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International Council for the Exploration of the Sea

Conseil International pour l'Exploration de la Mer

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Table 4.1.1

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 strata for the German groundfish survey off Greenland.

Stratum	geographic boundaries				depth	area
	south	north	east	west	(m)	(nm2)
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 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 by stratum and total, 1982-95.

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
1995	0	0	3	0	10	7	10	5	8	6	6	17	0	12	84

Table 5.1.4 G. morhua. Abundance indices (1000) for West, East Greenland and total by stratum, 1982-95. 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
1995					138	67	58	15	278

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
1995	265	78	2933	3654		257	7187	7463	93

Table 5.1.5 G. morhua. Biomass indices (tons) for West, East Greenland and total by stratum, 1982-95. 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
1995					26	13	11	7	57

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
1995	93	185	1115	13750		382	15525	15581	155

Table 5.1.6 G. morhua, West Greenland. Age disaggregate abundance indices (1000), 1982-1995. *) 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
1995	0	0	241	16	22	0	0	0	0	0	0	0	279

Table 5.1.7 G. morhua, East Greenland. Age disaggregate abundance indices (1000), 1982-1995. *) 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
1995	0	7	2523	1125	370	1730	450	141	460	36	217	125	7184

Table 5.1.8 G. morhua, Greenland (total). Age disaggregate abundance indices (1000), 1982-1995. *) 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	1140	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
1995	0	7	2764	1141	392	1730	450	141	460	36	217	125	7463

Table 5.1.9 G. morhua, West Greenland. Weighted mean weight (g., by stratum abundance) at age 1-10 years, 1982, 1984-1995.

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		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			
1995		186	329	482						

Table 5.1.10 G. morhua, East Greenland. Weighted mean weight (g., by stratum abundance) at age 1-10 years, 1982, 1984-1995. () 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	921	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	
1995	68	250	445	1521	2949	4179	5248	5923	9646	7442

Table 5.1.11 G. morhua, Greenland (total). Weighted mean weight (g., by stratum abundance) at age 1-10 years, 1982, 1984-1995. () 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	118	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	
1995	68	244	443	1463	2949	4179	5248	5923	9646	7442

Table 5.1.12 Nominal catch (tonnes) of Cod in NAFO Sub-area 1, 1982-1995 as officially reported to NAFO.

Country	1982	1983	1984	1985	1986	1987	1988
Faroe Islands	-	1.339	-	-	-	-	-
Germany	8.139	10.158	8.941	2.170	41	55	6.574
Greenland	47.693	44.970	24.457	12.651	6.549	12.284	52.135
Japan	-	-	13	54	11	33	10
Norway	-	-	5	1	2	1	7
UK	-	1174	-	-	-	-	927
Total	55.832	57.641	33.416	14.876	6.603	12.373	59.653

Country	1989	1990	1991	1992 [1]	1993 [2]	1994 [3]	1995 [3]
Faroe Islands	-	51	1	-	-		
Germany	12.892	7.515	96	-	-		
Greenland	92.152	58.816	20.238	5.723	1.924	2.115	1703
Japan	-	-	-	-	-		
Norway	2	948	-	-	-		
UK	3780	1.631	-		-		
Total	108.826	68.961	20.335	5.723	1.924	2.115	1703
WG estimate [4]	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 5.1.13 Nominal catch (tonnes) of cod in ICES Sub-area XIV, 1982-1995 as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988
Faroe Islands	-	368	-	-	86	-	12
Germany	8.940	8.238	7.035	2.006	4.063	5.358	12.049
Greenland	898	438	1.051	106	606	1.550	345
Iceland	-	-	-	-	-	1	9
Norway	-	-	794	-	-	-	-
UK (Engl. and Wales)	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-
Total	9.838	9.044	8.880	2.112	4.755	6.909	12.415
WG estimate [1]	27.000	13.378	8.914				9.457 [2]

Country	1989	1990	1991	1992	1993 [6]	1994 [6]	1995 [6]
Faroe Islands	40	-	-	-	-	1	
Germany	10.613	26.419	8.434	5.893	164		22
Greenland	3.715	4.442	6.677	1.283	241	73	5
Iceland	-	-	-	22	-	-	
Norway	-	17	828	1.030	183	43	2
Russia	-	-	-	126	-		
UK (Engl. and Wales)	1.158	2.365	5.832	2.532	162		
UK (Scotland)	135	93	29	463	46		
Untied Kingdom	-	-	-	-	-	296	232
Total	15.661	33.336	21.800	11.349	796	413	
WG estimate	14.669 [3]	33.513 [4]	21.818 [5]			437 [7]	261

[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 5.1.14 Greenland cod (NAFO 1 and ICES XIVb). Catches (t) as used by the Working Group, inshore and offshore by gear (Horsted, 1994).

Year	inshore	offshore miscellaneus	offshore OBT	offshore	total
1955	19787	117238	136028	253266	273053
1956	21063	121876	193593	315469	336532
1957	24790	104632	151666	256298	281088
1958	26684	121636	182516	304152	330836
1959	28184	97457	128777	226234	254418
1960	28708	115273	122859	238132	266840
1961	35164	140110	192007	332117	367281
1962	36283	168092	273598	441690	477973
1963	24173	138451	289143	427594	451767
1964	23106	118495	243714	362209	385315
1965	25209	133855	225150	359005	384214
1966	29956	149234	200086	349320	379276
1967	28277	132415	293519	425934	454211
1968	21215	64286	323800	388086	409301
1969	22119	36276	174031	210307	232426
1970	16114	16101	102196	118297	134411
1971	14039	25450	113207	138657	152696
1972	14753	29765	94730	124495	139248
1973	9813	16740	46141	62881	72694
1974	8706	18086	27695	45781	54487
1975	6779	13363	33692	47055	53834
1976	5446	8710	32157	40867	46313
1977	14964	10081	21726	31807	46771
1978	20295	4	26059	26063	46358
1979	36785	36	20056	20092	56877
1980	40122	0	57584	57584	97706
1981	40021	0	40266	40266	80287
1982	26934	2020	49827	51847	78781
1983	26689	3339	40991	44330	71019
1984	19967	5	22358	22363	42330
1985	8488	1	8499	8500	16988
1986	5320	2	6036	6038	11358
1987	8445	1	10836	10837	19282
1988	22814	7	49089	49096	71910
1989	38788	2	85946	85948	124736
1990	29513	948	99535	100483	129996
1991	18950	0	22966	22966	41916
1992	5723	0	11381	11381	17104
1993	1924	0	828	828	2752
1994	2115	0	469	469	2584
1995	1703	0	264	264	1967

Table 5.1.15 Greenland cod (offshore component NAFO 1 and ICES XIV). Tuning data derived from the German groundfish survey combined for West and East Greenland. Values in 1992 and 1994 were corrected due to incomplete survey coverage off East Greenland. Correction is calculated as the average decrease of cohorts between the previous and following year based on survey results for East Greenland.

Greenland cod (offshore component)
101 11
German survey
1982 1995
1 1 0.75 0.95
3 8

100	34309	13126	34497	10747	2987	704
100	3420	27627	6147	13094	3169	1294
100	3433	2200	11051	1703	3602	498
100	1015	8454	4651	9037	1154	2589
100	6067	1583	10256	3371	6354	673
100	710355	28120	6956	13580	2089	5568
100	108795	522565	7446	1094	2544	812
100	8112	187865	237701	5858	294	5005
100	3452	1735	27252	24962	312	71
100	823	1957	308	5626	5402	88
100	599	382	577	118	2012	2511
100	2406	390	307	284	88	263
100	407	1833	415	210	374	62
100	1141	392	1730	450	141	460

Table 5.1.16 Greenland cod (offshore component NAFO 1 and ICES XIV). XSA results using the period 1982-92.

VPA Version 3.1 (MSDOS)

4/05/1996 20:04

Extended Survivors Analysis

Greenland cod - (offshore component)

CPUE data from file codgretu.dat

Data for 1 fleets over 38 years
Age range from 3 to 10

Fleet, Alpha, Beta
German survey , .750 , .950

Time series weights :

Tapered time weighting applied
Power = 3 over 20 years

Catchability analysis :

Catchability dependent on stock size for ages < 5

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

Catchability independent of age for ages >= 8

Terminal population estimation :

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

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

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

Prior weighting not applied

Tuning converged after 12 iterations

1

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

Table 5.1.16 (Continued)

Fishing mortalities

Age,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992
3,	.008,	.081,	.000,	.005,	.001,	.007,	.000,	.023,	.378,	.060
4,	.335,	.359,	.004,	.035,	.811,	.161,	.233,	.280,	.661,	.332
5,	.681,	.441,	.044,	.157,	. 109,	. 315,	.592,	1.050,	.414,	.467
6,	. 710,	.666,	.137,	.177,	. 057,	.463,	1.069,	1.503,	.455,	.833
7,	1.637,	.427,	.354,	.185,	. 072,	1.090,	.430,	1.035,	1.219,	.957
8,	.621,	1.211,	.427,	.117,	. 157,	1.299,	1.223,	1.725,	.709,	1.002
9,	1.552,	.437,	.972,	.085,	. 941,	. 709,	1.396,	1.492,	1.162,	1.149
10,	1.059,	.648,	.405,	.142,	. 361,	. 787,	1.025,	1.391,	.792,	.898

1

XSA population numbers

	AGE							
YEAR ,	3,	4,	5,	6,	7,	8,	9,	10,
1983 ,	7.71E+03,	3.89E+04,	6.94E+03,	2.22E+04,	3.94E+03,	1.72E+03,	4.35E+02,	3.97E+02,
1984 ,	1.38E+04,	6.26E+03,	2.28E+04,	2.60E+03,	8.07E+03,	5.68E+02,	6.86E+02,	6.82E+01,
1985 ,	1.99E+03,	1.04E+04,	3.58E+03,	1.09E+04,	9.90E+02,	3.90E+03,	1.25E+02,	3.28E+02,
1986 ,	1.09E+04,	1.63E+03,	8.48E+03,	2.54E+03,	7.02E+03,	5.15E+02,	1.89E+03,	3.51E+01,
1987 ,	2.66E+05,	8.86E+03,	1.29E+03,	5.37E+03,	1.57E+03,	4.32E+03,	3.39E+02,	1.28E+03,
1988 ,	8.51E+04,	2.17E+05,	3.22E+03,	8.56E+02,	3.76E+03,	1.08E+03,	2.74E+03,	9.81E+01,
1989 ,	1.41E+03,	6.92E+04,	1.52E+05,	1.74E+03,	3.99E+02,	9.35E+02,	2.19E+02,	9.98E+02,
1990 ,	1.62E+03,	1.15E+03,	4.49E+04,	6.21E+04,	4.43E+02,	1.92E+02,	2.04E+02,	4.02E+01,
1991 ,	6.35E+02,	1.30E+03,	7.13E+02,	1.16E+04,	1.02E+04,	1.17E+02,	2.54E+01,	3.40E+01,
1992 ,	2.48E+02,	3.56E+02,	5.48E+02,	3.49E+02,	5.47E+03,	2.24E+03,	4.25E+01,	5.88E+00,

Estimated population abundance at 1st Jan 1992

, 0.00E+00, 1.91E+02, 2.09E+02, 2.55E+02, 1.12E+02, 1.56E+03, 6.09E+02, 9.99E+00,

Taper weighted geometric mean of the VPA populations:

, 7.84E+03, 8.81E+03, 7.53E+03, 5.04E+03, 2.90E+03, 1.04E+03, 2.99E+02, 1.02E+02,

Standard error of the weighted Log(VPA populations) :

, 2.1280, 1.9122, 1.7412, 1.4667, 1.2012, 1.2469, 1.4849, 1.6202,

	AGE
YEAR ,	
1983 ,	
1984 ,	
1985 ,	
1986 ,	
1987 ,	
1988 ,	
1989 ,	
1990 ,	
1991 ,	
1992 ,	

Estimated population abundance at 1st Jan 1992

,

Taper weighted geometric mean of the VPA populations:

,

Standard error of the weighted Log(VPA populations) :

Table 5.1.16 (Continued) ,
1

Log catchability residuals.

Fleet : German survey

Age	1982
3	-.37
4	-.17
5	-.38
6	.19
7	-.15
8	-.70

Age	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
3	-1.11	-1.62	-1.13	-.82	1.32	.36	1.55	.47	.14	. 42
4	-.67	-1.18	-.72	-.39	1.20	.20	.45	23	.52	.04
5	-.02	-.83	-.18	-.15	1.30	.63	.47	-.09	-.97	-.03
6	-.35	-.28	-.49	.01	.55	.22	1.69	-.06	-.76	-.80
7	.90	-.71	.18	-.21	.07	26	-.21	.26	.12	-.46
8	-.44	.21	-.73	-.31	-.30	.13	2.03	-.22	-.36	.28

Mean log catchability and standard error
of ages with catchability independent of year class strength

Age	5	6	7	8
Mean Log q	-3.8732	-3.9268	-4.0807	-3.6683
S.E(Log q)	.6574	.7324	.4117	.7845

Regression statistics :

Ages with q dependent on year class strength

Age	Slope	t-value	Intercept	RSquare	No Pts	Reg s.e	Mean Log q
3	1.12	-.740	3.68	.83	11	1.09	-4.22
4	.93	.602	4.25	.90	11	.71	-3.90

Ages with q constant w.r.t. time

Age	Slope	t-value	Intercept	RSquare	No Pts	Reg s.e	Mean Q
5	1.01	-.044	3.85	.89	11	.70	-3.87
6	1.06	-.354	3.65	.80	11	.82	-3.93
7	1.08	-.645	3.76	.88	11	.46	-4.08
8	1.04	-.164	3.54	.69	11	.86	-3.67

1

Terminal year survivor and F summaries :

Age 3 Catchability dependent on age and year class strength
Year class = 1989

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey ,	291.,	1.253,	.000,	.00,	1, .130,	.040
P shrinkage mean ,	8814.,	1.91,,,,			.056,	.001
F shrinkage mean ,	138.,	.50,,,,			.815,	.082

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
191.,	.45,	.74,	3,	1.645,	.060

1
Age 4 Catchability dependent on age and year class strength
Year class = 1988

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey ,	223.,	837,	.042,	.05,	2, .248,	.314
P shrinkage mean ,	7530.,	1.74,,,,			.057,	.011
F shrinkage mean ,	152.,	.50,,,,			.695,	.432

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
209.,	.42,	.52,	4,	1.248,	.332

Age 5 Catchability constant w.r.t. time and dependent on age
Year class = 1987

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey ,	303.,	.687,	.185,	.27,	3, .346,	.406
F shrinkage mean ,	232.,	.50,,,,			.654,	.502

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
255.,	.40,	.15,	4,	.377,	.467

1
Age 6 Catchability constant w.r.t. time and dependent on age
Year class = 1986

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey ,	72.,	731,	.438,	.60,	4, .319,	1.109
F shrinkage mean ,	139.,	.50,,,,			.681,	.721

Table 5.1.16 (Continued)

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
112.,	.41,	.34,	5,	.836,	.833

Age 7 Catchability constant w.r.t. time and dependent on age
Year class = 1985

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey	, 1008.,	.598,	.125,	.21,	5, .411,	1.246
F shrinkage mean	, 2107.,	.50,,,,			.589,	.781

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
1556.,	.38,	.26,	6,	.685,	.957

1
Age 8 Catchability constant w.r.t. time and dependent on age
Year class = 1984

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey	, 746.,	.908,	.056,	.06,	6, .233,	.878
F shrinkage mean	, 573.,	.50,,,,			.767,	1.041

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
609.,	.44,	.10,	7,	.223,	1.002

Age 9 Catchability constant w.r.t. time and age (fixed at the value for age) 8
Year class = 1983

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey	, 11.,	1.290,	.232,	.18,	6, .131,	1.068
F shrinkage mean	, 10.,	.50,,,,			.869,	1.161

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
10.,	.47,	.09,	7,	.200,	1.149

Table 5.1.16 (continued)

1

Age 10 Catchability constant w.r.t. time and age (fixed at the value for age) 8
Year class = 1982

Fleet,	Estimated,	Int,	Ext,	Var,	N, Scaled,	Estimated
,	Survivors,	s.e,	s.e,	Ratio,	, Weights,	F
German survey	, 2.,	2.490,	.228,	.09,	6, .039,	.932
F shrinkage mean	, 2.,	.50,,,,			.961,	.896

Weighted prediction :

Survivors,	Int,	Ext,	N,	Var,	F
at end of year,	s.e,	s.e,	,	Ratio,	
2.,	.49,	.05,	7,	.097,	.898

Table. 5.1.17 Greenland cod (offshore component NAFO 1 and ICES XIV). VPA input and results based on terminal Fs determined by XSA tuning 1982-92.

Run title : Greenland cod - (offshore component)
At 6/05/1996 14:24

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

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	19,	40,	240,	24,	200,	97,	112,	93,
4,	99,	990,	5879,	32,	1171,	1516,	12520,	5649,
5,	6693,	4812,	6080,	10569,	5719,	6197,	29005,	39319,
6,	7757,	38936,	7234,	9994,	40047,	5902,	10494,	59301,
7,	6607,	18199,	28505,	12206,	7802,	21992,	7151,	12263,
8,	41166,	7701,	18796,	27719,	5203,	6361,	22933,	5837,
9,	2885,	29328,	6124,	5012,	9462,	3668,	3809,	14184,
10,	9469,	1590,	9886,	4096,	2224,	6655,	2386,	1973,
+gp,	6377,	9942,	7618,	22565,	6693,	8896,	10988,	7154,
TOTALNUM,	81072,	111538,	90362,	92217,	78521,	61284,	99398,	145773,
TONSLAND,	253266,	315469,	256298,	304152,	226234,	238132,	332117,	441690,
SOPCOF %,	99,	97,	96,	101,	99,	100,	99,	91,

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

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	91,	4414,	1710,	1153,	133,	11,	86,	4,	145,	22,
4,	736,	11457,	25193,	4464,	5248,	1198,	869,	1338,	342,	473,
5,	17044,	7046,	50372,	67423,	21121,	30098,	4222,	3582,	3004,	853,
6,	55595,	24502,	10695,	32868,	82629,	35332,	22586,	4827,	2859,	6120,
7,	37526,	32332,	17227,	6202,	32219,	50257,	18524,	15191,	10770,	3102,
8,	4715,	17396,	19530,	9100,	3262,	13043,	24581,	6375,	19490,	5972,
9,	1963,	2832,	7493,	7008,	2324,	1963,	3401,	4874,	4343,	10645,
10,	5854,	983,	1124,	1552,	4004,	1310,	416,	1512,	2691,	2970,
+gp,	4798,	6442,	4160,	1711,	1511,	3660,	1264,	725,	917,	2725,
TOTALNUM,	128322,	107404,	137504,	131481,	152451,	136872,	75949,	38428,	44561,	32882,
TONSLAND,	427594,	362209,	359005,	349320,	425934,	388086,	210307,	118297,	138657,	124495,
SOPCOF %,	95,	98,	93,	97,	97,	98,	93,	101,	92,	97,

Table 5.1.17 (Continued)

	Table 1	Catch numbers at age	Numbers*10**-3							
	YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
	AGE										
	3,	85,	12,	2116,	19500,	0,	140,	4,	2345,	157,	8124,
	4,	324,	88,	1393,	4065,	18962,	3464,	34,	2842,	7189,	2759,
	5,	27558,	193,	2941,	568,	2842,	9319,	421,	1689,	1974,	8181,
	6,	3066,	4796,	707,	743,	463,	1104,	4589,	685,	1040,	3769,
	7,	1904,	2536,	5989,	321,	460,	144,	1160,	14458,	548,	2596,
	8,	278,	2033,	837,	1718,	118,	56,	160,	757,	5570,	1343,
	9,	1128,	2032,	248,	137,	211,	24,	48,	97,	148,	1482,
	10,	1046,	1670,	55,	106,	91,	32,	4,	9,	24,	117,
	+gp,	455,	2394,	388,	110,	58,	31,	9,	11,	26,	45,
0	TOTALNUM,	35844,	15754,	14674,	27268,	23205,	14314,	6429,	22893,	16676,	28416,
	TONSLAND,	62881,	45781,	47055,	40867,	31807,	26063,	20092,	57584,	40266,	51847,
	SOPCOF %,	81,	84,	103,	92,	82,	92,	99,	98,	93,	100,

Table	1	Catch numbers at age	Numbers*10**-3							
	YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
	AGE										
	3,	57,	970,	0,	52,	166,	516,	0,	33,	181,	13,
	4,	10038,	1707,	41,	50,	4453,	29226,	13037,	255,	568,	91,
	5,	2950,	7001,	134,	1058,	115,	750,	58253,	25106,	208,	176,
	6,	9700,	1088,	1198,	354,	258,	273,	985,	41583,	3665,	170,
	7,	2731,	2412,	254,	1020,	94,	2146,	120,	246,	6206,	2900,
	8,	686,	343,	1166,	49,	539,	679,	568,	136,	51,	1220,
	9,	295,	209,	67,	133,	178,	1196,	142,	136,	15,	25,
	10,	223,	28,	94,	4,	335,	46,	551,	26,	16,	3,
	+gp,	48,	44,	66,	5,	45,	392,	95,	129,	10,	1,
0	TOTALNUM,	26728,	13802,	3020,	2725,	6183,	35224,	73751,	67650,	10920,	4599,
	TONSLAND,	44330,	22363,	8500,	6038,	10837,	49096,	85948,	100483,	22966,	11381,
	SOPCOF %,	92,	81,	99,	99,	89,	98,	75,	95,	91,	88,

Table 5.1.17 (Continued)

Table 2 Catch weights at age (kg)

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.4680,	1.0070,	.4070,	.4720,	1.0840,	.8720,	.9960,	.9730,
4,	1.1420,	1.2690,	1.0190,	.9300,	1.4740,	1.6440,	1.5270,	1.5060,
5,	1.5500,	1.4800,	1.5660,	1.6360,	1.9300,	2.2700,	2.1570,	2.3100,
6,	2.3060,	2.1340,	2.1030,	2.1990,	2.3890,	2.8910,	2.9140,	2.9540,
7,	2.5780,	2.8280,	2.7350,	2.8300,	2.8320,	3.6120,	3.5440,	3.8150,
8,	2.9870,	3.1250,	3.2730,	3.3550,	3.4400,	4.1680,	4.3270,	4.3970,
9,	3.4360,	3.5530,	3.6240,	3.9270,	4.1200,	4.8550,	4.7580,	5.4950,
10,	4.4980,	4.3300,	3.5950,	4.7240,	4.3970,	5.2520,	5.6310,	6.1540,
+gp,	5.3910,	4.7090,	5.0995,	4.2855,	4.6018,	5.2184,	6.0726,	6.8729,
SOPCOFAC,	.9922,	.9708,	.9603,	1.0052,	.9913,	.9970,	.9907,	.9083,

Table 2 Catch weights at age (kg)

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	1.3590,	.9850,	.6620,	.8060,	1.1120,	.6250,	.6470,	.6390,	.7400,	.6660,
4,	1.6530,	1.5210,	1.4150,	1.3630,	1.4150,	1.2290,	1.1470,	.9570,	1.2230,	1.0260,
5,	2.1820,	2.2220,	2.0110,	2.0150,	1.9160,	1.7200,	1.3190,	1.8970,	1.9260,	1.8410,
6,	3.0380,	2.9000,	2.8710,	2.9490,	2.6530,	2.2530,	1.9200,	1.9730,	2.9630,	2.7500,
7,	3.8160,	3.6510,	3.6980,	3.5320,	3.5090,	3.3250,	2.5980,	2.7990,	2.8010,	3.8270,
8,	4.8130,	4.5950,	4.1520,	4.4790,	4.6390,	4.2500,	4.0290,	3.5070,	3.5180,	3.4360,
9,	5.3720,	5.0370,	5.1820,	5.1250,	5.2630,	4.8760,	5.1260,	4.5260,	4.0500,	4.2320,
10,	5.9110,	5.6480,	5.6070,	6.4100,	5.4550,	5.3600,	6.0880,	5.5740,	5.1310,	4.8850,
+gp,	6.6232,	6.5080,	6.3730,	7.3270,	6.9030,	6.4054,	6.9144,	5.8814,	6.3401,	6.3675,
0 SOPCOFAC,	.9497,	.9837,	.9319,	.9680,	.9681,	.9814,	.9312,	1.0091,	.9199,	.9711,

Table 5.1.17 (Continued)

Table 2 Catch weights at age (kg)

	YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
	AGE										
	3,	.7150,	.5180,	.7980,	1.0050,	.8920,	.7760,	1.2700,	.3170,	.4460,	.4140,
	4,	1.3290,	1.5370,	1.3700,	1.4030,	1.3630,	1.3160,	1.5470,	.8530,	1.0650,	.9840,
	5,	1.7650,	1.9620,	2.2680,	2.9260,	2.3600,	1.9300,	2.0790,	1.4700,	1.6070,	1.4940,
	6,	2.5330,	2.9600,	3.3140,	4.2360,	3.3320,	3.4290,	2.9210,	2.1130,	2.3540,	2.3880,
	7,	3.4090,	3.4020,	4.0840,	5.1430,	3.8260,	5.2810,	3.9840,	3.2640,	3.3250,	3.2200,
	8,	4.4220,	4.0750,	4.9500,	6.0900,	4.7170,	6.0460,	5.4190,	4.6050,	4.7650,	4.4190,
	9,	4.4480,	3.7110,	5.5550,	4.9420,	5.9520,	7.0280,	5.4240,	5.8180,	7.3320,	6.3160,
	10,	4.7550,	3.9940,	6.9190,	7.8500,	7.7440,	8.2050,	8.3430,	8.3630,	8.0850,	6.4170,
	+gp,	5.6116,	3.6851,	6.6754,	6.9450,	8.2082,	10.0792,	8.4443,	8.7152,	9.1558,	8.2542,
0	SOPCOFAC,	.8149,	.8375,	1.0328,	.9184,	.9820,	.9216,	.9949,	.9842,	.9315,	.9956,

Table 2 Catch weights at age (kg)

	YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
	AGE										
	3,	1.3530,	.7190,	.5960,	.9990,	.7210,	.6270,	.6160,	.6350,	1.7020,	1.3450,
	4,	.6970,	1.1750,	1.0320,	1.2970,	1.3060,	1.1190,	1.0410,	.6900,	1.4870,	1.6290,
	5,	1.4510,	1.6140,	1.6360,	1.7100,	1.9590,	1.8970,	1.5990,	1.1750,	1.8840,	2.0520,
	6,	2.3360,	2.3680,	2.0030,	2.1190,	2.4820,	1.6390,	1.9700,	1.7510,	1.9420,	2.5170,
	7,	2.9020,	2.9990,	2.8470,	2.6040,	3.0300,	2.3320,	3.3160,	2.8620,	2.5800,	2.4750,
	8,	4.2080,	4.2500,	3.4760,	3.7350,	3.6300,	3.1590,	3.7140,	3.8570,	4.1030,	3.8400,
	9,	5.5960,	7.6610,	4.5650,	4.0450,	4.8600,	4.3870,	4.3940,	4.5710,	5.5670,	4.0070,
	10,	5.9080,	5.7910,	4.8630,	4.7970,	5.7570,	6.3200,	3.7530,	5.0970,	6.4000,	7.7430,
	+gp,	11.1752,	9.3197,	5.8696,	6.1770,	6.7847,	5.8661,	4.8749,	6.1930,	8.9920,	10.3760,
0	SOPCOFAC,	.9172,	.8149,	.9898,	.9893,	.8926,	.9842,	.7518,	.9543,	.9129,	.8788,

Table 5.1.17 (Continued)

Table 3 Stock weights at age (kg)

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.4680,	1.0070,	.4070,	.4720,	1.0840,	.8720,	.9960,	.9730,
4,	1.1420,	1.2690,	1.0190,	.9300,	1.4740,	1.6440,	1.5270,	1.5060,
5,	1.5500,	1.4800,	1.5660,	1.6360,	1.9300,	2.2700,	2.1570,	2.3100,
6,	2.3060,	2.1340,	2.1030,	2.1990,	2.3890,	2.8910,	2.9140,	2.9540,
7,	2.5780,	2.8280,	2.7350,	2.8300,	2.8320,	3.6120,	3.5440,	3.8150,
8,	2.9870,	3.1250,	3.2730,	3.3550,	3.4400,	4.1680,	4.3270,	4.3970,
9,	3.4360,	3.5530,	3.6240,	3.9270,	4.1200,	4.8550,	4.7580,	5.4950,
10,	4.4980,	4.3300,	3.5950,	4.7240,	4.3970,	5.2520,	5.6310,	6.1540,
+gp,	5.3910,	4.7090,	5.0995,	4.2855,	4.6018,	5.2184,	6.0726,	6.8729,

Table 3 Stock weights at age (kg)

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	1.3590,	.9850,	.6620,	.8060,	1.1120,	.6250,	.6470,	.6390,	.7400,	.6660,
4,	1.6530,	1.5210,	1.4150,	1.3630,	1.4150,	1.2290,	1.1470,	.9570,	1.2230,	1.0260,
5,	2.1820,	2.2220,	2.0110,	2.0150,	1.9160,	1.7200,	1.3190,	1.8970,	1.9260,	1.8410,
6,	3.0380,	2.9000,	2.8710,	2.9490,	2.6530,	2.2530,	1.9200,	1.9730,	2.9630,	2.7500,
7,	3.8160,	3.6510,	3.6980,	3.5320,	3.5090,	3.3250,	2.5980,	2.7990,	2.8010,	3.8270,
8,	4.8130,	4.5950,	4.1520,	4.4790,	4.6390,	4.2500,	4.0290,	3.5070,	3.5180,	3.4360,
9,	5.3720,	5.0370,	5.1820,	5.1250,	5.2630,	4.8760,	5.1260,	4.5260,	4.0500,	4.2320,
10,	5.9110,	5.6480,	5.6070,	6.4100,	5.4550,	5.3600,	6.0880,	5.5740,	5.1310,	4.8850,
+gp,	6.6232,	6.5080,	6.3730,	7.3270,	6.9030,	6.4054,	6.9144,	5.8814,	6.3401,	6.3675,

Table 5.1.17 (Continued)

Table 3 Stock weights at age (kg)

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	.7150,	.5180,	.7980,	1.0050,	.8920,	.7760,	1.2700,	.3170,	.4460,	.4140,
4,	1.3290,	1.5370,	1.3700,	1.4030,	1.3630,	1.3160,	1.5470,	.8530,	1.0650,	.9840,
5,	1.7650,	1.9620,	2.2680,	2.9260,	2.3600,	1.9300,	2.0790,	1.4700,	1.6070,	1.4940,
6,	2.5330,	2.9600,	3.3140,	4.2360,	3.3320,	3.4290,	2.9210,	2.1130,	2.3540,	2.3880,
7,	3.4090,	3.4020,	4.0840,	5.1430,	3.8260,	5.2810,	3.9840,	3.2640,	3.3250,	3.2200,
8,	4.4220,	4.0750,	4.9500,	6.0900,	4.7170,	6.0460,	5.4190,	4.6050,	4.7650,	4.4190,
9,	4.4480,	3.7110,	5.5550,	4.9420,	5.9520,	7.0280,	5.4240,	5.8180,	7.3320,	6.3160,
10,	4.7550,	3.9940,	6.9190,	7.8500,	7.7440,	8.2050,	8.3430,	8.3630,	8.0850,	6.4170,
+gp,	5.6116,	3.6851,	6.6754,	6.9450,	8.2082,	10.0792,	8.4443,	8.7152,	9.1558,	8.2542,

Table 3 Stock weights at age (kg)

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
AGE										
3,	1.3530,	.7190,	.5960,	.9990,	.7210,	.6270,	.6160,	.6350,	1.7020,	1.3450,
4,	.6970,	1.1750,	1.0320,	1.2970,	1.3060,	1.1190,	1.0410,	.6900,	1.4870,	1.6290,
5,	1.4510,	1.6140,	1.6360,	1.7100,	1.9590,	1.8970,	1.5990,	1.1750,	1.8840,	2.0520,
6,	2.3360,	2.3680,	2.0030,	2.1190,	2.4820,	1.6390,	1.9700,	1.7510,	1.9420,	2.5170,
7,	2.9020,	2.9990,	2.8470,	2.6040,	3.0300,	2.3320,	3.3160,	2.8620,	2.5800,	2.4750,
8,	4.2080,	4.2500,	3.4760,	3.7350,	3.6300,	3.1590,	3.7140,	3.8570,	4.1030,	3.8400,
9,	5.5960,	7.6610,	4.5650,	4.0450,	4.8600,	4.3870,	4.3940,	4.5710,	5.5670,	4.0070,
10,	5.9080,	5.7910,	4.8630,	4.7970,	5.7570,	6.3200,	3.7530,	5.0970,	6.4000,	7.7430,
+gp,	11.1752,	9.3197,	5.8696,	6.1770,	6.7847,	5.8661,	4.8749,	6.1930,	8.9920,	10.3760,

Table 5.1.17 (Continued)

Table 4 Natural Mortality (M) at age

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
4,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
5,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
6,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
7,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
8,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
9,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
10,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
+gp,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,

Table 4 Natural Mortality (M) at age

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
4,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
5,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
6,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
7,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
8,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
9,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
10,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
+gp,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,

Table 5.1.17 (Continued)

Table 4 Natural Mortality (M) at age

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
4,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
5,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
6,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
7,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
8,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
9,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
10,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
+gp,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,

Table 4 Natural Mortality (M) at age

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
AGE										
3,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
4,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,	.2000,
5,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
6,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
7,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
8,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
9,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
10,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,
+gp,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,	.3000,

Table 5.1.17 (Continued)

Table 5 Proportion mature at age

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,
4,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,
5,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,
6,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,
7,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,
8,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,
9,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
10,	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,

Table 5 Proportion mature at age

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,
4,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,
5,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,
6,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,
7,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,
8,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,
9,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,
10,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 5.1.17 (Continued)

Table 5 Proportion mature at age

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,	.0100,
4,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0400,	.0300,
5,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1500,	.1600,	.1600,
6,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4600,	.4200,
7,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7900,	.7600,	.7400,
8,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9400,	.9200,	.9100,
9,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9900,	.9800,	.9800,
10,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 5 Proportion mature at age

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
AGE										
3,	.0100,	.0100,	.0100,	.0000,	.0000,	.0400,	.0400,	.0100,	.0100,	.0100,
4,	.0300,	.0300,	.0300,	.0300,	.0000,	.1000,	.1200,	.0300,	.0300,	.0300,
5,	.1300,	.1500,	.1400,	.2200,	.1200,	.2700,	.2600,	.1000,	.1000,	.1000,
6,	.4500,	.3900,	.4700,	.6200,	.6100,	.5400,	.5800,	.2900,	.2900,	.2900,
7,	.7500,	.7700,	.7500,	.9000,	.6600,	.8200,	.8400,	.8500,	.8500,	.8500,
8,	.9400,	.9100,	.9500,	.9400,	.9200,	.9300,	.9700,	1.0000,	1.0000,	1.0000,
9,	.9900,	.9900,	.9900,	1.0000,	.9800,	.9800,	.9800,	1.0000,	1.0000,	1.0000,
10,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	.9900,	.9900,	1.0000,	1.0000,	1.0000,
+gp,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,	1.0000,

Table 5.1.17 (Continued)

Table 6 Proportion of M before Spawning

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
9,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
10,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 6 Proportion of M before Spawning

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.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,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 5.1.17 (Continued)

Table 6 Proportion of M before Spawning

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.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,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 6 Proportion of M before Spawning

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
AGE										
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.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,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 5.1.17 (Continued)

Table 7 Proportion of F before Spawning

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
9,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
10,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 7 Proportion of F before Spawning

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.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,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 5.1.17 (Continued)

Table 7 Proportion of F before Spawning

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.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,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

Table 7 Proportion of F before Spawning

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,
AGE										
3,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
4,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
5,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
6,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
7,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,
8,	.0000,	.0000,	.0000,	.0000,	.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,
+gp,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,	.0000,

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1

Table 5.1.17 (Continued)

Table 8 Fishing mortality (F) at age

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	.0001,	.0001,	.0025,	.0002,	.0005,	.0002,	.0005,	.0011,
4,	.0007,	.0087,	.0156,	.0004,	.0118,	.0044,	.0323,	.0342,
5,	.0183,	.0471,	.0716,	.0370,	.0996,	.0843,	.1154,	.1420,
6,	.0658,	.1562,	.1031,	.1801,	.2143,	.1576,	.2243,	.4117,
7,	.0856,	.2425,	.1829,	.2840,	.2331,	.1950,	.3275,	.5053,
8,	.2655,	.1515,	.4823,	.3057,	.2095,	.3409,	.3611,	.5567,
9,	.2092,	.3458,	.1931,	.2524,	.1800,	.2507,	.3979,	.4512,
10,	.1297,	.1901,	.2083,	.2136,	.1887,	.2074,	.2880,	.4182,
+gp,	.1297,	.1901,	.2083,	.2136,	.1887,	.2074,	.2880,	.4182,
FBAR 5- 8,	.1088,	.1493,	.2100,	.2017,	.1891,	.1944,	.2571,	.4039,

Table 8 Fishing mortality (F) at age

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	.0002,	.0070,	.0066,	.0039,	.0014,	.0003,	.0024,	.0002,	.0018,	.0058,
4,	.0107,	.0385,	.0499,	.0214,	.0218,	.0155,	.0318,	.0474,	.0205,	.0073,
5,	.1448,	.1416,	.2505,	.1934,	.1408,	.1770,	.0731,	.1875,	.1509,	.0687,
6,	.3443,	.3601,	.3736,	.2887,	.4355,	.4176,	.2183,	.1245,	.2513,	.5941,
7,	.5712,	.3896,	.5300,	.4379,	.5849,	.5942,	.4569,	.2504,	.5095,	.5421,
8,	.4174,	.6578,	.4918,	.6898,	.4945,	.5697,	.7675,	.3135,	.6788,	.6880,
9,	.4127,	.5448,	.7789,	.3677,	.4192,	.7331,	.3150,	.3696,	.4133,	1.2596,
10,	.3822,	.4237,	.4911,	.4000,	.4198,	.5046,	.3701,	.2513,	.4053,	.6396,
+gp,	.3822,	.4237,	.4911,	.4000,	.4198,	.5046,	.3701,	.2513,	.4053,	.6396,
0 FBAR 5- 8,	.3694,	.3873,	.4115,	.4025,	.4139,	.4396,	.3790,	.2190,	.3976,	.4732,

Table 5.1.17 (Continued)

Table 8 Fishing mortality (F) at age

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	.0103,	.0021,	.0999,	.1501,	.0000,	.0077,	.0002,	.0371,	.0123,	.1729,
4,	.1108,	.0132,	.3626,	.2829,	.2136,	.3304,	.0023,	.1546,	.1527,	.3074,
5,	.7938,	.0939,	.8402,	.2599,	.3475,	.1629,	.0630,	.1593,	.1615,	.2759,
6,	.4228,	.3350,	.6674,	.5961,	.3953,	.2458,	.1251,	.1542,	.1549,	.6008,
7,	.4167,	.8857,	1.1112,	.8716,	1.1430,	.2276,	.5029,	.8361,	.1986,	.8316,
8,	.0911,	1.3665,	1.0071,	1.5565,	1.1714,	.4324,	.4834,	.8572,	1.1391,	1.2970,
9,	.2908,	2.8280,	.6560,	.4844,	.9686,	.9449,	.9833,	.7107,	.4432,	1.4390,
10,	.4076,	1.1223,	.8707,	.7655,	.8182,	.4073,	.4366,	.5507,	.4243,	.9040,
+gp,	.4076,	1.1223,	.8707,	.7655,	.8182,	.4073,	.4366,	.5507,	.4243,	.9040,
0 FBAR 5- 8,	.4311,	.6703,	.9065,	.8210,	.7643,	.2672,	.2936,	.5017,	.4135,	.7513,

Table 8 Fishing mortality (F) at age

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	FBAR 90-92
AGE											
3,	.0082,	.0810,	.0000,	.0053,	.0007,	.0067,	.0000,	.0228,	.3784,	.0597,	.1536,
4,	.3353,	.3588,	.0044,	.0345,	.8108,	.1608,	.2334,	.2803,	.6615,	.3320,	.4246,
5,	.6813,	.4412,	.0445,	.1567,	.1095,	.3151,	.5917,	1.0495,	.4137,	.4669,	.6434,
6,	.7103,	.6657,	.1371,	.1770,	.0574,	.4631,	1.0690,	1.5035,	.4554,	.8333,	.9307,
7,	1.6374,	.4266,	.3540,	.1850,	.0719,	1.0903,	.4300,	1.0349,	1.2192,	.9572,	1.0704,
8,	.6211,	1.2112,	.4265,	.1172,	.1566,	1.2989,	1.2231,	1.7253,	.7091,	1.0017,	1.1454,
9,	1.5524,	.4371,	.9719,	.0854,	.9409,	.7087,	1.3960,	1.4916,	1.1615,	1.1487,	1.2673,
10,	1.0594,	.6481,	.4047,	.1420,	.3614,	.7875,	1.0254,	1.3910,	.7918,	.8978,	1.0269,
+gp,	1.0594,	.6481,	.4047,	.1420,	.3614,	.7875,	1.0254,	1.3910,	.7918,	.8978,	
0 FBAR 5- 8,	.9125,	.6862,	.2405,	.1590,	.0989,	.7919,	.8285,	1.3283,	.6994,	.8148,	

Table 5.1.17 (Continued)

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

YEAR,	1955,	1956,	1957,	1958,	1959,	1960,	1961,	1962,
AGE								
3,	153802,	511983,	104904,	134529,	463649,	531662,	226870,	93567,
4,	148447,	125905,	419140,	85671,	110121,	379423,	435200,	185644,
5,	429936,	121449,	102186,	337843,	70113,	89100,	309273,	344983,
6,	141548,	312744,	85830,	70468,	241184,	47018,	60673,	204151,
7,	93586,	98184,	198174,	57358,	43602,	144205,	29752,	35915,
8,	205147,	63643,	57073,	122276,	31986,	25586,	87901,	15886,
9,	17755,	116545,	40520,	26103,	66727,	19217,	13480,	45380,
10,	90440,	10670,	61096,	24747,	15023,	41288,	11080,	6708,
+gp,	60484,	66157,	46661,	135101,	44832,	54702,	50470,	23980,
TOTAL,	1341145,	1427281,	1115583,	994096,	1087237,	1332201,	1224698,	956213,

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

YEAR,	1963,	1964,	1965,	1966,	1967,	1968,	1969,	1970,	1971,	1972,
AGE										
3,	409559,	703359,	286689,	329962,	105573,	37493,	39073,	22749,	87980,	4193,
4,	76522,	335236,	571867,	233174,	269107,	86316,	30687,	31912,	18621,	71901,
5,	146881,	61985,	264102,	445410,	186868,	215578,	69585,	24338,	24917,	14936,
6,	221728,	94142,	39855,	152296,	271936,	120256,	133798,	47916,	14947,	15873,
7,	100198,	116409,	48653,	20320,	84534,	130336,	58677,	79680,	31343,	8612,
8,	16052,	41929,	58409,	21216,	9715,	34893,	53299,	27525,	45954,	13949,
9,	6745,	7833,	16089,	26461,	7885,	4390,	14623,	18327,	14904,	17268,
10,	21410,	3307,	3366,	5470,	13571,	3841,	1562,	7906,	9382,	7303,
+gp,	17317,	21365,	12260,	5948,	5049,	10558,	4686,	3753,	3153,	6571,
0 TOTAL,	1016411,	1385566,	1301290,	1240257,	954238,	643659,	405991,	264107,	251202,	160608,

Table 5.1.17 (Continued)

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

YEAR,	1973,	1974,	1975,	1976,	1977,	1978,	1979,	1980,	1981,	1982,
AGE										
3,	9181,	6196,	24604,	154622,	16618,	20081,	26788,	71104,	14247,	56541,
4,	3413,	7440,	5062,	18230,	108950,	13606,	16314,	21928,	56093,	11523,
5,	58440,	2501,	6012,	2884,	11247,	72043,	8005,	13326,	15382,	39420,
6,	10331,	19574,	1687,	1922,	1647,	5886,	45350,	5568,	8419,	9696,
7,	6492,	5014,	10373,	641,	785,	822,	3410,	29646,	3535,	5341,
8,	3710,	3170,	1532,	2529,	199,	185,	485,	1528,	9518,	2147,
9,	5194,	2509,	599,	415,	395,	46,	89,	222,	480,	2257,
10,	3630,	2877,	110,	230,	189,	111,	13,	25,	81,	228,
+gp,	1557,	3998,	756,	234,	118,	106,	29,	30,	86,	86,
0 TOTAL,	101948,	53280,	50734,	181707,	140147,	112886,	100483,	143376,	107841,	127240,

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

YEAR,	1983,	1984,	1985,	1986,	1987,	1988,	1989,	1990,	1991,	1992,	1993,	GMST 55-90	AMST 55-90
AGE													
3,	7705,	13774,	1990,	10878,	265710,	85126,	1408,	1621,	635,	248,	0,	47716,	139883,
4,	38941,	6257,	10399,	1629,	859,	217395,	69228,	1153,	1297,	356,	191,	43764,	117537,
5,	6938,	22799,	3578,	8477,	1289,	3224,	151543,	44883,	713,	548,	209,	37751,	103652
6,	22162,	2600,	10864,	2535,	5369,	856,	1743,	62127,	11641,	349,	255,	23547,	69297
7,	3939,	8069,	990,	7017,	1574,	3756,	399,	443,	10234,	5469,	112,	12784,	40883
8,	1723,	568,	3902,	515,	4321,	1085,	935,	192,	17,	2240,	1556,	6842,	26963
9,	435,	686,	125,	1887,	339,	2737,	219,	204,	25,	43,	609,	3068,	13864
10,	397,	68,	328,	35,	1283,	98,	998,	40,	34,	6,	10,	1404,	9692
+gp,	83,	105,	227,	44,	170,	817,	167,	192,	21,	2,	2,		
0 TOTAL,	82321,	54926,	32404,	33017,	288914,	315092,	226641,	110856,	24717,	9261,	2945,		

Table 5.1.17 (Continued)

Run title : Greenland cod - (offshore component)

At 6/05/1996 14:24
Table 16 Summary (without SOP correction)

0,	RECRUITS,	TOTALBIO,	TOTSPBIO,	LANDINGS,	YIELD/SSB,	FBAR 5- 8,
0						
1955,	153802,	2882233,	1817484,	253266,	.1393,	.1088,
1956,	511983,	2770848,	1519495,	315469,	.2076,	.1493,
1957,	104904,	2143557,	1331280,	256298,	.1925,	.2100,
1958,	134529,	2221787,	1469227,	304152,	.2070,	.2017,
1959,	463649,	2157214,	1042375,	226234,	.2170,	.1891,
1960,	531662,	2648678,	1228850,	238132,	.1938,	.1944,
1961,	226870,	2653216,	1083431,	332117,	.3065,	.2571,
1962,	93567,	2432916,	1035904,	441690,	.4264,	.4039,
1963,	409559,	2414276,	1020359,	427594,	.4191,	.3694,
1964,	703359,	2428299,	887216,	362209,	.4083,	.3873,
1965,	286689,	2247323,	716209,	359005,	.5013,	.4115,
1966,	329962,	2311440,	715515,	349320,	.4882,	.4025,
1967,	105573,	2069749,	828645,	425934,	.5140,	.4139,
1968,	37493,	1462524,	775887,	388086,	.5002,	.4396,
1969,	39073,	893209,	572007,	210307,	.3677,	.3790,
1970,	22749,	654431,	466971,	118297,	.2533,	.2190,
1971,	87980,	558107,	378343,	138657,	.3665,	.3976,
1972,	4193,	379199,	248141,	124495,	.5017,	.4732,
1973,	9181,	228055,	109533,	62881,	.5741,	.4311,
1974,	6196,	143004,	88940,	45781,	.5147,	.6703,
1975,	24604,	104875,	54787,	47055,	.8589,	.9065,
1976,	154622,	221732,	30131,	40867,	1.3563,	.8210,
1977,	16618,	204073,	20604,	31807,	1.5437,	.7643,
1978,	20081,	200477,	37794,	26063,	.6896,	.2672,
1979,	26788,	225420,	78818,	20092,	.2549,	.2936,
1980,	71104,	178154,	94123,	57584,	.6118,	.5017,
1981,	14247,	172700,	71075,	40266,	.5665,	.4135,
1982,	56541,	159912,	57228,	51847,	.9060,	.7513,
1983,	7705,	123786,	46589,	44330,	.9515,	.9125,
1984,	13774,	93449,	35644,	22363,	.6274,	.6862,
1985,	1990,	59414,	29874,	8500,	.2845,	.2405,
1986,	10878,	61114,	32906,	6038,	.1835,	.1590,
1987,	265710,	249641,	36166,	10837,	.2996,	.0989,
1988,	85126,	333759,	56409,	49096,	.8704,	.7919,
1989,	1408,	329006,	83625,	85948,	1.0278,	.8285,
1990,	1621,	167685,	41003,	100483,	2.4506,	1.3283,
1991,	635,	54388,	30227,	22966,	.7598,	.6994,
1992,	248,	25292,	20732,	11381,	.5490,	.8148,
Arith. Mean ,	132544,	1017498,	478778,	159407,	.5813,	.4734,
0 Units,	(Thousands),	(Tonnes),	(Tonnes),	(Tonnes),		

Table 5.2.1 CPUE of age 2 cod by area as observed in the Greenland gill net survey in inshore areas off West Greenland, 1985-1995.

Year	Yearclas	Sisimiut (Div. 1B)	Nuuk (Div. 1D)	Qaqortoq (Div. 1F)	Average
1985	83	-	0.03	0.00	0.02
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
1995	93	0.18	0.07	0.00	0.08

Table 5.2.2 Inshore cod off West Greenland, NAFO Sub-area 1. Catch at age and mean weight-at-age bydivision, 1995.

Catch at age by division (000)

Age	1A	1B	1C	1D	1E	1F	NAFO 1
3	0.0	0.0	0.8	1.0	0.0	13.8	15.5
4	49.0	429.5	455.8	118.0	2.0	41.1	1095.5
5	9.4	82.7	237.8	203.0	3.0	18.3	554.2
6	0.6	3.5	12.2	11.1	0.0	2.4	29.8
7	0.6	4.2	3.5	0.0	0.0	3.0	10.7
8	0.0	0.0	0.0	0.0	0.0	1.0	1.0
+9	0.0	0.0	0.0	0.0	0.0	1.4	1.4
total	59.6	519.9	710.0	333.0	5.0	82.0	1708.0

Mean weight at age (kg) by division

Age	1B	1C	1D	1E	1F
3	0.70	0.59	0.60	0.62	0.77
4	0.80	0.67	0.85	0.80	1.01
5	1.12	0.99	1.32	1.47	1.81
6	1.46	1.23	1.75	1.69	2.08
7	2.17	2.83	2.46	2.11	2.98
8	3.80	3.58	3.29	3.26	3.05
9	6.50			3.69	
10					

Table 5.2.3 Inshore Cod off West Greenland. Catch at ages from 3 to 9+ years, 1982-95.

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	2061	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
1995	16	1186	598	163	8	1	1	1708

Table 6.1.1 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Sub-areas V and XIV 1981-1995, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988
Denmark	-	-	-	-	-	-	6	+
Faroe Islands	767	1,532	1,146	2,502	1,052	853	1,096	1,378
France	8	27	236	489	845	52	19	25
Germany	3,007	2,581	1,142	936	863	858	565	637
Greenland	+	1	5	15	81	177	154	37
Iceland	15,457	28,300	28,360	30,080	29,231	31,044	44,780	49,040
Norway	-	-	2	2	3	+	2	1
Russia	-	-	-	-	-	-	-	-
UK (Engl. and Wales)	-	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-	-	-
Total	19,239	32,441	30,891	34,024	32,075	32,984	46,622	51,118
Working Group estimate	-	-	-	-	-	-	-	-

Country	1989	1990	1991	1992	1993	1994 [1]	1995 [1]
Denmark	-	-	-	-	-	-	-
Faroe Islands	2,319	1,803	1,566	2,128	4,405	6,241	3,615
France	-	-	-	3	2	-	16
Germany	493	336	303	382	415	648	808
Greenland	11	40	66	437	288	922	940
Iceland	58,330	36,557	34,883	31,955	33,987	27,778	27,385
Norway	3	50	34	285 [1]	908 [1]	826	1,537
Russia	-	-	-	5	-	-	20
UK (Engl. and Wales)	-	27	38	109	811	513	-
UK (Scotland)	-	-	-	19	26	84	-
United Kingdom	-	-	-	-	-	-	1,668
Total	61,156	38,813	36,890	35,323	40,842	37,012	35,989
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 6.1.2 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Division Vb 1981-1995, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988
Denmark	-	-	-	-	-	-	6	+
Faroe Islands	442	863	1,112	2,456	1,052	775	907	901
France	8	27	236	489	845	52	19	25
Germany	114	142	86	118	227	113	109	42
Greenland	-	-	-	-	-	-	-	-
Norway	2	+	2	2	2	+	2	1
UK (Engl. and Wales)	-	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-	-	-
Total	566	1,032	1,436	3,065	2,126	940	1,043	969
Working Group estimate	-	-	-	-	-	-	-	-

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Denmark	-	-	-	-	-	-	
Faroe Islands	1,513	1,064	1,293	2,105	4,058	5,163	3,597
France 6	...	...	...	3	2	...	16 [7]
Germany	73	43	24	71	24	8	-
Greenland	-	-	-	-	-	-	-
Norway	3	42	16	25 [1]	371 [1]	53	142
UK (Engl. and Wales)	-	-	-	1	15	-	-
UK (Scotland)	-	-	-	1	-	-	-
United Kingdom	-	-	-	-	-	-	58
Total	1,589	1,149	1,333	2,206	4,470	5,224	3,813
Working Group estimate	1,606 [2]	1,282 [3]	1,662 [4]	2,269 [5]	-	-	-

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) Quantity unknown 1989-1991 and 1993-1994.
7) Reported to Faroese Coastal Guard service

Table 6.1.3 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Division Va 1981-1995, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988
Faroe Islands	325	669	33	46	-	-	15	379
Germany	-	-	-	-	-	-	-	-
Greenland	-	-	-	-	-	-	-	-
Iceland	15,455	28,300	28,359	30,078	29,195	31,027	44,644	49,000
Norway	-	-	+	+	2	-	-	-
Total	15,780	28,969	28,392	30,124	29,197	31,027	44,659	49,379
Working Group estimate	-	-	-	-	-	-	-	-

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Faroe Islands	719	739	273	23	166	910	18
Germany	-	-	-	-	-	1	-
Greenland	-	-	-	-	-	1	-
Iceland	58,330	36,557	34,883	31,955	33,968	27,696	27,375
Norway	-	-	-	-	-	-	-
Total	59,049	37,296	35,156	31,978	34,134	28,608	27,393
Working Group estimate	59,272 [2]	37,308 [3]	35,413 [4]	-	-	-	-

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.

Table 6.1.4 GREENLAND HALIBUT. Nominal catches (tonnes) by countries, in Sub-area XIV 1981–1995, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988
Faroe Islands	-	-	-	-	-	78	74	98
Germany	2,893	2,439	1,054	818	636	745	456	595
Greenland	+	1	5	15	81	177	154	37
Iceland	-	-	1	2	36	17	136	40
Norway	-	-	-	+	-	-	-	-
Russia	-	-	-	-	-	-	-	-
UK (Engl. and Wales)	-	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-	-	-
Total	2,893	2,440	1,060	835	753	1,017	820	770
Working Group estimate	-	-	-	-	-	-	-	-

Country	1989	1990	1991	1992	1993	1994	1,995 [1]
Faroe Islands	87	-	-	-	181	168	-
Germany	420	293	279	311	391	639	808
Greenland	11	40	66	437	288	921	940 [7]
Iceland	+	-	-	-	19	82	10
Norway	-	8	18	260	537 [1]	773	1,395
Russia	+	-	-	5	-	-	20
UK (Engl. and Wales)	-	27	38	108	796	513	...
UK (Scotland)	-	-	-	18	26	84	...
United Kingdom	-	-	-	-	-	-	1,610
Total	518	368	401	1,139	2,238	3,180	4,783
Working Group estimate	-	736 [2]	875 [3]	1,240 [4]	2,275 [5]	- [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: 159 t trawl (Norwegian charter), 205 t gillnets (Norwegian charter).

7) includes 439 t offshore longlines, 93 t inshore longlines, and 273 t offshore gillnets (Greenland charter), 135 t trawl (Japanese charter) and 159 t trawl (Norwegian caherter).

Table 6.1.5 Catch statistics for Greenland Halibut 1994.

Va	Long line	Trawl	Gill Net	SUM
Faroe Islands	910	-	-	910
Germany, Fed. Rep.	-	1	-	1
Greenland	1	-	-	1
Iceland	2,200	25,493	3	27,696
Total	3,111	25,494	3	28,608

Vb	Long line	Trawl	Gill Net	SUM
Faroe Islands	207	1,962	2,995	5,163
France	-	-	-	0
Germany Fed. Rep.	-	8	-	8
Norway	17	-	36	53
UK (England & Wales)	-	-	-	0
UK (Scotland)	-	-	-	0
United Kingdom	-	-	-	0
Total	224	1,970	3,031	5,224

XIV	Long line	Trawl	Gill Net	SUM
Faroe Islands	168	-	-	168
Germany, Fed. Rep.	-	639	-	639
Greenland 1	64	652	205	921
Iceland	82	-	-	82
Norway	435	338	-	773
Russia	-	-	-	0
UK (England & Wales)	-	513	-	513
UK (Scotland)	-	84	-	84
United Kingdom	-	-	-	0
Total	749	2,226	205	3,180

Summary of catch by gear	Long line	Trawl	Gill Net	SUM
	4,084	29,690	3,239	37,012

1 Provisional data. Includes 159 t trawl and 205 t gillnet Norwegian charter.

Table 6.1.6 Catch statistics for Greenland Halibut 1995.

Va	Long line	Trawl	Gill Net	SUM
Faroe Islands		18		18
Germany, Fed. Rep.				0
Greenland				0
Iceland	2,820	24,555		27,375
Total	2,820	24,573	0	27,393

Vb	Long line	Trawl	Gill Net	SUM
Faroe Islands	108	2,122	1,367	3,597
France		16		16
Germany Fed. Rep.				0
Norway	4		138	142
UK (England & Wales)				0
UK (Scotland)				0
United Kingdom		58		58
Total	112	2,196	1,505	3,813

XIV	Long line	Trawl	Gill Net	SUM
Faroe Islands				0
Germany, Fed. Rep.		808		808
Greenland	532	135	273	940 [1]
Iceland		10		10
Norway	1,367	28		1,395
Russia		20		20
UK (England & Wales)				0
UK (Scotland)				0
United Kingdom		1,610		1,610
Total	1,899	2,611	273	4,783

Summary of catch by gear	Long line	Trawl	Gill Net	SUM
	4,831	29,380	1,778	35,989

1 439 t offshore longline, 93 inshore longline, 273 gillnet (Norwegian charter), 135 t trawl (Japanese charter)

Table 6.2.1 GREENLAND HALIBUT. CPUE and total effort based on data from Icelandic trawlers.

Year	Total catch (t)	CPUE	Total effort (hr)
1985	32075	1000	32.08
1986	32984	992	33.25
1987	46622	956	48.77
1988	51118	1122	45.56
1989	61396	1060	57.92
1990	39326	786	50.03
1991	37950	828	45.83
1992	35487	672	52.81
1993	41247	564	73.13
1994	37012	429	86.28
1995	35989	316	113.89

Table 6.3.1 Catch numbers at age.

Numbers*10**-3

YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
AGE										
5	43	0	23	29	47	26	8	10	83	125
6	296	34	91	197	502	158	300	240	277	441
7	584	671	347	1605	1536	580	1140	1611	891	1018
8	621	1727	1037	2253	2630	1160	2451	2651	2139	2295
9	431	2289	1214	3090	3126	1430	2646	3060	3568	3454
10	240	834	848	1693	2324	1764	2456	2443	2800	2749
11	121	420	567	880	1739	1299	1803	1693	1825	1452
12	86	423	312	394	849	664	963	978	1134	627
13	37	174	232	246	578	435	609	424	588	423
14	32	120	218	189	306	252	331	174	363	137
15	14	28	114	147	143	176	195	37	92	36
+gp	9	141	204	125	116	159	132	47	20	46
0 TOTAL	2514	6861	5207	10848	13896	8103	13034	13368	13780	12803
TONSL	6045	16578	14349	23616	31252	19239	32441	30888	34024	32075
SOPC	100	100	100	101	99	100	100	101	99	103

Catch numbers at age Numbers*10**-3

YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
AGE										
5	245	182	129	499	188	289	17	45	78	499
6	612	3123	742	1657	463	1225	421	402	673	1574
7	1033	4863	2068	4485	1513	1797	2023	1918	2200	3005
8	1942	2586	2985	5961	3515	2866	3262	5082	3820	3259
9	2983	2156	3166	5763	4186	2935	2646	4374	3653	2586
10	3097	3476	2966	3246	3143	2074	3019	2892	2334	1946
11	1683	1847	1848	1601	1224	1130	1962	1557	1718	1535
12	820	1829	1761	1458	959	1072	1278	1428	991	1122
13	550	886	1851	1237	568	924	509	582	422	651
14	202	243	701	506	358	554	144	138	371	441
15	59	31	216	362	137	342	36	137	169	238
+gp	34	5	246	145	61	82	56	14	178	230
0 TOTAL	13260	21227	18679	26920	16315	15290	15373	18569	16607	17086
TONSL	32984	46622	51118	61396	39326	37950	35487	41247	37012	35989
SOPC	101	98	101	100	100	101	101	100	100	100
1										

Table 6.4.1 Catch weights at age (kg).

Run title : G. halibut V & XIV (run: XSAEIN02/X02)

At 4-May-96 19:41:39

Table 6.4.1 Catch weights at age (kg)

	YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	AGE										
	5	1.157	1.157	0.968	0.911	1.125	1.071	1.01	0.984	0.942	0.995
	6	1.585	1.046	1.199	0.942	1.283	1.257	1.368	1.338	1.275	1.23
	7	1.768	1.429	1.423	1.278	1.487	1.44	1.618	1.577	1.592	1.63
	8	2.18	1.794	1.854	1.676	1.756	1.66	1.905	1.848	1.817	1.951
	9	2.57	2.228	2.256	2.072	2.153	1.967	2.187	2.159	2.24	2.367
	10	3.018	2.687	2.607	2.333	2.279	2.258	2.516	2.434	2.461	2.637
	11	3.73	3.017	3.081	2.723	2.498	2.515	2.761	2.603	2.835	2.829
	12	4.052	3.914	3.591	3.297	3.059	2.95	3.129	3.034	3.262	3.353
	13	4.815	4.04	4.604	3.985	3.783	3.45	3.785	3.784	3.962	4.006
	14	5.348	4.714	4.695	4.668	4.507	4.033	4.475	4.446	4.936	4.792
	15	5.752	5.401	5.151	4.792	5.139	4.652	4.985	4.751	5.23	5.231
	+gp	7.094	5.597	6.45	5.387	5.983	5.33	6.088	6.385	7.192	6.323
0	SOPC	1.0024	1.0008	0.9993	1.0124	0.9902	1.0024	0.9997	1.011	0.9937	1.0258

Catch weights at age (kg)

	YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	AGE										
	5	1.03	1.03	1.129	0.842	1.029	1.001	1.016	0.991	1.163	0.95
	6	1.238	1.218	1.304	1.047	1.21	1.247	1.256	1.249	1.254	1.213
	7	1.499	1.533	1.541	1.425	1.572	1.472	1.401	1.401	1.488	1.413
	8	1.937	1.824	1.77	1.727	1.79	1.81	1.718	1.685	1.736	1.703
	9	2.363	2.187	2.236	2.125	2.126	2.088	2.049	1.982	2.15	2.028
	10	2.631	2.666	2.683	2.637	2.536	2.44	2.436	2.425	2.352	2.279
	11	2.848	2.996	3.082	3.22	3.214	2.935	2.868	2.952	2.736	2.643
	12	3.335	3.595	3.624	3.733	3.693	3.737	3.478	3.429	3.082	2.992
	13	4.039	4.431	4.312	4.135	4.448	4.401	4.51	4.479	3.607	3.568
	14	4.925	5.14	5.098	5.38	5.197	5.022	4.681	6.043	4.242	4.068
	15	5.466	5.764	5.213	6.569	5.891	5.991	6.01	5.832	5.293	5.302
	+gp	5.985	7.267	5.764	6.497	6.049	6.412	5.128	2.756	6.087	5.613
0	SOPC	1.006	0.9785	1.0063	0.9999	0.9998	1.0097	1.0051	0.9999	1	1.0013
	1										

Table 6.5.1 Proportion mature at age.

Run title : G. halibut V & XIV (run: XSAEIN02/X02)

At 4-May-96 19:41:40

Table 6.5.1 Proportion mature at age

YEA	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
AGE										
5	0	0	0	0	0	0	0	0.04	0	0.01
6	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.07	0.08	0.06
7	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.15	0.19	0.21
8	0.35	0.35	0.35	0.35	0.35	0.35	0.33	0.28	0.32	0.35
9	0.77	0.77	0.77	0.77	0.77	0.77	0.5	0.38	0.42	0.46
10	0.96	0.96	0.96	0.96	0.96	0.96	0.7	0.6	0.64	0.64
11	1	1	1	1	1	1	0.85	0.85	0.75	0.82
12	1	1	1	1	1	1	0.94	0.98	0.93	0.96
13	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1
+gp	1	1	1	1	1	1	1	1	1	1

Table 6.5.1 Proportion mature at age

YEA	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
AGE										
5	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.178
6	0.06	0.06	0.06	0.06	0.06	0.06	0.04	0.12	0.12	0.181
7	0.21	0.21	0.21	0.21	0.21	0.29	0.11	0.27	0.27	0.477
8	0.35	0.35	0.35	0.35	0.35	0.48	0.25	0.4	0.4	0.597
9	0.46	0.46	0.46	0.46	0.46	0.56	0.47	0.45	0.45	0.586
10	0.64	0.64	0.64	0.64	0.64	0.62	0.68	0.54	0.54	0.705
11	0.82	0.82	0.82	0.82	0.82	0.85	0.85	0.65	0.65	0.786
12	0.96	0.96	0.96	0.96	0.96	1	0.96	0.78	0.78	0.764
13	1	1	1	1	1	1	1	0.83	0.83	0.961
14	1	1	1	1	1	1	1	0.97	0.97	1
15	1	1	1	1	1	1	1	1	1	1
+gp	1	1	1	1	1	1	1	1	1	1
1										

Table 6.6.1.1 Output from XSA tuning.

```
Lowestoft VPA Version 3.1

   5-May-96  13:50:37

Extended Survivors Analysis

G. halibut V & XIV (run: XSAEIN03/X03)

CPUE data from file /users/fish/ifad/ifapwork/nwwg/ghl_grn/FLEET.X03

Catch data for  20 years. 1976 to 1995. Ages  5 to  16.

     Fleet                  Last      First     Last      Alpha      Beta
                           year  year       age       age
FLT04: Va TRW CPU          1985      1995         7        12         0         1


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
```

Table 6.6.1.1 (continued)

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 = 1.000

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

Prior weighting not applied

Tuning converged after 39 iterations

1

Regression weights

0.751	0.82	0.877	0.921	0.954	0.976	0.99	0.997	1	1

Fishing mortalities

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
5	0.006	0.005	0.004	0.017	0.007	0.014	0.001	0.002	0.003	0.016
6	0.018	0.092	0.025	0.069	0.019	0.052	0.024	0.023	0.034	0.061
7	0.049	0.179	0.077	0.199	0.079	0.091	0.107	0.136	0.16	0.198
8	0.13	0.158	0.15	0.313	0.224	0.199	0.224	0.401	0.412	0.354
9	0.234	0.197	0.28	0.452	0.356	0.28	0.27	0.495	0.531	0.513
10	0.307	0.442	0.428	0.486	0.45	0.282	0.487	0.499	0.507	0.569
11	0.241	0.286	0.42	0.408	0.32	0.271	0.444	0.472	0.593	0.701
12	0.214	0.421	0.457	0.651	0.431	0.485	0.525	0.64	0.59	0.951
13	0.446	0.356	0.958	0.64	0.536	0.925	0.422	0.455	0.368	0.952
14	1.007	0.34	0.499	0.713	0.358	1.629	0.323	0.181	0.556	0.776

Table 6.6.1.1 (continued)

15	0.445	0.371	0.543	0.491	0.397	0.651	0.37	0.546	0.331	0.807

1

XSA population numbers (Thousands)

	AGE									
YEAR	5	6	7	8	9	10	11	12	13	14
1986	4.47E+04	3.79E+04	2.32E+04	1.72E+04	1.54E+04	1.26E+04	8.47E+03	4.59E+03	1.65E+03	3.43E+02
1987	3.72E+04	3.83E+04	3.20E+04	1.90E+04	1.30E+04	1.05E+04	8.01E+03	5.73E+03	3.19E+03	9.08E+02
1988	3.12E+04	3.19E+04	3.00E+04	2.31E+04	1.40E+04	9.19E+03	5.81E+03	5.18E+03	3.24E+03	1.92E+03
1989	3.12E+04	2.68E+04	2.67E+04	2.39E+04	1.71E+04	9.09E+03	5.15E+03	3.29E+03	2.82E+03	1.07E+03
1990	3.07E+04	2.64E+04	2.15E+04	1.89E+04	1.51E+04	9.36E+03	4.81E+03	2.95E+03	1.48E+03	1.28E+03
1991	2.27E+04	2.62E+04	2.23E+04	1.71E+04	1.30E+04	9.09E+03	5.14E+03	3.01E+03	1.65E+03	7.43E+02
1992	2.22E+04	1.93E+04	2.14E+04	1.75E+04	1.21E+04	8.44E+03	5.90E+03	3.37E+03	1.60E+03	5.63E+02
1993	2.52E+04	1.91E+04	1.62E+04	1.66E+04	1.21E+04	7.93E+03	4.46E+03	3.26E+03	1.72E+03	9.01E+02
1994	3.35E+04	2.16E+04	1.61E+04	1.22E+04	9.55E+03	6.33E+03	4.14E+03	2.40E+03	1.48E+03	9.38E+02
1995	3.36E+04	2.87E+04	1.80E+04	1.18E+04	6.94E+03	4.83E+03	3.28E+03	1.97E+03	1.14E+03	8.80E+02

Estimated population abundance at 1st Jan 1996

0.00E+00	2.84E+04	2.33E+04	1.27E+04	7.13E+03	3.58E+03	2.36E+03	1.40E+03	6.56E+02	3.80E+02

Taper weighted geometric mean of the VPA populations:

3.13E+04	2.69E+04	2.24E+04	1.79E+04	1.29E+04	8.54E+03	5.13E+03	3.04E+03	1.62E+03	7.71E+02

Standard error of the weighted Log(VPA populations) :

0.2147	0.2225	0.2251	0.2338	0.2729	0.2672	0.2686	0.3338	0.4068	0.4842

	AGE
YEAR	15
1986	1.77E+02

Table 6.6.1.1 (continued)

1987	1.08E+02
1988	5.56E+02
1989	1.01E+03
1990	4.51E+02
1991	7.71E+02
1992	1.25E+02
1993	3.51E+02
1994	6.47E+02
1995	4.63E+02

Estimated population abundance at 1st Jan 1996

3.49E+02

Taper weighted geometric mean of the VPA populations:

3.29E+02

Standard error of the weighted Log(VPA populations) :

1	0.7892

Log catchability residuals.

Fleet : FLT04: Va TRW CPU 19

Age	1985
7	-0.04
8	0.02
9	0.08
10	0.15
11	0.14
12	0.02

Table 6.6.1.1 (continued)

Age	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
7	-0.62	0.39	0.07	0.24	-0.05	-0.35	0.17	-0.02	0.21	-0.06
8	-0.52	-0.28	-0.19	0.15	0.24	-0.11	0.1	0.33	0.3	-0.21
9	-0.02	-0.24	0.13	0.23	0.2	-0.18	-0.14	0.13	0.07	-0.24
10	0.07	0.06	0.1	0.26	0.16	-0.36	0.1	-0.03	-0.12	-0.28
11	0.18	0.11	0.11	0.16	-0.11	-0.24	-0.08	-0.04	-0.07	-0.03
12	0.03	-0.11	-0.01	0.43	-0.14	0.35	-0.01	-0.06	-0.39	-0.07

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
Mean Log q	-6.2626	-5.5317	-5.1328	-4.9967	-5.0781	-4.8105
S.E(Log q)	0.2742	0.2675	0.1788	0.1974	0.1354	0.2302

Regression statistics :

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

Age	Slope	t-value	Interce	RSquare	No Pts	Reg s.e	Mean Q
7	0.82	0.539	6.95	0.52	11	0.23	-6.26
8	1.09	-0.203	5.15	0.38	11	0.31	-5.53
9	0.74	1.803	6.24	0.86	11	0.12	-5.13
10	0.71	1.94	6.16	0.85	11	0.12	-5
11	0.8	1.744	5.79	0.9	11	0.1	-5.08
12	0.91	0.398	5.11	0.71	11	0.22	-4.81
1							

Table 6.6.1.1 (continued)

Terminal year survivor and F summaries :

Age 5 Catchability dependent on age and year class strength

Year class = 1990

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	1	0	0	0	0	0	0
P shrinkage mea	26868	0.22				0.953	0.017
F shrinkage mea	89782	1				0.047	0.005

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
28442	0.22	10.26	2	47.225	0.016

1

Age 6 Catchability dependent on age and year class strength

Year class = 1989

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	1	0	0	0	0	0	0
P shrinkage mea	22435	0.23				0.952	0.063
F shrinkage mea	47396	1				0.048	0.03

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F

Table 6.6.1.1 (continued)

23259	0.22	10.06	2	45.785	0.061

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

Year class = 1988

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	11913	0.3	0	0	1	0.901	0.21
F shrinkage mea	22913	1				0.099	0.115

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
12709	0.29	0.21	2	0.715	0.198

1

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

Year class = 1987

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	7023	0.213	0.206	0.97	2	0.935	0.358
F shrinkage mea	8870	1				0.065	0.293

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
7130	0.21	0.15	3	0.702	0.354

Table 6.6.1.1 (continued)

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

Year class = 1986

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	3495	0.178	0.162	0.91	3	0.937	0.523
F shrinkage mea	5058	1				0.063	0.388

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
3577	0.18	0.14	4	0.777	0.513

1

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

Year class = 1985

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	2307	0.164	0.138	0.84	4	0.936	0.578
F shrinkage mea	3200	1				0.064	0.447

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
2356	0.17	0.12	5	0.737	0.569

Table 6.6.1.1 (continued)

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

Year class = 1984

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	1336	0.153	0.067	0.44	5	0.933	0.726
F shrinkage mea	2713	1				0.067	0.422

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
1401	0.16	0.1	6	0.636	0.701

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

Year class = 1983

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	609	0.148	0.013	0.09	6	0.916	0.997
F shrinkage mea	1463	1				0.084	0.537

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
656	0.16	0.1	7	0.655	0.951

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

Table 6.6.1.1 (continued)

Year class = 1982

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	336	0.146	0.104	0.71	6	0.864	1.03
F shrinkage mea	835	1				0.136	0.544

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
380	0.19	0.16	7	0.88	0.952

1

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

Year class = 1981

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	328	0.143	0.075	0.52	6	0.842	0.81
F shrinkage mea	484	1				0.158	0.613

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
349	0.2	0.09	7	0.448	0.776

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

Year class = 1980

Table 6.6.1.1 (continued)

Fleet		Int s.e	E s	Var Ratio	N	Scaled Weights	Estimated F
FLT04: Va TRW CPU	177	0.145	0.085	0.59	6	0.756	0.811
F shrinkage mea	182	1				0.244	0.796

Weighted prediction :

Survivors at end of year	s.e	Ex s.	N	Var Ratio	F
178	0.27	0.07	7	0.253	0.807

1
1

FLT04: Va TRW CPU 19

CPUE adjusted to start of year

YEAR	AGE 5	6	7	8	9	10	11	12	13	14	15
1985	0.00E+00	0.00E+00	3.86E+01	8.20E+01	1.17E+02	1.00E+02	4.96E+01	2.15E+01	0.00E+00	0.00E+00	0.00E+00
1986	0.00E+00	0.00E+00	2.38E+01	4.03E+01	8.92E+01	9.20E+01	6.34E+01	3.85E+01	0.00E+00	0.00E+00	0.00E+00
1987	0.00E+00	0.00E+00	9.04E+01	5.68E+01	6.01E+01	7.52E+01	5.56E+01	4.19E+01	0.00E+00	0.00E+00	0.00E+00
1988	0.00E+00	0.00E+00	6.15E+01	7.59E+01	9.43E+01	6.89E+01	4.02E+01	4.16E+01	0.00E+00	0.00E+00	0.00E+00
1989	0.00E+00	0.00E+00	6.47E+01	1.10E+02	1.27E+02	7.94E+01	3.78E+01	4.10E+01	0.00E+00	0.00E+00	0.00E+00
1990	0.00E+00	0.00E+00	3.88E+01	9.46E+01	1.09E+02	7.41E+01	2.68E+01	2.08E+01	0.00E+00	0.00E+00	0.00E+00
1991	0.00E+00	0.00E+00	2.99E+01	6.05E+01	6.39E+01	4.27E+01	2.52E+01	3.47E+01	0.00E+00	0.00E+00	0.00E+00
1992	0.00E+00	0.00E+00	4.84E+01	7.67E+01	6.18E+01	6.33E+01	3.38E+01	2.72E+01	0.00E+00	0.00E+00	0.00E+00
1993	0.00E+00	0.00E+00	3.02E+01	9.12E+01	8.09E+01	5.21E+01	2.66E+01	2.49E+01	0.00E+00	0.00E+00	0.00E+00
1994	0.00E+00	0.00E+00	3.77E+01	6.54E+01	6.06E+01	3.80E+01	2.42E+01	1.33E+01	0.00E+00	0.00E+00	0.00E+00
1995	0.00E+00	0.00E+00	3.22E+01	3.81E+01	3.22E+01	2.47E+01	1.98E+01	1.49E+01	0.00E+00	0.00E+00	0.00E+00

Table 6.6.1.2

Run title : G. halibut V & XIV (run: XSAEIN03/X03)

At 5-May-96 13:51:16

Terminal Fs derived using XSA (With F shrinkage)

Table 6.6.1.2 Fishing mortality (F) at age

YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
AGE										
5	0.0018	0	0.0009	0.0009	0.0013	0.0007	0.0003	0.0004	0.0028	0.0031
6	0.0153	0.0017	0.0044	0.009	0.0181	0.0049	0.0095	0.009	0.0121	0.0175
7	0.0426	0.0415	0.0198	0.0941	0.0857	0.0249	0.0421	0.0612	0.0398	0.0535
8	0.0688	0.1619	0.0791	0.1636	0.208	0.0818	0.132	0.1234	0.1024	0.1294
9	0.0857	0.364	0.1549	0.3352	0.3377	0.1579	0.256	0.229	0.2299	0.226
10	0.0803	0.2245	0.2095	0.3167	0.4277	0.3056	0.4174	0.3753	0.3196	0.2631
11	0.0671	0.1864	0.2217	0.3299	0.5882	0.4255	0.5526	0.5359	0.503	0.2573
12	0.0597	0.3311	0.1946	0.2236	0.5763	0.4388	0.6104	0.6253	0.8025	0.3024
13	0.0421	0.1561	0.2879	0.2191	0.5571	0.6236	0.8843	0.5626	0.9337	0.7626
14	0.1746	0.1767	0.2822	0.3794	0.4369	0.4742	1.4495	0.6384	1.391	0.5412
15	0.0849	0.2157	0.24	0.2949	0.5202	0.456	0.7886	0.5508	0.7958	0.4275
+gp	0.0849	0.2157	0.24	0.2949	0.5202	0.456	0.7886	0.5508	0.7958	0.4275
0 FBAR 8-1	0.0723	0.2536	0.1719	0.2738	0.4276	0.2819	0.3937	0.3778	0.3915	0.2356

Table 6.6.1.2 Fishing mortality (F) at age

YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	FBAR 93-95
AGE											
5	0.0059	0.0053	0.0045	0.0174	0.0066	0.0138	0.0008	0.0019	0.0025	0.0161	0.0069
6	0.0176	0.0921	0.0254	0.069	0.0191	0.0516	0.0238	0.0229	0.0341	0.0609	0.0393
7	0.0491	0.1787	0.0771	0.1994	0.0789	0.0908	0.1072	0.1363	0.1596	0.1983	0.1647
8	0.1298	0.1584	0.1503	0.3126	0.2243	0.1992	0.2238	0.4011	0.4124	0.3535	0.389
9	0.234	0.197	0.2799	0.452	0.3558	0.2797	0.2697	0.4954	0.5312	0.5133	0.5133
10	0.3067	0.4415	0.4278	0.4858	0.4496	0.2824	0.4872	0.4994	0.5066	0.5689	0.525
11	0.2409	0.2859	0.4199	0.4077	0.3202	0.2707	0.4441	0.4718	0.5926	0.7013	0.5886
12	0.2139	0.4214	0.4567	0.6507	0.4312	0.4846	0.525	0.6401	0.5903	0.9509	0.7271
13	0.446	0.3558	0.9577	0.6396	0.5361	0.9253	0.4215	0.4547	0.3679	0.9518	0.5915
14	1.007	0.3404	0.4988	0.7134	0.3583	1.6286	0.3225	0.1805	0.5557	0.7765	0.5042
15	0.4452	0.3707	0.5427	0.4911	0.3966	0.6507	0.37	0.5459	0.3305	0.8073	0.5613
+gp	0.4452	0.3707	0.5427	0.4911	0.3966	0.6507	0.37	0.5459	0.3305	0.8073	**0.5613**
0 FBAR 8-1	0.2251	0.3009	0.3469	0.4618	0.3562	0.3033	0.3899	0.5016	0.5266	0.6176	**0.5486**
1											

F-factor 1

Table 6.6.1.3

Run title : G. halibut V & XIV (run: XSAEIN03/X03)

At 5-May-96 13:51:16

Terminal Fs derived using XSA (With F shrinkage)

Table 6.6.1.3 Stock number at age (start of year) Numbers*10**-3

YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
AGE										
5	25827	26127	27479	35014	40514	39905	33564	28801	31984	44147
6	21009	22190	22487	23630	30110	34827	34322	28882	24780	27452
7	15102	17808	19067	19271	20155	25450	29830	29263	24636	21072
8	10064	12456	14705	16089	15097	15923	21367	24617	23692	20378
9	5658	8086	9119	11694	11758	10554	12629	16117	18728	18408
10	3352	4470	4836	6723	7199	7220	7758	8415	11033	12810
11	2010	2663	3074	3376	4215	4040	4578	4398	4976	6898
12	1601	1617	1902	2119	2089	2015	2272	2267	2215	2590
13	968	1298	1000	1348	1459	1011	1118	1062	1044	855
14	215	798	956	645	932	719	466	397	521	353
15	185	156	576	620	380	518	385	94	181	112
+gp	119	781	1027	525	306	465	258	119	39	142
0 TOTAL	86109	98449	106227	121054	134214	142647	148547	144433	143830	155215

Table 6.6.1.3 Stock number at age (start of year) Numbers*10**-3

YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
AGE											
5	44721	37221	31244	31237	30681	22738	22223	25195	33452	33583	0
6	37881	38264	31868	26772	26423	26233	19303	19112	21644	28720	28442
7	23219	32037	30037	26741	21506	22313	21443	16223	16077	18004	23259
8	17192	19027	23063	23935	18855	17106	17538	16579	12184	11796	12709
9	15410	12996	13977	17081	15070	12968	12065	12068	9555	6943	7130
10	12639	10496	9185	9093	9355	9088	8438	7929	6329	4835	3577
11	8475	8006	5809	5154	4815	5136	5898	4462	4142	3282	2356
12	4590	5733	5177	3286	2951	3009	3372	3256	2396	1971	1401
13	1648	3190	3238	2822	1475	1650	1595	1717	1478	1143	656
14	343	908	1924	1069	1281	743	563	901	938	880	380
15	177	108	556	1006	451	771	125	351	647	463	349
+gp	101	17	628	400	200	183	194	36	678	443	348
0 TOTAL	166397	168003	156706	148595	133063	121937	112757	107829	109519	112064	80606
1											

Run title : G. halibut V & XIV (run: XSAEIN03/X03)

At 5-May-96 13:51:16

Terminal Fs derived using XSA (With F shrinkage)

Table 11 Spawning stock number at age (spawning time) Numbers*10**-3

YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
AGE										
5	0	0	0	0	0	0	0	1152	0	441
6	630	666	675	709	903	1045	1716	2022	1982	1647
7	1510	1781	1907	1927	2016	2545	5966	4389	4681	4425
8	3522	4360	5147	5631	5284	5573	7051	6893	7582	7132
9	4357	6226	7022	9005	9054	8127	6314	6124	7866	8468
10	3218	4291	4643	6454	6911	6931	5430	5049	7061	8198
11	2010	2663	3074	3376	4215	4040	3891	3739	3732	5657
12	1601	1617	1902	2119	2089	2015	2136	2222	2060	2486
13	968	1298	1000	1348	1459	1011	1118	1062	1044	855
14	215	798	956	645	932	719	466	397	521	353
15	185	156	576	620	380	518	385	94	181	112
+gp	119	781	1027	525	306	465	258	119	39	142

Table 6.6.1.4

Run title : G. halibut V & XIV (run: XSAEIN03/X03)

At 5-May-96 13:51:16

Terminal Fs derived using XSA (With F shrinkage)

Table 6.6.1.4 Spawning stock biomass at age (spawning time) Tonnes

	YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	AGE										
	5	0	0	0	0	0	0	0	1134	0	439
	6	999	696	809	668	1159	1313	2348	2705	2528	2026
	7	2670	2545	2713	2463	2997	3665	9653	6922	7452	7213
	8	7679	7821	9542	9438	9279	9251	13432	12738	13776	13915
	9	11197	13872	15841	18658	19493	15986	13810	13222	17620	20043
	10	9712	11530	12104	15056	15750	15651	13663	12289	17377	21618
	11	7496	8033	9470	9192	10530	10161	10743	9732	10581	16003
	12	6486	6331	6831	6988	6391	5944	6683	6742	6720	8337
	13	4659	5244	4603	5371	5518	3486	4233	4019	4137	3423
	14	1151	3764	4487	3012	4199	2901	2086	1767	2571	1693
	15	1066	840	2967	2973	1953	2410	1921	447	945	584
	+gp	844	4369	6621	2829	1831	2478	1571	758	279	896
0	TOTSPB	53959	65046	75987	76647	79100	73246	80142	72476	83986	96189

Table 6.6.1.4 Spawning stock biomass at age (spawning time) Tonnes

	YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	AGE										
	5	461	383	353	263	316	228	452	749	1167	5679
	6	2814	2796	2493	1682	1918	1963	970	2864	3257	6306
	7	7309	10314	9720	8002	7099	9525	3305	6137	6459	12135
	8	11655	12147	14287	14467	11813	14862	7532	11174	8461	11993
	9	16751	13074	14376	16697	14738	15163	11619	10764	9244	8251
	10	21283	17909	15772	15346	15184	13748	13978	10383	8039	7768
	11	19792	19667	14682	13609	12690	12814	14377	8562	7366	6819
	12	14697	19786	18011	11775	10462	11244	11260	8709	5760	4505
	13	6654	14136	13961	11669	6563	7262	7194	6383	4424	3919
	14	1690	4666	9808	5753	6659	3731	2636	5279	3859	3581
	15	967	622	2898	6605	2657	4617	754	2047	3426	2455
	+gp	607	126	3621	2598	1208	1174	995	98	4128	2485
0	TOTSPB	104679	115626	119983	108467	91306	96330	75071	73150	65590	75897
	1										

Table 6.6.1.5

Run title : G. halibut V & XIV (run: XSAEIN03/X03)

At 5-May-96 13:51:16

Table 6.6.1.5 Summary (without SOP correction)

Terminal Fs derived using XSA (With F shrinkage)

	REC Age 5	TOTALBIO	TOTSPBI	LANDING	YIELD/SSB	FBAR 8-12
1976	25827	158180	53959	6045	0.112	0.0723
1977	26127	159840	65046	16578	0.2549	0.2536
1978	27479	176115	75987	14349	0.1888	0.1719
1979	35014	176029	76647	23616	0.3081	0.2738
1980	40514	212834	79100	31252	0.3951	0.4276
1981	39905	214039	73246	19239	0.2627	0.2819
1982	33564	246517	80142	32441	0.4048	0.3937
1983	28801	239223	72476	30888	0.4262	0.3778
1984	31984	242364	83986	34024	0.4051	0.3915
1985	44147	263941	96189	32075	0.3335	0.2356
1986	44721	280098	104679	32984	0.3151	0.2251
1987	37221	289310	115626	46622	0.4032	0.3009
1988	31244	286788	119983	51118	0.426	0.3469
1989	31237	249536	108467	61396	0.566	0.4618
1990	30681	230323	91306	39326	0.4307	0.3562
1991	22738	211634	96330	37950	0.394	0.3033
1992	22223	192492	75071	35487	0.4727	0.3899
1993	25195	182267	73150	41247	0.5639	0.5016
1994	33452	182128	65590	37012	0.5643	0.5266
1995	33583	164542	75897	35989	0.4742	0.6176
Arith. Mean	32283	217910	84144	32982	0.3851	0.3455
0 Units	(Thousands	(Tonnes)	(Tonnes)	(Tonnes)		
1						

Table 6.7.1.1

11:35 Friday, May 10, 1996

Greenland halibut (Fishing Areas V and XIV)

Prediction with management option table: Input data

Year: 1996								
Age	Stock size	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
5	26000.000	0.1500	0.0595	0.0000	0.0000	1.035	0.0078	1.035
6	20021.000	0.1500	0.1003	0.0000	0.0000	1.239	0.0442	1.239
7	18078.000	0.1500	0.2868	0.0000	0.0000	1.434	0.1854	1.434
8	12709.000	0.1500	0.4318	0.0000	0.0000	1.708	0.4379	1.708
9	7130.000	0.1500	0.5165	0.0000	0.0000	2.053	0.5779	2.053
10	3577.000	0.1500	0.6363	0.0000	0.0000	2.352	0.5910	2.352
11	2356.000	0.1500	0.7840	0.0000	0.0000	2.777	0.6626	2.777
12	1401.000	0.1500	0.8760	0.0000	0.0000	3.168	0.8186	3.168
13	656.000	0.1500	0.9478	0.0000	0.0000	3.885	0.6659	3.885
14	380.000	0.1500	0.9925	0.0000	0.0000	4.784	0.5676	4.784
15	349.000	0.1500	1.0000	0.0000	0.0000	5.476	0.6319	5.476
16+	348.000	0.1500	1.0000	0.0000	0.0000	4.819	0.6319	4.819
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	26000.000	0.1500	0.0595	0.0000	0.0000	1.035	0.0078	1.035
6	.	0.1500	0.1003	0.0000	0.0000	1.239	0.0442	1.239
7	.	0.1500	0.2868	0.0000	0.0000	1.434	0.1854	1.434
8	.	0.1500	0.4318	0.0000	0.0000	1.708	0.4379	1.708
9	.	0.1500	0.5165	0.0000	0.0000	2.053	0.5779	2.053
10	.	0.1500	0.6363	0.0000	0.0000	2.352	0.5910	2.352
11	.	0.1500	0.7840	0.0000	0.0000	2.777	0.6626	2.777
12	.	0.1500	0.8760	0.0000	0.0000	3.168	0.8186	3.168
13	.	0.1500	0.9478	0.0000	0.0000	3.885	0.6659	3.885
14	.	0.1500	0.9925	0.0000	0.0000	4.784	0.5676	4.784
15	.	0.1500	1.0000	0.0000	0.0000	5.476	0.6319	5.476
16+	.	0.1500	1.0000	0.0000	0.0000	4.819	0.6319	4.819
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1998								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
5	26000.000	0.1500	0.0595	0.0000	0.0000	1.035	0.0078	1.035
6	.	0.1500	0.1003	0.0000	0.0000	1.239	0.0442	1.239
7	.	0.1500	0.2868	0.0000	0.0000	1.434	0.1854	1.434
8	.	0.1500	0.4318	0.0000	0.0000	1.708	0.4379	1.708
9	.	0.1500	0.5165	0.0000	0.0000	2.053	0.5779	2.053
10	.	0.1500	0.6363	0.0000	0.0000	2.352	0.5910	2.352
11	.	0.1500	0.7840	0.0000	0.0000	2.777	0.6626	2.777
12	.	0.1500	0.8760	0.0000	0.0000	3.168	0.8186	3.168
13	.	0.1500	0.9478	0.0000	0.0000	3.885	0.6659	3.885
14	.	0.1500	0.9925	0.0000	0.0000	4.784	0.5676	4.784
15	.	0.1500	1.0000	0.0000	0.0000	5.476	0.6319	5.476
16+	.	0.1500	1.0000	0.0000	0.0000	4.819	0.6319	4.819
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : MANJB002
Date and time: 10MAY96:11:44

Table 6.7.1.2

11:35 Friday, May 10, 1996

Greenland halibut (Fishing Areas V and XIV)

Prediction with management option table: Input data

Year: 1996								
Age	Stock size	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
5	32000.000	0.1500	0.0595	0.0000	0.0000	1.035	0.0078	1.035
6	27103.000	0.1500	0.1003	0.0000	0.0000	1.239	0.0442	1.239
7	22250.000	0.1500	0.2868	0.0000	0.0000	1.434	0.1854	1.434
8	12709.000	0.1500	0.4318	0.0000	0.0000	1.708	0.4379	1.708
9	7130.000	0.1500	0.5165	0.0000	0.0000	2.053	0.5779	2.053
10	3577.000	0.1500	0.6363	0.0000	0.0000	2.352	0.5910	2.352
11	2356.000	0.1500	0.7840	0.0000	0.0000	2.777	0.6626	2.777
12	1401.000	0.1500	0.8760	0.0000	0.0000	3.168	0.8186	3.168
13	656.000	0.1500	0.9478	0.0000	0.0000	3.885	0.6659	3.885
14	380.000	0.1500	0.9925	0.0000	0.0000	4.784	0.5676	4.784
15	349.000	0.1500	1.0000	0.0000	0.0000	5.476	0.6319	5.476
16+	348.000	0.1500	1.0000	0.0000	0.0000	4.819	0.6319	4.819
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	32000.000	0.1500	0.0595	0.0000	0.0000	1.035	0.0078	1.035
6	.	0.1500	0.1003	0.0000	0.0000	1.239	0.0442	1.239
7	.	0.1500	0.2868	0.0000	0.0000	1.434	0.1854	1.434
8	.	0.1500	0.4318	0.0000	0.0000	1.708	0.4379	1.708
9	.	0.1500	0.5165	0.0000	0.0000	2.053	0.5779	2.053
10	.	0.1500	0.6363	0.0000	0.0000	2.352	0.5910	2.352
11	.	0.1500	0.7840	0.0000	0.0000	2.777	0.6626	2.777
12	.	0.1500	0.8760	0.0000	0.0000	3.168	0.8186	3.168
13	.	0.1500	0.9478	0.0000	0.0000	3.885	0.6659	3.885
14	.	0.1500	0.9925	0.0000	0.0000	4.784	0.5676	4.784
15	.	0.1500	1.0000	0.0000	0.0000	5.476	0.6319	5.476
16+	.	0.1500	1.0000	0.0000	0.0000	4.819	0.6319	4.819
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Year: 1998								
Age	Recruit-ment	Natural mortality	Maturity ogive	Prop.of F bef.spaw.	Prop.of M bef.spaw.	Weight in stock	Exploit. pattern	Weight in catch
5	32000.000	0.1500	0.0595	0.0000	0.0000	1.035	0.0078	1.035
6	.	0.1500	0.1003	0.0000	0.0000	1.239	0.0442	1.239
7	.	0.1500	0.2868	0.0000	0.0000	1.434	0.1854	1.434
8	.	0.1500	0.4318	0.0000	0.0000	1.708	0.4379	1.708
9	.	0.1500	0.5165	0.0000	0.0000	2.053	0.5779	2.053
10	.	0.1500	0.6363	0.0000	0.0000	2.352	0.5910	2.352
11	.	0.1500	0.7840	0.0000	0.0000	2.777	0.6626	2.777
12	.	0.1500	0.8760	0.0000	0.0000	3.168	0.8186	3.168
13	.	0.1500	0.9478	0.0000	0.0000	3.885	0.6659	3.885
14	.	0.1500	0.9925	0.0000	0.0000	4.784	0.5676	4.784
15	.	0.1500	1.0000	0.0000	0.0000	5.476	0.6319	5.476
16+	.	0.1500	1.0000	0.0000	0.0000	4.819	0.6319	4.819
Unit	Thousands	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : MANJB001
Date and time: 10MAY96:11:43

Table 6.7.1.3

11:35 Friday, May 10, 1996

Greenland halibut (Fishing Areas V and XIV)

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	0.0383	0.0000	0.0000	1.025	0.0078	1.025
6	.	0.1500	0.0859	0.0000	0.0000	1.238	0.0442	1.238
7	.	0.1500	0.2453	0.0000	0.0000	1.499	0.1854	1.499
8	.	0.1500	0.4010	0.0000	0.0000	1.807	0.4379	1.807
9	.	0.1500	0.5409	0.0000	0.0000	2.177	0.5779	2.177
10	.	0.1500	0.6779	0.0000	0.0000	2.516	0.5910	2.516
11	.	0.1500	0.8051	0.0000	0.0000	2.904	0.6626	2.904
12	.	0.1500	0.8891	0.0000	0.0000	3.417	0.8186	3.417
13	.	0.1500	0.9459	0.0000	0.0000	4.107	0.6659	4.107
14	.	0.1500	0.9914	0.0000	0.0000	4.821	0.5676	4.821
15	.	0.1500	1.0000	0.0000	0.0000	5.421	0.6319	5.421
Unit	Numbers	-	-	-	-	Kilograms	-	Kilograms

Notes: Run name : YLDJB001
Date and time: 10MAY96:11:44

Table 6.7.2.1

11:35 Friday, May 10, 1996

Greenland halibut (Fishing Areas V and XIV)

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	12809.489	2.570	7949.404	2.570	7949.404
0.0500	0.0309	0.088	253.905	5.528	11773.756	2.336	7013.915	2.336	7013.915
0.1000	0.0618	0.161	449.164	5.291	10889.831	2.135	6222.567	2.135	6222.567
0.1500	0.0926	0.220	599.228	5.084	10132.549	1.961	5550.983	1.961	5550.983
0.2000	0.1235	0.269	714.470	4.902	9481.174	1.811	4979.116	1.811	4979.116
0.2500	0.1544	0.310	802.890	4.742	8918.591	1.680	4490.462	1.680	4490.462
0.3000	0.1853	0.345	870.653	4.599	8430.647	1.566	4071.408	1.566	4071.408
0.3500	0.2162	0.374	922.514	4.473	8005.620	1.465	3710.709	1.465	3710.709
0.4000	0.2470	0.399	962.134	4.360	7633.782	1.377	3399.061	1.377	3399.061
0.4500	0.2779	0.420	992.339	4.258	7307.043	1.299	3128.751	1.299	3128.751
0.5000	0.3088	0.439	1015.304	4.166	7018.664	1.230	2893.375	1.230	2893.375
0.5500	0.3397	0.455	1032.703	4.083	6763.016	1.168	2687.605	1.168	2687.605
0.6000	0.3706	0.469	1045.827	4.008	6535.388	1.113	2506.998	1.113	2506.998
0.6500	0.4014	0.482	1055.671	3.939	6331.830	1.063	2347.842	1.063	2347.842
0.7000	0.4323	0.493	1062.998	3.876	6149.019	1.018	2207.029	1.018	2207.029
0.7500	0.4632	0.503	1068.397	3.818	5984.151	0.978	2081.951	0.978	2081.951
0.8000	0.4941	0.512	1072.320	3.764	5834.861	0.941	1970.415	0.941	1970.415
0.8500	0.5250	0.521	1075.116	3.714	5699.139	0.907	1870.570	0.907	1870.570
0.9000	0.5558	0.528	1077.052	3.668	5575.281	0.877	1780.853	0.877	1780.853
0.9500	0.5867	0.535	1078.332	3.625	5461.832	0.849	1699.938	0.849	1699.938
1.0000	0.6176	0.542	1079.115	3.585	5357.549	0.823	1626.698	0.823	1626.698
1.0500	0.6485	0.548	1079.522	3.548	5261.367	0.799	1560.175	0.799	1560.175
1.1000	0.6794	0.553	1079.645	3.512	5172.368	0.777	1499.548	0.777	1499.548
1.1500	0.7102	0.559	1079.554	3.479	5089.762	0.756	1444.115	0.756	1444.115
1.2000	0.7411	0.564	1079.305	3.448	5012.865	0.737	1393.271	0.737	1393.271
1.2500	0.7720	0.568	1078.939	3.418	4941.083	0.719	1346.495	0.719	1346.495
1.3000	0.8029	0.573	1078.487	3.390	4873.899	0.703	1303.339	0.703	1303.339
1.3500	0.8338	0.577	1077.973	3.363	4810.861	0.687	1263.413	0.687	1263.413
1.4000	0.8646	0.581	1077.416	3.338	4751.573	0.673	1226.376	0.673	1226.376
1.4500	0.8955	0.585	1076.829	3.314	4695.687	0.659	1191.934	0.659	1191.934
1.5000	0.9264	0.588	1076.223	3.291	4642.897	0.646	1159.827	0.646	1159.827
1.5500	0.9573	0.592	1075.606	3.269	4592.931	0.634	1129.829	0.634	1129.829
1.6000	0.9882	0.595	1074.983	3.247	4545.550	0.622	1101.741	0.622	1101.741
1.6500	1.0190	0.598	1074.359	3.227	4500.537	0.611	1075.385	0.611	1075.385
1.7000	1.0499	0.601	1073.738	3.208	4457.704	0.601	1050.608	0.601	1050.608
1.7500	1.0808	0.604	1073.121	3.189	4416.879	0.591	1027.269	0.591	1027.269
1.8000	1.1117	0.607	1072.511	3.171	4377.908	0.581	1005.247	0.581	1005.247
1.8500	1.1426	0.610	1071.908	3.154	4340.655	0.572	984.431	0.572	984.431
1.9000	1.1734	0.612	1071.314	3.137	4304.994	0.564	964.724	0.564	964.724
1.9500	1.2043	0.615	1070.728	3.121	4270.814	0.555	946.037	0.555	946.037
2.0000	1.2352	0.617	1070.152	3.105	4238.013	0.548	928.292	0.548	928.292
-	-	Numbers	Grams	Numbers	Grams	Numbers	Grams	Numbers	Grams

Notes: Run name : YLDJB001
Date and time : 10MAY96:11:44
Computation of ref. F: Simple mean, age 8 - 12
F-0.1 factor : 0.4328
F-max factor : 1.1014
F-0.1 reference F : 0.2673
F-max reference F : 0.6802
Recruitment : Single recruit

Table 6.7.3.1

11:35 Friday, May 10, 1996

Greenland halibut (Fishing Areas V and XIV)

Prediction with management option table

Year: 1996					Year: 1997					Year: 1998	
F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	Stock biomass	Sp.stock biomass
1.0000	0.6176	141333	50632	30746	0.0000	0.0000	136787	45811	0	165438	63065
.	.	.	.	.	0.0500	0.0309	.	45811	1755	163534	61808
.	.	.	.	.	0.1000	0.0618	.	45811	3467	161679	60585
.	.	.	.	.	0.1500	0.0926	.	45811	5137	159870	59395
.	.	.	.	.	0.2000	0.1235	.	45811	6767	158105	58238
.	.	.	.	.	0.2500	0.1544	.	45811	8358	156384	57112
.	.	.	.	.	0.3000	0.1853	.	45811	9910	154705	56017
.	.	.	.	.	0.3500	0.2162	.	45811	11425	153068	54951
.	.	.	.	.	0.4000	0.2470	.	45811	12905	151470	53914
.	.	.	.	.	0.4500	0.2779	.	45811	14349	149912	52904
.	.	.	.	.	0.5000	0.3088	.	45811	15758	148391	51922
.	.	.	.	.	0.5500	0.3397	.	45811	17135	146907	50966
.	.	.	.	.	0.6000	0.3706	.	45811	18479	145459	50036
.	.	.	.	.	0.6500	0.4014	.	45811	19792	144046	49130
.	.	.	.	.	0.7000	0.4323	.	45811	21074	142666	48249
.	.	.	.	.	0.7500	0.4632	.	45811	22326	141319	47390
.	.	.	.	.	0.8000	0.4941	.	45811	23550	140004	46555
.	.	.	.	.	0.8500	0.5250	.	45811	24745	138721	45741
.	.	.	.	.	0.9000	0.5558	.	45811	25913	137467	44949
.	.	.	.	.	0.9500	0.5867	.	45811	27054	136243	44177
.	.	.	.	.	1.0000	0.6176	.	45811	28170	135047	43425
.	.	.	.	.	1.0500	0.6485	.	45811	29260	133879	42693
.	.	.	.	.	1.1000	0.6794	.	45811	30325	132739	41980
.	.	.	.	.	1.1500	0.7102	.	45811	31367	131624	41286
.	.	.	.	.	1.2000	0.7411	.	45811	32385	130535	40609
.	.	.	.	.	1.2500	0.7720	.	45811	33381	129471	39950
.	.	.	.	.	1.3000	0.8029	.	45811	34355	128432	39307
.	.	.	.	.	1.3500	0.8338	.	45811	35307	127415	38681
.	.	.	.	.	1.4000	0.8646	.	45811	36238	126422	38071
.	.	.	.	.	1.4500	0.8955	.	45811	37149	125451	37477
.	.	.	.	.	1.5000	0.9264	.	45811	38041	124502	36897
-	-	Tonnes	Tonnes	Tonnes	-	-	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

Notes: Run name : MANJB002
Date and time : 10MAY96:11:44
Computation of ref. F: Simple mean, age 8 - 12
Basis for 1996 : F factors

Table 6.7.3.2

11:35 Friday, May 10, 1996

Greenland halibut (Fishing Areas V and XIV)

Prediction with management option table

Year: 1996					Year: 1997					Year: 1998	
F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	F Factor	Reference F	Stock biomass	Sp.stock biomass	Catch in weight	Stock biomass	Sp.stock biomass
1.0000	0.6176	162301	53597	32086	0.0000	0.0000	162805	51415	0	198215	72314
.	.	.	.	.	0.0500	0.0309	.	51415	1944	196103	70959
.	.	.	.	.	0.1000	0.0618	.	51415	3843	194041	69640
.	.	.	.	.	0.1500	0.0926	.	51415	5697	192028	68357
.	.	.	.	.	0.2000	0.1235	.	51415	7508	190063	67107
.	.	.	.	.	0.2500	0.1544	.	51415	9277	188145	65890
.	.	.	.	.	0.3000	0.1853	.	51415	11005	186272	64704
.	.	.	.	.	0.3500	0.2162	.	51415	12694	184444	63550
.	.	.	.	.	0.4000	0.2470	.	51415	14343	182658	62427
.	.	.	.	.	0.4500	0.2779	.	51415	15955	180914	61332
.	.	.	.	.	0.5000	0.3088	.	51415	17531	179210	60266
.	.	.	.	.	0.5500	0.3397	.	51415	19071	177547	59227
.	.	.	.	.	0.6000	0.3706	.	51415	20576	175921	58216
.	.	.	.	.	0.6500	0.4014	.	51415	22047	174333	57230
.	.	.	.	.	0.7000	0.4323	.	51415	23486	172781	56269
.	.	.	.	.	0.7500	0.4632	.	51415	24892	171265	55334
.	.	.	.	.	0.8000	0.4941	.	51415	26267	169783	54422
.	.	.	.	.	0.8500	0.5250	.	51415	27613	168335	53533
.	.	.	.	.	0.9000	0.5558	.	51415	28928	166919	52666
.	.	.	.	.	0.9500	0.5867	.	51415	30215	165535	51822
.	.	.	.	.	1.0000	0.6176	.	51415	31474	164182	50999
.	.	.	.	.	1.0500	0.6485	.	51415	32705	162859	50196
.	.	.	.	.	1.1000	0.6794	.	51415	33910	161565	49414
.	.	.	.	.	1.1500	0.7102	.	51415	35090	160300	48651
.	.	.	.	.	1.2000	0.7411	.	51415	36244	159062	47907
.	.	.	.	.	1.2500	0.7720	.	51415	37373	157852	47181
.	.	.	.	.	1.3000	0.8029	.	51415	38479	156667	46474
.	.	.	.	.	1.3500	0.8338	.	51415	39561	155509	45783
.	.	.	.	.	1.4000	0.8646	.	51415	40621	154375	45110
.	.	.	.	.	1.4500	0.8955	.	51415	41659	153266	44453
.	.	.	.	.	1.5000	0.9264	.	51415	42675	152180	43812
-	-	Tonnes	Tonnes	Tonnes	-	-	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

Notes: Run name : MANJB001
Date and time : 10MAY96:11:43
Computation of ref. F: Simple mean, age 8 - 12
Basis for 1996 : F factors

Table 7.2.1 REDFISH. Nominal catches (tonnes) by countries, in Division Va 1981-1995, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988
Belgium	283	389	291	400	423	398	372
Faroe Islan	1,046	1,357	686	291	144	332	372
Germany, F	-	-	-	-	-	-	-
Iceland	115,051	122,749	108,270	91,381	85,992	87,768	93,995
Norway	11	32	12	8	2	7	7
Total	116,391	124,527	109,259	92,080	86,561	88,505	94,746

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Belgium	190	70	146	107	96	50	
Faroe Islan	394	624	412	389	438	202	
Germany, F	-	-	-	-	-	40	61
Iceland[2]	91,536	90,891	96,770	94,382	96,577	95,091	94,000
Norway	1	-	-	-	-	-	-
Total	92,121	91,585	97,328	94,878	97,111	95,383	94,061

1) Provisional

2) Oceanic *S. mentella* not included

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		91,536		1	92,121
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	96	438		99,180	[3]	0	99,714
1994	50	202	40	15,674	[4]	0	15,966
1995 [1]			61	91,010	[5]	0	91,071

1 Provisional data

2 Including 1968 tonnes oceanic S. mentella.

3 Including 2603 tonnes oceanic S. mentella.

4 Including 15472 tonnes oceanic S. mentella.

5 Including 1543 tonnes oceanic S. mentella.

Table 7.2.3 REDFISH. Nominal catches (tonnes) by countries, in Division Vb 1981-1995, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988
Denmark	-	-	-	-	-	36	176	8
Faroe Islan	3,232	3,999	4,642	8,770	12,634	15,224	13,477	12,966
France	59	204	439	559	1,157	752	819	582
Germany,	3,841	4,660	4,300	4,460	5,091	5,142	3,060	1,595
Iceland	-	1	-	-	-	-	-	
Norway	13	7	3	1	4	2	5	5
UK (Engl.	-	-	-	-	-	-	-	
USSR	-	-	-	142	-	-	-	
Total	7,145	8,871	9,384	13,932	18,886	21,156	17,537	15,156

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Denmark	-	+	-	-	-	-	-
Faroe Islan	12,636	10,017	14,090	15,279	9,687	8,872 [1]	
France [1]	996	909	473	114	32		
Germany,	1,191	441	447	450	239	155	44
Norway	21	21	20	34	26 [1]	31 [1]	33
UK (Engl.	-	-	2	21	28	1	
UK (Scotla	-	+	1	8	1	18	
United Kingdom							26
USSR/Russ	-	-	-	15	44	3	
Total	14,844	11,388	15,033	15,921	10,057	9,080	103

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	0	8,872	61 [3]	155	0	0	31	0	19	3	9,141
1995 [1]	0	8,030	18 [3]	44	0	0	33	0	26	9 [3]	8,160

1 Provisional data.
2 USSR 1978-1991, Russia 1992-1994
3 Reported to Faroese costal guard service

Table 7.2.5 REDFISH. Nominal catches (tonnes) by countries,
in Sub-area VI 1981-1995, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988
Faroe Islan	-	-	-	19	18	-	-	1
France	24	44	93	102	397	480	1,032	1,024
Germany,	983	604	359	563	76	24	-	16
Ireland	-	-	-	-	-	-	-	-
Norway	3	4	2	9	-	14	2	1
Spain	1	-	2	-	-	-	-	-
UK (Engl.	-	2	-	1	1	2	3	75
UK (Scotla	-	-	-	1	-	10	17	6
Total	1,011	654	456	695	492	530	1,054	1,123

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Faroe Islan	61	-	22	6	-	- [1]	
France [1]	726	684	483	127	268		
Germany,	1	6	8	-	77	87	5
Ireland	-	-	-	1	1	-	
Norway	2	5	+	4 [1]	3 [1]	2 [1]	8
Spain							
UK (Engl.	4	29	11	4	4	9	...
UK (Scotla	4	6	39	32	94	118	...
United Kingdom							599
Total	798	730	563	174	447	216	612

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	268	77	1	3	0	98	453
1994	0		87	0	2	0	127	216
1995 [1]	0		5		8	0	599	612

1 Provisional data.

Table 7.2.7 REDFISH. Nominal catches (tonnes) by countries,
in Sub-area XII 1982-1995, as officially reported to ICES and/or FAO.

Country	1982	1983	1984	1985	1986	1987	1988
Bulgaria	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-
Faroe Islan	-	-	-	-	-	-	-
Germany,	5,696	2,209	-	-	-	-	-
Germany,	-	-	-	-	-	-	-
Greenland	-	-	-	-	-	-	-
Iceland	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-
Lithuania	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-
UK (Scotla	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	
USSR	39,783	60,079	60,643	17,300	24,131	2,948	9,772
Total	45,479	62,288	60,643	17,300	24,131	2,948	9,772

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Bulgaria	-	1,617	-	628	3,216		
Estonia	-	-	-	1,810	6,365	17,875	421
Faroe Islan	-	-	-	-	4,026	2,896 [1]	
Germany' F	353	7	62	1,084	6,459	6,354	9,673
Greenland	-	-	-	9	710	-	
Iceland	567	185	95	361	8,098	17,892	18,000
Latvia	-	-	-	780	6,803	13,205	5,002
Lithuania	-	-	-	6,656	7,899	7,404	
Netherland	-	-	-	-	-	-	13
Norway	-	249	726	10,560 [1]	6,207 [1]	4,275	4,168
Poland	112	-	-	-	-	-	
UK (Scotla	-	-	-	-	+	-	
Ukraine	-	-	-	160	2,622	-	3,185
USSR/Russ	15,543	4,274	6,624	2,485	4,106	10,489	
Total	16,575	6,332	7,507	24,533	56,511	80,390	40,462

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	Canada	Estonia	Faroes	France	FRG [4]	reenland	Iceland	Japan	Latvia	ithuania	Nederland	Norway	Poland	Ukraine	Russia [3]	Spain	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		16,666
1990	1,617		0		0	7	0	215 5					926 [2]	0		4,274		7,039
1991	0		0		0	370	0	110 5					764 [2]	0		6,624		7,868
1992	628		1,810		2	1,280	9	110 5		780	6,656		369 [2]	0	160	11,266		23,070
1993	3,216		6,365	4,026	0	6,144	8	0 5		6,803	7,899		5,735 [2]	0	2,622	18,669		61,487
1994			17,875	2,896	606 [6]	7,058	0	0 5		13,205	7,404		4,774 [2]	0	0	10,489		64,307
1995 [1]		602 [7]	421	5,239	226 [6]	7,570	156	20,880 5	1,146	5,002		0	3,201 [2]	0	3,185	32,730	20	80,378

1 Provisional data.

2 Area and quantum adjusted according to official log-books and raised (by 5% prior to 1994 and 3% in 1994-1995) to account for discarding.

3 USSR 1981-1991, Russia 1992-1995.

4 Includes former GDR.

5 Raised by 16% to account for discarding.

6 As reported to Greenland

7 Taken in NAFO area 1F

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	1982	1983	1984	1985	1986	1987	1988
Bulgaria	-	-	2,961	5,825	11,385	12,270	8,455
Denmark	11	-	-	-	-	-	-
Faroe Islan	-	27	-	-	5	382	1,634
Germany,	-	155	989	5,438	8,574	7,023	22,582 [4]
Germany, F	37,119	28,878	14,141	5,974	5,584	4,691	
Greenland	+	1	10	5,519	9,542	670	42
Iceland	17	-	-	+	-	-	-
Norway	-	-	17	-	-	-	-
Poland	581	-	239	135	149	25	-
UK (Engl.	-	-	-	-	-	-	-
UK (Scotla	-	-	-	-	-	-	-
United Kingdom							-
USSR/Russ	20,217	-	-	42,973	60,863	68,521	55,254
Total	57,945	29,061	18,357	65,864	96,102	93,582	87,967

Country	1989	1990	1991	1992	1993	1994	1995 [1]
Bulgaria	4,546	1,073	-	-	-		
Denmark	-	-	-	-	-	-	
Faroe Islan	226	-	115	3,765	3,095	164 [1]	
Germany, F	8,816	11,218	9,122	7,959	26,969	22,406	9,702
Greenland	3	24	42	962	264	422	
Iceland	814	3,726	7,477	12,982	11,650	29,114	7,000
Norway	-	6,070	4,954	14000	7,162 [1]	2,609 [1]	2,429
Portugal	-	-	-	-	-	1,887	
UK (Engl.	5	39	219	178	241	138	...
UK (Scotla	-	3	+	28	8	4	...
United Kin	-	-	-	-	-		58
USSR/Russ	7,177	3,040	2,665	1,844	6,560	13,917	
Total	21,587	25,193	24,594	41,718	55,949	70,661	19,189

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	Danmark	Faroes	FRG [5]	Greenland	Iceland	Japan	Norway	Poland	Portugal	UK	Russia [3]	Spain	Total
1978	0		0	20,711	3	151	0	2	0		13	0		20,880
1979	0		0	20,428	0	0	0	0	0		0	0		20,918
1980	0		0	32,520	0	89	0	0	0		0	0		32,609
1981	0		18	42,980	1	0	0	0	0		0	0		42,999
1982	0		0	42,815	0	17	0	0	581		0	20,217		63,630
1983	0		27	30,970	1	0	0	0	0		0	0		30,998
1984	2,961		0	15,130	10	0	0	15	239		0	0		18,355
1985	5,825		0	11,412	5,519	0	0	0	135		0	42,973		65,864
1986	11,385		5	14,158	9,542	0	0	0	149		0	60,683		95,922
1987	12,270		382	11,714	2,912	0	0	0	25		0	68,521		95,824
1988	8,455		1,634	22,582	3,751	0	0	0	0		0	55,254		91,676
1989	4,546		226	8,816	285	3,158 [4]	307	0	0		5	7,177		24,520
1990	1,073		0	11,218	24	4,322 [4]	3,450	6,159 [2]	0		42	4,973		31,261
1991	0		115	10,028	42	8,673 [4]	1,224	5,434 [2]	0		219	2,665		28,400
1992	0		3,765	8,893	3,769	13,091 [4]	0	14,322 [2]	0		206	4,467		48,513
1993	0		3,095	26,404	264	10,911 [4]	938	8,848 [2]	0		241	5,496		56,197
1994			164	23,474	422	17,105 [4]		2,665 [2]		1,887	142	13,917		59,776
1995 [1]		14	10	11,805	400 [6]	8,120 [4]	89 [7]	3,378 [2]		5,125	58	9,452	4,535	42,986

1) Provisional data.

2 Area and quantum adjusted according to official log-books and raised (by 5% prior to 1994 and 3% in 1994-1995) to account for discarding.

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

4) Raised by 16% to account for discarding.

5) Includes former GDR

6) Estimated bycatch in the shrimfishery

7) Estimated bycatch in the shrimfishery

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Table 7.2.11. 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.*	*S.ment.*		*S.mar.*	*S.ment.*		S.mar.	S.ment.		*S.ment.*	*S.mar.*	*S.ment.*	*S.ment.*
		deep-sea	oceanic			deep-sea			deep-sea		oceanic		deep-sea	oceanic
Belgium	1.00													
Estonia											1.00			
Faroes	1.00	0.00	0.00		0.25	0.75					1.00	0.00	1.00	0.00
France						1.00					1.00			
Germany	0.00	1.00	0.00			1.00		0.00	1.00		1.00	0.06	0.51	0.43
Greenland											1.00	0.10	0.90	
Iceland	0.35	0.51	0.14								1.00			1.00
Latvia											1.00			
Lithuania											1.00			
Norway					1.00	0.00		1.00	0.00		1.00	0.02		0.98
Portugal														1.00
Russia					1.00	0.00					1.00	0.00	0.47	0.53
UK					1.00	0.00		1.00				0.11	0.90	

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.

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Table 7.2.12. Proportions used for splitting the 1995 REDFISH landings between *S.marinus* and *S.mentella* stocks.

Area	Va			Vb		VI		XII	XIV		
Species/stock	*S.mar.*	*S.ment.*	*S.ment.*	*S.mar.*	*S.ment.*	S.mar.	S.ment.	*S.ment.*	*S.mar.*	*S.ment.*	*S.ment.*
		deep-sea	oceanic		deep-sea		deep-sea	oceanic		deep-sea	oceanic
Belgium	1.00										
Canada								1.00			
Danmark										1.00	
Estonia								1.00			
Faroes				0.31	0.69			1.00	0.00	1.00	0.00
France					1.00						
Germany	0.00	1.00	0.00		1.00	0.00	1.00	1.00	0.00	0.04	0.96
Greenland								1.00	0.10	0.90	
Iceland	0.46	0.53	0.02					1.00			1.00
Japan								1.00			1.00
Latvia								1.00			
Nederlands								1.00			
Norway				1.00	0.00	1.00	0.00	1.00	0.01		0.99
Portugal											1.00
Russia				1.00	0.00			1.00			1.00
Spain								1.00			1.00
Ukraine								1.00			
UK				1.00	0.00	1.00		1.00	0.03	0.97	

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.

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

Year	Number
1970	8.6
1971	12.6
1972	31.1
1973	74.0
1974	23.6
1975	12.5
1976	5.8
1977	13.0
1978	6.5
1979	1.3
1980	3.0
1981	9.0
1982	2.7
1983	0.7
1984	4.3
1985	22.6
1986	12.1
1987	22.9
1988	17.0
1989	14.3
1990	23.5
1991	26.4
1992	11.6
1993	4.0
1994	5.8
1995	13.9

Table 7.3.2 Sebastes spp. (<17 cm). Abundance indices (n*1000) for West, East Greenland and total by stratum, 1982-95. 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
1995					399	10236	855	34694	46184

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
1995	274128	2671933	4072	188899		3061	3142093	3188277	106

Table 7.3.3 Sebastes spp. (<17cm). Biomass indices (tons) for West, East Greenland and total by stratum, 1982-95. 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
1995					6	330	10	347	693

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
1995	3834	40792	46	9749		190	54611	55303	97

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	49,677	2,140	292	0	4,255	56,364
1992	51,464	3,470	40	0	746	55,721
1993	45,890	2,631	101	0	1,737	50,360
1994	38,669	2,271	129	0	1,443	42,512
1995 [1]	41,513	2,594	607	0	84	44,798

1) Provisional data.

Table 8.2.2 S. marinus (≥17 cm). Abundance indices (n*1000) for West, East Greenland and total by stratum, 1982-95. 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 Gr.
m									
1982	7015	6340	88792	5512	5736	14876	4087		132358
1983	4025	3186	3355	6523	4043	5885	1697		28714
1984	1324	3438	460	1209	10671	2776	4214		24092
1985	4658	10451	6158	1569	3220	14441	4973		45470
1986	6327	4324	2077	3483	21503	2883	2717		43314
1987	906	653	1327		9612		659		13157
1988	831	2239	342	2255	5938	1954	731		14290
1989	421	422	776	690	6489		361		9159
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	2192
1993	169	481	59	267	80	132	0		1188
1994	111	325	156	167	65	46	151	247	1268
1995					51	67	38	146	302

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Gr.	Greenland	CI
m									
1982		195798		312132		38899	546829	679186	55
1983		140766	453	264813		14365	420397	449110	53
1984	6888			47974		9890	(64752)	(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	64889	66074	93
1994						3348	(3348)	(4615)	41
1995	346	1521	153	38892		2060	42972	43274	97

Table 8.2.3 S. marinus (≥17.5cm). Biomass indices (tons) for West, East Greenland and total by stratum, 1982-95. 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
1995					19	19	20	43	101

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenlan d	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
1995	114	712	51	8896		1141	10914	11014	38

Table 8.2.4 *S. marinus*. Parameters for the age-structured dynamic production mo

Von Bertanlanffy:

K	0.075	FIXED (estimated giving approx. same results)
L-inf	50.0	FIXED (estimated giving approx. same results)

Fishing pattern:

L_{50}	32.5	ESTIMATED
Kc	0.65	ESTIMATED

Length -weight rel.:

cond	0.015000	FIXED
Power	2.9730	FIXED

Recruitment:

R0	105914	ESTIMATED

Parametes for alternative method (Recruitment from O-group survey):

Von Bertanlanffy:

K	0.075	FIXED
L-inf	50.003	FIXED

Fishing pattern:

L_{50}	34.010	ESTIMATED
Kc	0.40	ESTIMATED

Length -weight rel.:

cond	0.015000	FIXED
Power	2.9730	FIXED

Recruitment:

Multiple factor on R0 from O-group survey. ESTIMATED see Table 7.

R0 18327

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	47,651	12,897	271	0	7,057	67,876
1992	43,414	12,533	137	0	6,992	63,075
1993	51,221	7,804	352	0	14,821	74,197
1994	56,714	6,870	87	0	19,305	82,976
1995 [1]	48,015	5,566	5	0	990	54,576

1) Provisional data.

Table 9.2.1 *S. mentella.* CPUE from Icelandic trawlers, catches in Va and effort in S. mentella.

Year	CPUE	Catch	Effort
1988	886	14,000	16
1989	974	41,000	42
1990	847	29,000	34
1991	770	46,524	60
1992	612	43,642	71
1993	547	51,504	94
1994	488	56,792	116
1995	508	47,913	94
1996*	508	47,913	94

* Assumed to be same as in 1995

Table 9.2.2 *S. mentella* (≥17 cm). Abundance indices (n*1000) for West, East Greenland and total by stratum, 1982-95. 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
1995					29	234	96	1468	1827

cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenlan d	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		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
1995	265	24463	1173	2394064		83314	2503279	2505106	55

Table 9.2.3 *S. mentella* (≥17 cm). Biomass indices (tons) for West, East Greenland and total by stratum, 1982-95. 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
1995					5	25	10	159	199

Table cont'd

year/stratum	5.1	5.2	6.1	6.2	7.1	7.2	East Greenl.	Greenlan d	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

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	16,666	21,551	38,217
1990	0	0	0	7,039	24,477	31,516
1991	0	0	0	7,868	17,088	24,956
1992	1,968	0	0	23,379	40,775	66,122
1993	2,603	0	0	70,881	39,639	113,123
1994	15,472	0	0	85,062	39,028	139,562
1995 [1]	1,543	0	0	80,391	41,912	123,846

1) Provisional data.

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

Year	Bulgaria	Canada	Estonia	Faroes	France	FRG [3]	Greenland	Iceland	Japan	Latvia	Lithuania	Netherlands	Norway	Poland	Portugal	Russia [2]	Spain	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	571	0	8,783					6,198	0		9,289			24,956
1992	628		1,810	3,765	2	6,447	9	15,478		780	6,656		14,654	0		15,733		160	66,122
1993	3,216		6,365	7,121	0	17,498	8	22,908		6,803	7,899		14,518	0		24,165		2,622	113,123
1994			17,875	2,896	606	17,152	0	53,332		13,205	7,404		7,391	0	1,887	17,814			139,562
1995 [1]		602 [4]	421	5,239	226	18,900	156	30,543	1,146	5,002		13	6,551	0	5,125	42,182	4,555	3,185	123,846

1) Provisional data.

2) USSR 1981-1991; Russia since 1992.

3) Includes former GDR.

4) Taken in NAFO area 1F.

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Table 10.1.3 Oceanic *S. mentella*. Catch per unit effort 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	-	-	-	2.83	1.70
1995 [1]	-	-	-	2.1	1.00

1) Preliminary

Table 10.2.1. Oceanic S. mentella biomass from Russian and joint trawl-acoustic surveys in 1982-1995.

Year	Area surveyed, thou. sq. miles			Abundance, mill. spec.			Biomass, thou.t		
	Greenl EEZ	Intern waters	Total	Greenl EEZ	Intern waters	Total	Greenl EEZ	Intern waters	Total
1982	-	40	40	-	790	790	-	560	560
1983	-	50	50	-	960	960	-	700	700
1984	-	55	55	-	660	660	-	526	526
1985	-	71	71	-	1122	1122	-	700	700
1986	74	43	117	989	923	1912	610	570	1180
1987	59	156	215	682	1221	1903	437	783	1220
1988	72	91	163	796	714	1510	504	452	956
1989	70	79	149	570	1040	1610	336	582	918
1990	-	73	73	-	1495	1495	-	848	848
1991	45	60	105	387	274	661	227	169	396
1992*	40	150	190	950	1600	2550	600	1000	1600
1993	55	65	120	2493	1693	4186	1557	999	2556
1994**			190			3496			2190
1995	88	79	167	2514	1577	4091	1640	841	2481

* - joint Russian-Icelandic survey,

** - joint Icelandic-Norwegian survey.

Table 10.2.2. Oceanic S. mentella abundance and biomass from the ichthyoplankton survey of 1995.

Indices	Northern area	Southern area	Total reproduct. area
Square surveyed, thou. sq. miles	46.7	89.3	136.0
Females abundance, spec.*10^8	5.2	11.1	16.3
Males abundance, spec.*10^8	2.2	17.8	20.0
Females biomass, thou.t	440.7	1062.0	1502.7
Males biomass, thou.t	165.4	1280.5	1445.9
Total biomass, thou.t	606.1	2342.5	2948.6

Table 10.2.3. Oceanic S. mentella biomass from the the Russian ichthyoplankton surveys in 1982-1995.

Years	Square surveyed, thou. sq. miles			Redfish abundance, mill. spec.			Redfish biomass, thou. t		
	Ice-land EEZ	Intern. waters	Total	Ice-land EZ	Intern. waters	Total	Ice-land EZ	Intern. waters	Total
1982	-	88	88	-	662	662	-	421.3	421.3
1983	-	148	148	-	1944	1944	-	1198.0	1198.0
1984	-	96	96	-	1423	1423	-	957.0	957.0
1985	-	100	100	-	1169	1169	-	687.0	687.0
1986	42	98	140	9602	1136	10738	1011.9	680.3	1692.2
1987	-	114	114	-	1032	1032	-	646.1	646.1
1988	178	99	277	723	1212	1936	396.4	636.2	1031.6
1989	90	100	190	393	998	1391	263.3	607.6	870.9
1990	39	81	120	420	890	1310	280.7	677.3	863.0
1991	-	115	115	-	1390	1390	-	801.6	801.6
1992	No survey								
1993	-	126	126	-	4460	4460	-	3119.4	3119.4
1994	No survey								
1995	-	136	136	-	3640	3640	-	2948.7	2948.7

Table 10.4.1. Oceanic *S.mentella*. Input parameters for the stock production model.

von Bertalanffy:		
t0	0	FIXED
K	0.120	FIXED
L-inf	40	FIXED
Fishing pattern:		
1/(1+exp(-Kc(L-L50c)))		
L50c	28.0	ESTIMATED
Kc	6.97	ESTIMATED
Length-weight rel.:		
cond	7E-06	FIXED
power	3.16	FIXED
Recruitment:		
R0	407281	ESTIMATED

Figure 2.1.1 The Faroe area and adjacent areas divided into ICES Divisions. The Faroese 200 Miles economic zone is indicated.

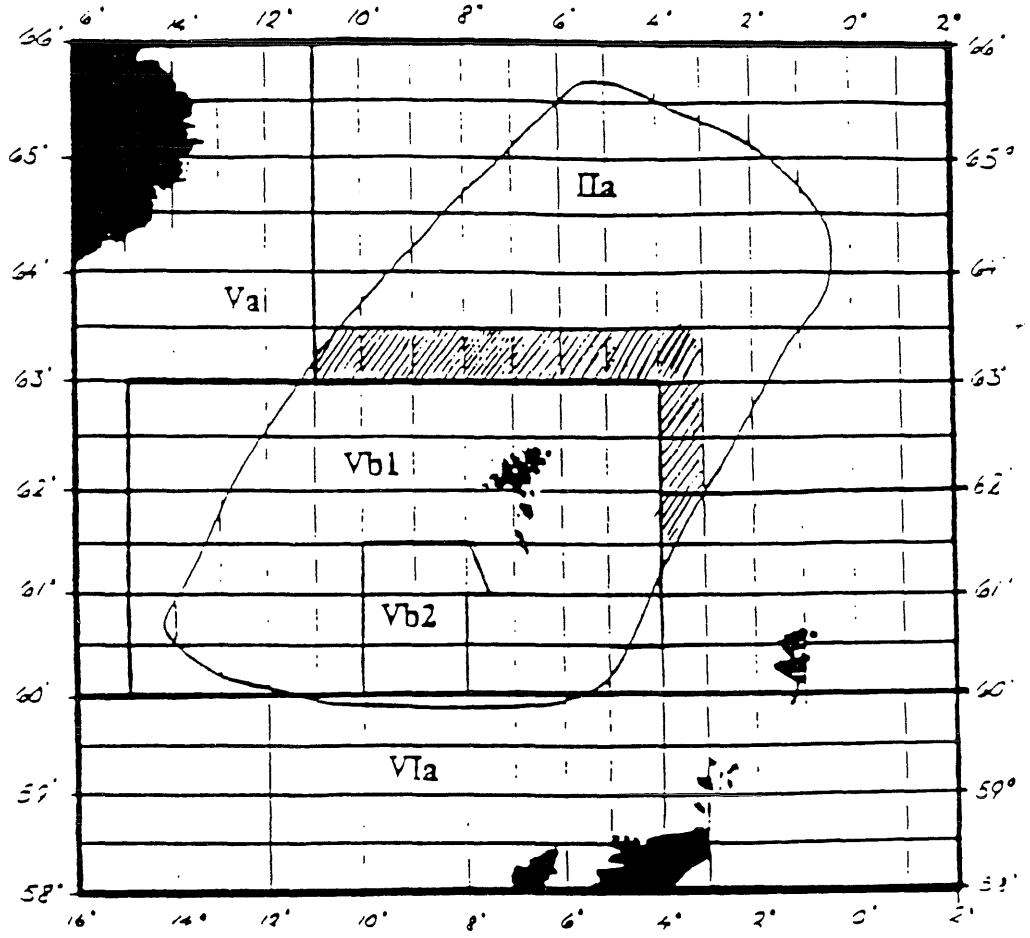
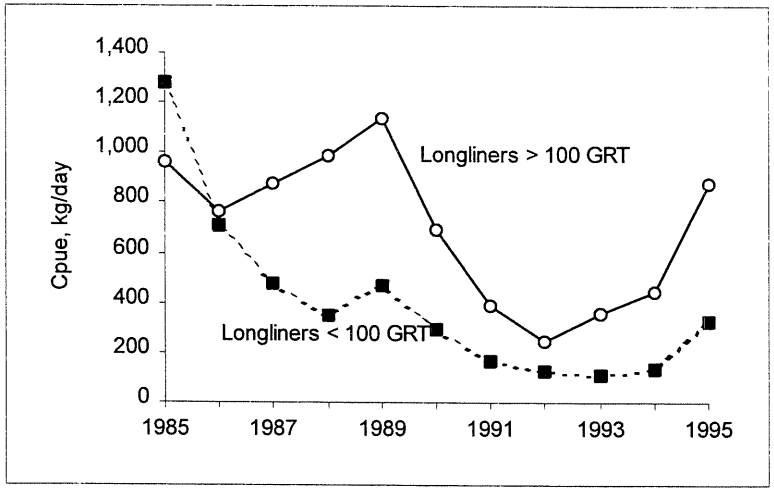
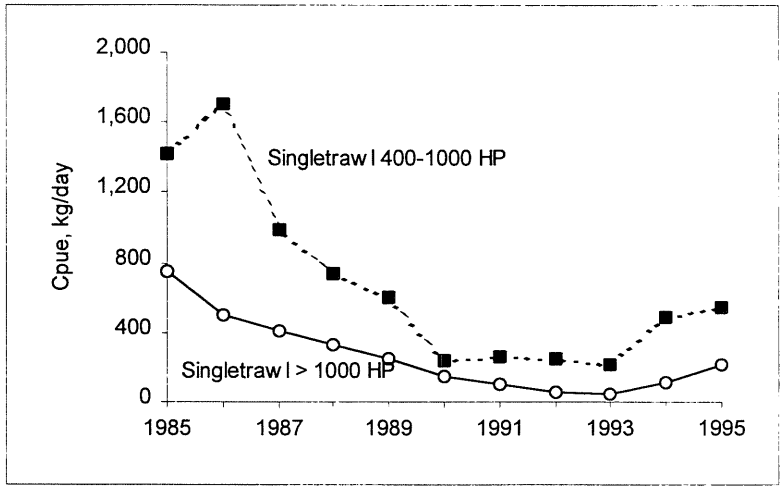
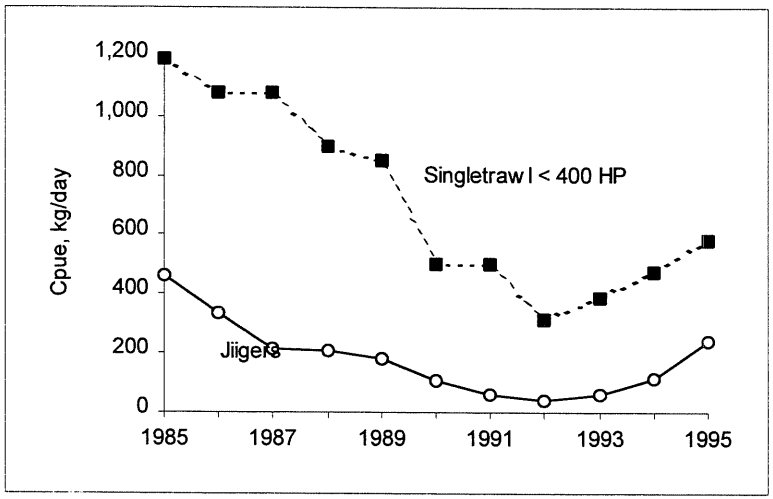


Figure 2.2.1 Catch per unit effort of Faroe Plateau cod January–December (kg/day)







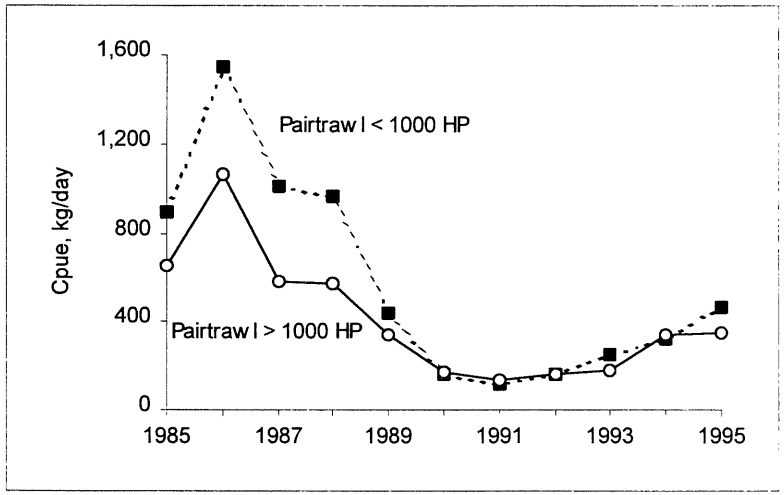


Figure 2.2.2 Mean weight at age for Faroe Plateau cod 1978–1995.

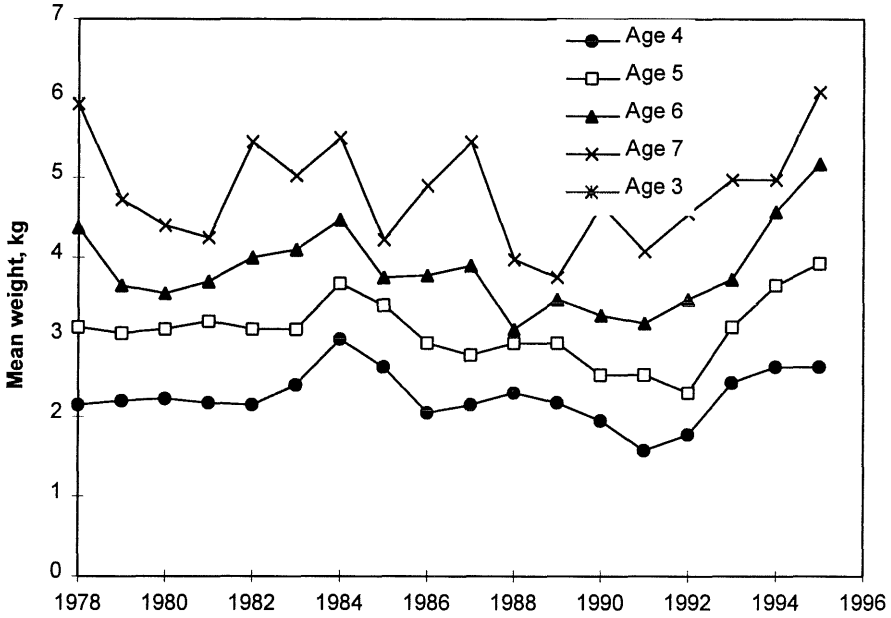


Figure 2.2.3 Faroe Plateau cod mean weight at age 1st quarter each year 1986–1996. Based on samples from commercial landings.

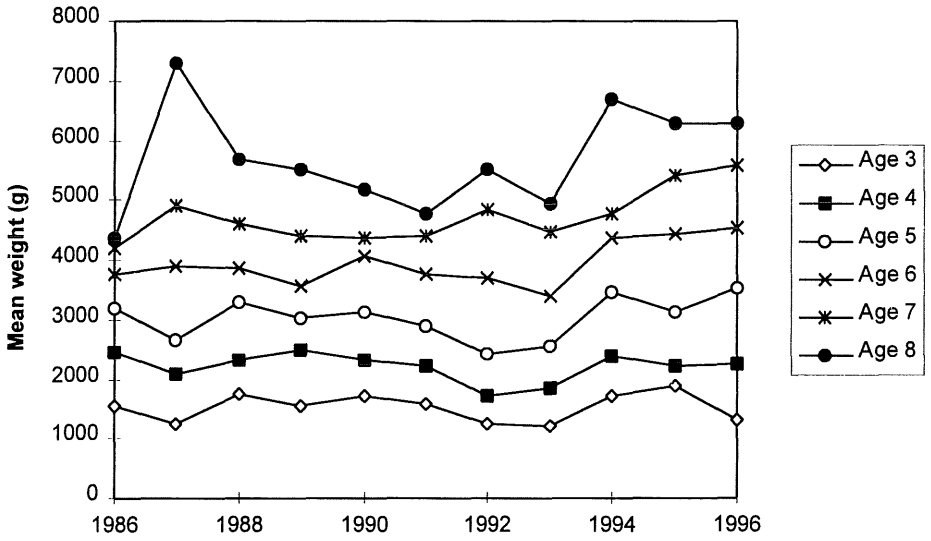


Figure 2.2.4 Faroe Plateau cod. Proportion mature at age as observed and smoothed as running 3 years average.

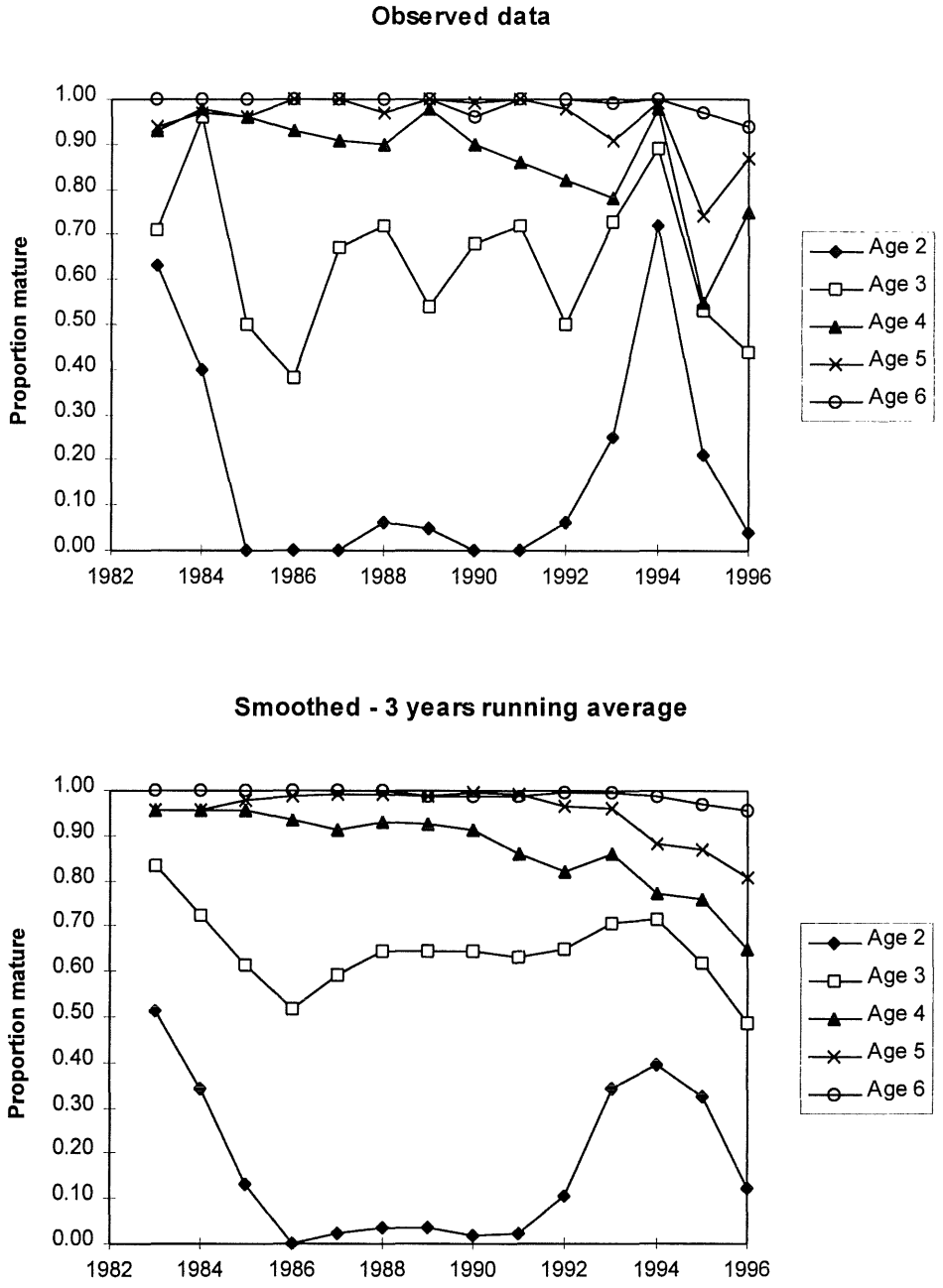


Figure 2.2.5 Spawning stock biomass calculated using observed proportion mature at age and smoothed (3 years running average) values.

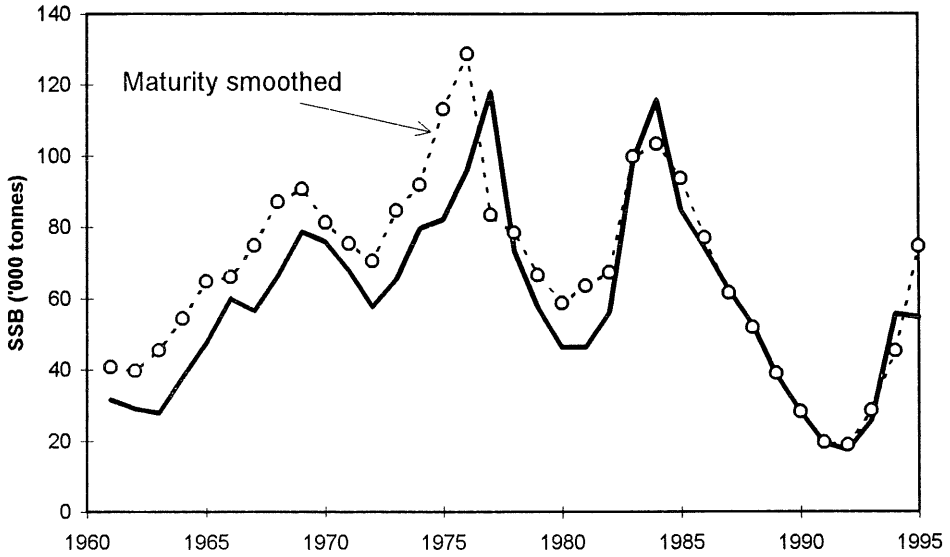


Figure 2.2.6 Catch of Faroe Plateau cod (kg) per unit effort in the groundfish surveys 1983–1996.

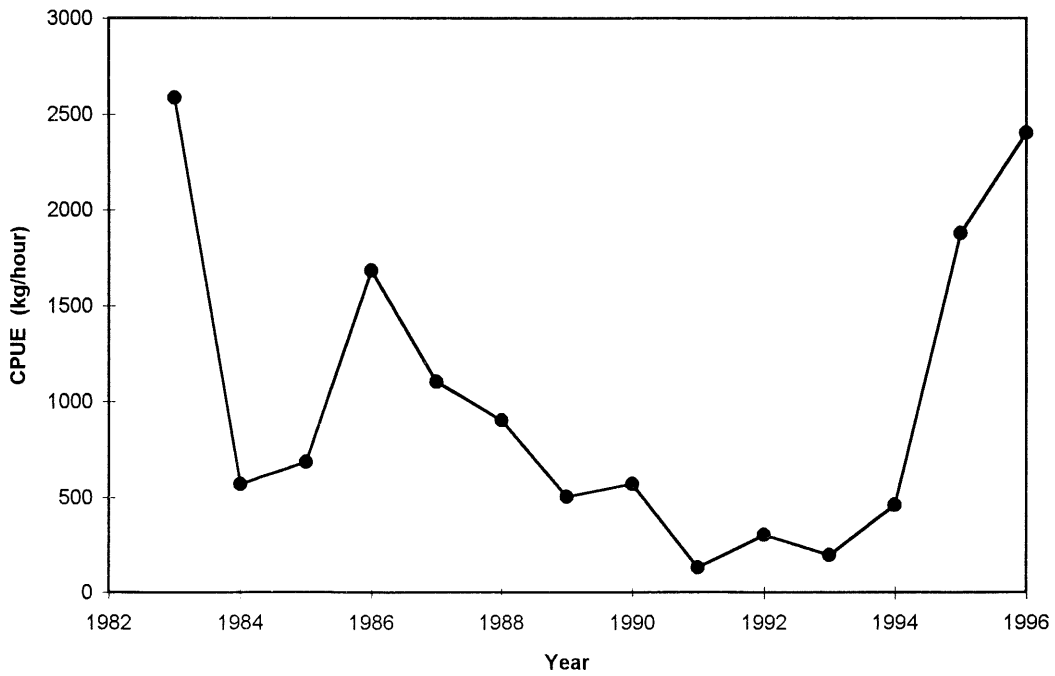


Figure 2.2.7 The stratified mean catch of cod per trawl hour in the groundfish surveys on Faroe Plateau 1983–1996.

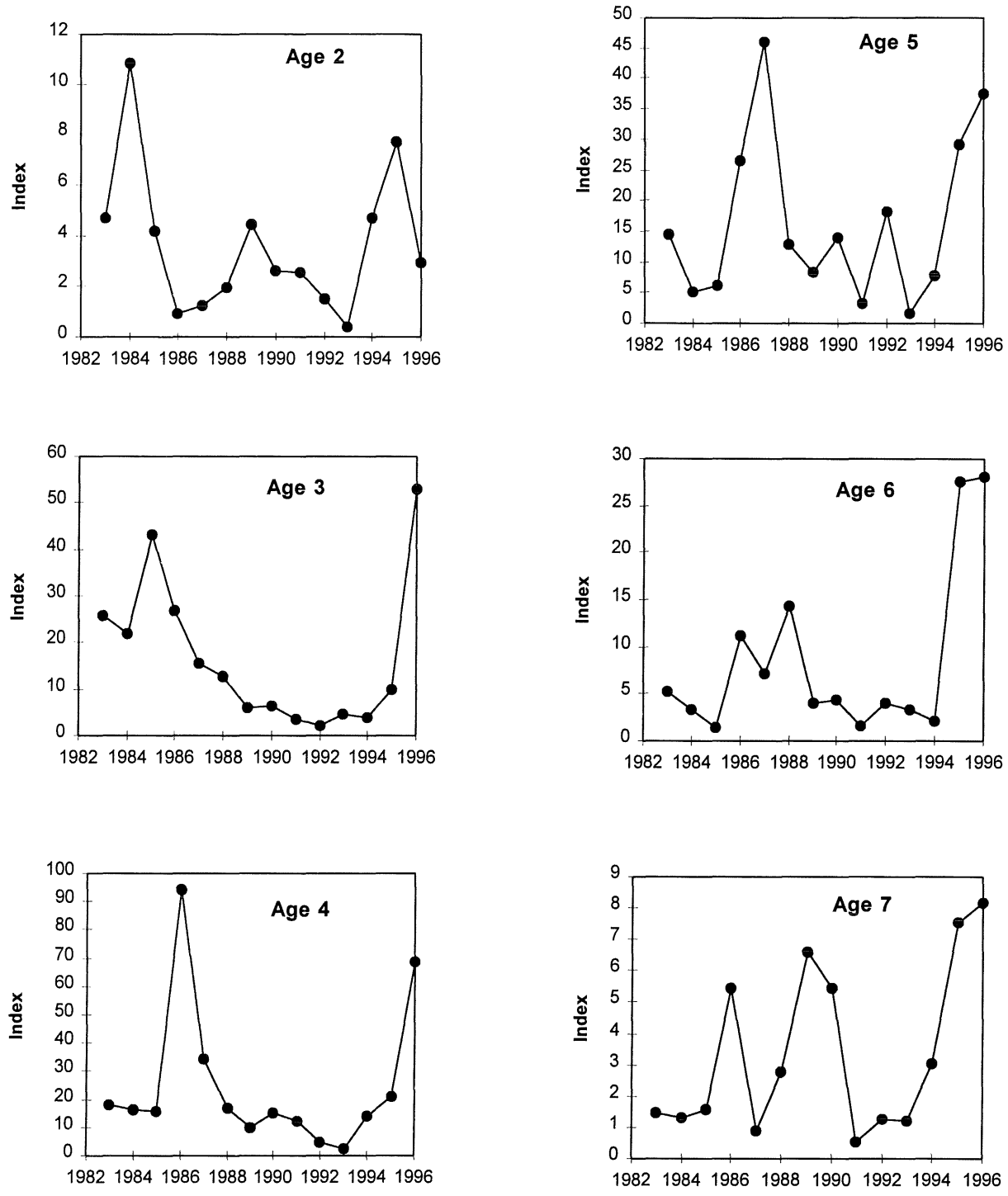


Figure 2.2.8 Faroe Plateau Cod: Results of ADAPT calibrations with the research vessel survey index of stock size alone by 5 year periods to investigate changes in the availability of cod to the survey. The 5 year periods correspond to the catch at age used while the survey index for the year following the last year of catch at age data in each period was included in the calibration. The last period, 1991 to 1995, is strikingly different from the other periods, suggesting that the series cannot be treated as a consistent continuous time series of stock size.

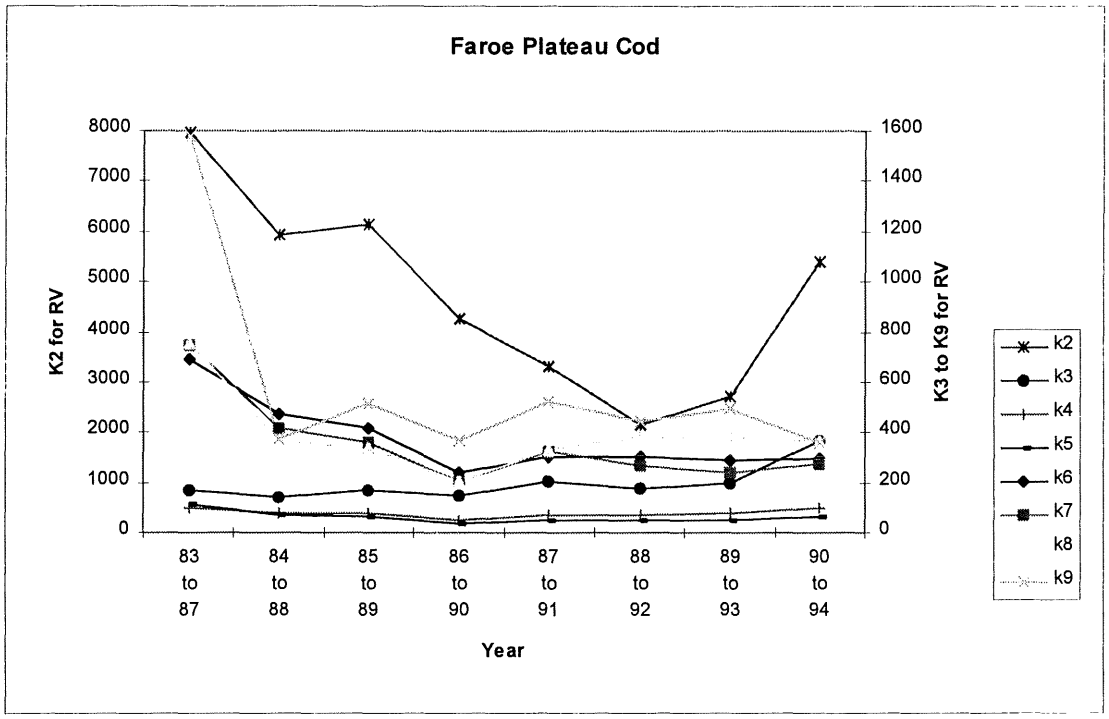
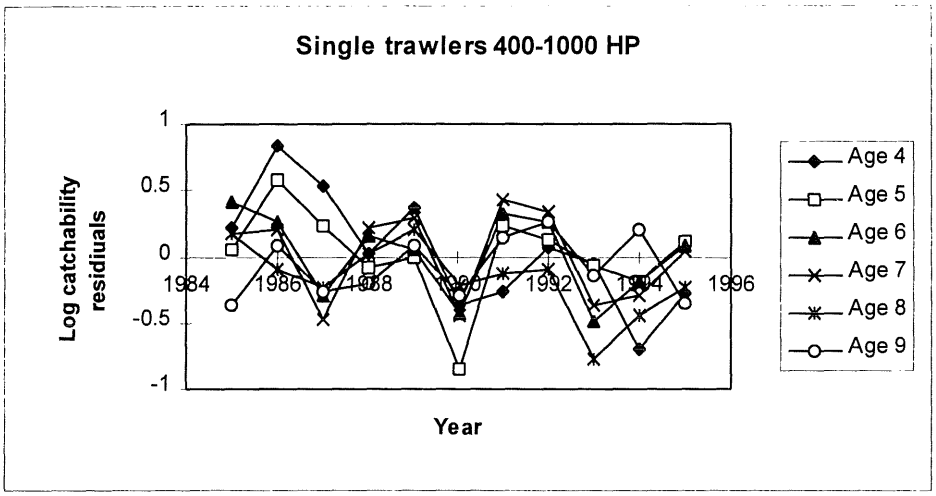


Figure 2.2.9 Log catchability residuals for the series used in the tuning of Faroe Plateau cod.



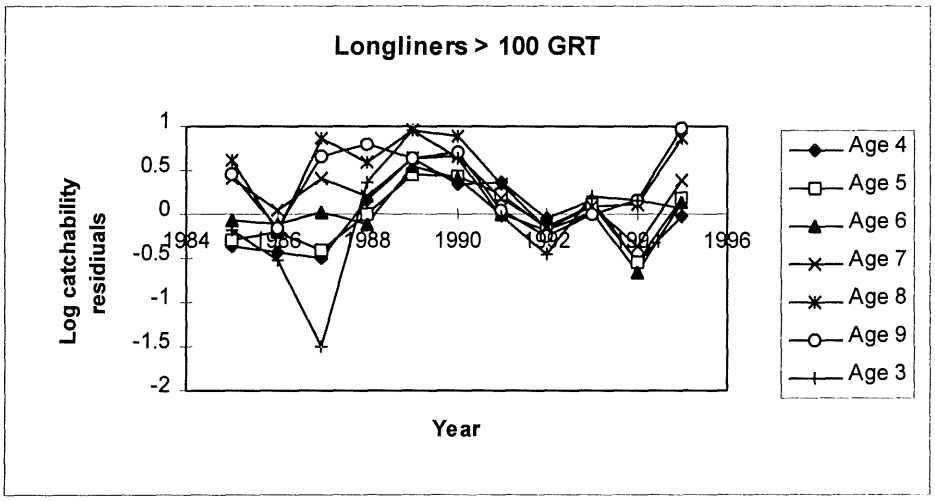


Figure 2.2.10 Retrospective analysis of XSA - Faroe Plateau cod.

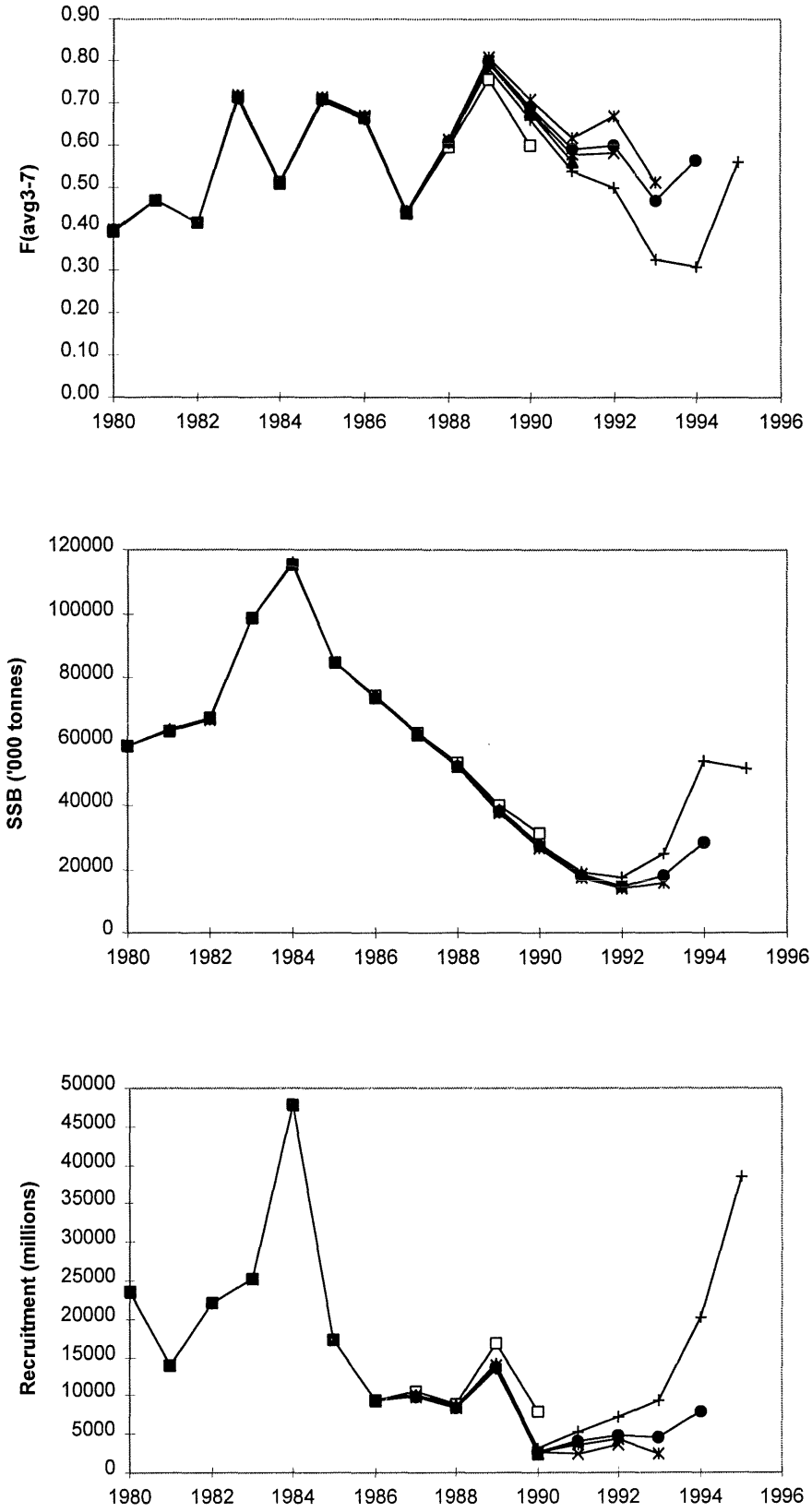
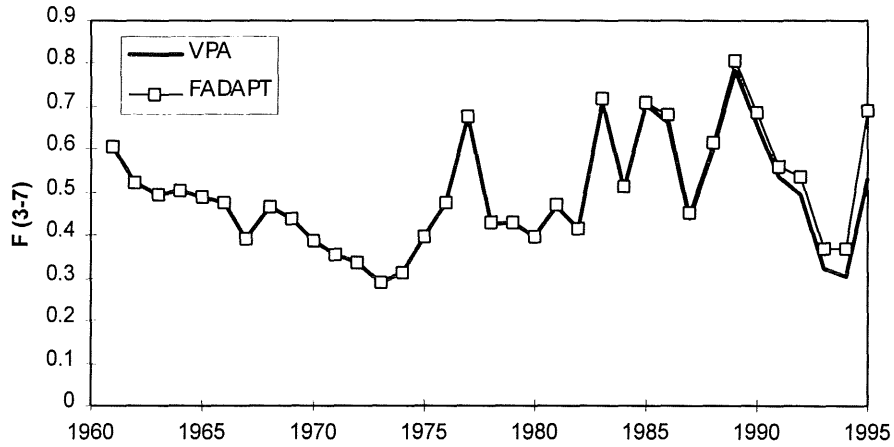
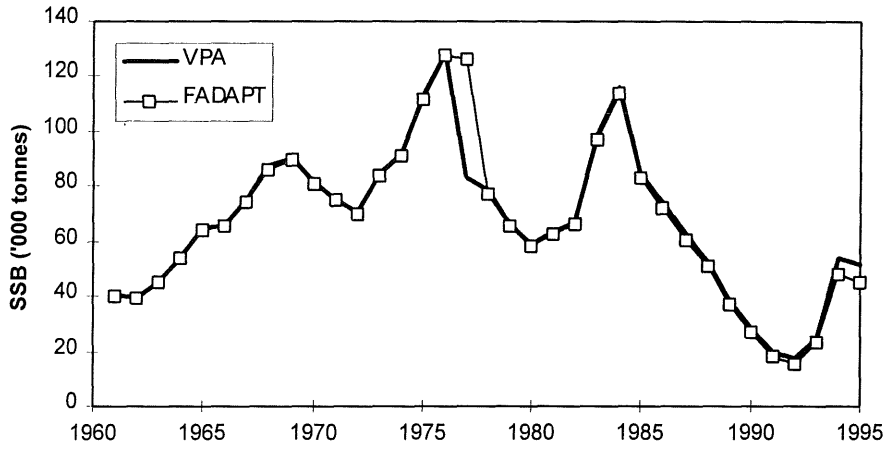


Figure 2.2.11 Comparisons of the estimated fishing mortality, spawning stock biomass and the recruitment by the XSA and the ADAPT, respectively.





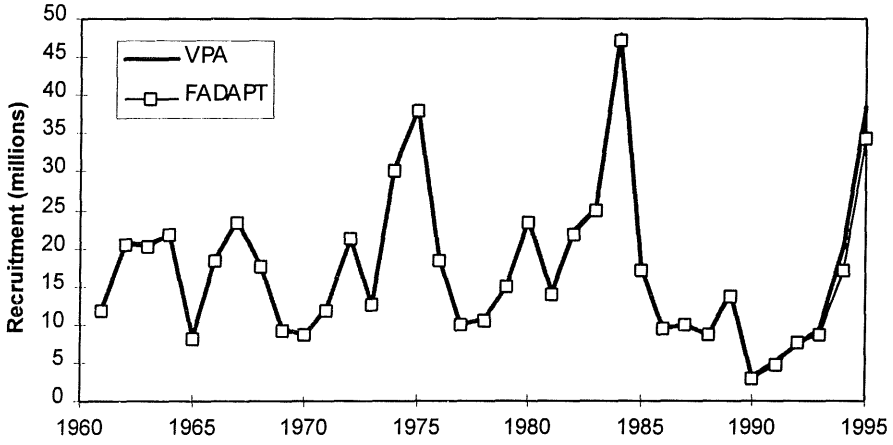
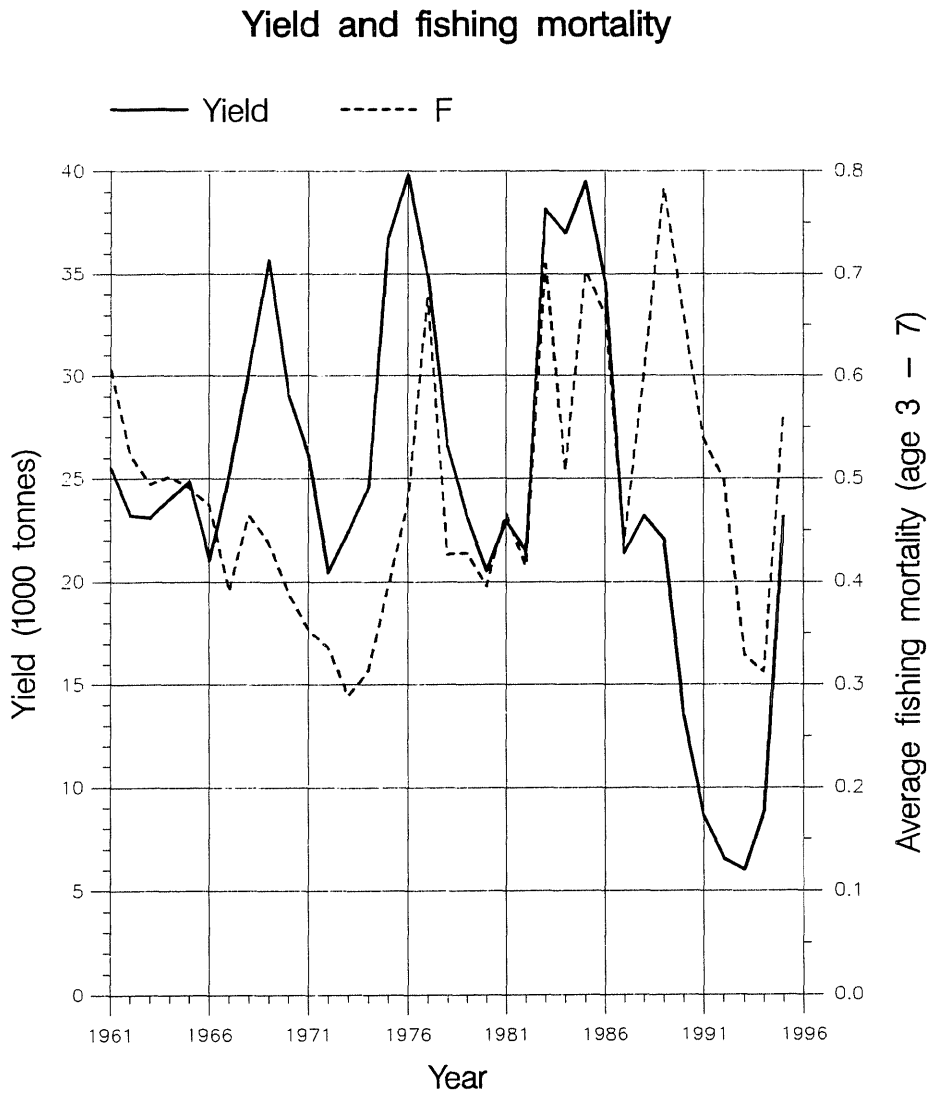
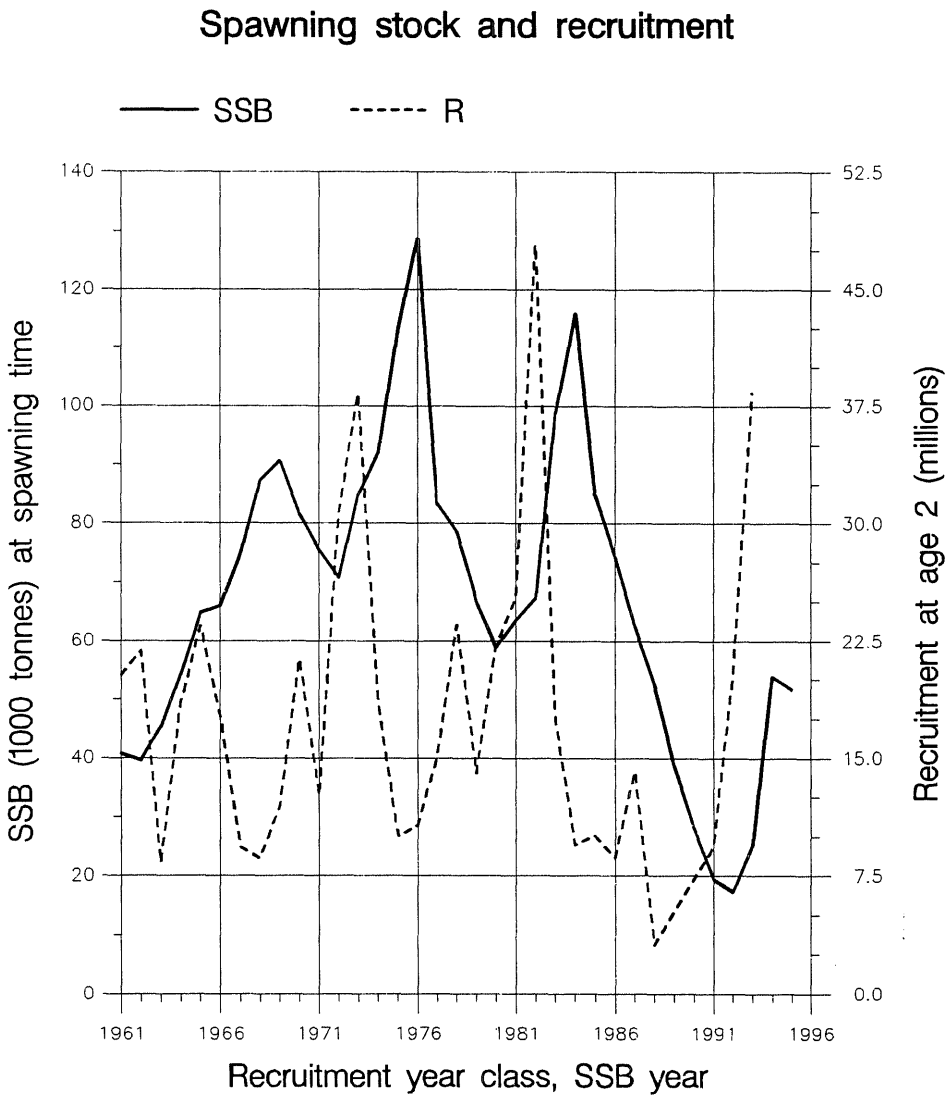


Figure 2.2.12

Fish Stock Summary
Cod in the Faroe Plateau (Fishing Area Vb1)
6 – 5 – 1996



(run: XSAAK09) A



(run: XSAAK09) B

Figure 2.2.13 Cod Faroe Plateau. Stock recruitment relationship with a fitted Ricker recruitment curve.

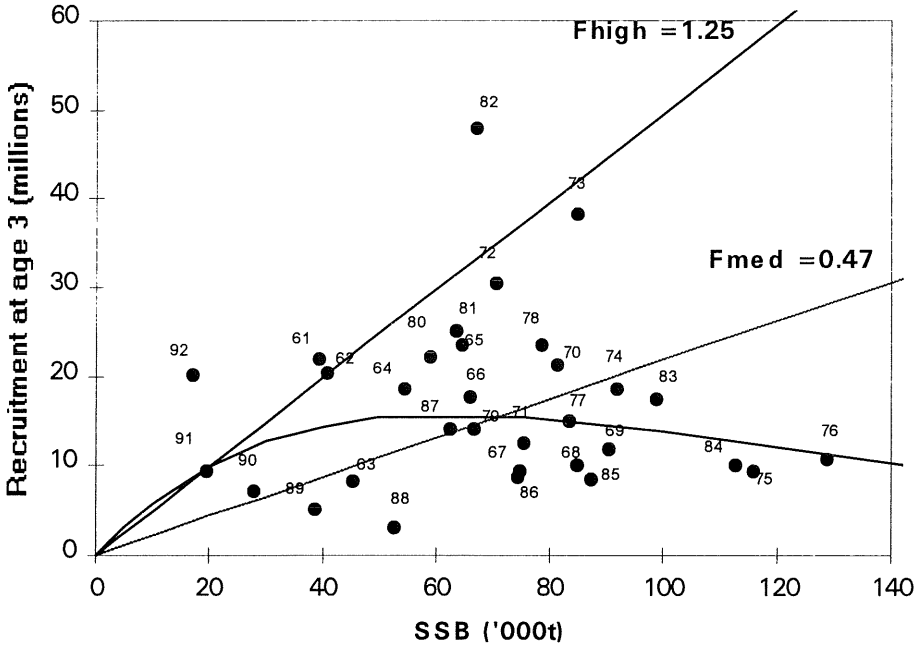


Figure 2.2.14 Results of the medium-term predictions for Faroe Plateau cod.

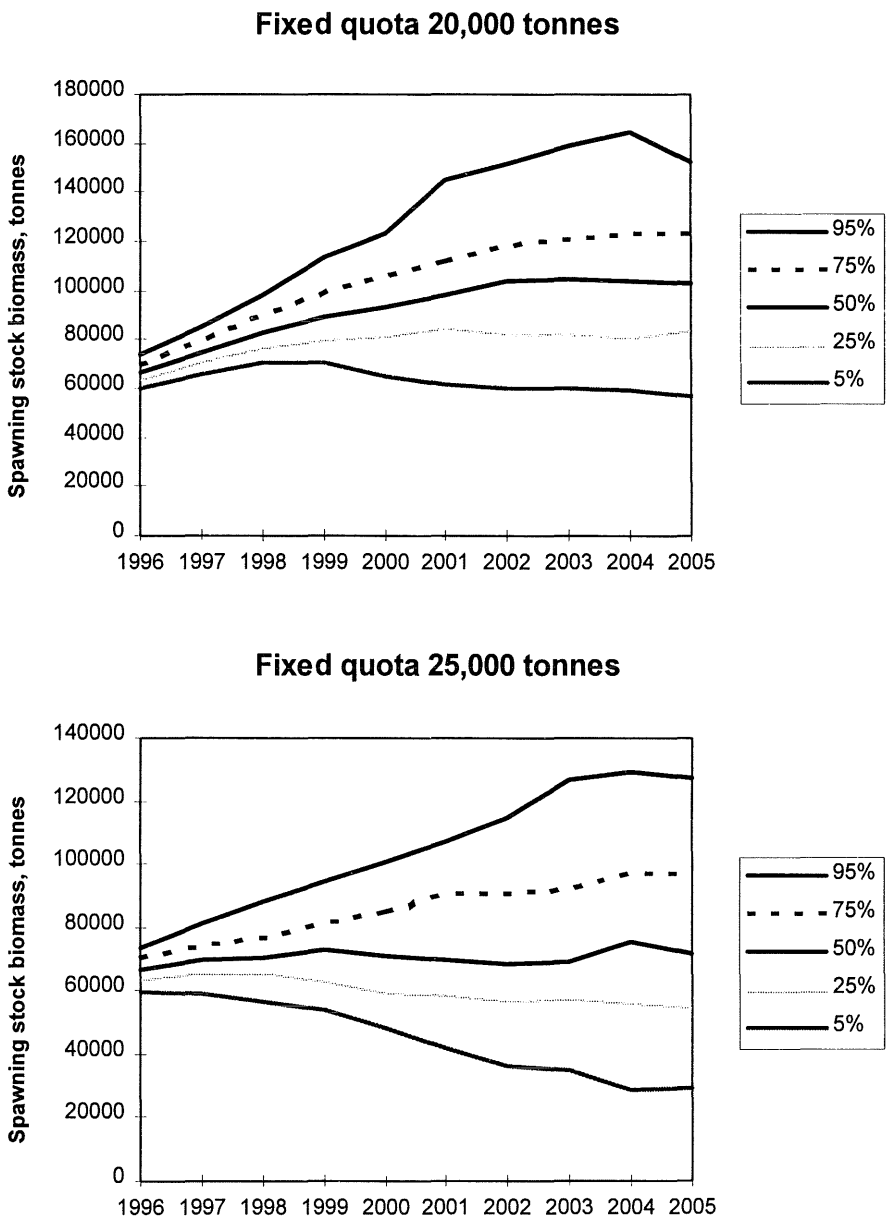
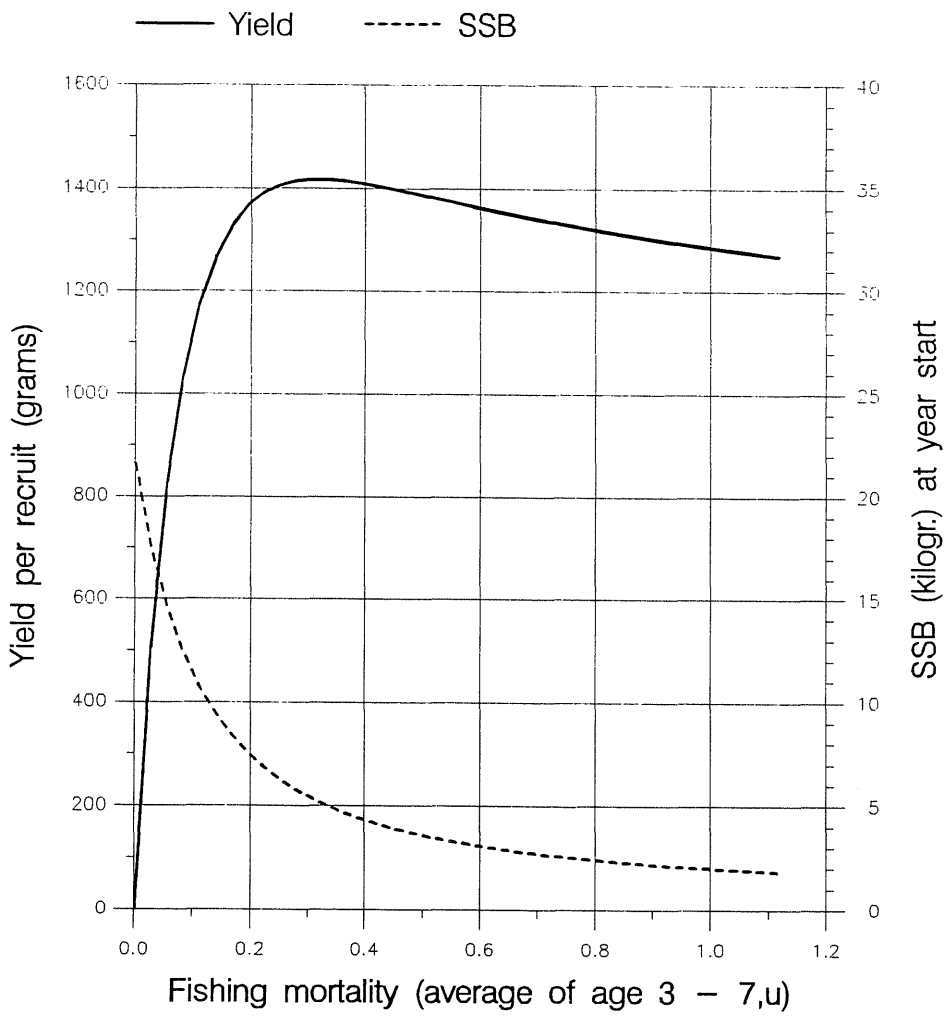


Figure 2.2.15

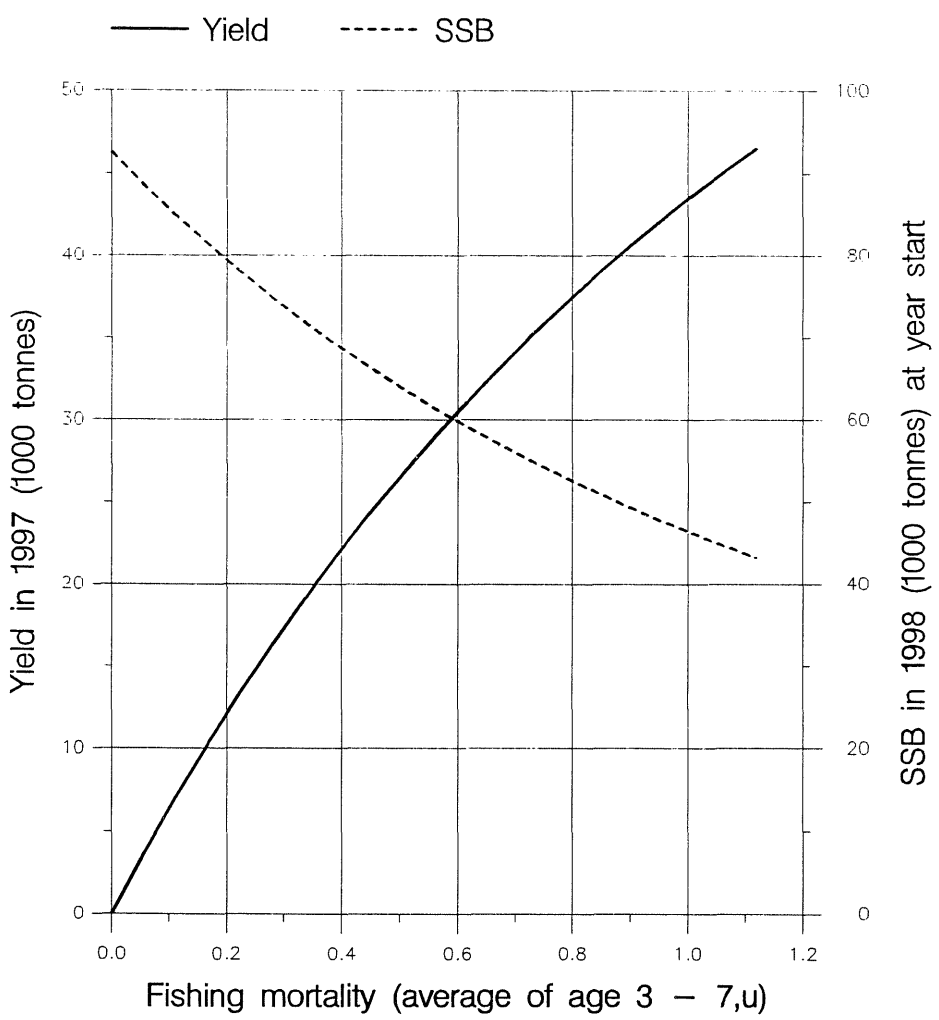
Fish Stock Summary
Cod in the Faroe Plateau (Fishing Area Vb1)
20 – 5 – 1996

Long term yield and spawning stock biomass



(run: YLDAK02) C

Short term yield and spawning stock biomass



(run: MANAK02) D

Figure 2.2.16 Multiplicative analysis of the Faroese ground fish surveys catches of Faroe Plateau cod.

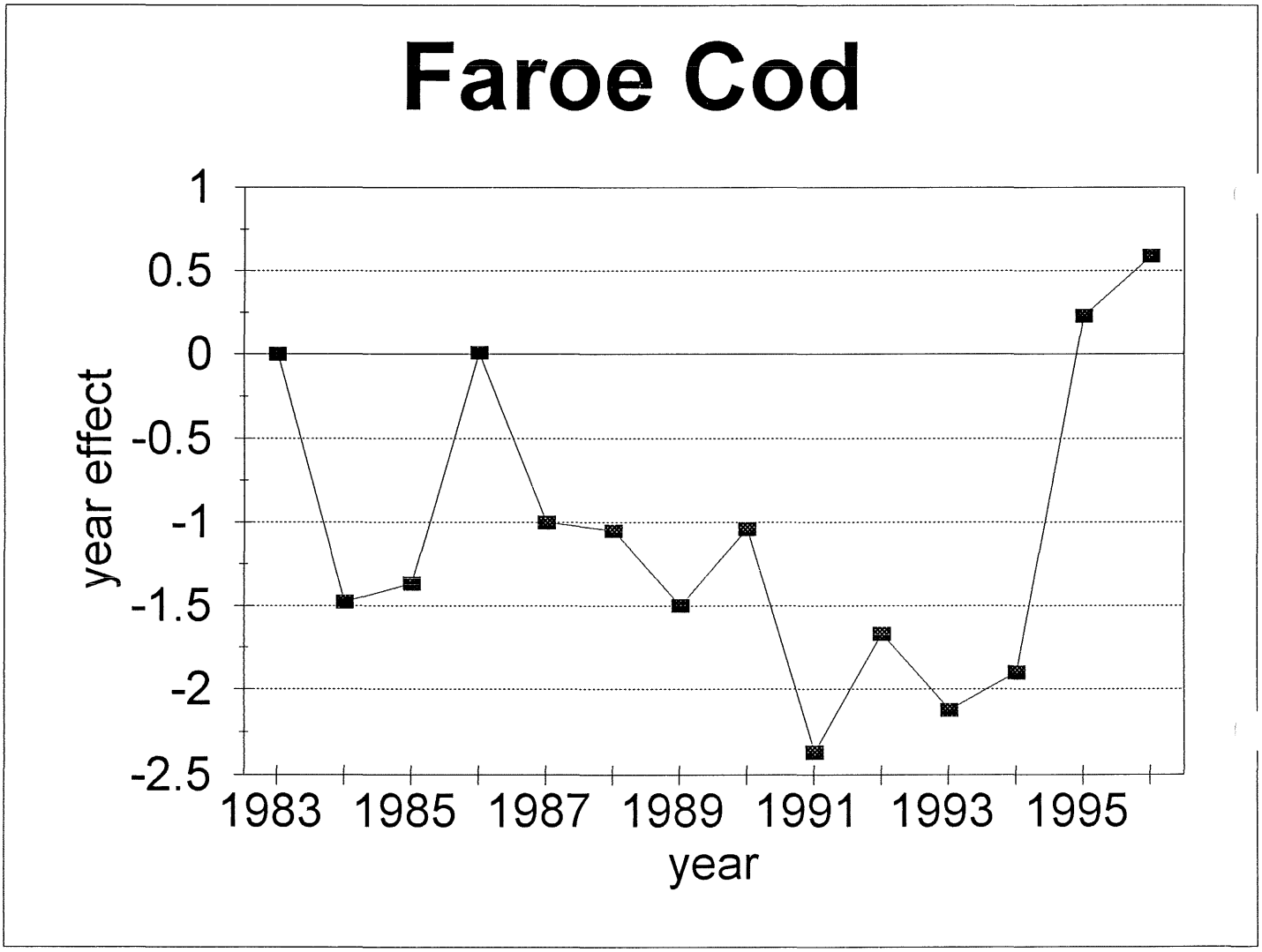


Figure 2.3.1 Catch per unit effort of Faroe Bank cod for selected commercial fleet categories.

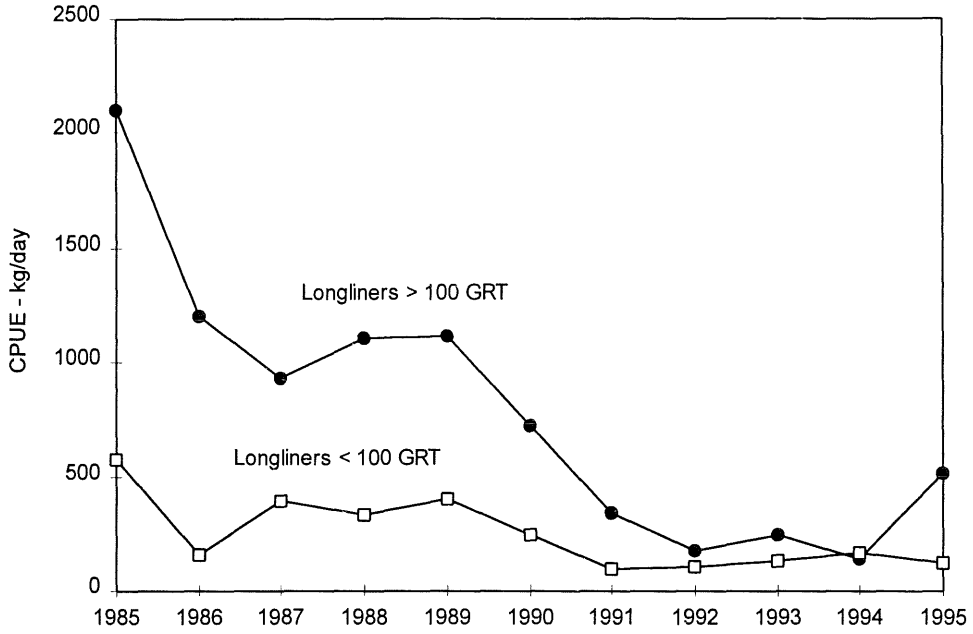


Figure 2.3.2 Catch per unit effort of Faroe Bank cod in the annual groundfish surveys.

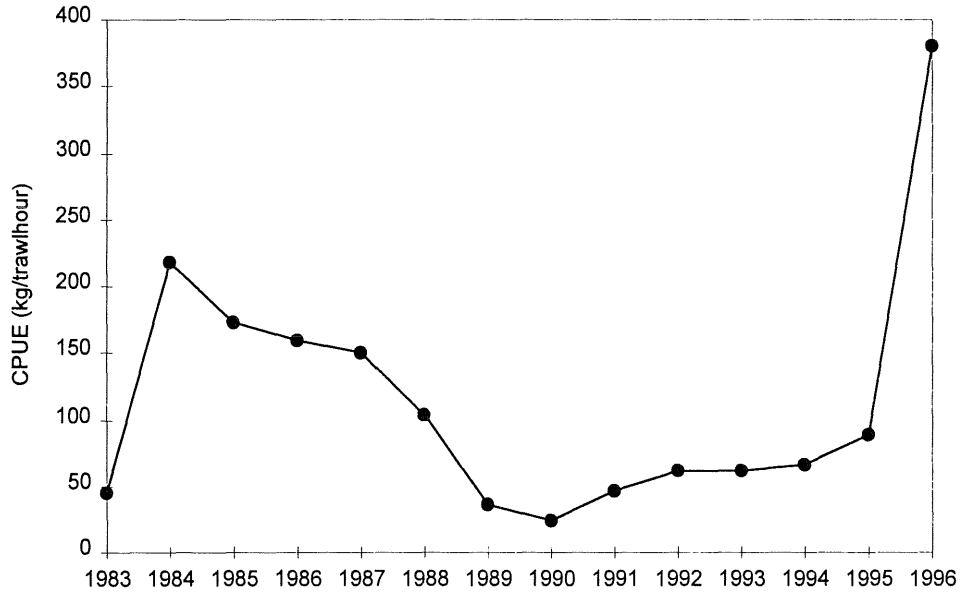


Figure 2.3.3 Length distribution in the cod catches for longliners at Faroe Bank in 1st quarter 1994–1996.

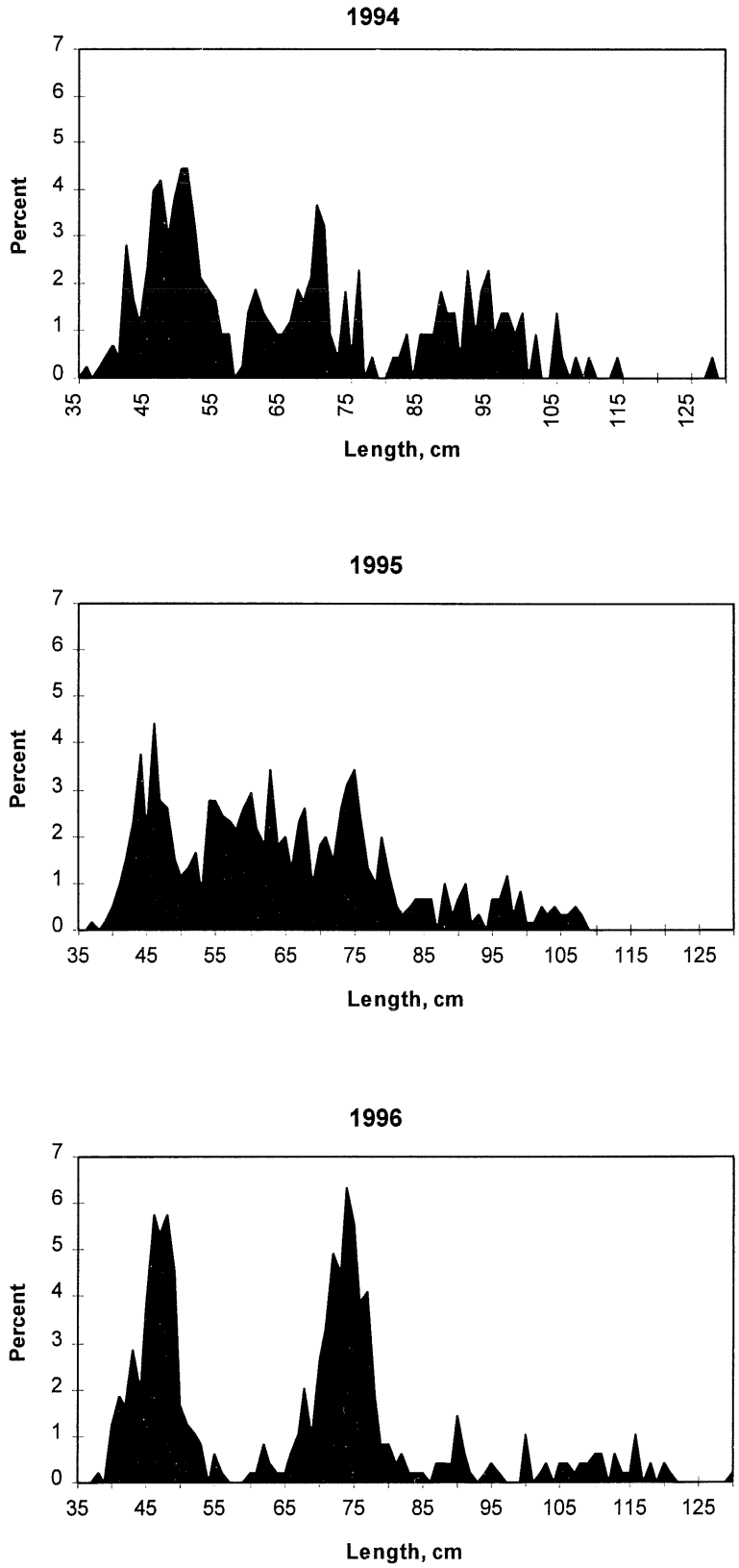


Figure 2.3.4 Faroe Bank cod. Results of Schaefer general production model, with the equilibrium and transient points, the observed and predicted CPUE, the residuals vs CPUE and the residuals vs time.

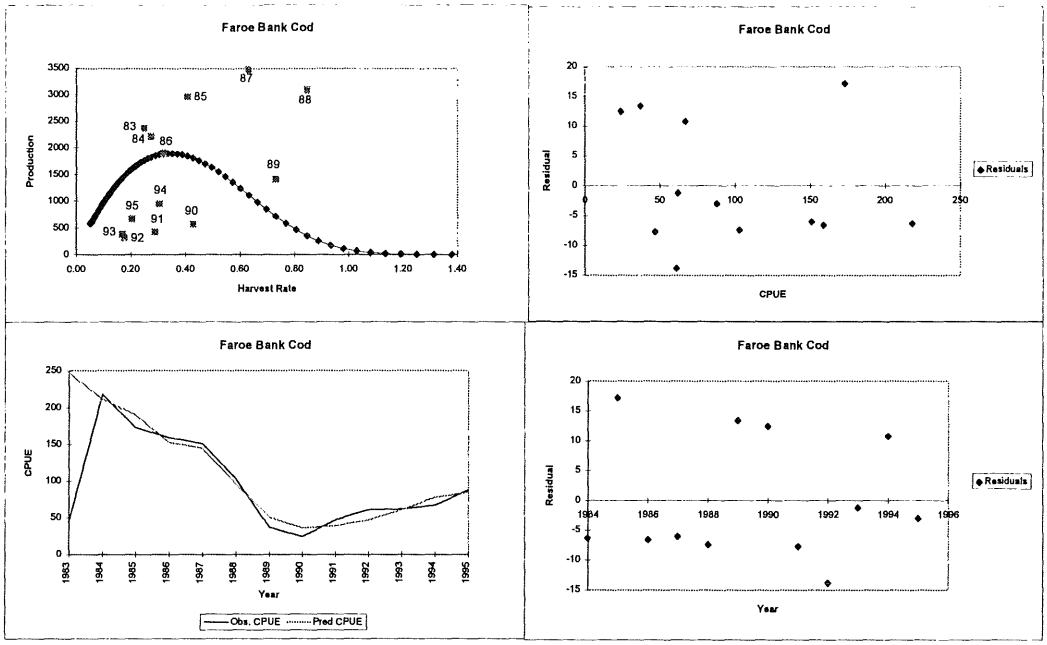


Figure 2.4.1 Haddock in Division Vb 1985–1995. Catch per day for longliners.

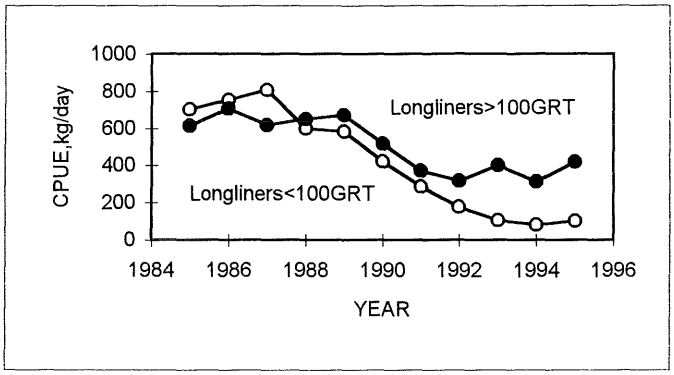


Figure 2.4.2 Haddock in Division Vb 1985–1995. Catch per day for otter board trawlers.

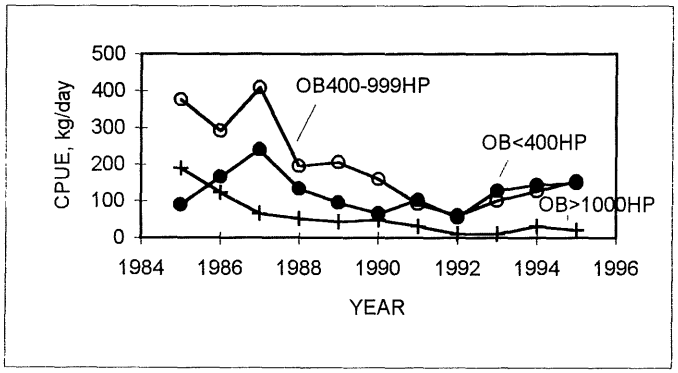


Figure 2.4.3 Haddock in Division Vb 1985–1995. Catch per day for pair trawlers.

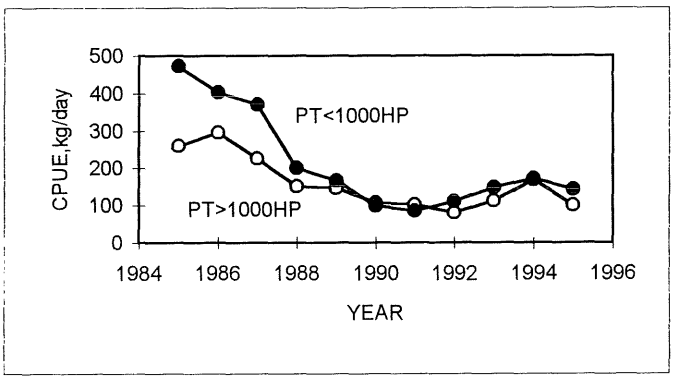


Figure 2.4.4 Faroese landings of haddock from Vb_1 in 1995 per fleet category. Tonnes ungutted weight.

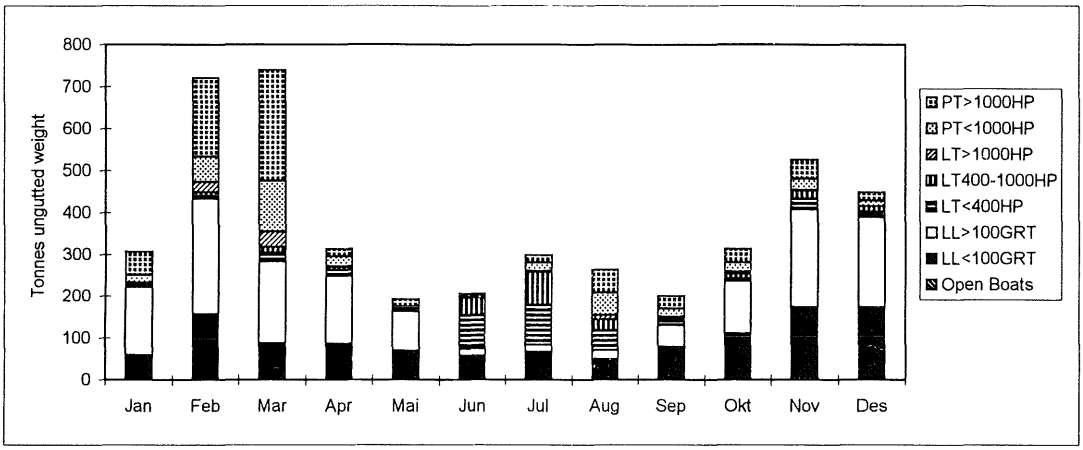


Figure 2.4.5 Faroese landings of haddock from Vb_2 in 1995 per fleet category. Tonnes ungutted weight.

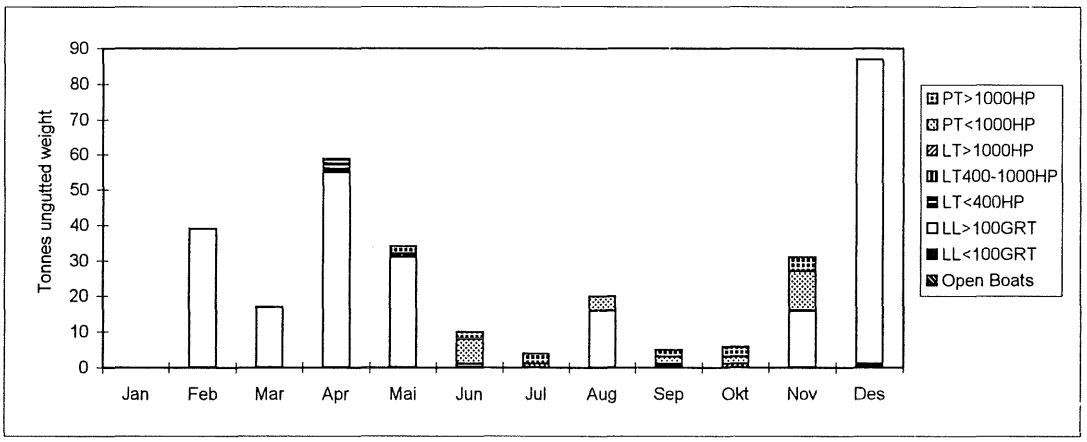


Figure 2.4.6

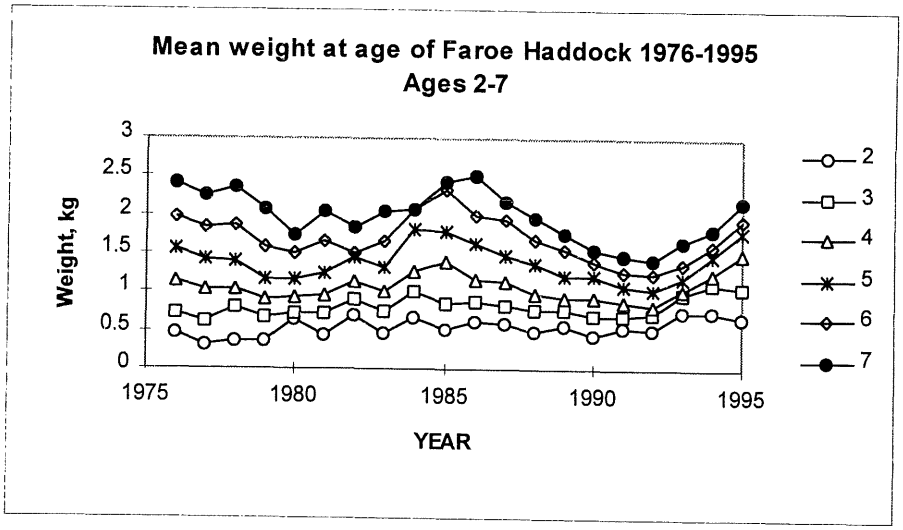


Figure 2.4.7

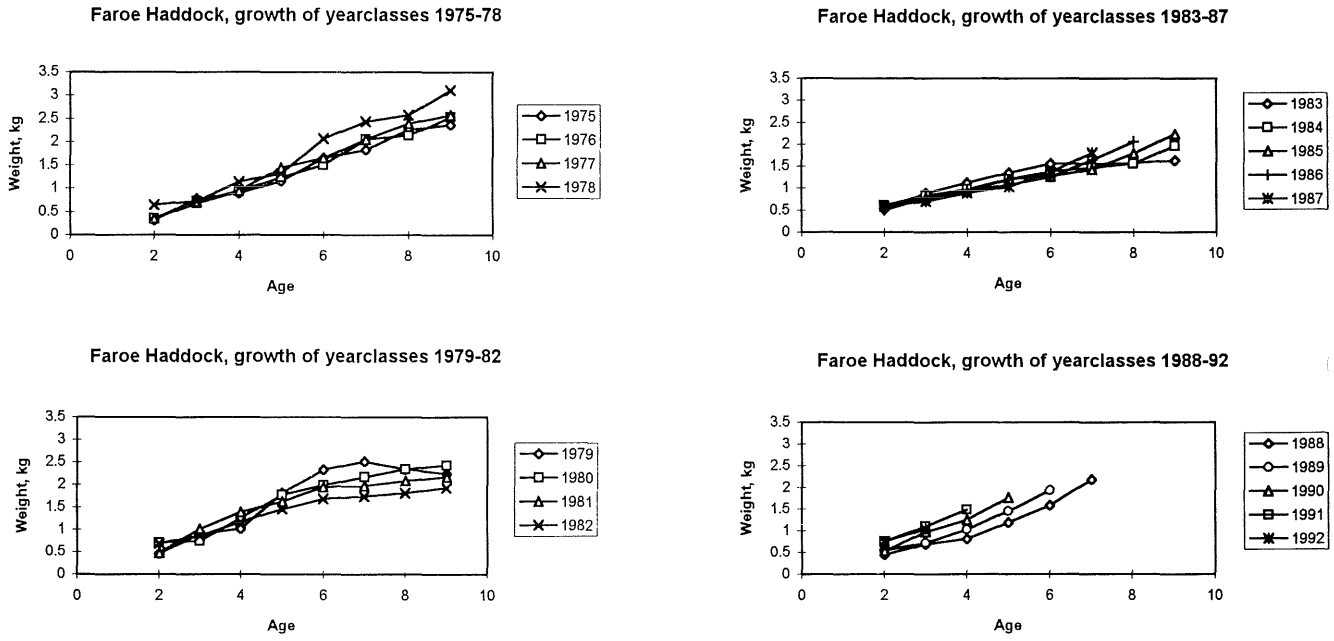


Figure 2.4.8 Retrospective analysis Faroe Haddock. XSA standard settings. Survey not tricked from the spring to the end of the year before.

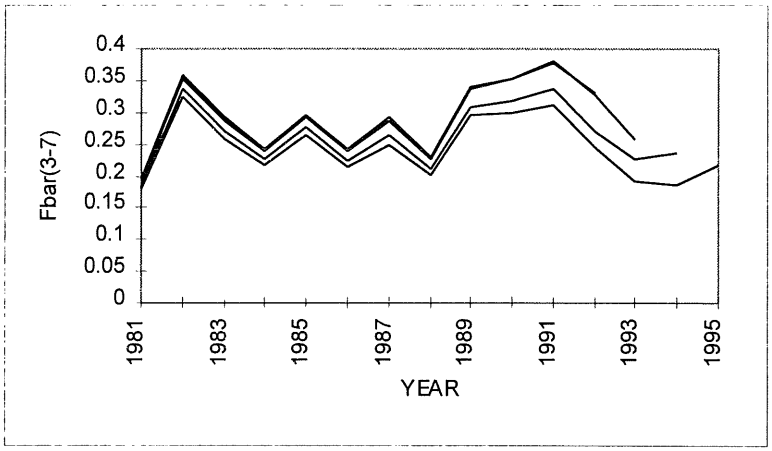


Figure 2.4.9 Retrospective analysis Faroe Haddock. XSA standard settings. Survey tricked from the spring to the end of the year before.

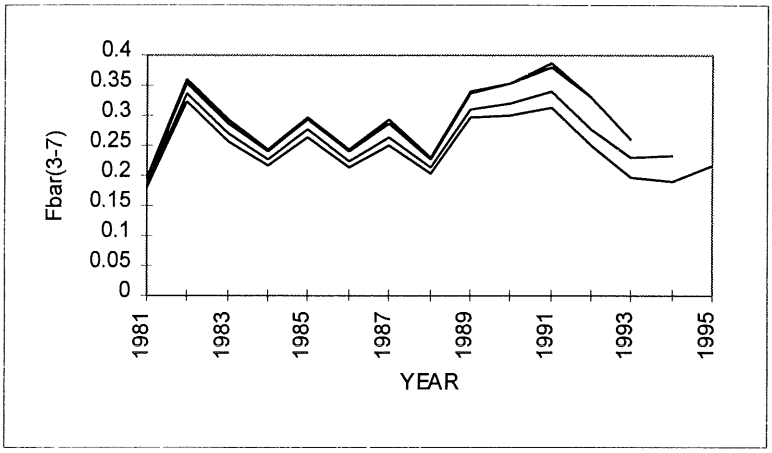


Figure 2.4.10 Faroe Haddock Vb. Retrospective analysis. XSA default settings except shrinkage = 0.3. Tuning fleets as in Table 2.4.8.

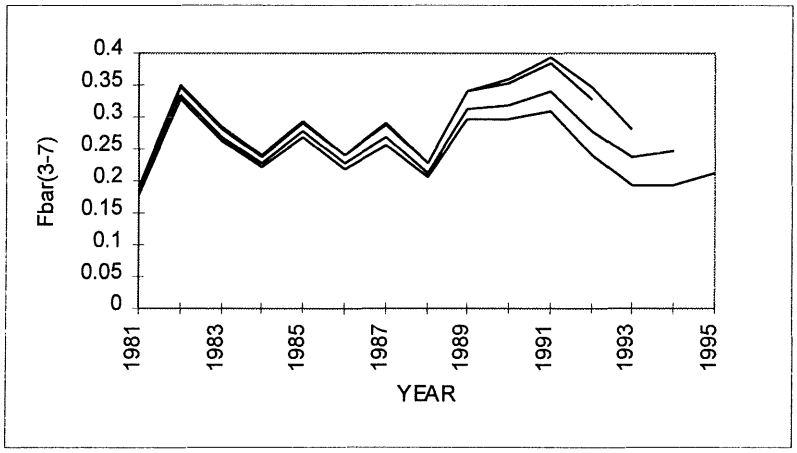


Figure 2.4.11 Faroe Haddock Vb. Retrospective analysis. XSA default settings except shrinkage = 0.7. Tuning fleets as in Table 2.4.8.

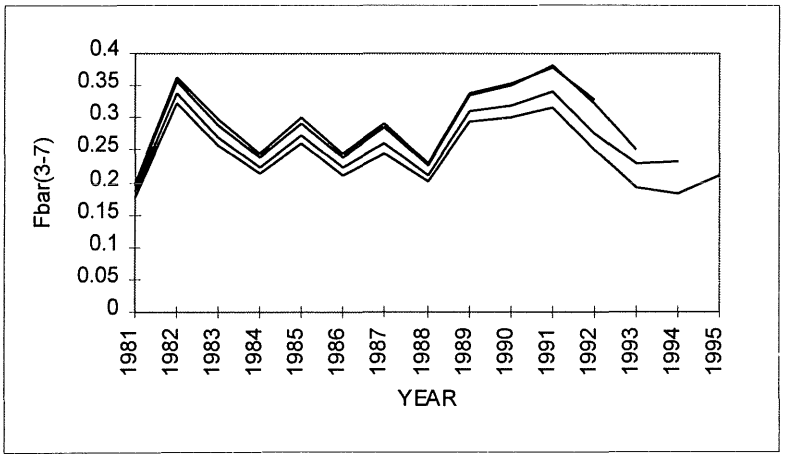


Figure 2.4.12 Tuning fleets for Faroe haddock Vb. Log Catchability Residuals Plot.

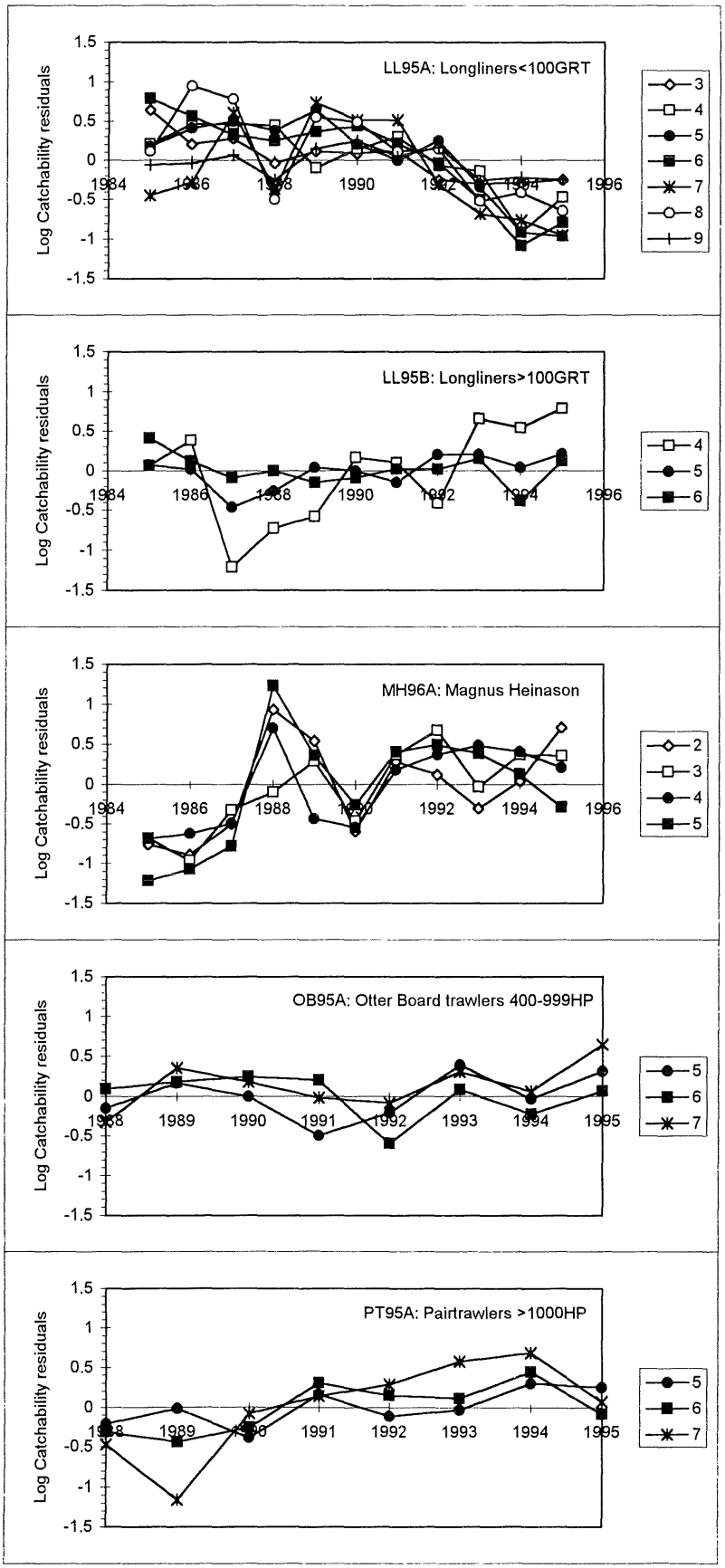
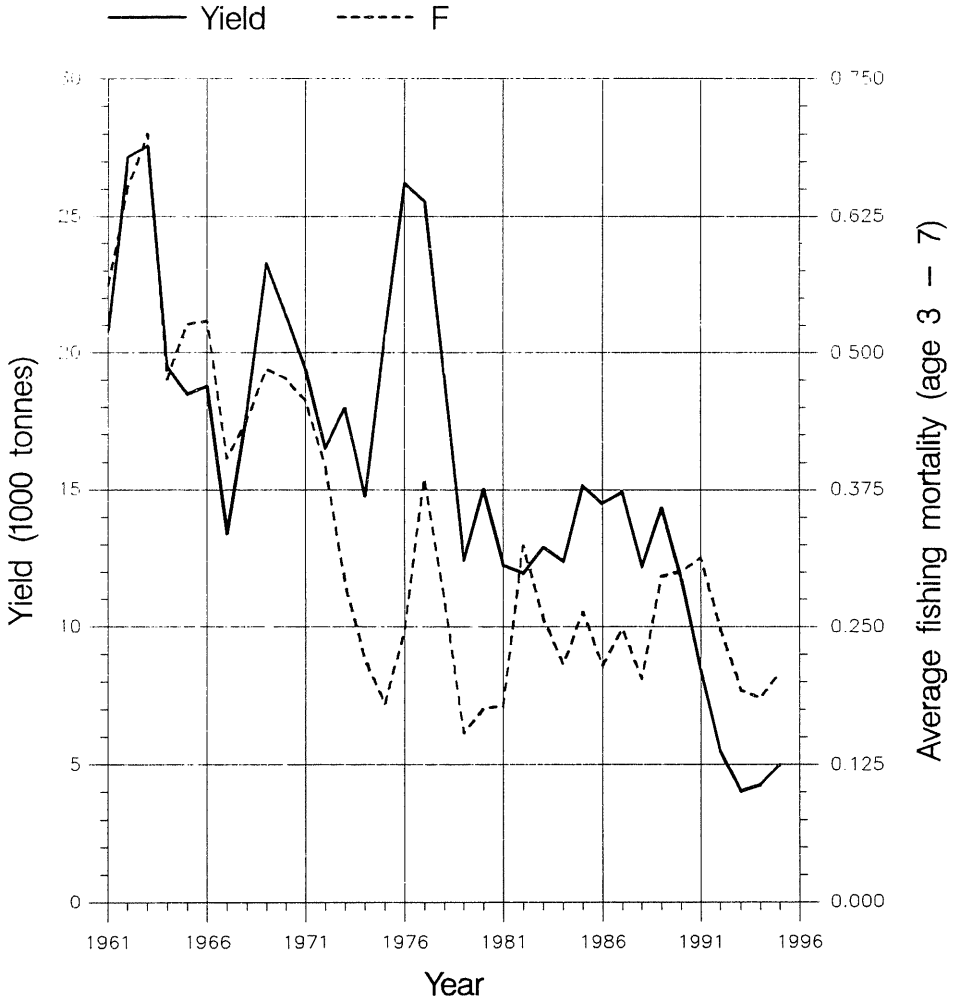


Figure 2.4.13

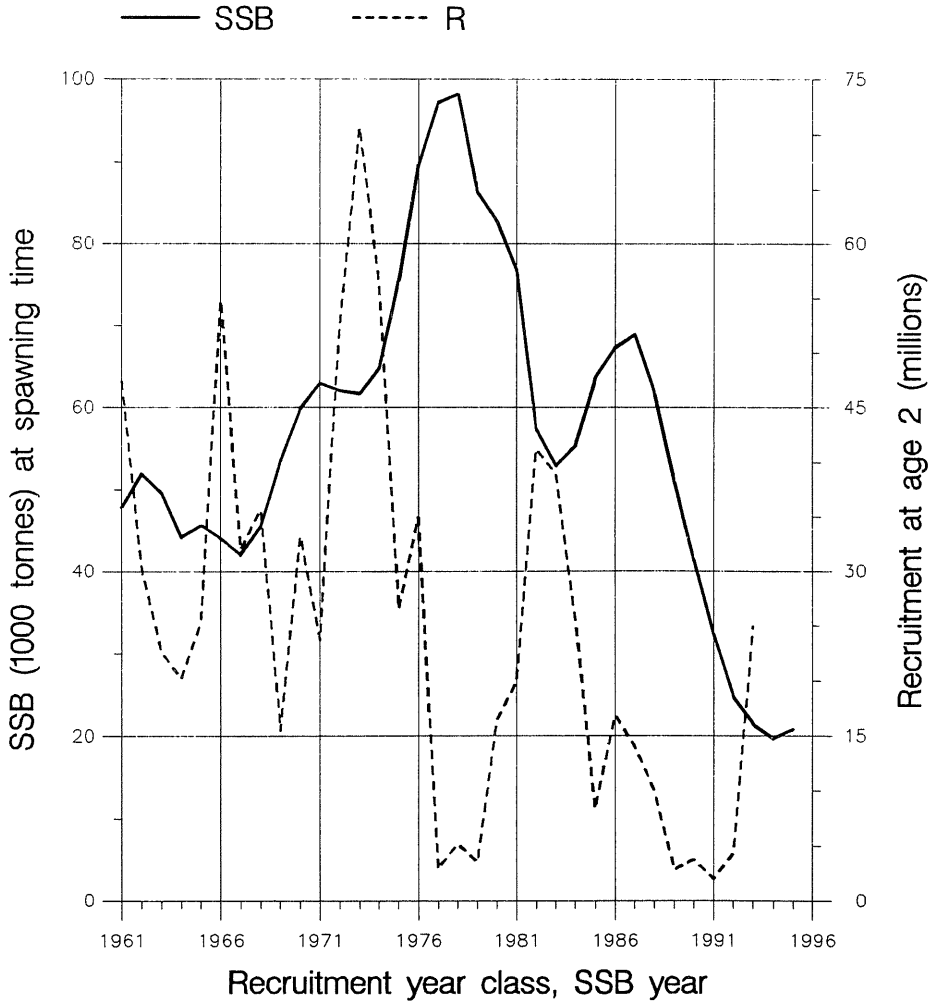
Fish Stock Summary
Haddock in the Faroe Grounds (Fishing Area Vb)
2 – 5 – 1996

Yield and fishing mortality



(run: XSAJAK01) **A**

Spawning stock and recruitment

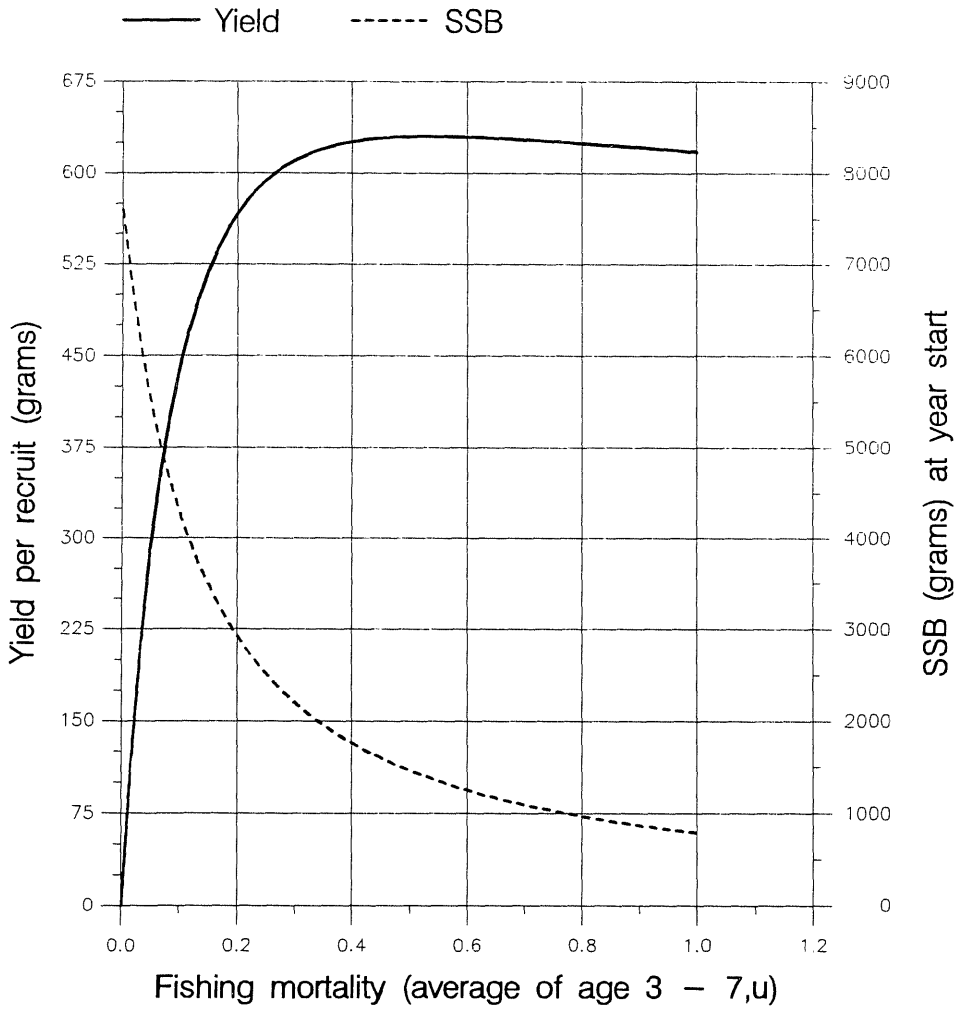


(run: XSAJAK01) **B**

Figure 2.4.14

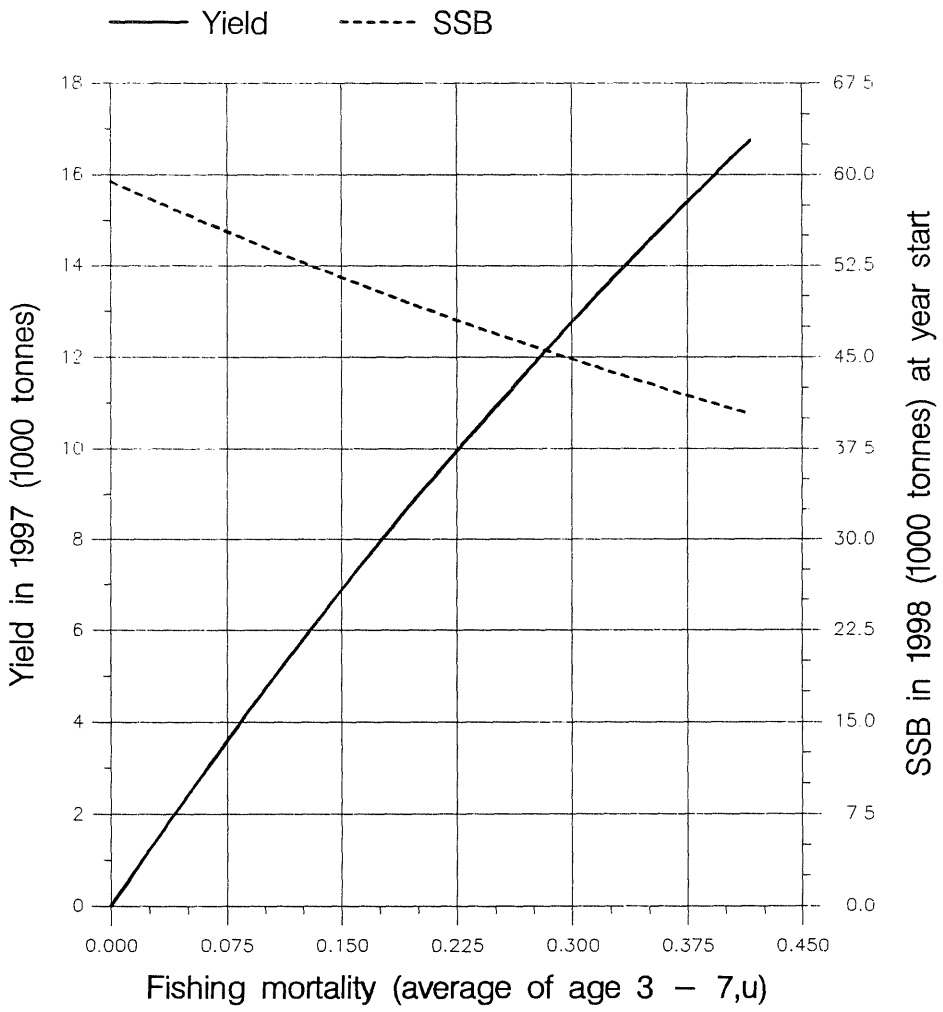
Fish Stock Summary
Haddock in the Faroe Grounds (Fishing Area Vb)
6 – 5 – 1996

Long term yield and spawning stock biomass



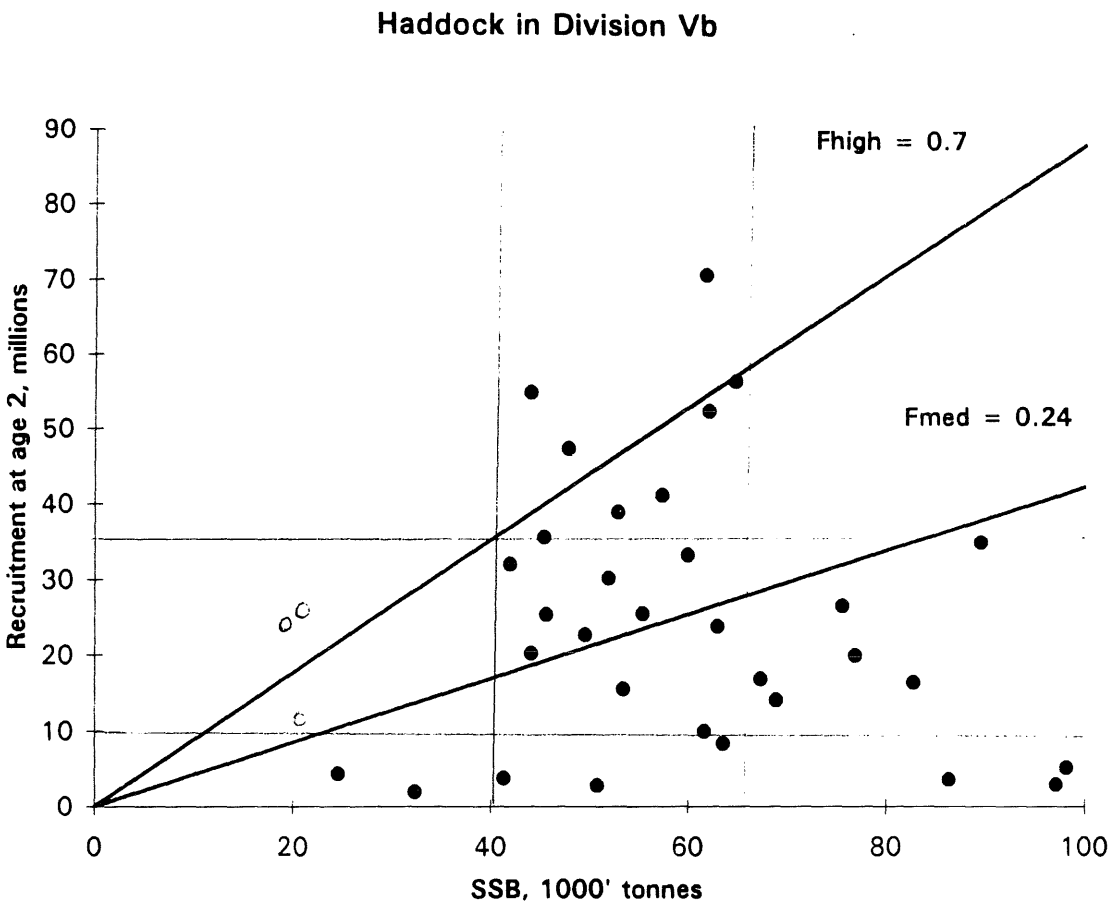
(run: YLDJAK01) C

Short term yield and spawning stock biomass



(run: MANJAK02) D

Figure 2.4.15



o predicted RCT3 96

● final VPA 1996`

Figure 2.4.16 Stock-recruitment relationship for Faroe haddock with an estimated Ricker curve.

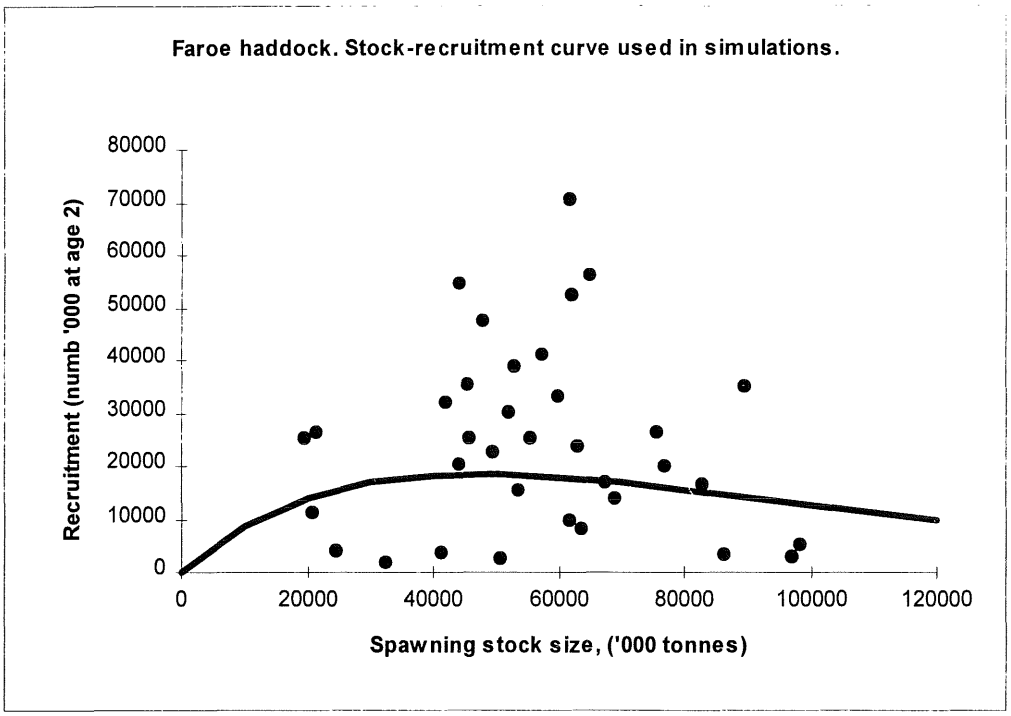


Figure 2.4.17 Results of the medium-term predictions for Faroe Haddock.

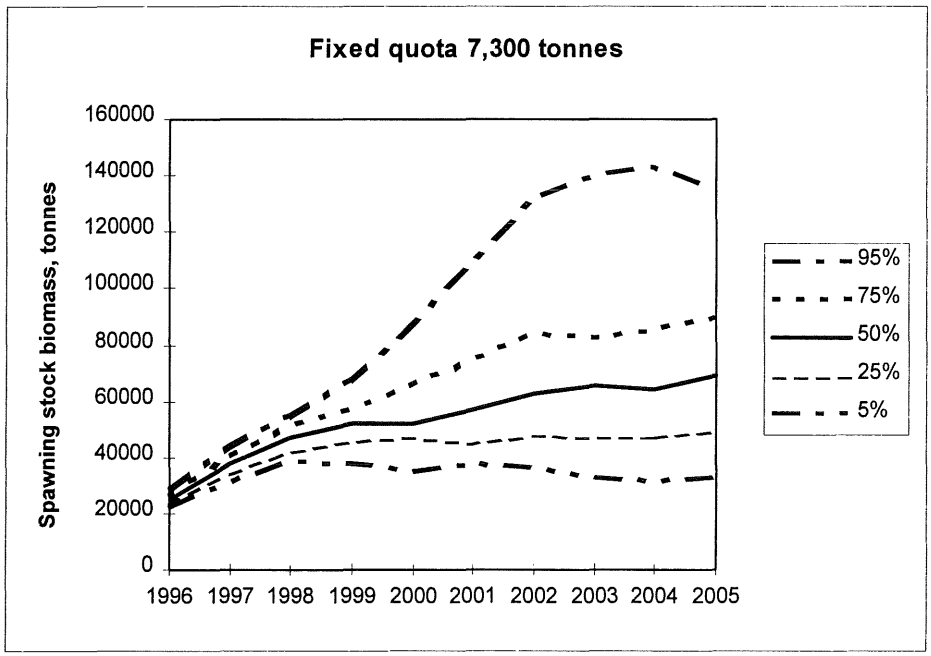


Figure 2.4.18 Results of the medium-term predictions for Faroe Haddock.

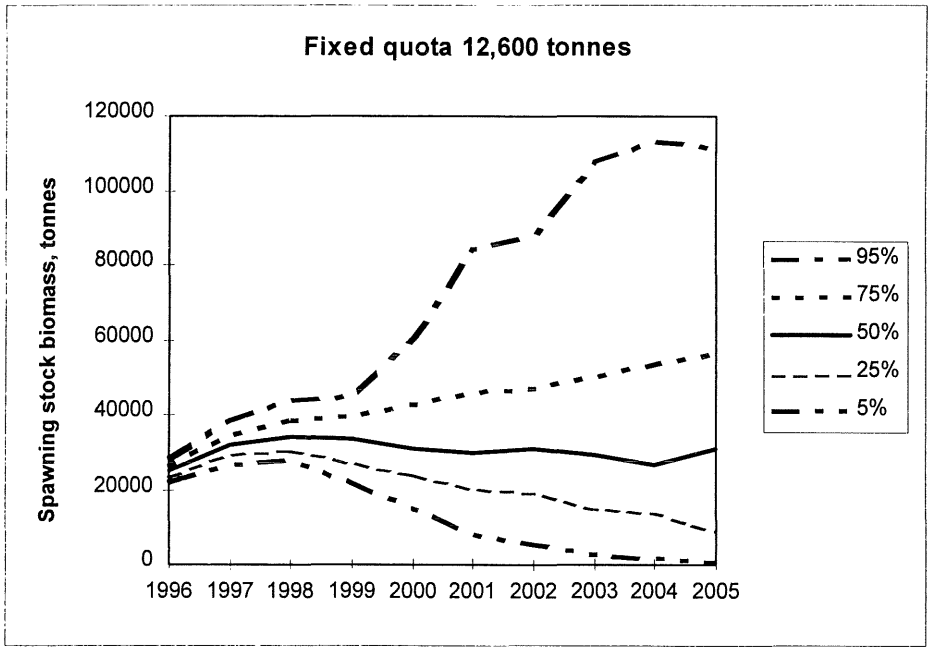


Figure 2.4.19 Results of the medium-term predictions for Faroe Haddock.

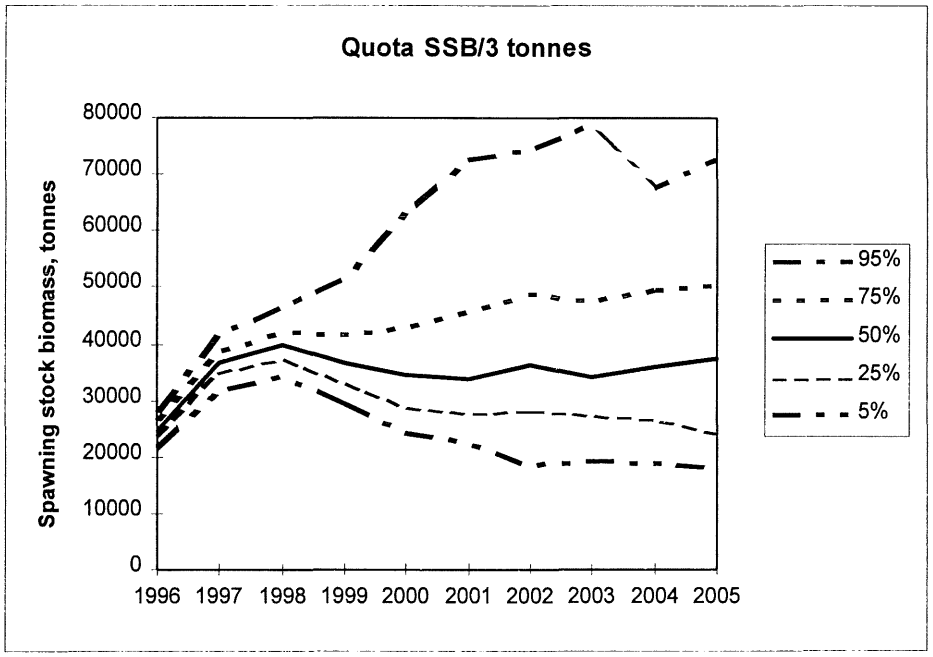


Figure 2.5.1 Saithe in the Faroes. Cpue (tonnes/days) by fleet categories

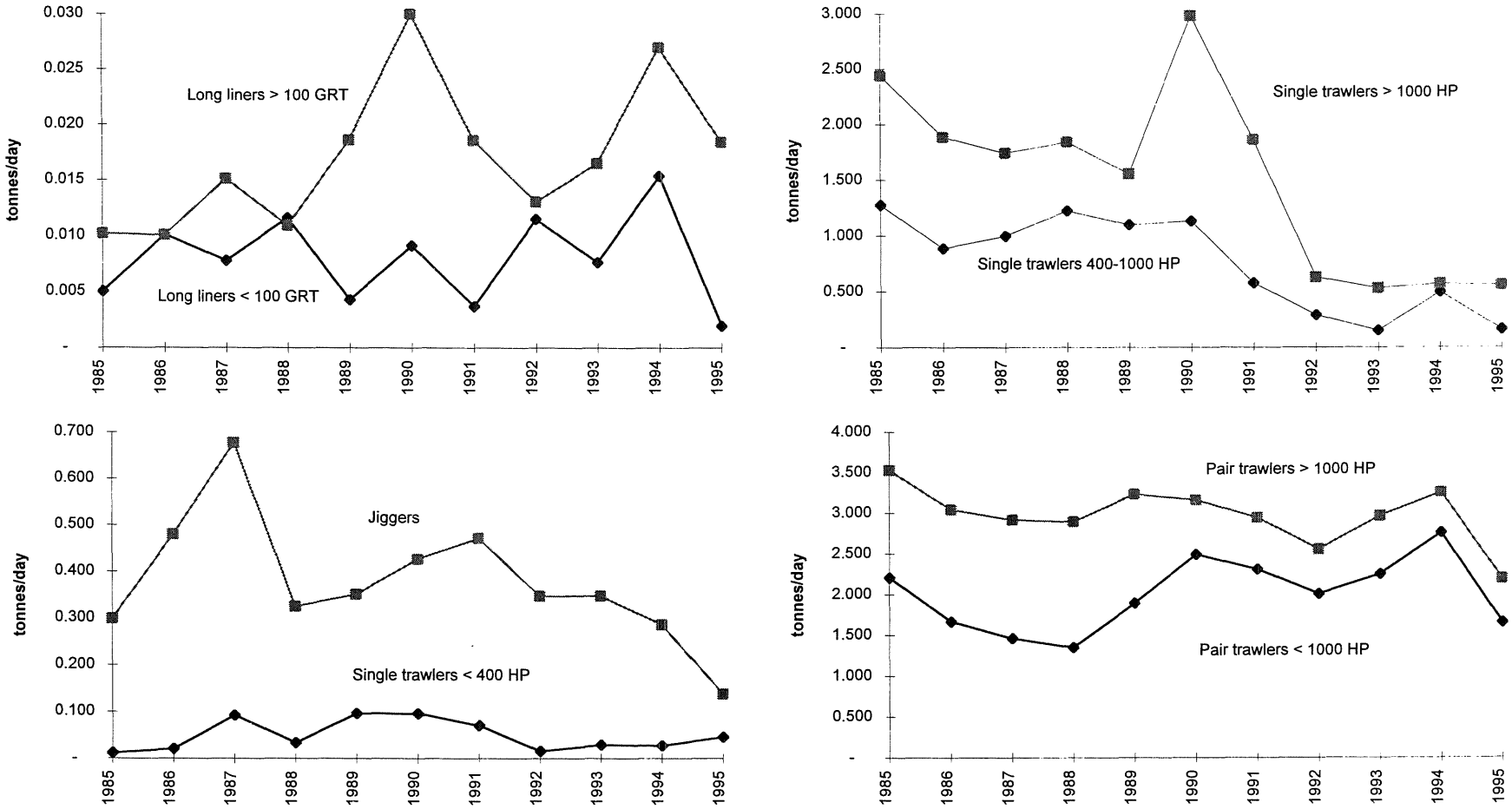


Figure 2.5.2 Saithe in the Faroes. Mean weight (kg) at age in the period 1961–1995.

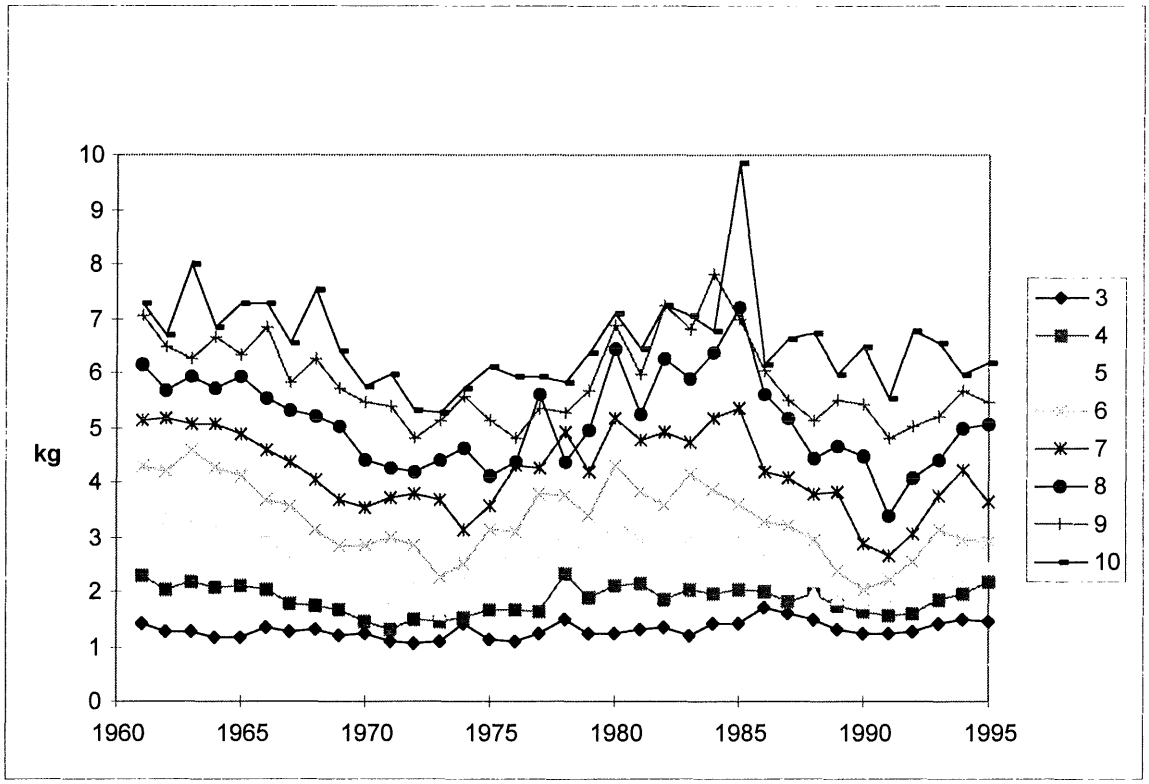


Figure 2.5.3 Saithe in the Faroes. Maturity at age observations and fitted values for 1961–1995.

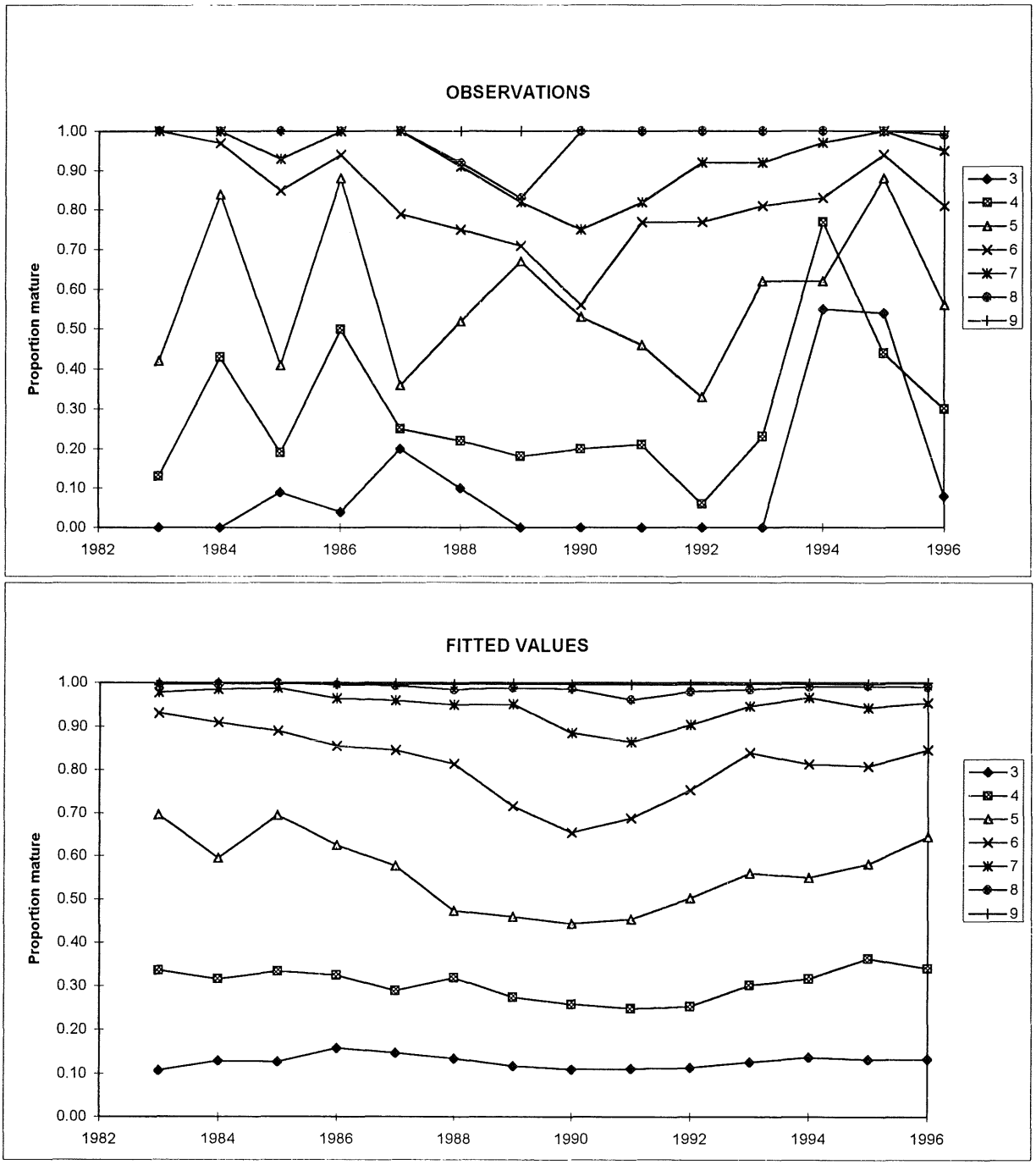
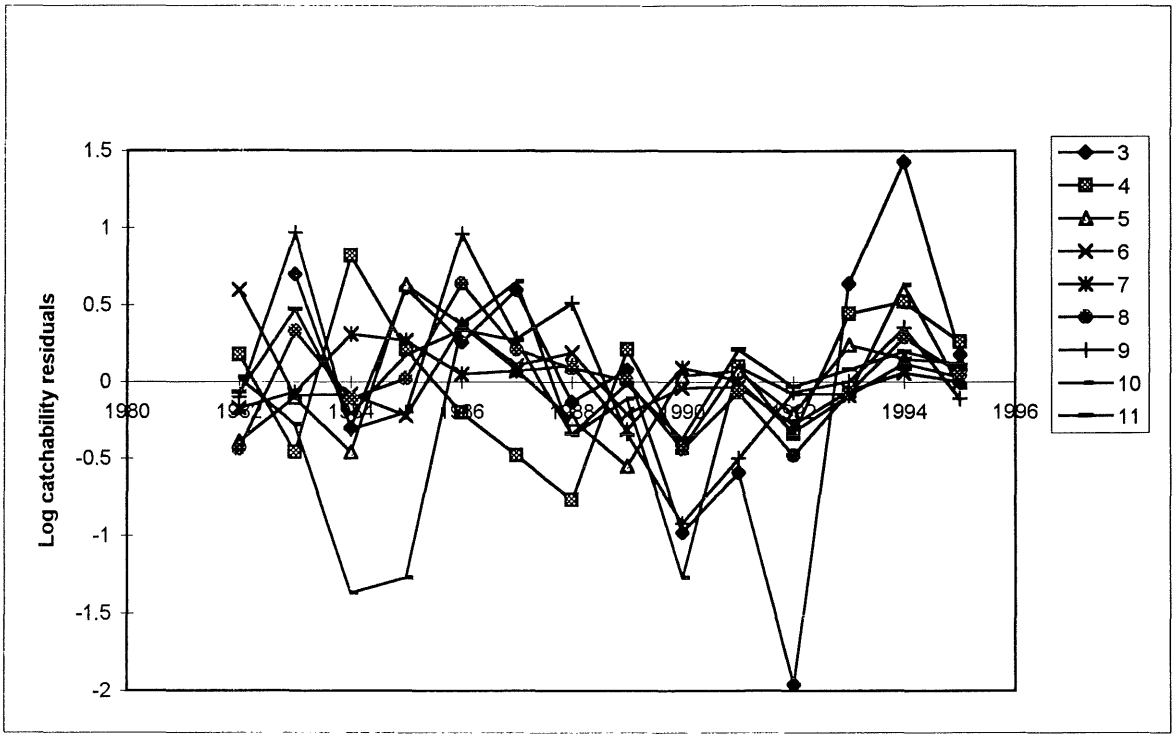
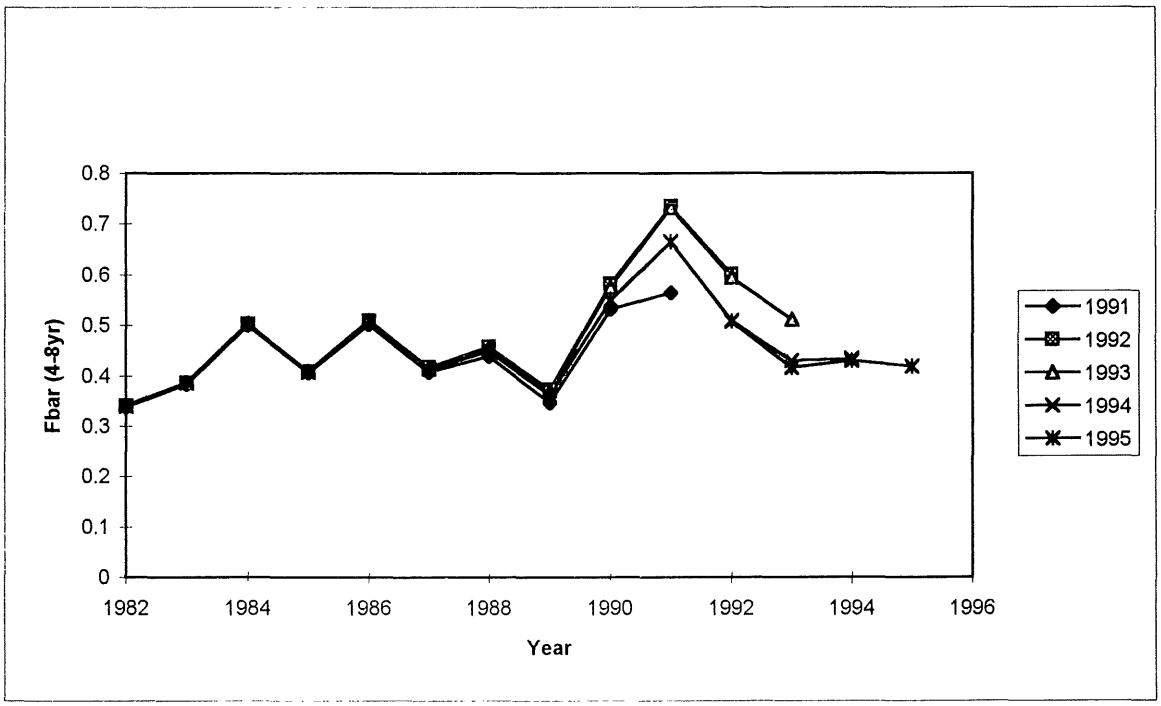


Figure 2.5.4 Saithe in the Faroes. Log catchability residuals fro each age group from the XSA tuning. Data from the Cuba trawlers.



G:\ACFM\NWWG\SAI_FARO\LOGQCUBA.XLS 08. 05. 1996, 18:01

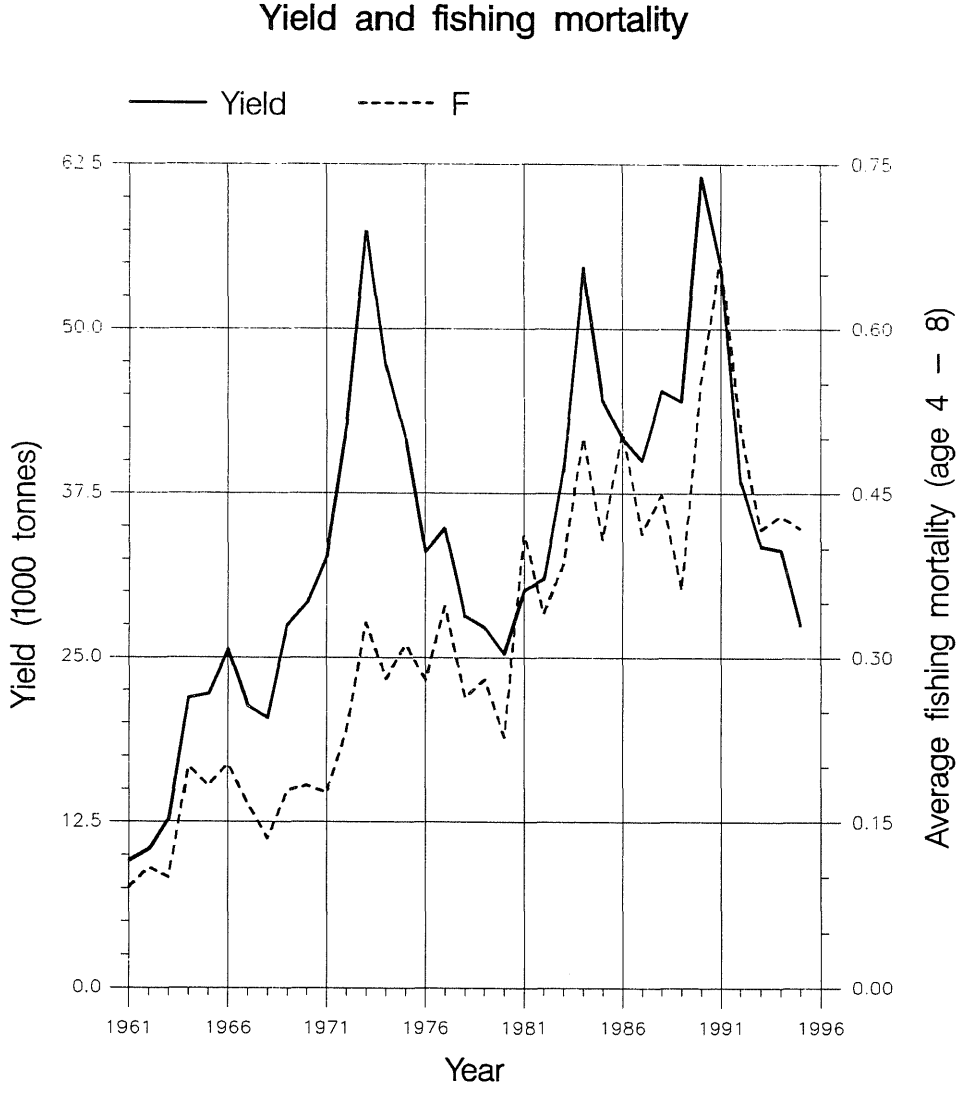
Figure 2.5.5 Saithe in the Faroes. Retrospective analysis of fishing mortality from XSA.



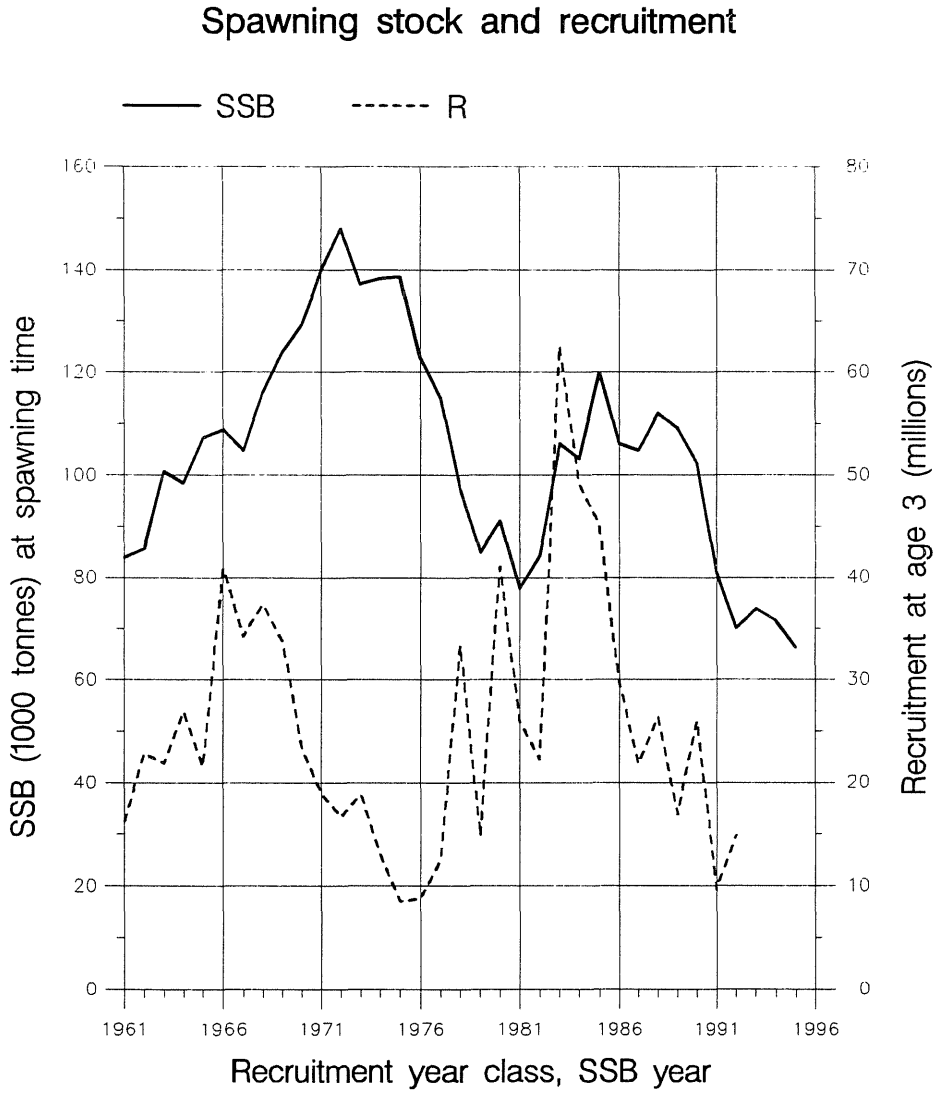
G:\ACFM\NWWG\SAI_FARO\RET_CUBA.XLS 08. 05. 1996, 17:58

Figure 2.5.6

Fish Stock Summary
Saithe in the Faroes Grounds (Fishing Area Vb)
8 – 5 – 1996



(run: XSAANI15) **A**

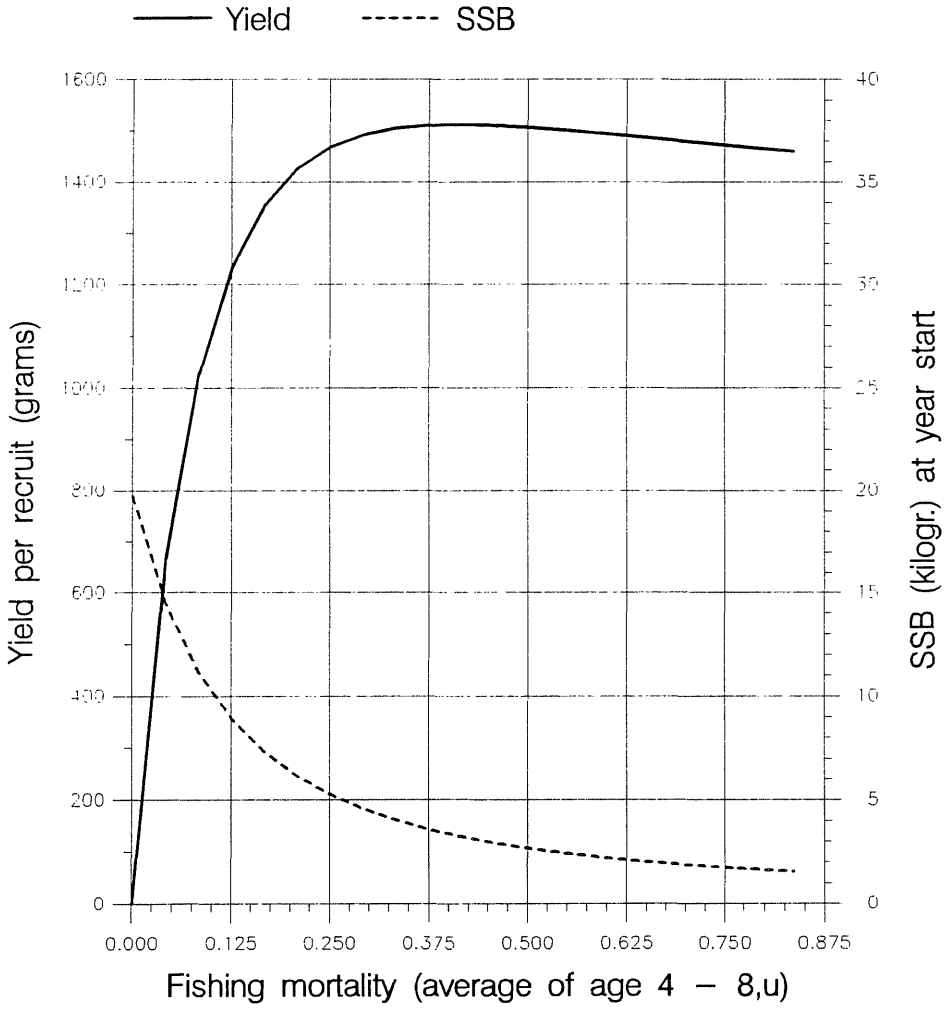


(run: XSAANI15) **B**

Figure 2.5.7

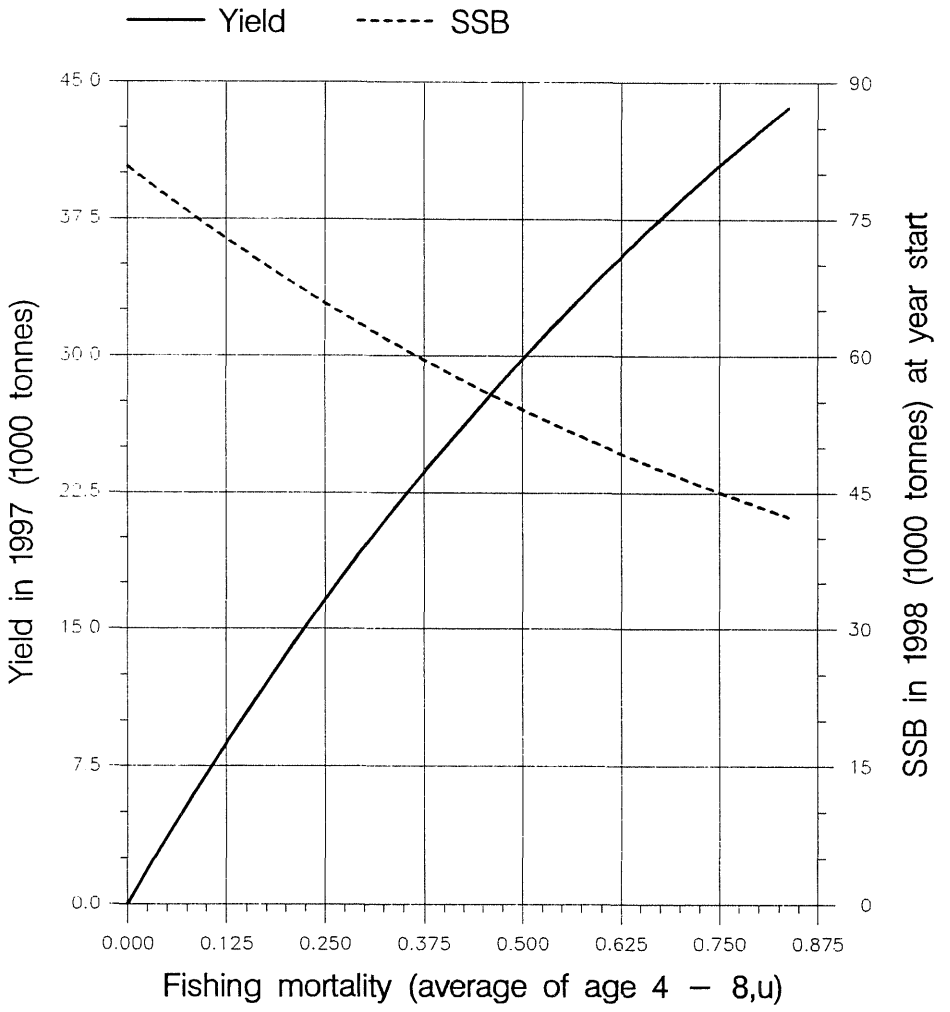
Fish Stock Summary
Saithe in the Faroes Grounds (Fishing Area Vb)
22 – 5 – 1996

Long term yield and spawning stock biomass



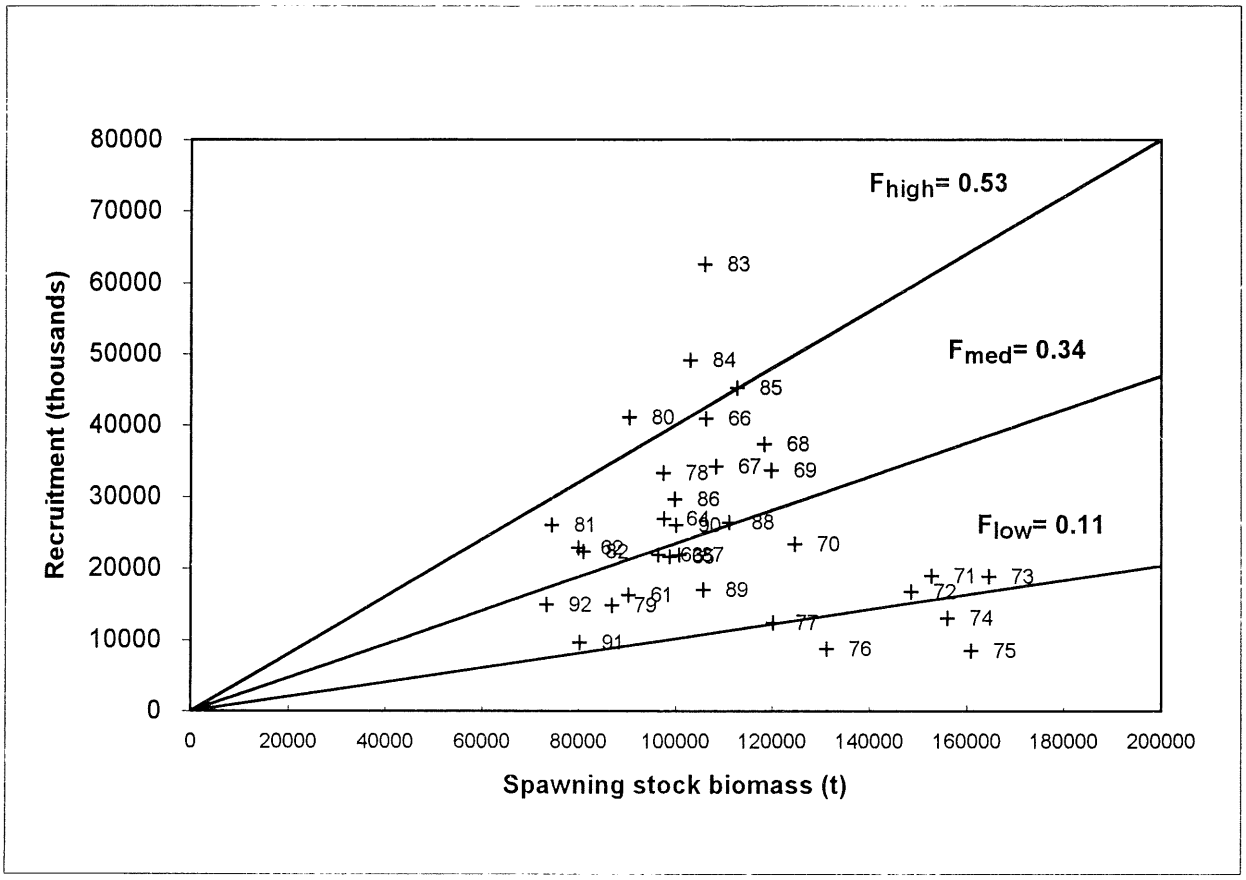
(run: YLDJAK02) C

Short term yield and spawning stock biomass



(run: MANJAK05) D

Figure 2.5.8 Saithe in the Faroes. Spawning stock-recruitment data with F_{low}, F_{med} and F_{high}.



G:\ACFM\NWWG\SAI_FARO\SSB_R.XLS 08. 05. 1996, 17:59

Figure 3.2.1 Icelandic Saithe Proportional catches in different gears.

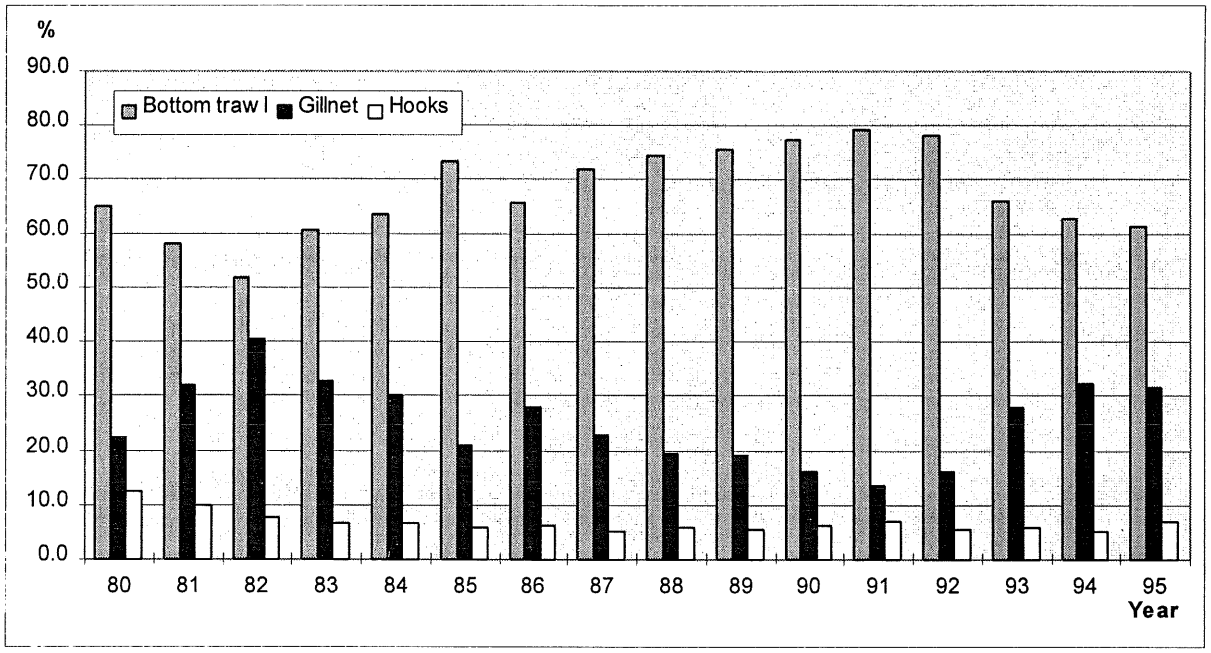


Figure 3.2.2 Icelandic Saithe. Prognosis in May 1995 and estimate in April 1996 for percent (by number) age distribution in the 1995 landings.

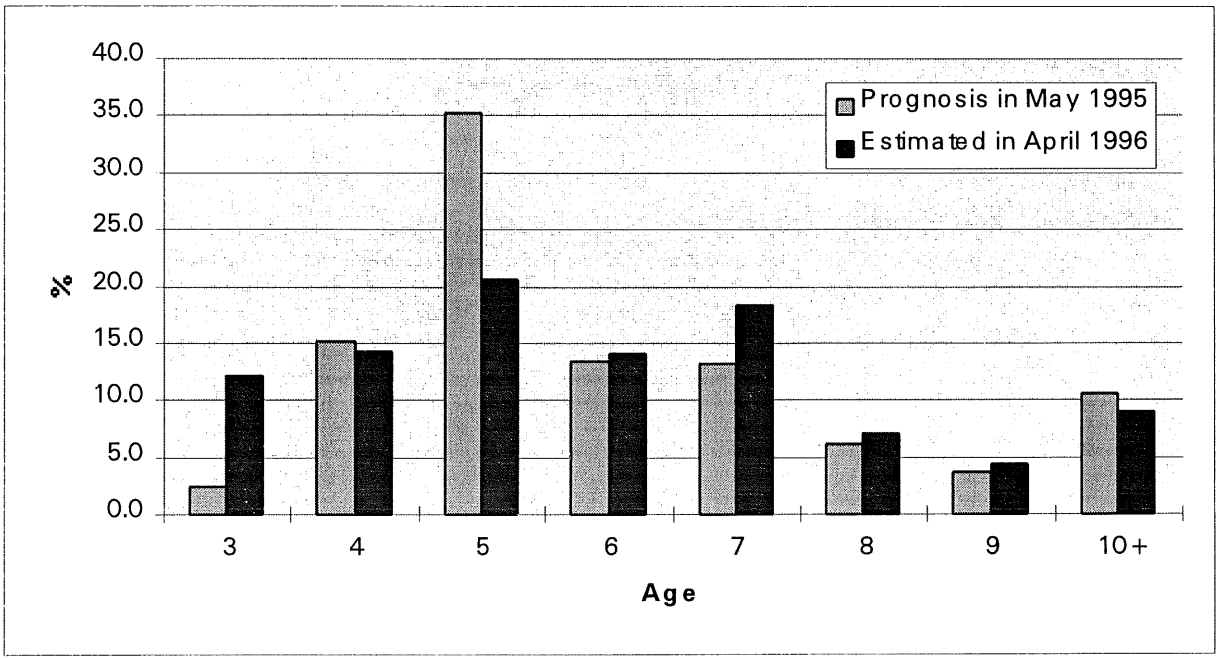
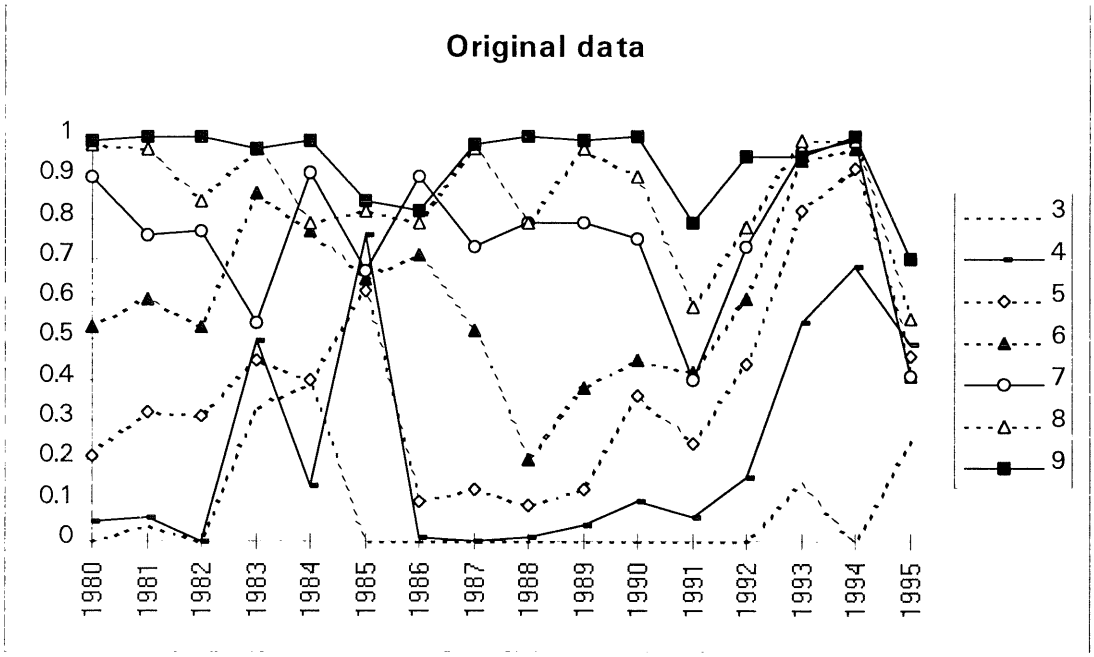


Figure 3.2.3 Icelandic Saithe. Maturity at age, data and fitted values.



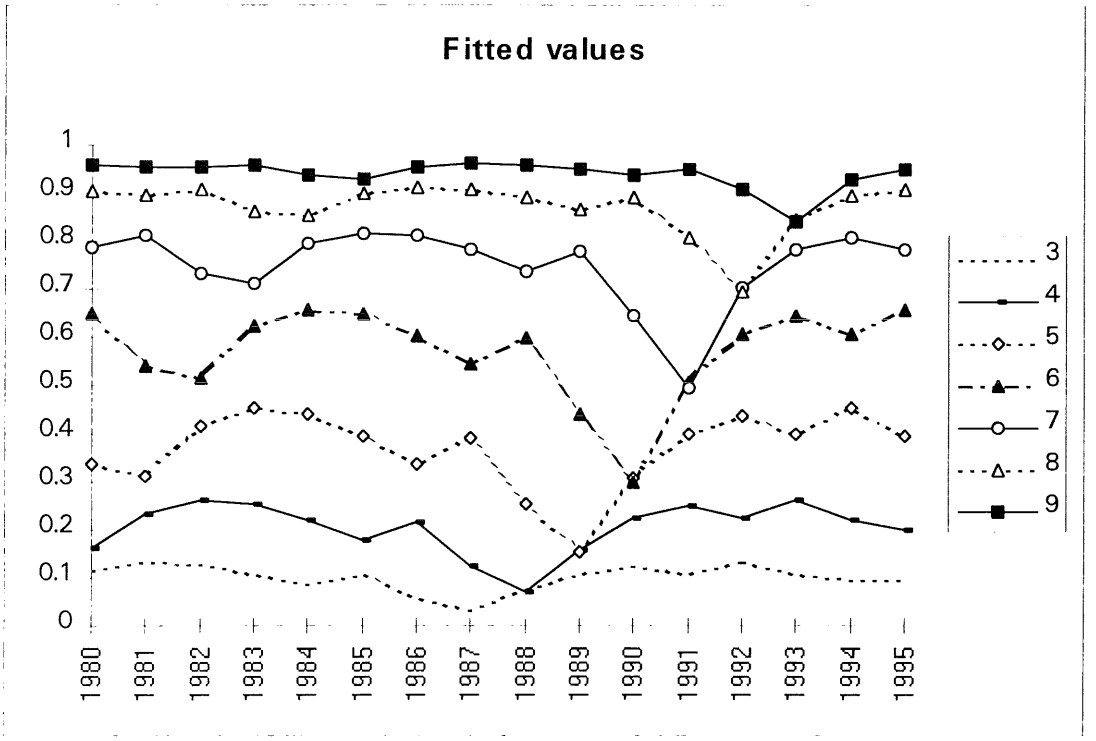


Figure 3.2.4 Retrospective Analysis.

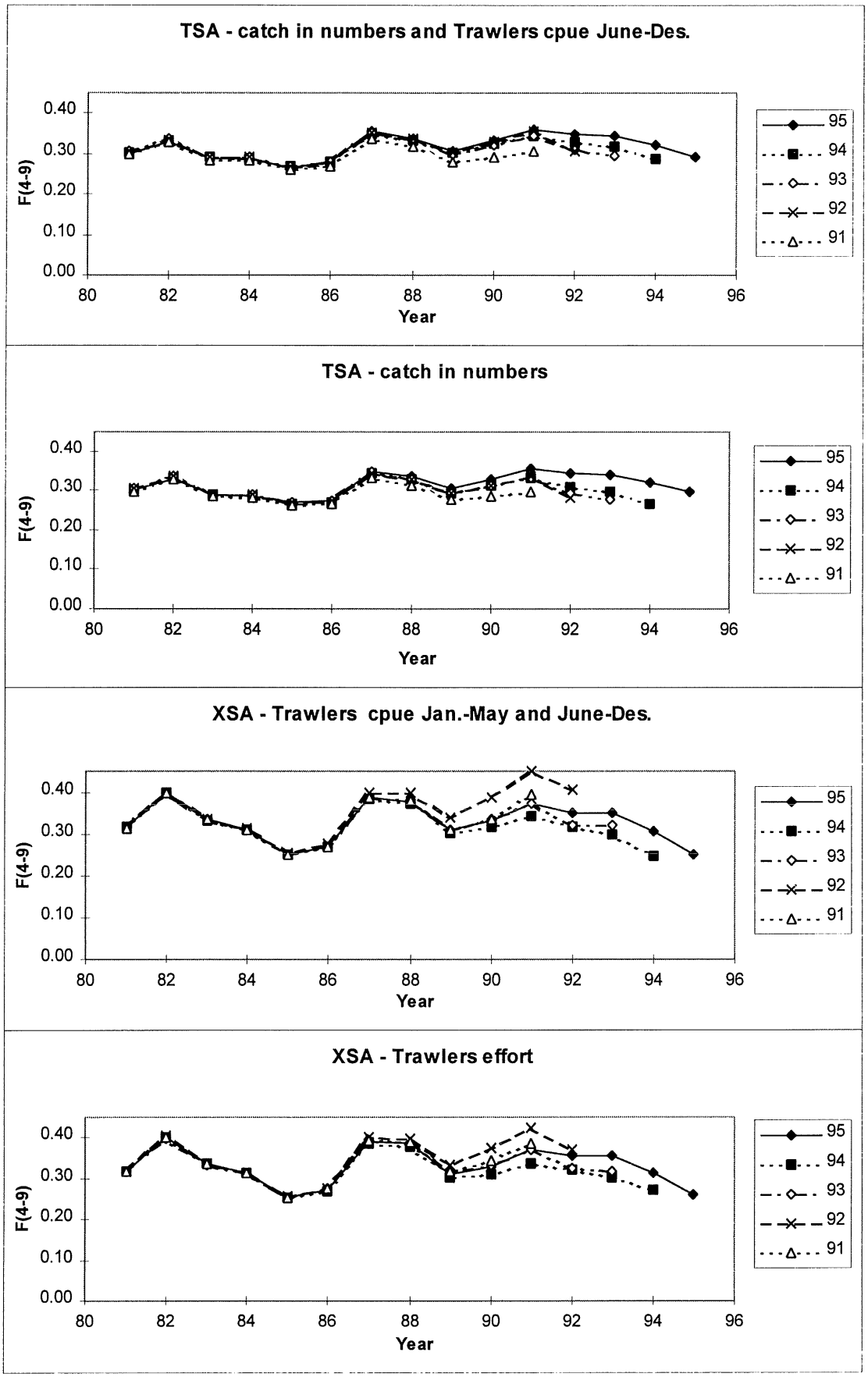
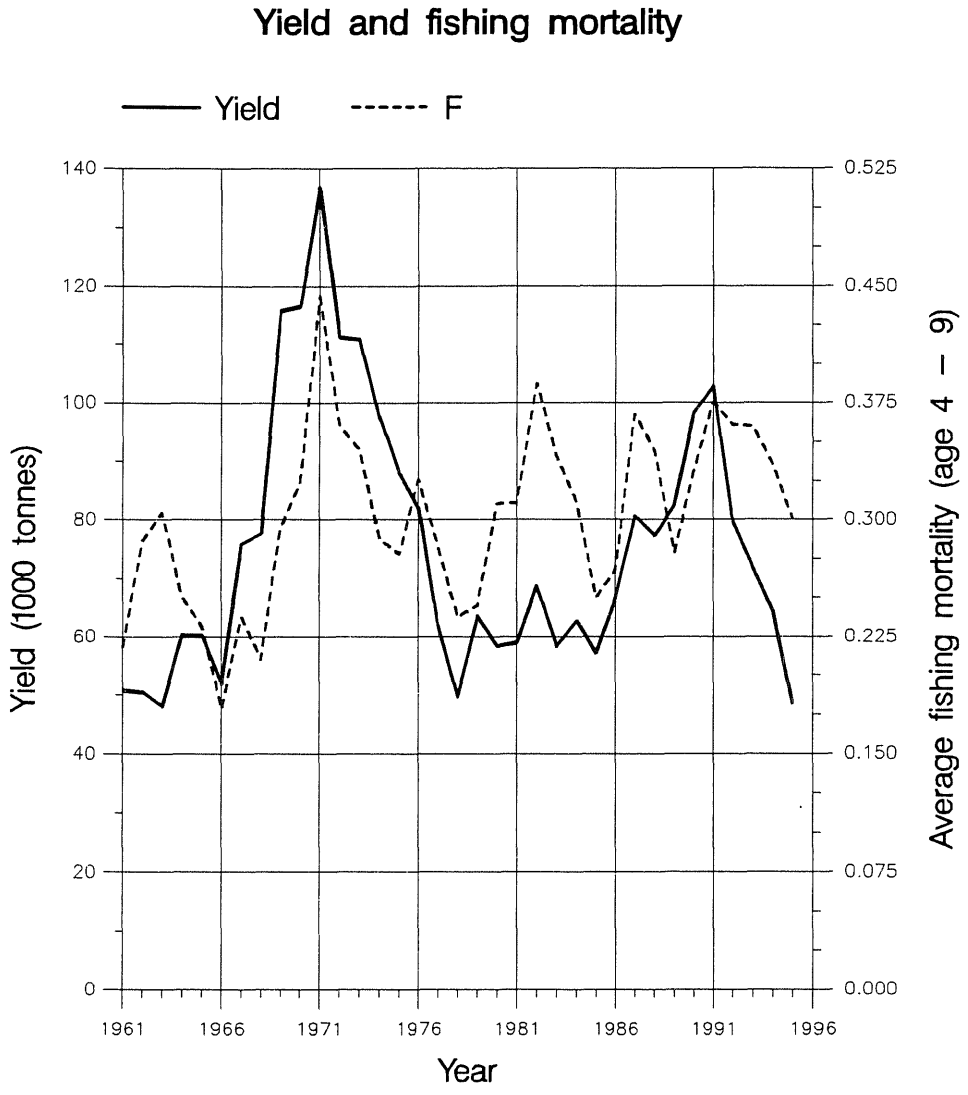
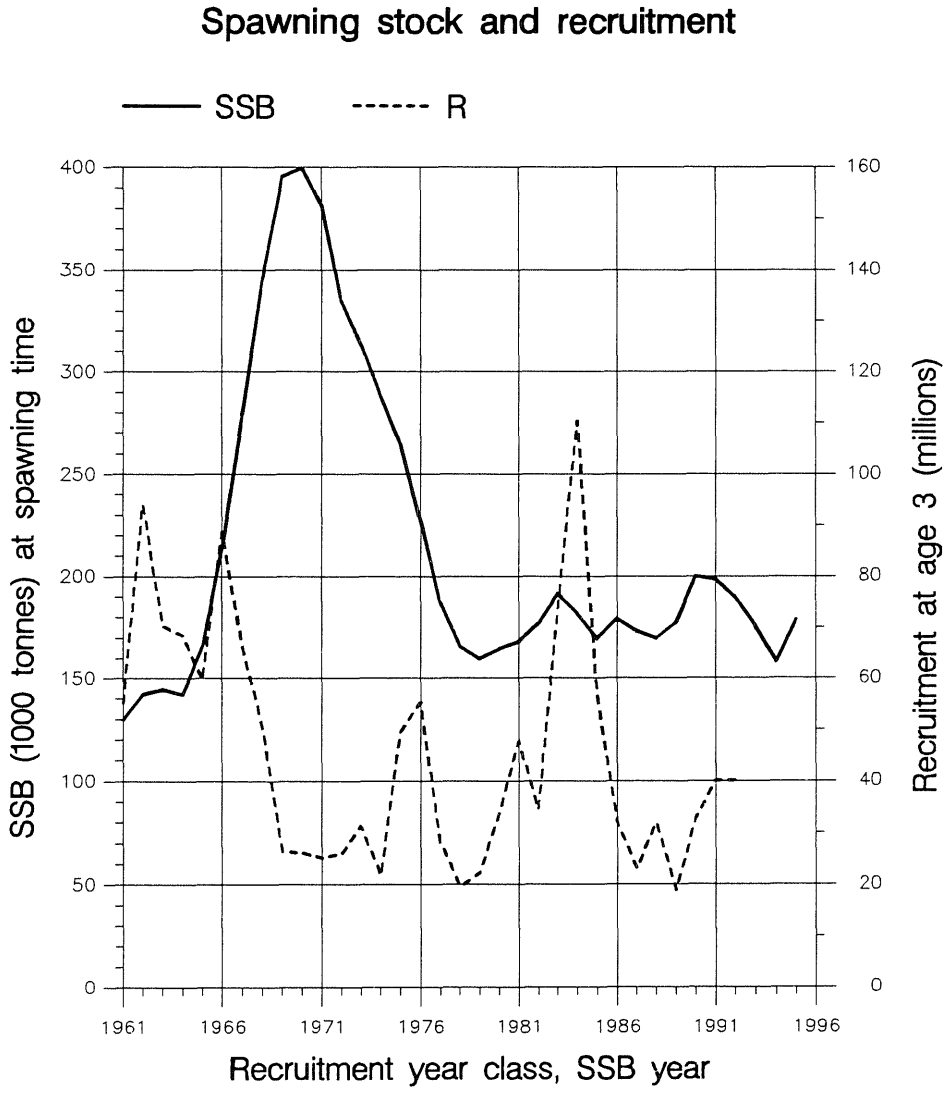


Figure 3.2.5

Fish Stock Summary
Saithe in the Iceland Grounds (Fishing Area Va)
4 – 5 – 1996



(run: SVPBS07) **A**

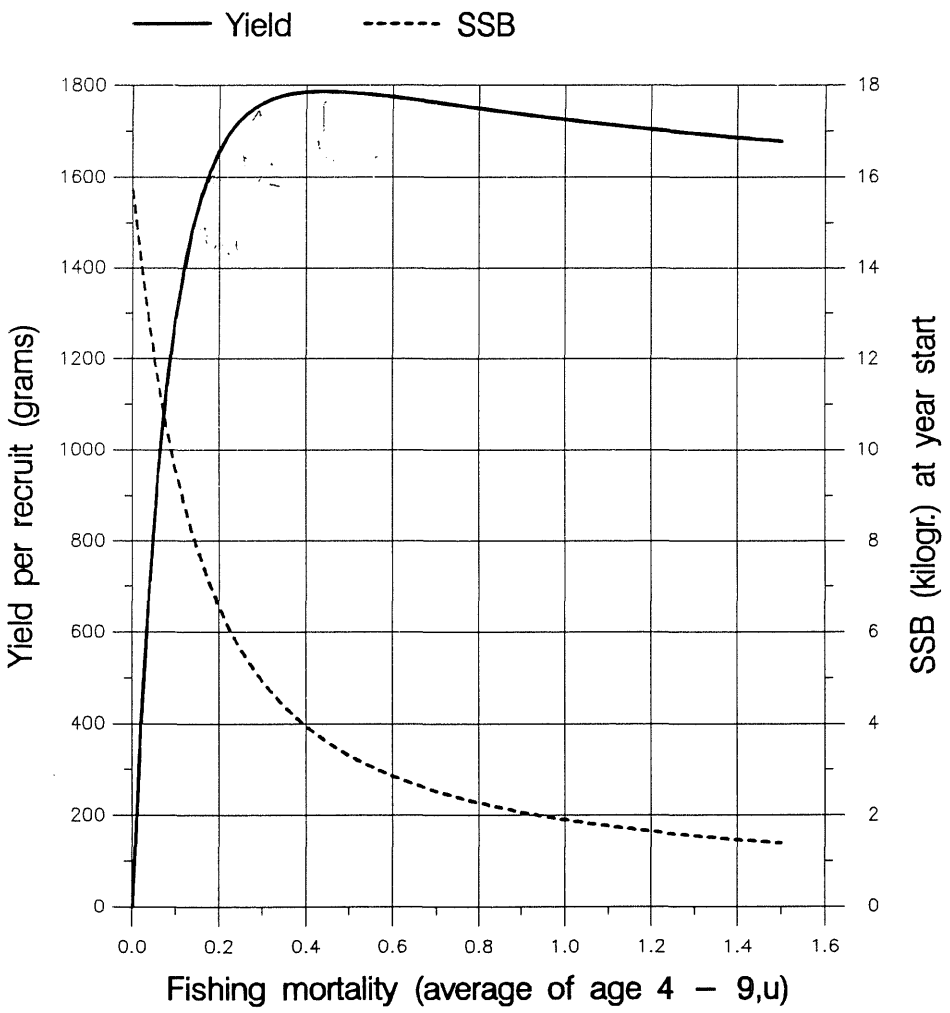


(run: SVPBS07) **B**

Figure 3.2.6

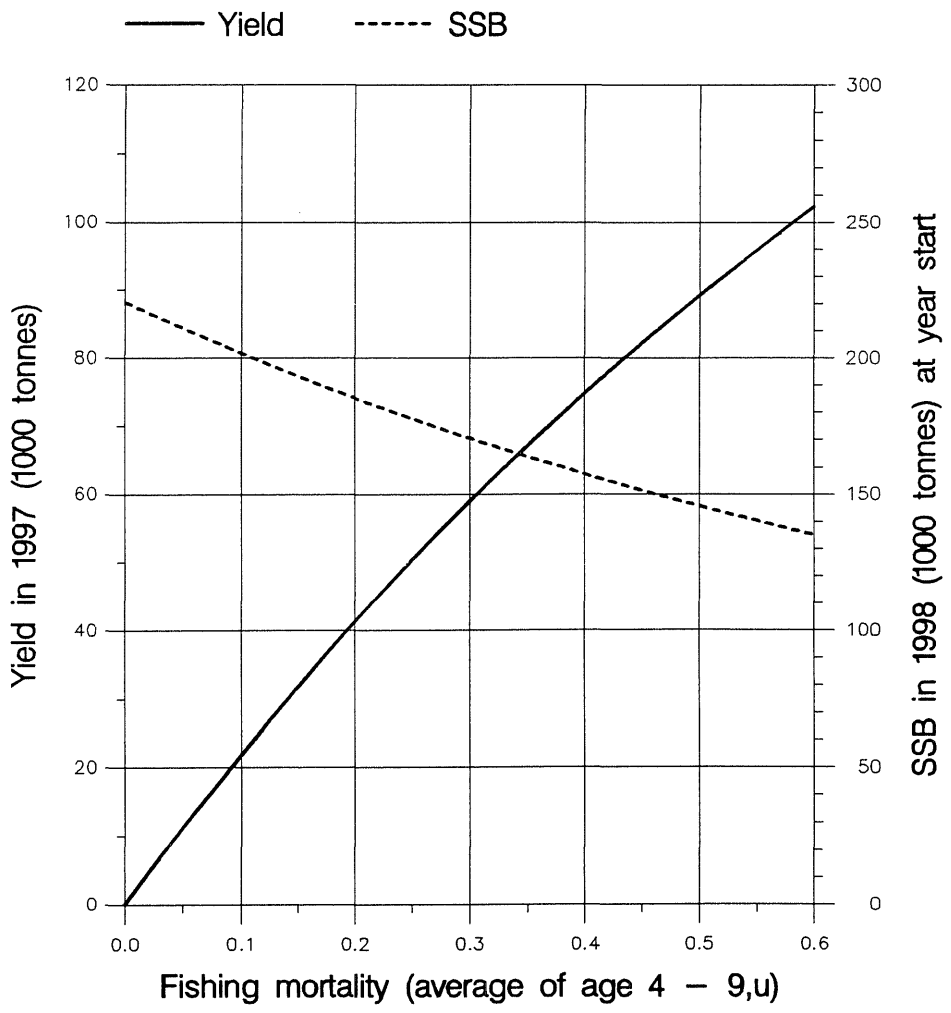
Fish Stock Summary
Saithe in the Iceland Grounds (Fishing Area Va)
3 – 5 – 1996

Long term yield and spawning stock biomass



(run: YIELD3) C

Short term yield and spawning stock biomass



(run: PRED94) D

Figure 3.2.7

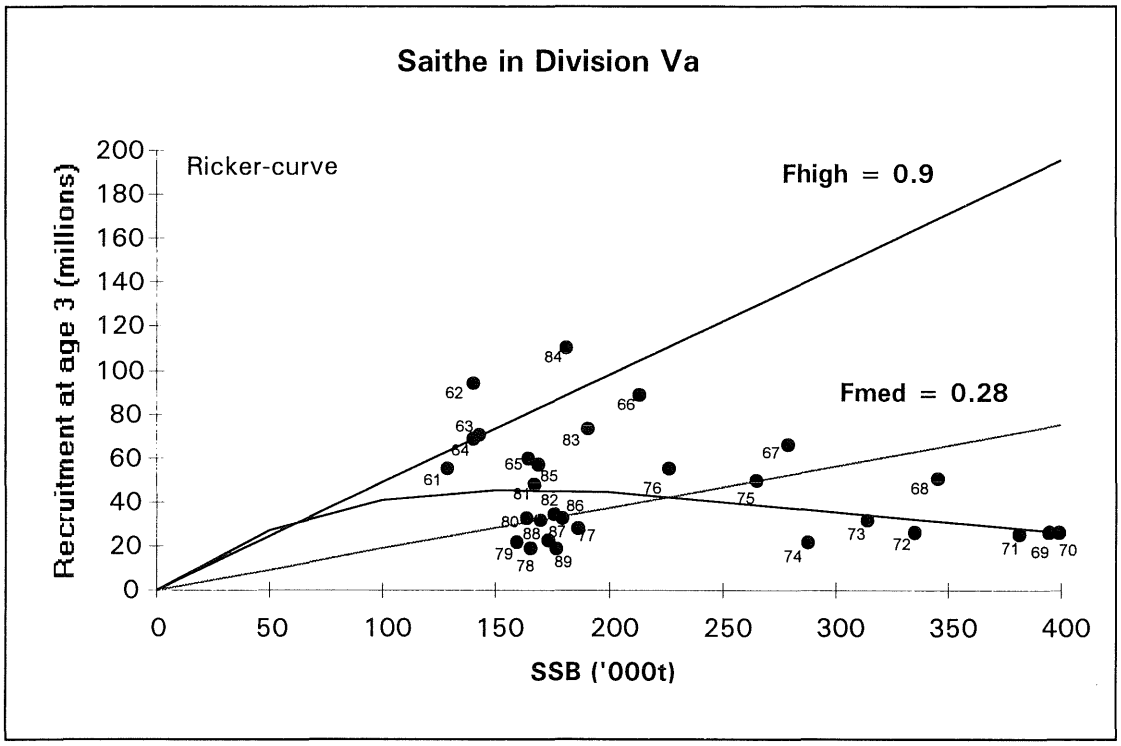

Saithe in Division Va
Ricker-curve
Fhigh = 0.9
Fmed = 0.28
Recruitment at age 3 (millions)
SSB ('000t)
0
20
40
60
80
100
120
140
160
180
200
0
50
100
150
200
250
300
350
400
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Figure 3.3. 1. Icelandic Cod. The percentage decline in effort directed against cod since 1991 for the main cod fleets.

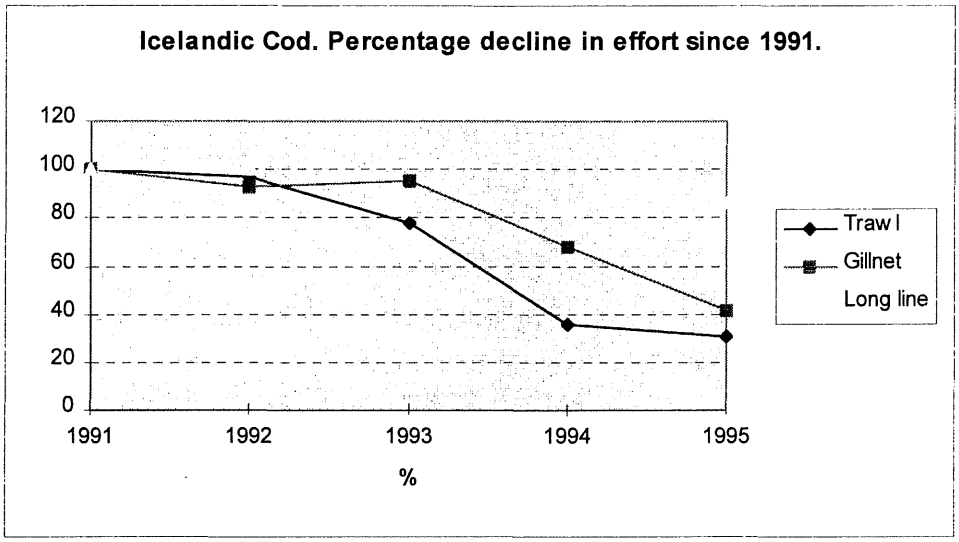


Figure 3.3.2. Icelandic Cod. The percentage changes in CPUE since 1991 for the main cod fleets.

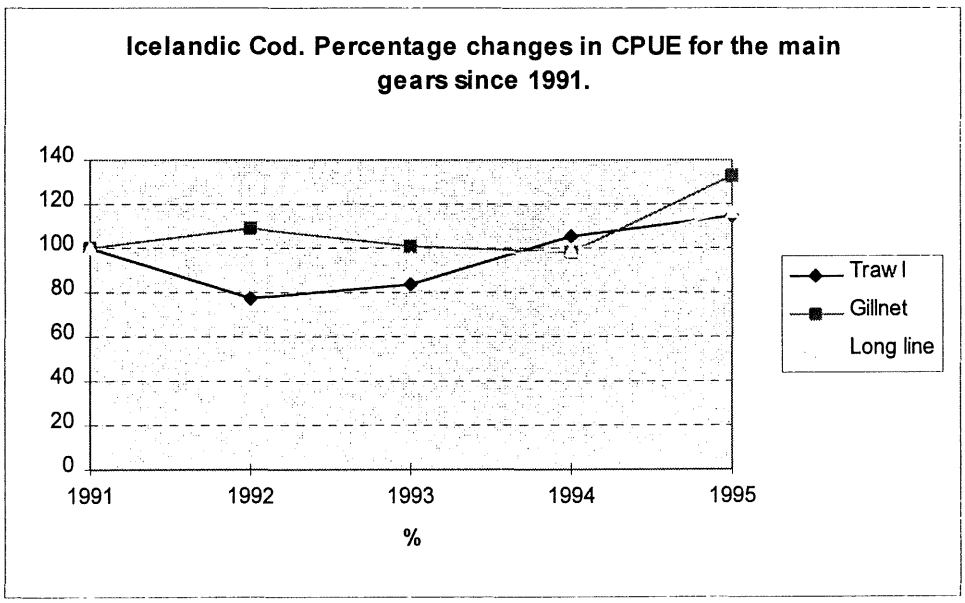


Figure 3.3.3. Iceland Cod. Retrospective analysis of the XSA.

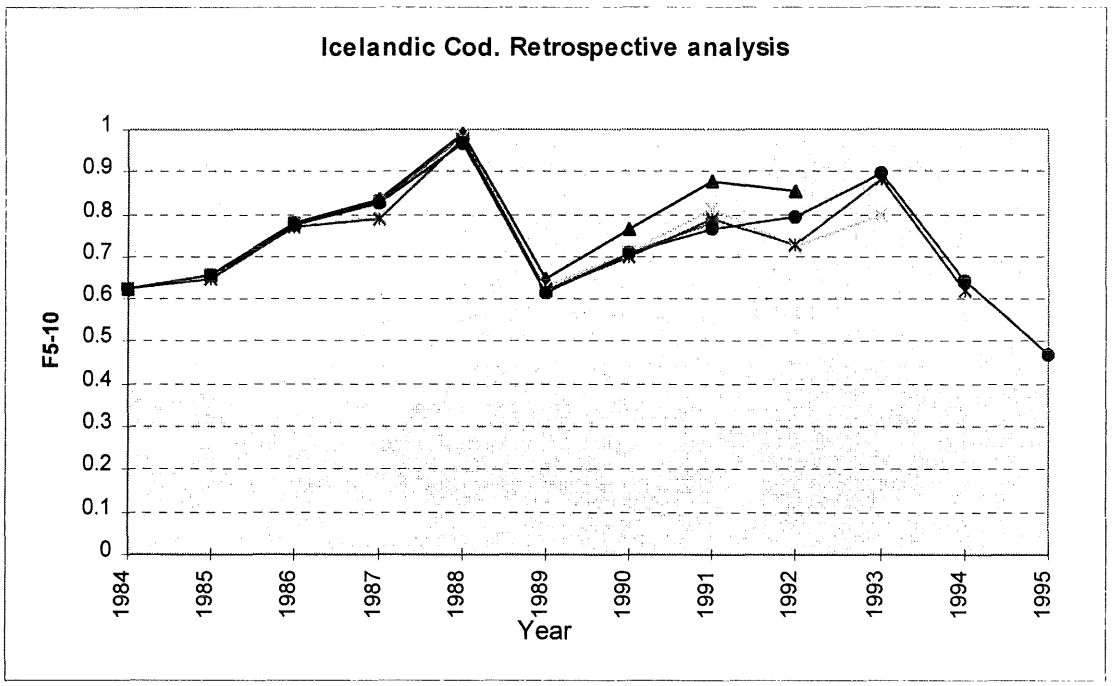


Figure. 3.3.4. Stock-recruitment plot. Historical data, lines corresp. to Fmed=0.45, Fhigh=0.70 and the stock-recruitment curve.

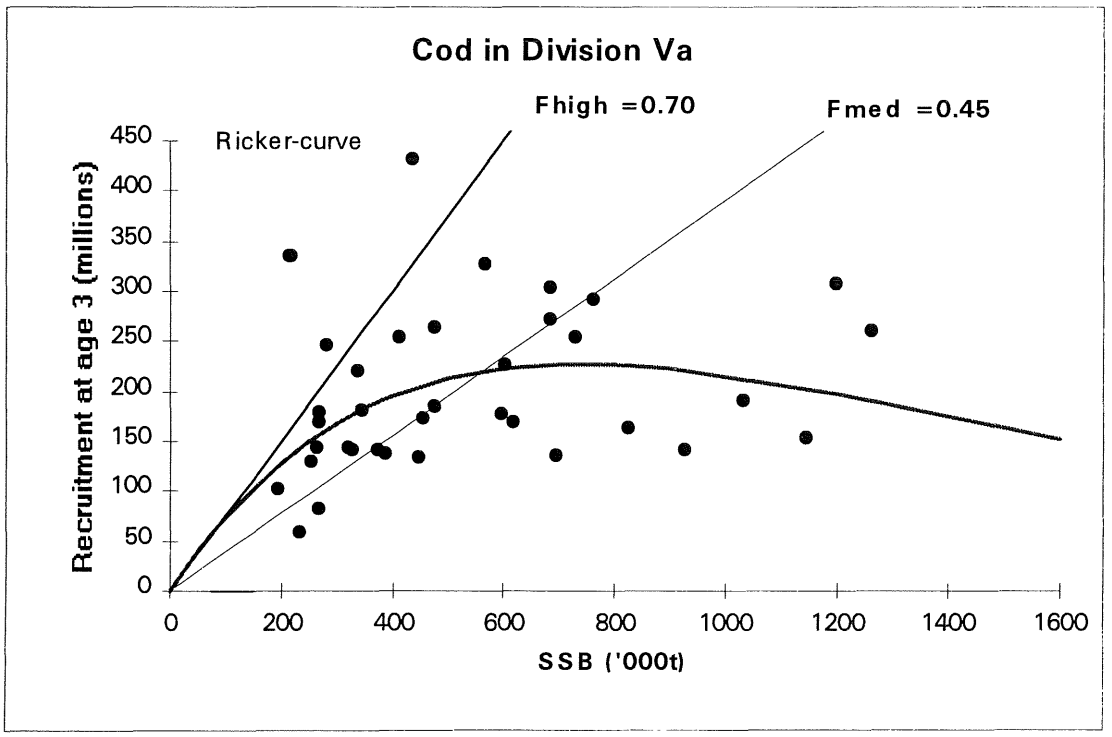


Figure 3.3.5. Icelandic Cod. Proportion mature by age and year, as estimated from the commercial catches taken during January-May.

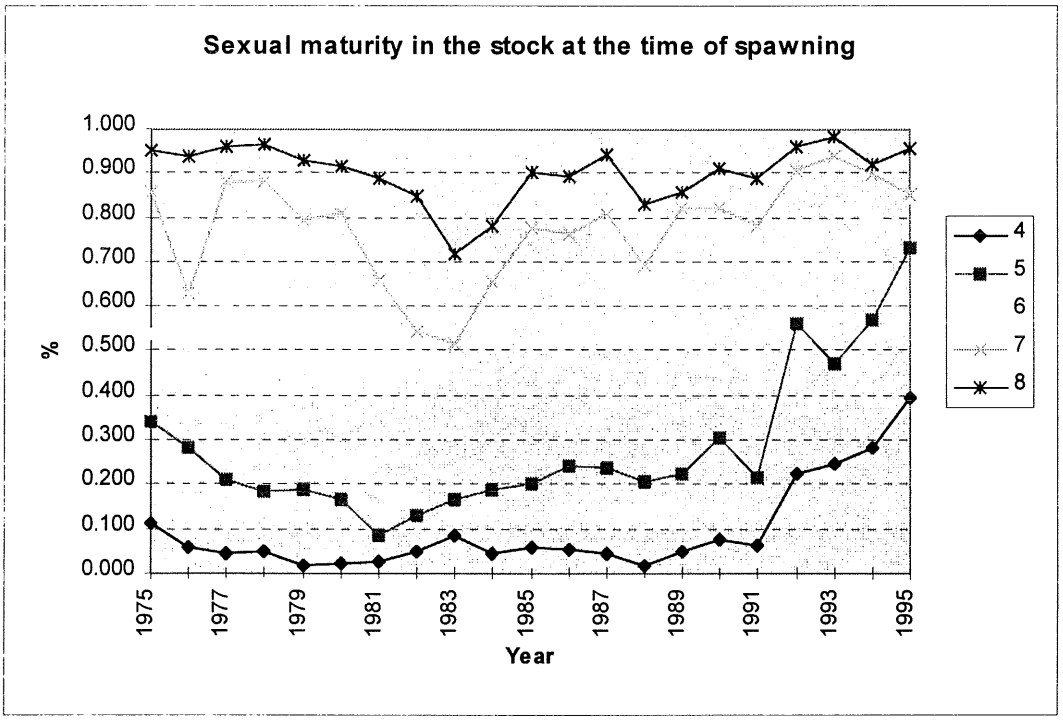
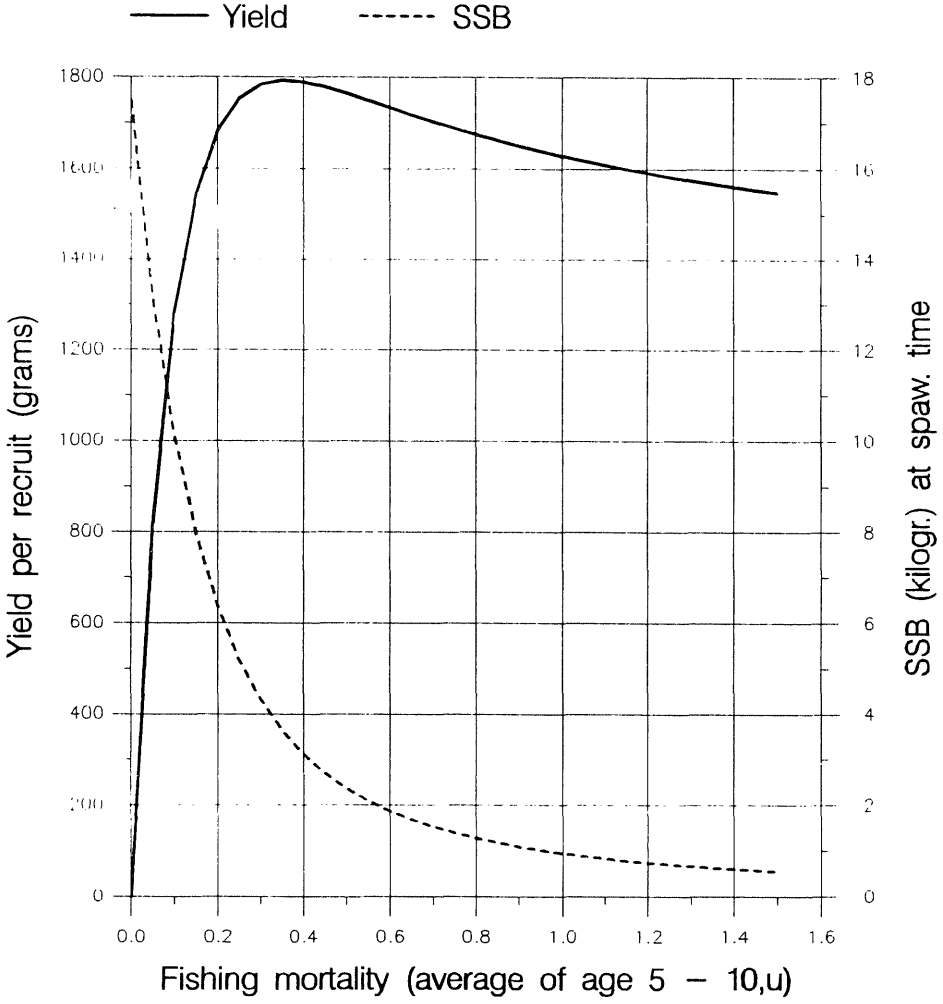


Figure 3.3.6

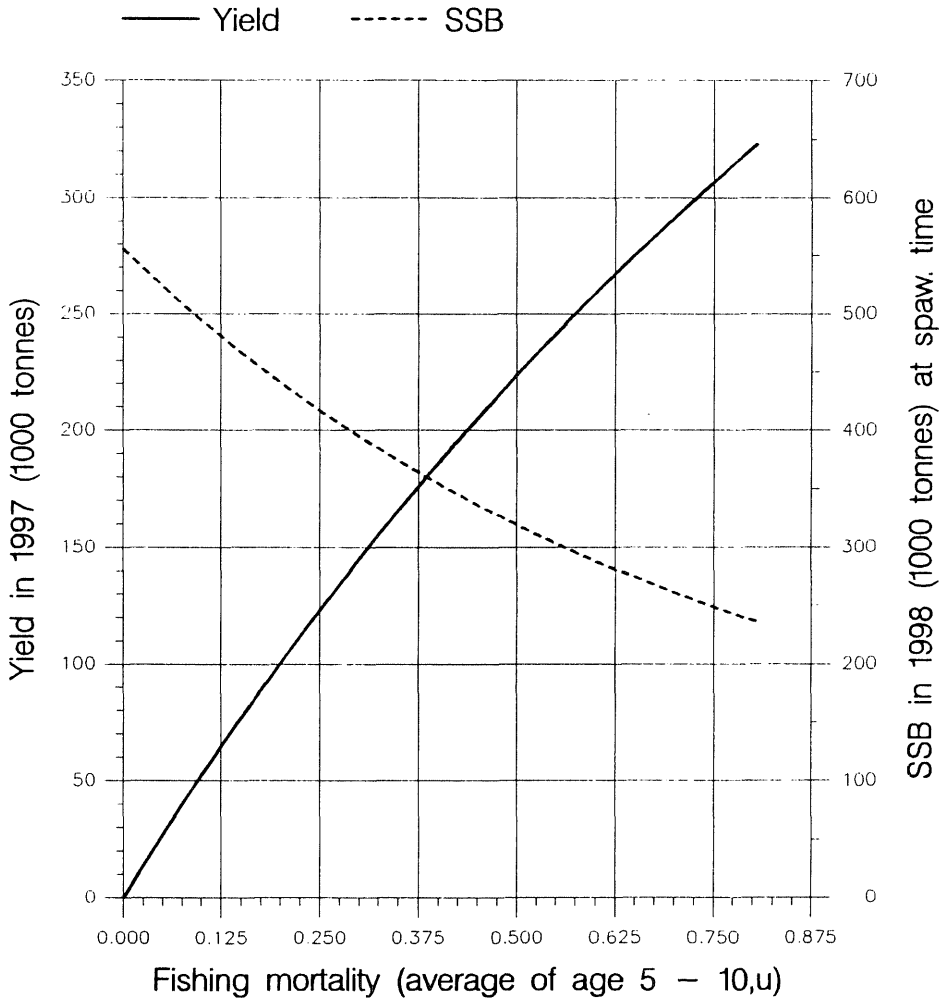
Fish Stock Summary
Cod in the Iceland Grounds (Fishing Area Va)
5 – 5 – 1996

Long term yield and spawning stock biomass



(run: YLDSAS01) C

Short term yield and spawning stock biomass



(run: MANSAS01) D

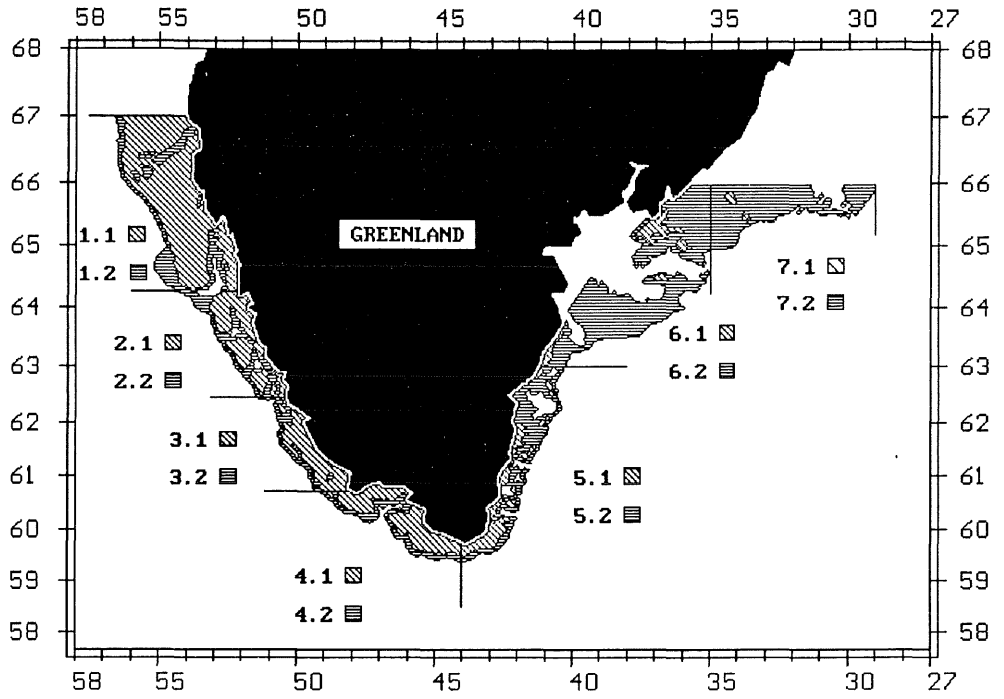


Fig. 5.1.1 Cod off Greenland (offshore component). Survey area and stratification.

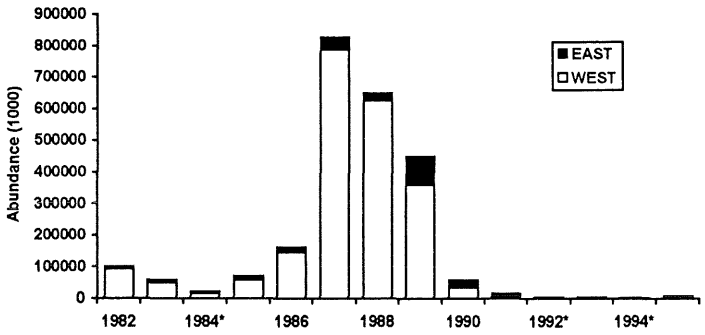


Fig. 5.1.2 G. morhua. Aggregated survey abundance indices for West and East Greenland, 1982-95. *) incomplete survey coverage.

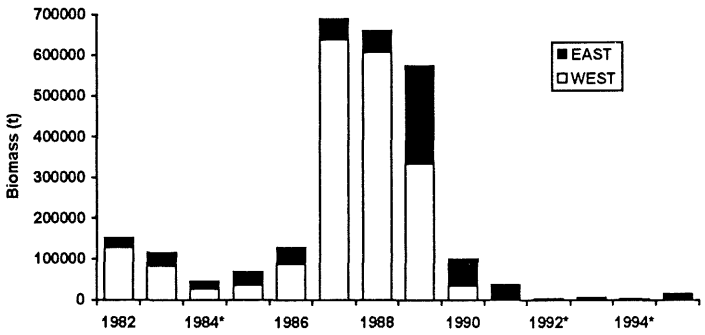


Fig. 5.1.3 G. morhua. Aggregated survey biomass indices for West and East Greenland, 1982-95. *) incomplete survey coverage.

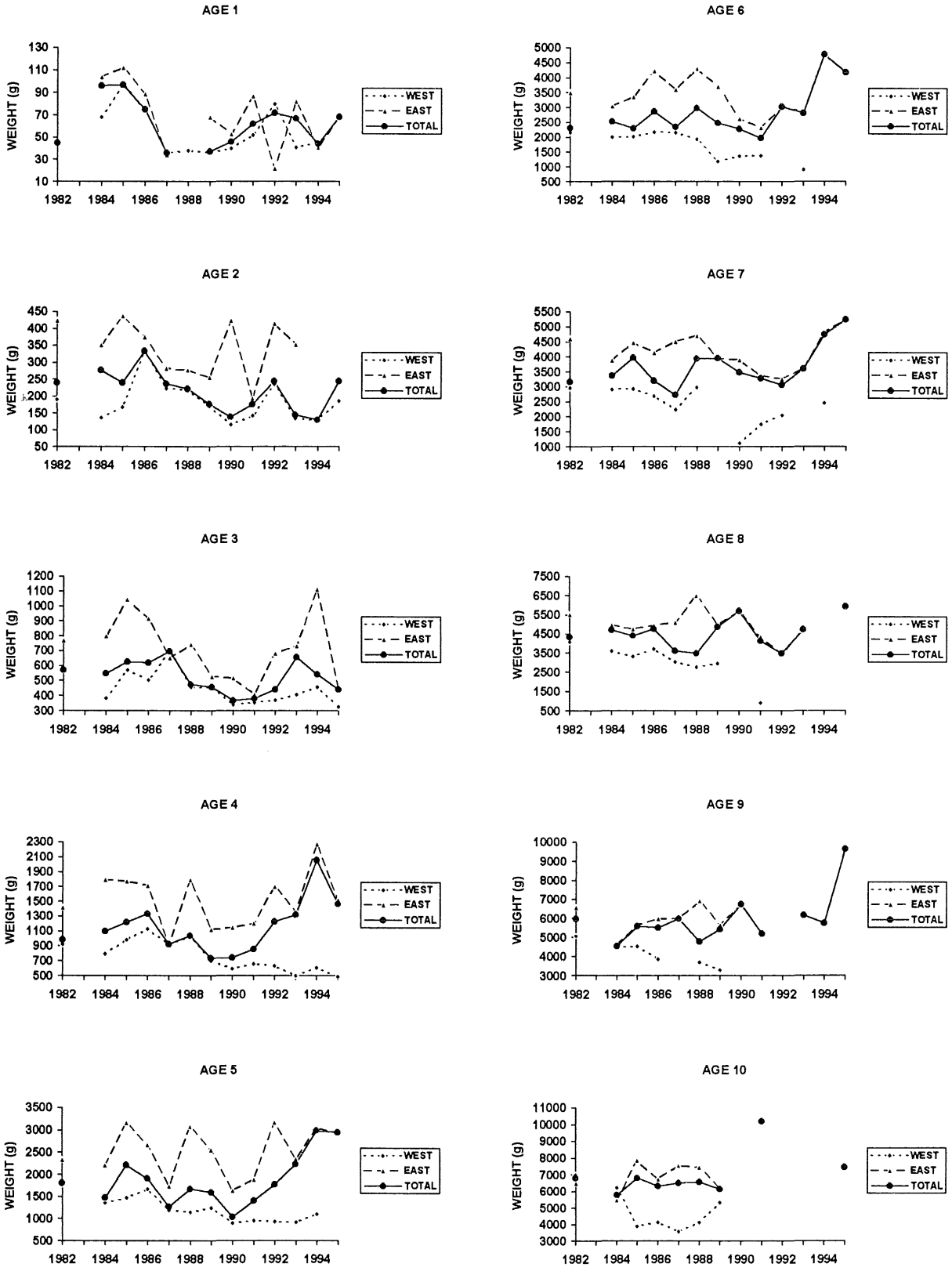


Fig. 5.1.4 G. morhua. Weighted mean weight at age 1-10 years for West, East Greenland and total, 1982-95.

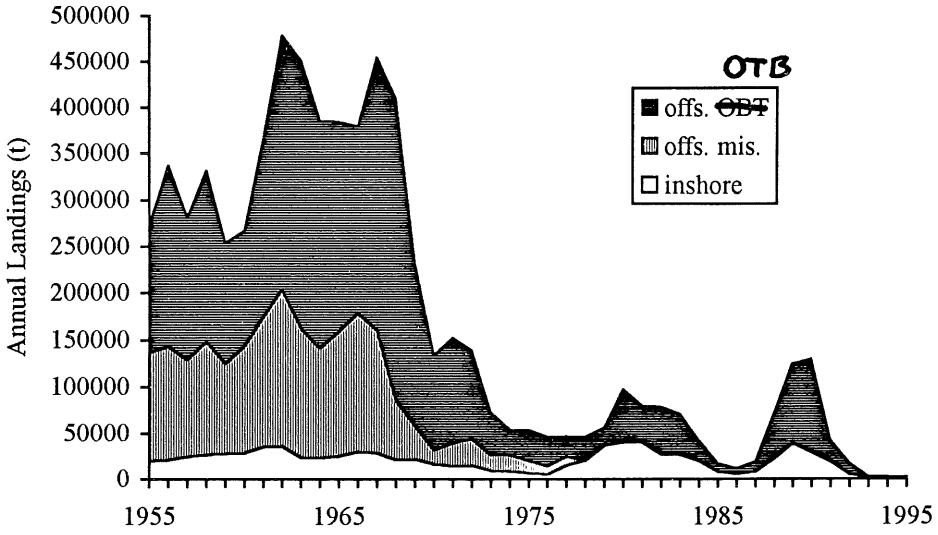


Fig. 5.1.5 Greenland cod catches 1955-95 as used by the Working Group, inshore and offshore by gear (Horsted,1994).

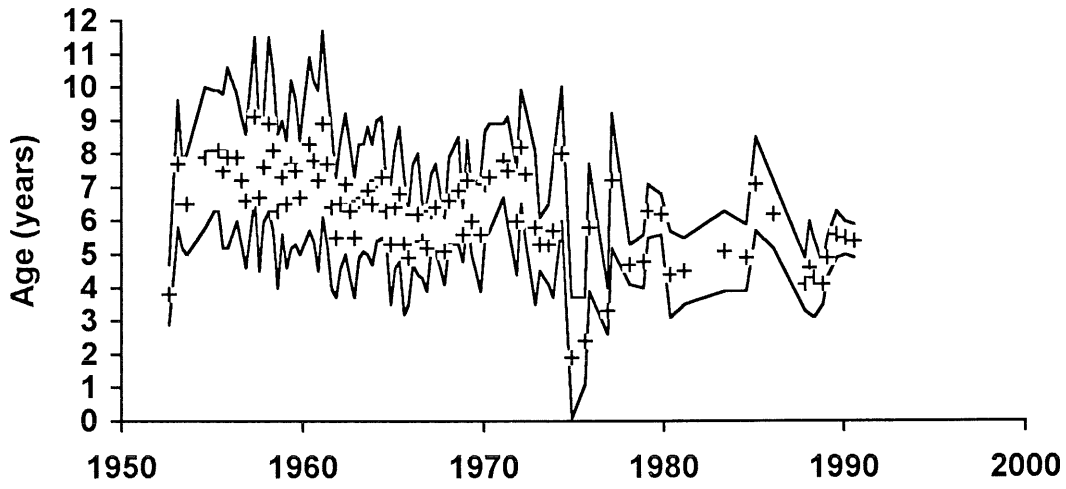


Fig. 5.1.6 G. morhua. Mean age ± standard deviation of quaterly aggregated landings taken off West Greenland, 1952-90.

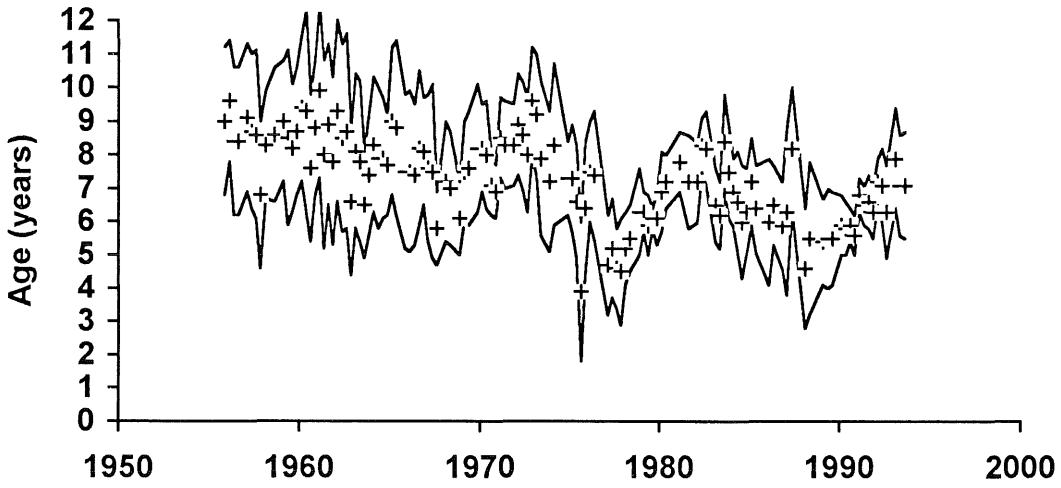


Fig. 5.1.7 G. morhua. Mean age ± standard deviation of quaterly aggregated landings taken off East Greenland, 1955-93.

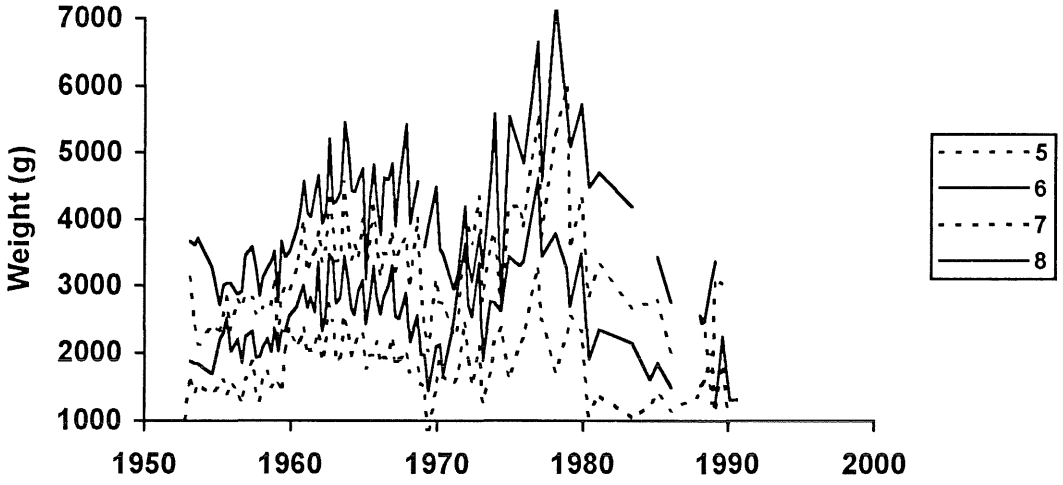


Fig. 5.1.8 G. morhua. Mean weight at ages 5-8 years of quarterly aggregated landings taken off West Greenland, 1952-90.

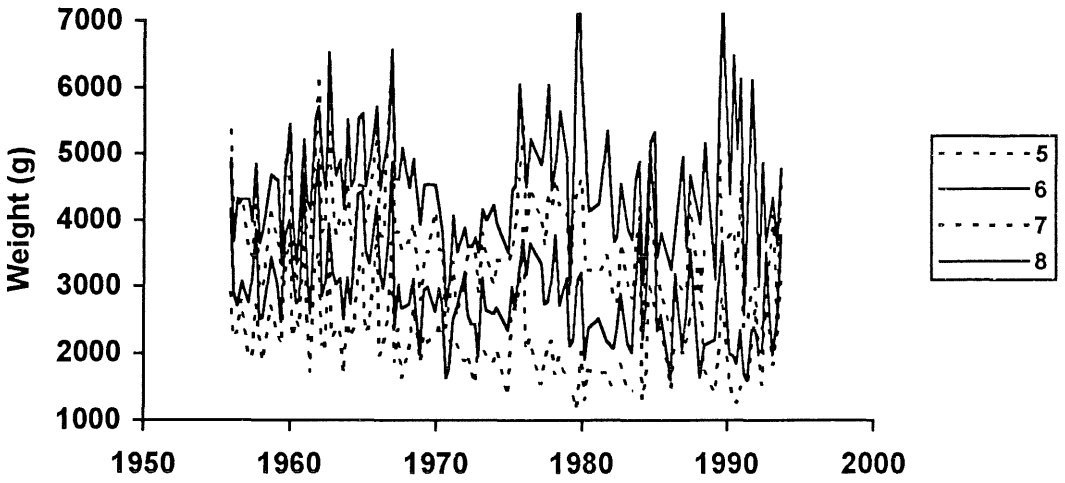


Fig. 5.1.9 G. morhua. Mean weight at ages 5-8 years of quarterly aggregated landings taken off East Greenland, 1955-93.

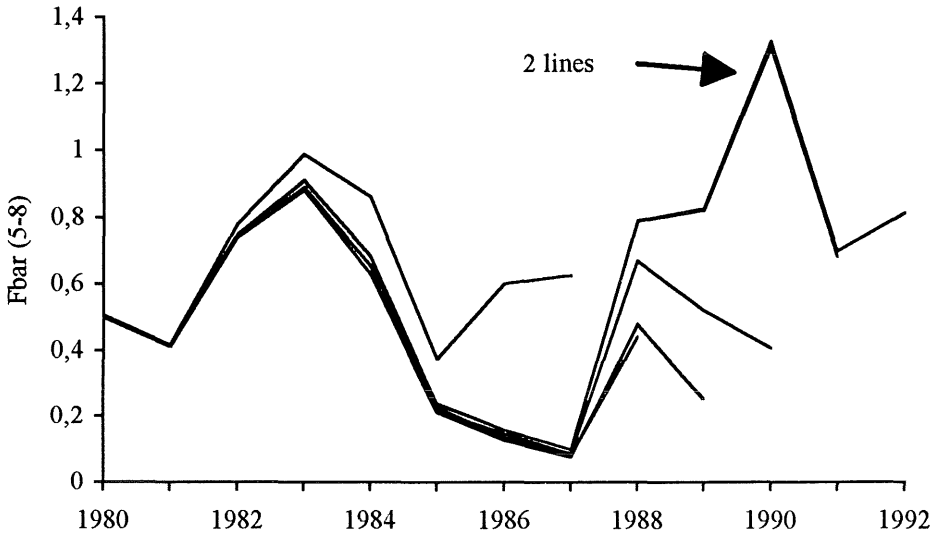


Fig. 5.1.10 Greenland cod (offshore component). Retrospective analysis of the performance of the XSA for the 1955-92 period.

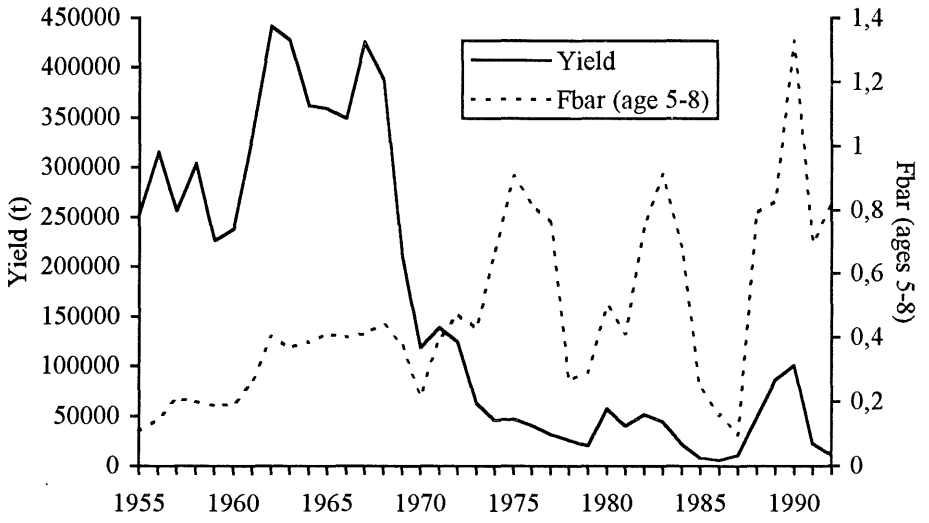


Fig. 5.1.11 Greenland cod (offshore component). Trends in yield and fishing mortality.

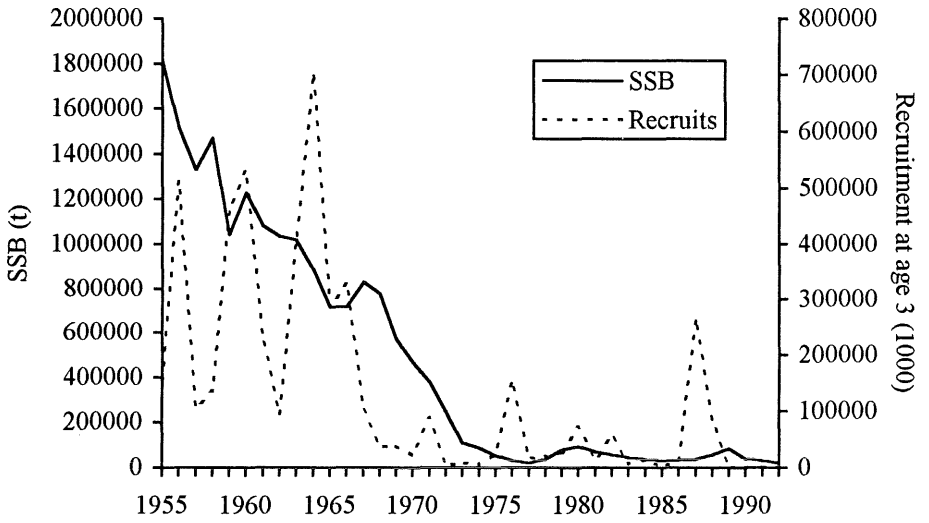


Fig. 5.1.12 Greenland cod (offshore component). Trends in spawning stock biomass (SSB) and recruitment.

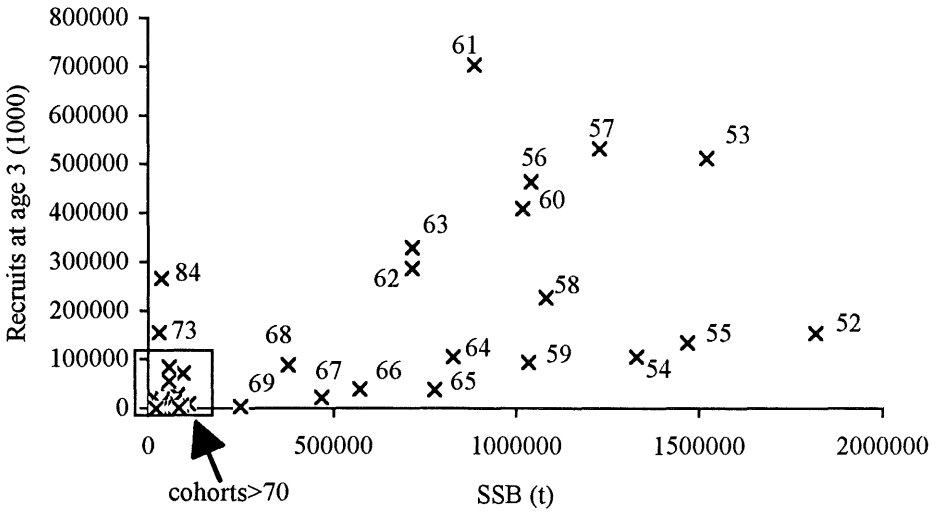


Fig. 5.1.13 Greenland cod (offshore component). Spawning stock-recruitment plot.

Figure 6.6.1.1. Plot of S.E. (log q) for ages 7-14 , from initial XSA .

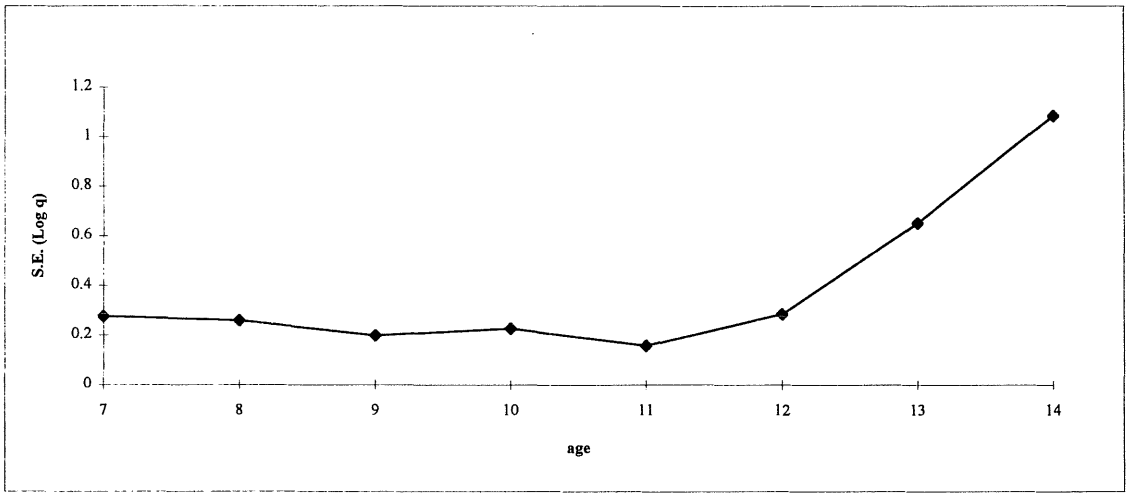


Figure 6.6.1.2 . Plots of log (q) residuals for age groups 7-12 in the years 1985 to 1995, from XSA and L/S tunings.

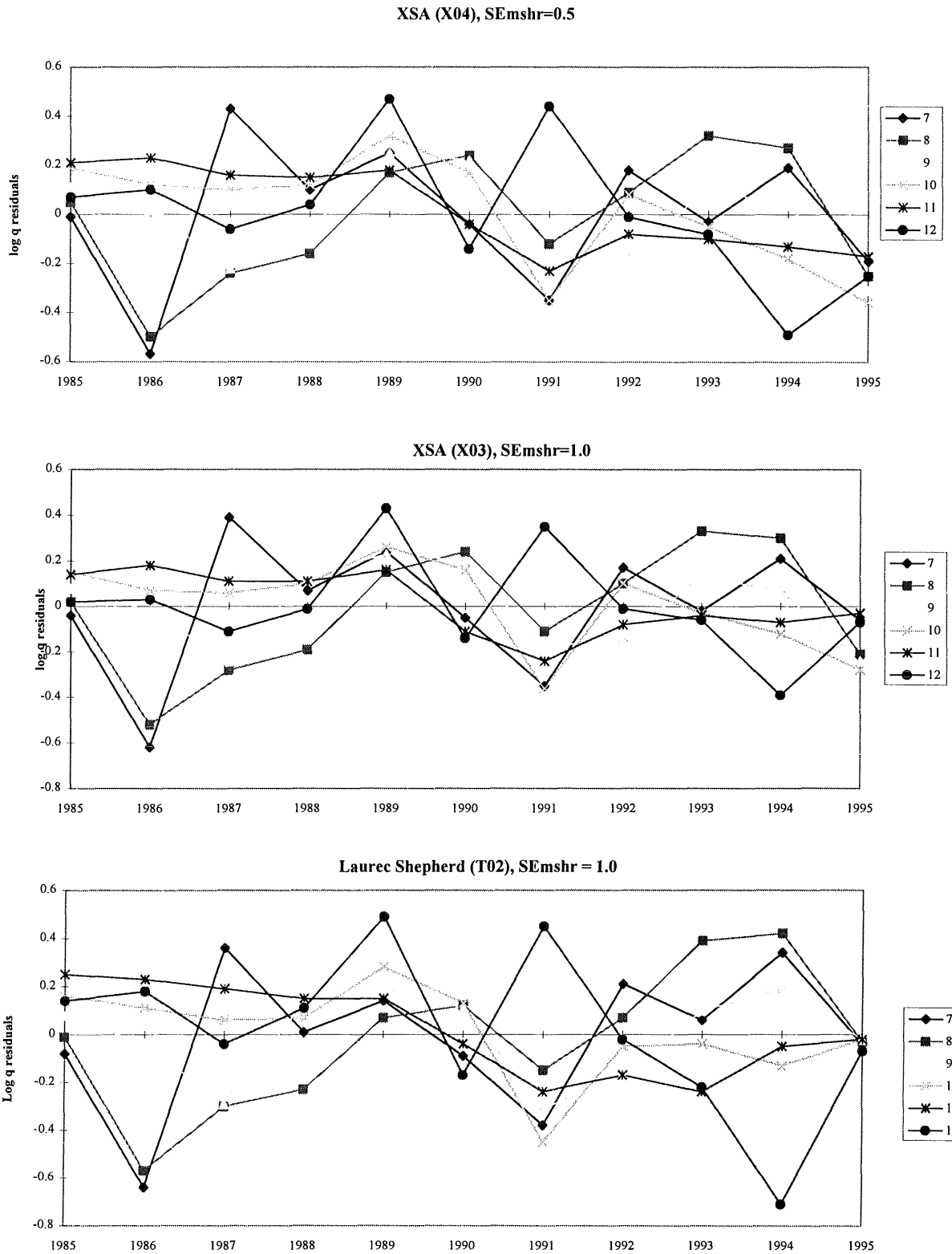
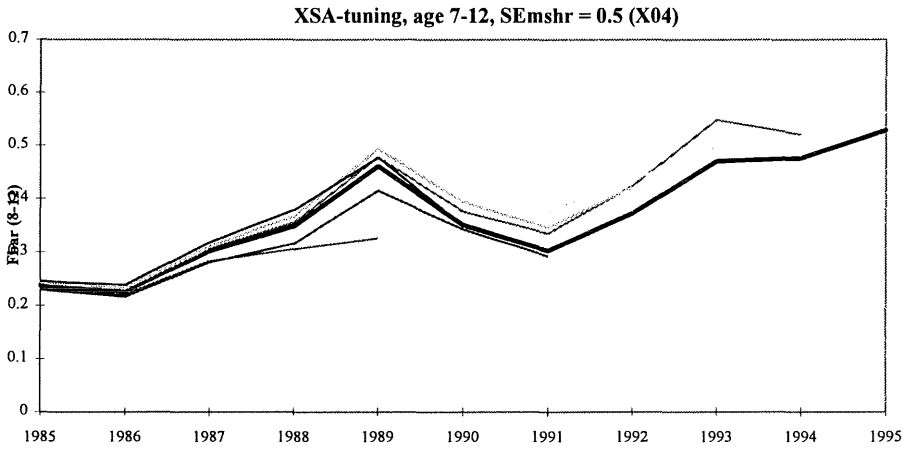
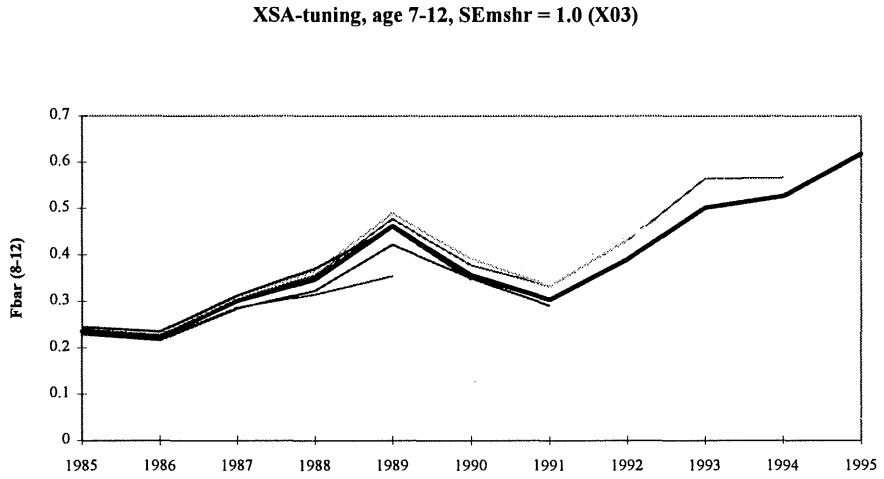


Figure 6.6.1.3. Retrospective analyses Greenland halibut XIV and V.





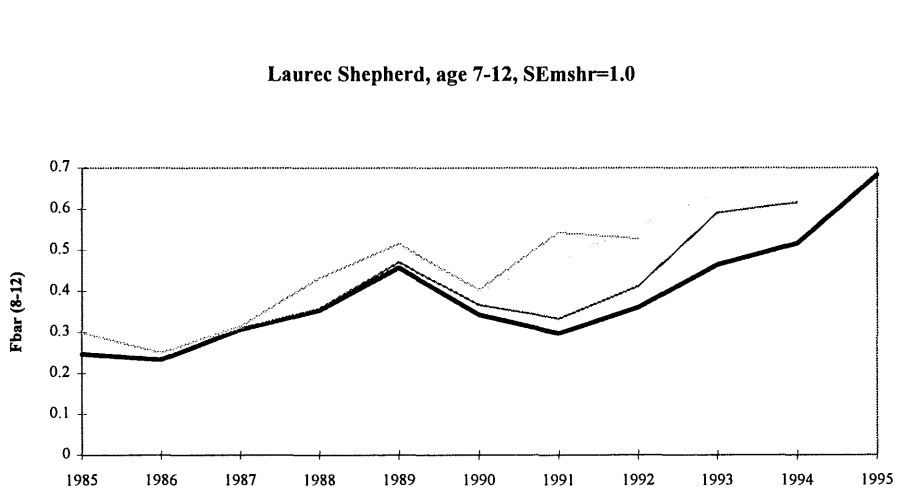


Figure 6.6.1.4 . Plot of Fbar (8-12) versus total effort. F values based on XSA with SEmshr = 1.0 (Table 6.x.x) and on a L/S run with a SEmshr=1.0, and effort values based on Icelandic trawlerfleet (Table 6.x.x).

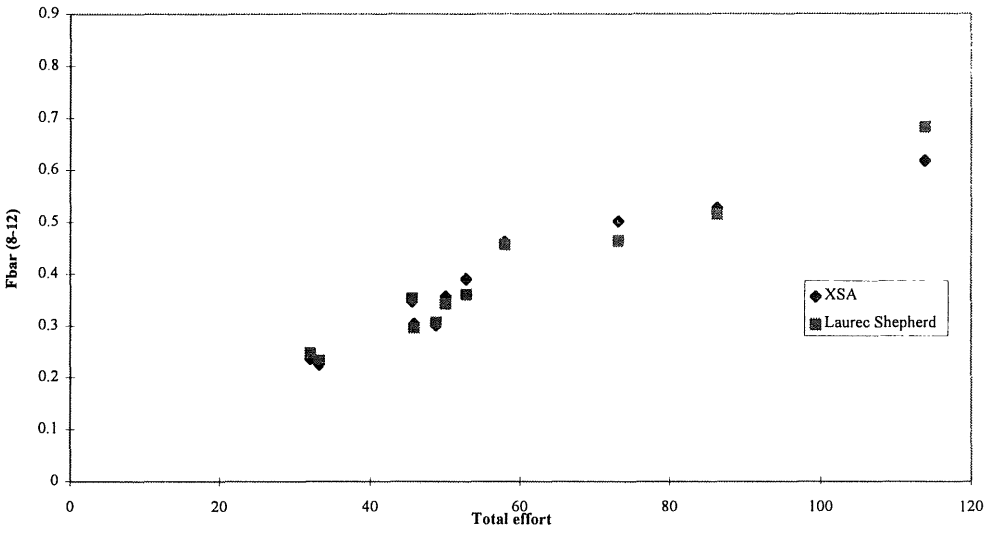
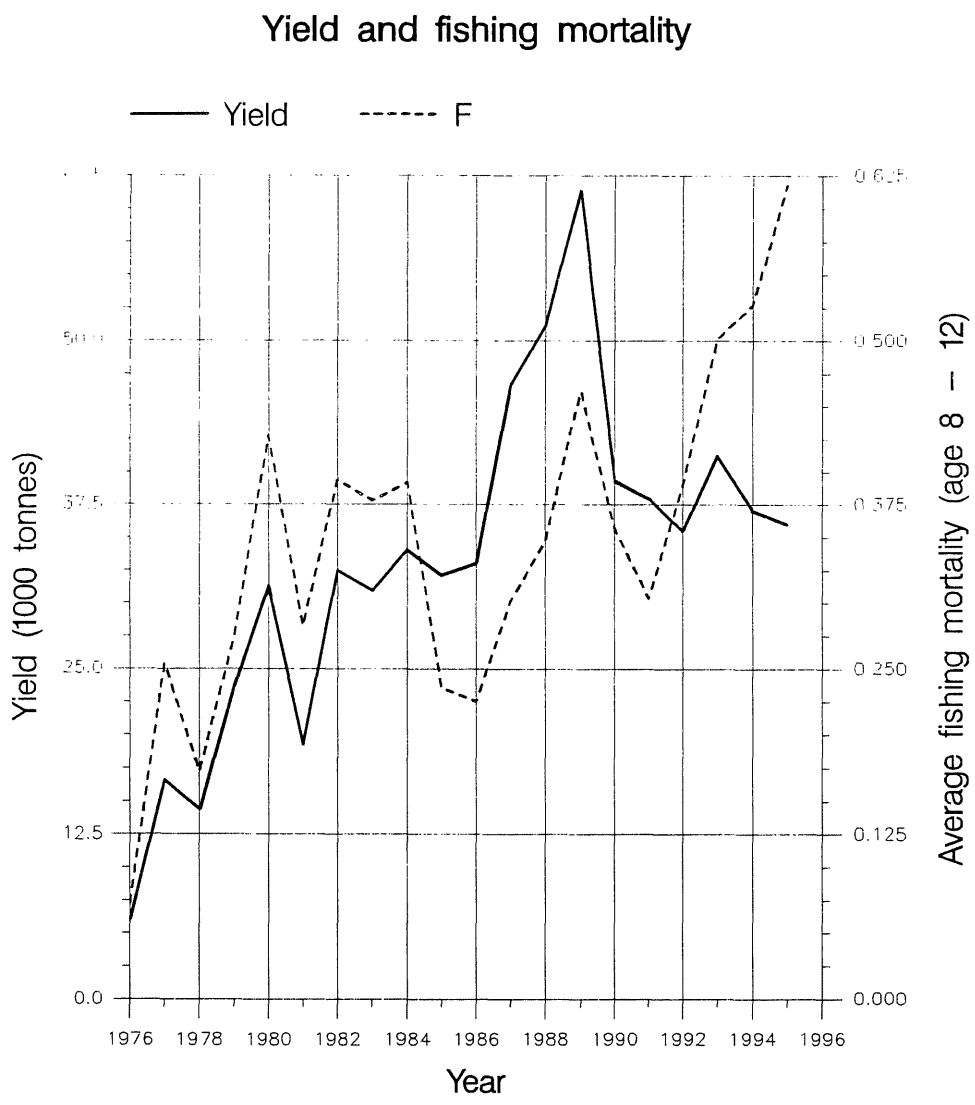
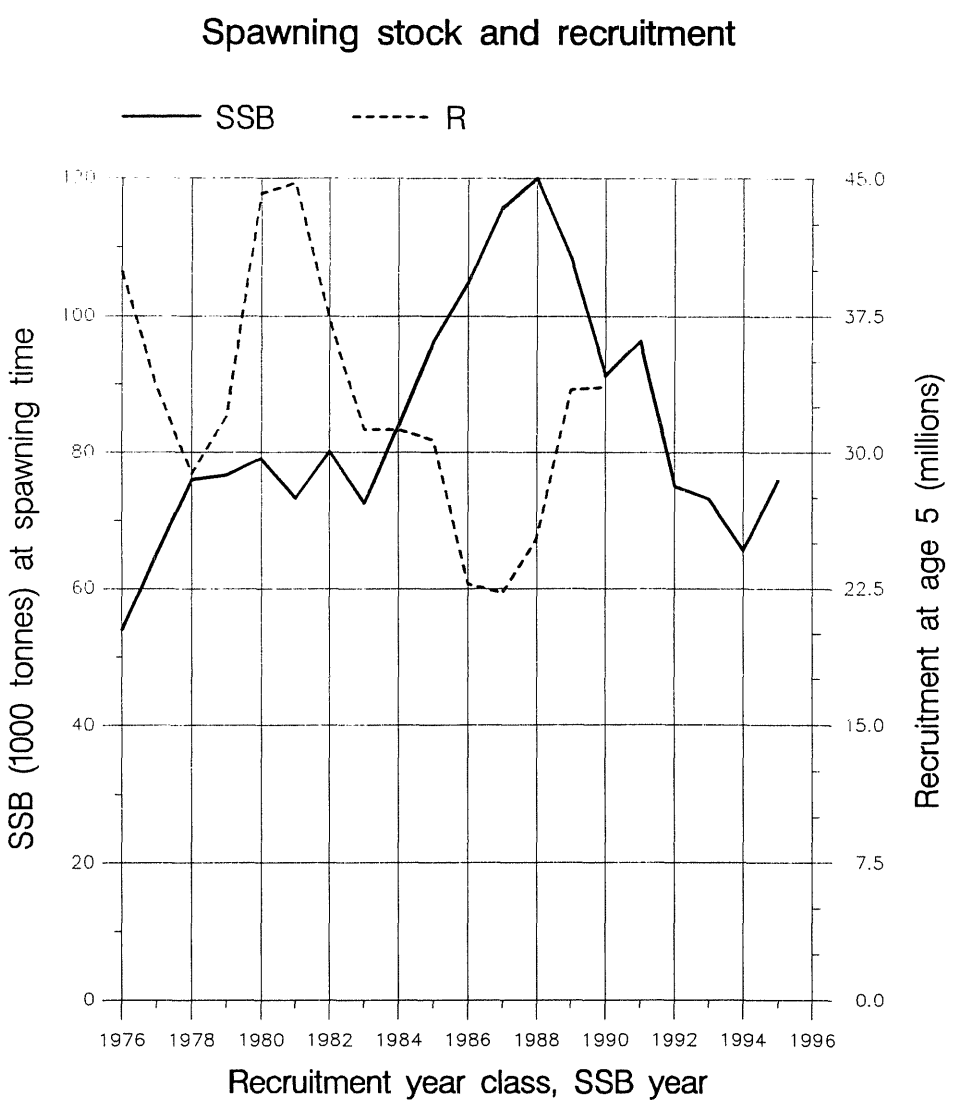


Figure 6.6.1.5

Fish Stock Summary
Greenland halibut (Fishing Areas V and XIV)
5 – 5 – 1996



(run: XSAEIN03) A

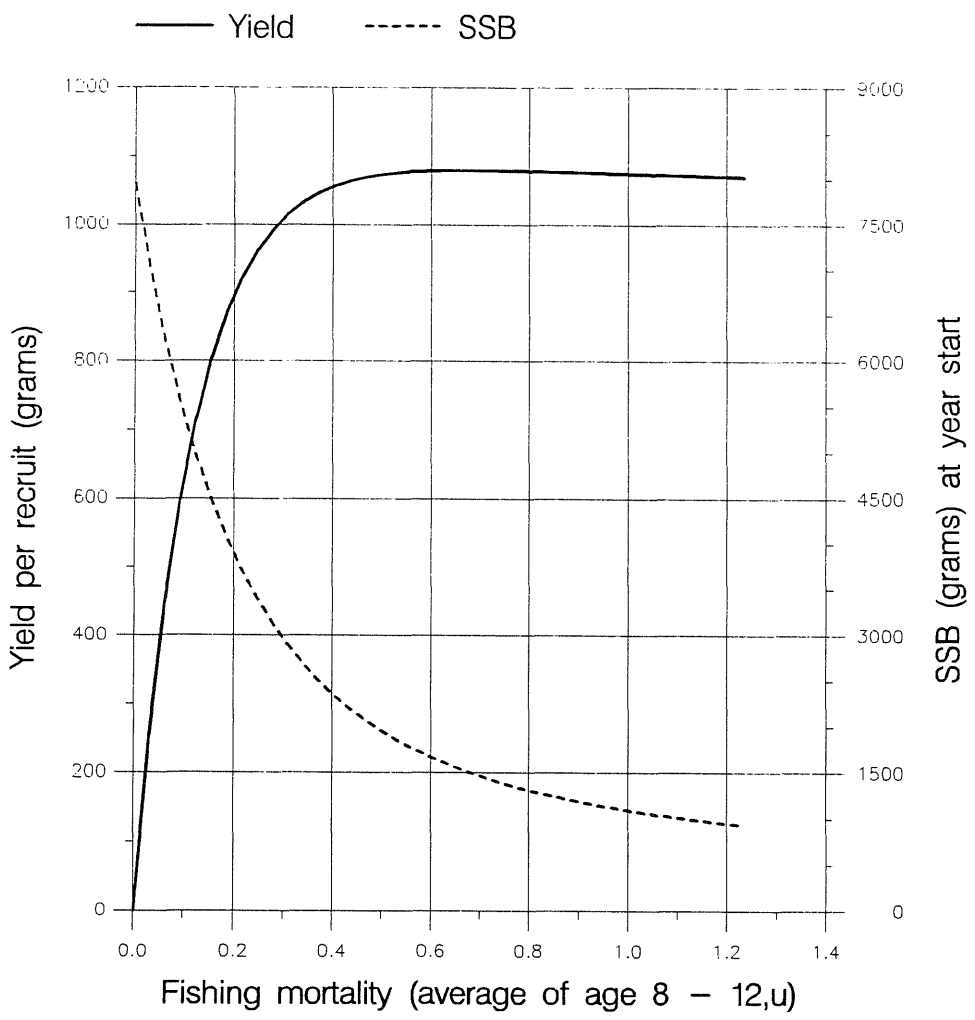


(run: XSAEIN03) B

Figure 6.7.2.1

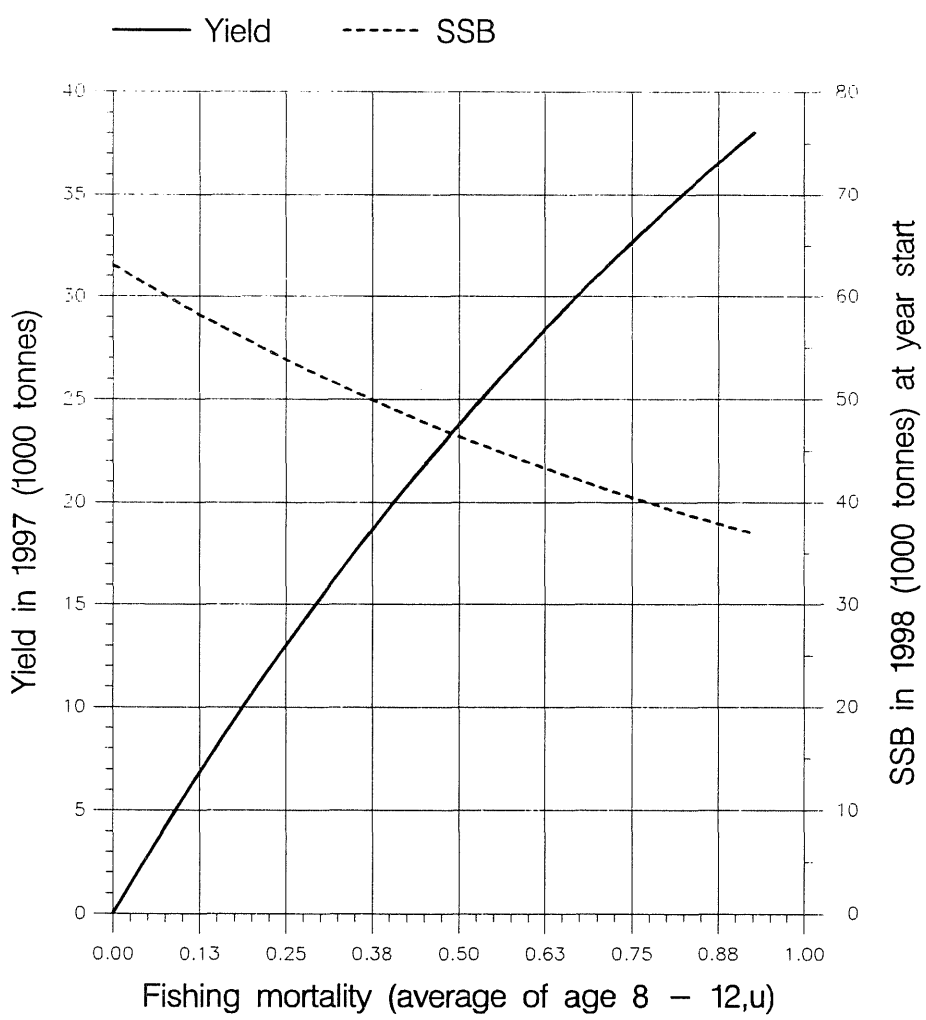
Fish Stock Summary
Greenland halibut (Fishing Areas V and XIV)
8 – 5 – 1996

Long term yield and spawning stock biomass



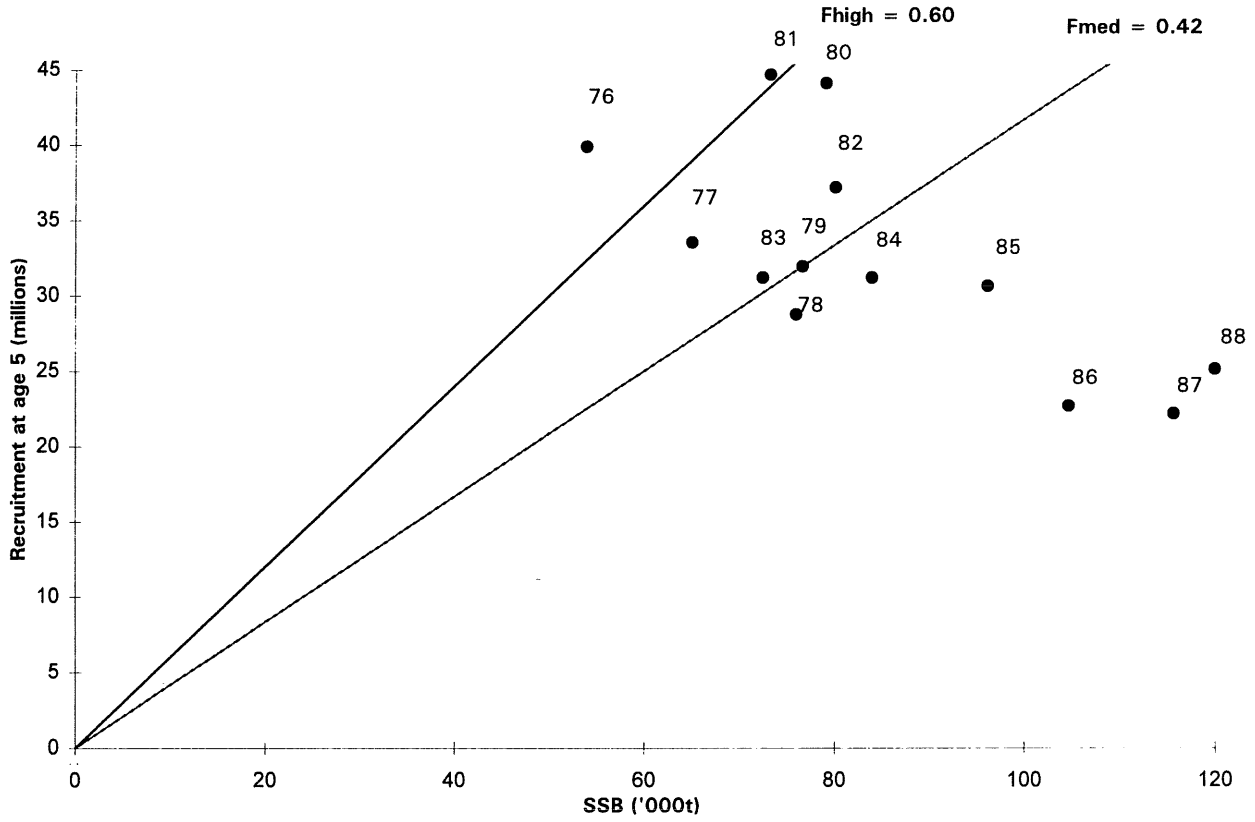
(run: YLDJBO01) C

Short term yield and spawning stock biomass



(run: MANJBO02) D

Figure 6.7.2.2. Stock recruitment plot. Year corresponding to the actual value is shown. Lines corresponding to Fmed and Fhigh are given.



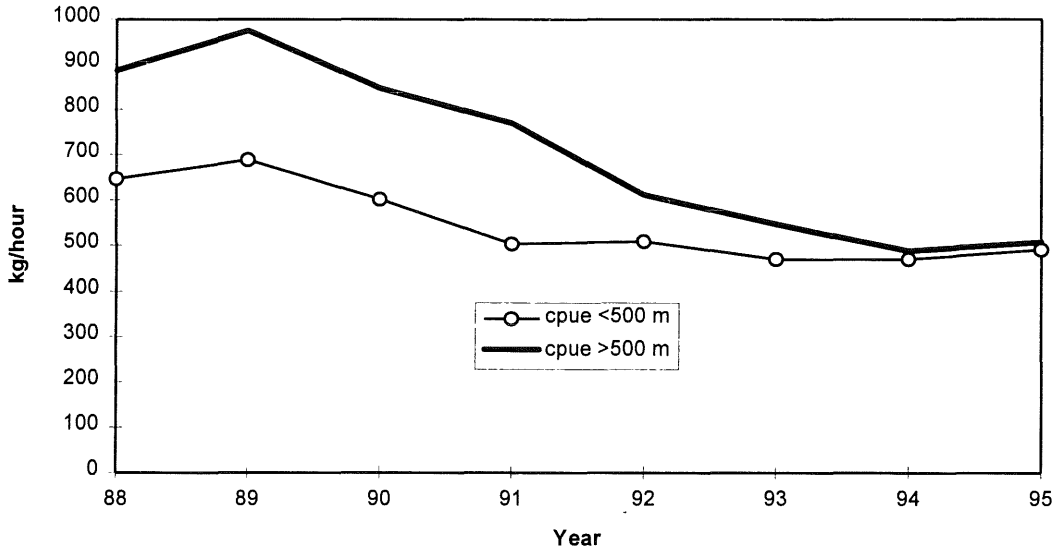


Figure 7.2.1. Results of CPUE from Icelandic trawlers data at differnt dephts, and where redfish is more than 10% of catch in each haul.

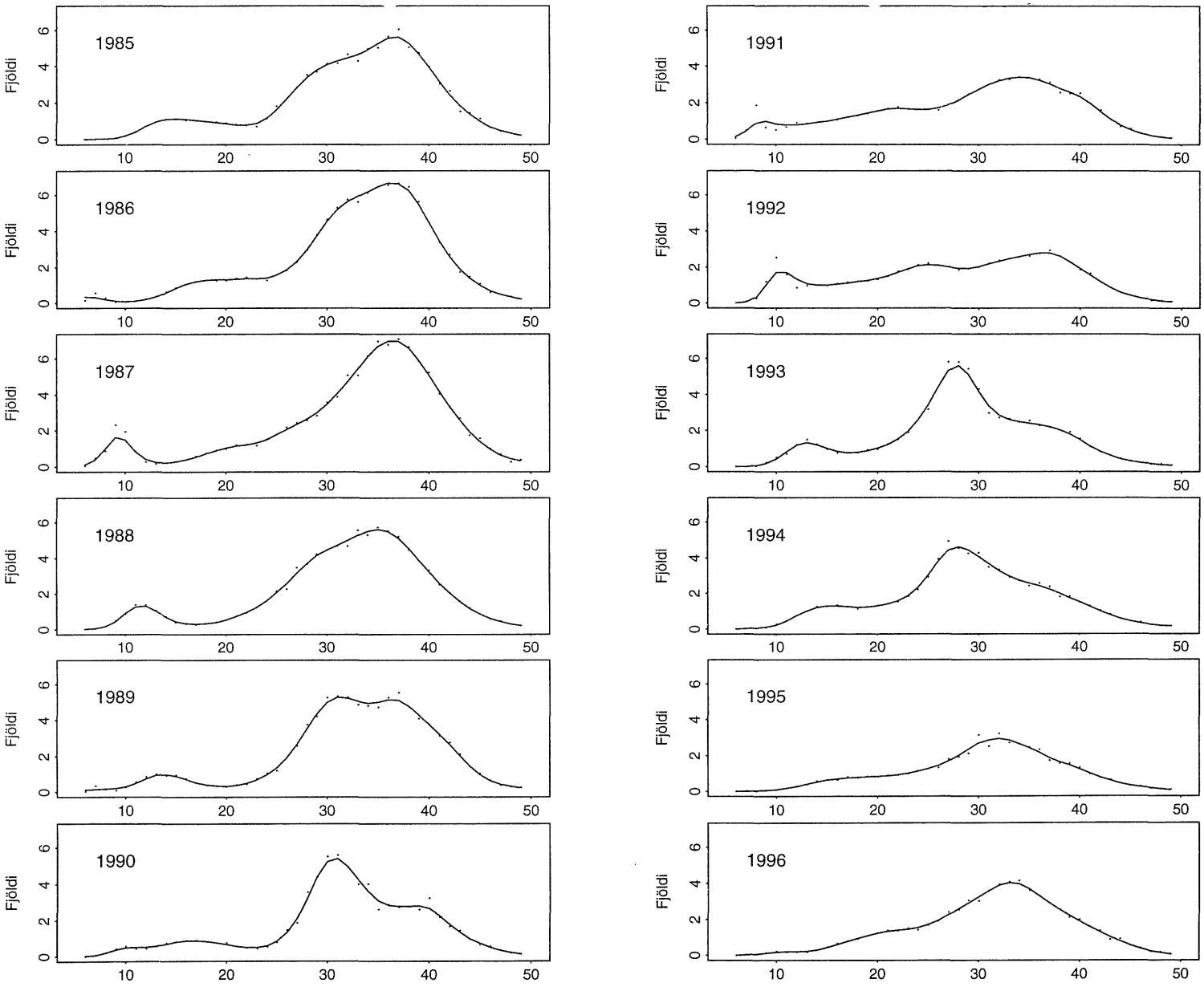


Figure 7.3.1 *S. marinus*. Length distribution from survey of 0-500 m depth range. Number of fish per towing mile by cm groups.

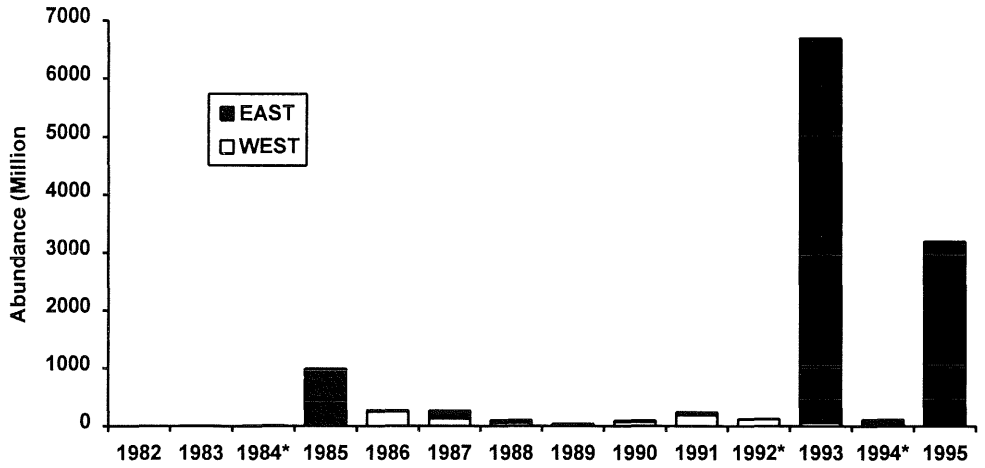


Figure. 7.3.2 Sebastes spp. (<17 cm). Survey abundance indices for East and West Greenland, 1982-95. *) incomplete survey coverage.

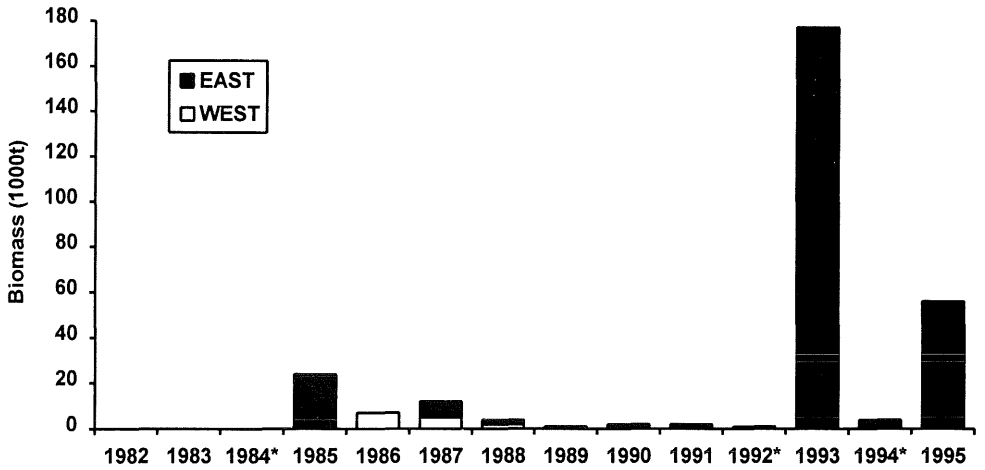


Figure. 7.3.3 Sebastes spp. (<17 cm). Survey biomass indices for East and West Greenland, 1982-95. *) incomplete survey coverage.

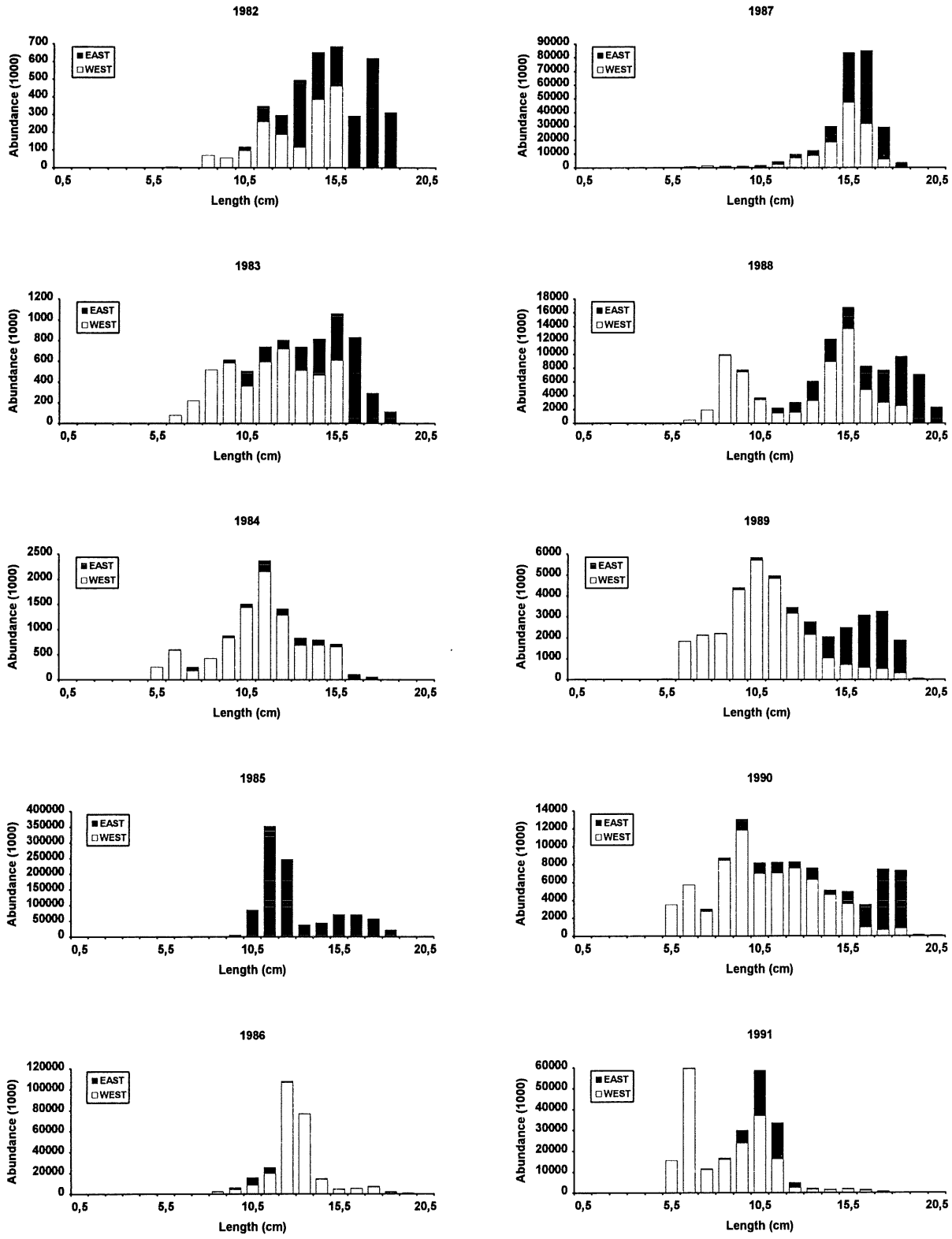


Figure 7.3.4. Sebastes spp. (<17 cm). Length frequencies for East and West Greenland, 1982-91 (note different skaling on the y-axis).

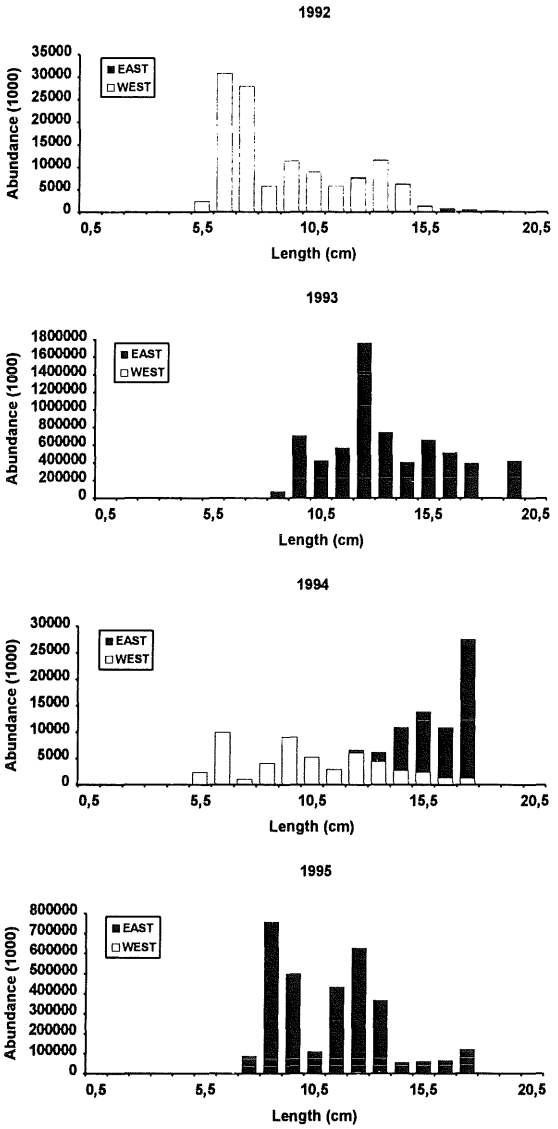


Figure. 7.3.5 Sebastes spp. (<17 cm). Length frequencies for East and West Greenland, 1992-95 (note different skaling on the y-axis).

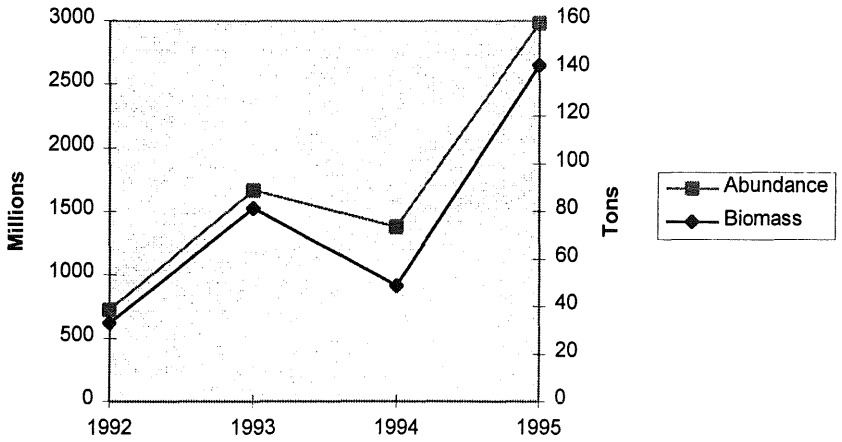


Figure 7.3.6. Biomass and abundance indices for juvenile redfish as derived from the Greenland trawl survey 1992-1995.

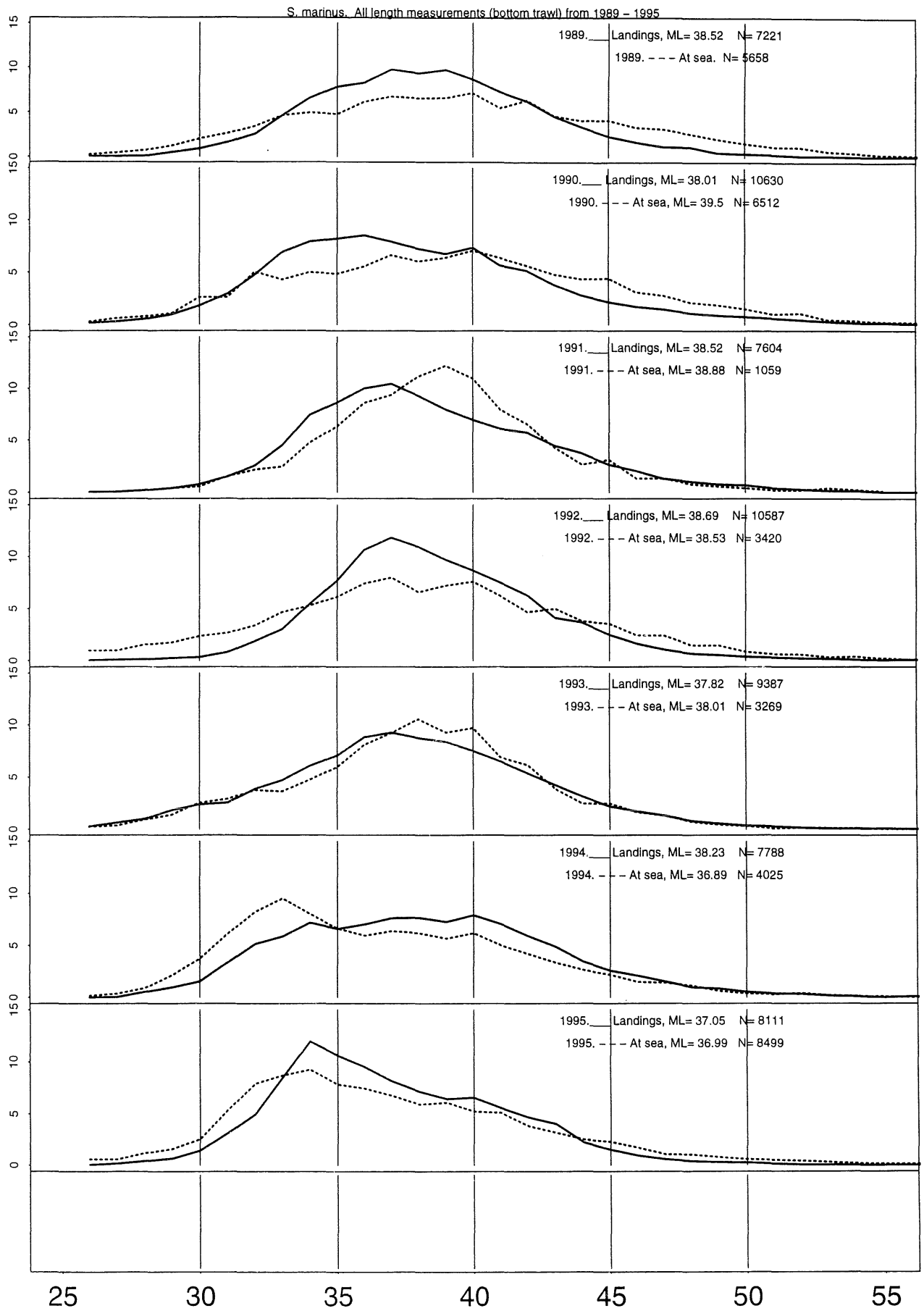


Figure 8.1.1 Length distribution of *S. marinus* in Icelandic landings and at sea from the trawler fleet from 1989-1995.

Figure 8.1.2

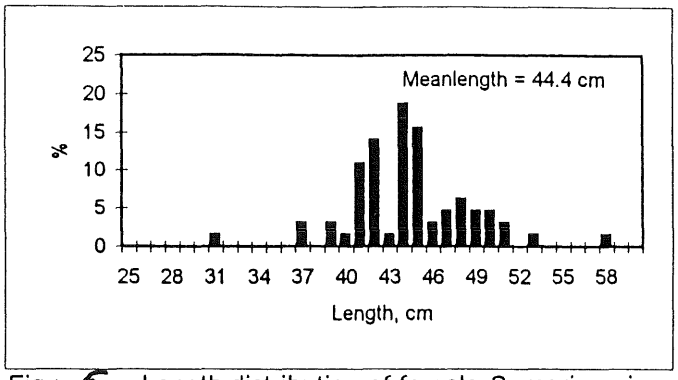


Fig.: 5. Length distribution of female *S. marinus* in Faroese catches in Vb 1995.

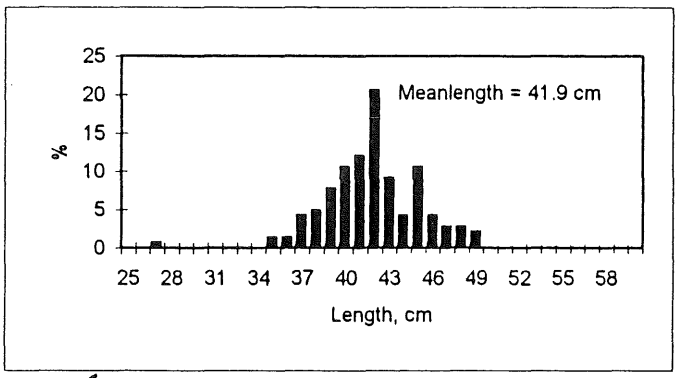


Fig.: 6. Length distribution of male *S. marinus* in Faroese catches in Vb 1995.

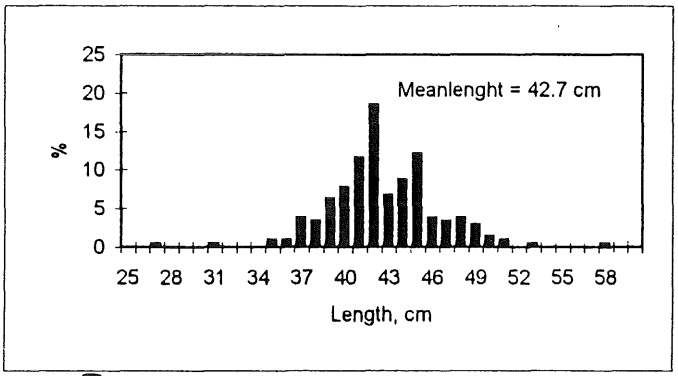


Fig.: 7. Length distribution of *S. marinus* in Faroese catches in Vb 1995.

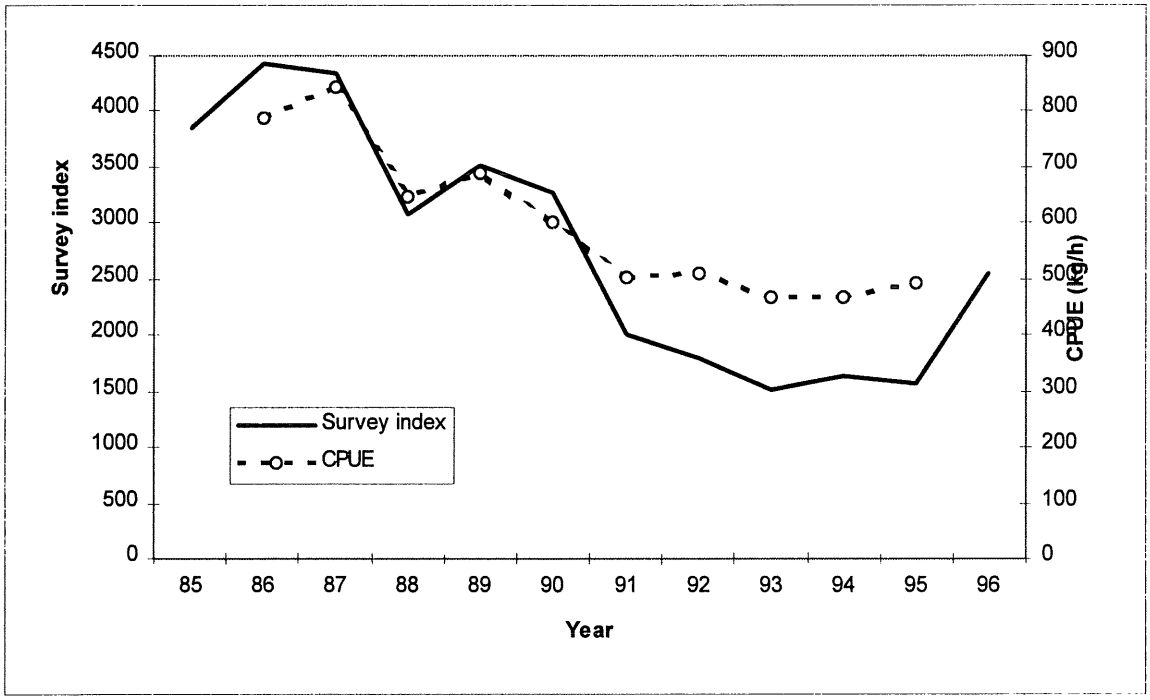


Figure 8.2.1. CPUE in *S. marinus* from Icelandic trawlers and durvey indices from the ground fish surevey.

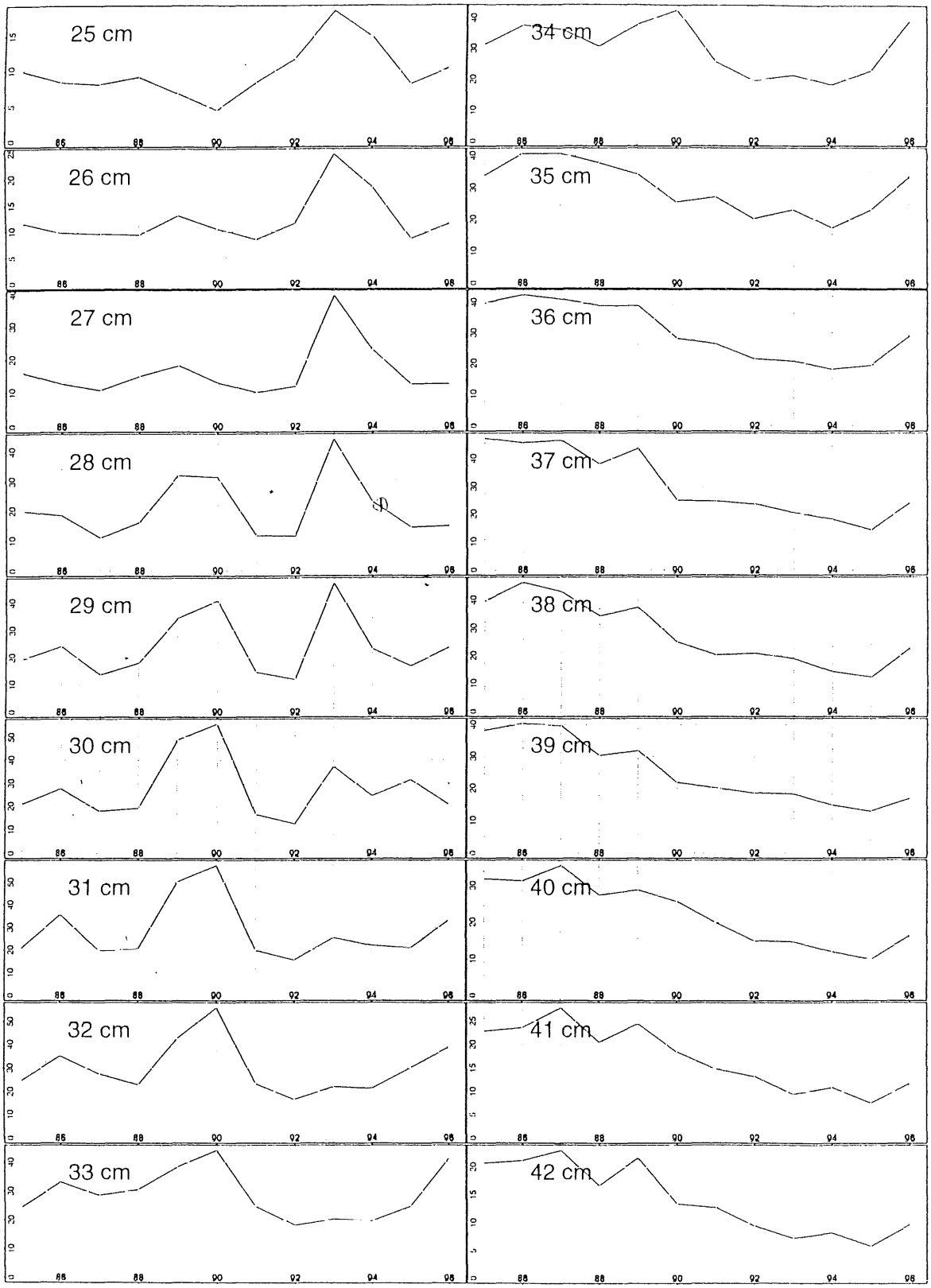


Figure 8.2.2 *S. marinus.* Cochran indices for each length group from the Icelandic groundfish survey

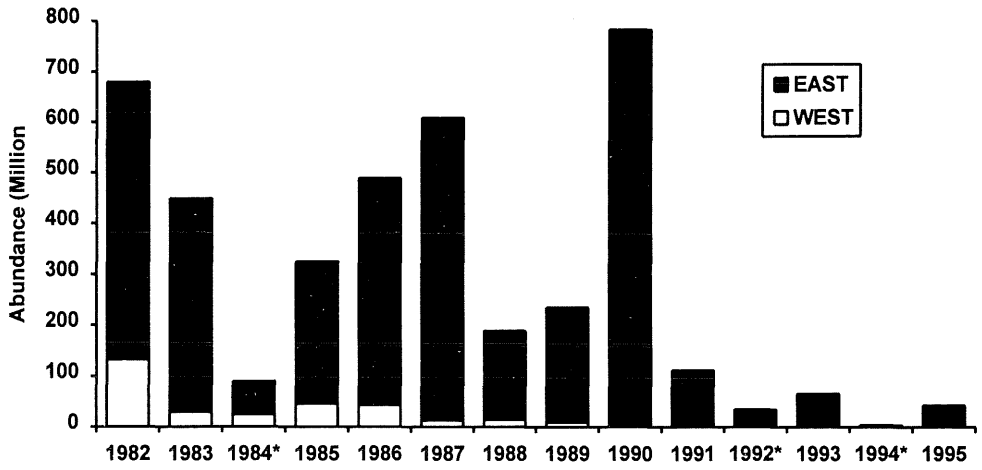


Figure. 8.2.3 S. marinus (≥17 cm). Survey abundance indices for East and West Greenland, 1982-95. *) incomplete survey coverage.

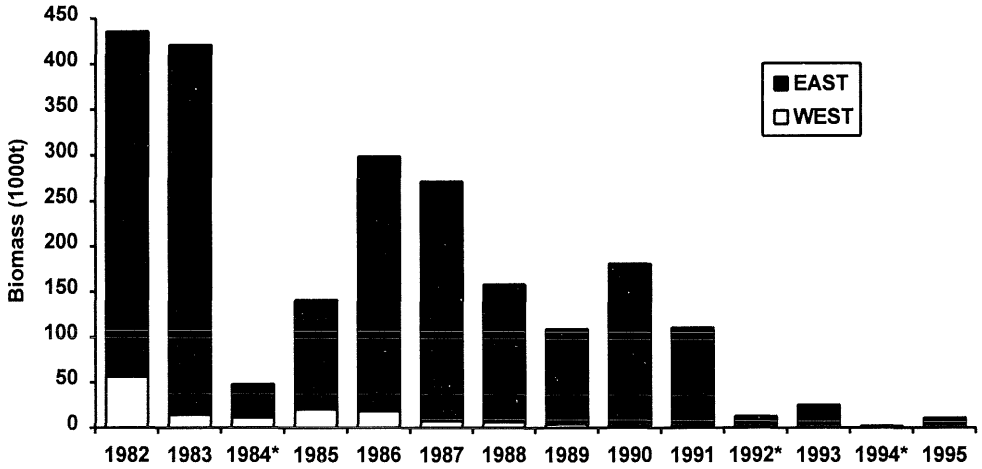


Figure. 8.2.4 S. marinus (≥17 cm). Survey biomass indices for East and West Greenland, 1982-95. *) incomplete survey coverage.

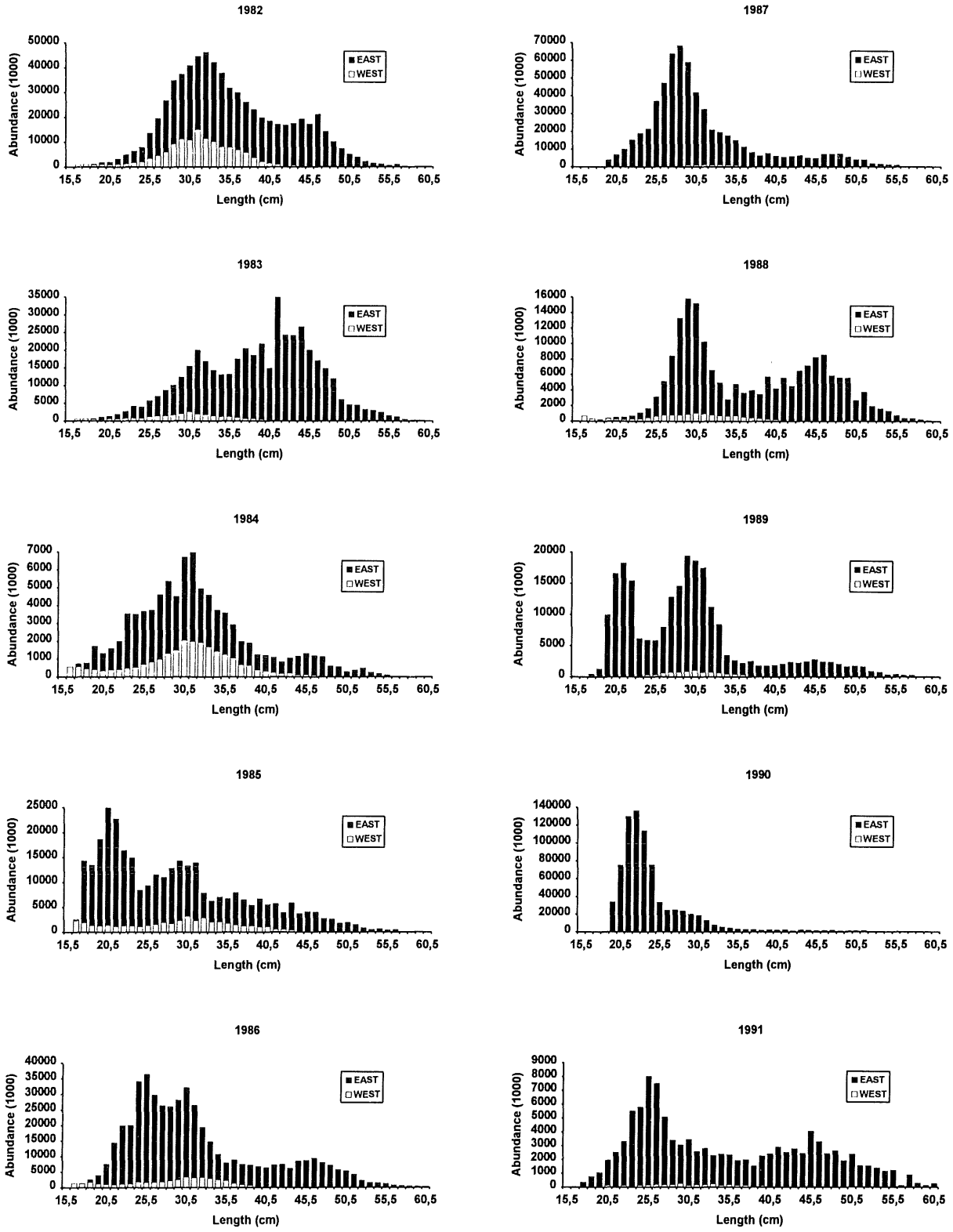


Figure 8.2.5 *S. marinus* (≥17 cm). Length frequencies for East and West Greenland, 1982-91. (note different skaling on y-axis).

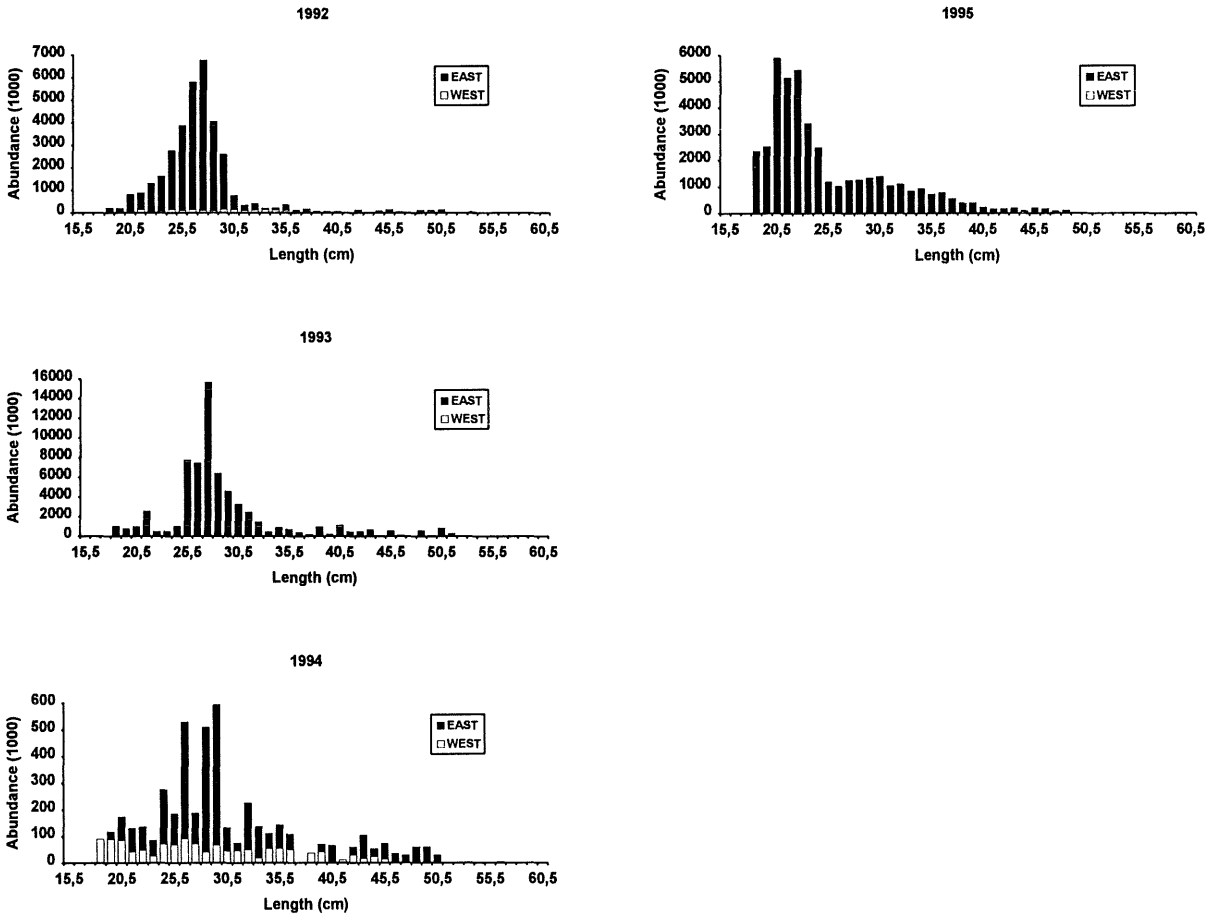
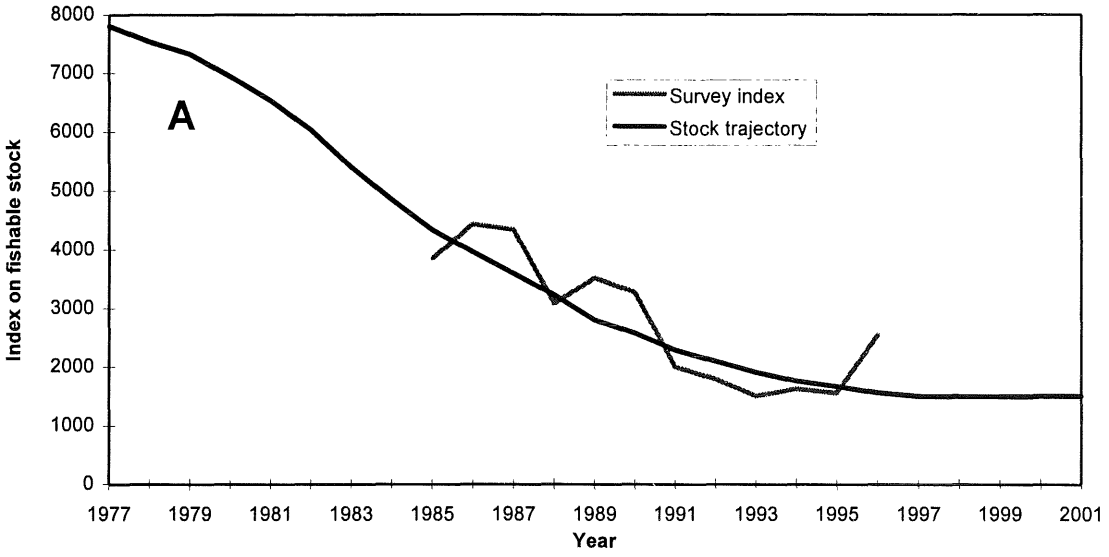
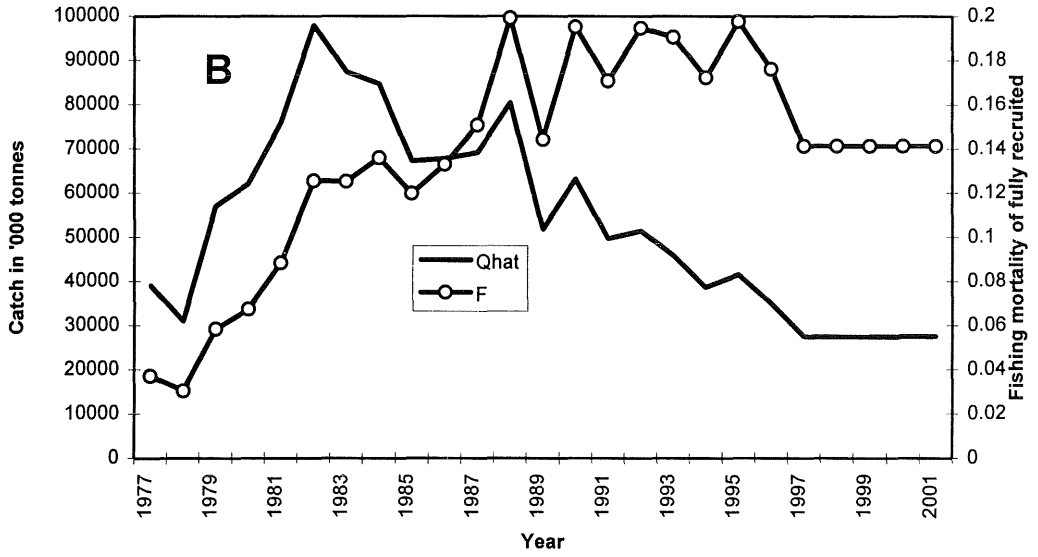


Figure 8.2.6 *S. marinus* (≥17 cm). Length frequencies for East and West Greenland, 1992-95.

Figure 8.2.7. *S. marinus.* Results from the age structured dynamic production model.





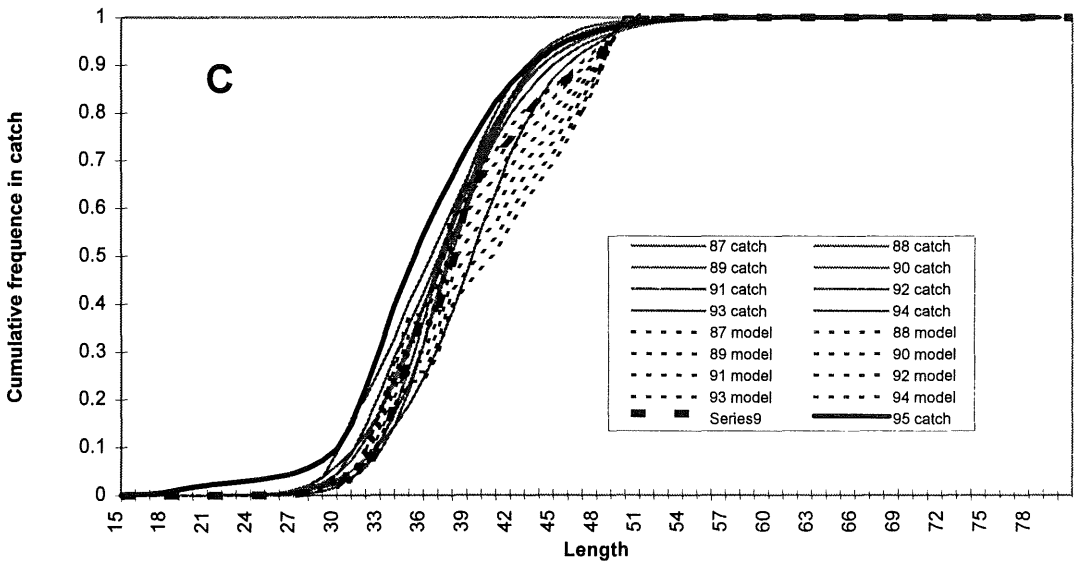


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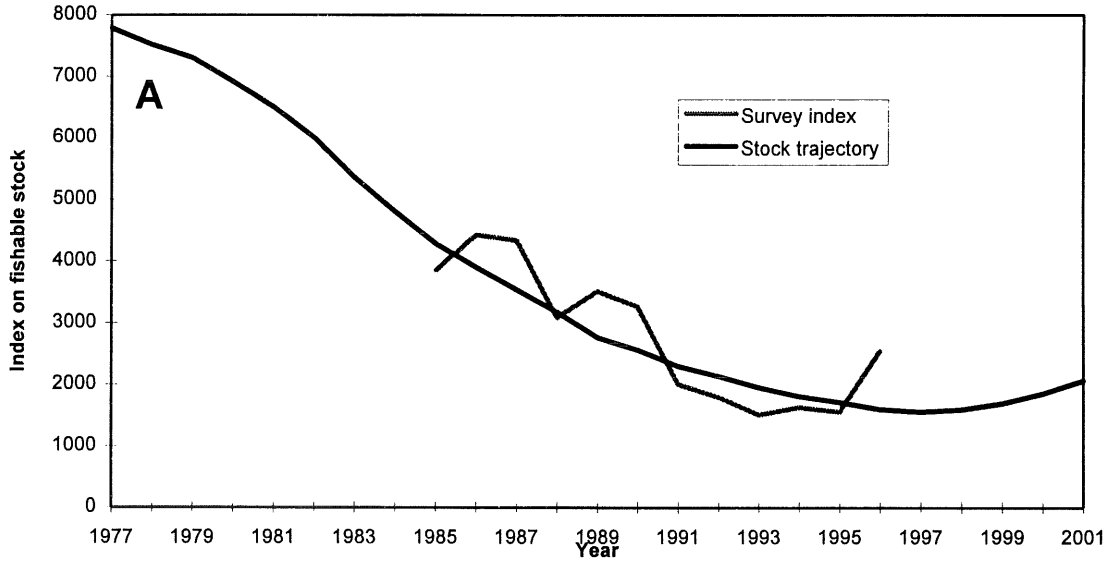
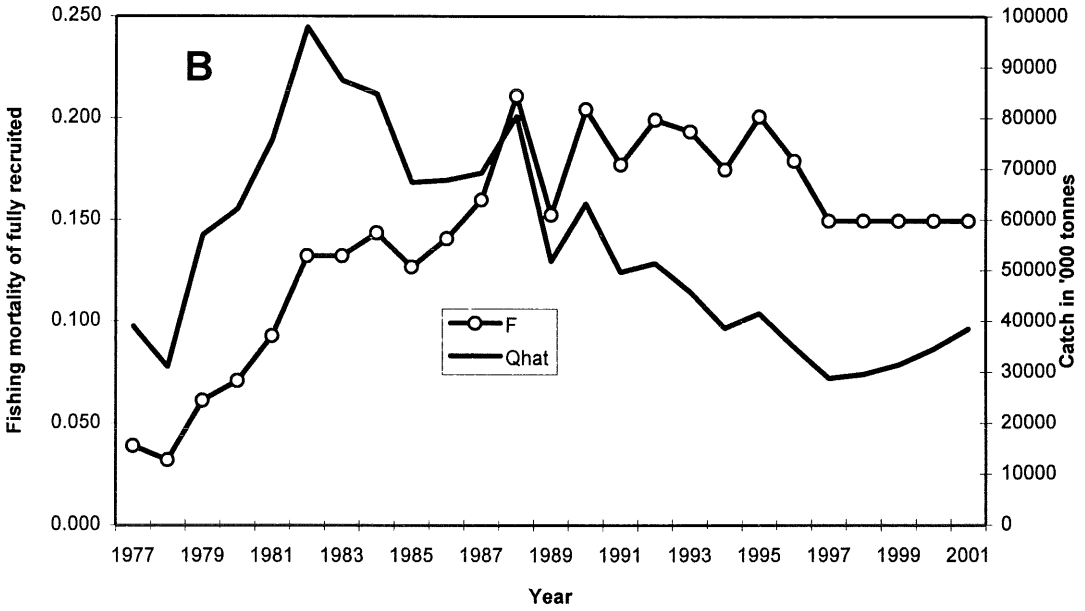
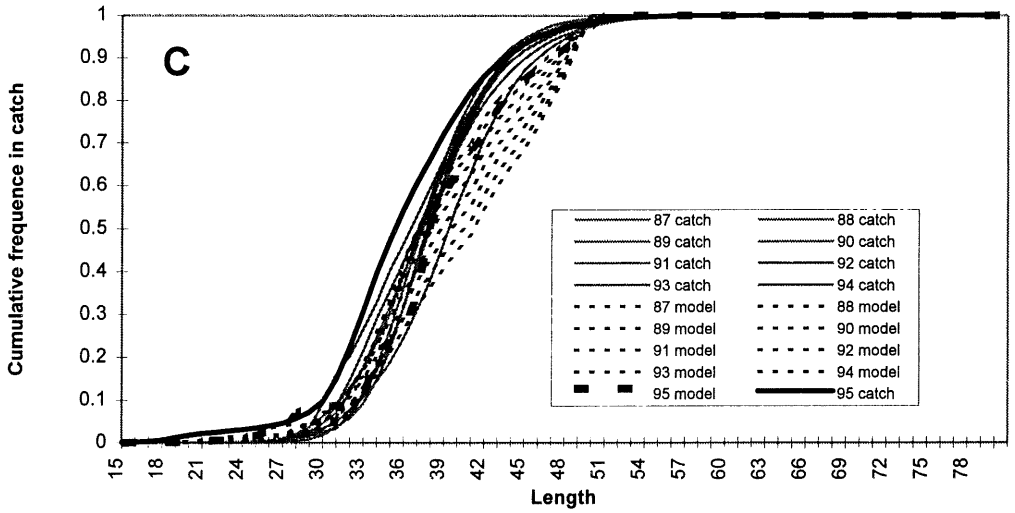
Figure 8.2.8. *S. marinus*. Results from the age-structured dynamic production model using the O-group survey as a measurement of recruitment.







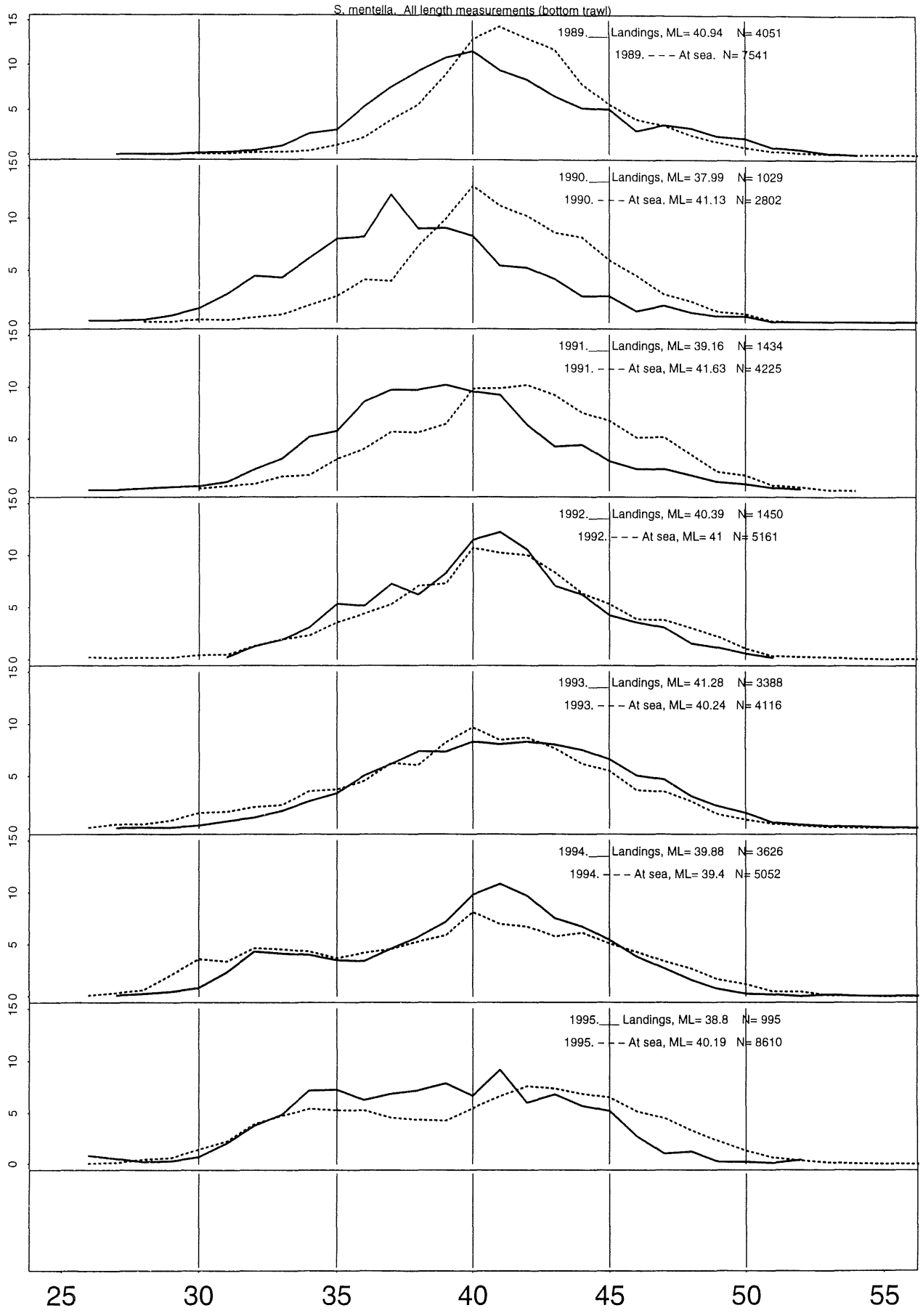
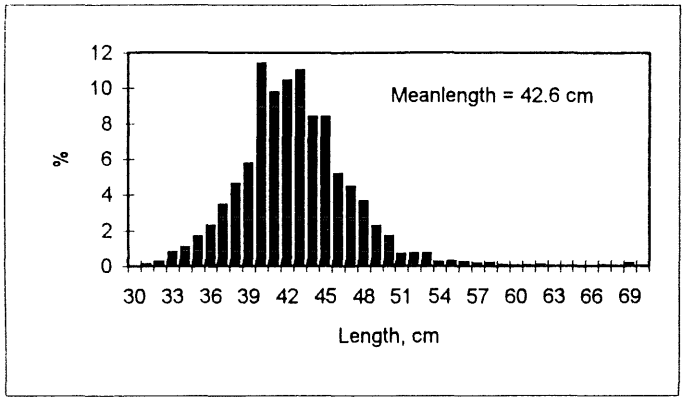
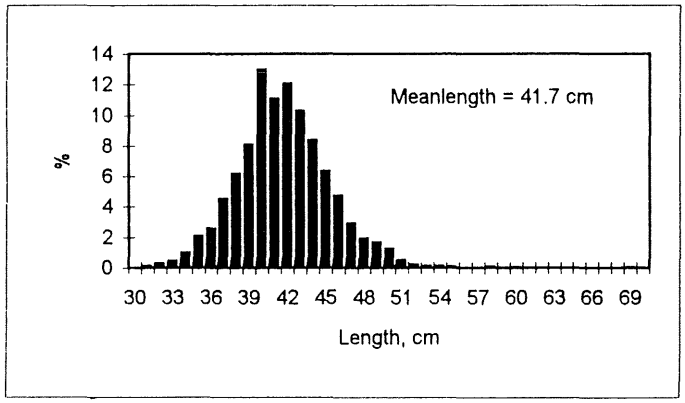


Figure 9.1.1. Length distribution of *S. mentella* in Icelandic landings and at sea from the trawler fleet from 1989-1995.

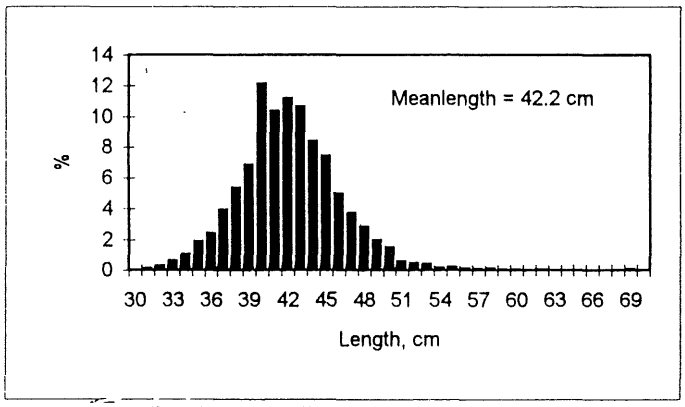
Figure 9.1.2



Length distribution of female *S. mentella in* Faroese landings from Vb in 1995.



Length distribution of male *S. mentella in* Faroese landings from Vb in 1995.



Total length distribution of *S. mentella in* Faroese landings from Vb in 1995.

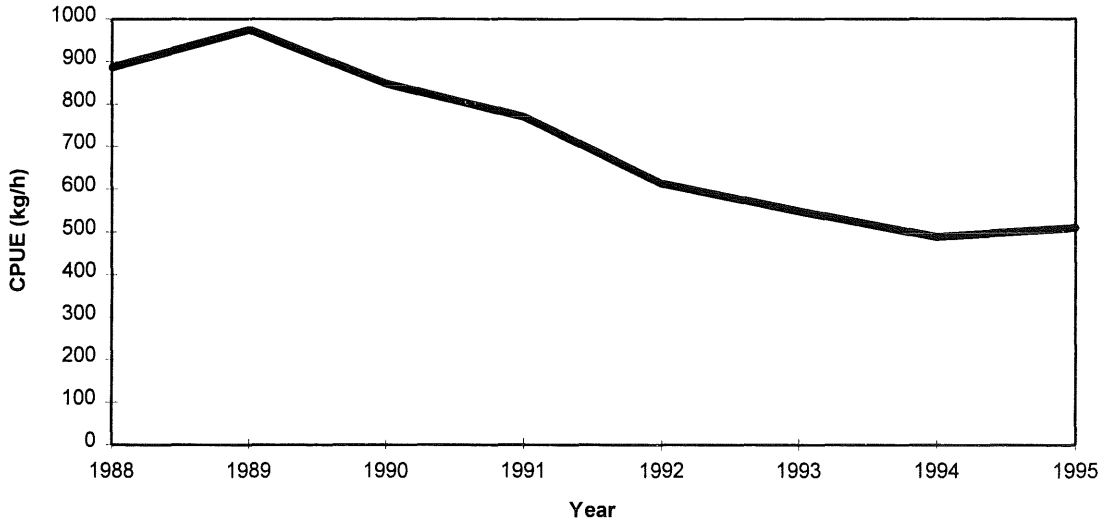
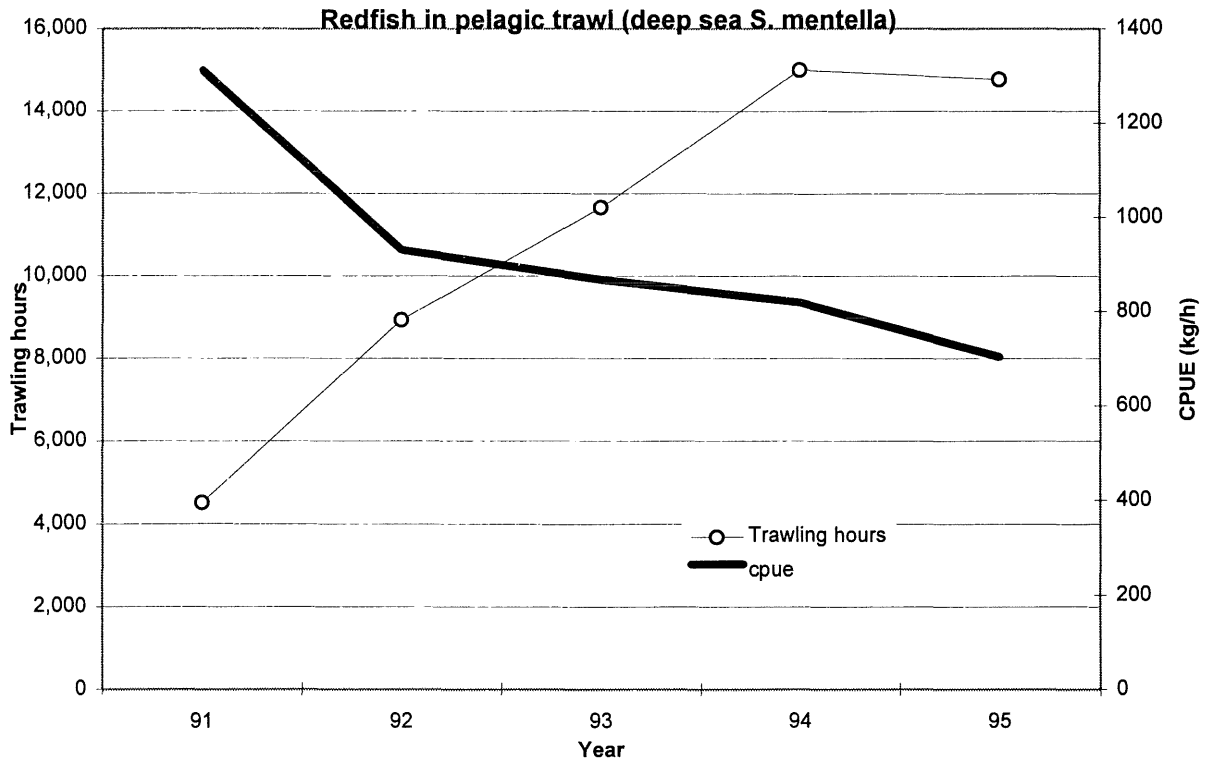


Figure 9.2.1. Cpue in *S. mentella* from Icelandic trawlers.

Figure 9.2.2. Deep sea *S. mentella* CPUE and trawling hours in pelagic trawl.



Year	catch (t)	Trawling hours	cpue
91	5,927	4,519	1311
92	8,308	8,930	930
93	10,122	11,665	868
94	12,286	15,007	819
95	10,395	14,773	704

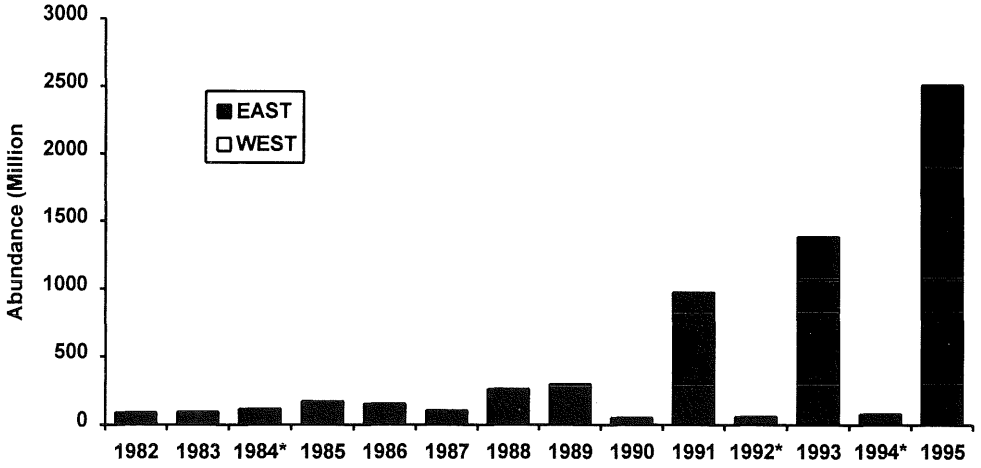


Figure. 9.2.3 *S. mentella* (≥17 cm). Survey abundance indices for East and West Greenland, 1982-95. *) incomplete survey coverage.

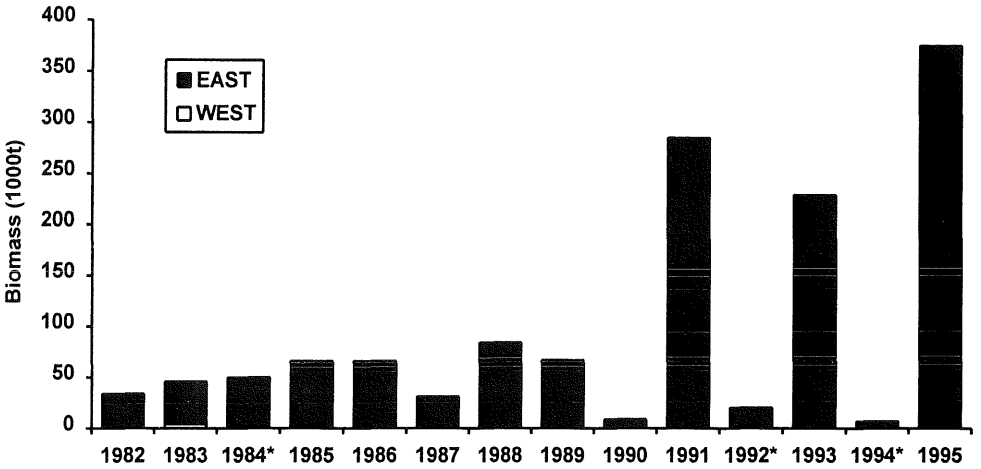


Figure. 9.2.4 *S. mentella* (≥17 cm). Survey biomass indices for East and West Greenland, 1982-95. *) incomplete survey coverage.

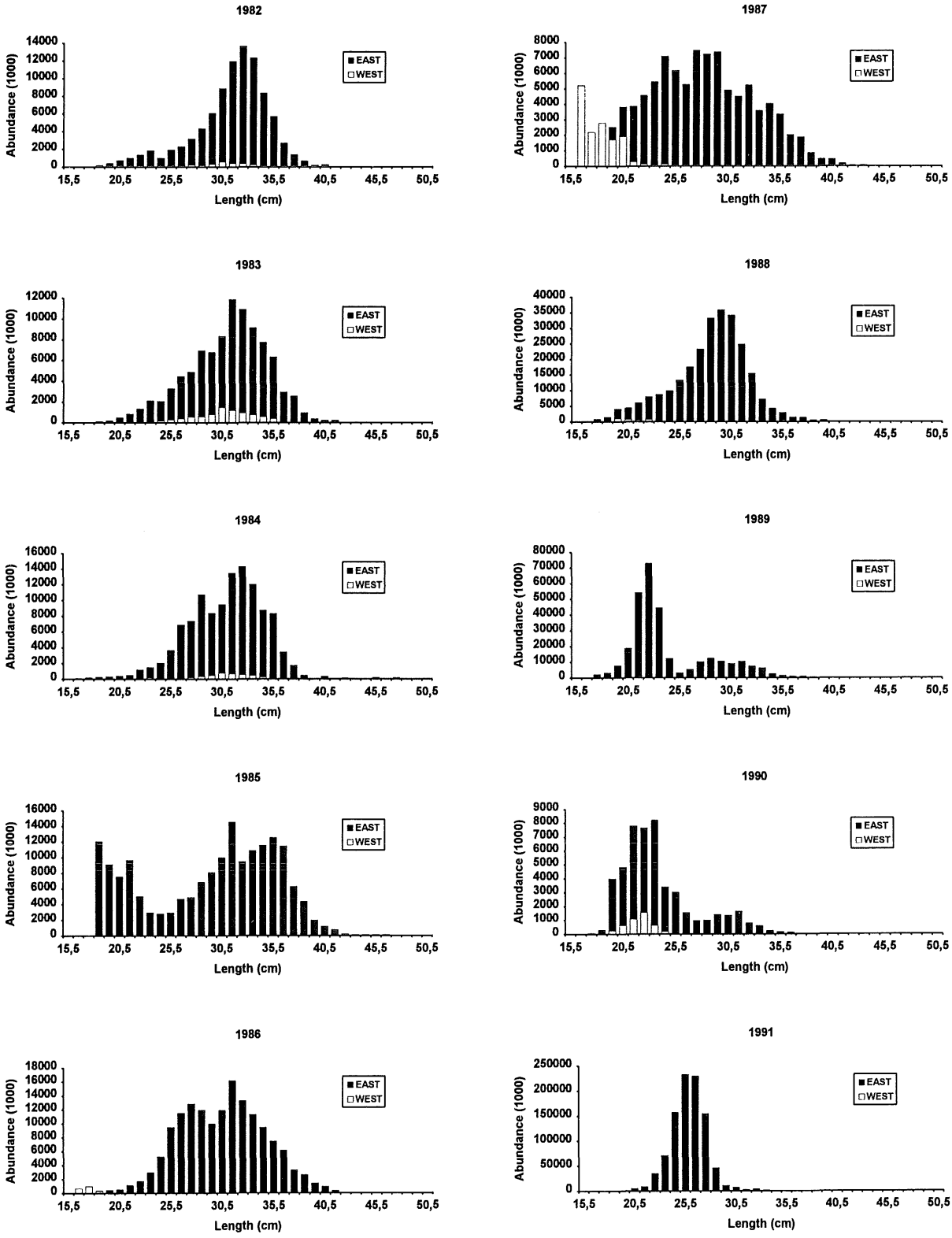


Figure 9.2.5 *S. mentella* (≥17 cm). Length frequencies for East and West Greenland, 1982-91 (note different skaling on y-axis)..

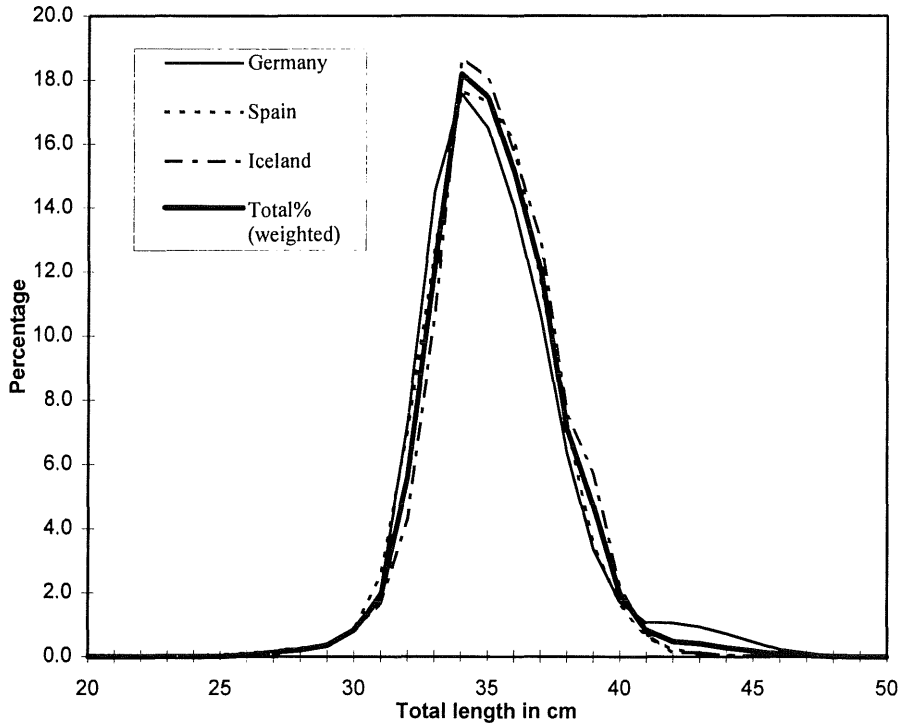


Figure 10.1.1. Length distributions from landings of oceanic *S.mentella* in 1995.

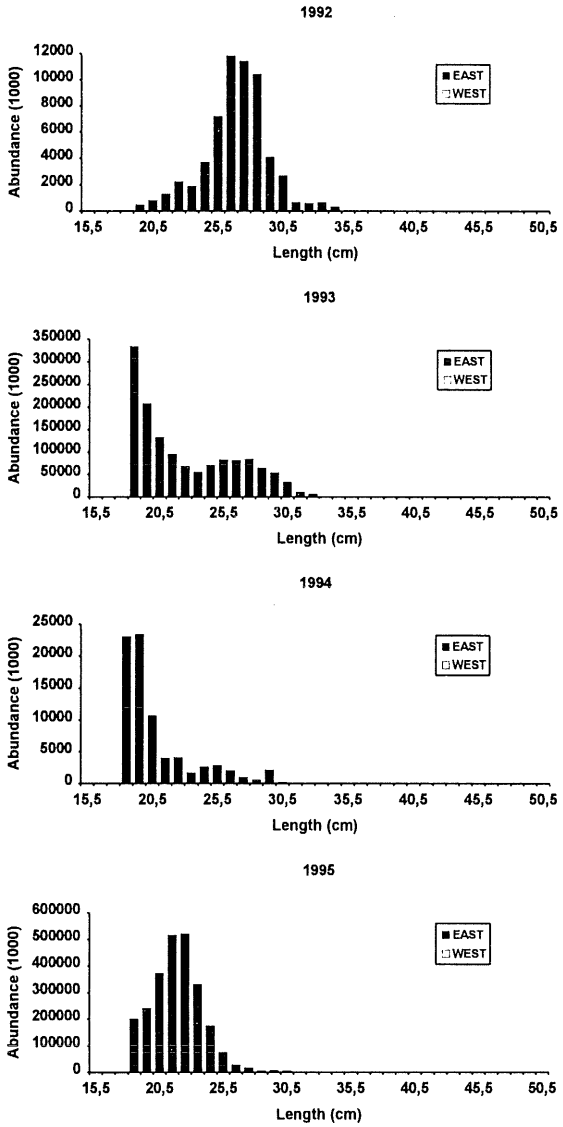


Figure 9.2.6 *S. mentella* (≥17 cm). Length frequencies for East and West Greenland, 1992-95 (note different skaling on y-axis).

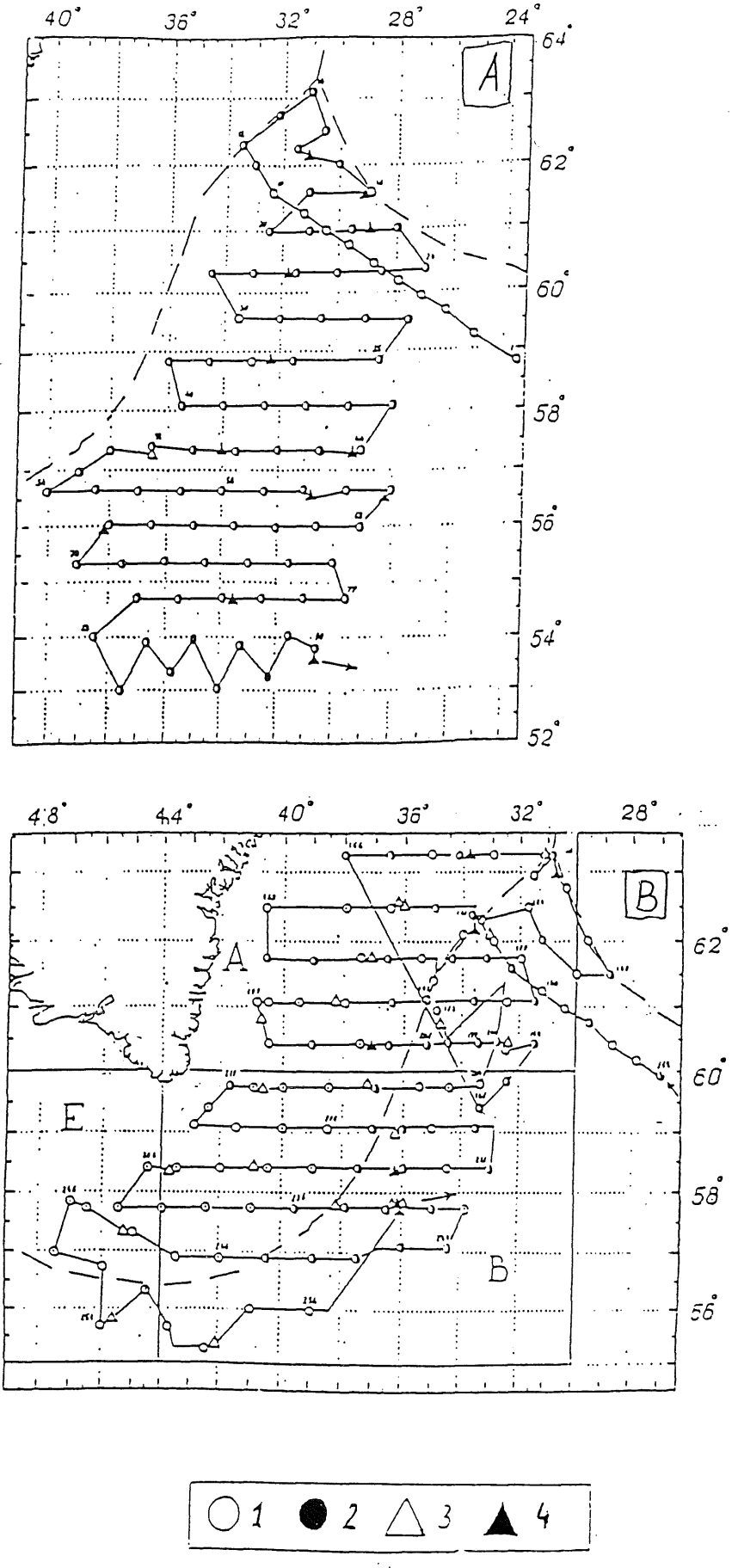


Fig. 10.2.1. Routes of the ichthyoplankton survey (A), and trawl acoustic survey (B) of *S. mentella* in 1995, location of STD-stations (1), Bongo-stations (2), and trawlings in 200-400 m layer (3) and 500-850 m layer (4).

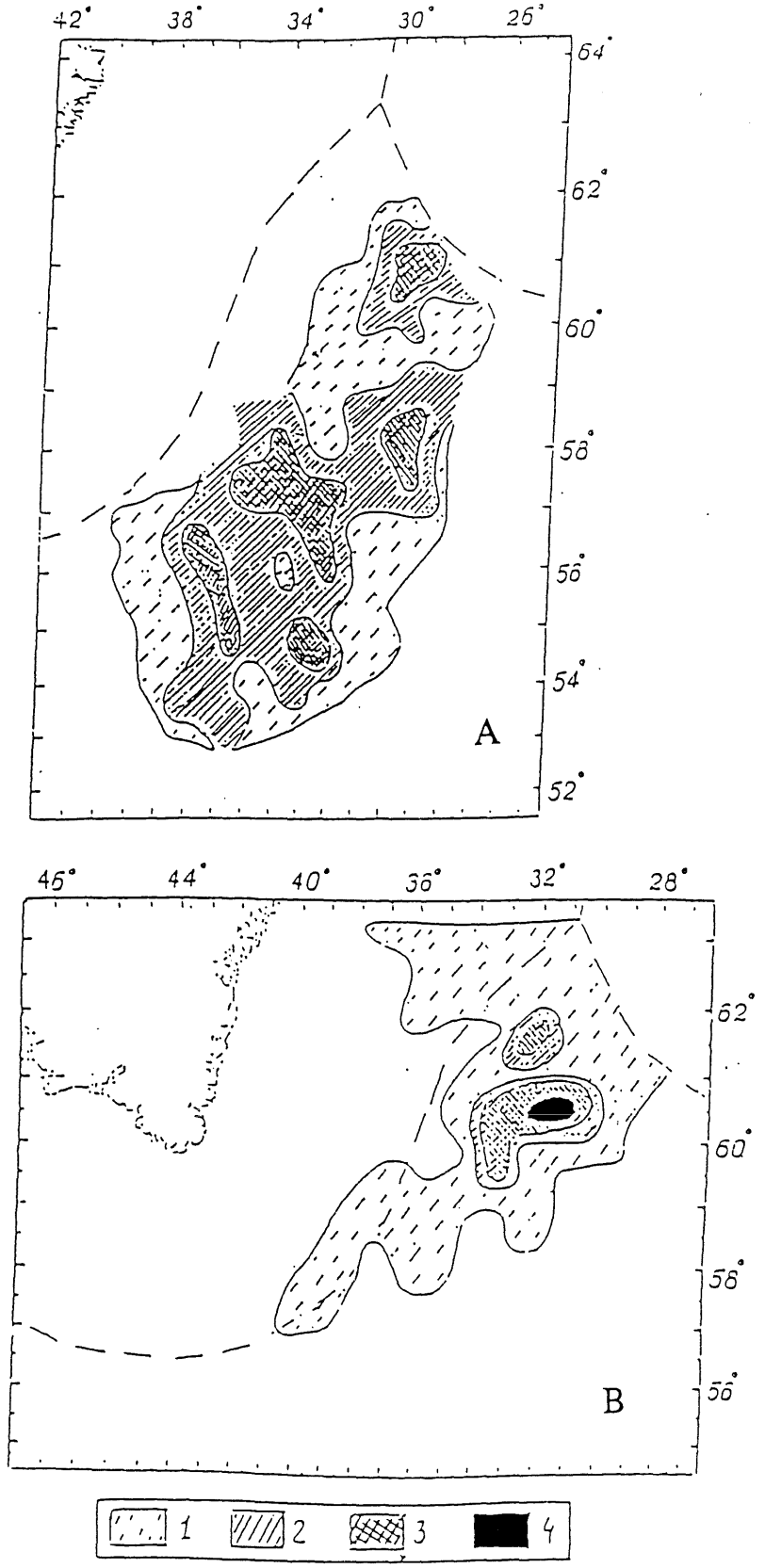


Fig. 10.3.1. Density of larvae and fry of S. mentella (spec./m^2) during the ichthyoplankton survey (A) and TAS (B) in 1995.

A: 1 - less than 10; 2 - 10.1-25; 3 - 25.1-50.

B: 1 - less than 2.5; 2 - 2.6-5; 3 - 5.1-10; 4 - more than 10.

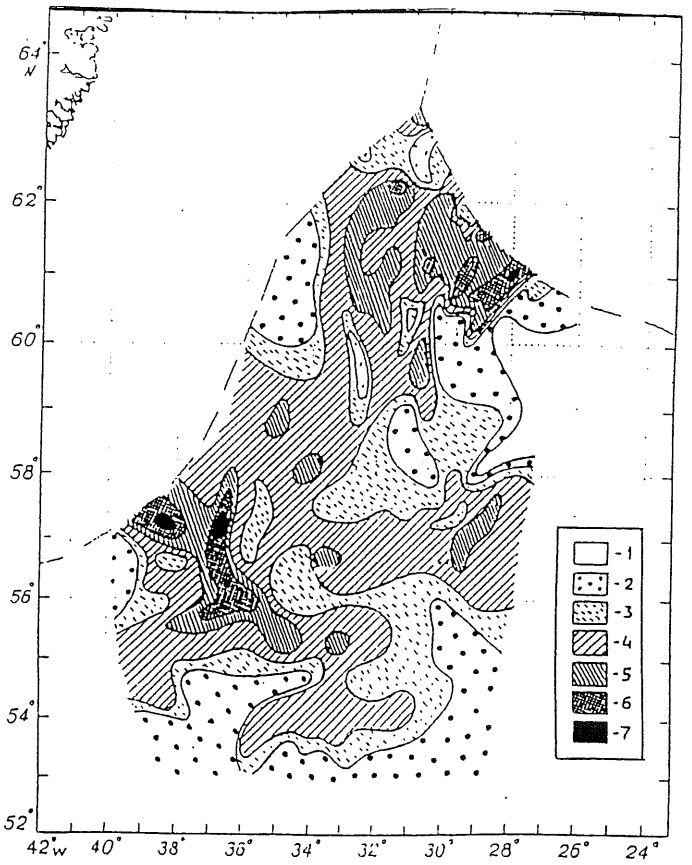


Fig. 10.3.2. Summarized density of concentrations of *S. mentella* Sa (sq.m/sq. mile) in April-May, 1995:

1 - less 0.5; 2 - 0.5-5; 3 - 5-10; 4 - 10-25; 5 - 25-50; 6 - 50-100; 7 - more than 100.

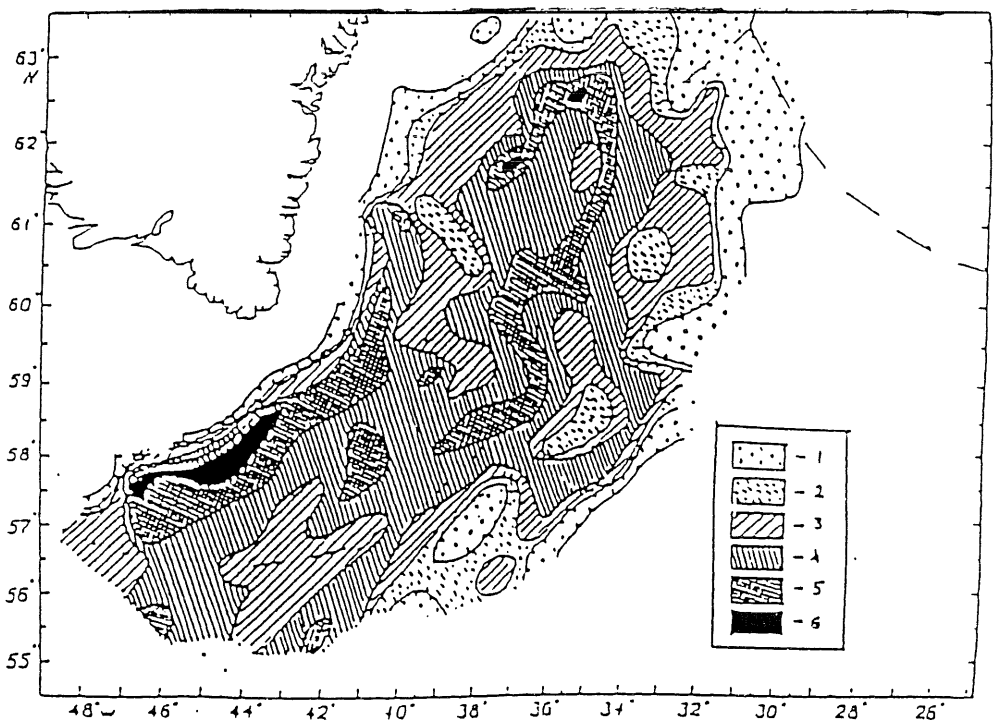


Fig. 10.3.3. Distribution of *S. mentella* in the area of trawl acoustic survey in the layer 150-500 m in June-July, 1995.
Redfish density Sa (sq.m/sq.mile): 1 - less than 5; 2 - 5-10; 3 - 10-25; 4 - 25-50; 5 - 50-100; 6 - 100-300.

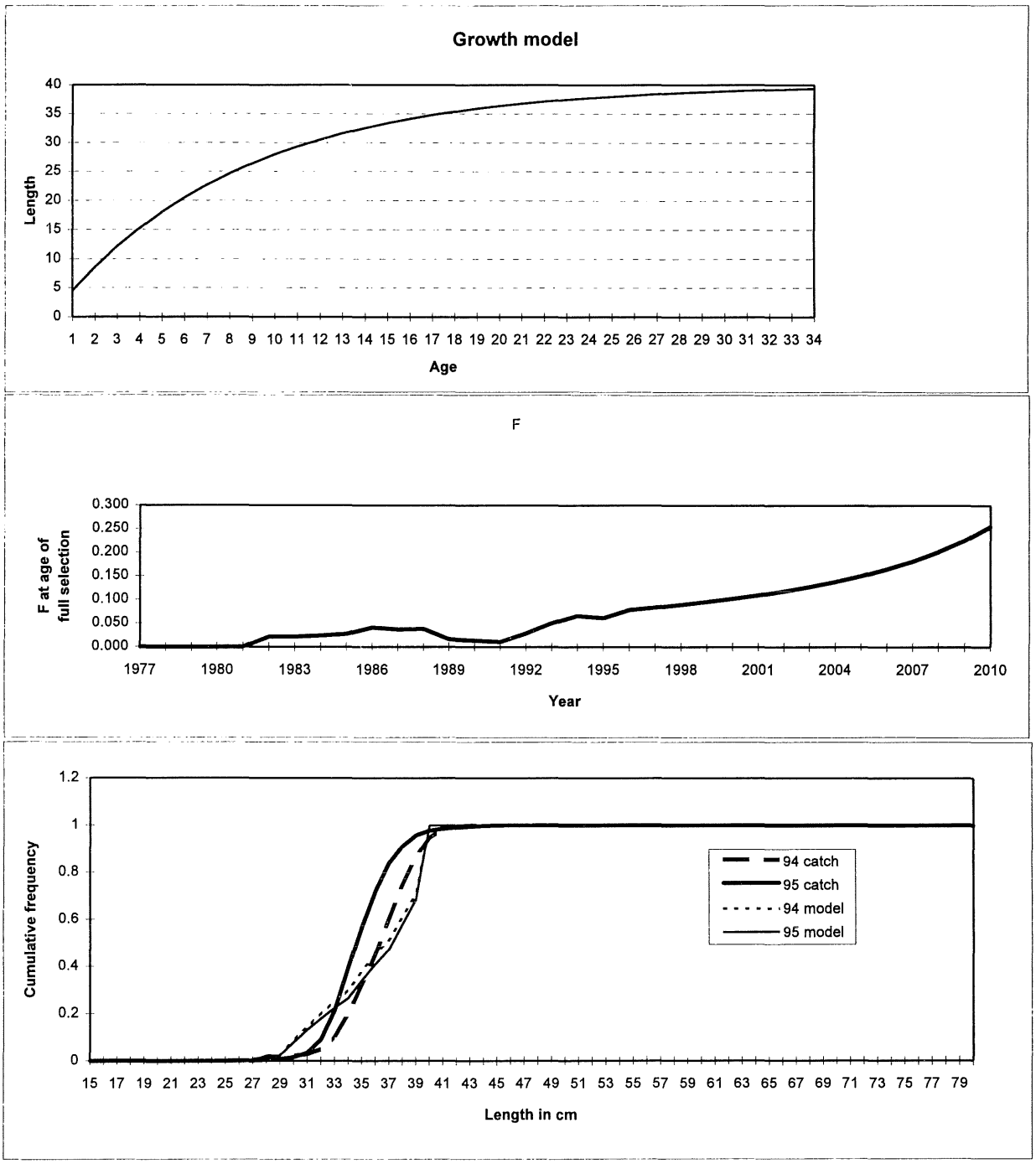


Figure 10.4.1. Oceanic *S.mentella*. Results from the age-structured dynamic production model. The figure shows the growth, fishing mortality and fishing pattern generated by the model. In this example the fishing mortalities for 1996-2010 relate to a constant catch of 150,000 t in 1996 and a 5 year fixed catch (5% of fishable biomass in the beginning of the 5 year period) for later years.

Figure 10.4.2. 'Oceanic S.mentella. Medium term prognosis of stock and catches. Scenario 1.

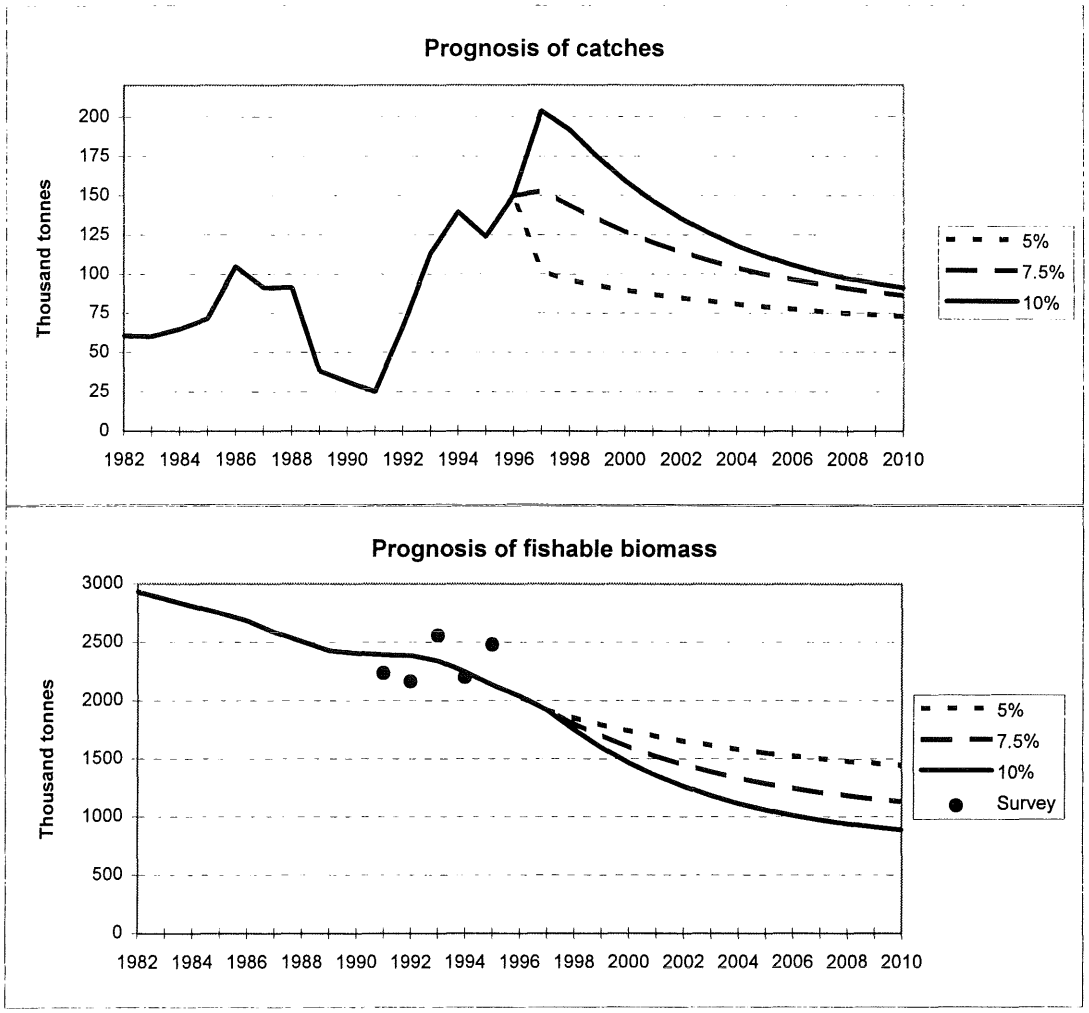


Figure 10.4.3. 'Oceanic *S.mentella*. Medium term prognosis of stock and catches (Scenario 2).

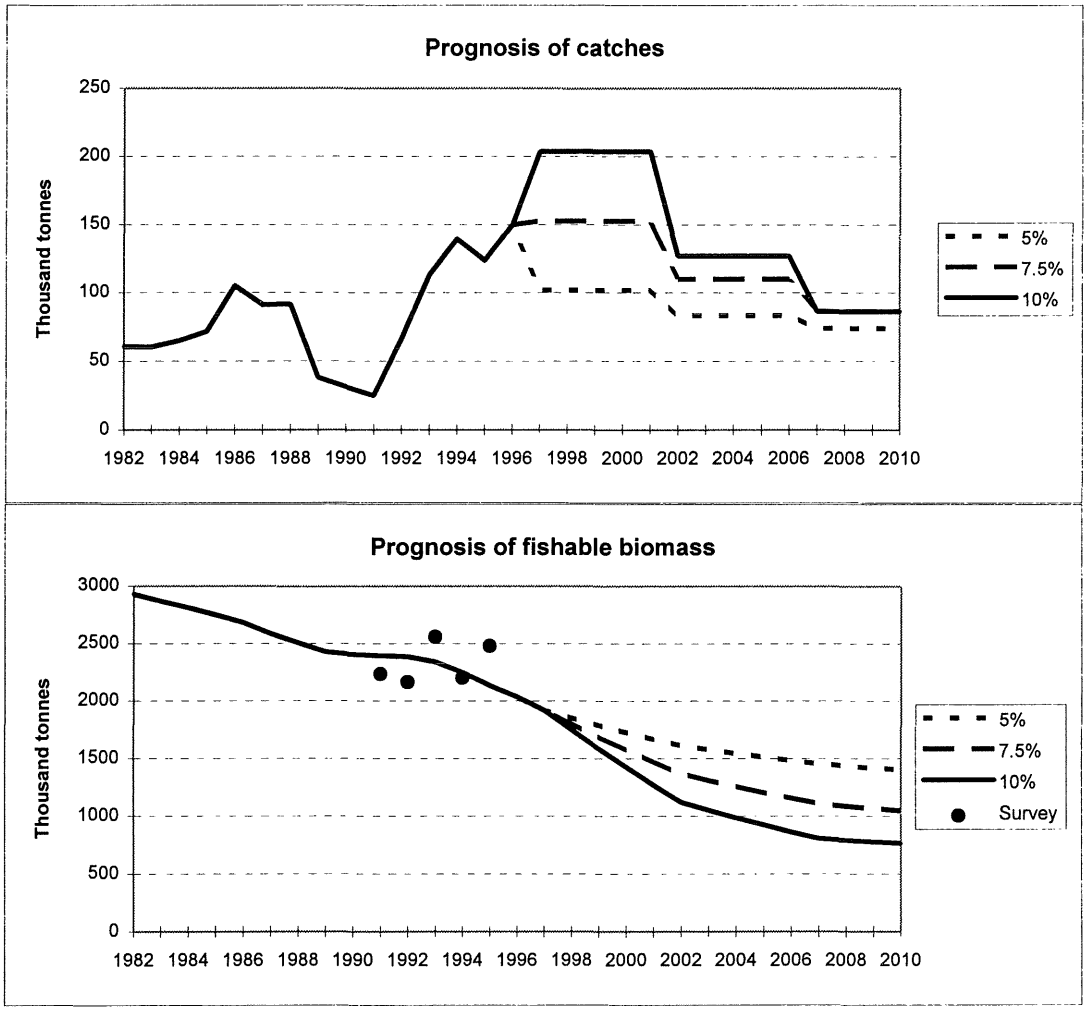


Figure 10.4.4. 'Oceanic *S.mentella*. Medium term prognosis of stock and catches. Scenario 3.