

Summary of the Catch and Catch-at-age Data for Harp Seals in the Northwest Atlantic, 1946–94

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Abstract

Information on catch levels and on the age structure (catch-at-age) of the harp seal (*Phoca groenlandica*) hunt in the Northwest Atlantic is necessary for responsible management. This report summarizes harp seal catch and catch-at-age statistics from 1946–94. Most harp seals are hunted in Labrador and the Northeast coast of Newfoundland ('the Front'); the Gulf of St. Lawrence ('the Gulf'); West Greenland (NAFO Divisions 1A–1F); and the Eastern Canadian Arctic (in the vicinity of Baffin Island). Catches and catch-at-age data are reported here for these areas.

Key words: Catch, harp seals, Newfoundland area, statistics

Introduction

Information on catch levels and on the age structure (catch-at-age) of the harp seal (*Phoca groenlandica*) hunt in the Northwest Atlantic is necessary if a responsible management plan is to be developed for this growing population. This report summarizes harp seal catch and catch-at-age statistics from 1946–94. Although data presented here can be considered as reconciled statistics from the Canadian Department of Fisheries and Oceans (DFO), it is likely to be subject to minor changes as the verification process conducted by DFO, the sealing industry, and NAFO continues. This is particularly true for the period 1990–94. In addition, data from 1946–52 are generally thought to be incomplete and should only be considered rough estimates.

Data and Discussions

Harp Seal Catches

Most harp seals are hunted in the following regions of the Northwest Atlantic (Fig. 1, Anon., 1986): Labrador and the Northeast coast of Newfoundland ('the Front' – NAFO Divisions 2GH and 3KL); the Gulf of St. Lawrence ('the Gulf' – NAFO Divisions 4S, T, Vn); West Greenland (NAFO Divisions 1A–F); and the Eastern Canadian Arctic (in the vicinity of Baffin Island). Catches reported for these areas are summarized in Table 1; additional details on catches for the Front and Gulf Regions are presented in Table 2.

Catches at the Front and in the Gulf for the years 1946–78 were compiled from values reported in the Statistical Bulletin of the International Commission

for Northwest Atlantic Fisheries (ICNAF, 1970–77 and subsequent corrections were noted from the Statistical Bulletins (ICNAF 1985a, b). Catches for the years 1979–89 were compiled from values reported in the Statistical Bulletin of the Northwest Atlantic Fisheries Organization (NAFO, 1984–94). Catches at the Front and in the Gulf for the years 1989–94 were provided by DFO Statistics Branch, Ottawa, and R. Simon (pers. comm., DFO Area Manager, Magdalen Islands, PQ, Canada) provided values for Quebec and Maritimes regions of Canada.

West Greenland catches for the years 1954 to 1987 were provided by F. Kapel (pers. comm., Greenland Fisheries Research Institute, Denmark). There are no new Greenland catch statistics for the years 1988 through to the present, so the old information was carried forward (Table 1).

Canadian Arctic harp seal catches have not been well documented. The only available values are those reported by Bowen (1982) and Roff and Bowen (1983; 1986) for the years up to and including 1982. These were based on an estimated annual average catch of 1 768 seals during 1962–71 (Smith and Taylor, 1977), estimates were provided for 1974–77 by Sergeant (pers. comm., DFO Ste Anne de Bellevue, PQ, Canada) and for 1978–82 by Goodman (pers. comm., DFO Science Branch, Ottawa, Ontario, Canada). Given that there are no new Arctic catch statistics available, the 1982 estimates are still being used (Table 1).

Age Composition of Catches

Determining the age composition of the various harp seal catches is difficult (Bowen *et al.*, 1983),

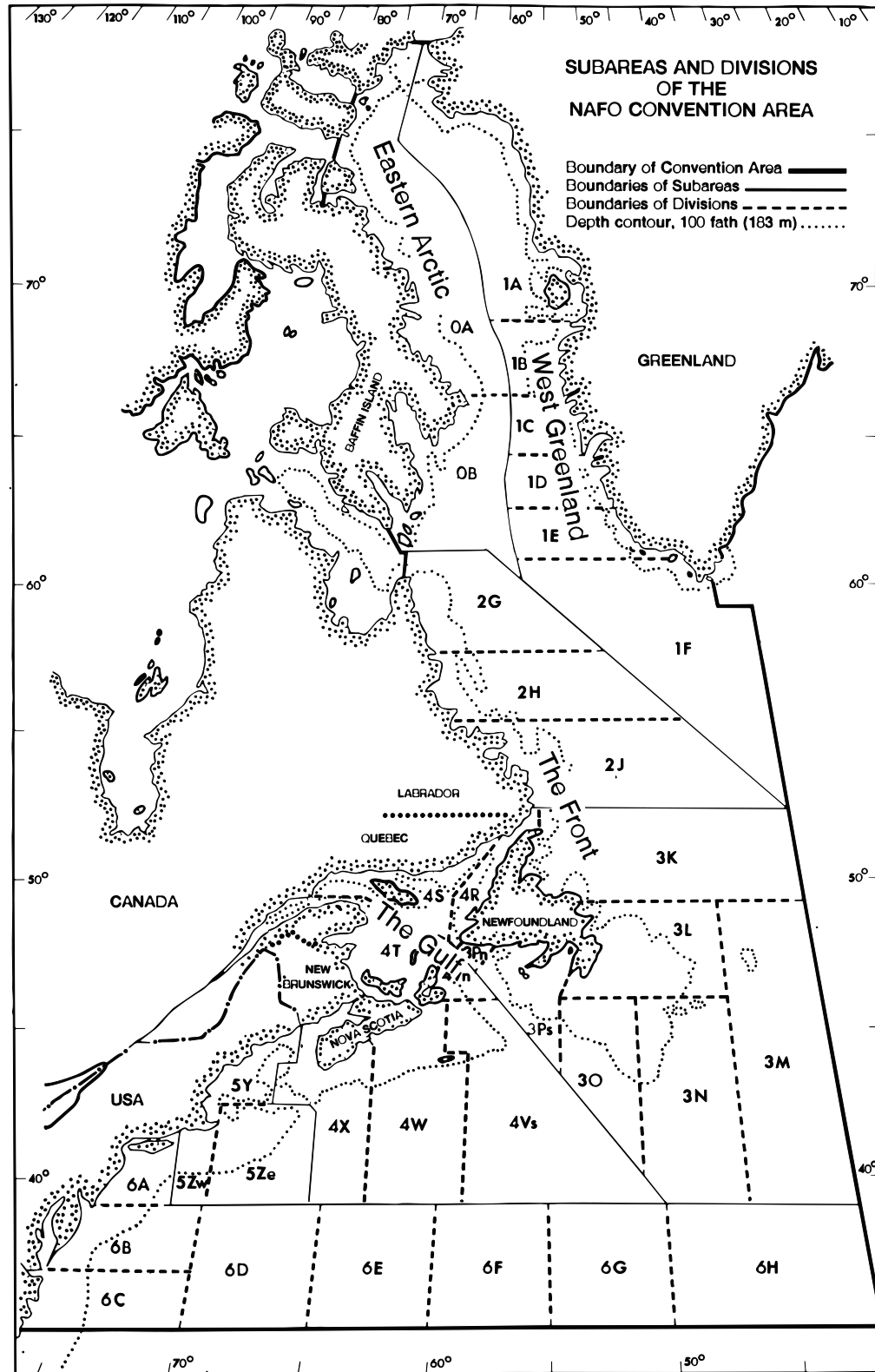


Fig. 1. Map showing Subareas and Divisions of the NAFO Convention Area and seal fishing grounds.

TABLE 1. Summary of harp seal catches in the Northwest Atlantic, 1952–94.

Year	Front and Gulf ¹		Canadian Arctic ²		West Greenland ³		Northwest Atlantic TOTALS		TOTAL
	0	1+	0	1+	0	1+	0	1+	
1952	198 063	109 045	61	1 739	9 676	6 724	207 800	117 508	325 308
1953	197 975	74 911	61	1 739	9 676	6 724	207 712	83 374	291 086
1954	175 034	89 382	61	1 739	11 158	7 754	186 253	98 875	285 128
1955	252 297	81 072	61	1 739	9 113	6 332	261 471	89 143	350 614
1956	341 397	48 013	61	1 739	6 421	4 462	347 879	54 214	402 093
1957	165 498	80 042	61	1 739	7 562	5 255	173 121	87 036	260 157
1958	140 996	156 790	61	1 739	9 859	6 849	150 916	165 378	316 294
1959	238 832	81 302	61	1 739	5 219	3 625	244 112	86 666	330 778
1960	156 168	121 182	61	1 739	9 430	6 554	165 659	129 475	295 134
1961	168 819	19 047	61	1 739	7 013	4 874	175 893	25 660	201 553
1962	207 088	112 901	61	1 739	4 946	3 438	212 095	118 078	330 173
1963	270 419	71 623	61	1 739	5 803	4 200	276 283	77 562	353 845
1964	266 382	75 281	61	1 739	5 302	3 838	271 745	80 858	352 603
1965	182 758	51 495	61	1 739	5 365	3 886	188 184	57 120	245 304
1966	251 735	72 004	61	1 739	4 078	2 951	255 874	76 694	332 568
1967	277 750	56 606	61	1 739	2 446	1 769	280 257	60 114	340 371
1968	156 458	36 238	61	1 739	4 076	2 950	160 595	40 927	201 522
1969	233 340	55 472	61	1 739	3 702	2 681	237 103	59 892	296 995
1970	217 431	40 064	61	1 739	3 583	2 595	221 075	44 398	265 473
1971	210 579	20 386	61	1 739	2 214	2 326	212 854	24 451	237 305
1972	116 810	13 073	61	1 739	3 392	2 500	120 263	17 312	137 575
1973	98 335	25 497	61	1 739	5 039	4 124	103 435	31 360	134 795
1974	114 825	32 810	61	1 739	4 527	2 546	119 413	37 095	156 508
1975	140 638	33 725	61	1 739	3 750	2 203	144 449	37 667	182 116
1976	132 085	32 917	61	1 739	4 828	2 959	136 974	37 615	174 589
1977	126 982	28 161	61	1 739	7 850	2 088	134 893	31 988	166 881
1978	116 190	45 533	72	2 057	4 796	5 744	121 058	53 334	174 392
1979	132 458	28 083	128	3 492	6 614	6 160	139 200	37 735	176 935
1980	132 421	37 105	215	6 135	3 546	8 724	136 182	51 964	188 146
1981	178 394	23 775	158	4 514	6 041	7 564	184 593	35 853	220 446
1982	145 274	23 120	166	4 715	7 656	9 588	153 096	37 423	190 519
1983	50 058	7 831	166	4 715	8 320	10 419	58 544	22 965	81 509
1984	23 840	7 077	166	4 715	7 844	9 823	31 850	21 615	53 465
1985	13 334	5 701	166	4 715	8 190	10 255	21 690	20 671	42 361
1986	21 888	4 046	166	4 715	6 186	7 746	28 240	16 507	44 747
1987	33 657	10 378	166	4 715	7 128	8 925	40 951	24 018	64 969
1988	66 950	27 096	166	4 715	7 128	8 925	74 244	40 736	114 980
1989	53 879	11 195	166	4 715	7 128	8 925	54 173	24 835	87 955
1990	33 188	25 034	166	4 715	7 128	8 925	40 482	38 674	79 156
1991	42 379	10 186	166	4 715	7 128	8 925	49 673	23 826	73 499
1992	43 861	24 748	166	4 715	7 128	8 925	51 155	38 388	89 543
1993	16 401	10 602	166	4 715	7 128	8 925	23 695	24 242	47 937
1994	25 223	36 131	166	4 715	7 128	8 925	32 517	49 771	82 288

¹ Summarized from Table 2.² See text for sources and explanation of values.³ Catch values for 1954–87 provided by F. Kapel (pers. comm.).

because over the years the size of the hunt, the type of hunt (large vessel, landsmen etc.) and the harvesting methods (shot, netted etc.) have changed significantly. Also, due to the limited commercial hunts in recent years, appropriate biological samples have been more difficult to obtain.

Front and Gulf Regions: In 1984, a seal collection program was initiated by Canadian DFO

personnel in Labrador, Newfoundland (the Front) and in Gulf Region to obtain the necessary samples to estimate the age structure of the catch in each area. The program is on-going and involves fishermen, professional sealers and DFO personnel. The proportion of 1+ (animals 1 year of age and older) in each age class was obtained from the catches taken by these collectors and then applied to the total harp seal catches for that year (Table 3). Catches of 0 age-class seals were taken directly

TABLE 2. Annual harp seal catches by large vessels and landmen in the Front and Gulf regions, 1946–94¹ (includes research catches).

Year	Large Vessel Catch				Landmen Catch ²				Total Catches			
	0	1+	UNK	Total	0	1+	UNK	Total	0	1+	UNK	Total
1946	36 161	17 709	0	53 870	36 839	11 853	0	48 692	73 000	29 562	0	102 562
1947	67 513	64 446	0	131 959	34 781	9 769	0	44 550	102 294	74 215	0	176 509
1948	88 052	83 670	0	171 722	48 617	10 675	0	59 292	136 669	94 345	0	231 014
1949	167 469	55 324	0	222 793	59 702	14 216	0	73 918	227 171	69 540	0	296 711
1950	182 086	47 664	0	229 750	43 683	9 649	0	53 332	225 769	57 313	0	283 082
1951	247 956	113 083	0	361 039	70 670	23 876	0	94 546	318 626	136 959	0	455 585
1952	172 185	98 378	0	270 563	25 878	10 667	0	36 545	198 063	109 045	0	307 108
1953	147 090	66 811	0	213 901	50 885	8 100	0	58 985	197 975	74 911	0	272 886
1954	125 353	83 939	0	209 292	49 681	5 443	0	55 124	175 034	89 382	0	264 416
1955	231 700	75 671	0	307 371	20 597	5 401	0	25 998	252 297	81 072	0	333 369 ³
1956	299 745	42 585	0	342 330	41 652	5 428	0	47 080	341 397	48 013	0	389 410
1957	137 721	76 437	0	214 158	27 777	3 605	0	31 382	165 498	80 042	0	245 540
1958	80 430	137 227	0	217 657	60 566	19 563	0	80 129	140 996	156 790	0	297 786
1959	227 212	77 304	0	304 516	11 620	3 998	0	15 618	238 832	81 302	0	320 134
1960	131 649	114 534	0	246 183	24 519	6 648	0	31 167	156 168	121 182	0	277 350
1961	154 286	13 170	0	167 456	14 533	5 877	0	20 410	168 819	19 047	0	187 866
1962	164 625	99 513	0	264 138	42 463	13 388	0	55 851	207 088	112 901	0	319 989
1963	207 818	57 094	0	264 912	62 601	14 529	0	77 130	270 419	71 623	0	342 042
1964	210 089	60 348	0	270 437	56 293	14 933	0	71 226	266 382	75 281	0	341 663
1965	121 398	33 757	0	155 155	61 360	17 738	0	79 098	182 758	51 495	0	234 253
1966	209 145	59 364	0	268 509	42 590	12 640	0	55 230	251 735	72 004	0	323 739
1967	252 837	41 361	0	294 198	24 913	15 245	0	40 158	277 750	56 606	0	334 356
1968	125 236	30 328	0	155 564	31 222	5 910	0	37 132	156 458	36 238	0	192 696
1969	202 685	44 940	0	247 625	30 655	10 532	0	41 187	233 340	55 472	0	288 812
1970	184 192	26 225	0	210 417	33 239	13 839	0	47 078	217 431	40 064	0	257 495
1971	169 426	14 343	0	183 769	41 153	6 044	0	47 197	210 579	20 387	0	230 966
1972	104 109	1 646	0	105 755	12 701	11 427	0	24 128	116 810	13 073	0	129 883
1973	63 369	15 081	0	78 450	34 966	10 416	0	45 382	98 335	25 497	0	123 832
1974	85 387	21 828	0	107 215	29 438	10 982	0	40 420	114 825	32 810	0	147 635
1975	109 832	10 992	0	120 824	30 806	22 733	0	53 539	140 638	33 725	0	174 363
1976	93 939	4 576	0	98 515	38 146	28 341	0	66 487	132 085	32 917	0	165 002
1977	92 904	2 048	0	94 952	34 078	26 113	0	60 191	126 982	28 161	0	155 143
1978	63 669	3 523	0	67 192	52 521	42 010	0	94 531	116 190	45 533	0	161 723
1979	96 926	449	0	97 375	35 532	27 634	0	63 166	132 458	28 083	0	160 541
1980	91 577	1 563	0	93 140	40 844	35 542	0	76 386	132 421	37 105	0	169 526
1981 ⁴	89 049	1 211	0	90 260	89 345	22 564	0	111 909	178 394	23 775	0	202 169
1982	100 568	1 655	0	102 223	44 706	19 810	0	64 516	145 274	21 465	0	166 739
1983	9 529	1 021	0	10 550	40 529	6 810	0	47 339	50 058	7 831	0	57 889
1984 ⁵	95	549	0	644	23 745	6 528	0	30 273	23 840	7 077	0	30 917
1985 ⁵	0	1	0	1	13 334	5 700	0	19 034	13 334	5 701	0	19 035
1986	0	0	0	0	21 888	4 046	0	25 934	21 888	4 046	0	25 934
1987 ⁶	2 671	90	2	2 763	30 986	10 266	20	41 272	33 657	10 356	22	44 035
1988 ⁶	0	0	0	0	66 950	13 493	13 603	94 046	66 950	13 493	13 603	94 046
1989 ⁶	0	0	0	0	53 879	5 504	5 691	65 074	53 879	5 504	5 691	65 074
1990 ⁵	48	44	0	92	33 144	22 087	2 903	58 134	33 188	22 131	2 903	58 222
1991	0	0	0	0	42 379	10 186	0	52 565	42 379	10 186	0	52 565
1992 ⁵	94	792	0	886	43 767	23 956	0	67 723	43 861	24 748	0	68 609
1993 ⁵	8	111	0	119	16 393	10 491	0	26 884	16 401	10 602	0	27 003
1994 ⁵	43	127	0	170	25 180	36 004	0	61 184	25 223	36 131	0	61 354

¹ All values are from ICNAF, NAFO or DFO Statistics except where noted.² Landmen values include catches by small vessels (<150 gr tons) and aircraft.³ Addition error in NAFO Statistical Bulletin corrected.⁴ NAFO values revised to include complete Quebec catch (Bowen, 1982).⁵ Large vessel catches represent research catches and may differ from NAFO values.⁶ Total catch may differ from NAFO value. Maritime and Quebec catches from R. Simon (pers. comm.).

TABLE 3. Age frequencies of harp seal catches in the Gulf and Front regions, 1986–92.

Age	Year						
	1986	1987	1988	1989	1990	1991	1992
0	21 888	33 657	66 950	53 879	33 188	42 379	43 861
1	1 069	1 497	6 533	2 570	4 716	1 816	6 574
2	891	1 376	6 839	2 366	3 189	632	4 362
3	875	1 695	3 815	1 703	3 467	1 066	2 350
4	398	1 365	2 631	1 298	3 259	1 658	2 304
5	165	638	1 404	981	2 982	1 461	1 724
6	130	550	1 227	606	1 387	789	1 578
7	67	440	439	115	694	276	1 183
8	48	297	482	58	138	158	525
9	48	308	306	58	416	158	805
10	29	176	87	86	278	158	373
11	29	220	87	86	623	316	305
12	29	99	133	86	486	276	161
13	16	121	263	86	556	276	151
14	29	110	176	29	208	118	155
15	16	154	220	86	416	198	82
16	12	121	263	86	138	40	297
17	6	121	176	29	278	118	359
18	22	77	263	145	208	118	218
19	16	67	350	29	0	80	433
20	22	132	350	86	348	40	74
21	25	77	87	58	0	0	73
22	12	22	43	202	138	79	6
23	16	88	87	86	208	0	143
24	16	88	220	86	0	79	74
25+	60	539	615	174	901	276	439
TOTAL	25 934	44 035	94 046	65 074	58 222	52 565	67 723

from the DFO Statistics Branch database. Only animals collected by land-based sealers during normal hunting effort were included in this summary, while the age structure of animals caught as by-catch in fishing gear were not. Seals taken for research samples by DFO personnel from large vessels were also included in this summary.

Any seals listed as unknown age since the late-1980s were primarily from the Quebec North Shore. In previous catch statistics they were included in the age 1+ catch because they were composed of less than 5% young of the year (R. Simon, pers. comm., DFO Area Manager, Magdalen Islands, PQ, Canada). The animals of unknown age have been included in the age 1+ catch when calculating age frequencies.

Catch-at-age values for 1952–84 are given in Bowen (1982) and Roff and Bowen (1986). These were used with the exception of 1979, 1980, 1982 and 1984 in which the total catch statistics have

been revised. For these years the proportions at age provided by Bowen (1982) and Roff and Bowen (1986) have been applied to the revised total catches.

West Greenland: Age frequencies of harp seals caught in West Greenland during 1984–94 are given in Table 4. A weighted average was calculated for each age class, based on catch-at-age frequencies reported for 1978–80 in Roff and Bowen (1986), and applied to the total catch statistics for the years 1984 to 1994, inclusive. Catch-at-age for previous years are given by Bowen (1982) and Roff and Bowen (1986). Because there has been no new catch data since 1987, the information from that year was carried forward to 1994.

Canadian Arctic: As there are no recent reports of Arctic harp seal catch-at-age frequencies, we assumed that recent catches have remained at the proportions reported by Roff and Bowen (1986) (Table 5).

TABLE 4. Estimated age frequencies of harp seal catches in West Greenland, 1984–94.

Age	Year			
	1984	1985	1986	1987–94
0	7 844	8 190	6 186	7 128
1	4 258	4 445	3 358	3 869
2	2 403	2 509	1 895	2 183
3	1 131	1 180	891	1 028
4	477	498	376	433
5	300	314	237	273
6	247	258	195	225
7	124	129	98	112
8	124	129	98	112
9	106	111	83	96
10+	653	682	515	594
TOTAL	17 667	18 445	13 932	16 053

TABLE 5. Estimated age frequencies of harp seal catches in the Canadian Arctic, 1984–94 (based on a total catch of 4 881).

Year	Age												
	0	1	2	3	4	5	6	7	8	9	10	11	12
1984 to 1994	166	320	580	646	436	260	237	254	182	132	215	149	155

Table of age frequencies (Continued).

Year	Age												
	13	14	15	16	17	18	19	20	21	22	23	24	25+
1984 to 1994	94	110	199	94	105	77	83	127	61	50	44	50	55

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