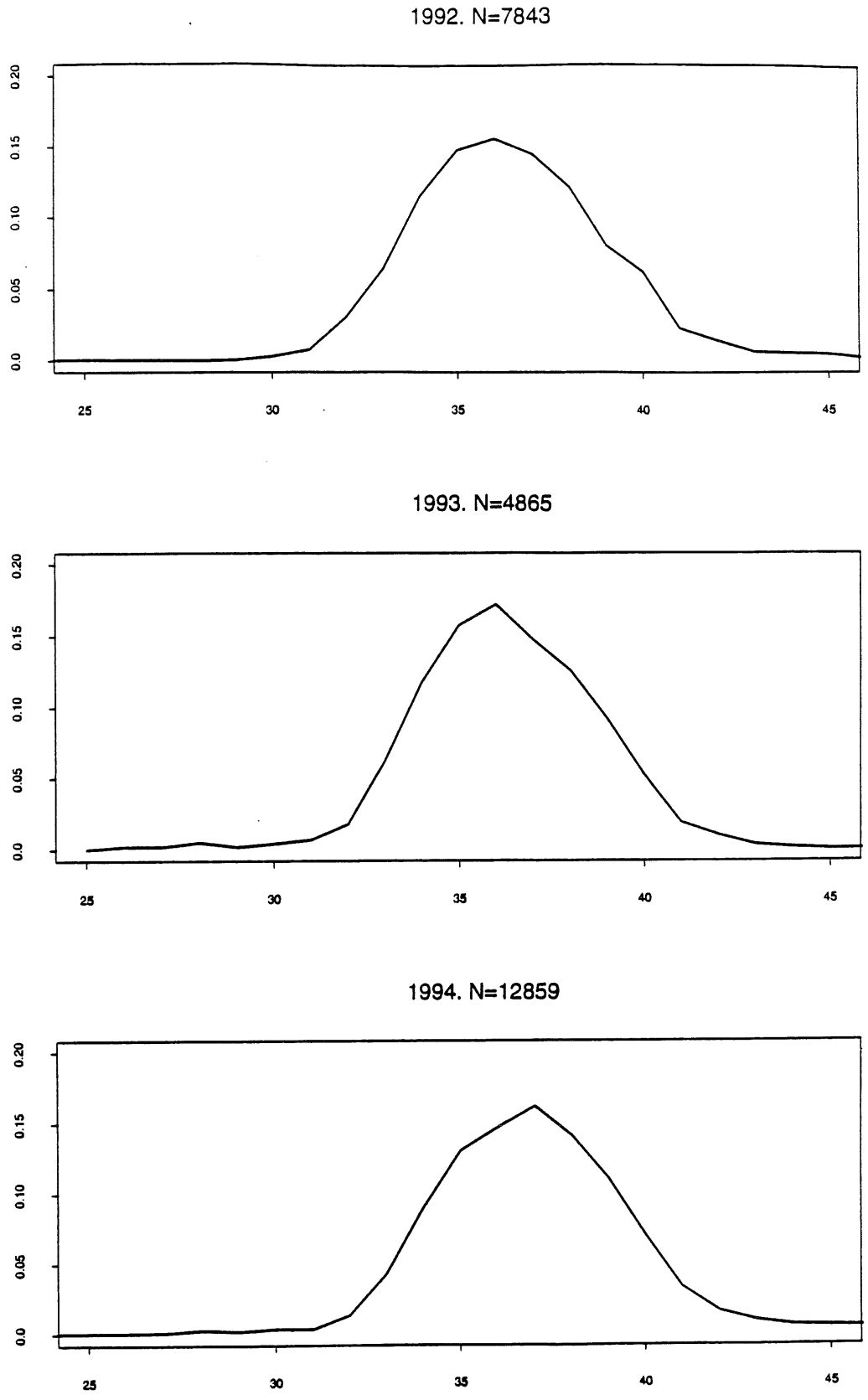
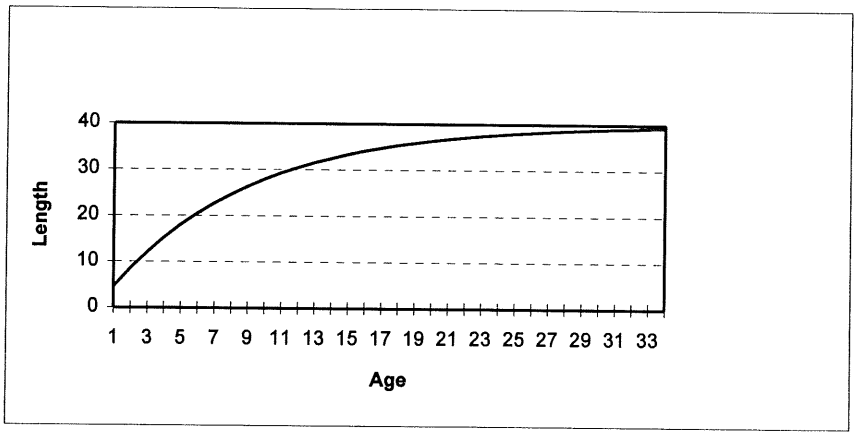
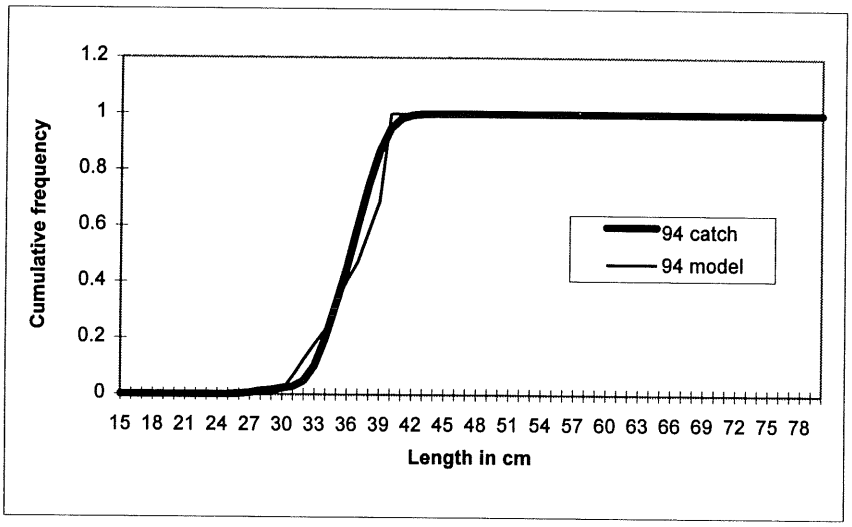


Figure 10.1 Length distribution of oceanic *S. mentella* from 1992 - 1994, based on surveys and landings.





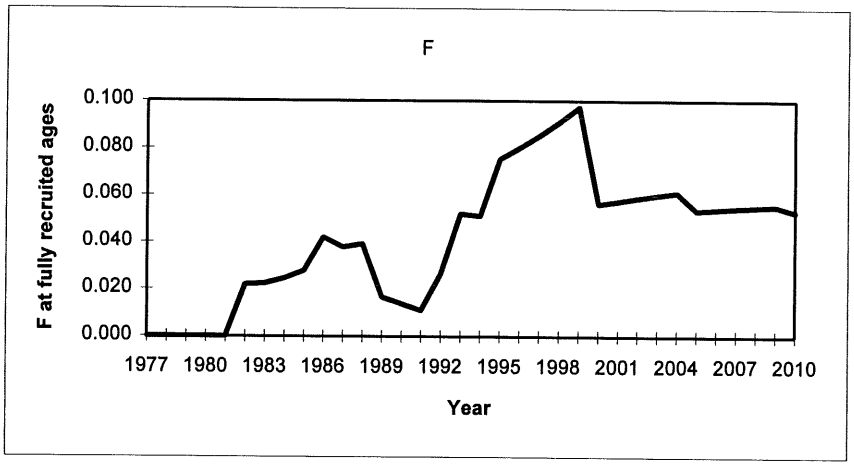


Figure 10.2.1. Oceanic *S.mentella*. Results from the age-structured dynamic production model. The figure shows the growth, fishing pattern and fishing mortalities generated by the model. In this case the fishing mortalities for 1995-2010 relate to a constant catch of 150,000 tonnes in 1995-1999 and a 5 year fixed catch (5% of fishable biomass in the beginning of the 5 year period) for later years.

Figure 10.2.2. 'Oceanic *S.mentella*. Medium term prognisis of stock and catches (Scenario 1).

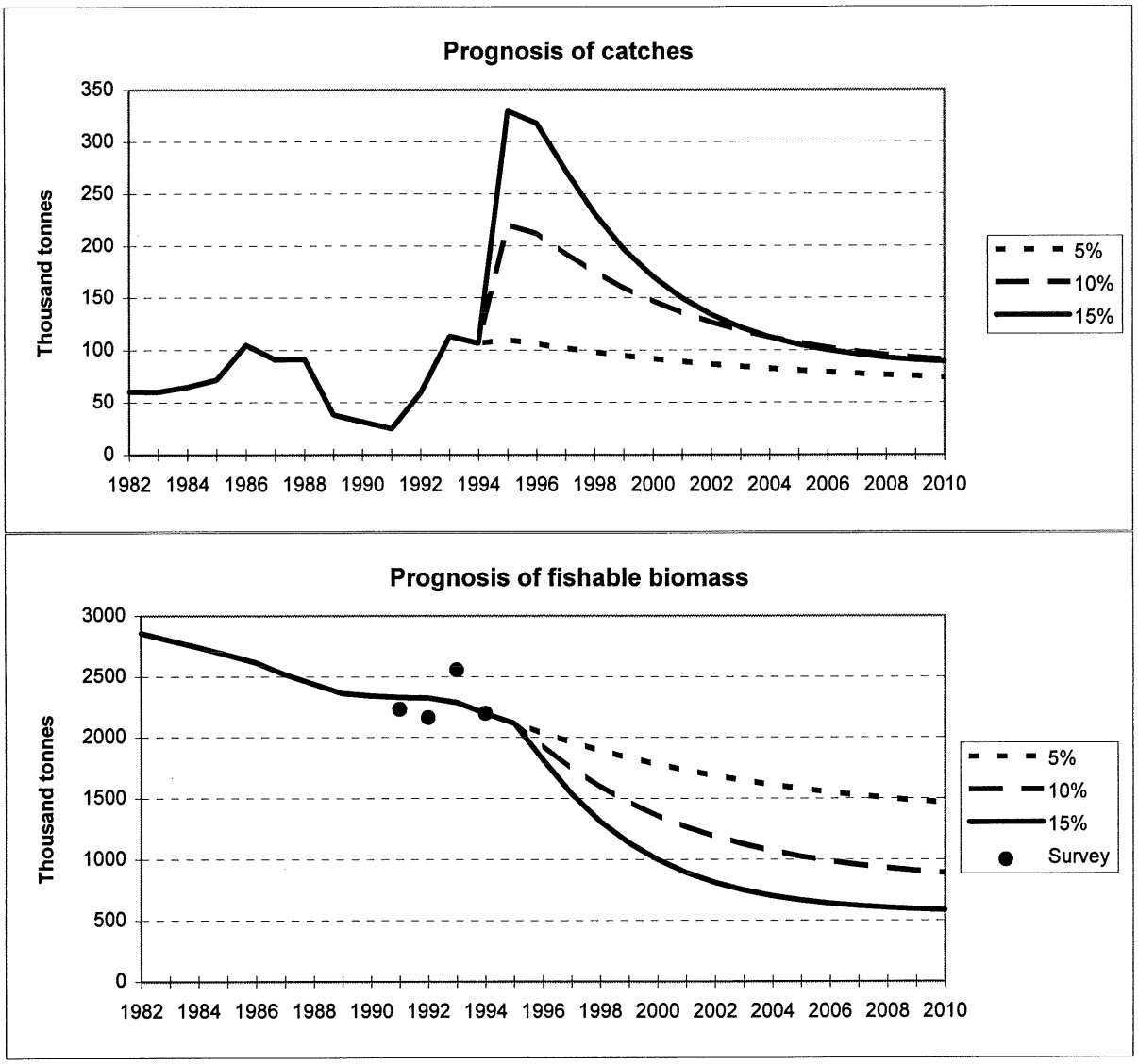


Figure 10.2.3. 'Oceanic *S.mentella*. Medium term prognosis of stock and catches (Scenario 2).

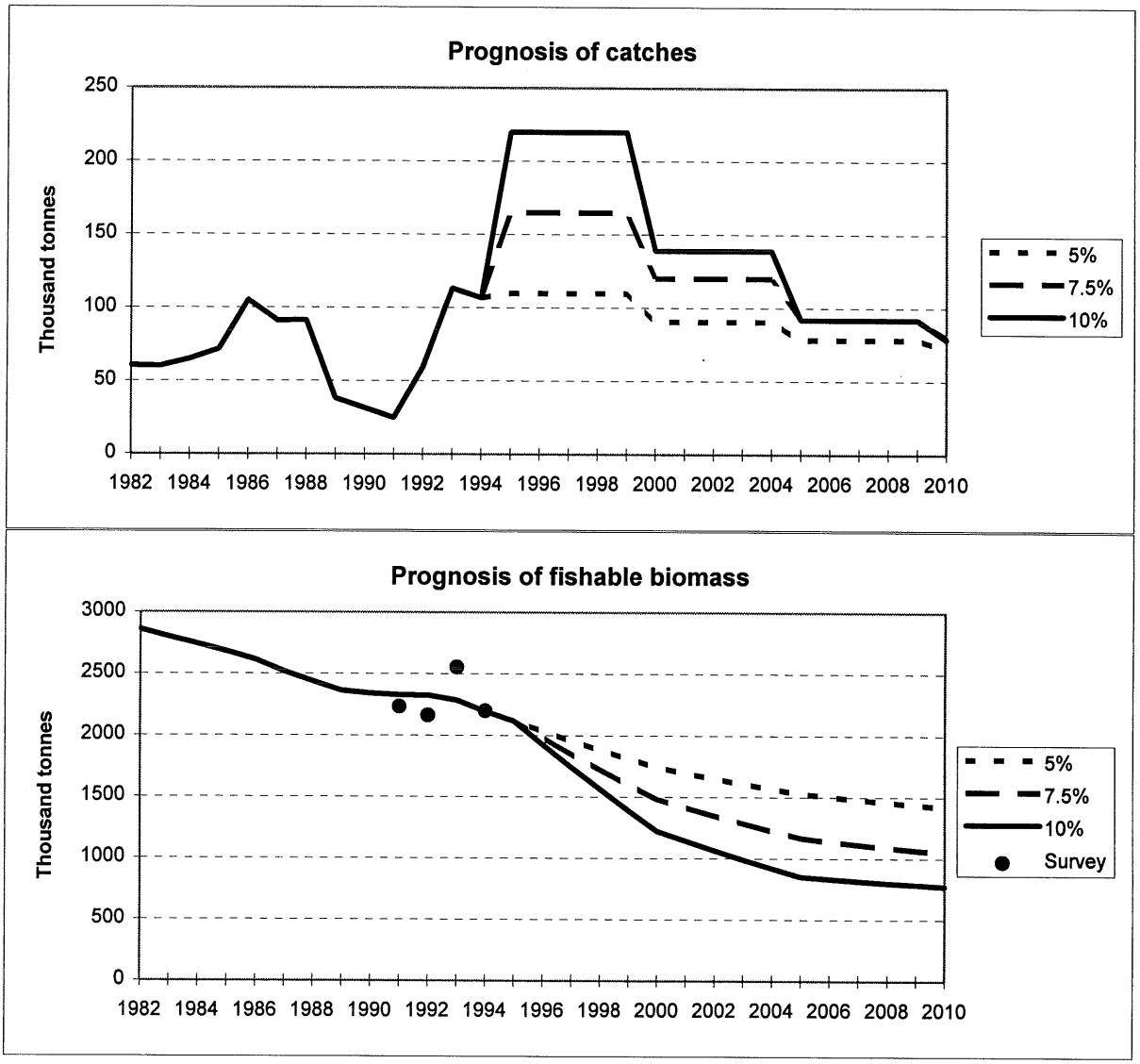


Figure 10.2.4. 'Oceanic S.mentella. Medium term prognosis of stock and catches (Scenario 3).