Trends in Hunter Participation in Alberta, 1990 to 2000: an analysis of the Hunter Licensing System databases

D. O. T. Watson and P. C. Boxall

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TRENDS IN HUNTER PARTICIPATION IN ALBERTA, 1990–2000: AN ANALYSIS OF THE HUNTER LICENSING SYSTEM DATABASES

D.O.T. Watson and P.C. Boxall[1]

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[1]Department of Rural Economy, University of Alberta, Edmonton, Alberta T6G 2H1

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ABSTRACT

After peaking in 1965, the number of active hunters in Alberta has been declining steadily. The authors used data from the Alberta Client Licensing and Survey System database (1990–1997) and its replacement, the Recreational Licensing Management System (1998–2000), to determine trends in hunting participation in the province. The aim was to derive hypotheses to explain the decline and perhaps identify policies that might help to mitigate it. On the basis of this analysis, the decline in numbers is expected to continue, in part because the number of new entrants decreased over the study period and in part because new entrants quit at a higher rate than hunters from the initial (1990) cohort. Both gender and age seemed to play a role. Specifically, females were more likely to quit hunting than males, even though the proportion of new entrants who were female increased over time. New entrants were generally younger than hunters in the 1990 cohort, and although new entrants overall quit at a higher rate than hunters from the 1990 cohort, younger new entrants were more likely to continue as active hunters than older new entrants. Although the distribution of hunters in rural and urban settings differed, place of residence did not seem to be a factor in the decline. The data were also analyzed according to animal species sought. Bird game hunters represented a much smaller proportion of each cohort than big game hunters or mixed hunters (those hunting both big game and bird game). Bird game hunting underwent a substantial decline over the study period, whereas big game hunting increased in importance. The report concludes with suggestions for future work to clarify the reasons for the changes in hunting patterns over time and to determine the effect of these changes on animal management.

RÉSUMÉ

Après avoir atteint un maximum en 1965, le nombre de chasseurs actifs en Alberta n'a cessé de diminuer. Les auteurs ont utilisé des informations provenant de la base de données du système de délivrance des permis et de sondage des clients de l'Alberta (1990–1997) et de son successeur, le système de gestion de la délivrance des permis récréatifs (1998–2000), pour étudier l'évolution de la population des chasseurs dans cette province. L'objectif était d'émettre des hypothèses permettant d'expliquer le déclin observé et de proposer des stratégies capables d'en atténuer les effets. L'analyse des données montre que ce déclin devrait se poursuivre, d'une part parce que le nombre de nouveaux demandeurs de permis de chasse n'a cessé de diminuer sur la période étudiée et d'autre part parce que ces nouveaux chasseurs abandonnent plus souvent l'activité que les chasseurs issus de la cohorte initiale (1990). Le sexe et l'âge des chasseurs semblent jouer un rôle. Il s'avère en particulier que les femmes abandonnent plus souvent l'activité que les hommes, même si elles représentent une part croissante des nouveaux chasseurs. Les nouveaux chasseurs étaient généralement plus jeunes que les chasseurs de la cohorte 1990. Bien qu'ils aient, dans l'ensemble, abandonné plus souvent l'activité

que les chasseurs de la cohorte 1990, les plus jeunes ont eu plus tendance à persévérer que leurs aînés. Le lieu de résidence ne semble pas être un facteur pesant sur le déclin observé, même si la distribution des chasseurs différait entre les zones rurales et les zones urbaines. Les données ont également été analysées en fonction de l'espèce chassée. Dans chaque cohorte, les chasseurs d'oiseaux représentaient une proportion moindre que celle des chasseurs de gros gibier ou des chasseurs polyvalents (ceux qui chassent le gros gibier et les oiseaux). La chasse des oiseaux a décliné de façon substantielle sur la période étudiée, alors que la chasse du gros gibier a pris plus d'importance. Le rapport conclut en mentionnant les travaux qui restent à faire pour éclaircir la nature des facteurs qui influent sur l'évolution à long terme de la chasse et déterminer les effets de cette évolution sur la gestion de la faune.

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INTRODUCTION

The government of Alberta maintains a computerized database of provincial sales of hunting licenses. The original system, called the Client Licensing and Survey System (CLASS), was initiated for the 1992 hunting season but included records dating back to 1990. In the CLASS database, each hunter was given an individual "lifetime" identification number, the wildlife identification number (WIN). The WIN allows an analyst to follow the activity of individual hunters over time. CLASS was replaced with a new computerized database in 1998. The new system, the Recreational Licensing Management System (RELMS), incorporates a new personal identification number system that does not match the number system used by CLASS, although the numbers themselves are still called WINs. As hunters have purchased their wildlife certificates in subsequent years, their old WINs have been linked to the new RELMS WIN. This correlation of numbers in the two systems allows continued comparison of individual hunters' activities over the period of study.

The assignment of a WIN involves the collection of routine demographic data such as name, address, birth date, and gender. Once a WIN has been assigned, a hunter must purchase an annual wildlife certificate to participate in any type of hunting in the province. The purchase of a certificate "activates" a hunter's WIN for a given year. The wildlife certificate allows the hunter to purchase one or more licenses for big game and bird game species and to apply for a lottery-rationed license (see next paragraph). Since 1995, it has been possible to apply for a lottery-rationed license by phone, without first obtaining a wildlife certificate. An associated series of records for hunting licenses is also kept. These records include information about the license, such as species sought, method of hunting, and, in some cases, season.

In certain regions, if there is a concern about the size of the animal population or a need to improve harvest and hunter distribution, a lottery draw is held for the licenses for certain species. A hunter applies for the draw in a specific area and, if selected, receives the applicable license for the chosen draw. A priority system was initiated in 1993, so that a hunter not chosen in one year has a greater chance of being drawn for a license in subsequent years. An additional series of records is kept for applications for lottery-rationed licenses.

Despite the fact that people who have not previously hunted start hunting each year, the number of active hunters in Alberta in 1997 was the lowest since 1965, when formal licensing of hunting was initiated in the province (Fig. 1). After 1965, the annual number of active hunters increased to a peak in 1980, but it has dropped steadily since then. This decline continued during the period for which data were available to the researchers (1990–2000). Hence, it was of interest to examine the hunter databases to determine if there is any information in these systems that might explain the decline. Furthermore, it was thought that an examination of trends in new entrants to hunting might help to identify policy prescriptions that could mitigate the decline.

This report summarizes some analyses that might shed light on these issues. The goal of these descriptive analyses was to derive some hypotheses to explain the general decline in hunting, which could then be tested with more informative methods, such as surveys or focus groups.

The report begins with a short section on the methods used, followed by more detailed examinations of the CLASS and RELMS data.

The first main section, describing trends in sales of wildlife certificates, is divided chronologically. Hunters who were active in 1990 are examined first. This year is the first for which information was available at the individual level in the CLASS. New entrants to hunting for the period 1991–2000 are then examined and compared with the 1990 hunters. Finally, the active hunting population in 1990 is compared with active hunters in 2000. The emphasis throughout is on Alberta residents. The activity of nonresident hunters, both Canadian and international, is presented in only a few places.

The second main section examines differences among groups of hunters: big game hunters, bird game hunters, and "mixed" hunters (those who seek both big game and bird game). This analysis is based on data from both license sales and draw applications. An individual was considered an active or willing hunter for a species group if he or she obtained at least one license for that group or showed an interest in hunting a species in the group by applying for a draw. The analysis mirrors that for wildlife certificate sales in that it tracks the year a hunter first participated in hunting big game or bird game and, if relevant, the year in which the person stopped hunting.

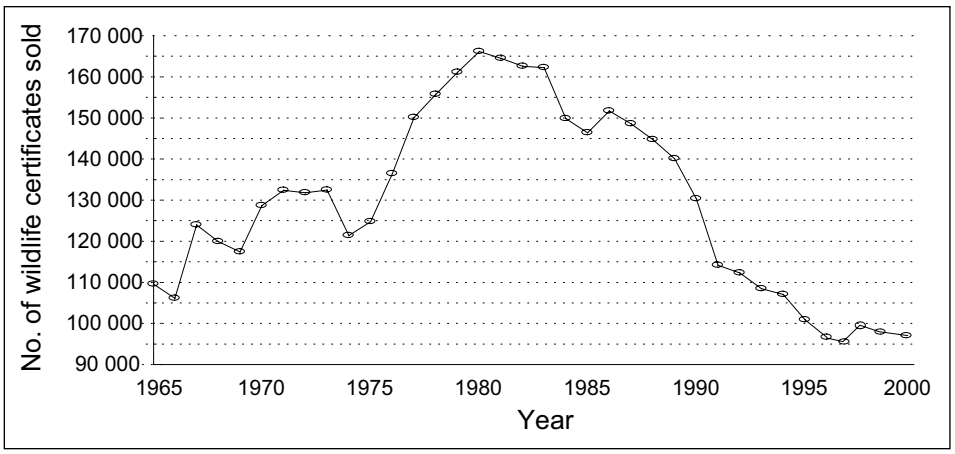

Figure 1. Sales of wildlife certificates to residents and nonresidents in Alberta, 1965–2000. Source: updated from McFarlane B.L.; Boxall P.C.; Adamowicz W.L. 1999. Descriptive analysis of hunting trends in Alberta. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Inf. Rep. NOR-X-366.

METHODS

The CLASS database contains all information related to wildlife certificate sales, license sales, and draw applications for the years 1990 to 1997 inclusive. The information used for the analyses reported here was received in Oracle database format. The database was then rearranged into a more suitable format for the analysis. A single record was created for each individual, according to his or her WIN, to allow tracking of the activities of individuals over time. Some necessary information, such as license sales for the years 1990–1992, was not included in CLASS and had to be added to the database. No attempt was made to verify the accuracy of the data. Records with obvious errors were removed from certain aspects of the analysis if the error was important for the particular aspect, but they were retained for other aspects. For example, an incorrect birth date would result in exclusion of the record from the analysis by age class (because it would not be assigned to any of the classes used), but that same record would be included in the analysis by gender. The total number of hunters therefore varies slightly among the tables.

Information from the RELMS database was used for the years 1998 to 2000. The information was received as text files, which were converted to Microsoft Excel files. The information about individual hunters was the same as that in the CLASS database, with the exception of a new WIN. For hunters who had been active during the CLASS period as well, the WINs assigned in both systems were listed, which allowed data from the two systems to be merged.

The data from both systems were then exported into SAS statistical software for further manipulation. Some new information was created from the original data, the most important of which was the age of each person in the database (according to the listed birth date). The birth date was subtracted from 1 September 1990 to obtain the person's age in 1990. The age of the individual when he or she first joined or quit the hunting population was then calculated by adding the appropriate number of years. In some cases, the calculated age was incorrect because of typographic errors in the birth date in the original database (i.e., the calculated age was less than zero, in which case the record was dropped), but unless the error was obvious (as described above) the record was retained for analysis. Age was also used to group the hunters into the age categories used by the Canada census. In any part of the analysis where the initial age distribution of a group is compared with the age distribution of people in that group who were still active hunters in 2000, people are grouped according to their age when they first appeared in one of the hunter databases.

Part of the analysis involved looking for trends related to place of residence, comparing rural and urban groups and examining five regions in the province. The designations for this component of the analysis were taken from an annual provincial survey of hunters that includes rural or urban classification and a regional breakdown (part of CLASS and RELMS). The five regions (and major centers in each) are as follows: southern (Lethbridge), central (Calgary and Red Deer), eastern slopes (Edson), Peace River (Grande Prairie), and northeastern (Edmonton and Fort McMurray).

One possible source of bias in the place of residence is the address. In CLASS and RELMS only one address is listed for each person for the entire period. If a person moved within the 10-year period, his or her address is listed as the address in effect when he or she bought the most recent license; the old address is removed. People might therefore be listed as urban dwellers even if for most of the period they lived in a rural area or vice versa.

Definition of Terms

The following terms are used in this report (Fig. 2).

Active hunter: Within the analysis of wildlife certificate sales, anyone who, in a given year, purchased a wildlife certificate.

Active/willing hunter: Within the analysis of license groups, anyone who, in a given year, purchased a license, applied for a draw, or both.

Big game hunter: A hunter who hunted big game at some point during the study period and never hunted bird game. Big game species include moose, elk, deer (white and mule), bear (black and grizzly), sheep, and antelope. Hunting methods include rifle and bow. (See also "Mixed hunter.")

Bird game hunter: A hunter who hunted bird game at some point during the study period and never hunted big game. A provincial bird game license allows hunting of upland game birds, pheasant, and turkey. A bird game hunter who wishes to hunt waterfowl must also purchase a federal migratory bird hunting permit. Data on waterfowl licenses are not included in the CLASS or RELMS, so these hunters cannot be specifically identified. Hunting methods include rifle and bow. (See also "Mixed hunter.")

Cohort: A group of hunters first appearing in the CLASS or RELMS database in the same year.

Hunter who quits or drops out: Anyone who no longer participates in hunting, as indicated by no purchase of a wildlife certificate or license and no draw application. Dropouts are listed according to the last year of a purchase or draw application and must not have participated in any subsequent year to the end of the study period.

Mixed hunter: A hunter who at some point in the study period hunted both big game and bird species, either in the same year or in different years.

New entrant: Anyone who first became an active hunter in 1991 or later. New entrants are grouped into yearly cohorts.

Nonresident: Person living outside the province of Alberta.

Resident: Person living in the province of Alberta.

Rural dweller: Person not living in or in close proximity to one of the major urban centers of the province. This classification is part of the CLASS and RELMS databases.

Urban dweller: Person living in or in close proximity to one of the major urban centers of the province. This classification is part of the CLASS and RELMS databases.

Note about Numbers and Totals

Some numbers listed under various categories in different tables are not the same, primarily because of typographic errors in information entered into the CLASS or RELMS. For example, the total number of individuals per year in the regional analysis is not the same as the total per year by gender because of missing values in the regionally coded data. Also, in the initial database, the category for "resident" hunters included some non-Albertans (e.g., residents of Lloydminster, Saskatchewan) because of interprovincial arrangements, but for the purpose of these analyses, the resident category was limited to Albertans.

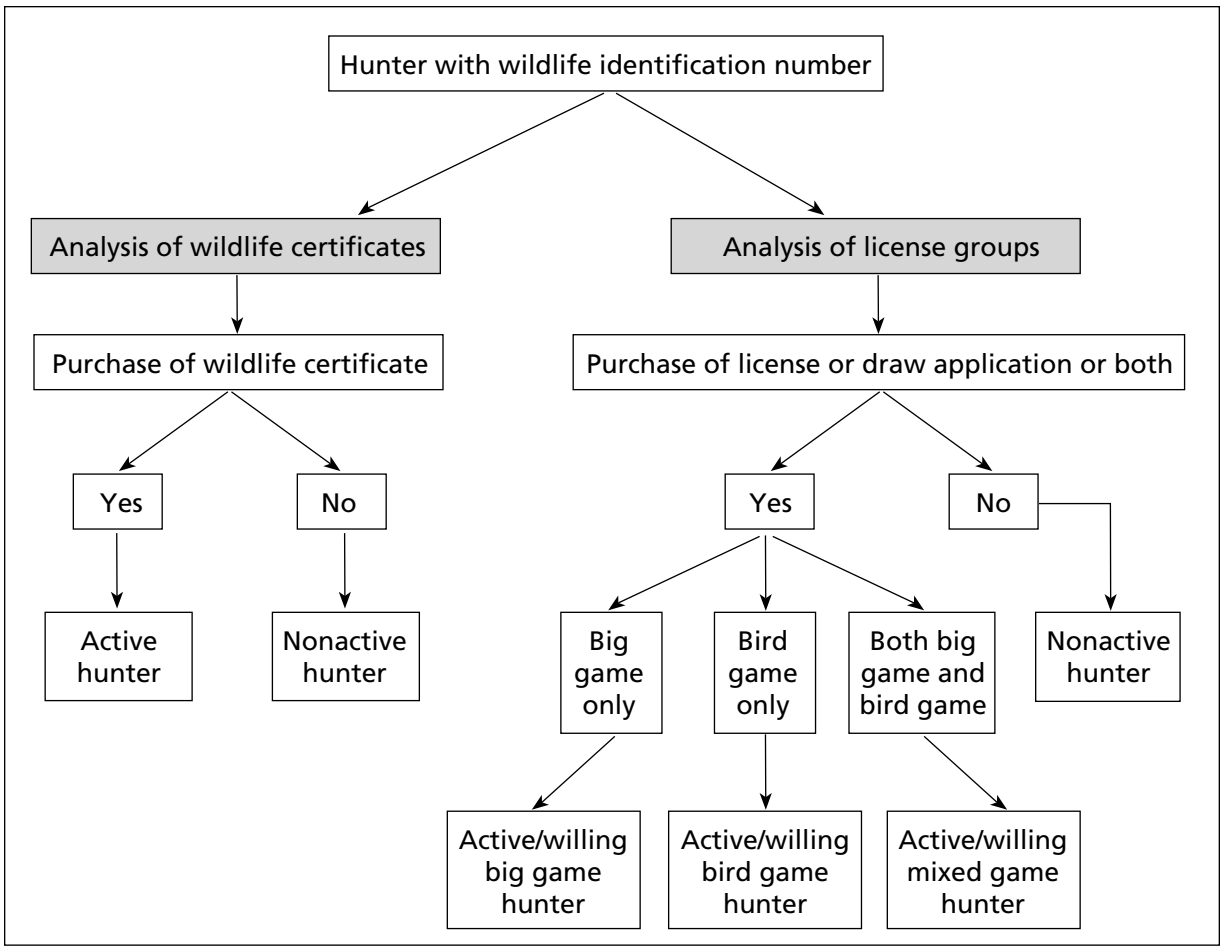

Figure 2. Licensing requirements for hunters in Alberta and breakdown of hunting population into various groups.

Overview of Patterns of Participation among Active Hunters

A good indicator of participation in hunting in Alberta is the purchase of a wildlife certificate. Possession of a certificate is a prerequisite for purchasing a license and, until recently, applying for a draw. The sale of certificates fell steadily over the study period, primarily among residents (Fig. 1, Table 1), despite an annual influx of new resident hunters and increasing sales to nonresidents. Specific reasons for this decline are unknown, but demographic trends evident from the hunter licensing databases may provide some clues.

The years in which hunters began and subsequently quit hunting are shown in Table 2. For each cohort, the first row shows the number of individuals who quit in a given year (i.e., participated for the last time in that year) and the fourth row, the number of that cohort remaining as active hunters in the license databases. Thus, for example, of the 1990 cohort, only 43 633 of the original 121 678 hunters remained in the hunter licensing databases in 2000. This table highlights the decline in participation, particularly for the 1990 cohort, for which the longest series of data is available. Because the hunter licensing databases contain no data for years before 1990, it is impossible to know when the hunters in the 1990 cohort began hunting. Some were new entrants in 1990, but most began in a previous year and remained active until at least 1990. Therefore, the first-year drop-out rate cannot be calculated for this cohort. Nonetheless, in 1991, 21 378 of this 1990 cohort quit. This number is much higher than for other years, in which a relatively consistent drop of 6 000–7 000 hunters per year was recorded.

It is notable that for each cohort year except 1990, approximately 30% to 35% of the hunters appearing in the hunter licensing databases quit after only 1 year of hunting. The rate of quitting in subsequent years (i.e., second, third, and subsequent years) then leveled off to just under 10% of the original cohort per year.

The accuracy of the counts of hunters quitting in 1999 and 2000 cannot be verified because of the limited time span of the data. In other words, it is possible that some hunters shown as leaving in these 2 years may simply have skipped one or several years and then returned to hunting in 2001 or a later year. However, within the other cohorts few hunters skipped a year and then returned (at least during the period 1990–1998). Within the study period, a participant who did not purchase a certificate in a particular year usually did not reappear as an active hunter in the hunter licensing databases in subsequent years.

Table 1. Total number of wildlife certificates sold from 1990 to 2000, as recorded in the Client Licensing and Survey System and the Recreational Licensing Management System

Year	Resident hunters	Nonresident hunters	Total
1990	121 678	6 683	128 361
1991	106 731	6 223	112 954
1992	105 271	6 401	111 672
1993	99 763	6 640	106 403
1994	97 518	7 591	105 109
1995	91 617	7 981	99 598
1996	87 593	8 787	96 380
1997	88 067	8 091	96 158
1998	90 739	9 647	100 386
1999	87 960	10 116	98 076
2000	87 466	10 426	97 892

Table 2. Number of resident hunters by cohort, 1990–2000

	Year of analysis										
Cohort[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1990 cohort											
Quit		21 378	7 645	6 115	5 648	6 037	5 221	4 834	8 696	5 488	6 983
Active		85 151	78 220	72 487	68 250	61 882	57 368	55 604	50 074	45 801	43 633
Skipped a year		15 149	14 435	14 053	12 642	12 973	12 266	9 196	6 030	4 815	N/A[c]
Remaining hunters	**121 678**[b]	100 300	92 655	86 540	80 892	74 855	69 634	64 800	56 104	50 616	43 633
1991 cohort											
Quit			7 718	1 806	1 328	1 275	1 009	948	1 367	874	998
Active			10 578	8 930	7 990	6 945	6 202	5 913	5 163	4 504	4 257
Skipped a year			3 284	3 126	2 738	2 508	2 242	1 583	966	751	N/A
Remaining hunters		**21 580**	13 862	12 056	10 728	9 453	8 444	7 496	6 129	5 255	4 257
1992 cohort											
Quit				5 318	1 608	1 357	1 008	894	1 163	788	915
Active				8 633	7 305	6 008	5 187	4 844	4 161	3 698	3 422
Skipped a year				2 522	2 242	2 182	1 995	1 444	964	639	N/A
Remaining hunters			**16 473**	11 155	9 547	8 190	7 182	6 288	5 125	4 337	3 422
1993 cohort											
Quit					3 043	1 042	720	634	804	559	628
Active					5 398	4 333	3 674	3 305	2 733	2 464	2 283
Skipped a year					1 272	1 295	1 234	969	737	447	N/A
Remaining hunters				**9 713**	6 670	5 628	4 908	4 274	3 470	2 911	2 283
1994 cohort											
Quit						2 593	811	693	875	595	658
Active						4 768	4 030	3 580	2 649	2 471	2 350
Skipped a year						1 214	1 141	898	954	537	N/A
Remaining hunters					**8 575**	5 982	5 171	4 478	3 603	3 008	2 350
1995 cohort											
Quit							2 244	810	911	611	703
Active							4 420	3 801	2 683	2 521	2 402
Skipped a year							1 017	826	1 033	584	N/A
Remaining hunters						**7 681**	5 437	4 627	3 716	3 105	2 402
1996 cohort											
Quit								2 014	1 085	605	719
Active								4 012	2 728	2 383	2 289
Skipped a year								686	885	625	N/A
Remaining hunters							**6 712**	4 698	3 613	3 008	2 289
1997 cohort											
Quit									2 710	715	794
Active									3 590	3 046	2 789
Skipped a year									708	537	N/A
Remaining hunters								**7 008**	4 298	3 583	2 789
1998 cohort											
Quit										5 163	2 647
Active										10 536	9 148
Skipped a year										1 259	N/A
Remaining hunters									**16 958**	11 795	9 148
1999 cohort											
Quit											4 740
Active											5 796
Skipped a year											N/A
Remaining hunters										**10 536**	5 796
2000 cohort											
Quit											
Active											
Skipped a year											
Remaining hunters											**9 097**
Total active hunters	121 678	106 731	105 271	99 763	97 518	91 617	87 593	88 067	90 739	87 960	87 466
Total remaining[d]	121 678	121 880	122 990	119 464	116 412	111 789	107 488	103 669	103 016	98 154	87 466

[a]Quit = the number of individuals who quit hunting in a given year, Active = the number of individuals who wanted to hunt in that year, and Skipped = the number of individuals who did not buy a wildlife certificate in that year.

[b]Values presented in bold indicate the number of new entrants in a given year (cohort). These hunters were active in their year of entry, and none could have quit or skipped, but to highlight their entry, they are listed only in the "Remaining hunters" category.

[c]N/A = not applicable.

[d]The total in the last row for each year shows the number of potential hunters and does not match the total wildlife certificate sales listed in Table 1. Some of these have skipped 1 year and returned to hunting the following year.

Active Hunters at the Start of the Study Period: the 1990 Cohort

Although there were declines in hunting participation before 1990 (Fig. 1), there were still a substantial number of active hunters in 1990. Because the 1990 cohort was large and had the longest time series of information, it was examined in detail to determine demographic trends that might shed light on reasons for quitting hunting. The analysis revealed several trends.

The decline in participation for the 1990 cohort was more pronounced than the decline in total wildlife certificate sales over the period (Fig. 3). Only 35.9% of the 1990 cohort remained active hunters in 2000 (Fig. 4). The year of the largest single decline was 1991, when 21 378 hunters quit. There was no discernible trend in the numbers of dropouts in subsequent years (see rows labelled "total" in Table 3). The annual drop-out rate decreased from 1992 to 1994, increased in 1995, and then declined until 1998 (which had a large spike); the drop-out rates in 1999 and 2000 were variable but lower than in 1998.

Female participants were more likely than male participants to quit (Table 3). The proportion of females in the cohort declined from 6.0% in 1990 to 2.8% in 2000. Furthermore, only 16.9% of the females who hunted in 1990 were still hunting in 2000, whereas 37.1% of the males who hunted in 1990 were still active in 2000.

Hunters in almost all age groups were equally likely to remain active hunters in later years, with 35% to 40% still hunting in 2000. The exceptions were hunters 15–19 years of age (31%) and those over 65 years of age (less than 20%) (Fig. 5).

A majority of hunters in the 1990 cohort were rural dwellers (Table 4), and the relative proportions of rural and urban hunters in the cohort were similar in 1990 and 2000. The rate of quitting was initially higher for urban dwellers (Table 4); however, this disparity narrowed in later years, such that there was little change in the rural–urban mix of the 1990 cohort at the end of the analysis period.

There were no discernible patterns in the rates of quitting among hunters from different regions of the province (Table 5). The percentages of hunters from various regions who quit were similar throughout the period 1990–2000.

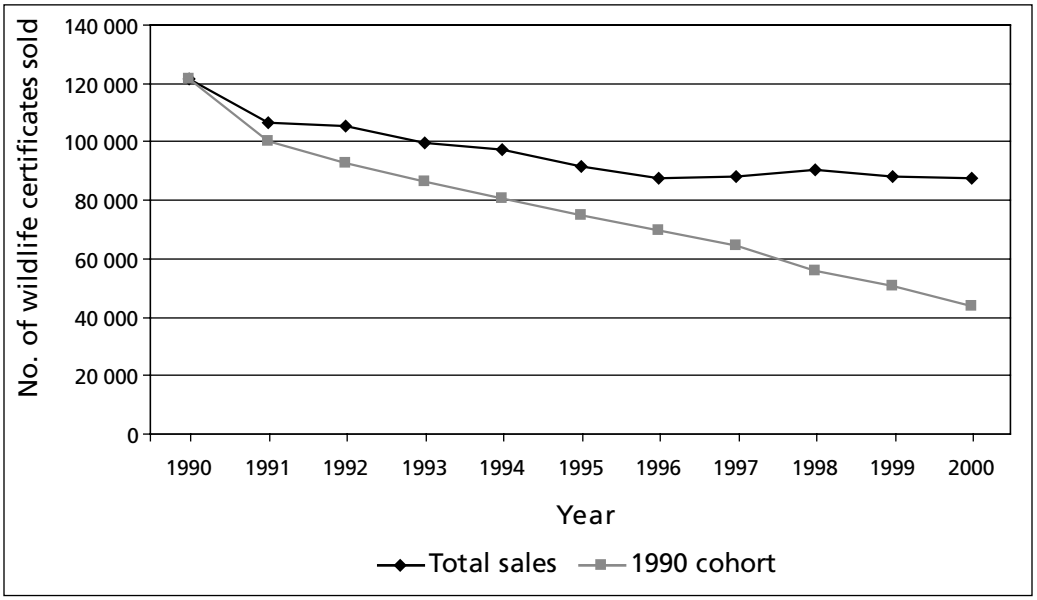

Figure 3. Sales of wildlife certificates to all resident Albertans and sales to those who purchased a certificate in 1990.

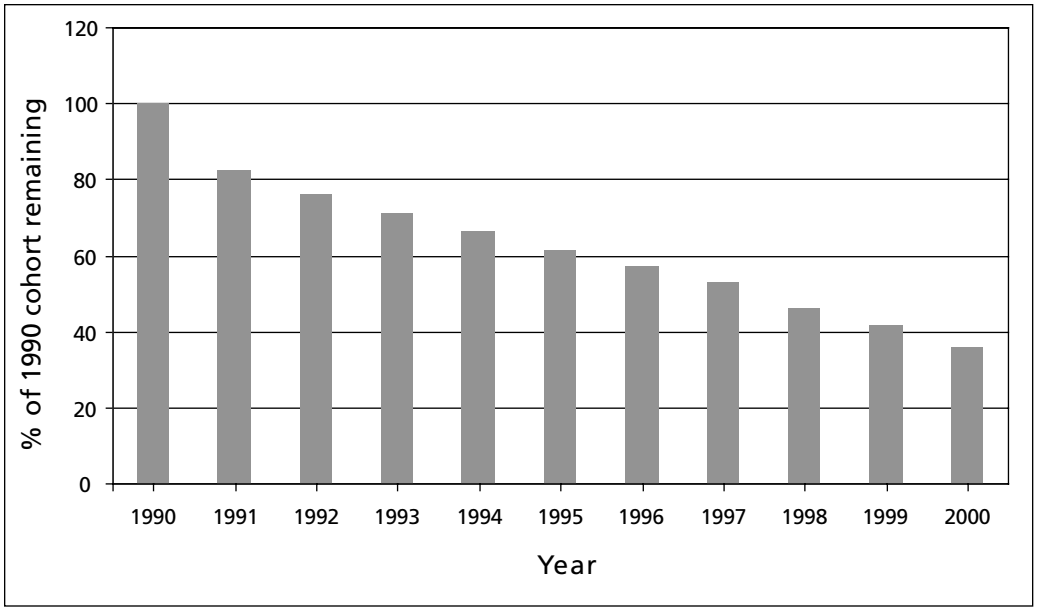

Figure 4. Percentage of the 1990 cohort still active each year from 1990 to 2000.

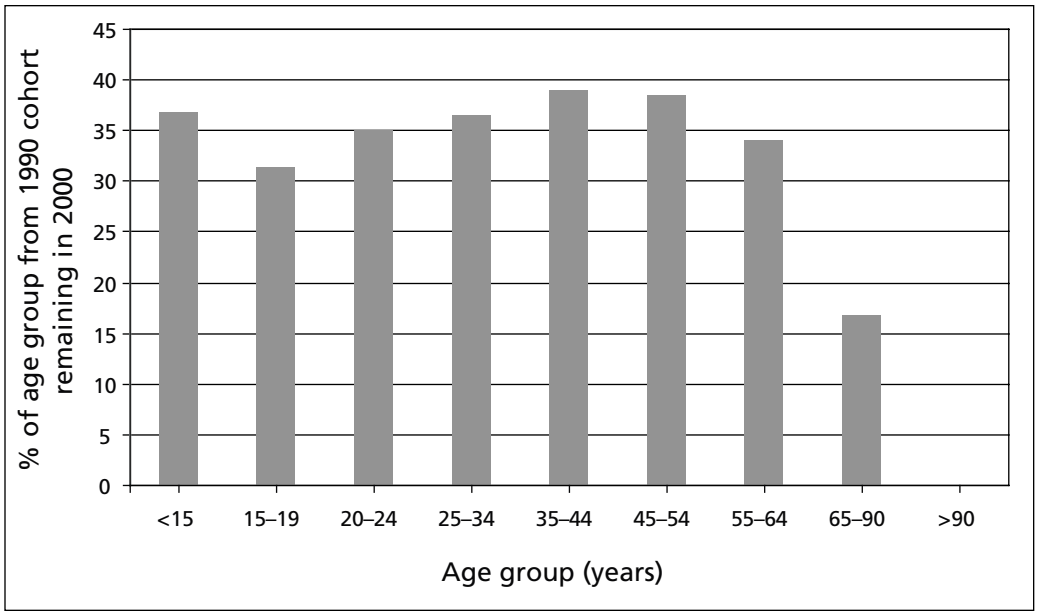

Figure 5. Percentage of each age group in the 1990 cohort remaining active in 2000. The age groups shown along the x axis reflect the age of cohort members in 1990.

Table 3. Drop-out rate of the 1990 cohort by gender

Year	No. who quit	% of annual total	% of 1990 cohort remaining
Original 1990 cohort			
Female	7 340	6.0	N/A[a]
Male	114 338	94.0	N/A
Total	121 678	100.0	N/A
1991			
Female	2 283	10.7	68.9
Male	19 095	89.3	83.3
Total	21 378	100.0	82.4
1992			
Female	692	9.1	59.5
Male	6 953	90.9	77.2
Total	7 645	100.0	76.1
1993			
Female	429	7.0	53.6
Male	5 686	93.0	72.2
Total	6 115	100.0	71.1
1994			
Female	401	7.1	48.2
Male	5 247	92.9	67.7
Total	5 648	100.0	66.5
1995			
Female	486	8.1	41.5
Male	5 551	91.9	62.8
Total	6 037	100.0	61.5
1996			
Female	361	6.9	36.6
Male	4 860	93.1	58.6
Total	5 221	100.0	57.2
1997			
Female	278	5.8	32.8
Male	4 556	94.2	54.6
Total	4 834	100.0	53.3
1998			
Female	372	4.3	27.8
Male	8 324	95.7	47.3
Total	8 696	100.0	46.1
1999			
Female	327	6.0	23.3
Male	5 161	94.0	42.8
Total	5 488	100.0	41.6
2000			
Female	470	6.7	16.9
Male	6 513	93.3	37.1
Total	6 983	100.0	35.9

[a]N/A = not applicable.

Table 4. Drop-out rate of the 1990 cohort by location (urban or rural)

Year	No. who quit	% of annual total	% of 1990 cohort remaining
Original 1990 cohort			
Urban	46 974	38.6	N/A[a]
Rural	74 704	61.4	N/A
Total	121 678	100.0	N/A
1991			
Urban	8 969	42.0	80.9
Rural	12 409	58.0	83.4
Total	21 378	100.0	82.4
1992			
Urban	3 041	39.8	74.4
Rural	4 604	60.2	77.2
Total	7 645	100.0	76.1
1993			
Urban	2 495	40.8	69.1
Rural	3 620	59.2	72.4
Total	6 115	100.0	71.1
1994			
Urban	2 318	41.0	64.2
Rural	3 330	59.0	67.9
Total	5 648	100.0	66.5
1995			
Urban	2 405	39.8	59.1
Rural	3 632	60.2	63.1
Total	6 037	100.0	61.5
1996			
Urban	1 918	36.7	55.0
Rural	3 303	63.3	58.6
Total	5 221	100.0	57.2
1997			
Urban	1 829	37.8	51.1
Rural	3 005	62.2	54.6
Total	4 834	100.0	53.3
1998			
Urban	3 447	39.6	43.8
Rural	5 249	60.4	47.6
Total	8 696	100.0	46.1
1999			
Urban	1 855	33.8	39.8
Rural	3 633	66.2	42.7
Total	5 488	100.0	41.6
2000			
Urban	2 541	36.4	34.4
Rural	4 442	63.6	36.8
Total	6 983	100.0	35.9

[a]N/A = not applicable.

Table 5. Drop-out rate of the 1990 cohort by region of residence[a]

Year	No. who quit	% of annual total	% of 1990 cohort remaining
Original 1990 cohort			
Southern	11 942	9.8	N/A[b]
Central	36 699	30.2	N/A
Eastern slopes	6 980	5.7	N/A
Peace River	15 785	13.0	N/A
Northeastern	50 259	41.3	N/A
Total[a]	121 678	100.0	N/A
1991			
Southern	1 982	9.3	83.4
Central	6 123	28.6	83.3
Eastern slopes	1 229	5.7	82.4
Peace River	2 988	14.0	81.1
Northeastern	9 056	42.4	82.0
Total	21 378	100.0	82.4
1992			
Southern	734	9.6	77.3
Central	2 157	28.2	77.4
Eastern slopes	420	5.5	76.4
Peace River	1 133	14.8	73.9
Northeastern	3 201	41.9	75.6
Total	7 645	100.0	76.1
1993			
Southern	592	9.7	72.3
Central	1 741	28.5	72.7
Eastern slopes	336	5.5	71.6
Peace River	975	15.9	67.7
Northeastern	2 471	40.4	70.7
Total	6 115	100.0	71.1
1994			
Southern	566	10.0	67.6
Central	1 777	31.5	67.9
Eastern slopes	320	5.7	67.0
Peace River	678	12.0	63.4
Northeastern	2 307	40.8	66.1
Total	5 648	100.0	66.5
1995			
Southern	551	9.1	62.9
Central	1 868	30.9	62.8
Eastern slopes	322	5.3	62.4
Peace River	807	13.4	58.3
Northeastern	2 489	41.2	61.2
Total	6 037	100.0	61.5
1996			
Southern	489	9.4	58.9
Central	1 539	29.5	58.6
Eastern slopes	325	6.2	57.7
Peace River	818	15.7	53.1
Northeastern	2 050	39.3	57.1
Total	5 221	100.0	57.2

Table 5. Concluded

Year	No. who quit	% of annual total	% of 1990 cohort remaining
1997			
Southern	519	10.7	54.5
Central	1 445	29.9	54.6
Eastern slopes	283	5.9	53.7
Peace River	587	12.1	49.4
Northeastern	2 000	41.4	53.1
Total	4 834	100.0	53.3
1998			
Southern	831	9.6	47.5
Central	2 677	30.8	47.3
Eastern slopes	494	5.7	46.6
Peace River	1 238	14.2	41.6
Northeastern	3 452	39.7	46.2
Total[a]	8 696	100.0	46.1
1999			
Southern	508	9.3	43.3
Central	1 594	29.0	43.0
Eastern slopes	364	6.6	41.4
Peace River	861	15.7	36.1
Northeastern	2 160	39.4	41.9
Total[a]	5 488	100.0	41.6
2000			
Southern	651	9.3	37.8
Central	2 102	30.1	37.3
Eastern slopes	427	6.1	35.2
Peace River	977	14.0	29.9
Northeastern	2 826	40.5	36.3
Total	6 983	100.0	35.9
Remaining in 2000			
Southern	4 519	10.4	37.8
Central	13 676	31.3	37.3
Eastern slopes	2 460	5.6	35.2
Peace River	4 723	10.8	29.9
Northeastern	18 247	41.8	36.3
Total[a]	43 633	100.0	35.9

[a]The sum of the regions does not equal the total listed; 13 hunters could not be assigned a region. Of these, 4 dropped out in 1998, 1 in 1999, and 8 were remaining in 2000.
[b]N/A = not applicable.

The Other Cohorts: New Entrants to Hunting, 1991–2000

A total of 114 333 individuals first appeared in the CLASS or RELMS databases after 1990 (Table 2). All of these hunters are called "new entrants," even though some of them may have hunted in one or more years before 1990. In each of the tables describing new entrants, the 1990 cohort is included for comparison. Figure 6 and Table 6 summarize the overall entry rate and the distribution of these new hunters by gender, respectively. A number of observations are apparent.

The number of new entrants to hunting has been declining (Fig. 6). In 1991 more than 21 000 new hunters were registered in the CLASS and purchased certificates. By 1997, the number of new entrants had dropped to just over 7 000 (Table 2). The number of new entrants then surged in 1998 and remained relatively high until 2000. It should be noted that 1998

was the year that the CLASS database was replaced by the RELMS database. Although every effort was made to ensure that hunters who had been listed in CLASS were identified as such in RELMS, it is possible that many of the "new entrants" in 1998 had in fact been hunters before inauguration of the RELMS. As discussed below, the demographic characteristics of the 1998 cohort do not resemble those of the other cohorts.

An increasing proportion of new entrants were female (Table 6). However, their actual numbers, like the total numbers of new entrants, have declined. On average, females made up approximately 8% of new entrants each year.

Although new entrants commenced hunting in each year during the period 1990–2000, it appears that they then quit at rates higher than those for the 1990 cohort. For example, about 36% of the 1990 cohort was still active in 2000, whereas only 20% of the 1991 cohort was still active in 2000. Although the probability of being active increased with more recent entry into hunting, only about 55% of the most recent cohort that could be examined (the 1999 cohort) was still active the following year.

Over the years 1991–2000, a total of 9 503 females and 104 829 males became new entrants. Of this group, females quit at a higher rate than males. Of the 114 332 new entrants over the period, only 38.8% of the males and 33.1% of the females were still hunting in 2000 (Table 6).

While there has been declining recruitment to the hunter population, an increasing proportion of the recruits have been younger individuals (Table 7). The percentage of people in the three youngest age groups was much higher for new entrants in each year from 1991 to 2000 than in the 1990 cohort.

The younger recruits were also more likely to continue as active hunters (Table 8). For example, about 36% of the hunters less than 15 years of age in 1991 were still active in 2000, whereas the percentage was about 20% for those over 24 years. New entrants in the older age groups were less likely to be active in subsequent years (Table 9). Thus, it seems that the probability of quitting in the first year increases with age.

The proportional representation of urban residents in the cohorts of new entrants declined after 1991 (Table 10). In the 1991 cohort, about 42% of hunters were from urban centers of Alberta, but by 2000 this proportion had declined to about 40%. This decline is not dramatic. However, in each cohort the urban dwellers dropped out at a higher rate than the rural dwellers (Table 10).

There were few discernible patterns in the cohorts of new entrants across the provincial regions of residence (Table 11). The regional composition of each of the cohorts was similar to that of the 1990 cohort. Furthermore, the percentages of hunters from a given cohort who were still active in 2000 were similar across regions (Table 12).

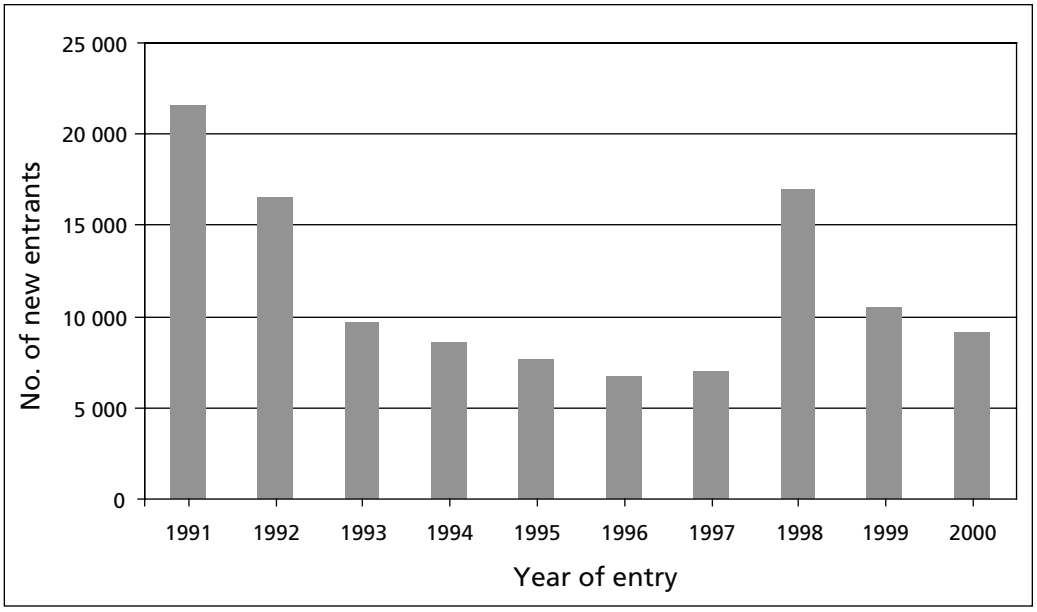

Figure 6. Number of new entrants to the hunting population from 1991 to 2000.

Table 6. Gender distribution of new entrants

Year of entry	No. who joined (% of annual total)		No. (%) of original new entrants still active in 2000	
1990 cohort (existing hunter population)[a]				
Female	7 340	(6.0)	1 241	(16.9)
Male	114 338	(94.0)	42 392	(37.1)
Total	121 678	(100.0)	43 633	(35.9)
1991 cohort				
Female	1 540	(7.1)	186	(12.1)
Male	20 040	(92.9)	4 071	(20.3)
Total	21 580	(100.0)	4 257	(19.7)
1992 cohort				
Female	1 205	(7.3)	186	(15.4)
Male	15 267	(92.7)	3 236	(21.2)
Total	16 472[b]	(100.0)	3 422	(20.8)
1993 cohort				
Female	860	(8.9)	140	(16.3)
Male	8 853	(91.1)	2 143	(24.2)
Total	9 713	(100.0)	2 283	(23.5)
1994 cohort				
Female	756	(8.8)	166	(22.0)
Male	7 819	(91.2)	2 184	(27.9)
Total	8 575	(100.0)	2 350	(27.4)
1995 cohort				
Female	685	(8.9)	170	(24.8)
Male	6 996	(91.1)	2 232	(31.9)
Total	7 681	(100.0)	2 402	(31.3)
1996 cohort				
Female	603	(9.0)	176	(29.2)
Male	6 109	(91.0)	2 113	(34.6)
Total	6 712	(100.0)	2 289	(34.1)
1997 cohort				
Female	649	(9.3)	216	(33.3)
Male	6 359	(90.7)	2 573	(40.5)
Total	7 008	(100.0)	2 789	(39.8)
1998 cohort				
Female	1 251	(7.4)	517	(41.3)
Male	15 707	(92.6)	8 631	(55.0)
Total	16 958	(100.0)	9 148	(53.9)
1999 cohort				
Female	1 046	(9.9)	483	(46.2)
Male	9 490	(90.1)	5 313	(56.0)
Total	10 536	(100.0)	5 796	(55.0)
2000 cohort				
Female	908	(10.0)	908	(100.0)
Male	8 189	(90.0)	8 189	(100.0)
Total	9 097	(100.0)	9 097	(100.0)
Summation over period 1991–2000				
Female	9 503	(8.3)	3 148	(33.1)
Male	104 829	(91.7)	40 685	(38.8)
Total	114 332	(100.0)	43 833	(38.3)

[a]The study period began in 1990; consequently, there is no information on hunters that first participated in that year. The 1990 cohort is included as a reference year to allow the new entrants' demographic characteristics to be compared with those of the existing hunter population.
[b]Does not match Table 2 due to missing gender designation.

Table 7. Age distribution of new entrants, as number (and percentage) of total cohort

Age (years)	Cohort										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
<15	855 (0.7)	567 (2.6)	964 (5.9)	740 (7.6)	864 (10.1)	902 (11.7)	857 (12.8)	788 (11.2)	1 210 (7.1)	1 100 (10.4)	924 (10.2)
15–19	8 405 (6.9)	2 179 (10.1)	2 860 (17.4)	1 589 (16.4)	1 572 (18.3)	1 461 (19.0)	1 364 (20.3)	1 346 (19.2)	1 563 (9.2)	1 513 (14.4)	1 455 (16.0)
20–24	10 148 (8.3)	2 513 (11.6)	1 839 (11.2)	924 (9.5)	854 (10.0)	733 (9.5)	702 (10.5)	717 (10.2)	2 099 (12.4)	1 326 (12.6)	1 025 (11.3)
25–34	35 445 (29.1)	6 648 (30.8)	4 483 (27.2)	2 474 (25.5)	2 025 (23.6)	1 848 (24.1)	1 581 (23.6)	1 669 (23.8)	4 273 (25.2)	2 561 (24.3)	2 228 (24.5)
35–44	31 871 (26.2)	4 984 (23.1)	3 228 (19.6)	2 014 (20.7)	1 657 (19.3)	1 439 (18.7)	1 113 (16.6)	1 291 (18.4)	3 874 (22.8)	2 010 (19.1)	1 711 (18.8)
45–54	18 424 (15.1)	2 671 (12.4)	1 751 (10.6)	1 124 (11.6)	895 (10.4)	727 (9.5)	638 (9.5)	723 (10.3)	2 315 (13.7)	1 251 (11.9)	1 051 (11.6)
55–64	10 743 (8.8)	1 350 (6.3)	896 (5.4)	598 (6.2)	468 (5.5)	381 (5.0)	293 (4.4)	309 (4.4)	1 166 (6.9)	537 (5.1)	466 (5.1)
65–90	5 774 (4.7)	656 (3.0)	443 (2.7)	250 (2.6)	240 (2.8)	190 (2.5)	164 (2.4)	165 (2.4)	458 (2.7)	236 (2.2)	237 (2.6)
>90	13 (0.0)	12 (0.1)	9 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.0)	0 (0.0)
Total	121 678(100.0)	21 580 (100.0)	16 473 (100.0)	9 713 (100.0)	8 575 (100.0)	7 681 (100.0)	6 712 (100.0)	7 008 (100.0)	16 958 (100.0)	10 536 (100.0)	9 097 (100.0)

Note: The study period began in 1990; consequently, there is no information on hunters that first participated in that year. The 1990 cohort is included as a reference year to allow the new entrants' demographic characteristics to be compared with those of the existing hunter population.

Table 8. Age distribution of hunters still active in 2000, as number (and percentage) of original age group

Age (years)	Cohort									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<15	315 (36.8)	202 (35.6)	353 (36.6)	294 (39.7)	400 (46.3)	452 (50.1)	497 (58.0)	522 (66.2)	897 (74.1)	898 (81.6)
15–19	2 642 (31.4)	519 (23.8)	670 (23.4)	447 (28.1)	448 (28.5)	445 (30.5)	467 (34.2)	554 (41.2)	691 (44.2)	903 (59.7)
20–24	3 550 (35.0)	511 (20.3)	390 (21.2)	235 (25.4)	224 (26.2)	235 (32.1)	221 (31.5)	278 (38.8)	1 076 (51.3)	691 (52.1)
25–34	12 933 (36.5)	1 323 (19.9)	887 (19.8)	573 (23.2)	568 (28.0)	590 (31.9)	496 (31.4)	611 (36.6)	2 291 (53.6)	1 368 (53.4)
35–44	12 475 (39.1)	944 (18.9)	653 (20.2)	428 (21.3)	411 (24.8)	387 (26.9)	334 (30.0)	474 (36.7)	2 143 (55.3)	1 001 (49.8)
45–54	7 093 (38.5)	488 (18.3)	297 (17.0)	202 (18.0)	189 (21.1)	183 (25.2)	180 (28.2)	222 (30.7)	1 244 (53.7)	593 (47.4)
55–64	3 656 (34.0)	215 (15.9)	131 (14.6)	84 (14.0)	86 (18.4)	82 (21.5)	70 (23.9)	81 (26.2)	598 (51.3)	239 (44.5)
65–90	969 (16.8)	55 (8.4)	41 (9.3)	20 (8.0)	24 (10.0)	28 (14.7)	24 (14.6)	47 (28.5)	208 (45.4)	102 (43.2)
>90	N/A[a]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 (50.0)
Total	43 633 (35.9)	4 257 (19.7)	3 422 (20.8)	2 283 (23.5)	2 350 (27.4)	2 402 (31.3)	2 289 (34.1)	2 789 (39.8)	9 148 (53.9)	5 796 (55.0)

Note: The study period began in 1990; consequently, there is no information on hunters that first participated in that year. The 1990 cohort is included as a reference year to allow the new entrants' demographic characteristics to be compared with those of the existing hunter population.
[a]N/A = not applicable (no new entrants in the cohort in this age category).

Table 9. First-year drop-out rate of new entrants (as percentage of original age or gender group)

Demographic characteristic	Cohort									
	1991	1992	1993	1994	1995	1996	1997	1998	1999	Average
Age (years)										
<15	7.6	8.8	6.8	7.2	7.8	9.7	19.3	11.8	18.4	11.1
15–19	27.4	22.0	18.6	21.9	21.6	20.5	32.8	35.4	40.3	26.3
20–24	36.8	36.1	31.8	30.9	32.9	31.1	40.3	31.0	47.9	35.7
25–34	36.9	34.8	32.8	31.9	32.2	34.9	42.0	30.9	46.6	35.7
35–44	37.7	35.4	37.7	36.8	35.8	37.1	41.9	30.3	50.2	37.2
45–54	36.4	38.0	39.6	39.0	34.7	39.2	45.9	32.7	52.6	38.7
55–64	41.0	41.3	44.5	42.5	40.2	44.7	52.4	33.5	55.5	42.1
65–90	43.3	43.6	48.8	50.0	54.2	53.0	55.2	37.8	56.8	46.6
>90	100.0	100.0	N/A[a]	N/A	N/A	N/A	N/A	N/A	50.0	95.7
Gender										
Female	39.7	31.5	35.2	34.5	35.5	32.0	41.1	39.9	53.8	38.6
Male	35.5	32.3	30.9	29.8	28.6	29.8	38.4	29.7	44.0	33.3

[a]N/A = not applicable (no new entrants in the cohort in this age category).

Table 10. Distribution of urban and rural new entrants

Year of entry	No. who joined (% of annual total)		Still active in 2000		
			Remaining hunters	% of original urban or rural cohort	% of total remaining hunters
1990					
Urban	46 973	(38.6)	16 156	34.4	37.0
Rural	74 705	(61.4)	27 477	36.8	62.3
Total	121 678	(100.0)	43 633	35.9	100.0
1991					
Urban	9 169	(42.5)	1 734	18.9	40.7
Rural	12 411	(57.5)	2 523	20.3	59.3
Total	21 580	(100.0)	4 257	19.7	100.0
1992					
Urban	6 817	(41.4)	1 271	18.6	37.1
Rural	9 656	(58.6)	2 151	22.3	62.9
Total	16 473	(100.0)	3 422	20.8	100.0
1993					
Urban	4 135	(42.6)	841	20.3	36.8
Rural	5 578	(57.4)	1 442	25.9	63.2
Total	9 713	(100.0)	2 283	23.5	100.0
1994					
Urban	3 360	(39.2)	844	25.1	35.9
Rural	5 215	(60.8)	1 506	28.9	64.1
Total	8 575	(100.0)	2 350	27.4	100.0
1995					
Urban	2 939	(38.3)	838	28.5	34.9
Rural	4 742	(61.7)	1 564	33.0	65.1
Total	7 681	(100.0)	2 402	31.3	100.0
1996					
Urban	2 676	(39.9)	853	31.9	37.3
Rural	4 036	(60.1)	1 436	35.6	62.7
Total	6 712	(100.0)	2 289	34.1	100.0
1997					
Urban	2 725	(38.9)	963	35.3	34.5
Rural	4 283	(61.1)	1 826	42.6	65.5
Total	7 008	(100.0)	2 789	39.8	100.0
1998					
Urban	6 688	(39.4)	3 624	54.2	39.6
Rural	10 270	(60.6)	5 521	53.8	60.4
Total	16 958	(100.0)	9 148[a]	53.9	100.0
1999					
Urban	4 241	(40.3)	2 192	51.7	37.8
Rural	6 295	(59.7)	3 603	57.2	62.2
Total	10 536	(100.0)	5 796[a]	55.0	100.0
2000					
Urban	3 642	(40.0)	3 642	99.9	40.0
Rural	5 455	(60.0)	5 455	99.9	60.0
Total	9 097	(100.0)	9 097	99.9	100.0

Note: The study period began in 1990; consequently, there is no information on hunters that first participated in that year. The 1990 cohort is included as a reference year to allow the new entrants' demographic characteristics to be compared with those of the existing hunter population.

[a]Values do not match Table 2 because of missing rural/urban designation.

Table 11. Regional distribution of new entrants, as number (and percentage) of total cohort

	Cohort										
Region	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Southern	11 942 (9.8)	2 054 (9.5)	1 658 (10.1)	1 037 (10.7)	982 (11.5)	840 (10.9)	800 (11.9)	755 (10.8)	1 453 (8.6)	1 058 (10.0)	982 (10.8)
Central	36 699 (30.2)	6 638 (30.8)	5 125 (31.1)	3 333 (34.3)	2 743 (32.0)	2 292 (29.8)	2 166 (32.3)	2 335 (33.3)	4 891 (28.9)	3 380 (32.1)	2 974 (32.7)
Eastern slopes	6 980 (5.7)	1 243 (5.8)	936 (5.7)	636 (6.5)	522 (6.1)	460 (6.0)	381 (5.7)	433 (6.2)	1 053 (6.2)	613 (5.8)	510 (5.6)
Peace River	15 785 (13.0)	2 700 (12.5)	1 911 (11.6)	913 (9.4)	1 018 (11.9)	1 072 (14.0)	764 (11.4)	804 (11.5)	2 714 (16.0)	1 310 (12.4)	1 103 (12.1)
Northeastern	50 259 (41.3)	8 942 (41.4)	6 838 (41.5)	3 792 (39.0)	3 306 (38.6)	3 015 (39.3)	2 596 (38.7)	2 678 (38.2)	6 839 (40.3)	4 168 (39.6)	3 520 (38.7)
Total[a]	121 678(100.0)	21 580 (100.0)	16 473 (100.0)	9 713 (100.0)	8 575 (100.0)	7 681 (100.0)	6 712 (100.0)	7 008 (100.0)	16 958 (100.0)	10 536 (100.0)	9 097 (100.0)

Note: The study period began in 1990; consequently, there is no information on hunters that first participated in that year. The 1990 cohort is included as a reference year to allow the new entrants' demographic characteristics to be compared with those of the existing hunter population.

[a]The total listed is the number by cohort by year. The sum of the regions does not equal the total value, because there were a number of individuals who could not be assigned to a region (13 in 1990, 3 in 1991, 5 in 1992, 2 in 1993, 4 in 1994, 2 in 1995, 5 in 1996, 3 in 1997, 8 in 1998, 7 in 1999, and 8 in 2000).

Table 12. Regional distribution of hunters still active in 2000, as number (and percentage) of original regional group

	Cohort									
Region	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Southern	4 519 (37.8)	447 (21.8)	357 (21.5)	248 (23.9)	277 (28.2)	250 (29.8)	267 (33.4)	300 (39.7)	798 (54.9)	603 (57.0)
Central	13 676 (37.3)	1 350 (20.3)	1 057 (20.6)	727 (21.8)	713 (26.0)	689 (30.1)	718 (33.1)	895 (38.3)	2 752 (56.3)	1 847 (54.6)
Eastern slopes	2 460 (35.2)	246 (19.8)	193 (20.6)	168 (26.4)	133 (25.5)	145 (31.5)	145 (38.1)	204 (47.1)	542 (51.5)	340 (55.5)
Peace River	4 723 (29.9)	403 (14.9)	361 (18.9)	221 (24.2)	281 (27.6)	331 (30.9)	261 (34.2)	293 (36.4)	1 286 (47.4)	670 (51.1)
Northeastern	18 247 (36.3)	1 809 (20.2)	1 451 (21.2)	918 (24.2)	945 (28.6)	986 (32.7)	897 (34.6)	1 097 (41.0)	3 764 (55.0)	2 334 (56.0)
Total[a]	43 633 (35.9)	4 257 (19.7)	3 422 (20.8)	2 283 (23.5)	2 350 (27.4)	2 402 (31.3)	2 289 (34.1)	2 789 (39.8)	9 148 (53.9)	5 796 (55.0)

Note: The study period began in 1990; consequently, there is no information on hunters that first participated in that year. The 1990 cohort is included as a reference year to allow the new entrants' demographic characteristics to be compared with those of the existing hunter population.

[a]The total listed is the number by cohort by year. The sum of the regions does not equal the total value, because there were a number of individuals who could not be assigned to a region (8 in 1990, 2 in 1991, 3 in 1992, 1 in each of 1993 to 1996, 6 in 1998, and 2 in 1999).

Comparison of Active Hunters in 1990 and 2000: Short-Run Results of the Decline

Tables 13 to 16 compare the active hunters in 2000 with those active at the beginning of the study period, in 1990. Thus, this analysis examines the combined effect of dropouts from the 1990 cohort, new entrants, and dropouts from the 1991–1999 cohorts.

Female hunters constituted a smaller proportion of the total population of hunters in 2000 than in 1990 (Table 13). Female new entrants dropped out at a faster rate than both male new entrants and the original female group. Of the active female hunters in 2000, only 28.3% had been active in 1990 (Table 13).

In general, the hunting population became older between 1990 and 2000 (Table 14). Although the proportion of hunters under 20 years of age remained the same, at about 9%, the proportion of hunters over 45 years of age rose from about 29% to about 40%. There was no distinct trend by age group in the likelihood of the 1990 cohort to remain active hunters in 2000, with about 36% of most age groups still present. The exceptions with a lower proportion remaining active were the cohorts 15–19 years of age (about 31%) and 65–90 years of age (about 17%); the exceptions with a higher proportion remaining active were the cohorts 35–44 and 45–54 years of age (about 40% for both).

There was not much variation in the regional structure of the active hunting population from 1990 to 2000 (Table 15). The southern region seemed to increase its share slightly at the expense of the Peace River region, possibly because of a higher number of dropouts in the Peace River region.

There was no significant change in the rural–urban mix of the hunting population from 1990 to 2000 (Table 16).

Summary and Observations

The total number of people who participate in hunting in Alberta has been declining since the early 1980s. This analysis of the wildlife certificate sales databases sheds light on who has quit, who has joined, and what the future Alberta resident hunter population might look like, given the continued presence of the factors contributing to the decline. The analysis so far raises the following observations.

The decline in numbers of hunters will continue under the present system of management. Several statistics support this conclusion. First, a large number of the 1990 cohort (hunters who began hunting in any year up to 1990 and were still active in 1990) quit: more than half of the hunters in this cohort were no longer active in 2000. Second, the number of new entrants to hunting declined until 1997. Even considering that the high numbers of recruits in 1991 and 1992 may have been due to people returning to the sport who had not hunted since 1989 or earlier, the decline from about 9 700 new entrants in 1993 to about 7 000 in 1997 is significant. There was a remarkable increase in new entrants in 1998 and high numbers in 1999 and 2000. However, this increase in new entrants was matched by an increase in the number of hunters quitting in those years. The result was a minor change in the total number of wildlife certificates sold. Given that there were no major price or regulatory changes in this period, the most plausible explanation is incomplete transition of hunter data from the CLASS database to the RELMS database. Third, new entrants did not continue as active hunters. The number of new entrants continuing to hunt in 2000 was not as high as the number of 1990 cohort hunters continuing to hunt in 2000, and about 30% of new entrants quit after hunting for only a single year.

Place of residence in the province did not seem to play a role in the declining number of hunters. The distribution of hunters in urban and rural areas was essentially identical in 1990 and 2000, as was the distribution of hunters among the five regions of the province.

Gender appeared to play a role in the decline and will affect the composition of the future hunting population. Although the number of female hunters has never been high, it declined steadily throughout the period examined, in spite of the fact that the percentage of females in the new entrant groups was higher than in the overall hunter population. Although these two statements appear contradictory, a major reason for concluding that gender played a role in the decline is the fact that female new entrants did not remain active as long as their male counterparts.

Age appeared to influence the likelihood of recruitment to hunting and of quitting:

- Slightly more than 50% of the hunters who dropped out from the 1990 cohort were 25 to

44 years of age (Table 14), but this age group accounted for only 40% of new entrants.

- The older age groups, as might be expected, had a higher drop-out rate than their initial proportion in the hunting population.
- In 1990, those under 20 years of age accounted for just 8% of active hunters, but by 2000 they made up 26% of new entrants. This finding is significant because this group is most likely to remain active after joining. For those under 15 years of age, the retention rate in any given cohort was nearly double that for any of the age groups over 24 years of age.
- The total number of new entrants to hunting declined, and the proportion of people under 20 years of age increased as a percentage of the total number of new entrants, although the actual number joining was relatively low and constant. Approximately 850 people under 15 years of age and 1 400 between 15 and 19 years of age took up hunting in each year of the study, with the exception of 1991 and 1992, when the number of new entrants 15 to 19 years of age was between 2 000 and 3 000. However, the number of young hunters joining and remaining active was not large enough to replace the middle-aged hunters who quit. This discrepancy suggests that the overall hunting population will be smaller and somewhat younger in the future.

Table 13. Gender distribution of active hunting population in 1990 and 2000

	Active in 1990		Active in 2000		Active in 1990 and still active in 2000			
Gender	No.	% of total	No.	% of total	No.	% of total	% of 1990 value[a]	% of 2000 value[a]
Female	7 340	6.0	4 389	5.0	1 241	2.8	16.9	28.3
Male	114 338	94.0	83 077	95.0	42 392	97.2	37.1	51.0
Total	121 678	100.0	87 466	100.0	43 633	100.0	35.9	50.0

[a]Calculated on the basis of active hunters in 1990 or 2000, by category.

Table 14. Age distribution of active hunting population in 1990 and 2000

	Active in 1990		Active in 2000		Active in 1990 and still active in 2000			
Age (years)	No.	% of total	No.	% of total	No.	% of total	% of 1990 value[a]	% of 2000 value[a]
<15	855	0.7	1 430	1.6	315	0.7	36.8	22.0
15–19	8 405	6.9	6 335	7.2	2 642	6.1	31.4	41.7
20–24	10 148	8.3	6 152	7.0	3 550	8.1	35.0	57.7
25–34	35 445	29.1	16 656	19.0	12 933	29.6	36.5	77.6
35–44	31 871	26.2	22 548	25.8	12 475	28.6	39.1	55.3
45–54	18 424	15.1	18 590	21.3	7 093	16.3	38.5	38.2
55–64	10 743	8.8	9 769	11.2	3 656	8.4	34.0	37.4
65–90	5 774	4.7	5 981	6.8	969	2.2	16.8	16.2
>90	13	0.0	5	0.0	0	0.0	0.0	0.0
Total	121 678	100.0	87 466	100.0	43 633	100.0	35.9	50.0

[a]Calculated on the basis of active hunters in 1990 or 2000, by category.

Table 15. Regional distribution of active hunting population in 1990 and 2000

	Active in 1990		Active in 2000		Active in 1990 and still active in 2000			
Region	No.	% of total	No.	% of total	No.	% of total	% of 1990 value[a]	% of 2000 value[a]
Southern	11 942	9.8	9 048	10.3	4 519	10.4	37.8	49.9
Central	36 699	30.2	27 398	31.3	13 676	31.3	37.3	49.9
Eastern slopes	6 980	5.7	5 086	5.8	2 460	5.6	35.2	48.4
Peace River	15 785	13.0	9 933	11.4	4 723	10.8	29.9	47.5
Northeastern	50 259	41.3	35 968	41.1	18 247	41.8	36.3	50.7
Total[b]	121 678	100.0	87 466	100.0	43 633	100.0	35.9	50.0

[a]Calculated on the basis of active hunters in 1990 or 2000, by category.
[b]Totals do not equal the sum of the regions; in both 1990 and 2000 there were some hunters who could not be assigned to a region.

Table 16. Distribution of active hunting population according to urban or rural residence in 1990 and 2000

	Active in 1990		Active in 2000		Active in 1990 and still active in 2000			
Location	No.	% of total	No.	% of total	No.	% of total	% of 1990 value[a]	% of 2000 value[a]
Urban	46 974	38.6	32 958	37.7	16 156	37.0	34.4	49.0
Rural	74 704	61.4	54 504	62.3	27 477	63.0	36.8	50.4
Total	121 678	100.0	87 466[b]	100.0	43 633	100.0	35.9	50.0

[a]Calculated on the basis of active hunters in 1990 or 2000, by category.
[b]Values do not match Table 2 because of missing rural/urban designation.

ANALYSIS OF LICENSE GROUPS: BIG GAME, BIRD GAME, AND MIXED HUNTERS

This section describes participants who hunted big game species only, bird game species only, or both during the study period. Big game includes both ungulate and carnivore species but not bird species. Bird game includes grouse, waterfowl, and pheasants, as well as wild turkey. As defined above, an active/willing big game hunter is someone who purchased a big game license or applied for a big game draw (even if he or she did not receive a license), or both. The exception to this definition is the total for 1990, which is the number who purchased licenses only, because draw data for that year were not available. Because of the draw data, the sum of participants in the three license groups for a given year may not be the same as the number of licenses sold. In addition, the sales of wildlife certificates may not equal the sum of the three categories, for two reasons: it is possible to purchase a certificate without purchasing a license and the definition of active/willing hunters includes those who applied for a draw without obtaining a license. Furthermore, starting in 1995 it was possible to apply for a draw without first obtaining a wildlife certificate.

To examine these groups, two tables are presented for each. The first table compares the total number of hunters each year who hunted only big game, only bird game, or both with the number who, over the period 1990–2000, hunted only big game, only bird game, or both. The second table presents the same cohort analysis as in Table 2.

Overview of Big Game Hunters

Table 17 shows the increasing importance of big game hunting for Alberta residents. The number of hunters who hunted only big game in a given year remained relatively constant at about 55 000 until 1998–2000, when it rose to about 60 000, but the decrease in certificate sales has meant that the dominance of this group in the hunter population has increased. It is noteworthy that the number of hunters who hunted big game only throughout the study period accounted for more than half of those who hunted big game only in a given year.

Table 18 shows the cohort analysis of hunters who hunted only big game throughout their active hunting years. Declines in the 1990 big game cohort were roughly constant, at about 2 000 (except for 1991, 1992, and 1998–2000). For the other cohorts, the declines are apparent but are not as pronounced as those for certificates (compare Table 18 with Table 2).

Except for 1991, 1992, and 1998, recruitment to big game hunting was relatively stable, at about 5 000 per year. For all years except 1992 recruitment was slightly less than the total number of hunters who quit in that year.

Overview of Bird Game Hunters

The annual number of bird game hunters constituted a small proportion of the active hunting population in any year (Table 19).

The number of hunters who hunted only bird game over the entire study period accounted for about half of the bird game hunters in any given year. This group was a very small proportion of all hunters.

For the period 1993–1997, the number of bird game hunters was relatively stable, but declining. The number of dropouts was greatest in 1999 and 2000.

Recruitment of bird game hunters was not high and from 1991 to 1993 was marked by dramatic declines (Table 20). Recruitment from 1993 to 1997 was stable at about 1 000 per year, but more than half of the new entrants quit after just 1 year. As for other profiles, there were large increases in 1998 and 1999.

In each year, those who quit hunting outnumbered new entrants by a significant margin, such that from 1990 to 2000 the number of bird game hunters declined from over 10 000 to about 4 000.

Table 17. Resident participants hunting only big game species, 1990–2000

Year	No. of Albertans who wanted to hunt[a]	No. who hunted only big game in that year	No. who hunted only big game over the study period[b]
1990	117 572	55 843	38 391
1991	104 077	52 794	31 061
1992	101 604	57 778	30 635
1993	98 277	60 266	29 591
1994	96 679	56 684	28 531
1995	96 906	55 945	28 815
1996	93 939	54 944	27 983
1997	94 753	55 024	28 865
1998	99 447	58 252	33 574
1999	98 996	60 919	35 216
2000	97 893	62 380	36 425

[a]This category includes all Albertans who purchased a license (and therefore a wildlife certificate) and/or applied for a lottery draw. For 1990 to 1994, the value shown here may be lower than the total certificates sold as shown in Table 2, if some people did not buy a license. From 1995 to 2000, the value shown here may be higher than certificates sold because from that date forward a draw application did not require prior purchase of a certificate. Unsuccessful draw applicants might not have hunted at all.
[b]Number of annual big game hunters who were lifetime big game only hunters.

Table 18. Number of resident hunters of big game only by cohort, 1990–2000

	Year of analysis										
Cohort[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1990 Cohort											
Quit		10 299	3 023	2 272	2 121	1 804	1 931	1 708	2 494	1 285	1 506
Active/willing		21 366	18 707	17 360	15 643	14 853	13 487	12 934	11 307	10 491	9 948
Skipped a year		6 726	6 362	5 437	5 033	4 019	3 454	2 209	1 432	963	N/A[c]
Remaining hunters	**38 391**[b]	28 092	25 069	22 797	20 676	18 872	16 941	15 133	12 739	11 454	9 948
1991 Cohort											
Quit			4 005	847	639	553	520	428	631	280	317
Active/willing			3 912	3 320	2 785	2 497	2 232	2 160	1 747	1 591	1 475
Skipped a year			1 778	1 523	1 419	1 154	899	543	325	201	N/A
Remaining hunters		**9 695**	5 690	4 843	4 204	3 651	3 131	2 703	2 072	1 792	1 475
1992 Cohort											
Quit				3 011	860	656	568	490	529	262	339
Active/willing				3 681	2 941	2 496	2 049	1 840	1 543	1 423	1 301
Skipped a year				1 324	1 204	993	872	591	359	217	N/A
Remaining hunters			**8 016**	5 005	4 145	3 489	2 921	2 431	1 902	1 640	1 301
1993 Cohort											
Quit					1 770	586	466	398	470	215	274
Active/willing					2 687	2 209	1 795	1 567	1 253	1 147	1 051
Skipped a year					773	665	613	443	287	178	N/A
Remaining hunters				**5 230**	3 460	2 874	2 408	2 010	1 540	1 325	1 051
1994 Cohort											
Quit						1 474	486	420	500	270	243
Active/willing						2 459	2 010	1 699	1 325	1 153	1 082
Skipped a year						542	505	396	270	172	N/A
Remaining hunters					**4 475**	3 001	2 515	2 095	1 595	1 325	1 082
1995 Cohort											
Quit							1 308	521	545	309	330
Active/willing							2 448	2 027	1 639	1 414	1 288
Skipped a year							545	445	288	204	N/A
Remaining hunters						**4 301**	2 993	2 472	1 927	1 618	1 288
1996 Cohort											
Quit								1 223	660	324	408
Active/willing								2 372	1 816	1 578	1 347
Skipped a year								361	263	177	N/A
Remaining hunters							**3 962**	2 733	2 079	1 755	1 347
1997 Cohort											
Quit									1 745	391	405
Active/willing									2 313	1 971	1 719
Skipped a year									202	153	N/A
Remaining hunters								**4 260**	2 515	2 124	1 719
1998 Cohort											
Quit										3 080	1 599
Active/willing										6 852	5 952
Skipped a year										699	N/A
Remaining hunters									**10 631**	7 551	5 952
1999 Cohort											
Quit											3 077
Active/willing											4 519
Skipped a year											N/A
Remaining hunters										**7 596**	4 519
2000 Cohort											
Quit											
Active/willing											
Skipped a year											
Remaining hunters											**6 743**
Total active	38 391	31 061	30 635	29 591	28 531	28 815	27 983	28 865	33 574	35 216	36 425
Total remaining[d]	38 391	37 787	38 775	37 875	36 960	36 188	34 871	33 837	37 000	38 180	36 425

[a]Quit = the number of individuals who quit hunting in a given year, Active/willing = the number of individuals who wanted to hunt in that year, and Skipped = the number of individuals who did not buy a wildlife certificate in that year.
[b]Values presented in bold indicate the number of new entrants in a given year (cohort). These hunters were active in their year of entry, and none could have quit or skipped, but to highlight their entry, they are listed only in the "Remaining hunters" category.
[c]N/A = not applicable.
[d]The total in the last row for each year shows the number of potential hunters and does not match the total active/willing hunters listed in Table 17. Some of these have skipped 1 year and returned to hunting the following year.

Table 19. Resident participants hunting only bird game species, 1990–2000

Year	No. of Albertans who wanted to hunt[a]	No. who hunted only bird game in that year	No. who hunted only bird game over the study period[b]
1990	117 572	16 351	10 075
1991	104 077	14 562	7 754
1992	101 604	11 919	6 305
1993	98 277	9 769	5 055
1994	96 679	9 751	4 742
1995	96 906	9 451	4 520
1996	93 939	8 944	4 147
1997	94 753	8 819	4 047
1998	99 447	8 614	4 517
1999	98 996	7 924	4 349
2000	97 893	6 993	4 020

[a]This category includes all Albertans who purchased a license (and therefore a wildlife certificate) and/or applied for a lottery draw. For 1990 to 1994, the value shown here may be lower than the total certificates sold as shown in Table 2, if some people did not buy a license. From 1995 to 2000, the value shown here may be higher than certificates sold because from that date forward a draw application did not require prior purchase of a certificate. Unsuccessful draw applicants might not have hunted at all.
[b]Number of annual big game hunters that were lifetime big game only hunters.

Table 20. Number of resident hunters of bird game only by cohort, 1990–2000

	Year of analysis										
Cohort[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1990 cohort											
Quit		4 236	1 053	676	511	488	437	428	580	251	304
Active/willing		4 417	3 426	2 810	2 540	2 301	2 033	1 836	1 382	1 244	1 111
Skipped a year		1 422	1 360	1 300	1 059	810	641	410	284	171	N/A[c]
Remaining hunters	**10 075**[b]	5 839	4 786	4 110	3 599	3 111	2 674	2 246	1 666	1 415	1 111
1991 cohort											
Quit			2 061	270	188	155	126	106	149	60	53
Active/willing			784	569	478	409	347	337	215	178	169
Skipped a year			492	437	340	254	190	94	67	44	N/A
Remaining hunters		**3 337**	1 276	1 006	818	663	537	431	282	222	169
1992 cohort											
Quit				1 300	197	132	74	85	87	57	51
Active/willing				504	382	295	262	215	162	124	112
Skipped a year				291	216	171	130	92	58	39	N/A
Remaining hunters			**2 095**	795	598	466	392	307	220	163	112
1993 cohort											
Quit					713	132	97	57	54	28	27
Active/willing					312	220	151	119	84	76	64
Skipped a year					147	107	79	54	35	15	N/A
Remaining hunters				**1 172**	459	327	230	173	119	91	64
1994 cohort											
Quit						635	108	72	64	40	40
Active/willing						286	184	146	109	84	71
Skipped a year						109	103	69	42	27	N/A
Remaining hunters					**1 030**	395	287	215	151	111	71
1995 cohort											
Quit							623	120	83	45	61
Active/willing							267	184	127	118	77
Skipped a year							119	82	56	20	N/A
Remaining hunters						**1 009**	386	266	183	138	77
1996 cohort											
Quit								572	159	49	51
Active/willing								272	132	103	72
Skipped a year								59	40	20	N/A
Remaining hunters							**903**	331	172	123	72
1997 cohort											
Quit									691	75	61
Active/willing									193	142	111
Skipped a year									54	30	N/A
Remaining hunters								**938**	247	172	111
1998 cohort											
Quit										1 203	355
Active/willing										790	111
Skipped a year										120	N/A
Remaining hunters									**2 113**	910	555
1999 cohort											
Quit											1 064
Active/willing											426
Skipped a year											N/A
Remaining hunters										**1 490**	426
2000 cohort											
Quit											
Active/willing											
Skipped a year											
Remaining hunters											**1 252**
Total active/willing	38 391	7 754	6 305	5 055	4 742	4 520	4 147	4 047	4 517	4 349	4 020
Total remaining[d]	38 391	9 176	8 157	7 083	6 504	5 971	5 409	4 907	5 153	4 835	4 020

[a]Quit = the number of individuals who quit hunting in a given year, Active/willing = the number of individuals who wanted to hunt in that year, and Skipped = the number of individuals who did not buy a wildlife certificate in that year.
[b]Values presented in bold indicate the number of new entrants in a given year (cohort). These hunters were active in their year of entry, and none could have quit or skipped, but to highlight their entry, they are listed only in the "Remaining hunters" category.
[c]N/A = not applicable.
[d]The total in the last row for each year shows the number of potential hunters and does not match the active/willing hunters listed in Table 19. Some of these have skipped 1 year and returned to hunting the following year.

Overview of Mixed Hunters

The number of people who hunted both big game and bird game in a given year (Table 21) was less than the number who hunted big game only in the same year (Table 17). However, the number of mixed hunters for the study period was greater than the number of mixed hunters in any given year, because a person only had to hunt the other species group (i.e., bird game if mainly a big game hunter or big game if mainly a bird game hunter) or apply for a draw once in the period of analysis to be classed as a mixed hunter for the entire period.

The number of mixed hunters over the entire period declined less dramatically than the decline in wildlife certificate sales. From 1990 to 2000 there was a drop of about 11 600 mixed hunters (69 106 to 57 448) (Table 21), whereas the drop in certificate sales was about 33 000 (Table 2).

Recruitment to this group of hunters, however, seems to have declined rapidly (Table 22). In 1991 about 9 200 people joined, but by 2000, recruitment had dropped to about 1 200. As for the other profiles, recruitment increased in 1998 and 1999. It should be remembered, however, the way in which mixed hunters were defined. The 1 200 new entrants in 2000 had to have hunted both species group in that year, but many hunters in the 1991 cohort could have been single-species hunters for years and mixed hunters for only one year. The analysis did not include an examination of how many new entrants were mixed hunters in their first year of hunting.

For most cohorts (particularly the 1990 cohort), there was a decrease in the number of mixed hunters quitting initially, but later in the period the number quitting increased. For the two "oldest" cohorts (1990 and 1991), this switch in the trend occurred in 1994. A unique surge in the drop-out rate occurred in 1998.

Table 21. Resident participants hunting both big game and bird game species, 1990–2000

Year	No. of Albertans who wanted to hunt[a]	No. who hunted both big game and bird game in that year	No. who hunted both big game and bird game over the study period[b]
1990	117 572	45 378	69 106
1991	104 077	36 721	65 262
1992	101 604	31 907	64 664
1993	98 277	28 242	63 631
1994	96 679	30 244	63 406
1995	96 906	31 510	63 571
1996	93 939	30 051	61 809
1997	94 753	30 910	61 841
1998	99 447	32 581	61 356
1999	98 996	30 153	59 431
2000	97 893	28 520	57 448

[a]This category includes all Albertans who purchased a license (and therefore a wildlife certificate) and/or applied for a lottery draw. For 1990 to 1994, the value shown here may be lower than the total certificates sold as shown in Table 2, if some people did not buy a license. From 1995 to 2000, the value shown here may be higher than certificates sold because from that date forward a draw application did not require prior purchase of a certificate. Unsuccessful draw applicants might not have hunted at all.
[b]Includes hunters who may have hunted big game or bird game only in a single year, but were mixed hunters during their lifetimes.

Table 22. Number of resident mixed hunters (both big game and bird game) by cohort, 1990–2000

	Year of analysis										
Cohort[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1990 cohort											
Quit		3 842	2 491	2 205	2 553	2 760	3 154	3 198	6 397	2 709	3 675
Active/willing		55 991	53 024	50 626	48 790	47 394	45 133	44 167	39 480	37 568	36 122
Skipped a year		9 273	9 749	9 942	9 225	7 861	6 968	4 736	3 026	2 229	N/A[b]
Remaining hunters	**69 106**[c]	65 264	62 773	60 568	58 015	55 255	52 101	48 903	42 506	39 797	36 122
1991 cohort											
Quit			1 057	461	536	513	592	631	966	437	564
Active/willing			5 996	5 621	5 311	5 155	4 817	4 623	4 000	3 710	3 514
Skipped a year			2 218	2 132	1 906	1 549	1 295	858	515	368	N/A
Remaining hunters		**9 271**	8 214	7 753	7 217	6 704	6 112	5 481	4 515	4 078	3 514
1992 cohort											
Quit				463	374	348	370	393	644	309	441
Active/willing				3 911	3 566	3 404	3 162	3 063	2 643	2 481	2 302
Skipped a year				1 270	1 241	1 055	927	633	409	262	N/A
Remaining hunters			**5 644**	5 181	4 807	4 459	4 089	3 696	3 052	2 743	2 302
1993 cohort											
Quit					277	198	226	244	379	223	268
Active/willing					2 575	2 408	2 211	2 096	1 900	1 734	1 658
Skipped a year					621	590	561	432	249	192	N/A
Remaining hunters				**3 473**	3 196	2 998	2 772	2 528	2 149	1 926	1 658
1994 cohort											
Quit						231	230	216	353	225	307
Active/willing						2 414	2 198	2 113	1 885	1 758	1 602
Skipped a year						519	505	374	249	151	N/A
Remaining hunters					**3 164**	2 933	2 703	2 487	2 134	1 909	1 602
1995 cohort											
Quit							228	225	326	206	261
Active/willing							2 154	2 020	1 813	1 640	1 550
Skipped a year							414	323	204	171	N/A
Remaining hunters						**2 796**	2 568	2 343	2 017	1 811	1 550
1996 cohort											
Quit								211	312	175	230
Active/willing								1 679	1 454	1 329	1 206
Skipped a year								244	157	107	N/A
Remaining hunters							**2 134**	1 923	1 611	1 436	1 206
1997 cohort											
Quit									315	214	242
Active/willing									1 599	1 408	1309
Skipped a year									166	143	N/A
Remaining hunters								**2 080**	1 765	1 551	1 309
1998 cohort											
Quit										628	800
Active/willing										5 545	5 154
Skipped a year										409	N/A
Remaining hunters									**6 581**	5 954	5 154
1999 cohort											
Quit											463
Active/willing											1 795
Skipped a year											
Remaining hunters										**2 258**	1 795
2000 cohort											
Quit											
Active/willing											
Skipped a year											
Remaining hunters											**1 236**
Total active/willing	69 106	65 262	64 664	63 631	63 406	63 571	61 809	61 841	61 355	59 431	57 448
Total remaining[d]	69 106	74 535	76 631	76 975	76 399	75 145	72 479	69 441	66 330	63 463	57 448

[a]Quit = the number of individuals who quit hunting in a given year, Active/willing = the number of individuals who wanted to hunt in that year, and Skipped = the number of individuals who did not buy a wildlife certificate in that year.
[b]N/A = not applicable.
[c]Values presented in bold indicate the number of new entrants in a given year (cohort). These hunters were active in their year of entry, and none could have quit or skipped, but to highlight their entry, they are listed only in the "Remaining hunters" category.
[d]The total in the last row for each year shows the number of potential hunters and does not match the active/willing hunters listed in Table 21. Some of these have skipped 1 year and returned to hunting the following year.

Sociodemographic Characteristics of Hunter Groups

For both 1990 and 2000, females were more likely to be big game hunters than either bird game or mixed hunters (Table 23), whereas males were more likely to be mixed hunters. There was little change in the overall gender composition of the groups between 1990 and 2000, except for hunters of big game only, among whom the proportion of females rose from 10.1% to 13.0%.

The number of female hunters willing to hunt rose from 6 370 in 1990 to 6 942 in 2000. This increase was directly attributable to a rise in the number of females hunting big game only, from 3 875 to 4 733. The number of females hunting bird game only declined substantially, while female mixed hunter numbers stayed the same (Table 23).

In 2000, most hunters in the two youngest age categories were big game hunters (Table 24). In particular, of 7 010 hunters between the ages of 15 and 19 years, 5 829 were big game hunters. Big game hunting now appears to be the hunting activity of choice among younger hunters. Since 1992, new entrants between 12 and 17 years of age could purchase a special youth wildlife certificate and youth deer hunting license. The youth certificate also included a free bird hunting license. There is no way of determining how many youths actually hunted birds under this system. Therefore, the numbers listed as big game hunters (which includes those with the youth deer license) may be inflated, and the numbers of mixed hunters may be too low.

In 1990, mixed game hunters were the most important single group for all hunters older than 19, and under 90 (Table 24), but in 2000 the predominance of mixed hunting began at age 25. This might suggest that younger new entrants were not taking up bird game hunting, despite a free (and unlisted) bird game license with the special youth option.

Big game hunters in the older age groups quit at higher rates than those in the younger age groups (Table 25). However, bird game hunters quit at much higher rates than big game hunters after their first year of hunting (Table 26). The pattern of quitting in each age group over the period appeared similar to that for big game hunters; for example, hunters in the youngest age group generally quit at the lowest rate. For the next oldest age category, there was a considerable jump in the rate.

Mixed hunters had a similar drop-out pattern to that shown by big game hunters (Table 27), with the youngest least likely to drop out. An exception is the years 1996 and 1997 where the under 15 quit at about the same or a higher rate than some other age groups. However, the overall drop-out rate for mixed hunters was dramatically lower than the other two groups.

Among big game hunters, the numbers of new entrants in the two youngest age categories were generally much higher than in the other two groups (Table 28). For the big game hunters, these two age categories were frequently the highest contributors to the new entrant population in a given year, except in 1998–2000, when there were high numbers of new entrants between 25 and 44 years of age. For the other two hunter groups, people 25–44 years of age contributed most of the new entrants in each year.

Bird game hunters had higher rates of quitting than either of the other groups (Table 29). The pattern of quitting among the age categories was similar for all cohorts.

The observations noted above for the younger age categories are highlighted in Table 29, which compares the 1990 hunters with those still active in 2000. The information in the table is presented according to age in 1990. First, retention rates were highest among the big game hunters and lowest among the bird game hunters. Second, the retention rate for big game hunters was lowest for hunters between 15 and 24 years of age and for those over 65 years of age. For mixed hunters there was an increase in retention rate with age until age 55 and a sharp drop among those over 65 years of age.

Of the three groups, bird game hunters showed the most change in rural–urban distribution of hunters active in 1990 and still active in 2000 (Table 30). Of the 1990 bird game hunters still active in 2000, over 70% were residing in urban areas, whereas only about 60% had been urban dwellers in 1990. Only about 24% of the urban big game hunters and about 27% of urban mixed hunters who were active in 1990 were still active hunters in 2000. This observation suggests that the avid bird hunters (at least those who hunt nothing else) were more likely to be urban dwellers in the later years of the study period.

The percentages of the 1990 big game hunters and bird game hunters still active in 2000 was much lower than the percentage of mixed hunters. This decline was particularly pronounced for the bird game hunters: only 11.0% of bird game hunters were still active in 2000, and only about 8% of rural bird game hunters were still active in 2000.

Table 23. Gender of resident hunters in 1990 and 2000, by hunter group

	1990				2000			
Gender	No. (and %) of Albertans who wanted to hunt[a]	No. (and %) of big game hunters	No. (and %) of bird game hunters	No. (and %) of mixed hunters	No. (and %) of Albertans who wanted to hunt[a]	No. (and %) of big game hunters	No. (and %) of bird game hunters	No. (and %) of mixed hunters
Female	6 370 (5.4)	3 875 (10.1)	418 (4.1)	2 077 (3.0)	6 942 (7.1)	4 733 (13.0)	164 (4.1)	2 045 (3.6)
Male	111 202 (94.6)	34 516 (89.9)	9 657 (95.9)	67 029 (97.0)	90 951 (92.9)	31 692 (87.0)	3 856 (95.9)	55 403 (96.4)
Total	117 572 (100.0)	38 391 (100.0)	10 075 (100.0)	69 106 (100.0)	97 893 (100.0)	36 425 (100.0)	4 020 (100.0)	57 448 (100.0)

Note: This category includes Albertans who purchased a license (and therefore a wildlife certificate) and/or applied for a lottery draw. For 1990 to 1994 the value shown here may be lower than the total certificates sold as shown in Table 2, if some people did not buy a license. From 1995 to 2000, the value shown here may be higher than certificates sold because from that date forward a draw application did not require prior purchase of a certificate. Unsuccessful draw applicants might not have hunted at all.

Table 24. Age of resident hunters in 1990 and 2000, by hunter group

	1990				2000			
Age (years)	No. (and %) of Albertans who wanted to hunt	No. (and %) of big game hunters	No. (and %) of bird game hunters	No. (and %) of mixed hunters	No. (and %) of Albertans who wanted to hunt	No. (and %) of big game hunters	No. (and %) of bird game hunters	No. (and %) of mixed hunters
<15	831 (0.7)	86 (0.2)	96 (1.0)	649 (0.9)	1 505 (1.5)	1 325 (3.6)	1 (0.0)	179 (0.3)
15–19	8 149 (6.9)	2 438 (6.4)	655 (6.5)	5 056 (7.3)	7 010 (7.2)	5 829 (16.0)	38 (1.0)	1 143 (2.0)
20–24	9 881 (8.4)	3 146 (8.2)	832 (8.3)	5 903 (8.5)	6 918 (7.1)	3 094 (8.5)	296 (7.4)	3 528 (6.1)
25–34	34 328 (29.2)	11 515 (30.0)	2 525 (25.1)	20 288 (29.4)	18 377 (18.8)	6 536 (17.9)	771 (19.2)	11 070 (19.3)
35–44	30 759 (26.2)	9 922 (25.8)	2 356 (23.4)	18 481 (26.7)	25 108 (25.6)	7 999 (22.0)	966 (24.0)	16 143 (28.1)
45–54	17 730 (15.1)	5 703 (14.9)	1 588 (15.8)	10 439 (15.1)	20 851 (21.3)	6 284 (17.3)	904 (22.5)	13 663 (23.8)
55–64	10 332 (8.8)	3 491 (9.1)	1 171 (11.6)	5 670 (8.2)	11 242 (11.5)	3 364 (9.2)	576 (14.3)	7 302 (12.7)
65–90	5 549 (4.7)	2 084 (5.4)	850 (8.4)	2 615 (3.8)	6 874 (7.0)	1 989 (5.5)	468 (11.6)	4 417 (7.7)
>90	13 (0.0)	6 (0.0)	2 (0.0)	5 (0.0)	8 (0.0)	5 (0.0)	0 (0.0)	3 (0.0)
Total	117 572 (100.0)	38 391 (100.0)	10 075 (100.0)	69 106 (100.0)	97 893 (100.0)	36 425 (100.0)	4 020 (100.0)	57 448 (100.0)

Table 25. First-year drop-out rate of new big game hunters (as percentage of original age or gender group)[a]

Demographic characteristic	Cohort								
	1991	1992	1993	1994	1995	1996	1997	1998	1999
Age (years)									
<15	9.6	13.6	4.6	8.2	6.1	10.1	17.4	9.8	16.3
15–19	33.1	28.3	22.4	24.6	23.4	22.2	30.7	25.6	34.1
20–24	44.8	44.7	37.1	38.4	38.5	35.7	47.5	35.9	46.8
25–34	43.4	39.0	37.5	37.9	36.0	36.2	50.3	33.4	46.4
35–44	41.7	40.3	39.5	39.4	37.4	37.7	47.8	31.9	46.3
45–54	37.8	39.0	37.1	39.2	35.3	41.4	49.9	30.7	46.9
55–64	45.0	40.7	43.3	39.3	31.7	52.1	56.9	31.8	49.7
65–90	43.0	47.3	48.7	48.1	50.0	52.9	58.3	40.9	52.9
>90	100.0	100.0	N/A[b]	N/A	100.0	100.0	66.7	N/A	66.7
Gender									
Female	40.0	32.6	27.7	28.3	28.0	30.0	37.0	27.5	36.7
Male	41.5	38.1	34.8	33.6	30.8	31.0	41.5	29.2	41.2

[a]The 1990 cohort is the existing population in 1990, they did not join in 1990. Since we cannot determine which of them joined in 1990, we cannot say how many are first year dropouts; consequently, they are not included.
[b]N/A = not applicable (no new big game hunters in the cohort in this age category).

Table 26. First-year drop-out rate of new bird game hunters (as percentage of original age or gender group)[a]

Demographic characteristic	Cohort								
	1991	1992	1993	1994	1995	1996	1997	1998	1999
Age (years)									
<15	56.9	33.3	45.5	41.7	57.1	70.0	100.0	N/A	N/A
15–19	69.4	67.4	51.6	46.3	58.1	58.5	8.7	65.3	77.8
20–24	64.6	64.1	67.9	66.7	71.4	63.8	72.0	65.1	77.2
25–34	63.0	63.7	62.5	61.9	61.7	63.1	72.0	55.3	72.0
35–44	61.6	60.7	59.9	64.3	60.9	66.5	73.3	52.1	70.2
45–54	59.0	60.3	58.9	62.9	52.5	61.4	73.5	59.8	67.8
55–64	58.2	61.6	58.2	60.7	65.3	57.8	75.9	59.2	72.4
65–90	54.6	59.0	69.1	61.3	70.0	66.0	67.4	52.5	65.2
>90	100.0	100.0	N/A[b]	N/A	N/A	N/A	N/A	N/A	N/A
Gender									
Female	71.2	60.2	60.0	71.7	72.1	60.0	61.5	66.4	77.1
Male	61.4	62.1	60.9	61.2	61.1	63.5	74.6	56.4	71.1

[a]The 1990 cohort is the existing population in 1990, they did not join in 1990. Since we cannot determine which of them joined in 1990, we cannot say how many are first year dropouts; consequently, they are not included.
[b]N/A = not applicable (no new bird game hunters in the cohort in this age category).

Table 27. First-year drop-out rate of new mixed hunters (as percentage of original age or gender group)[a]

Demographic characteristic	Cohort								
	1991	1992	1993	1994	1995	1996	1997	1998	1999
Age (years)									
<15	1.7	0.0	0.0	0.8	0.5	1.4	0.0	3.2	10.2
15–19	8.4	2.9	2.8	2.1	2.2	1.9	5.8	9.7	13.4
20–24	13.0	10.5	9.2	7.1	10.1	9.6	18.6	9.8	24.0
25–34	11.9	9.0	7.4	8.5	9.2	14.5	16.8	10.5	19.9
35–44	12.8	8.5	12.4	9.7	11.6	10.0	14.8	9.1	23.1
45–54	12.4	10.6	11.0	10.6	9.7	13.6	18.1	9.7	20.6
55–64	10.7	12.4	13.1	15.8	13.5	17.3	20.0	8.8	18.5
65–90	13.3	11.9	10.6	7.1	13.2	16.7	31.4	8.7	27.5
>90	100.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gender									
Female	12.0	6.1	9.8	7.8	7.1	6.2	15.6	10.2	18.6
Male	11.4	8.3	7.9	7.3	8.2	10.2	15.1	9.5	20.7

[a]The 1990 cohort is the existing population in 1990, they did not join in 1990. Since we cannot determine which of them joined in 1990, we cannot say how many are first year dropouts; consequently, they are not included.

Table 28. Age distribution of new entrants, as number (and percentage) of cohort of hunter type

Age (years)	Cohort																			
	1991		1992		1993		1994		1995		1996		1997		1998		1999		2000	
Big game only																				
<15	83	(0.9)	235	(2.9)	262	(5.0)	390	(8.7)	425	(9.9)	485	(12.2)	472	(11.1)	1 247	(11.7)	1 049	(13.8)	872	(12.9)
15–19	858	(8.8)	1 596	(19.9)	1 051	(20.1)	1 076	(24.0)	1 094	(25.4)	1 110	(28.0)	1 209	(28.4)	1 873	(17.6)	1 321	(17.4)	1 081	(16.0)
20–24	1 054	(10.9)	828	(10.3)	442	(8.5)	396	(8.8)	348	(8.1)	342	(8.6)	314	(7.4)	1 070	(10.1)	823	(10.8)	711	(10.5)
25–34	3 049	(31.4)	2 177	(27.2)	1 288	(24.6)	994	(22.2)	887	(20.6)	809	(20.4)	876	(20.6)	2 198	(20.7)	1 613	(21.2)	1 638	(24.3)
35–44	2 347	(24.2)	1 601	(20.0)	1 075	(20.6)	832	(18.6)	784	(18.2)	578	(14.6)	697	(16.4)	2 072	(19.5)	1 395	(18.4)	1 225	(18.2)
45–54	1 315	(13.6)	896	(11.2)	625	(12.0)	432	(9.7)	416	(9.7)	365	(9.2)	388	(9.1)	1 261	(11.9)	850	(11.2)	737	(10.9)
55–64	647	(6.7)	440	(5.5)	337	(6.4)	224	(5.0)	224	(5.2)	169	(4.3)	195	(4.6)	658	(6.2)	370	(4.9)	328	(4.9)
65–90	335	(3.5)	239	(3.0)	150	(2.9)	131	(2.9)	122	(2.8)	102	(2.6)	103	(2.4)	252	(2.4)	172	(2.3)	151	(2.2)
>90	7	(0.1)	4	(0.0)	0	(0.0)	0	(0.0)	1	(0.0)	2	(0.1)	6	(0.1)	0	(0.0)	3	(0.0)	0	(0.0)
Total	9 695	(100.0)	8 016	(100.0)	5 230	(100.0)	4 475	(100.0)	4 301	(100.0)	3 962	(100.0)	4 260	(100.0)	10 631	(100.0)	7 596	(100.0)	6 743	(100.0)
Bird game only																				
<15	58	(1.7)	15	(0.7)	11	(0.9)	12	(1.2)	7	(0.7)	10	(1.1)	18	(1.9)	0		0		1	(0.1)
15–19	271	(8.1)	89	(4.2)	62	(5.3)	67	(6.5)	43	(4.3)	41	(4.5)	61	(6.5)	75	(3.5)	45	(3.0)	35	(2.8)
20–24	328	(9.8)	259	(12.4)	106	(9.0)	87	(8.4)	98	(9.7)	105	(11.6)	118	(12.6)	241	(11.4)	206	(13.8)	176	(14.1)
25–34	915	(27.4)	615	(29.4)	280	(23.9)	247	(24.0)	282	(27.9)	233	(25.8)	232	(24.7)	523	(24.8)	421	(28.3)	335	(26.8)
35–44	796	(23.9)	506	(24.2)	287	(24.5)	249	(24.2)	253	(25.1)	236	(26.1)	225	(24.0)	572	(27.1)	349	(23.4)	310	(24.8)
45–54	473	(14.2)	307	(14.7)	224	(19.1)	186	(18.1)	158	(15.7)	145	(16.1)	155	(16.5)	371	(17.6)	273	(18.3)	210	(16.8)
55–64	311	(9.3)	203	(9.7)	134	(11.4)	107	(10.4)	98	(9.7)	83	(9.2)	83	(8.8)	211	(10.0)	127	(8.5)	120	(9.6)
65–90	183	(5.5)	100	(4.8)	68	(5.8)	75	(7.3)	70	(6.9)	50	(5.5)	46	(4.9)	120	(5.7)	69	(4.6)	65	(5.2)
>90	2	(0.1)	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)
Total	3 337	(100.0)	2 095	(100.0)	1 172	(100.0)	1 030	(100.0)	1 009	(100.0)	903	(100.0)	938	(100.0)	2 113	(100.0)	1 490	(100.0)	1 252	(100.0)
Mixed game																				
<15	421	(4.5)	210	(3.7)	233	(6.7)	260	(8.2)	213	(7.6)	146	(6.8)	97	(4.7)	156	(2.4)	88	(3.9)	91	(7.4)
15–19	1 075	(11.6)	895	(15.9)	618	(17.8)	576	(18.2)	490	(17.5)	374	(17.5)	226	(10.9)	453	(6.9)	172	(7.6)	69	(5.6)
20–24	1 142	(12.3)	732	(13.0)	382	(11.0)	381	(12.0)	335	(12.0)	293	(13.7)	306	(14.7)	933	(14.2)	379	(16.8)	174	(14.1)
25–34	2 816	(30.4)	1 669	(29.6)	969	(27.9)	832	(26.3)	807	(28.9)	593	(27.8)	638	(30.7)	1 834	(27.9)	725	(32.1)	413	(33.4)
35–44	2 074	(22.4)	1 157	(20.5)	710	(20.4)	620	(19.6)	543	(19.4)	409	(19.2)	461	(22.2)	1 655	(25.1)	458	(20.3)	268	(21.7)
45–54	1 043	(11.3)	594	(10.5)	335	(9.6)	301	(9.5)	259	(9.3)	214	(10.0)	237	(11.4)	945	(14.4)	277	(12.3)	149	(12.1)
55–64	488	(5.3)	267	(4.7)	160	(4.6)	152	(4.8)	111	(4.0)	75	(3.5)	80	(3.8)	445	(6.8)	119	(5.3)	54	(4.4)
65–90	210	(2.3)	118	(2.1)	66	(1.9)	42	(1.3)	38	(1.4)	30	(1.4)	35	(1.7)	161	(2.4)	40	(1.8)	18	(1.5)
>90	2	(0.0)	2	(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)
Total	9 271	(100.0)	5 644	(100.0)	3 473	(100.0)	3 164	(100.0)	2 796	(100.0)	2 134	(100.0)	2 080	(100.0)	6 582	(100.0)	2 258	(100.0)	1 236	(100.0)

Table 29. Age distribution of hunters active in 1990 and still active in 2000, by hunter group

Age (years)	Big game only			Bird game only			Mixed game		
	No. in 1990	No. remaining in 2000 (and % of 1990)		No. in 1990	No. remaining in 2000 (and % of 1990)		No. in 1990	No. remaining in 2000 (and % of 1990)	
<15	86	26	(30.2)	96	5	(5.2)	649	303	(46.7)
15–19	2 438	516	(21.2)	655	18	(2.7)	5 056	2 293	(45.4)
20–24	3 146	706	(22.4)	832	42	(5.0)	5 903	3 013	(51.0)
25–34	11 515	2 909	(25.3)	2 525	207	(8.2)	20 288	10 714	(52.8)
35–44	9 922	2 887	(29.1)	2 356	316	(13.4)	18 481	10 282	(55.6)
45–54	5 703	1 720	(30.2)	1 588	259	(16.3)	10 439	5 818	(55.7)
55–64	3 491	893	(25.6)	1 171	198	(16.9)	5 670	2 951	(52.0)
65–90	2 084	291	(14.0)	850	66	(7.8)	2 615	748	(28.6)
>90	6	0	(0.0)	2	0	(0.0)	5	0	(0.0)
Total	38 391	9 948	(25.9)	10 075	1 111	(11.0)	69 106	36 122	(52.3)

Table 30. Distribution of urban and rural hunters active in 1990 and still active in 2000, by hunter group

Location	Active in 1990		Active in 2000		% of 1990 group
	No.	% of total	No.	% of total	
Big game only					
Urban	12 634	32.9	3 036	30.5	24.0
Rural	25 757	67.1	6 912	69.5	26.8
Total	38 391	100.0	9 948	100.0	25.9
Bird game only					
Urban	6 128	60.8	808	72.7	13.2
Rural	3 947	39.2	303	27.3	7.7
Total	10 075	100.0	1 111	100.0	11.0
Mixed game					
Urban	26 349	38.1	13 454	37.2	51.1
Rural	42 757	61.9	22 668	62.8	53.0
Total	69 106	100.0	36 122	100.0	52.3

Summary and Observations

This analysis of the species groups that hunters are seeking adds to the picture provided by the preceding analysis of certificate sales. Two interesting observations are apparent: the hunting of bird game only underwent a substantial decline over the study period, and big game hunting increased in importance. These observations suggest major changes in the preferences of hunters over the study period.

The big game group seems more stable and is becoming a dominant segment of the hunter population. This activity attracts more women than the other types of hunting, and it also attracts more young recruits. However, study of this activity is complex, because in addition to the big game group, there is a group of hunters seeking both big game and bird game. Despite this complexity, there are some important differences between mixed hunters and those who hunt only big game.

Recruitment to the big game group was roughly equal to that of the mixed hunters group, until 1998, after which recruitment to the big game group became much higher (Fig. 7). After the dramatic decline from 1990 to 1991, recruitment to these groups was relatively stable, though still in decline from 1991 to 1997.

The rates of quitting for these two groups in the cohort for which there were the most data (1990 cohort) suggest that mixed hunters quit at a much

lower rate than big game hunters. The annual number of mixed hunters in the 1990 cohort who quit increased after 1991, from 1992 to 1997 was marginally greater than the number of big game hunters who quit (Fig. 8). From 1998 to 2000 the numbers of mixed hunters quitting was substantially higher than the number of big game hunters.

This information points to the overall future dominance of big game hunters in the Alberta hunting population. One of the major reasons for this trend could be the decline in interest in bird game hunting, as indicated by the data for bird game hunters and for mixed hunters.

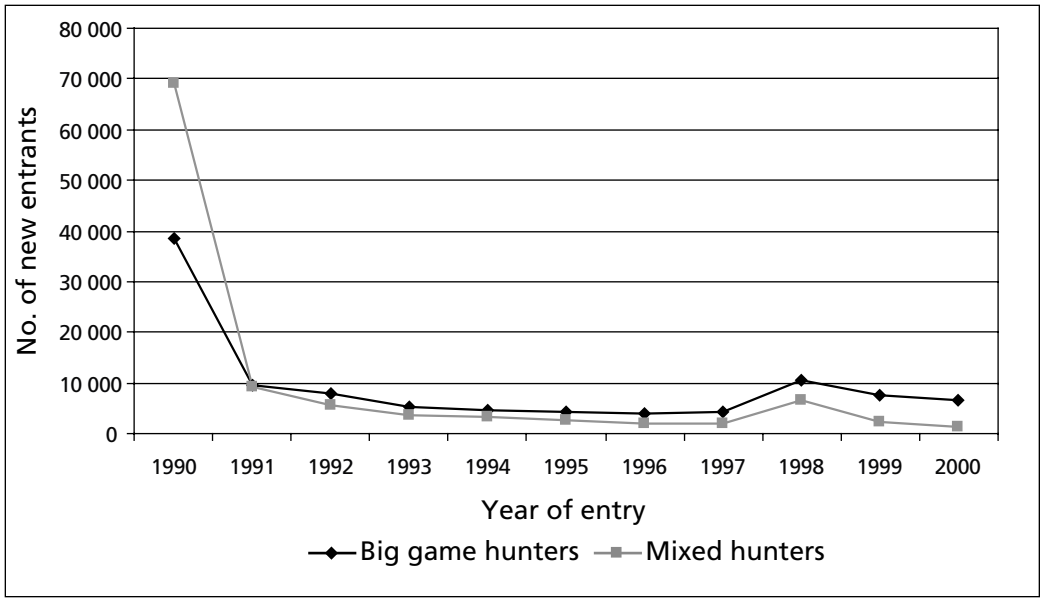

Figure 7. Number of big game and mixed hunters who entered the hunting population over the period 1990–2000. The 1990 values represent the hunter populations existing at that time, not just hunters joining in 1990.

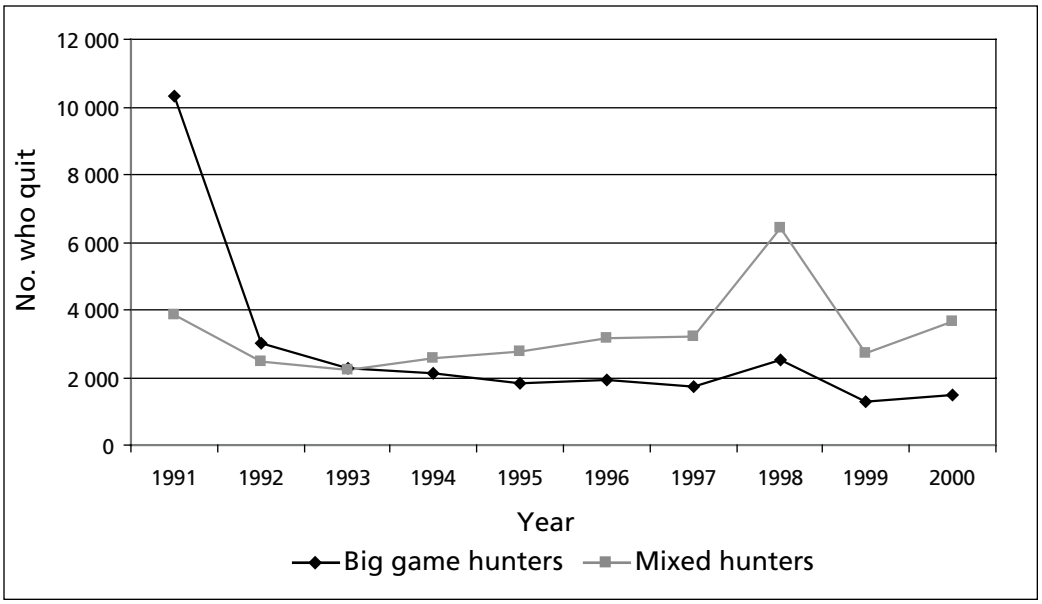

Figure 8. Number of big game and mixed hunters from the 1990 cohort who quit over the period 1991–2000.

FUTURE WORK

The analyses presented here suggest general trends in hunter participation in Alberta. However, they do little to clarify the reasons for these trends. For example, those identified as big game hunters included hunters of all big game, and future studies could focus on individual species of interest to determine if there are differences between, for example, deer hunters and bighorn sheep hunters. Such species-specific analyses could also examine the effect of the increase in lottery-rationed zones on participation or desire to participate (as indicated by the number of draw applications).

Another avenue of research suggested by these analyses is a survey of active and former hunters to discover why hunters stop participating. A survey of this type should include hunting history, attitudes about hunting, and reasons why hunters who have quit no longer participate. More detailed demographic information would also be useful.

The number of young hunters among the new entrants suggests that this group should be more closely examined. The province instituted a special, low-priced youth license in 1992. The effect of this license on recruitment and retention is of great interest. CLASS and RELMS data could be analyzed to determine if the number of youths hunting increased when the new license became available and how long these new entrants continued participating. In addition, young people in general (hunters and nonhunters) could be surveyed to determine their attitudes about hunting. Such a survey could include, among other things, perceptions of social support for hunting, who did or would aid them in joining the sport, and environmental attitudes in general.

Hunting is currently an integral part of wildlife management in the province, as well as being an activity enjoyed by many people. Approximately half of the revenue from license sales is used to fund conservation activities. The effect of a reduction in the number of hunters on animal management should be examined. Part of such an analysis should include the potential to seek an alternative source of funding for wildlife conservation activities.

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