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Factors influencing changes in origin, numbers, and distribution of non-resident, waterfowl hunters in Canada

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Introduction

In 1978, I made a study of the distribution, activity, and kill by United States hunters seeking migratory game birds in Canada (Cooch 1978), basing it on a single year of data and excluding other hunters. The present study attempts to document the factors influencing the origin, numbers, and distribution of all non-resident hunters in Canada, regardless of citizenship.

Non-resident hunters are those hunting in provinces other than their province or state of residence. From 1966, when records first became available, to the present, they made up about 7 to 9% of all persons hunting in Canada. In the period 1972–80, the proportions of US and Canadian hunters in this mobile group were roughly equal. Although in 1972, the first year of such records, Canadians non-resident of a province — called here out-of-province (OP) hunters — made up the larger proportion, they began to decline in 1977, and now OP hunters are outnumbered by US hunters in Canada.

While the numbers of active hunters in both citizenship categories are similar, their distribution within Canada and their principal quarry species are not. As a general rule, US hunters take a higher proportion of geese than OP hunters do. Also, OP hunters in some situations respond more to changes in regulations and, apparently, increases in the costs of travel.

Mobile hunters now represent at most 9% of active hunters in Canada, but take an average 15% of the geese and 11% of the ducks annually. In some localities, they can account for 75% of the active hunters, and 85% of the geese and 80% of the ducks killed. Because much of their hunting is concentrated, their impact on local stocks of geese and ducks may be considerable. Being mobile, this group of hunters responds relatively quickly to changes (real or imaginary) in regulations and the distribution and size of waterfowl populations. This paper documents changes in hunting activity by non-residents of a province (OP and US hunters) and some factors influencing those changes.

Results

Sales of the Canada migratory game bird hunting permit (MGBHP) and returns from the National Harvest Survey (NHS) together offer a means of determining both where hunters come from and where they do most of their hunting in Canada (Cooch *et al.* 1978). A modification to the NHS sampling scheme made in 1976 has given us a means of measuring activity by US hunters within a provincial zone or a degree block. I have computed estimates of active US hunters before 1976 from licences sold to them multiplied by a conversion factor relating sales to reported activity in the period 1976-78; i.e., sales divided by the number of active hunters in that zone of a province. Because the relationship between sales and activity was consistent in the period 1976-78, I have assumed that the error introduced by this procedure was slight.

The average distribution of sales of MGBHP for 1976–80, by province of purchase according to residency, is given in Table 1. I have also included estimates of active hunters by residency category within a province, since most Canadians purchase permits near their place of residence, regardless of where they hunt. Not surprisingly, a relatively good fit exists between permit sales to US hunters in any province and the number of them subsequently hunting in that province. An exception is Saskatchewan, since many Americans buy permits at border crossing points such as Emerson, Manitoba or Fort Frances, Ontario en route to hunting areas that include Saskatchewan. Detailed sales records for US hunters for 1966–81 are given in Table 2, and for active OP hunters for 1972–80 inclusive in Table 3. A gradual increase in US hunters reached its peak in 1976, with a gradual decline thereafter, as well as a decline in OP hunters.

On average, non-residents constitute 8.3% of all active hunters and 8.9% of all successful hunters, and take 10.4 and 15.1% respectively of all ducks and geese taken by sport hunters in Canada. Mobile hunters are not uniformly spread across Canada, but tend to gather along provincial borders or in areas of known waterfowl abundance. In an earlier paper, Cooch (1978) showed the detailed distribution of US hunters in Canada by degree blocks.

In Figures 1 and 2, I have summarized these data, along with those of OP hunters, for 1976 and 1980 by NHS sampling zone as defined in Cooch *et al.* 1978. These summaries, based on large geographical areas, do not completely capture the concentration of non-resident hunters that occurs in some favoured areas. The distribution of OP hunters generally approximates that of US hunters, but there are exceptions, particularly in (1) the Peace River district of northern Alberta, (2) along that part of the Quebec–Ontario border formed by the Ottawa River, and (3) along the Nova Scotia–New Brunswick border, where most non-resident hunters are Canadian. The areas around Kenora and Windsor, Ontario are frequented largely by US hunters. Figure 3 covers 14 reference areas accounting for more than 65% of all non-resident hunting in Canada. Table 4 shows the numbers of OP, US and resident hunters in each reference area and the changes that occurred between 1976 and 1979. (Seven detailed case studies appear later in this paper.) The decrease in activity by OP hunters in some areas may be related to increases in cost of

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Table 1
Average distribution of sales of migratory game bird hunting permits by province according to residency, 1976–80, compared with reported hunter activity (waterfowl)

Permits	Nfld.	PEI	NS	NB	Que.	Ont.	Man.	Sask.	Alta.	BC	NWT	YT	Total	% activity
OP	110	70	79	278	454	644	412	1 337	2 078	164	22	21	5 669	1.23
Active	207	331	420	376	2 422	2 052	1 391	3 825	4 509	201	14	14	15 762	3.95
US	38	23	55	278	655	8 502	3 772	4 192	1 062	266	6	12	18 461	3.76
Active	7	8	21	105	581	7 437	3 726	4 453	1 009	137	2	2	17 538	4.38
Residents	33 594	5739	14 557	13 352	69 092	142 742	42 911	53 182	73 090	27 102	791	533	476 685	95.11
Active	22 491	4824	10 840	9 152	53 223	106 892	37 088	44 246	58 334	17 554	727	501	365 872	91.67
Total	33 742	5832	14 691	13 908	70 201	151 888	47 095	58 711	76 230	27 532	819	566	501 215	
Active	22 705	5163	11 281	9 633	56 226	116 381	42 205	52 524	63 852	17 892	743	517	399 122	

Table 2
Sale of migratory game bird hunting permits to US hunters, 1966–81

Year	Nfld.	PEI	NS	NB	Que.	Ont.	Man.	Sask.	Alta.	BC	YT	NWT	Total US	Total Can.	% US
1966	23	14	60	251	625	8172	1544	2744	733	500	—	—	14 666	365 393	3.9
1967	40	15	54	251	542	8022	1591	3006	926	576	—	—	15 070	365 557	4.0
1968	49	9	67	301	680	9281	1757	3163	936	592	—	—	16 843	366 542	4.4
1969	26	13	70	289	692	9081	2170	3863	878	644	—	—	17 759	367 847	4.6
1970	44	20	89	156	907	7789	2318	3540	879	598	—	—	16 387	386 650	4.1
1971	36	11	48	252	885	7770	2665	4888	821	547	—	—	17 967	395 622	4.3
1972	56	17	43	259	1107	6893	1943	3936	634	336	—	—	15 225	406 452	3.6
1973	105	13	58	279	1239	7783	2643	2879	833	419	—	—	16 251	436 489	3.6
1974	57	15	39	300	1242	7690	2049	3393	845	276	7	2	15 915	418 247	3.7
1975	45	10	35	330	968	7957	2588	3815	1036	245	6	2	17 037	454 283	3.6
1976	52	38	66	258	639	8718	3915	4734	1148	240	9	3	19 847	464 924	4.1
1977	24	33	79	297	532	8636	3930	4292	1051	240	4	7	19 125	501 405	3.7
1978	11	26	67	210	524	8704	4119	4267	1025	284	7	21	19 265	505 681	3.7
1979	58	10	29	270	612	8498	4310	3851	1051	321	13	16	19 039	485 420	3.8
1980	30	23	33	250	485	7749	5376	3313	1050	250	4	9	18 581	480 333	3.7
1981	25	27	30	186	452	7101	5873	3199	906	230	8	7	18 094	447 258	3.9

travel and, as will be shown later, to changes in regulations.

While, nationally, the numbers of mobile American and Canadian hunters have stayed relatively constant, they have shown some marked shifts from some localities to others, but not necessarily with synchronized movements of both groups.

Changes in the total numbers of both categories of non-resident hunters and resident hunters occuring annually between 1972 and 1980 are given in Table 5, in which eastern and western Canada have been divided at the Ontario–Manitoba border. This table shows the consistency of US hunters going to eastern Canada, and their marked increase in western Canada beginning in 1976, along with the sharp decrease of OP hunters in western Canada beginning in 1977. Table 6 gives changes in numbers that have occurred between and within provinces during the period 1972–79. I have restricted the presentation to selected zones in Ontario, Manitoba, Saskatchewan, and Alberta where most non-residents are found.

Tables 5 and 6 do not show the changes in origin of non-resident hunters that have occurred in the review period. While numbers of non-residents in a zone or province often appear to be relatively constant, their states or provinces of origin have changed. The origins of US hunters coming to hunt in Canada, given in Table 7 for selected periods in 1967–79, show that while the aggregate percentage contributions by major donor states have remained relatively constant despite an increase of about 30% in total US hunters coming to Canada, two of the original major donor states (Nebraska and New York) have shown marked declines.

Whereas US hunters have generally been consistent in state of origin, marked changes have occurred among the origins of OP hunters as shown in Table 8, which gives the contributions of mobile hunters from all provinces for 1972–80.

Table 3
Province of origin of active (OP) hunters hunting in a different province, 1972–80

Province	1972	1973	1974	1975	1976	1977	1978	1979	1980
Nfld.	311	299	313	345	287	391	357	335	542
PEI	48	57	133	141	176	105	56	113	129
NS	549	561	626	729	659	600	620	725	804
NB	700	692	760	604	1 095	1 091	1 054	1 610	1 673
Que.	2 456	2 252	2 612	2 080	2 102	1 506	1 942	2 071	1 480
Ont.	4 878	4 328	4 823	4 348	4 632	2 528	2 908	3 113	3 237
Man.	833	807	1 260	1 306	1 570	1 015	834	368	355
Sask.	1 312	1 704	2 756	1 020	911	831	795	1 287	1 158
Alta.	905	916	1 654	1 897	1 774	1 110	1 439	1 381	1 275
BC	5 512	5 173	6 092	4 756	5 773	4 432	4 372	4 645	4 143
Total	17 547	16 799	20 478	17 225	18 979	13 609	14 377	15 648	14 796

Discussion

Among non-residents, US hunters are the easier to study because most hunt in the province of permit purchase. Fewer than one-third of the OP hunters purchase permits outside the province in which they reside. This study does not address the situation of Canadians hunting within their province but outside the zone where they live, or who hunt for 1 or 2 days in another province but hunt mostly close to home. Beznaczuk (1980) showed that hunters who were active in more than three degree-blocks within their province of residence had the same success and activity patterns as US and OP hunters. The NHS permits selection of only a single place where each respondent hunted most. In 1979, active non-resident hunters represented about 9% of all active hunters in Canada but, within some provinces and some zones, non-residents may represent more than 25% of the people in the field, and within some degree-blocks as much as 80%.

The two major categories of mobile US duck hunters are (1) those residing close to the border who come into zones 1 and 3 of Ontario at the rate of about 8000 per year, and who are hunting within 300 km of home, and (2) 8000 hunters whose principal quarry is geese and who travel 300 to 1500 km to prairie Canada. OP hunters also fall into two categories: (1) those who might be called "border hoppers" seeking two opening dates close to home or escaping from restrictive regulations, and (2) long-range hunters, principally from British Columbia and Ontario. The Ontario-based hunters are apparently much more sensitive to changes in costs, regulations, and expectations than are those from British Columbia. In the latter case, a return to ancestral haunts undoubtedly plays an important role. Before 1977, approximately 4000 hunters from eastern Canada indicated that they did the bulk of their hunting west of the Manitoba–Ontario border. By 1977, the number of hunters from the east had dropped to approximately 2000, and by

Table 4
Concentrations of active resident and non-resident (OP and US) hunters in 14 reference areas, and changes occurring from 1976 to 1979

Ref. areas	Year	OP	%	US	%	Res.	%
1	76	335	16.4	0	0	1 710	83.6
	79	266	15.2	4	trace	1 475	84.7
2	76	2 162	12.6	201	trace	14 841	86.3
	79	3 722	21.2	205	1.2	13 608	77.7
3	76	161	1.8	264	3.0	8 396	95.2
	79	195	2.8	340	4.9	6 396	92.3
4	76	71	trace	2 654	31.0	5 764	63.9
	79	47	trace	2 400	26.0	6 770	73.5
5	76	211	7.1	2 178	73.7	565	19.2
	79	107	3.2	1 891	57.8	1 276	39.0
6	76	692	4.8	1 550	10.7	12 257	84.5
	79	357	1.8	1 553	7.7	18 242	90.5
7	76	590	5.4	592	5.5	9 684	89.1
	79	676	6.6	1 108	10.7	8 534	82.7
8	76	44	2.7	632	38.7	958	58.6
	79	29	1.7	486	27.8	1 232	70.5
9	76	353	11.5	285	9.2	2 446	79.3
	79	76	2.3	434	12.9	2 844	84.8
10	76	679	5.9	1 337	11.6	9 474	82.5
	79	1 070	9.2	1 282	11.1	9 233	79.7
11	76	2 182	17.4	2 147	17.2	8 173	65.4
	79	836	10.7	1 248	15.9	5 758	73.4
12	76	1 075	13.0	744	9.1	6 405	77.9
	79	652	9.8	521	7.8	5 514	82.9
13	76	1 449	8.4	144	trace	15 766	90.8
	79	1 311	9.8	83	trace	11 885	89.5
14	76	946	21.5	27	trace	3 429	77.9
	79	897	18.7	65	1.3	3 801	80.2
Total	76	10 950	8.9	12 755	10.3	99 868	80.8
	79	10 241	8.7	11 620	9.8	96 568	81.4
Change	76/79	−709	6.5	−1 135	−8.9	−3 300	−3.3

1980 to 1500. At the same time, while BC-based hunters have generally pulled back from the eastern prairies, I have not detected a significant decrease in overall numbers hunting out of that province; they represent up to 18% of all BC's active hunters. This is more than twice the relative contribution from any other province or state.

Table 9 summarizes sociological and regulatory events occuring between 1972 and 1980 that may have had a bearing on the numbers and distribution of mobile hunters. Factors influencing the number of mobile hunters in a region vary and often are unrelated to potential success. It also appears that factors influencing the OP and the US mobile hunter are not necessarily identical in kind, place, or time. The same applies to the influences within those groups; i.e., what influences one group of hunters from a particular area may have no detectable bearing on another group, even if both are hunting in the same region.

To show more clearly some of the suspected factors influencing mobile hunters, I have briefly outlined and discussed them in the following seven case histories. The criteria used in selecting five of these examples are summarized in Table 10. To facilitate comparisons, I have calculated all data used in the case studies as percentages of the numbers for 1972, which are considered to equal 100%. I could not extend the study into the period before 1972 because of the imperfect sampling frame used before that date (Cooch *et al.* 1978).

Table 5
Changes in numbers of active waterfowl hunters in eastern and western Canada from 1972 to 1980 inclusive

Year	Eastern Canada				Western Canada				Canada			
	OP	US*	Res.	Total	OP	US*	Res.	Total	OP	US*	Res.	Total
1972	6329	7789	161 196	175 314	11 218	6372	143 189	160 779	17 547	14 161	304 385	336 093
%	3.6	4.4	92.0		7.0	4.0	89.0		5.2	4.2	90.6	
1973	5417	8813	180 276	194 506	11 372	6303	149 379	167 054	16 789	15 116	329 655	343 885
%	2.8	4.5	92.7		6.8	3.8	89.4		4.9	4.4	90.7	
1974	8306	8689	182 654	199 649	12 172	6115	147 580	165 867	20 478	14 804	330 234	365 516
%	4.2	4.4	91.4		7.3	3.7	89.0		5.6	4.1	90.3	
1975	6417	8690	195 458	210 565	10 811	7157	154 376	172 344	17 228	15 847	349 834	382 909
%	3.1	4.1	92.8		6.3	4.1	89.6		4.5	4.1	90.4	
1976	6276	8337	193 049	207 662	12 703	9804	162 292	184 799	18 979	18 141	355 341	392 461
%	3.0	4.0	93.0		6.9	6.0	87.1		4.8	4.6	90.6	
1977	5369	8199	219 033	232 601	8 240	9040	162 995	180 275	13 609	17 239	382 846	412 876
%	2.3	3.5	94.2		4.6	5.0	90.4		3.3	4.2	92.5	
1978	5093	7970	219 195	232 258	9 284	9287	160 729	179 300	14 377	17 257	379 924	411 558
%	2.2	3.4	94.4		5.2	5.2	89.6		3.5	4.2	92.3	
1979	6319	7987	201 342	215 648	9 329	9057	151 749	170 135	15 648	17 044	353 091	385 783
%	2.9	3.7	93.4		5.5	5.3	89.2		4.1	4.4	91.1	
1980	6580	7461	201 707	215 928	8 216	9757	151 401	169 374	14 796	17 218	353 108	385 302
%	3.1	3.5	93.4		4.7	5.8	89.4		3.8	4.5	91.6	
1972–80 Mean	6234	8215	196 149	210 598	10 372	8099	153 743	172 214	16 610	16 314	349 892	382 812
%	3.0	3.9	93.1		6.0	4.7	89.3		4.3	4.3	91.4	

*Computed 1972-75 because of lack of special sample.

Table 6
Distribution of active non-resident hunters in selected zones, 1972–80 inclusive

	Ontario				Manitoba				Saskatchewan						Alberta			
Zone	01		03		01		02		01		02		03		01		02	
Year	OP	US	OP	US	OP	US	OP	US	OP	US	OP	US	OP	US	OP	US	OP	US
1972	666	1533	374	2248	1828	1542	257	536	2529	3073	990	683	960	1370	2352	473	2147	198
1973	778	2752	437	3254	1256	1516	478	471	1422	1420	387	414	591	1103	3782	566	3322	179
1974	56	2646	454	3420	720	1318	241	293	2012	1438	880	441	1447	1520	3205	610	3132	208
1975	85	3044	287	3339	889	1447	311	850	2861	1571	717	481	1286	1673	2333	762	2196	248
1976	81	2917	424	4000	1380	2495	441	1258	2810	2529	832	755	1574	1638	1822	869	3525	264
1977	95	2850	278	3909	469	2378	554	1056	1948	2596	489	518	869	1363	1985	644	1894	330
1978	150	2924	370	3513	837	2382	430	1419	1856	2363	543	511	1021	1472	2026	699	2361	214
1979	241	2861	365	3387	1142	2429	291	1373	1299	1571	594	560	1336	1732	1474	626	2881	369
1980	205	2706	444	3342	781	3694	419	1577	1415	1343	498	390	983	1650	1062	569	2457	405

Table 7
State of origin of majority of US hunters purchasing migratory game bird hunting permits in 1967, 1970, and 1976–80

State	1967		1970		1976		1977		1978		1978–80	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
California	282	1.9	351	2.1	221	1.1	275	1.4	308	1.6	267	1.4
Illinois	1 140	7.6	1 169	7.1	929	4.7	880	4.6	941	4.9	1 091	5.7
Indiana	381	2.5	411	2.5	395	2.0	262	1.4	243	1.3	407	2.1
Iowa	480	2.8	473	2.9	730	3.7	562	2.9	440	2.3	587	3.1
Michigan	3 022	20.1	3 062	18.7	3 418	17.2	3 432	18.0	3 422	17.8	3 511	18.4
Minnesota	3 512	23.2	4 027	24.6	6 677	33.6	6 693	35.0	6 435	33.4	5 995	31.5
Nebraska	288	1.9	233	1.4	98	0.5	65	0.3	78	0.4	84	0.4
New York	1 158	7.7	1 031	6.3	757	3.8	737	3.9	582	3.0	576	3.0
Ohio	728	4.8	922	5.6	911	4.6	657	3.4	853	4.4	1 026	5.1
Pennsylvania	392	2.6	491	3.0	485	2.4	489	2.6	594	3.1	650	3.4
Washington	582	3.9	496	3.0	475	2.4	309	1.6	503	2.6	391	2.1
Wisconsin	1 308	8.7	1 489	9.1	2 522	12.7	2 540	13.3	2 855	14.8	2 061	10.8
Other	1 857	12.3	2 232	13.6	2 229	11.2	2 224	11.6	2 011	10.4	2 393	12.6
Total	15 070		16 387		19 847		19 125		19 265		19 039	

Table 8
Origins of active OP hunters, 1972–80, by province of hunt

Prov. of hunt	1972	1973	1974	1975	1976	1977	1978	1979	1980
Total Que.	3124	2630	3336	3599	2277	2637	1985	2800	3439
From NB	278	228	242	281	389	573	593	1104	852
Ont.	2337	1901	2804	2534	1488	1615	1097	1437	1982
Others	509	501	290	784	400	439	295	259	605
Total Ont.	2433	2127	2647	1670	2545	1540	2036	2085	1895
From Que.	1857	1642	2044	1416	1845	1199	1649	1619	1454
Man.	463	311	390	219	477	234	183	87	67
Others	113	174	213	35	223	107	204	379	374
Total Man.	1885	1734	961	1200	1822	1022	1266	1453	1200
From Ont.	1042	716	469	591	1144	393	824	518	401
Sask.	580	432	350	420	281	244	238	630	412
Others	263	586	142	189	397	385	204	405	387
Total Sask.	4479	4399	4339	4864	5216	3339	3477	3267	2941
From Ont.	888	869	658	901	1089	309	602	640	313
Man.	307	287	895	1009	989	593	448	421	487
Alta.	608	734	871	1683	1334	907	1023	918	872
BC	2319	2273	1599	938	1237	1391	1289	1249	1018
Others	357	236	316	333	567	139	85	39	261
Total Alta.	4499	5162	5337	4528	5347	3879	4854	4354	3875
From Ont.	492	443	298	294	389	133	353	344	397
Sask.	578	727	975	497	487	495	486	467	679
BC	3158	3621	3964	3716	3998	2734	3087	3029	2681
Others	271	371	100	21	473	517	928	514	118

Table 9
Calendar of events assumed to influence hunting activity by non-residents

Year	Events
1972	Daily bag limits set on ducks in three Prairie Provinces, 8; Ontario, 5; adjacent states, 4.
1973	Saskatchewan delayed date of sale of provincial permit for all non-residents in provincial zones 01–25 and 28. Bag limit in Manitoba, zone 01, reduced to 6, including 3 Mallards.
1974	Price of Canada permit increased to $3.50 followed by a drop of 4% in sales. Common opening date along Ottawa River portion of Quebec–Ontario border terminated. Extended season in Essex County, zone 01, Ontario, terminated, and large areas of zone 01 closed to goose hunting. Mallard bag limit in Manitoba reduced to 2; season opening in Manitoba, zone 01, delayed to 7 October.
1975	Duck bag limit set in Manitoba at 6 (3 Mallards) and season opened on 6 October in zone 01.
1976	Daily bag limits on ducks in Saskatchewan and Manitoba reduced to 4. No change in goose regulations.
1977	Hunting season in northern Wisconsin and Minnesota delayed due to fire hazard. Season in Manitoba 01 opened 3 October.
1978	Massive increase in fall flight of geese in southeast Saskatchewan and Manitoba. Daily bag limit on geese in Manitoba increased to 8, highest in North America.
1979	Stabilized regulations, reduced fall flight of ducks on prairies, increase in number of geese in southeast Saskatchewan and southwest Manitoba.
1980	Drought on prairies, poor fall flight of ducks and geese in Alberta and western Saskatchewan.

Case 1
In the border area of Nova Scotia–New Brunswick, regulations have been stable for many years. Marsh development by CWS and Nova Scotia, plus the introduction of a commercialized wild rice industry and its associated water areas, have led to a gradual increase in hunting activity and opportunity on both sides of the border. OP hunters utilizing the region come largely from within a 100 km radius. They are small in number, increasing slowly from 200 in 1972 to 366 in 1980, and they represent a stable 16% of all active hunters in the region. The proportion hunting on either side of the border has remained relatively unchanged, responding only to the opening of new marsh units (Figure 4) and changing province of hunt in response to new opportunities.

Case 2
In 1969, CWS established a small no-hunting zone near Montmagny, Que. on the south side of the St. Lawrence River below Quebec City. They increased such areas to three in 1972, their aim being to help disperse an expanding population of Greater Snow Geese (*Anser caerulescens atlantica*) from the Cap Tourmente National Wildlife Area on the North Shore to under-utilized feeding areas on the South Shore. The plan worked well and provided both dispersal and increased hunting opportunity. Geese now occur in large numbers along a 100 km stretch of the South Shore. Few hunters from the United States utilize the area except for commercial operations on islands such as Île-au-Coudre. A completely unexpected response has come, however, from OP hunters of the largely francophone part of northern New Brunswick. The enhanced populations of Greater Snow Geese within 250 km of their major population centres, and an improved highway, have resulted in the number of active New Brunswick OP hunters in Quebec increasing by 350%, from 200 in 1972 to 900± in 1979 and 1980. In this case, a regulation designed to disperse an increasingly large population of geese has had the added impact of increasing OP hunting activity.

Table 10
Criteria considered in selecting five case studies

Case	Criteria
1	Canadians only, no changes in regulations. An example of OP hunting close to place of residence (proximity hunting) responding to improved access to hunting.
2	Canadian hunters from one province entering another in reaction to increased hunting opportunity provided by regulations intented to disperse flocks of geese and protect their feeding habitat.
3	Canadians only, proximity hunting in response to regulatory changes along a provincial border.
4	US and Canadian hunters representing long-range and proximity travel in response to changes in regulations and waterfowl populations.
5	Canadian and US hunters representing proximity and long-range travel in response to different changes in hunting regulations and changes in opportunity.

Case 3
For nearly 20 years, Quebec and Ontario had a common opening date for the hunting season along the Ottawa River. In 1973, Quebec discontinued its 16-km-wide zone and converted it to the same opening date as the adjacent parts of the province, which had long opened 7 days earlier than in Ontario. This created two opening dates along the river. The response was dramatic. OP hunters entering Quebec, largely from Ontario, increased from 400 to 1800, with no appreciable change in the number of Quebec hunters entering Ontario. Hunting opportunity on much of the Ottawa River is better on the Quebec shore than in Ontario, especially

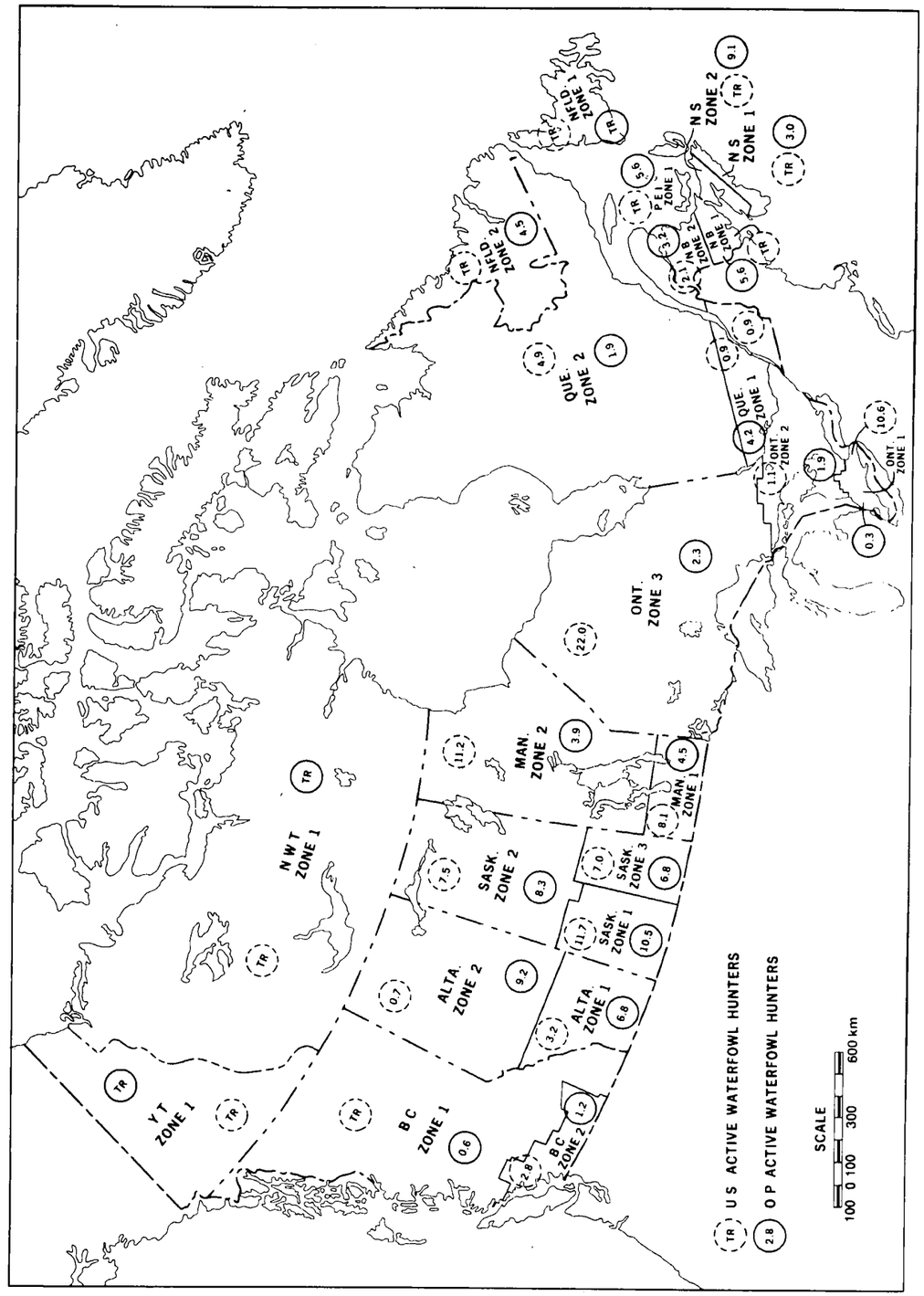


Figure 1
Distribution of US and OP hunters as percentages of all active hunters in a zone, 1976 (TR = trace)

Figure 2
Distribution of US and OP hunters as percentages of all active hunters in a zone, 1980 (TR = trace)

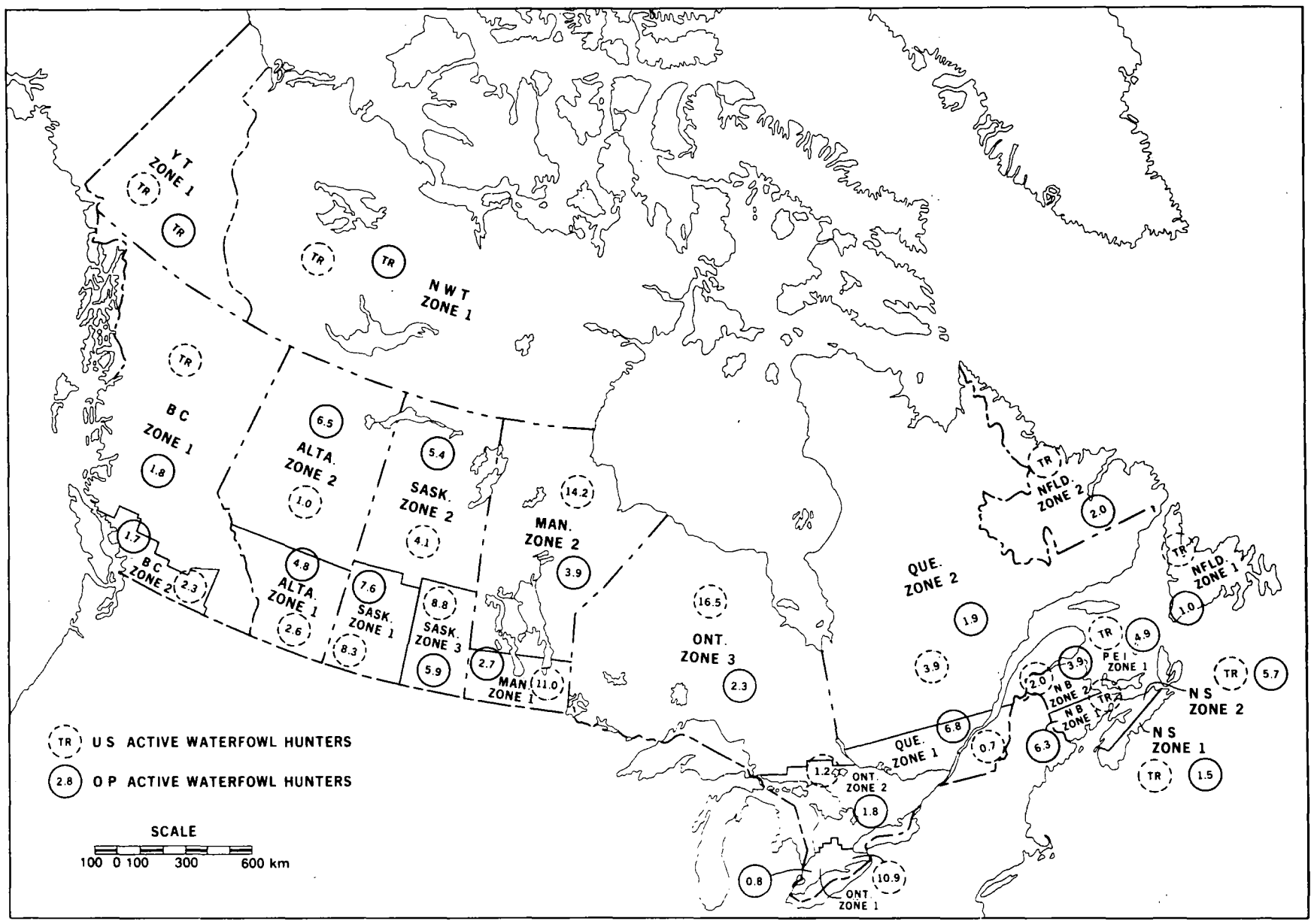


Figure 3
Areas of concentration of non-resident hunters

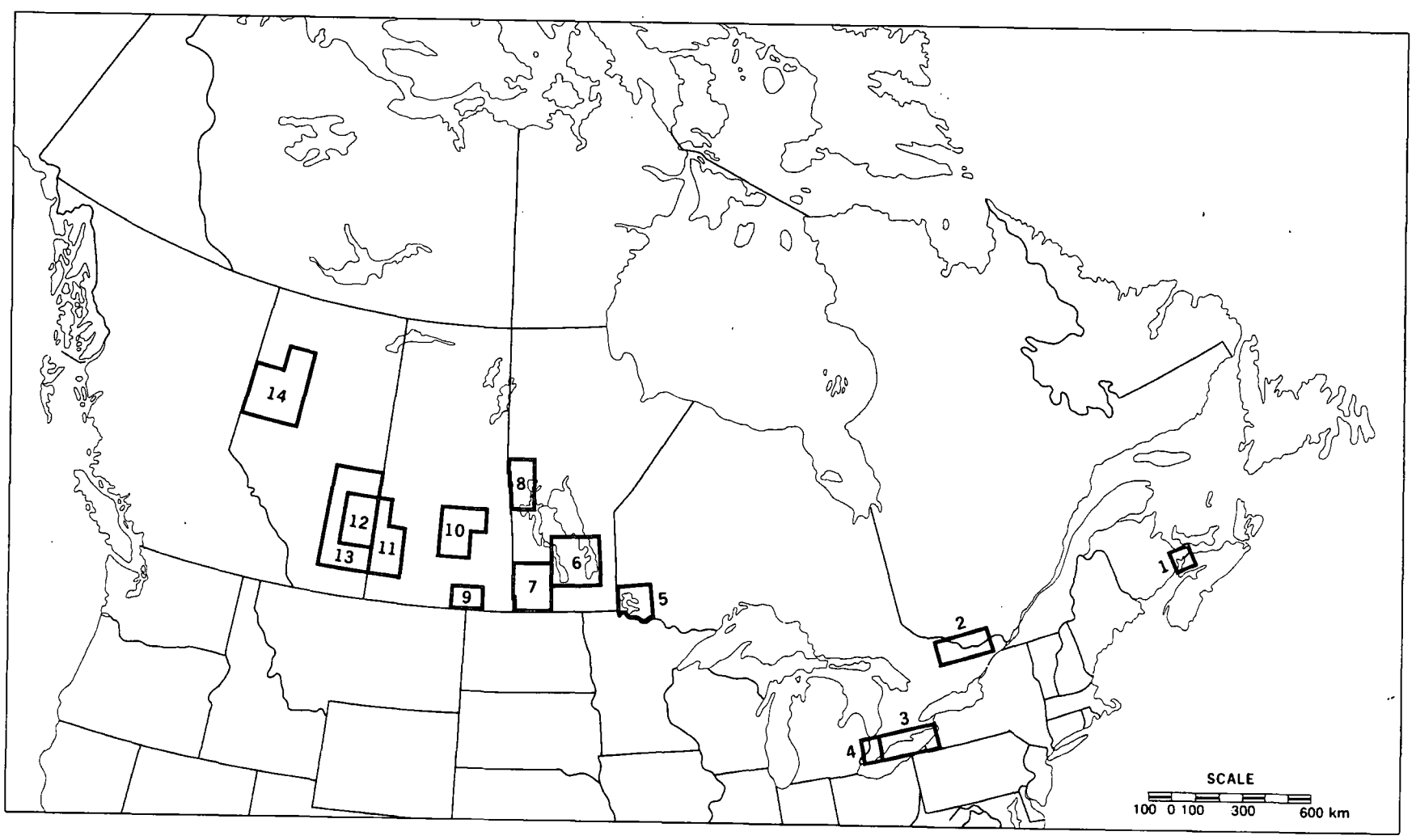
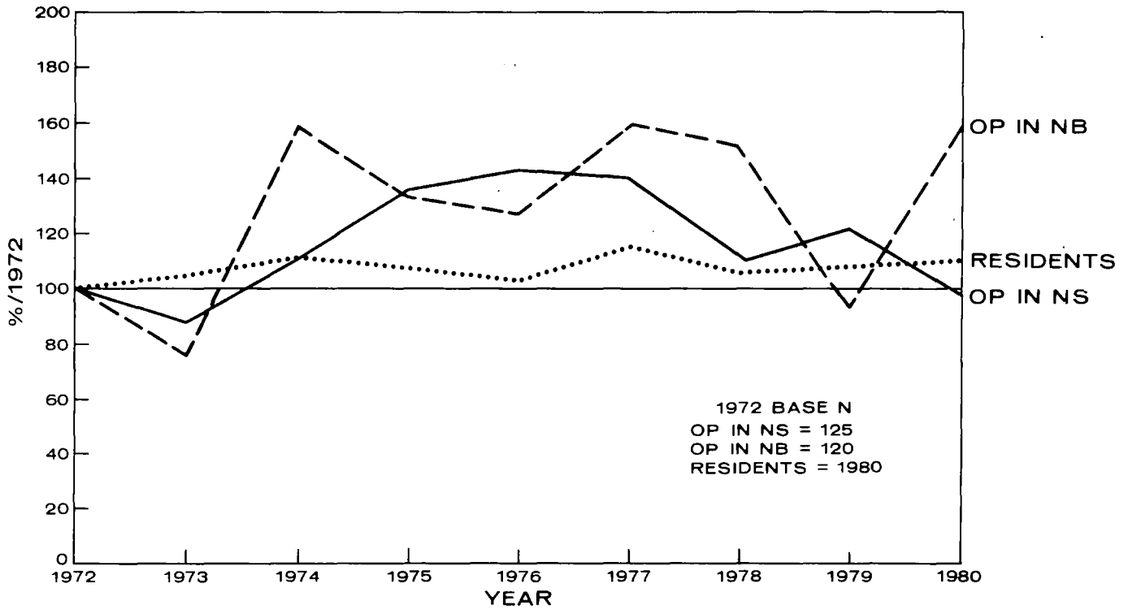


Figure 4
Changes in origins of hunters along Nova Scotia–New Brunswick border, 1972–80



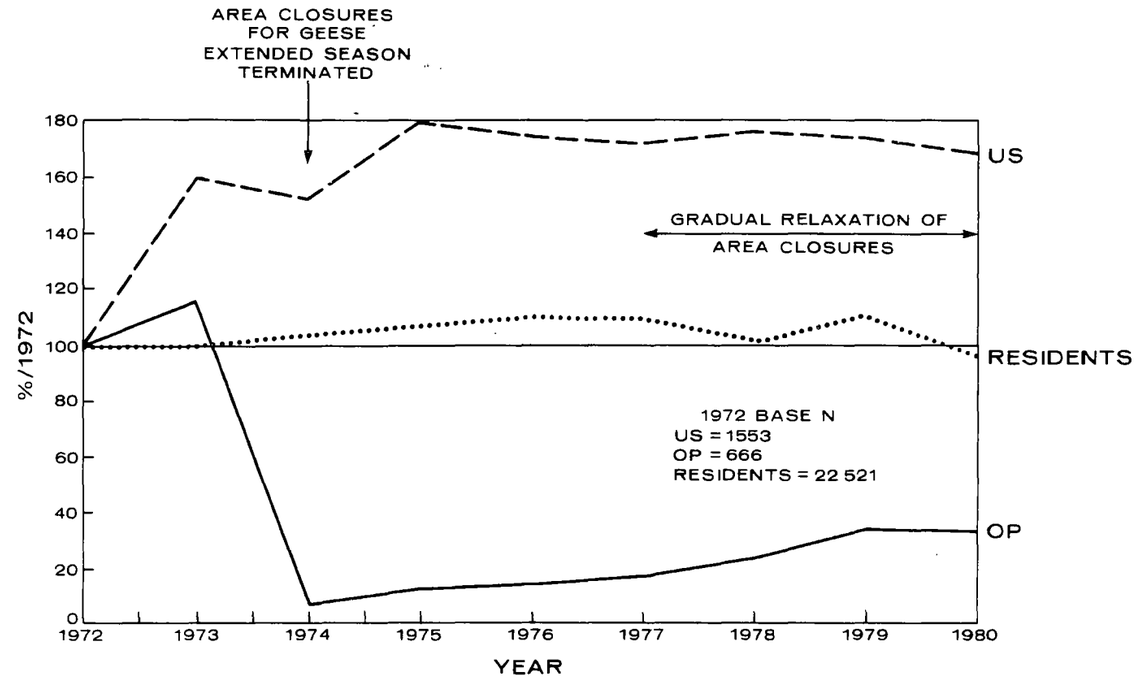
in newly flooded lands upstream of the dam at Chute-à-Blondeau. The opening date has not been changed since 1974, and the situation now appears to be similar to that outlined in Case 1, with the number of Ontario hunters stabilized. Case 3 is an example of proximity hunting by OP hunters in response to a change in opening date affording increased hunting opportunity (Table 11).

Case 4
In 1974, two regulatory changes were imposed in southwest Ontario with (1) the termination of extended hunting seasons in Essex County (15–30 December) and (2) area closures of hunting to protect Canada Geese that had been reintroduced by the Ontario Ministry of Natural Resources. Before these changes, an average of 1550 US hunters, mostly from the adjacent states of Michigan, New York, and Ohio, and 670 OP hunters (mostly from Quebec) hunted in the region. Activity by US hunters continues throughout the season, whereas the OP hunters concentrate their activity in late December. The impact of these changes is shown in Figure 5. In 1974, OPH numbers fell to 46 from 670, and had only slowly recovered to 250 by 1980, apparently in response to a relaxation of the goose regulations. At the same time, US participation had increased to an average (1974–80) of 2760 active hunters from the previous base of 1550. US hunters have to travel on the average less than 160 km, much less than those from Quebec (800 km). Their increased participation is presumably in response to increased populations of geese, higher energy costs that have made more extended trips prohibitive, and perhaps a lack of accessible hunting opportunity within their state of residence. In the case of OP hunters, the termination of the extended hunting season (15–30 December) appears to have had the greatest impact, since the hunting period reported on their NHS questionnaires coincided with the Christmas holidays. I see this case study as an example of a regulation intended to protect local stocks of geese that has effectively eliminated OP hunting, while having no effect on US utilization of the resource.

Table 11
Changes in distribution of hunting effort along Ottawa River, 1972–80

Year	Que. Res.	OP in Que.	OP in Ont.	Ont. Res.	Total hunters
1972	1613	332	236	9418	11 599
1973	1389	395	367	7034	9 185
1974	1646	1838	343	7968	11 795
1975	1507	1490	489	7937	11 423
1976	1327	1385	556	8099	11 367
1977	1574	1484	496	7510	11 064
1978	1328	1357	509	6948	10 142
1979	1244	1353	475	7161	10 233
1980	1154	1510	515	7136	10 315

Figure 5
Changes in origins of hunters in zone 01, Ontario, 1972–80



Case 5
Southern Manitoba (zone 01) has long been a famous waterfowl hunting area. During the baseline period of 1967–72, it annually attracted an average of 1830 OP hunters, largely from Ontario, and 1550 US hunters, largely from Minnesota and Wisconsin. OP hunters have traditionally reported killing ducks. US hunters, while taking large numbers of ducks, also have taken a significant number of geese. In 1973, the daily bag limits were reduced on ducks from 8 to 6, on Mallard to 2, and on Canvasback and Redheads from 2 of each species to 1 of either. In 1974, the opening date was delayed from 24 September to 7 October. These restrictions has no effect on the number of US hunters coming to zone 01 of Manitoba, but the OP hunters were reduced to less than half their previous number (Figure 6). In 1976, much of northern Minnesota and Wisconsin was closed to hunting because of severe fire conditions. Waterfowl production in states bordering Canada had also been seriously affected by a prolonged drought. Consequently, an abnormally large number of US hunters from the lake states entered zones 03 of Ontario and 01 of Manitoba. This coincided with an immense stop-over of geese at Oak Hammock and elsewhere in southwestern Manitoba. While OP hunters apparently continued to react to the reduced duck hunting opportunity and increased cost of travel, US hunters responded to the increase in the opportunity to hunt geese. The numbers of US hunters increased from the baseline average of 1500 (6%) of all active hunters to 2500 in the period 1976-79 and to 3700 (15%) in 1980. Preliminary figures for 1981 (4700) indicate that the climb continues.

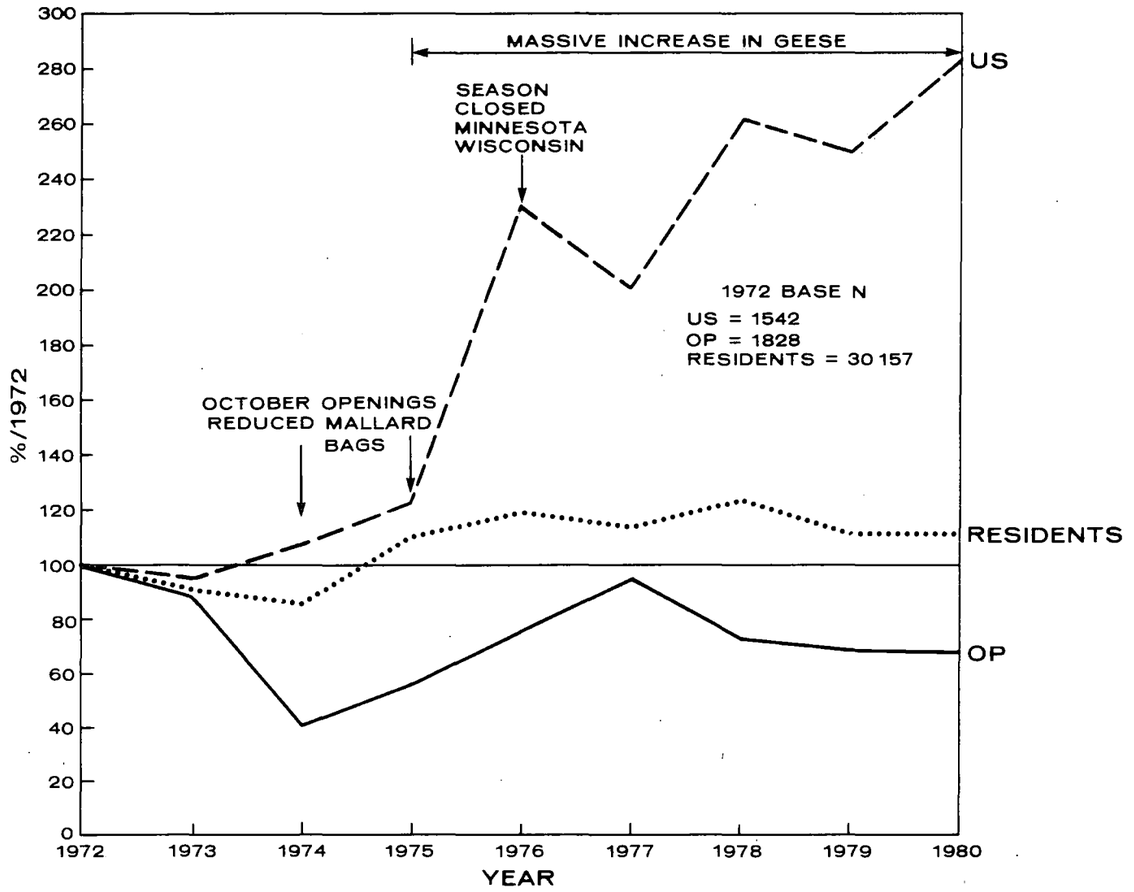
The restrictive regulations introduced in zone 01 of Manitoba in 1973 and 1974 were designed to protect their breeding populations, primarily of Mallards, Redheads, and Canvasback. They succeeded not only in reducing activity by OP hunters in Manitoba, but also in causing an emigration of Manitoba hunters to Saskatchewan and Ontario (Table 8), while having no effect on US hunters. Unforeseen events outside Canada caused a large influx of these non-resident hunters, whose arrival coincided with a massive increase in short-stopped geese. OP hunters from eastern Canada (southern Ontario) responded negatively to restrictions imposed in 1973, primarily on duck hunting, and have not subsequently responded to increases in opportunity to hunt geese despite the enhanced bag limits set in 1978. The increases in OP hunters recorded in 1978 and 1979 were primarily from Saskatchewan and extreme western Ontario, again apparently in response to immense flights of geese. The

situation in Manitoba 01 is characteristic of proximity hunters (US) residing within a day's drive by automobile responding to both the American and Manitoba situations. The mobile group of OP hunters from southern Ontario, who must travel four to six times further, had decreased from 7% of active hunters in 1972 to only 3% by 1980. Despite the massive increase in accessible goose populations, the number of active resident hunters has not increased significantly since then.

Case 6
Manitoba zone 02 contains the famous duck hunting area of the Saskatchewan Delta at The Pas, diving duck areas such as Waterhen Lake, and the northern Interlake region. Unlike the situation in the southern zone (01), this zone had neither major restrictions on the daily bag of ducks nor delays in opening the waterfowl season between 1972 and 1974. Despite that consistency, the number of OP hunters fell below the 9-year average of 415 in 1974-75. US hunters, on the other hand, stayed at a base of approximately 570 hunters per year between 1972 and 1975.

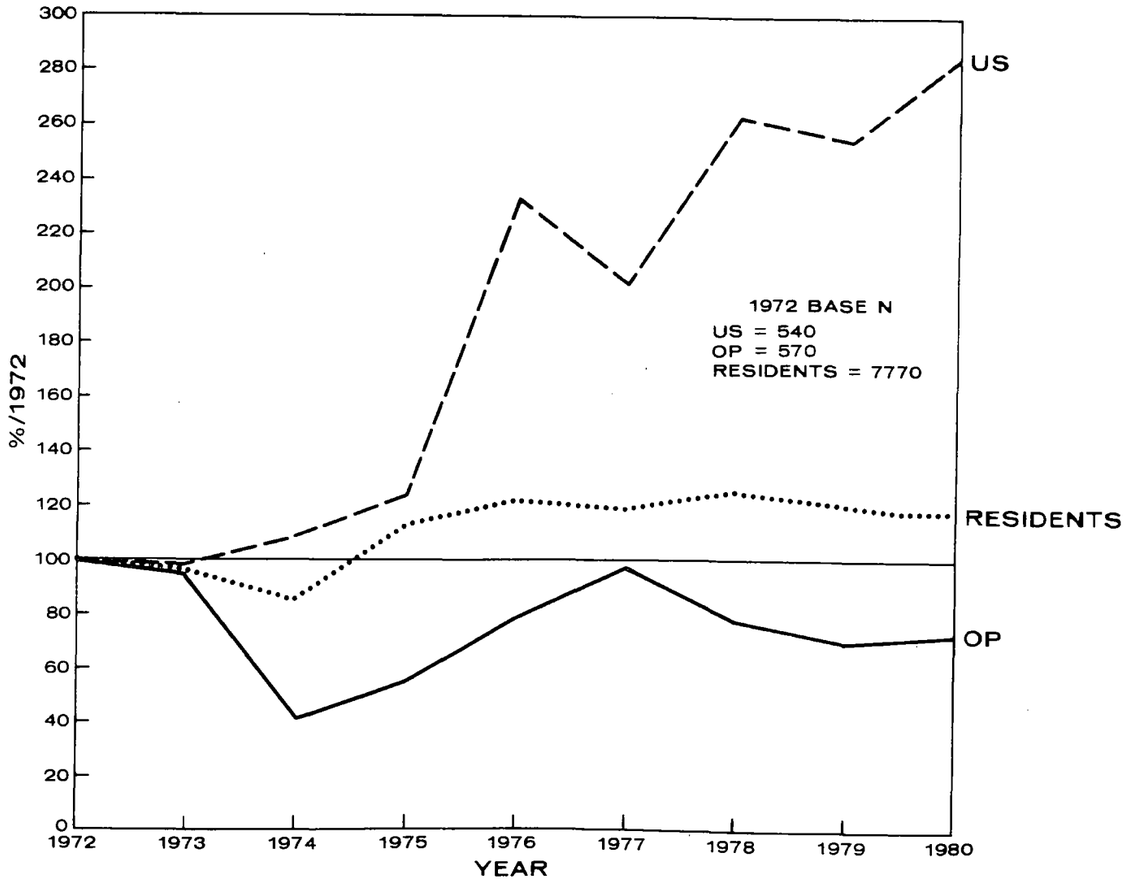
In 1976 and the years following, US hunters repeated their previous pattern and rate of increase in zone 01, and by 1980 had increased to 1550. At the same time, hunters from Ontario had shown a 40% reduction and had been replaced by hunters from Saskatchewan. An examination of associated kill data reveals that OP hunters characteristically continue to seek ducks, while the US hunters take both ducks and geese. The situation in zone 02 should be compared with that in zone 01. US hunters have more than doubled there since the large influx of 1976, and are entering the southern part of the zone rather than proceeding to the traditional duck hunting areas around The Pas or Waterhen Lake. This is an example of regulations staying largely unchanged, while travel distance for most OP hunters, and possibly their mistaken belief that the severely restrictive regulations of zone 01 also apply to zone 02, have led to a reduction in long-distance OP hunters (Figure 7).

Figure 6
Changes in origins of hunters in zone 01, Manitoba, 1972–80



Case 7
The Kindersley-Kerrobert-Estlin area of western Saskatchewan has long been attractive to non-resident hunters, especially those seeking geese. In 1973, following several years of complaints by residents of damage to gravel roads and competition for hunting space, Saskatchewan decided not to allow non-residents to buy a provincial licence until 1 October, 2 weeks after the goose season and 3 weeks after the duck season had opened for provincial residents. Because this provincial regulation was not included in the federal Migratory Bird Regulations, knowledge of it may have spread unevenly. The impact was greatest on OP hunters, many of whom traditionally sought ducks in preference to geese. The number of US hunters fell to 50% of the those present in the previous year, but the effect on them was temporary and their numbers rebounded to the normal plateau in 1974, while OP hunters continued to be affected until 1975. In 1977, OP hunters generally withdrew from western Canada, especially those from Ontario, as also happened in cases 4 and 5. A decline in the number of US hunters began in 1978 and has continued, many of them moving into southeast Saskatchewan or Manitoba, where populations of geese are increasing and bag limits are more generous. Case 7 shows how a regulation imposed to provide increased hunting benefits for residents of an area has a temporary effect directed largely against long-range OP and US hunters but, until other pressures were exerted, the regulation was largely ineffectual against either of them (Figure 8).

Figure 7
Changes in origins of hunters in zone 02, Manitoba, 1972–80



Conclusion

In 1972, OP and US hunters represented 5.22 and 4.21% respectively of all active waterfowl hunters in Canada. By 1980–81, these proportions had changed marginally

to 3.84 and 4.47% respectively. The number of OP hunters travelling long distances from their place of residence has dropped sharply since 1976. Most US hunters actually travel shorter distances to hunt in Canada than OP hunters do. In areas where both US and OP hunters initially occurred in 1972 in nearly equal numbers, restrictive regulations have had an almost uniquely negative effect on the numbers of OP hunters, while having little or no effect on US hunters. Both US and OP hunters tend to concentrate their activities in areas of hunting opportunity relatively close to their places of residence.

While the numbers of hunters from southern Ontario undertaking long-range trips to western Canada have dropped significantly, those from British Columbia have fallen only slightly. Although active mobile hunters in Canada make up less than 10% of all hunters, their tendency to concentrate in certain choice areas sometimes leads to unanticipated impacts on local populations of waterfowl.

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Figure 8
Changes in origins of hunters in zone 01, Saskatchewan, 1972–80