Table 1. Nominal catches (t) of eastern Scotian Shelf haddock (Div.4TVW) by NAFO Division and country.

	4T					4Vn					4Vs					4W						
Year	Can.	USA	USSR	Spain	Other	Can.	USA	USSR	Spain	Other	Can.	USA	USSR	Spain	Other	Can.	USA	USSR	Spain	Other	Total	TAC
1954	5918	1044			40	5549	405		1058	24						12323	1956		17		28334	
1955	3101	31				3339	450		1183	13						12777	1217				22111	
1956	2861					4899	147		1350	12						18273	1661		354		29557	
1957	1740	1				5869	120		747	9						19960	1533		132		30111	
1958	2599			151		3166	71		1343	6						17572	427		1593		26928	
1959	2996	1		64		1594	159		69		3456	111		2870		21156	4804		640		37920	
1960	2041					1317	6		97		1187	18		3926	1	20093	127		1024		29837	
1961	1297			273	2	1055	1		47	1	846			1526	7	22277	23	151	1441	16	28963	
1962	1132			10		1097	1		5	2	1235			1076		15566	51	2567	3224		25966	
1963	1019			46		1213	1	6	64		1061	1		2828	195	11002	60	3295	4915	866	26572	
1964	461			1		958			59	52	677	11		2057	2	9810	42	4391	2884	1889	23294	
1965	432			3	3	402			53	84	1201			1806	47	7007	8	42876	1500	96	55518	
1966	149			1		311		516	30		1494			940	9	8259	19	9985	1885	51	23649	
1967	112			9		203		95	26	31	898			839	9	7180	5	459	1046		10912	
1968	144				4	127			70	6	1128		59	1702	23	8392		195	1458	10	13318	
1969	167				3	245				112	726			631	66	8270		235	864	1	11320	
1970	160					395	2		75	1	620		34	830	16	4754	574	636	1332		9429	
1971	151					466			215	1	1133		11	1114		7940	497	464	1477		13469	
1972	60					362	3		136	19	421		3	599	37	2096	70	103	737	102	4748	
1973	21				2	286			76	164	233			431	9	2830	173	76	95	18	4414	
1974	17				14	161			3	1	147		30	174	196	907	6	102	521	78	2357	0
1975	35				2	67			15	4	107	1		48	3	1393	20	52	63	59	1868	0
1976	12					40				1	52	1	9		1	1198	31	15			1360	2000
1977	8					189				8	144				1	2845	1	14		38	3248	2000
1978	18					119				3	441		3		38	4949	82	139		109	5901	2000
1979	59					194				11	650				2	2339		104		73	3433	2000
1980	81					188				42	1841					12448		209		31	14840	15000
1981	177					119				25	1796					17684		187		21	20009	23000
1982	47					183				23	2373					12498		53		49	15226	23000
1983	30					206				17	1542					7302		149		166	9412	15000
1984	120					299				11	3195		2		1	3992		168		233	8021	15000
1985	498					598				52	7291				42	2862		176		51	11570	15000
1986	465					898				19	8706		8		2	6170		165		32	16465	17000
1987	425					488				8	1537					991		180		157	3786	0
1988	353					506				2	2022					1175		327		99	4484	0
1989	73					421					3113					3580		471		211	7869	6700
1990	29					108				3	2427					4078		297		118	7060	6000
1991	18					50					972					4001		279		51	5371	0
1992	9					27					776					5261		2		153	6228	0
1993	4					11					435					824				135	1409	0
1994	0					9					35					47				12	103	0
1995	0					1					57					51				26	135	0
1996	0					1					45					154				39	239	0
1997	0					2					24					102				23	151	0
1998	0					2					16					144				15	177	0
1999	0					1					28					47				5	81	0
*2000	1					1					19					48				2	71	0

* Provisional data

Between 1954 and 1958 catches for 4Vn and 4Vs were combined as 4V.
Canadian landings, 1954-85 NAFO, 1986 to present ZIF
Foreign landings: 1954-1985 NAFO, 1986 - present Cdn. observers

Table 2. Canadian nominal landings,t of Div 4TVW haddock by gear.

	4TV					4W					4TVW
YEAR	OT	DS/SS	LL/LHS	Misc	Total	OT	DS/SS	LL/LHS	MISC.	Total	Total
1960	3741	27	488	289	4545	18902	6	275	910	20093	24638
1961	2196	51	500	451	3198	21341	29	532	375	22277	25475
1962	2673	51	576	164	3464	14729	57	396	384	15566	19030
1963	2382	92	628	191	3293	10454	97	276	175	11002	14295
1964	1787	38	18	253	2096	9278	49	429	54	9810	11906
1965	1852	27	104	52	2035	6565	49	142	251	7007	9042
1966	1817	55	42	40	1954	7942	13	112	192	8259	10213
1967	1068	27	57	61	1213	6890	55	125	110	7180	8393
1968	1278	16	40	65	1399	7781	110	207	294	8392	9791
1969	903	65	94	76	1138	7774	113	161	222	8270	9408
1970	897	19	152	107	1175	4258	105	32	359	4754	5929
1971	1500	24	166	60	1750	7370	85	34	451	7940	9690
1972	613	85	86	59	843	1589	20	41	446	2096	2939
1973	358	6	43	133	540	2098	35	65	632	2830	3370
1974	226	12	31	56	325	333	16	92	466	907	1232
1975	175	6	16	12	209	446	9	67	871	1393	1602
1976	88	3	9	4	104	305	9	90	794	1198	1302
1977	319	14	6	2	341	1910	17	159	759	2845	3186
1978	543	15	16	4	578	3647	54	177	1071	4949	5527
1979	802	75	19	7	903	974	18	115	1232	2339	3242
1980	1951	116	27	16	2110	11195	151	207	895	12448	14558
1981	1873	97	34	88	2092	15878	400	107	1299	17684	19776
1982	2230	231	129	13	2603	10192	704	127	1475	12498	15101
1983	1497	135	130	16	1778	5582	410	153	1157	7302	9080
1984	3249	174	178	13	3614	2871	348	25	748	3992	7606
1985	7545	583	251	8	8387	2002	247	17	596	2862	11249
1986	8969	702	392	6	10070	4893	472	739	66	6170	16239
1987	1629	502	305	15	2451	427	70	445	49	991	3442
1988	1987	359	516	19	2881	336	123	638	78	1175	4056
1989	2853	288	460	5	3606	1479	184	1877	41	3580	7187
1990	2094	167	300	4	2565	877	295	2860	45	4078	6642
1991	698	50	288	4	1041	1014	54	2896	37	4001	5042
1992	568	92	153	0	813	1704	154	3382	22	5261	6074
1993	247	43	160	0	450	127	10	682	5	824	1275
1994	27	4	14	0	45	18	0	26	3	48	93
1995	27	3	28	1	59	18	0	32	1	51	110
1996	24	4	18	0	46	42	0	110	3	154	201
1997	6	0	17	2	26	23	0	77	1	102	127
1998	6	0	11	1	19	74	0	68	2	144	163
1999	20	0	9	0	29	20	0	26	1	47	76
2000	17	0	4	0	21	12	0	36	0	48	69
*2001	11	0	4	0	15	16	0	40	0	56	71

* landings to Sept. 1/2001

Table 3. Commercial catch at age (thousands of fish) for Div. 4TVW haddock.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	306	268	306	487	59	279	431	213	714	1	332	870	530	497	10
2	129	667	288	1178	233	61	676	283	433	268	376	318	433	470	360
3	679	888	671	646	975	470	157	965	811	423	2372	262	1520	1084	1514
4	1743	2188	751	1467	254	805	249	335	2412	1120	4334	5072	764	3207	4158
5	1400	2740	924	811	464	282	323	513	436	675	3238	5081	5629	2040	2225
6	1365	1208	668	723	298	185	189	283	715	159	1702	3010	1957	1677	821
7	1163	944	345	342	114	63	132	117	203	149	249	1178	1220	530	410
8	389	1177	191	159	47	30	36	80	61	16	129	139	214	235	90
9	88	277	159	60	8	8	8	19	23	5	39	105	48	29	30
10	38	39	9	99	17	4	10	15	8	6	9	30	28	18	5
11	19	21	18	2	16	1	3	6	2	2	7	10	5	19	2
12	14	25	0	4	0	1	7	7	0	0	2	5	7	6	1
13	6	5	0	3	0	1	1	3	1	0	1	4	0	0	0
14	6	2	0	1	0	0	0	1	1	1	1	4	0	0	0
15	0	2	0	0	0	0	0	0	0	1	1	0	1	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0
1	111	12	118	305	1973	139	4	7	10	12	22	140	15	15	3	5
2	39	84	83	97	575	561	128	12	17	11	40	48	26	21	3	4
3	313	100	80	45	140	295	731	125	8	4	21	96	27	15	3	2
4	5006	3189	90	117	201	202	1095	1761	94	2	8	96	71	12	4	0
5	4988	9654	743	220	284	148	418	1400	430	17	10	19	9	31	10	3
6	1457	4244	1493	991	263	160	189	589	256	25	21	9	5	33	32	4
7	312	1015	631	1505	1596	411	239	418	89	13	32	15	2	2	9	29
8	323	255	183	696	2430	1640	319	204	46	0	11	18	11	8	2	3
9	257	184	49	175	956	2090	952	246	77	0	2	7	15	27	6	2
10	127	102	37	32	345	525	812	577	88	1	1	0	4	34	6	3
11	47	19	14	24	63	206	292	386	126	3	2	0	2	21	4	3
12	8	24	6	35	37	20	89	196	116	2	3	0	0	5	0	1
13	0	2	0	7	8	10	5	46	36	5	6	0	1	0	0	0
14	1	0	0	6	2	3	1	2	6	1	1	2	1	0	0	0
15	0	0	0	1	2	0	1	0	1	0	0	0	1	0	0	0
16	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4. Differences observed (000's) between the new catch-at-age and the catch-at-age from the 1997 assessment.

Difference(new-old)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
0	0	0	0	0	5	1	0	0	0	0	0	0	-	-	-	-
1	-777	-4	35	193	420	119	3	-7	-4	0	-1	-7	-	-	-	-
2	13	-48	5	28	-248	424	55	-2	-5	0	-1	-2	-	-	-	-
3	-199	-852	-12	-3	-85	148	182	-2	-2	1	-1	32	-	-	-	-
4	2059	140	27	-49	-105	19	111	40	0	0	0	56	-	-	-	-
5	494	3978	323	-19	-143	1	39	11	2	0	0	12	-	-	-	-
6	-280	-1108	667	39	-226	12	11	13	2	0	0	6	-	-	-	-
7	-69	-932	-482	311	205	3	16	5	0	0	0	8	-	-	-	-
8	-507	-241	-223	-163	958	16	13	2	0	0	0	9	-	-	-	-
9	-88	-213	-24	-39	-367	82	18	-6	0	0	0	3	-	-	-	-
10	-22	-28	-130	-44	-180	45	23	-12	0	0	0	-1	-	-	-	-
Sum	625	692	186	253	236	872	470	42	-7	1	-1	116				

Table 5. Number of stratified random sets by stratum and year during the Div. 4VsW Sentinel Survey.

Strata	1995	1996	1997	1998	1999	2000
444	13	26	24	29	28	29
446	4	6	6	6	6	5
447	13	11	12	12	12	12
448	9	9	10	9	9	9
449	5	4	4	4	4	4
450	6	7	7	7	7	7
451	4	4	4	4	4	4
452	3	5	4	5	4	4
453	5	5	4	5	5	4
454	6	6	6	6	6	7
455	16	14	13	13	13	14
456	7	6	6	7	6	7
457	4	7	7	6	5	6
458	4	5	5	5	5	5
459	20	19	19	20	20	19
460	12	9	8	10	10	9
461	9	8	7	6	6	6
462	18	14	13	13	14	13
463	5	5	5	5	5	5
464	11	11	12	12	12	13
465	9	14	15	15	14	15
466	1	4	4	4	4	4
467	3	11	10	11	9	11
468	12	11	10	12	12	12
469	20	14	14	11	12	12
Total	219	235	229	237	232	236

Table 6. Catch rate(kg.per set) of haddock by stratum from the fixed gear sentinel survey in Div. 4VsW. Stratified means are also shown with and without the inclusion of three inshore strata (467-469).

Stratum	1995	1996	1997	1998	1999	2000
444	0.0	0.0	0.0	0.0	0.0	0.0
446	3.8	1.3	8.9	0.1	0.6	1.8
447	1.5	2.1	1.1	0.0	1.9	0.0
448	0.1	0.0	0.0	0.0	0.2	0.0
449	13.2	32.1	7.2	3.9	3.5	0.0
450	7.0	11.6	0.2	0.0	0.0	10.6
451	62.5	90.5	49.6	16.7	24.7	4.5
452	0.0	21.6	0.0	0.3	2.4	7.3
453	0.2	1.0	3.8	1.5	10.1	14.7
454	13.2	18.6	3.1	1.8	6.7	25.7
455	51.1	56.6	20.1	8.3	22.1	20.6
456	75.7	52.5	3.0	2.7	11.7	35.9
457	0.3	4.0	0.0	0.8	0.0	0.0
458	0.0	14.3	34.7	0.0	0.0	0.0
459	1.6	5.1	0.3	0.1	0.0	0.1
460	3.8	4.9	1.0	4.9	22.5	6.0
461	0.0	0.0	1.6	0.0	0.3	0.0
462	14.5	9.4	3.7	11.2	8.7	10.0
463	164.4	65.4	116.7	157.1	103.0	90.2
464	236.2	202.5	118.5	141.5	54.3	64.9
465	83.4	41.7	28.7	52.1	67.3	21.6
466	0.0	2.9	29.8	0.0	9.4	64.2
467	0.0	0.0	0.0	0.0	0.0	0.0
468	0.0	0.0	0.0	0.0	0.0	0.0
469	4.4	7.3	2.4	1.7	1.3	1.6
Stratified Mean(444-466)	28.5	23.2	12.9	14.6	13.7	11.0
Stratified Mean(444-469)	26.9	22.0	12.2	13.8	13.0	10.4

Table 7. Sentinel Survey stratified mean numbers at age from 1995 to 2000.

Age	1995	1996	1997	1998	1999	2000
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00
2	0.32	0.07	0.09	0.02	0.01	0.14
3	3.15	2.72	0.48	0.65	0.50	0.69
4	0.67	4.12	1.99	1.76	1.81	1.89
5	1.21	1.61	2.71	2.45	1.76	3.97
6	3.88	0.73	0.87	1.65	2.26	1.87
7	11.95	3.41	0.80	0.68	1.23	1.70
8	8.19	8.00	1.81	0.30	0.60	1.28
9	2.09	1.97	3.48	1.67	0.62	0.40
10	0.46	0.87	1.21	4.37	1.56	0.08
11	0.09	0.09	0.41	1.20	2.74	0.46
12	0.14	0.15	0.11	0.56	0.42	1.00
13	1.16	0.20	0.02	0.02	0.00	0.14
14	0.13	0.04	0.03	0.11	0.00	0.02
15	0.20	0.11	0.05	0.00	0.03	0.00
16	0.00	0.00	0.04	0.01	0.00	0.00
17	0.00	0.00	0.01	0.00	0.00	0.00
3+	33.31	24.01	14.03	15.44	13.52	13.50
5+	29.50	17.17	11.56	13.03	11.21	10.91
7+	24.40	14.84	7.98	8.93	7.20	5.07
Total	33.63	24.09	14.12	15.46	13.53	13.63

Table 8. Catch rate at length of haddock in Div. 4VW from the summer RV survey.

Length(cm)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.5	0	0	0.01	0	0	0	0.01	0	0	0.05	0.04	0.01	0.07	0.01	0	0
6.5	0.03	0.04	0.03	0	0	0.02	0.32	0.06	0	0.52	0.89	4.50	0.32	0.10	0.02	0
8.5	0.07	0.02	0.01	0	0.14	0.02	0.25	0.13	0	0.87	0.42	14.31	0.29	0.02	0.26	0.01
10.5	0	0	0	0	0.09	0.03	0.04	0.07	0	0.05	0.12	3.34	0.10	0	0	0
12.5	0	0	0	0	0	0	0	0	0	0	0.01	0.19	0.03	0.02	0	0
14.5	0	0	0	0	0	0	0	0.02	0.04	0	0.02	0.31	1.37	0.29	0.00	0
16.5	0.03	0.02	0.03	0	0	0.03	0.10	0.02	0.53	0	0.04	2.31	7.77	4.16	0	0.02
18.5	0.23	0.15	0.22	0.01	0.03	0.10	0.14	0.09	2.95	0.02	0.59	5.24	5.81	9.84	0.04	0.15
20.5	0.79	0.32	0.52	0.08	0.02	0.22	1.26	0.83	4.03	0.04	1.48	4.78	2.58	8.21	0.26	1.29
22.5	1.23	0.67	0.51	0.21	0.14	0.35	1.04	2.24	1.72	0.02	1.11	2.09	0.74	3.02	0.35	2.35
24.5	0.34	0.48	0.14	0.18	0.10	1.93	0.39	2.22	0.90	0.20	0.39	1.10	1.55	2.12	0.95	0.68
26.5	0.15	0.34	0.19	0.16	0.08	2.38	0.45	1.14	0.49	0.51	0.03	0.59	3.54	2.58	1.85	0.23
28.5	0.04	0.32	0.16	0.26	0.04	0.50	0.35	1.12	0.30	1.62	0.07	1.77	4.46	3.98	3.13	0.31
30.5	0.37	0.95	0.37	0.24	0.13	0.12	0.26	2.03	1.56	2.39	0.02	2.72	3.51	4.20	5.20	0.83
32.5	0.38	1.19	0.36	0.56	0.46	0.03	0.53	3.12	3.44	2.94	0.10	2.59	2.24	5.15	4.55	1.80
34.5	0.19	0.73	0.25	0.37	0.91	0.05	0.71	2.96	4.25	2.54	0.77	1.66	0.97	5.17	4.27	3.37
36.5	0.43	0.39	0.25	0.22	0.75	0.10	0.69	2.08	3.46	1.48	1.88	0.56	1.76	7.83	7.17	4.23
38.5	0.47	0.22	0.20	0.21	0.65	0.11	0.31	1.36	3.21	2.07	4.39	0.31	3.41	9.09	9.95	4.60
40.5	0.69	0.37	0.30	0.17	0.50	0.45	0.08	1.67	4.74	3.41	5.21	0.70	3.72	5.08	10.58	6.28
42.5	0.68	0.63	0.20	0.06	0.69	0.48	0.19	2.45	3.79	3.64	4.43	1.82	2.89	3.33	6.79	6.29
44.5	0.79	0.55	0.17	0.17	0.64	0.95	0.12	2.18	2.96	3.47	5.56	2.39	3.25	2.59	3.95	4.12
46.5	0.53	0.42	0.25	0.15	0.48	0.57	0.26	1.41	2.27	3.03	4.79	2.47	2.40	2.15	2.18	2.75
48.5	0.47	0.38	0.13	0.05	0.23	0.45	0.40	0.53	2.08	2.22	4.69	2.43	2.20	1.81	1.70	1.59
50.5	0.59	0.40	0.34	0.16	0.14	0.44	0.37	0.67	1.27	1.52	3.69	1.77	2.02	1.35	1.04	1.33
52.5	0.50	0.27	0.14	0.17	0.24	0.28	0.31	0.76	0.52	0.83	1.74	1.05	1.61	1.18	1.07	0.83
54.5	0.21	0.16	0.12	0.15	0.27	0.46	0.32	0.52	0.16	0.63	1.34	0.60	1.14	0.84	0.53	0.43
56.5	0.33	0.16	0.10	0.03	0.21	0.27	0.21	0.44	0.17	0.20	0.43	0.54	0.66	0.32	0.48	0.37
58.5	0.24	0.09	0.05	0.15	0.17	0.30	0.07	0.31	0.12	0.09	0.35	0.29	0.48	0.27	0.30	0.24
60.5	0.11	0.06	0.07	0.05	0.08	0.25	0.02	0.32	0.11	0.15	0.24	0.26	0.19	0.09	0.24	0.09
62.5	0.17	0.06	0.09	0.09	0.07	0.13	0.10	0.11	0.11	0.10	0.19	0.09	0.27	0.12	0.13	0.07
64.5	0.24	0.02	0.04	0	0.09	0.13	0.08	0.08	0.07	0.05	0.11	0.13	0.17	0.08	0.10	0.03
66.5	0.20	0.10	0	0.06	0.01	0.08	0.04	0.02	0	0.06	0.05	0.03	0.08	0.10	0.07	0.10
68.5	0.03	0.01	0.05	0	0.02	0.03	0.02	0.06	0.03	0.04	0.05	0.03	0	0.04	0.07	0.03
70.5	0.04	0.02	0	0	0.01	0.05	0	0	0.03	0.02	0	0	0.02	0.00	0	0.02
72.5	0.04	0	0	0.02	0.02	0.04	0.06	0.03	0.01	0	0	0	0	0.02	0.01	0.00
74.5	0.01	0	0	0.04	0	0	0.00	0	0	0	0	0	0.02	0.00	0.01	0
76.5	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	0
78.5	0.01	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0	0
80.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Total	10.65	9.53	5.29	4.03	7.41	11.35	9.49	31.10	45.31	34.76	45.24	62.99	61.62	85.16	67.25	44.46

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	0	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.5	0	0	0	0	0	0	0	0.01	0	0.01	0	0.02	0.02	0.02	0.02	0.01
6.5	0.09	0.02	0.06	0	0	0.02	0	0.28	0.31	0.04	0.19	0.06	0.05	0.54	0.26	0.02
8.5	0.05	0.06	0.69	0.06	0	0	0	1.11	0.69	0.20	2.25	0.22	0.61	11.95	3.04	0.33
10.5	0	0.00	0.28	0.04	0	0	0	0.98	0.35	0.03	1.76	0.07	0.63	44.29	6.00	0.36
12.5	0	0	0.01	0	0	0	0	0.06	0.01	0	0.00	0	0.05	14.82	1.05	0.13
14.5	0	0	0	0	0.02	0	0	0	0	0	0.02	0	0.06	0.30	0.34	0.01
16.5	0	0.17	0	0.74	0.01	0	0.02	0.01	0	0.08	0.11	0.07	0.39	0.07	1.86	0.18
18.5	0.06	0.49	0.07	5.29	0.05	0.02	0.01	0.05	0.06	0.19	1.49	0.23	1.07	0.25	5.39	0.65
20.5	0.18	0.94	1.04	5.63	0.25	0.06	0.32	0.34	0.75	1.12	3.47	1.55	1.14	2.24	16.21	2.07
22.5	0.46	0.87	2.08	1.63	0.38	0.09	0.30	1.05	2.48	1.86	3.49	3.26	0.36	3.50	21.40	2.56
24.5	0.48	0.31	1.31	0.57	0.42	0.03	0.14	0.91	3.24	0.77	1.57	1.91	0.07	7.47	9.61	4.8
26.5	0.18	0.14	0.27	0.22	1.62	0.07	0.05	0.41	1.01	0.41	0.62	2.93	0.52	3.33	2.16	15.63
28.5	0.19	0.21	0.36	0.51	5.71	0.56	0.16	0.21	1.70	1.53	1.11	4.12	2.44	3.09	3.14	15.97
30.5	0.91	0.50	2.71	1.74	6.87	1.94	0.43	0.69	1.94	2.65	3.06	2.29	4.90	3.83	5.65	6.59
32.5	1.57	0.88	8.21	3.20	2.86	7.43	1.25	0.61	0.94	2.26	3.79	1.52	7.28	4.21	5.19	5.24
34.5	2.03	0.90	6.18	1.72	1.99	11.33	4.51	0.96	0.75	1.87	3.84	1.86	6.35	7.26	6.01	4.33
36.5	4.27	1.53	2.74	0.94	3.13	10.04	6.04	2.88	1.32	1.39	3.38	2.46	4.51	7.93	6.49	4.09
38.5	7.59	2.53	3.64	1.05	3.29	7.96	4.76	5.02	2.95	2.03	2.44	1.96	2.89	5.96	6.06	3.15
40.5	9.06	4.56	4.27	1.57	2.46	6.15	3.73	4.43	3.94	2.82	2.56	1.79	1.82	3.75	3.66	2.81
42.5	7.81	5.43	5.34	2.95	2.11	4.94	2.35	3.21	2.79	2.59	2.39	1.93	1.76	2.27	3.23	1.71
44.5	5.61	4.81	6.12	3.97	2.98	3.88	1.47	1.72	1.52	1.54	1.86	1.54	0.97	1.56	1.56	0.83
46.5	3.65	2.91	4.70	3.69	2.71	3.34	1.11	1.03	0.65	0.68	1.15	0.90	0.83	0.63	1.50	0.4
48.5	2.24	1.83	3.01	2.71	1.97	2.44	0.76	0.44	0.37	0.24	0.48	0.47	0.30	0.46	0.88	0.19
50.5	1.56	0.77	1.45	1.50	1.43	0.82	0.53	0.42	0.16	0.08	0.20	0.30	0.32	0.33	0.20	0.13
52.5	0.76	0.51	0.73	0.83	0.59	0.44	0.31	0.16	0.07	0.06	0.06	0.14	0.20	0.11	0.25	0.06
54.5	0.65	0.20	0.32	0.44	0.30	0.09	0.10	0.07	0.03	0.10	0.07	0.04	0.07	0.04	0.07	0.03
56.5	0.50	0.15	0.19	0.28	0.25	0.07	0.11	0.03	0.02	0.11	0.02	0	0.01	0.06	0.01	0
58.5	0.31	0.07	0.11	0.07	0.06	0.03	0.01	0.02	0.00	0.07	0.01	0.01	0.03	0.15	0.01	0
60.5	0.15	0.03	0.13	0.10	0.09	0.00	0.01	0.01	0.01	0.09	0.01	0.01	0.01	0.00	0.01	0
62.5	0.07	0.00	0.06	0.04	0.02	0	0.01	0	0	0.04	0.01	0.01	0.03	0	0.01	0
64.5	0.04	0.01	0.07	0.02	0.00	0.01	0	0.00	0	0.03	0.01	0.01	0.01	0	0	0
66.5	0.02	0.01	0.02	0.01	0.01	0	0.01	0	0	0.01	0	0	0.02	0.01	0	0
68.5	0.01	0.00	0	0.01	0	0.02	0.01	0	0	0	0	0.01	0	0	0	0
70.5	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72.5	0	0	0	0	0.00	0	0	0	0.01	0	0	0	0.01	0	0	0
74.5	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0
76.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80.5	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	50.48	30.88	56.17	41.53	41.60	61.80	28.50	27.12	28.06	24.91	41.42	31.66	39.73	130.43	111.25	72.28

Table 9. Catch rate at length of Div. 4VW haddock from the spring RV survey.

Length, cm	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
2.5	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
4.5	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
6.5	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
8.5	0.00	0.00	0.02	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
10.5	0.00	0.00	1.88	0.49	0.25	0.00		0.00	0.02	0.00	0.00	0.00
12.5	0.00	0.69	9.16	9.17	2.49	0.64		0.07	0.05	0.07	1.39	0.02
14.5	0.01	3.06	10.33	14.87	6.53	0.97		0.15	1.11	1.50	11.16	0.02
16.5	0.00	1.69	4.83	6.96	4.72	0.10		0.28	1.55	4.12	6.85	0.05
18.5	0.02	0.45	1.38	2.20	1.82	0.30		0.99	0.79	2.26	1.00	0.18
20.5	0.07	0.14	0.07	2.30	2.59	2.27		0.41	0.11	0.64	0.21	0.11
22.5	0.23	0.02	0.57	4.75	4.32	3.27		0.09	0.05	0.15	0.08	0.78
24.5	0.58	0.03	3.67	9.23	5.52	3.72		0.13	0.29	0.88	1.20	3.31
26.5	0.85	0.05	4.45	10.02	3.49	3.63		0.69	0.70	2.58	4.46	4.66
28.5	0.61	0.17	2.64	4.94	2.63	4.65		0.68	0.76	3.09	8.03	2.84
30.5	0.22	0.54	1.38	2.21	4.65	9.27		0.75	0.69	1.28	4.76	0.58
32.5	0.37	1.67	0.50	1.46	10.61	15.56		1.46	1.38	0.49	2.18	2.01
34.5	0.53	2.52	0.12	2.60	13.01	16.26		3.78	2.56	0.94	3.39	3.07
36.5	1.74	3.23	3.14	3.67	8.21	11.27		7.90	3.96	1.50	3.40	2.56
38.5	1.29	2.41	11.40	2.57	6.24	10.49		11.57	5.46	2.11	3.06	1.55
40.5	1.89	1.44	22.09	2.43	7.68	7.28		12.03	8.86	3.50	3.95	2.89
42.5	2.14	0.94	27.89	1.48	6.41	4.14		11.51	9.16	5.85	4.69	3.73
44.5	1.97	0.93	21.77	2.63	5.15	4.63		9.38	8.94	5.43	6.07	5.57
46.5	1.86	1.04	18.37	3.63	3.82	3.28		5.91	7.70	4.88	3.49	5.09
48.5	1.48	0.70	12.95	2.60	3.36	2.49		3.47	4.71	2.87	2.89	4.53
50.5	0.85	0.73	9.94	2.59	3.33	2.48		2.27	2.59	1.86	1.76	3.16
52.5	0.99	0.72	8.28	1.75	2.51	1.58		1.19	1.61	1.24	0.95	1.63
54.5	0.50	0.30	6.22	1.41	2.07	1.36		1.10	0.76	0.70	1.04	0.71
56.5	0.51	0.33	3.13	1.29	1.46	0.91		0.51	0.56	0.34	0.58	0.68
58.5	0.44	0.39	2.87	0.79	0.70	0.61		0.31	0.35	0.23	0.31	0.32
60.5	0.35	0.30	2.37	0.73	0.48	0.31		0.25	0.18	0.27	0.31	0.16
62.5	0.20	0.18	1.12	0.64	0.27	0.36		0.09	0.07	0.09	0.08	0.14
64.5	0.07	0.06	0.37	0.36	0.12	0.22		0.10	0.02	0.10	0.02	0.01
66.5	0.20	0.11	0.37	0.11	0.14	0.11		0.03	0.00	0.03	0.04	0.05
68.5	0.04	0.05	0.08	0.10	0.04	0.04		0.03	0.00	0.00	0.00	0.00
70.5	0.02	0.02	0.00	0.06	0.06	0.13		0.02	0.05	0.00	0.00	0.00
72.5	0.05	0.00	0.00	0.03	0.01	0.02		0.00	0.00	0.01	0.00	0.00
74.5	0.00	0.01	0.02	0.02	0.00	0.01		0.00	0.00	0.00	0.00	0.00
76.5	0.01	0.00	0.00	0.00	0.01	0.02		0.00	0.00	0.00	0.00	0.00
78.5	0.00	0.00	0.00	0.02	0.00	0.01		0.00	0.00	0.01	0.00	0.00
80.5	0.01	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
total	20.11	24.92	193.38	100.10	114.71	112.38		77.13	65.05	49.03	77.32	50.43

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
6.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
8.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
10.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.01	0.00
12.5	0.02	0.02	0.00	0.07	0.08	0.00	0.00		0.46	0.88	0.00
14.5	0.01	0.60	0.12	0.14	1.63	1.66	0.17		1.62	5.33	0.14
16.5	0.10	0.36	0.92	1.41	1.90	3.90	1.56		3.86	13.27	0.64
18.5	0.04	0.01	1.54	1.54	0.43	2.23	1.68		3.37	21.31	0.75
20.5	0.00	0.00	0.61	0.71	0.12	0.80	1.08		0.59	14.72	0.35
22.5	0.13	0.00	0.00	0.10	0.05	0.31	0.72		0.43	2.79	1.48
24.5	0.18	0.06	0.00	0.11	0.73	0.70	2.88		4.70	1.10	4.79
26.5	0.65	0.06	0.04	0.71	1.34	2.78	3.64		5.85	2.32	3.97
28.5	0.97	0.02	0.00	0.84	1.23	2.44	1.41		2.40	2.69	1.29
30.5	2.39	0.08	0.06	0.58	0.78	3.79	2.06		4.49	1.28	0.78
32.5	3.69	0.32	0.43	0.48	1.07	7.52	3.82		11.17	1.18	1.19
34.5	2.40	0.67	1.06	1.54	0.89	6.36	3.01		11.56	1.55	1.38
36.5	1.85	1.10	3.56	4.49	0.65	4.16	2.84		11.14	2.30	1.22
38.5	1.70	0.79	3.43	9.95	0.43	4.04	2.52		8.46	3.08	1.41
40.5	1.28	1.05	2.57	7.22	0.73	6.08	1.90		6.60	2.27	1.19
42.5	0.99	0.95	1.24	4.67	0.36	8.19	1.36		4.99	2.11	0.83
44.5	0.56	0.78	0.88	2.53	0.36	4.51	1.35		3.59	2.05	0.83
46.5	0.90	0.70	0.42	1.48	0.28	2.37	0.73		3.88	1.52	0.39
48.5	0.83	0.48	0.24	0.79	0.11	1.29	0.44		1.19	0.89	0.27
50.5	0.81	0.48	0.06	0.54	0.09	1.15	0.37		1.05	0.71	0.22
52.5	0.46	0.28	0.07	0.27	0.05	0.24	0.13		0.63	0.34	0.08
54.5	0.31	0.34	0.04	0.15	0.01	0.21	0.07		0.21	0.11	0.04
56.5	0.26	0.11	0.02	0.15	0.01	0.02	0.07		0.06	0.03	0.05
58.5	0.11	0.03	0.07	0.17	0.00	0.02	0.04		0.03	0.02	0.01
60.5	0.13	0.11	0.01	0.08	0.01	0.01	0.02		0.01	0.01	0.03
62.5	0.03	0.05	0.01	0.06	0.00	0.00	0.01		0.02	0.01	0.00
64.5	0.04	0.03	0.01	0.04	0.00	0.00	0.00		0.00	0.00	0.00
66.5	0.00	0.00	0.00	0.00	0.01	0.00	0.00		0.00	0.00	0.00
68.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.02	0.00	0.00
70.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.01	0.00	0.00
72.5	0.02	0.00	0.00	0.02	0.00	0.00	0.00		0.00	0.00	0.00
74.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
76.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
78.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
80.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
total	20.87	9.52	17.40	40.84	13.33	64.78	33.87		92.39	83.89	23.30

Table 10. Proportion of female haddock mature at length from the spring RV survey. Missing values (bold) were derived from the other time periods. The 1982-1984 average was applied to 1985 and 1986. The 1988 to 1990 average was applied to 1991 and some empty cells in 1992 and 1993. The 1995 to 1997 average was applied to 1998.

Length, cm	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
20.5	**0.00**	0.00	0.00	0.00	0.00	0.08	**0.02**	**0.02**	0.00	0.00	0.00	0.00
22.5	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	0.50	0.00	0.00	0.00
24.5	0.10	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	0.00	0.00	0.00	0.00
26.5	0.06	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	0.17	0.00	0.00	0.00
28.5	0.17	0.00	0.17	0.04	0.04	0.00	**0.03**	**0.03**	0.00	0.00	0.00	0.08
30.5	0.14	0.00	0.11	0.00	0.05	0.08	**0.04**	**0.04**	0.63	0.17	0.10	0.00
32.5	0.33	0.25	0.00	0.25	0.10	0.22	**0.17**	**0.17**	0.80	0.50	0.17	0.50
34.5	0.17	0.28	1.00	0.43	0.23	0.33	**0.31**	**0.31**	0.68	0.92	0.75	0.15
36.5	0.69	0.16	1.00	0.23	0.45	0.54	**0.44**	**0.44**	0.79	0.91	0.83	0.31
38.5	0.92	0.47	1.00	0.36	0.67	0.92	**0.70**	**0.70**	**0.89**	0.92	1.00	0.78
40.5	0.76	0.44	0.08	0.61	0.90	0.95	**0.85**	**0.85**	1.00	1.00	1.00	0.86
42.5	0.92	0.60	1.00	0.75	0.79	1.00	**0.85**	**0.85**	0.98	0.96	1.00	1.00
44.5	1.00	0.89	0.91	0.80	1.00	0.98	**0.96**	**0.96**	1.00	1.00	0.91	1.00
46.5	0.94	0.83	0.93	1.00	1.00	0.94	**0.98**	**0.98**	0.98	1.00	1.00	1.00
48.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
50.5	0.96	0.96	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
52.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
54.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
56.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
58.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
60.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
62.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
64.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	1.00	1.00	1.00	1.00
66.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	-	-	1.00	1.00
68.5	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	**1.00**	-	-	-	-
70.5	1.00	1.00	-	1.00	1.00	1.00	**1.00**	**1.00**	-	-	-	-
72.5	1.00	-	-	1.00	1.00	1.00	**1.00**	**1.00**	-	-	-	-

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
20.5	**0.00**	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00
22.5	**0.00**	**0.00**	**0.00**	0.00	0.33	0.00	0.13	**0.15**	0.00	0.00	0.00
24.5	**0.00**	**0.00**	**0.00**	0.00	0.10	0.00	0.00	**0.05**	0.11	0.17	0.00
26.5	**0.00**	**0.00**	0.00	0.33	0.09	0.00	0.00	**0.04**	0.06	0.17	0.17
28.5	**0.04**	**0.04**	**0.04**	0.00	0.27	0.00	0.29	**0.25**	0.43	0.00	0.36
30.5	**0.10**	0.00	**0.10**	0.33	0.33	0.40	0.76	**0.58**	0.75	0.39	0.54
32.5	**0.40**	0.75	**0.40**	0.63	0.91	0.50	0.71	**0.71**	0.80	0.67	0.64
34.5	**0.55**	1.00	1.00	1.00	0.90	0.71	0.84	**0.83**	0.79	0.87	0.78
36.5	**0.61**	1.00	1.00	0.86	1.00	0.83	0.95	**0.94**	0.92	0.81	0.76
38.5	**0.88**	1.00	1.00	1.00	1.00	0.75	0.95	**0.94**	0.93	0.92	0.92
40.5	**0.95**	1.00	1.00	1.00	1.00	1.00	0.95	**0.97**	1.00	1.00	0.94
42.5	**0.98**	1.00	0.88	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
44.5	**0.98**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	0.94	1.00	1.00
46.5	**1.00**	1.00	1.00	1.00	1.00	1.00	0.93	**0.97**	0.95	1.00	1.00
48.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
50.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
52.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
54.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
56.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
58.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
60.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
62.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
64.5	**1.00**	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
66.5	**1.00**	-	-	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00
68.5	-	-	-	**1.00**	**1.00**	**1.00**	1.00	-	1.00	1.00	1.00
70.5	-	-	-	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00
72.5	-	-	-	-	-	-	-	-	-	-	-

Table 11. Weight (g) per tow at length of haddock from the summer RV survey in Div. 4VW

Length, cm	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
6.5	0.1	0.1	0.1	0.0	0.0	0.1	0.7	0.2	0.0	1.1	1.5	11.6	1.0	0.3	0.0	0.0
8.5	0.4	0.2	0.1	0.0	0.8	0.1	1.3	0.8	0.0	4.4	1.7	83.8	1.9	0.2	1.4	0.1
10.5	0.0	0.0	0.0	0.0	0.9	0.3	0.4	0.8	0.0	0.5	1.0	37.4	1.3	0.0	0.0	0.0
12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.6	0.6	0.3	0.0	0.0
14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.0	0.0	0.5	9.4	44.4	8.3	0.1	0.0
16.5	1.1	0.8	1.7	0.0	0.0	1.5	3.8	1.1	21.1	0.0	1.3	103.3	372.4	179.3	0.0	1.0
18.5	13.8	9.5	14.2	0.8	1.6	6.0	8.1	5.6	167.8	1.4	30.3	332.7	390.1	599.0	2.4	9.6
20.5	65.7	27.5	48.0	6.5	1.9	18.8	100.1	74.2	322.7	2.8	105.6	416.0	231.9	684.6	21.1	107.8
22.5	136.5	76.0	58.4	22.8	15.1	43.5	107.6	265.0	182.3	2.5	107.3	242.1	89.3	339.3	36.8	259.3
24.5	49.4	70.1	21.0	26.4	14.2	284.6	54.1	339.4	126.5	25.1	50.4	164.6	238.6	322.9	133.7	96.4
26.5	27.8	63.1	38.5	28.1	14.4	446.4	79.0	214.1	86.9	91.9	5.0	112.2	702.7	481.4	328.5	40.7
28.5	9.8	74.1	36.7	59.0	8.6	117.4	78.4	270.6	71.6	365.9	13.6	422.5	1108.3	909.5	695.5	68.6
30.5	105.3	270.2	110.9	68.7	36.2	35.1	70.5	601.5	431.7	667.0	4.7	801.1	1122.5	1169.6	1421.3	228.0
32.5	138.1	409.5	130.1	191.1	154.5	8.8	183.8	1128.6	1166.2	999.1	33.7	925.7	828.9	1740.3	1511.0	595.4
34.5	81.7	341.7	114.4	153.4	368.6	18.0	284.5	1280.4	1740.8	1041.4	303.0	710.6	408.6	2094.5	1692.2	1327.7
36.5	212.6	189.8	122.2	109.2	362.8	44.0	334.4	1071.5	1688.2	725.9	889.0	285.8	963.0	3764.4	3386.8	1975.4
38.5	280.5	122.8	134.2	118.4	367.1	61.5	169.8	823.1	1854.1	1197.9	2473.2	188.8	2013.8	5140.1	5532.1	2513.7
40.5	492.2	247.6	202.2	111.8	335.1	304.0	54.8	1177.7	3213.8	2295.6	3459.4	489.1	2594.1	3350.3	6877.0	3993.0
42.5	548.9	483.9	163.5	49.8	531.4	381.2	144.4	2003.6	2993.6	2864.0	3447.2	1479.3	2276.1	2523.9	5122.0	4613.2
44.5	738.6	484.6	143.0	156.1	570.9	843.1	105.1	2043.7	2687.6	3153.2	5026.3	2242.6	2949.0	2293.6	3422.8	3467.6
46.5	573.6	420.0	268.9	155.3	487.7	568.0	266.2	1506.2	2380.5	3158.4	5004.3	2649.7	2435.1	2157.2	2166.7	2634.9
48.5	555.7	432.8	163.7	55.2	267.3	525.7	474.2	651.6	2451.2	2645.6	5621.4	2960.7	2555.7	2060.8	1901.8	1733.5
50.5	817.9	488.7	466.1	218.0	187.7	581.6	496.4	963.6	1723.3	2058.2	5050.8	2442.1	2674.5	1736.2	1325.7	1636.3
52.5	783.8	366.2	223.1	254.9	357.3	380.1	475.2	1106.7	795.2	1263.7	2701.9	1620.7	2427.9	1705.8	1531.1	1142.0
54.5	373.7	259.5	231.2	257.7	453.0	777.4	546.7	855.8	281.6	1072.6	2342.6	1037.4	1928.0	1357.3	877.3	653.6
56.5	658.3	321.9	167.3	61.3	397.0	468.4	396.6	847.7	320.1	331.8	851.8	1055.8	1179.5	585.1	833.7	638.5
58.5	540.6	173.9	118.8	315.8	352.6	615.3	150.9	673.1	248.4	197.8	766.2	623.7	964.8	519.4	603.3	459.5
60.5	262.0	125.6	160.2	112.1	148.8	573.9	59.7	771.3	267.5	368.2	586.0	587.7	414.2	202.9	526.8	195.2
62.5	459.5	117.9	239.9	241.8	173.6	335.0	264.4	297.5	283.6	252.8	510.2	238.7	707.5	297.8	308.0	168.7
64.5	730.1	55.1	104.2	0.0	248.4	355.2	229.3	243.8	218.2	150.0	321.1	389.1	473.5	224.8	274.4	78.7
66.5	645.1	305.4	0.0	184.0	29.5	242.7	141.5	53.5	0.0	195.7	165.3	103.9	225.1	294.2	194.9	258.6
68.5	112.9	27.2	162.6	0.0	72.8	100.6	75.6	217.5	110.6	126.3	195.5	113.8	0.0	136.6	213.3	85.0
70.5	175.8	88.9	0.0	0.0	17.7	171.3	0.0	0.0	116.4	73.7	0.0	0.0	63.4	7.1	0.0	79.4
72.5	186.7	0.0	0.0	93.2	62.6	143.4	250.8	134.2	45.8	0.0	0.0	0.0	0.0	92.7	53.8	14.4
74.5	39.5	0.0	0.0	154.8	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	91.2	0.0	25.1	0.0
76.5	42.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	117.7	0.0
78.5	46.6	0.0	0.0	0.0	0.0	0.0	0.0	158.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	9.8
82.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Length, cm	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.5	0.2	0.0	0.1	0.0	0.0	0.1	0.0	1.0	0.8	0.1	0.5	0.1	0.1	1.3	0.6	0.0
8.5	0.2	0.3	3.5	0.3	0.0	0.0	0.0	8.4	4.0	1.2	12.9	1.2	3.5	67.2	15.6	1.9
10.5	0.0	0.0	2.7	0.4	0.0	0.0	0.0	13.7	3.8	0.3	19.1	0.7	6.9	476.5	59.0	3.9
12.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.4	0.2	0.0	0.0	0.0	0.9	272.2	17.7	2.3
14.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.6	0.0	1.8	8.7	9.0	0.2
16.5	0.0	7.4	0.0	29.5	0.6	0.0	0.9	0.3	0.0	3.5	4.7	2.9	16.9	3.0	73.6	7.4
18.5	3.3	29.5	4.3	300.9	3.0	1.1	0.5	3.6	3.6	11.7	89.8	13.5	65.7	15.3	303.3	38.7
20.5	13.3	78.2	82.3	440.1	20.8	5.3	28.2	31.0	61.8	93.7	285.2	125.0	95.7	187.6	1251.2	168.7
22.5	44.9	96.3	219.7	170.6	42.9	10.5	34.5	126.0	270.7	205.8	380.1	348.9	40.1	390.1	2198.8	275.7
24.5	63.0	44.5	180.0	78.2	60.9	5.2	20.4	140.0	457.5	110.0	221.2	266.4	10.1	1081.1	1283.9	669.2
26.5	29.8	23.9	47.5	37.8	301.4	12.8	9.2	79.8	180.8	74.2	110.8	520.1	95.3	613.1	367.4	2765.8
28.5	39.3	48.2	78.7	111.8	1337.8	131.6	37.4	50.5	379.1	344.4	247.1	912.5	558.0	711.2	668.1	3520.9
30.5	237.6	140.5	738.9	467.9	1994.5	562.8	124.7	198.9	531.0	731.5	836.4	626.2	1377.4	1085.3	1481.2	1783.2
32.5	498.8	298.5	2735.3	1051.9	1011.2	2607.4	432.4	208.9	311.8	755.1	1255.3	505.3	2482.8	1449.6	1654.3	1719.7
34.5	778.7	364.2	2481.3	680.2	829.4	4762.5	1871.8	393.0	297.9	747.6	1523.6	742.9	2597.3	3002.5	2302.2	1702.5
36.5	1961.1	751.8	1311.5	445.0	1540.7	5016.3	2970.2	1386.5	621.7	658.3	1590.3	1168.3	2189.7	3898.4	2956.9	1908.3
38.5	4128.4	1455.7	2059.3	586.8	1917.9	4668.5	2748.4	2810.3	1632.5	1128.6	1349.1	1096.7	1650.5	3450.9	3253.6	1727.8
40.5	5775.9	3056.5	2829.4	1022.5	1653.3	4191.8	2505.9	2865.7	2541.0	1825.7	1649.7	1170.3	1212.6	2536.2	2296.4	1792.1
42.5	5798.5	4224.0	4112.6	2233.0	1630.9	3884.3	1826.5	2377.1	2081.5	1938.2	1781.9	1463.3	1357.9	1779.9	2350.7	1266.7
44.5	4815.3	4305.2	5446.8	3469.5	2646.1	3490.8	1310.2	1456.1	1303.1	1323.3	1593.7	1344.8	860.8	1408.5	1307.9	705.1
46.5	3603.5	2985.0	4798.3	3706.8	2752.1	3439.5	1123.2	978.0	636.4	666.9	1125.5	899.7	842.0	650.9	1430.2	388.9
48.5	2521.2	2133.8	3507.6	3096.1	2270.7	2847.0	888.6	472.6	411.4	267.1	533.6	534.7	345.9	540.8	961.6	211.2
50.5	1994.2	1015.0	1917.2	1951.7	1870.8	1117.5	683.2	511.2	201.0	100.5	251.2	386.5	417.3	439.2	247.5	165.8
52.5	1099.0	765.8	1083.1	1211.2	874.2	677.6	444.7	220.7	98.9	84.7	84.8	203.2	293.5	164.9	348.6	90.8
54.5	1060.9	313.5	533.2	725.7	489.0	154.2	160.9	102.9	47.5	158.0	110.7	65.1	115.1	67.3	109.5	44.2
56.5	907.9	311.0	362.2	506.3	465.2	130.1	193.7	48.8	35.3	193.7	35.3	0.0	18.4	112.7	10.5	0.0
58.5	620.6	145.1	240.6	143.6	132.4	68.2	22.1	41.3	0.0	136.9	19.6	20.2	61.2	313.4	14.6	0.0
60.5	350.7	73.5	302.1	232.4	209.8	15.5	33.3	15.8	21.7	194.7	21.7	22.4	22.6	0.0	32.1	0.0
62.5	165.5	5.1	144.1	108.4	39.9	0.0	36.7	0.0	0.0	95.4	23.9	24.8	74.8	0.0	12.4	0.0
64.5	105.2	36.3	190.2	52.8	13.7	24.2	0.0	4.7	0.0	78.7	26.3	27.3	27.5	0.0	0.0	0.0
66.5	61.0	30.7	50.0	24.5	21.1	0.0	20.6	0.0	0.0	28.7	0.0	0.0	60.3	31.0	0.0	0.0
68.5	23.4	6.7	0.0	26.8	0.0	51.5	22.5	0.0	0.0	0.0	0.0	32.9	0.0	0.0	0.0	0.0
70.5	25.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.5	0.0	0.0	0.0	0.0	19.6	0.0	0.0	0.0	37.5	0.0	0.0	0.0	39.2	0.0	0.0	0.0
74.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.7	0.0	0.0	0.0	0.0	0.0
76.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.5	0.0	44.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 12. Stratified mean number per tow of Div. 4VW haddock from the July RV survey.

Age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
0	0.11	0.06	0.00	0.00	0.23	0.07	0.30	0.19	0.00	1.49	1.44
1	2.74	1.74	1.31	0.53	0.37	4.82	2.78	6.07	9.91	0.10	3.52
2	1.00	3.50	0.95	1.74	2.14	0.95	3.13	11.23	11.04	9.42	0.28
3	1.79	1.20	1.26	0.54	2.84	1.97	0.48	9.06	14.77	9.78	14.95
4	2.12	1.57	0.59	0.47	0.59	1.78	0.95	1.36	8.39	10.27	13.92
5	1.00	0.65	0.50	0.17	0.54	0.48	0.94	1.96	0.50	2.87	8.53
6	0.62	0.37	0.34	0.34	0.26	0.85	0.20	0.73	0.49	0.37	2.08
7	0.62	0.16	0.16	0.08	0.20	0.22	0.23	0.22	0.12	0.31	0.34
8	0.41	0.25	0.11	0.10	0.10	0.10	0.05	0.11	0.01	0.07	0.12
9	0.14	0.01	0.04	0.02	0.05	0.05	0.01	0.00	0.00	0.00	0.02
10	0.04	0.00	0.01	0.05	0.04	0.06	0.01	0.05	0.01	0.04	0.00
11	0.04	0.00	0.00	0.00	0.04	0.00	0.01	0.01	0.01	0.01	0.00
12	0.02	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
unknown	0.00	0.00	0.05	0.00	0.01	0.00	0.32	0.10	0.02	0.00	0.05
total	10.64	9.53	5.29	4.03	7.42	11.35	9.49	31.10	45.31	34.76	45.24

Age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
0	22.36	0.79	0.14	0.28	0.01	0.14	0.08	1.04	0.10	0.02
1	15.71	18.3	21.29	0.30	4.61	1.20	3.02	4.73	13.65	0.97
2	9.32	15.19	14.68	10.79	1.40	3.25	1.23	12.88	7.64	14.90
3	0.98	12.82	30.15	17.30	8.85	4.16	2.53	6.13	1.93	10.06
4	7.32	2.54	11.72	29.30	10.97	12.77	1.59	4.52	1.39	3.46
5	4.73	7.71	3.00	5.19	12.00	13.49	7.42	3.38	1.81	0.74
6	2.02	3.02	2.77	2.39	3.37	10.09	7.38	9.57	1.73	0.94
7	0.31	0.97	0.95	1.31	0.68	3.22	5.76	6.87	4.69	1.12
8	0.10	0.22	0.27	0.24	1.49	0.81	1.34	5.35	3.71	2.04
9	0.12	0.03	0.08	0.09	0.65	0.80	0.10	0.89	3.40	2.70
10	0.02	0.02	0.03	0.02	0.29	0.32	0.26	0.35	1.03	2.44
11	0.00	0.00	0.00	0.01	0.12	0.10	0.05	0.17	0.18	1.84
12	0.00	0.00	0.04	0.00	0.00	0.11	0.09	0.18	0.23	0.20
13	0.00	0.00	0.00	0.00	0.04	0.02	0.01	0.04	0.02	0.02
14	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.01	0.01	0.13
15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
unknown	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00
total	62.99	61.62	85.16	67.25	44.46	50.49	30.89	56.15	41.52	41.60

Age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
0	0.02	0.00	2.43	1.36	0.27	4.19	0.36	1.39	71.21	10.29
1	0.13	0.78	2.61	7.02	3.72	9.81	6.59	3.06	15.49	50.29
2	1.88	1.10	1.53	4.49	5.39	6.14	8.6	6.38	7.99	18.96
3	21.61	3.53	1.12	1.19	4.50	8.88	3.65	13.34	9.02	7.31
4	19.87	11.86	3.56	0.89	0.52	4.78	4.46	5.63	11.48	7.1
5	7.11	6.88	9.71	2.25	0.79	0.74	2.27	4.81	6.67	8.41
6	1.52	0.83	3.43	6.93	4.13	0.34	1.02	2.16	3.35	3.13
7	2.37	0.70	0.94	2.81	4.27	1.34	0.28	0.44	2.12	2.67
8	2.01	0.22	0.23	0.24	0.80	3.09	0.48	0.36	0.31	1.11
9	2.19	0.24	0.37	0.19	0.16	1.62	2.01	0.54	0.4	0.45
10	2.29	0.70	0.15	0.09	0.05	0.26	1.4	1	1.12	0.2
11	0.64	0.79	0.48	0.19	0.08	0.05	0.44	0.54	0.87	0.6
12	0.16	0.58	0.27	0.19	0.13	0.02	0.06	0.03	0.3	0.43
13	0.00	0.25	0.23	0.12	0.06	0.02	0.02	0.02	0.06	0.25
14	0.00	0.00	0.01	0.08	0.04	0.09	0	0	0.04	0.02
15	0.00	0.01	0.03	0.00	0.01	0.05	0.03	0	0	0
16	0.00	0.00	0.00	0.00	0.00	0.00	0	0.02	0	0
17	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0	0	0
unknown	0.00	0.01	0.02	0.00	0.00	0.00	0	0	0	0.02
total	61.80	28.48	27.13	28.04	24.92	41.42	31.67	39.73	130.43	111.25

Table 13. Biomass (kg) per tow at age of Div. 4VW haddock from the summer RV survey.

age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
0	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.001	0.000	0.006	0.004
1	0.281	0.200	0.127	0.063	0.046	0.768	0.251	0.799	0.766	0.009	0.274
2	0.331	1.119	0.253	0.577	0.873	0.215	1.024	4.171	3.911	2.937	0.057
3	1.176	0.772	0.647	0.363	2.061	1.630	0.273	7.074	9.587	6.046	9.221
4	2.092	1.478	0.575	0.529	0.625	2.061	1.077	1.522	8.943	10.152	13.815
5	1.414	0.840	0.645	0.237	0.848	0.813	1.415	3.289	0.774	3.932	11.086
6	1.109	0.590	0.633	0.668	0.544	1.813	0.382	1.387	1.012	0.714	3.770
7	1.351	0.290	0.355	0.173	0.409	0.502	0.560	0.524	0.323	0.732	0.827
8	1.125	0.629	0.216	0.263	0.221	0.254	0.131	0.313	0.023	0.208	0.373
9	0.444	0.027	0.079	0.098	0.102	0.120	0.035	0.000	0.000	0.000	0.059
10	0.122	0.000	0.042	0.193	0.114	0.192	0.020	0.167	0.000	0.132	0.000
11	0.140	0.000	0.000	0.000	0.108	0.000	0.035	0.063	0.000	0.038	0.000
12	0.090	0.000	0.000	0.000	0.000	0.096	0.251	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000
14	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
total	9.743	5.946	3.573	3.164	5.953	8.464	5.455	19.375	25.339	24.908	39.485
5+	5.862	2.377	1.971	1.632	2.347	3.789	2.828	5.806	2.133	5.758	16.115
7+	3.338	0.946	0.692	0.727	0.955	1.163	1.031	1.131	0.346	1.111	1.259

age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	0.128	0.004	0.000	0.001	0.000	0.000	0.000	0.006	0.001	0.001	0.000
1	1.211	1.097	1.406	0.026	0.489	0.131	0.293	0.516	0.981	0.110	0.013
2	2.867	3.773	2.466	2.542	0.414	1.012	0.394	4.397	2.356	3.841	0.622
3	0.525	8.164	13.684	7.388	3.775	2.285	1.293	2.636	0.995	4.633	9.154
4	6.984	2.223	8.622	18.937	6.989	7.352	0.962	2.710	1.069	2.043	11.017
5	6.005	8.831	3.343	5.058	9.028	9.786	5.339	2.484	1.460	0.600	4.629
6	3.469	4.781	3.780	3.204	3.341	8.597	6.210	7.643	1.530	0.784	1.165
7	0.703	1.854	1.607	2.312	0.818	3.335	5.534	6.920	4.371	1.176	2.267
8	0.235	0.544	0.562	0.562	1.938	1.068	1.474	4.945	4.050	2.095	1.848
9	0.329	0.112	0.218	0.237	0.919	1.221	0.158	1.119	3.637	2.941	2.209
10	0.076	0.054	0.067	0.059	0.561	0.593	0.416	0.390	1.327	2.595	2.444
11	0.000	0.000	0.000	0.042	0.231	0.192	0.091	0.347	0.279	1.913	0.763
12	0.000	0.000	0.119	0.000	0.000	0.189	0.113	0.362	0.331	0.319	0.195
13	0.000	0.000	0.000	0.000	0.110	0.050	0.000	0.079	0.040	0.046	0.000
14	0.000	0.000	0.077	0.000	0.000	0.030	0.000	0.021	0.023	0.148	0.000
15	0.000	0.041	0.000	0.000	0.000	0.000	0.000	0.053	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
total	22.531	31.480	35.951	40.368	28.611	35.843	22.277	34.628	22.449	23.265	36.329
5+	10.816	16.219	9.772	11.474	16.944	25.062	19.335	24.364	17.048	12.637	15.521
7+	1.343	2.607	2.649	3.212	4.576	6.679	7.786	14.236	14.059	11.254	9.727

age	1992	1993	1994	1995	1996	1997	1998	1999	2000
0	0.000	0.023	0.008	0.002	0.031	0.002	0.011	0.781	0.096
1	0.084	0.344	0.897	0.385	0.953	0.712	0.222	1.993	4.882
2	0.409	0.484	1.094	1.362	1.548	1.789	1.672	1.862	4.241
3	1.557	0.523	0.435	1.732	3.724	1.243	4.852	3.600	2.868
4	6.119	2.073	0.476	0.251	2.311	2.242	2.661	5.380	3.724
5	4.593	5.761	1.400	0.465	0.462	1.363	2.785	3.868	4.833
6	0.678	2.362	4.407	2.898	0.248	0.681	1.507	2.377	2.173
7	0.568	0.747	2.100	3.249	1.095	0.203	0.346	1.477	2.181
8	0.235	0.165	0.242	0.752	2.555	0.377	0.245	0.289	1.009
9	0.274	0.337	0.175	0.143	1.427	1.785	0.553	0.345	0.368
10	0.745	0.147	0.100	0.045	0.214	1.252	1.034	1.051	0.192
11	0.869	0.451	0.179	0.073	0.062	0.449	0.582	0.871	0.659
12	0.680	0.299	0.209	0.151	0.023	0.062	0.040	0.268	0.461
13	0.305	0.212	0.132	0.094	0.041	0.020	0.041	0.086	0.276
14	0.000	0.013	0.099	0.071	0.112	0.000	0.000	0.088	0.033
15	0.016	0.037	0.000	0.011	0.054	0.041	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.000
total	17.133	13.976	11.955	11.685	14.862	12.244	16.577	24.336	27.996
5+	8.964	10.529	9.044	7.952	6.294	6.256	7.159	10.720	12.185
7+	3.693	2.407	3.237	4.589	5.584	4.212	2.867	4.475	5.179

Table 14. Correlation table showing magnitude of correlation (r^2) among year-class estimates at successive ages from the summer RV survey for Div. 4VW haddock

Age	1	2	3	4	5	6	7	8	9
1	-	0.62	0.54	0.45	0.62	0.80	0.74	0.57	0.75
2		-	0.66	0.58	0.84	0.52	0.56	0.45	0.55
3			-	0.74	0.72	0.62	0.58	0.69	0.65
4				-	0.62	0.62	0.54	0.50	0.71
5					-	0.65	0.72	0.66	0.69
6						-	0.81	0.79	0.89
7							-	0.78	0.90
8								-	0.83
9									-

Table 15. Size at age of Div. 4VW haddock from the summer RV survey. A) Length, cm B)Weight, g.

A)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1970	7.92	21.95	31.94	39.73	45.20	50.80	54.58	58.14	62.79	65.08	67.10	70.10	69.30		78.50
1971	7.30	22.59	31.73	40.05	45.43	50.55	54.05	56.99	62.85	60.50					
1972		21.07	29.39	36.49	45.11	49.30	56.00	59.61	57.13	58.81	68.50				
1973		23.18	32.18	40.44	47.84	51.37	57.42	58.07	63.71	72.50	72.14				
1974	9.25	23.48	34.59	41.64	47.14	53.50	58.43	57.91	60.52	59.06	67.16	66.06			
1975	8.57	25.13	28.23	43.23	48.31	54.71	58.98	60.72	63.34	62.20	67.41		72.50		
1976	8.80	21.36	32.20	38.40	47.88	52.44	56.14	61.20	63.23	64.50	54.50	64.50	72.50		
1977	9.18	23.31	32.79	41.87	47.19	53.89	56.06	60.81	64.45		68.50	78.50		78.50	
1978		20.32	32.96	39.95	46.77	52.51	57.64	62.78	56.50		72.50	68.50			
1979	7.74	21.21	31.60	39.33	45.69	50.73	56.49	60.24	64.40		69.54	66.50			66.50
1980	7.48	21.04	28.28	39.61	45.80	49.74	55.10	60.46	64.92	60.50					
1981	8.43	19.71	30.95	37.03	44.77	49.15	54.27	59.25	60.91	63.18	66.20				
1982	7.57	17.80	28.78	39.56	44.05	48.24	53.81	57.35	62.58	72.01	64.50				
1983	6.60	18.99	25.83	35.82	42.00	48.15	51.47	55.24	59.14	64.59	60.63		66.50		72.50
1984	8.37	20.91	29.02	35.27	40.40	46.23	51.32	56.17	61.65	64.04	66.50	74.50			
1985	8.50	22.18	31.30	35.41	40.52	42.85	47.01	50.16	51.51	52.97	58.86	58.74		66.18	
1986	7.25	23.14	32.27	38.63	39.21	42.19	44.40	47.23	50.99	53.41	56.79	57.41	55.43	62.50	66.50
1987	8.18	21.57	31.83	37.06	39.16	41.44	43.61	45.53	47.59	53.56	53.78	56.06	49.70		
1988	8.95	22.74	32.75	35.26	39.22	41.86	42.99	46.30	45.04	49.71	47.84	58.06	57.74	57.45	58.50
1989	9.37	19.95	31.84	37.55	42.70	43.35	44.65	45.41	47.78	47.46	50.39	53.46	52.19	58.15	60.50
1990	14.50	22.66	29.69	35.92	38.98	43.25	43.65	47.08	46.74	47.65	47.28	46.93	54.01	60.98	48.34
1991	6.50	21.48	32.04	34.79	38.06	40.16	42.41	45.67	45.07	46.49	47.37	49.17	49.57		
1992		21.95	33.29	35.23	37.13	40.47	43.30	43.21	47.39	48.44	47.30	47.83	48.87	49.49	60.50
1993	9.18	23.34	31.74	36.42	39.35	39.61	41.74	43.90	42.38	46.05	47.24	46.55	49.32	46.23	52.50
1994	8.61	23.71	29.35	33.56	38.06	40.02	40.31	42.53	46.98	45.61	48.46	45.93	48.30	48.32	50.26
1995	8.39	22.02	29.62	34.07	36.74	39.24	41.60	42.74	45.86	45.04	45.11	45.40	49.21	54.35	56.60
1996	9.25	21.67	29.69	35.14	36.83	40.07	42.21	43.81	43.98	44.91	43.93	50.28	49.33	59.26	50.37
1997	8.38	22.55	27.90	32.75	37.18	39.39	40.78	41.88	42.98	44.74	44.84	46.80	47.02	46.50	
1998	9.50	19.55	29.81	33.19	36.18	38.67	41.12	42.78	40.76	46.65	46.79	47.43	50.90	58.70	
1999	10.56	23.58	28.62	34.10	35.94	38.52	41.14	40.89	44.99	43.84	45.07	46.03	44.33	51.65	59.49
2000	9.99	21.55	28.34	34.08	37.49	38.63	41.11	43.36	44.91	43.38	45.74	47.77	47.41	47.89	54.37
average	8.68	21.80	30.66	37.15	41.82	45.52	48.83	51.53	53.65	54.53	56.62	56.20	54.43	56.41	59.67

B)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1970	4.23	102.80	332.48	657.96	984.90	1419.73	1777.22	2165.76	2756.14	3082.34	3392.21	3889.70	3751.61		5542.17
1971	3.84	114.90	319.37	643.42	940.44	1296.73	1586.34	1860.34	2496.86	2226.54					
1972		96.98	266.41	513.83	977.81	1280.59	1884.73	2278.11	2002.81	2187.04	3474.25				
1973		120.24	331.59	671.82	1129.95	1408.45	1987.95	2057.57	2741.36	4088.42	4026.29				
1974	6.97	123.49	408.67	724.54	1062.64	1570.37	2061.17	2005.21	2298.07	2131.41	3169.28	3012.10			
1975	6.06	159.30	226.85	828.18	1160.64	1693.89	2128.13	2324.46	2642.38	2501.40	3193.42		3983.91		
1976	5.56	90.06	326.97	568.46	1135.92	1511.83	1872.98	2455.99	2720.82	2895.64	1706.21	2895.64	4179.98		
1977	7.75	131.58	371.38	780.85	1122.50	1681.34	1894.84	2426.46	2895.11		3484.92	5272.96		5272.96	
1978		77.25	354.25	649.01	1066.18	1535.08	2057.91	2692.85	1932.79						
1979	3.82	89.58	311.82	618.24	988.32	1371.10	1919.68	2346.77	2891.84		3678.36	3197.61			
1980	2.64	77.94	204.90	616.72	992.45	1299.33	1816.05	2461.44	3105.58	2466.17					
1981	5.70	77.11	307.49	533.10	954.06	1270.10	1720.58	2251.82	2451.09	2741.26	3163.11				
1982	4.77	59.95	248.36	636.84	875.32	1145.43	1583.03	1911.60	2474.04	3749.18	2705.98				
1983	2.67	66.04	168.01	453.87	735.65	1114.26	1364.59	1691.09	2081.06	2719.38	2244.39		2971.71		3863.40
1984	5.32	86.75	235.61	427.02	646.31	974.62	1340.40	1764.52	2343.71	2632.35	2953.12	4175.47			
1985	6.10	105.97	295.19	426.76	637.01	752.10	990.70	1201.66	1299.90	1412.51	1933.26	1922.09		2740.17	
1986	2.79	108.99	311.39	549.34	575.72	725.43	852.07	1035.78	1318.98	1526.73	1852.74	1916.86	1715.88	2506.83	3048.93
1987	4.96	97.08	320.46	511.01	604.74	719.50	841.43	960.78	1099.86	1580.60	1600.84	1818.83	1257.12		
1988	5.92	109.14	341.35	430.02	599.51	734.91	798.65	1007.28	924.30	1257.56	1115.57	2043.75	2008.44	1976.54	2092.22
1989	6.82	71.83	308.35	515.46	769.24	806.38	884.22	932.05	1091.77	1069.67	1288.58	1549.92	1438.14	2013.65	2278.33
1990	29.07	113.24	259.69	460.14	599.36	842.88	832.72	1052.01	1027.29	1088.36	1065.98	1041.42	1595.17	2310.84	1138.77
1991	2.80	100.07	331.09	423.60	554.48	651.11	766.52	956.62	919.49	1008.81	1067.03	1192.59	1221.64		
1992		107.19	372.24	440.99	515.96	667.57	817.18	811.82	1069.72	1142.46	1063.78	1100.20	1173.27	1218.13	2220.48
1993	9.29	131.86	316.13	467.23	582.21	593.30	688.54	794.90	719.04	910.22	978.94	938.64	1106.11	920.33	1321.48
1994	5.98	127.82	243.72	365.43	534.58	622.28	635.98	747.39	1010.19	923.49	1108.99	943.42	1097.89	1099.25	1238.24
1995	5.70	103.62	252.73	384.88	482.92	588.57	701.71	760.94	940.60	891.10	895.33	912.32	1162.94	1567.60	1770.51
1996	7.41	97.18	252.04	419.41	483.46	624.05	730.44	817.37	826.96	880.70	824.31	1239.58	1169.85	2038.05	1246.56
1997	5.17	108.08	208.01	340.47	502.77	600.24	667.97	724.65	784.53	887.85	894.05	1019.49	1034.25	999.61	
1998	8.08	72.61	262.14	363.71	472.56	578.94	697.56	787.25	679.34	1024.52	1034.08	1077.17	1336.01	2061.02	
1999	10.96	128.66	233.02	399.10	468.67	579.90	709.62	696.67	933.44	862.44	938.80	1001.24	892.13	1426.34	2200.42
2000	9.34	97.07	223.66	392.32	524.53	574.62	694.39	816.81	909.21	818.17	961.68	1097.72	1072.66	1105.63	1628.14
average	6.66	101.75	288.56	523.02	763.90	1007.57	1267.91	1509.61	1722.20	1810.94	1993.41	1966.31	1798.35	1950.46	2276.13

Table 16. Diagnostics from ADAPT for the Div. 4TVW haddock stock.

Mean square of the residuals = 0.643983

Age	Parameter	Estimate	SE	CV	Bias
1	popnums	12.5647		0.817367	-0.00146039
2	popnums	10.8649		0.489154	-0.00227728
3	popnums	8.91408		0.385100	-0.00304621
4	popnums	8.91312		0.329261	-0.00370754
5	popnums	9.01557		0.293233	-0.00503732
6	popnums	8.10372		0.268286	-0.00308811
7	popnums	8.09079		0.263614	0.00503127
8	popnums	7.32706		0.261764	-0.01079500
9	popnums	5.90138		0.265859	-0.04220450
10	popnums	5.56646		0.246343	-0.11695700
1	q - July RV	0.000151840	0.000023700	0.156015	-1.20473
2	q - July RV	0.000313950	0.000048100	0.153281	-1.16584
3	q - July RV	0.000494323	0.000075000	0.151819	-1.14791
4	q - July RV	0.000605164	0.000091300	0.150893	-1.14437
5	q - July RV	0.000681081	0.000102414	0.150370	-1.14811
6	q - July RV	0.000781480	0.000117324	0.150131	-1.15997
2	q - sentinel	0.000002900	0.000001090	0.373809	-6.98051
3	q - sentinel	0.000084400	0.000030900	0.366241	-6.67967
4	q - sentinel	0.000252788	0.000091600	0.362307	-6.49511
5	q - sentinel	0.000520110	0.000186708	0.358979	-6.26502
6	q - sentinel	0.000619136	0.000222865	0.359961	-6.49457
7	q - sentinel	0.001124770	0.000407582	0.362370	-6.74624
8	q - sentinel	0.002324730	0.000841334	0.361906	-6.70933

Table 17. Age by age residuals from ADAPT.

		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
	age											
RV	1	0.92	1.06	0.16	-0.66	-0.57	0.51	-0.34	0.17	0.58	-3.06	-0.40
	2	-0.37	0.79	0.07	0.13	0.33	-0.08	-0.36	0.60	0.32	0.08	-2.45
	3	-0.44	-0.26	-0.32	-0.51	0.65	0.10	-0.96	0.53	0.67	-0.03	0.36
	4	-0.43	-0.16	-0.66	-0.83	-0.17	0.54	-0.54	0.20	0.67	0.38	0.50
	5	-0.60	-0.81	-0.63	-1.20	-0.02	-0.01	0.31	0.45	-0.45	-0.13	0.53
	6	-0.90	-0.76	-0.50	0.08	0.17	0.94	-0.41	0.51	-0.37	-0.44	-0.01
Sent	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	avg	-0.14	-0.01	-0.14	-0.23	0.03	0.15	-0.18	0.19	0.11	-0.25	-0.11

		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
	age											
RV	1	0.42	0.11	0.81	-1.93	1.34	0.22	0.17	0.79	1.18	-1.48	-2.32
	2	0.12	-0.07	-0.58	-0.33	-0.83	0.62	-0.08	1.31	1.00	1.00	-1.13
	3	-1.39	0.25	0.39	-0.63	-0.73	0.11	0.27	1.46	-0.66	1.24	1.33
	4	-0.11	-0.36	0.31	0.45	-1.00	-0.22	-0.71	1.03	0.18	0.10	2.25
	5	-0.03	0.61	0.23	-0.23	-0.17	-0.43	-0.49	0.31	0.45	-0.12	1.12
	6	-0.22	0.14	0.29	0.51	-0.35	0.08	-0.69	0.04	-0.07	0.15	1.00
Sent	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	avg	-0.09	0.05	0.11	-0.17	-0.13	0.03	-0.12	0.38	0.16	0.07	0.17

		1992	1993	1994	1995	1996	1997	1998	1999	2000
	age									
RV	1	-0.74	-0.51	0.52	-0.12	0.35	0.21	0.14	0.66	1.80
	2	-0.50	-0.39	-0.28	-0.06	0.06	-0.10	-0.14	0.78	0.55
	3	-0.58	-0.56	-0.72	-0.37	0.35	-0.54	0.26	0.12	0.61
	4	1.04	-0.41	-0.64	-1.40	-0.15	-0.18	0.04	0.26	0.03
	5	2.04	1.21	-0.64	-0.54	-0.82	-0.67	0.13	0.44	0.17
	6	-0.61	2.20	1.12	0.18	-1.16	-0.28	-0.50	-0.02	-0.11
Sent	2	0.00	0.00	0.00	1.82	0.31	0.00	-1.04	-1.43	0.34
	3	0.00	0.00	0.00	1.18	1.07	-0.67	-0.86	-0.87	0.15
	4	0.00	0.00	0.00	-0.08	0.77	0.09	-0.05	-0.52	-0.22
	5	0.00	0.00	0.00	0.34	0.40	-0.05	-0.10	-0.45	-0.14
	6	0.00	0.00	0.00	0.54	0.02	-0.03	-0.35	0.01	-0.20
	7	0.00	0.00	0.00	1.86	0.17	-0.12	-0.51	-0.89	-0.51
	8	0.00	0.00	0.00	3.19	1.14	-0.79	-1.42	-0.96	-1.17
	avg	0.05	0.12	-0.05	0.50	0.19	-0.24	-0.34	-0.22	0.10

Table 18. Population numbers (thousands of fish) at age of Div. 4TVW haddock from the SPA.

age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1	8164	4575	8296	7755	4810	21292	28877	37355	40903	14943	38235
2	5466	6407	3503	6515	5909	3884	17180	23253	30391	32842	12233
3	7161	4358	4642	2608	4268	4627	3125	13454	18782	24490	26647
4	7618	5249	2765	3193	1550	2612	3363	2417	10142	14643	19668
5	4156	4660	2318	1584	1287	1039	1410	2528	1675	6121	10975
6	3322	2136	1336	1061	563	634	596	862	1606	977	4401
7	3385	1485	656	490	215	191	352	317	450	668	656
8	823	1719	362	225	91	73	100	168	154	185	412
9	190	322	342	123	40	32	32	49	66	71	137
10	70	76	13	136	47	26	19	19	23	33	53
11	61	23	27	2	22	23	17	7	2	12	21
12	28	32	0	6	0	4	18	11	0	0	8
sum	40444	31042	24259	23699	18802	34438	55090	80441	104193	94984	113447

age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	75712	120072	69091	15016	9091	7408	18308	17021	31024	27991	9427
2	31004	61200	97827	56117	12285	6982	5478	12803	11739	20206	19608
3	9676	25096	49715	79669	45619	9533	5100	3791	8941	7789	13768
4	19670	7685	19172	39722	63857	35252	6976	3526	2633	6183	5241
5	12181	11515	5600	12795	28759	45314	23370	4840	2387	1686	4187
6	6056	5376	4334	2739	8462	17996	25260	15845	3226	1443	1064
7	2063	2235	2631	2031	1500	5305	9679	16547	10334	2053	882
8	312	623	726	1674	1292	893	3056	6291	10397	5942	1102
9	220	130	317	382	1289	721	442	2000	3849	5286	2811
10	77	85	63	233	285	777	375	271	1263	1910	1971
11	35	36	45	35	186	110	488	234	164	600	905
12	11	20	25	19	27	104	65	332	145	63	250
sum	157018	234073	249544	210432	172654	130394	98599	83500	86101	81153	61215

age	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	8798	26314	40224	27868	49318	30603	21414	332808	4904274
2	6639	6194	18535	28335	19620	34637	21553	15077	234523
3	13710	4669	4350	13052	19934	13785	24386	15171	10622
4	9088	9556	3283	3063	9180	13967	9692	17172	10688
5	2774	4926	6855	2312	2152	6388	9783	6820	12098
6	2600	779	3110	4676	1621	1500	4494	6868	4798
7	591	1338	335	2171	3277	1134	1052	3139	4813
8	422	66	868	225	1503	2297	798	740	2205
9	509	126	8	611	149	1044	1609	555	520
10	1182	152	24	5	429	99	723	1111	387
11	707	348	33	16	2	302	66	481	778
12	392	174	140	21	10	2	212	29	336
sum	47412	54642	77566	82356	107194	105758	95782	399972	5186042

Table 19. Population biomass (tonnes) at age of Div. 4TVW haddock from the SPA.

age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1	476	267	626	407	314	1940	3211	1657	3280	575	2265
2	1306	1161	613	1168	1310	650	3921	4253	6561	5097	1657
3	3941	2016	1880	1103	2092	2692	1122	6798	9221	11461	11685
4	6539	4129	2193	2433	1310	2396	3262	1930	9254	11728	15406
5	5582	5266	2543	1859	1715	1395	1868	3494	2199	7401	12437
6	5771	3205	2089	1694	960	1159	1061	1460	2987	1677	6945
7	6827	2700	1246	964	429	419	804	675	1017	1467	1426
8	2523	3997	698	561	199	167	251	449	333	516	1112
9	730	797	800	353	97	77	90	109	150	132	365
10	313	189	35	404	168	67	40	61	44	85	101
11	346	60	54	6	77	57	53	20	6	29	58
12	76	86	0	11	0	12	51	26	0	0	18
3+	32648	22445	11538	9388	7047	8441	8602	15022	25211	34496	49553
5+	22168	16300	7465	5852	3643	3353	4217	6294	6734	11307	22463

age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	2971	5159	2474	525	427	458	1164	881	2014	1061	624
2	4800	8469	9818	7000	1967	1269	1024	2331	2153	2750	3795
3	3198	11106	16691	21339	14463	3841	2034	1407	3750	2935	4550
4	15088	5249	13122	21514	33307	17470	4021	1952	1514	3411	2648
5	13676	12038	5531	10834	20054	30806	15041	3227	1659	1332	2596
6	9055	7623	5419	3348	8318	14409	19735	12011	2601	1184	839
7	4172	4053	4304	3152	1904	5375	8758	15234	8916	1978	788
8	766	1471	1448	3333	1958	1124	3262	5928	10903	5814	1083
9	643	393	821	893	2346	1016	638	2353	3827	5765	2861
10	214	233	182	660	644	1257	587	359	1607	2037	2124
11	70	89	103	107	444	212	895	423	215	694	1019
12	21	38	60	36	74	188	101	634	248	99	281
3+	46903	42293	47681	65216	83512	75698	55072	43528	35240	25249	18789
5+	28618	25936	17867	22364	35741	54388	49018	40169	29977	18902	11592

age	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	456	1642	3901	2533	3277	2033	1486	13489	478570
2	1281	1140	3323	5093	3171	4925	3628	1961	39783
3	5239	1947	1479	3998	6490	4038	6708	4907	3212
4	4249	4842	1641	1287	3960	6413	3888	7090	4890
5	1688	2726	4006	1297	1181	3441	5278	3570	6278
6	1896	528	1911	3090	1063	968	2908	4402	3044
7	466	1078	240	1510	2482	825	763	2189	3664
8	426	50	778	189	1192	1839	560	634	1755
9	521	124	6	580	136	895	1443	425	454
10	1224	161	24	5	368	88	693	1090	352
11	766	348	32	16	3	277	65	490	790
12	464	192	142	22	10	2	247	28	348
3+	16939	11996	10259	11994	16885	18786	22553	24825	24787
5+	7453	5208	7139	6709	6434	8336	11956	12828	16686

Table 20. Population biomass (tonnes) at age of Div. 4TVW haddock from the SPA. The shaded part of the matrix highlights cells with haddock greater than 42 cm.

age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1	476	267	626	407	314	1940	3211	1657	3280	575	2265
2	1306	1161	613	1168	1310	650	3921	4253	6561	5097	1657
3	3941	2016	1880	1103	2092	2692	1122	6798	9221	11461	11685
4	6539	4129	2193	2433	1310	2396	3262	1930	9254	11728	15406
5	5582	5266	2543	1859	1715	1395	1868	3494	2199	7401	12437
6	5771	3205	2089	1694	960	1159	1061	1460	2987	1677	6945
7	6827	2700	1246	964	429	419	804	675	1017	1467	1426
8	2523	3997	698	561	199	167	251	449	333	516	1112
9	730	797	800	353	97	77	90	109	150	132	365
10	313	189	35	404	168	67	40	61	44	85	101
11	346	60	54	6	77	57	53	20	6	29	58
12	76	86	0	11	0	12	51	26	0	0	18
42cm +	28707	20429	9658	8285	4955	8441	7480	8224	15990	23035	37868

age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	2971	5159	2474	525	427	458	1164	881	2014	1061	624
2	4800	8469	9818	7000	1967	1269	1024	2331	2153	2750	3795
3	3198	11106	16691	21339	14463	3841	2034	1407	3750	2935	4550
4	15088	5249	13122	21514	33307	17470	4021	1952	1514	3411	2648
5	13676	12038	5531	10834	20054	30806	15041	3227	1659	1332	2596
6	9055	7623	5419	3348	8318	14409	19735	12011	2601	1184	839
7	4172	4053	4304	3152	1904	5375	8758	15234	8916	1978	788
8	766	1471	1448	3333	1958	1124	3262	5928	10903	5814	1083
9	643	393	821	893	2346	1016	638	2353	3827	5765	2861
10	214	233	182	660	644	1257	587	359	1607	2037	2124
11	70	89	103	107	444	212	895	423	215	694	1019
12	21	38	60	36	74	188	101	634	248	99	281
42 cm+	43705	31187	30990	22363	35742	23581	33976	36942	29976	18903	8995

age	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	456	1642	3901	2533	3277	2033	1486	13489	478570
2	1281	1140	3323	5093	3171	4925	3628	1961	39783
3	5239	1947	1479	3998	6490	4038	6708	4907	3212
4	4249	4842	1641	1287	3960	6413	3888	7090	4890
5	1688	2726	4006	1297	1181	3441	5278	3570	6278
6	1896	528	1911	3090	1063	968	2908	4402	3044
7	466	1078	240	1510	2482	825	763	2189	3664
8	426	50	778	189	1192	1839	560	634	1755
9	521	124	6	580	136	895	1443	425	454
10	1224	161	24	5	368	88	693	1090	352
11	766	348	32	16	3	277	65	490	790
12	464	192	142	22	10	2	247	28	348
42cm +	5763	1953	1222	2322	4191	3926	3771	4856	7363

Table 21. Fishing mortality at age of Div. 4TVW haddock from the SPA.

age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1	0.04	0.07	0.04	0.07	0.01	0.01	0.02	0.01	0.02	0.00	0.01
2	0.03	0.12	0.10	0.22	0.04	0.02	0.04	0.01	0.02	0.01	0.03
3	0.11	0.26	0.17	0.32	0.29	0.12	0.06	0.08	0.05	0.02	0.10
4	0.29	0.62	0.36	0.71	0.20	0.42	0.09	0.17	0.30	0.09	0.28
5	0.47	1.05	0.58	0.83	0.51	0.36	0.29	0.25	0.34	0.13	0.39
6	0.61	0.98	0.80	1.40	0.88	0.39	0.43	0.45	0.68	0.20	0.56
7	0.48	1.21	0.87	1.48	0.88	0.45	0.54	0.52	0.69	0.28	0.54
8	0.74	1.41	0.88	1.52	0.84	0.61	0.51	0.74	0.58	0.10	0.43
9	0.72	3.04	0.72	0.77	0.25	0.32	0.32	0.56	0.49	0.08	0.38
10	0.91	0.83	1.54	1.62	0.52	0.19	0.86	1.96	0.49	0.23	0.21
11	0.43	5.25	1.32	2.90	1.63	0.05	0.21	3.99	2.90	0.21	0.45
12	0.79	1.76	1.05	1.31	0.54	0.37	0.56	1.09	0.52	0.14	0.34
avg 5-7	0.52	1.08	0.75	1.24	0.76	0.40	0.42	0.41	0.57	0.20	0.50

age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.02	0.08	0.01	0.00
2	0.01	0.01	0.01	0.01	0.00	0.01	0.02	0.01	0.06	0.03	0.01
3	0.03	0.07	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.05	0.07
4	0.34	0.12	0.20	0.12	0.09	0.11	0.02	0.04	0.10	0.04	0.29
5	0.62	0.78	0.52	0.21	0.22	0.28	0.04	0.06	0.15	0.11	0.13
6	0.80	0.51	0.56	0.40	0.22	0.32	0.07	0.08	0.10	0.14	0.24
7	1.00	0.92	0.25	0.25	0.27	0.25	0.08	0.11	0.20	0.27	0.39
8	0.68	0.48	0.44	0.06	0.33	0.40	0.07	0.14	0.33	0.40	0.42
9	0.75	0.53	0.11	0.09	0.26	0.35	0.14	0.11	0.35	0.64	0.52
10	0.57	0.45	0.38	0.02	0.70	0.17	0.12	0.15	0.39	0.40	0.67
11	0.37	0.17	0.64	0.07	0.34	0.22	0.04	0.13	0.61	0.53	0.49
12	0.66	0.48	0.31	0.06	0.43	0.31	0.11	0.13	0.36	0.48	0.54
avg 5-7	0.81	0.74	0.44	0.29	0.24	0.28	0.06	0.08	0.15	0.17	0.25

age	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
4	0.26	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00
5	0.92	0.11	0.00	0.01	0.01	0.00	0.00	0.00	0.00
6	0.31	0.50	0.01	0.01	0.01	0.00	0.01	0.01	0.00
7	1.85	0.08	0.05	0.02	0.01	0.00	0.00	0.00	0.01
8	0.86	1.82	0.00	0.06	0.01	0.01	0.01	0.00	0.00
9	0.86	1.31	0.02	0.00	0.06	0.02	0.02	0.01	0.00
10	0.87	1.17	0.04	0.41	0.00	0.06	0.06	0.01	0.01
11	1.05	0.56	0.10	0.19	0.04	0.01	0.47	0.01	0.01
12	0.86	1.43	0.02	0.16	0.02	0.03	0.03	0.01	0.01
avg 5-7	1.027	0.230	0.020	0.013	0.010	0.000	0.003	0.003	0.003

Table 22. Proportion of Div. 4VW haddock mature at age. Note: Values for 1970-1978 were based on the average from 1979-1984.

age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.09	0.00
3	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.62	0.28
4	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.92	0.89
5	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.92
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.06	0.01	0.00	0.01	0.01	0.01	0.07	0.00	0.00	0.03	0.01
3	0.19	0.21	0.11	0.12	0.14	0.14	0.70	0.22	0.25	0.24	0.24
4	0.64	0.52	0.64	0.73	0.66	0.66	0.79	0.92	0.94	0.48	0.78
5	0.95	0.95	0.90	0.98	0.95	0.95	0.99	1.00	1.00	0.86	0.95
6	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.91	1.00	0.97
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

age	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.01	0.21	0.13	0.00	0.04	0.07	0.06	0.13
3	0.24	0.24	0.35	0.49	0.41	0.67	0.56	0.66	0.38
4	0.78	0.78	0.92	0.94	0.77	0.89	0.87	0.85	0.83
5	0.95	1.00	1.00	1.00	0.75	0.95	0.94	0.93	0.92
6	0.97	0.88	1.00	1.00	1.00	0.95	0.97	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00

Table 23. Rationale table of indicators, their limits, characteristics and weighting factors that went into the table lights for Div. 4TVW haddock.

Indicator	Green	Red	Characteristic& Weighting
Summer RV #/tow (26-41cm)	40 – Top four estimates observed; all preceded by strong year-classes	7 – Lowest observed (1970-76)	Abundance/1.0
Summer RV #/tow (42cm+)	20 – Top three estimates when stock at peak levels during 1980s	7 – Low values that coincide with periods of collapse	Abundance/1.0
Sentinel (kg/set)	35 – Never observed in survey; considered good catch rate	10 – Near to lowest catch rates recorded in past few years	Abundance/1.0
Area occupied(30cm+)	0.6 – Contains top four observations when stock widely distributed in 1980s	0.3 – Encompasses two observations during the early 1970s	Abundance/1.0
Density(30cm+)	3.3 – Contains two highest observations; may be unresponsive indicator	2.4 – Contains estimates associated with 1970-1976	Abundance/1.0
Summer RV #/tow (1-25 cm)	21 -- Contains early 1980's and recent peaks	3 -- Contains lowest observed values in 1970's, 1980's and 1990's	Production/1.0
SPA SSB	50000 – Based on historical series and similarity of mid-1980s SSB to that earlier period	12000 – Captures both mid-1970s and mid-1990s minimum	Abundance/1.0
Area occupied (1-29cm)	0.45 – Captures strong year-classes in early 1980s and recent ones with wide distribution	0.2 – Associated with three lowest values and lowest R estimates	Production/1.0
Density (1-29cm)	2.8 – Contains early 1980s and late 1990s observations	1.2 – Among lowest observed	Production/1.0
SPA Recruitment	50000 – Based on historical series; captures early 1980s and recent strong year-classes	10000 – Among lowest observed	Production/1.0
Summer RV Condition	945 – Contains several observations during 1970s/early 1980s when stock recovered rapidly	860 – Contains one observation	Production/1.0
Summer RV growth age7(length)	60 – Largest body sizes observed during 1970s/early 1980s	45 – Contains most of the data from early 1990s onward	Production/1.0
Spring RV 50% maturity	39.5 – Larger sizes associated with higher fecundity and better egg quality	30 – Small sizes associated with low fecundity and poor egg quality	Production/1.0
Spring RV condition	900 – Among highest observed	808 – Among lowest observed	Production/1.0
Misaine Temperature	0.25 – Captures high values in the late 1970s/early 1980s when condition and size at age were high	-0.25 – Associated with mid-1980s/mid-1990s when capelin and other cold-water sp. flourished	Environment/1.0
Exploitation (%) (ages 5-10)	20 – F0.1 reference level	40 – Twice F0.1 reference level	Fishing Mortality/1.0