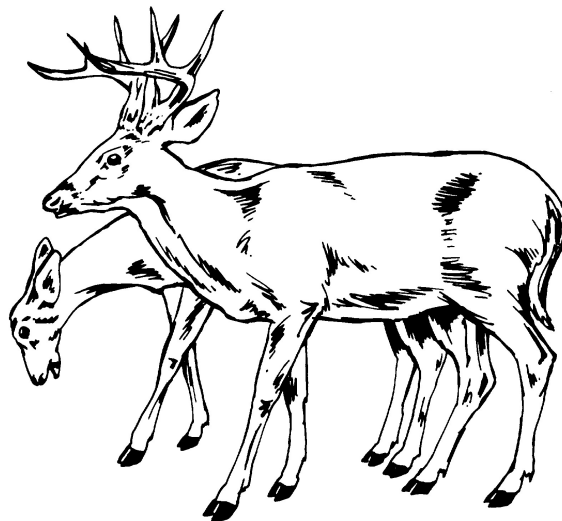

Deer Hunting and Deer Hunting Trends in New York State



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 - Provide baseline data for future studies of hunting trends.
 - Assess hunters' support for potential changes in deer hunting regulations.
 - Determine how these regulatory changes would influence BOW's deer management capability.
 - Identify the reasons hunters have for supporting or opposing regulatory changes.
 - Explore how communication can influence hunters' attitudes toward regulatory changes.

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EXECUTIVE SUMMARY

White-tailed deer hunting plays a multifaceted role in New York State:

- It plays a critical role in controlling the size of the deer herd.
- It generates substantial economic activity in rural communities.
- It provides recreational and cultural benefits to hunters and communities.

Despite its importance, deer hunting has been on the decline in New York State. Given the role that deer hunting plays and the decline in the number of hunters, wildlife managers need to understand the characteristics of hunters and how they participate in hunting. Knowing these characteristics and how they have changed may influence actions that managers take to promote the benefits of deer hunting, such as proposing new hunting regulations or initiating educational programs.

We conducted a study of 1997 deer hunters, and analyzed it in conjunction with a similar study of 1989 deer hunters, in order to:

- provide a detailed portrait of the characteristics of 1997 New York State deer hunters;
- compare the characteristics of 1997 deer hunters with 1989 deer hunters; and
- serve as a baseline for future studies of hunting trends.

We selected a random sample of 5,323 people who bought licenses to hunt deer in New York State in 1997. A random sample of license buyers was drawn from each of four geographic strata:

- Metro/Long Island;
- the Catskills;
- the Adirondacks; and
- western New York.

Our sample was large enough to produce accurate estimates of population parameters for hunters who applied for deer management permits (DMPs) and hunters who did not apply for DMPs in each stratum. Our sample was also large enough to estimate population parameters for bowhunters, muzzleloader hunters, and nonresident hunters.

We collected data from hunters through a mail survey implemented in January 1999. We designed this questionnaire to obtain the following information:

- demographic characteristics;
- hunting history, including social influences on interest in hunting;
- participation during the 1997 and 1998 deer seasons, including:
 - seasons hunted;
 - counties hunted;
 - types of land hunted;

- use of DMPs (and reasons for using or not using DMPs); and
- deer take;
- preferred deer take; and
- attitudes toward proposed regulatory changes (and reasons underlying these attitudes).

The development of the questionnaire was aided by a series of group and individual open-ended interviews of approximately 65 deer hunters.

In implementing the mail survey, we followed the 4-wave approach advocated by Dillman (1978) and Brown et al. (1989). The response rate to the survey was 61.9%. A telephone survey of 50 nonrespondents was conducted beginning in February 1998.

Our primary findings regarding the basic characteristics of 1997 deer hunters and trends in deer hunting were:

- From a peak of 712,000 in 1984, the number of resident license buyers in New York had dropped to 621,000 by 1997, a decrease of about 13%.
- The average age of resident hunters increased from 41.4 years in 1989 to 46.3 years in 1997.
- The youngest 2 age classes (hunters 16-35 years old) have dropped from 39% of the hunting population to 25% since 1989. Meanwhile, hunters over age 65 have increased from 7% to 14% of the population.
- Almost half of all license buyers bought licenses in western New York. About one-fifth bought their licenses in the Catskills and one-fifth in the Adirondacks. The remaining 12.2% bought licenses in the Metro/Long Island region. Since the late 1980s there has been a drop of 24-31% in resident license buyers in both the Metro/Long Island area and the Catskills.
- Since 1989, the percentage of nonresident hunters from Pennsylvania has dropped.
- Overall, the percentage of hunters living in rural areas has increased to over half of the hunting population. In fact, we estimate that the total number of resident deer hunters who say that they live in rural farm areas has increased by 24.3%. This increase is probably not an increase in the number of hunters living on farms but is possibly attributable to hunters shifting their residences from population centers to rural farm areas.
- On average, 1997 resident license buyers had hunted for 24.4 years starting in 1971 and had taken 15.1 deer during their lifetimes. On average, 1989 license buyers had less experience, having hunted deer for 19.9 years while taking 9.4 deer.
- Of those residents who bought 1997 deer hunting licenses, 92.6% of them actually hunted, similar to the 93.2% participation rate in 1989. A total of 93.4% of 1997 license buyers also purchased a 1998 deer hunting license.
- The vast majority of hunters participate in the regular gun season. In 1989 and 1997, 84-90% of resident hunters took part in the gun season. Participation in the special seasons has been increasing. Between 1989 and 1997, resident hunters taking part in the bow season increased from 25.5% to 33.4% and those participating in the muzzleloader season increased from 4.2% to 14.4%.

- The number of resident license buyers applying for, receiving, and filling DMPs did not change dramatically between 1989 and 1997. According to survey data from 1989 hunters, 36.2% of resident hunters who received a DMP filled it. In 1997, the percentage filling first DMPs had increased to 46.7%. Although we had no comparable data for 1989, we found that 25.9% of resident hunters who received a second DMP in 1997 filled it. The average fill rate for all DMPs in 1997 was 44.0%. This figure is considerably higher than DEC's estimate that 28.3% of DMPs were filled in 1997. Mail surveys tend to overestimate hunters' success at bagging deer because those who bag deer are more likely to respond to surveys.
- Within New York State, the highest densities of hunters afield occur in the Southern Zone, particularly in the Appalachian Plateau, the Binghamton-Elmira area, and parts of the Catskills. The statewide distribution of hunting pressure has changed since 1989. The number of hunters afield in the Binghamton-Elmira area, the Lake Plains, and the peripheral Adirondacks has increased. The number of hunters has decreased in the Catskills, parts of Region 7, and parts of the Allegheny Plateau and Finger Lakes region.
- The average license buyer took 0.68 deer in 1997. Success taking deer during the bowhunting seasons has increased 50% since 1989. Success during the muzzleloading season has doubled.
- If their deer take were not restricted by regulations, hunters would like to take an average of 2.04 deer each year with a minimum of 1.37 bucks. If hunters had the opportunity to donate unneeded meat to a worthy cause, the average hunter would like to take 2.69 deer with a minimum of 1.65 bucks.

We detected a variety of differences between hunters from different regions:

- Hunters from the Metro/Long Island region had less experience deer hunting than hunters from other regions. Metro/Long Island hunters had 21.9 years deer hunting experience (compared to 24 to 26 years for hunters from other regions), and they had taken a mean of 11.4 deer over their lifetime (compared to 15 to 18 for others).
- Only 22.3% of hunters from the Adirondacks participated in the bow season (compared to 30-40% of hunters from other regions). A total of 35.6% of Adirondack hunters participated in the muzzleloading season (compared to no more than 12% of the hunters from any of the other regions).
- The highest application rate for DMPs was among Western New York hunters, who applied for a mean of nearly 1 DMP per license buyer. The lowest application rate was among hunters from the Adirondacks (0.6 per license buyer), where opportunities to use DMPs are limited unless hunters travel.

We divided respondents into 4 groups based on the seasons during which they hunted deer. Because most hunters took part in the regular gun season, we distinguished those who hunted only during the regular gun season from those who hunted during one or more special seasons (but also may have participated in the regular gun season).

- Gun hunters hunted only during the regular gun season.

- Bow hunters hunted during the bowhunting season, but not the muzzleloading season.
- Muzzleloader hunters hunted during the muzzleloading season, but not the bowhunting season.
- Combination hunters hunted during both the bowhunting and muzzleloading seasons.

We found that these hunters differed from each other in several respects.

- Bow hunters and combination hunters were about 5 years younger than other hunters, on average, and bow hunters had less deer hunting experience than gun and muzzleloader hunters.
- Combination hunters had the highest lifetime deer take and the highest average deer take each year. Gun hunters had the lowest lifetime deer take and the lowest average deer take each year.
- The hunters who were most successful at taking deer during the regular gun season were those who also hunted during one or more of the special seasons. Hunters who participated in special seasons were more likely to be continuous hunters.
- Bow hunters and combination hunters applied for, received, and filled more DMPs on average than other hunters. Gun hunters filled the fewest DMPs on average.

We detected a variety of differences between resident and nonresident hunters.

- Nonresident hunters were almost exclusively male (99%).
- Nonresident hunters were particularly likely to buy their hunting licenses in the Catskills and Western New York.
- On average, resident hunters have been hunting for more years than nonresidents.
- Nonresidents had taken a mean of 20.9 deer over their lifetime while residents had taken a mean of 15.1 deer.
- Nonresidents were significantly less likely to participate in special deer hunting opportunities.
- Overall deer take during the 1997 season did not differ between residents and nonresidents. Nonresidents, however, were less likely to take antlerless deer during the regular gun season.

We defined "continuous hunters" as those who bought licenses both in 1997 and 1998 and "sporadic hunters" as those who bought licenses only in 1997. A total of 7.2% of 1997 license buyers were sporadic hunters.

- Continuous hunters were more likely than sporadic hunters to come from rural areas.
- For any given 1997 season (gun, muzzleloader, or bow), sporadic hunters were less likely than continuous hunters to participate.
- Sporadic hunters were less likely to apply for, receive, and fill DMPs than continuous hunters in 1997.
- Sporadic hunters wanted on average to take fewer deer than continuous hunters (1.76 vs. 2.06).

We found several differences between male and female hunters.

- Female hunters were much more likely than males to come from rural farm areas.
- Female hunters had less deer hunting experience than males. Females on average had hunted in fewer years (16.5 vs. 25.0) and had taken fewer deer over their lifetime (9.7 vs. 15.7)
- Women were less likely than men to hunt during the bow season.

A variety of differences among hunters were correlated with age.

- Family influence on interest in hunting was strongest among the youngest hunters. The influence of friends, however, appears to become more important with age.
- Older license buyers were less likely to go afield. The percentage of 1997 license buyers who went afield declined steadily with age.
- The number of DMPs applied for was lowest for young and old hunters and highest for the middle-aged. The average number of DMPs filled per license buyer did not vary significantly with age, however.
- Interest in taking deer and bucks declined linearly with age.

Management implications of this study are:

- Given managers' dependence on hunters for controlling the size of the deer herd, the decline in hunters will make it increasingly difficult for the size of the deer herd to be managed through recreational hunting. Successful management in the future will depend on restructuring hunting regulations; educating hunters to make them more committed to helping to manage deer; and exploring other avenues to achieve management goals besides recreational hunting.
- Because hunting in New York State is declining primarily in the Catskill and Metro/Long Island regions, deer management problems are likely to be more intensive and difficult to address in these areas.
- Given that (1) the hunting population is aging and that (2) older hunters are less interested in hunting, taking deer, and using DMPs, it is possible that managers will find it increasingly difficult to manage deer in the future. On the other hand, today's older hunters include those who have never accepted killing does. This reluctance to kill does among older hunters may not be as prevalent in future years.
- The growing interest in special seasons and opportunities may help to improve BOW's deer management capability because hunters taking part in these opportunities are more successful than other hunters at taking deer.
- Hunters may be willing to increase their take of deer if given the opportunity.

Several research questions suggested by this study may be worthwhile to explore in the future:

- What forces are most responsible for the decline of deer hunters in the Metro/Long Island and Catskill regions of New York State? Is this decline attributable to the

- lower proportion of more stable rural hunters in these areas? The loss of lands which can be hunted to development? A decline in the social acceptability of hunting? Low recruitment and/or retention? Migration of hunters to other regions?
- Why has the total number of hunters living in rural farm areas increased? Are hunters moving from population centers to rural farm areas? Or are other social forces at work?
 - Given that the hunting population is aging, what types of hunting opportunities are older hunters most likely to prefer?
 - How can the higher success at taking deer of today's hunters be harnessed by managers to help control the deer herd?
 - Has the increased involvement in special hunting opportunities contributed to the greater commitment to hunting shown by participants? Or does commitment to hunting lead to involvement in special opportunities?
 - If taking part in special opportunities increases commitment to hunting, how can hunters be involved in these opportunities?
 - What causes hunters to choose the regions where they will hunt? Proximity to their homes? Access to land? The size of the deer population? How have these and other factors influenced the change in the distribution of hunters afield in New York State?
 - Given that hunters would like to take more deer than they do, can hunters' success at taking deer be increased to more closely match their interests? If so, how?
 - Given that BOW will depend on fewer hunters in the future to control the size of the deer population, can hunters' willingness to take does be increased by regulatory changes or education? If so, how?

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BACKGROUND

Deer hunting plays a multifaceted role in New York State. Wildlife managers depend on hunting to manage the size of the deer herd. For a variety of reasons, the deer populations in some portions of New York have been increasing for years. With this growth in deer numbers, public concerns about the problems associated with a large deer population also have grown – concerns about deer-vehicle collisions, crop damage, ornamental plant damage, interference with forest regeneration, and Lyme disease. Hunting remains the only effective and economically viable tool that managers have to affect deer populations at landscape scales. In particular, hunters must harvest antlerless deer if managers are to control the deer population.

Deer hunting also makes an important contribution to the economies of rural communities in New York. Hunters spend large amounts of money on both equipment (e.g., rifles, ammunition, camping gear, clothing, etc.) and hunting trips (e.g., food, lodging, transportation, etc.). The U.S. Fish and Wildlife Service has estimated that hunting and fishing generate more than 3 billion dollars in economic activity annually in New York (USDOJ and USDOC 1996). This activity can provide a boost to the economy of rural communities.

Finally, deer hunting provides recreation for approximately 650,000 hunters, and, furthermore, is of great sociocultural significance to many participants, their families, friends, and communities (Brown et al. 1995, Stedman and Decker, 1993; Stedman et al., 1993). It is a source of important social meanings and values in communities throughout New York State, particularly rural communities, where it is a deeply rooted and symbolic part of the rural lifestyle. Brown et al. (1995) reported the existence of numerous hunting-related traditions throughout the United States.

Despite its importance on several planes, deer hunting is on the decline in New York State. This gradual decline in participation is likely a response to several social factors.

- More Americans are living in urban and suburban areas, while deer hunting is most strongly rooted in rural communities. Various authors have argued that urbanization has led to a decline in hunting participation (Connelly and Brown 1990; Manfredo and Zinn 1996).
- Manfredo and Zinn (1996) concluded there has been a recent shift in wildlife-related values. People are less likely to view wildlife as a resource whose use is ethically appropriate and more likely to believe that wildlife, like humans, have individual rights. These changes make the social climate less favorable to hunting.
- The U.S. population is aging as members of the post-World War II "baby boom" advance through middle age. The percentage of the population that hunts steadily declines as people age (USDOJ and USDOC 1996).

Given the economic and social contributions that deer hunting plays in New York State and the continuing decline in the number of hunters, wildlife managers need to understand the characteristics of hunters and how they participate in hunting. The contributions that deer hunting can make in New York State will be influenced by these characteristics, including:

- demographic characteristics, such as age, gender, and the size of community in which hunters reside;
- participation variables, such as seasons hunted, implements used, and the likelihood of hunting in the future; and
- hunters' contribution to the deer harvest, particularly their take of antlerless deer.

These characteristics have a strong influence on the ability of wildlife managers to manage the deer herd, the economic contribution that hunting makes, and the future of hunting as an important recreational and cultural activity. Knowing these characteristics and how they have changed, therefore, may influence actions that managers take, such as proposing new hunting regulations or initiating educational programs.

The Human Dimensions Research Unit (HDRU) and the New York State Department of Environmental Conservation (DEC) have a rich history of research on deer hunters and hunting on which to build, having collaborated on a number of studies over the past 25 years. Of particular relevance to this report was an extensive study of 1989 New York State deer hunters (Enck and Decker 1991). We used Enck and Decker's (1991) study as a foundation for this one. Using a similar sampling strategy, we undertook this study of 1997 license buyers. Our research allowed us to measure changes in deer hunters and hunting in New York State since the late 1980s.

This study was a multi-faceted effort that will be summarized in three reports focused on hunting participation and trends, the implications of hunter characteristics for DEC's deer management capability, and hunters' attitudes toward proposed regulations. The specific objectives of this phase of the study (on hunting participation and trends) were to:

- provide a detailed portrait of the characteristics of 1997 New York State deer hunters;
- compare the characteristics of 1997 deer hunters with 1989 deer hunters; and
- serve as a baseline for future studies of hunting trends.

METHODS

Sample Selection

We selected a random sample of 5,323 people who bought licenses to hunt deer in New York State in 1997. This sample included people who bought senior licenses, big game licenses, sportsman licenses, junior archery licenses, and one or more nonresident licenses (combination, big game, bowhunting, and/or muzzleloading).

A random sample of license buyers was drawn from each of four geographic strata (Figure 1):

- 1,300 from Metro/Long Island;
- 1,250 from the Catskills;
- 1,250 from the Adirondacks; and

Figure 1. Geographic strata used in sample selection.



- 1,250 from western New York.

The initial sample sizes were large enough to produce accurate estimates of population parameters for hunters who applied for deer management permits (DMPs) and hunters who did not apply for DMPs in each region.

In addition, we wanted to be able to produce accurate estimates of population parameters for:

- license buyers who hunted in the regular gun, bowhunting, and muzzleloading seasons; and
- resident and nonresident license buyers.

We drew an additional sample of 273 nonresident license buyers to ensure an adequate sample of that group. This additional sample was drawn in proportion to the number of nonresident license buyers we expected from each region in the original sample:

- 67 from Metro/Long Island;
- 120 from the Catskills;
- 43 from the Adirondacks; and
- 43 from western New York.

Questionnaire Development

A mail questionnaire was the primary data collection instrument (Appendix A). We designed this questionnaire to collect the following information:

- demographic characteristics;
- hunting history, including social influences on interest in hunting;
- participation during the 1997 and 1998 deer seasons, including:
 - seasons hunted;
 - counties hunted;
 - types of land hunted (private land they owned, private land they did not own, or public land);
 - use of DMPs (and reasons for using or not using DMPs); and
 - deer take;
- how many deer they would like to take each year; and
- attitudes toward proposed regulatory changes (and reasons underlying these attitudes).

The development of the questionnaire was aided by a series of group and individual interviews of deer hunters. These interviews took place over the telephone and face-to-face. They were tape recorded whenever possible and involved approximately 65 individuals. The interviews were conducted using a semi-structured interview guide with open-ended questions. These questions focused primarily on hunters' attitudes toward proposed regulatory changes and the reasons for these attitudes.

Survey Implementation

In implementing the mail survey, we followed the 4-wave approach advocated by Dillman (1978) and Brown et al. (1989). We sent out a copy of the mail survey along with a cover letter early in January 1999. A reminder letter was sent to nonrespondents one week later. A second reminder letter accompanied by an additional copy of the questionnaire was sent out 10 days later. A final reminder letter was sent out one week after that. The response rate to the survey was 61.9%.

A telephone survey of nonrespondents was conducted beginning in February 1999. A random sample of 298 nonrespondents was chosen. We developed a brief telephone interview guide covering a selection of topics from the mail survey (Appendix B). These topics were:

- whether license buyers hunted during the 1997 and 1998 hunting seasons;
- the particular seasons during which they hunted deer;
- their take of antlered and antlerless deer;
- their use of DMPs;
- their desired deer take; and
- their attitudes toward two proposed regulation changes.

We attempted to reach each nonrespondent a minimum of four times and completed 50 telephone interviews.

Analysis

All statistical analyses were conducted using SPSS 8.0 for Windows. In analyzing mail survey data, individual cases were weighted to account for the fact that the number of respondents from each geographic region were not proportional to the number of hunters from those regions. In calculating trends, we computed statistics directly from Enck and Decker's (1991) data collected from 1989 license buyers.

We compared the characteristics of nonrespondents with those of respondents. The only significant differences between respondents and nonrespondents were:

- nonrespondents were younger;
- nonrespondents were less likely to hunt in 1997; and
- nonrespondents applied for fewer DMPs in 1997.

To produce an unbiased estimate of the mean age of deer hunters, we relied on data from our initial sample of 5,323 license buyers because age had been recorded on the hunting license receipts we extracted to determine our sample. To produce an unbiased estimate of the other two variables, we combined data from respondents and nonrespondents. Each case was weighted based on the assumption that respondents represented the 61.9% of the population who had responded to our mail survey and nonrespondents represented other license buyers. Whenever figures have been adjusted for nonresponse bias in text and tables, we have noted it.

RESULTS AND DISCUSSION

In this section, we summarize the results of our most informative analyses. A set of tables describing the results of all the analyses we conducted is included in Appendix C.

New York State Deer Hunters: Yesterday and Today

Basic Characteristics

People can purchase different types of licenses to hunt deer in New York State. According to DEC's records of hunting license sales, more than half of 1997 resident license buyers bought sportsman's licenses (Table 1). Big game license buyers accounted for another one-quarter. A total of 26.2% of resident license buyers purchased bowhunting stamps, and 9.4% bought muzzleloading stamps. Among nonresidents, nearly 80% of licenses purchased were big game licenses (Table 2). Big game and combination license sales accounted for almost 90% of nonresident licenses sold.

The overall number of deer hunters in New York State is declining (Figure 2). From a peak of 712,000 in 1984, the number of resident license buyers in New York had dropped to 621,000 by 1997, a decrease of nearly 13%. This trend is consistent with reports of a decline in hunting participation in the United States, although big game hunting has been growing nationwide (Bissell et al. 1998, Duda et al. 1998, USDOJ and USDOC 1996). We used our data to explore whether the characteristics of New York State deer hunters had changed between 1989 and 1997 as this decline was occurring.

Deer hunters are older today than in the late 1980s. The average resident hunter in 1989 was 41.4 years old (SD = 14.6) while in 1997 the average age was 46.3 (SD = 15.1). Figure 3 depicts how the percentage of resident hunters in different age classes has changed during this period. The youngest 2 age classes (hunters 16-35 years old) have dropped from 39% of the hunting population to 25%. Meanwhile, hunters over age 65 have increased from 7% to 14% of the population. This shift may be at least partly attributable to the aging of the U.S. population (Manfredo and Zinn 1996), but it is a dramatic shift for such a short time period. It may also reflect the difficulty of recruiting younger hunters in an increasingly urbanized society (Decker et al. 1991; Bissell 1995; Bissell et al. 1998; Purdy and Decker 1986).

The gender composition of deer hunters did not shift during the same period. Hunting has been and continues to be a predominantly male activity. Only 6.5% of resident deer hunters were female in 1989, and this percentage was not substantially different (7.5%) in 1997. Our finding is in contrast to Bissell et al.'s (1998) report that hunting among females has been rapidly increasing.

Many hunters are landowners (Figure 4). Slightly more than half (54.8%) of 1997 hunters owned no land or no more than one acre of land in New York State, leaving nearly half owning 2 or more acres. Almost 20% owned between 2 and 10 acres of land. The remaining one-quarter owned more than 10 acres of land with 12.3% owning more than 50 acres.

Table 1. License types sold to resident hunters in 1997¹.

License Type	Number	%
Sportsman	351,141	56.6
Big Game	162,169	26.1
Senior	103,763	16.7
Junior Archery	3,799	0.6
Total	620,872	

¹Data from records supplied by DEC on hunting license sales.

Table 2. License types sold to nonresident hunters in 1997¹.

License Type	Number	%
Big Game	25,421	79.2
Combination	3,763	11.7
Bow Hunting	2,234	7.0
Muzzleloader	685	2.1
Total	32,103	

¹Data from records supplied by DEC on hunting license sales.

Figure 2. Number of resident deer hunting licenses purchased in New York State. Trends reported are based on studies of license buyers in the two years highlighted in white.

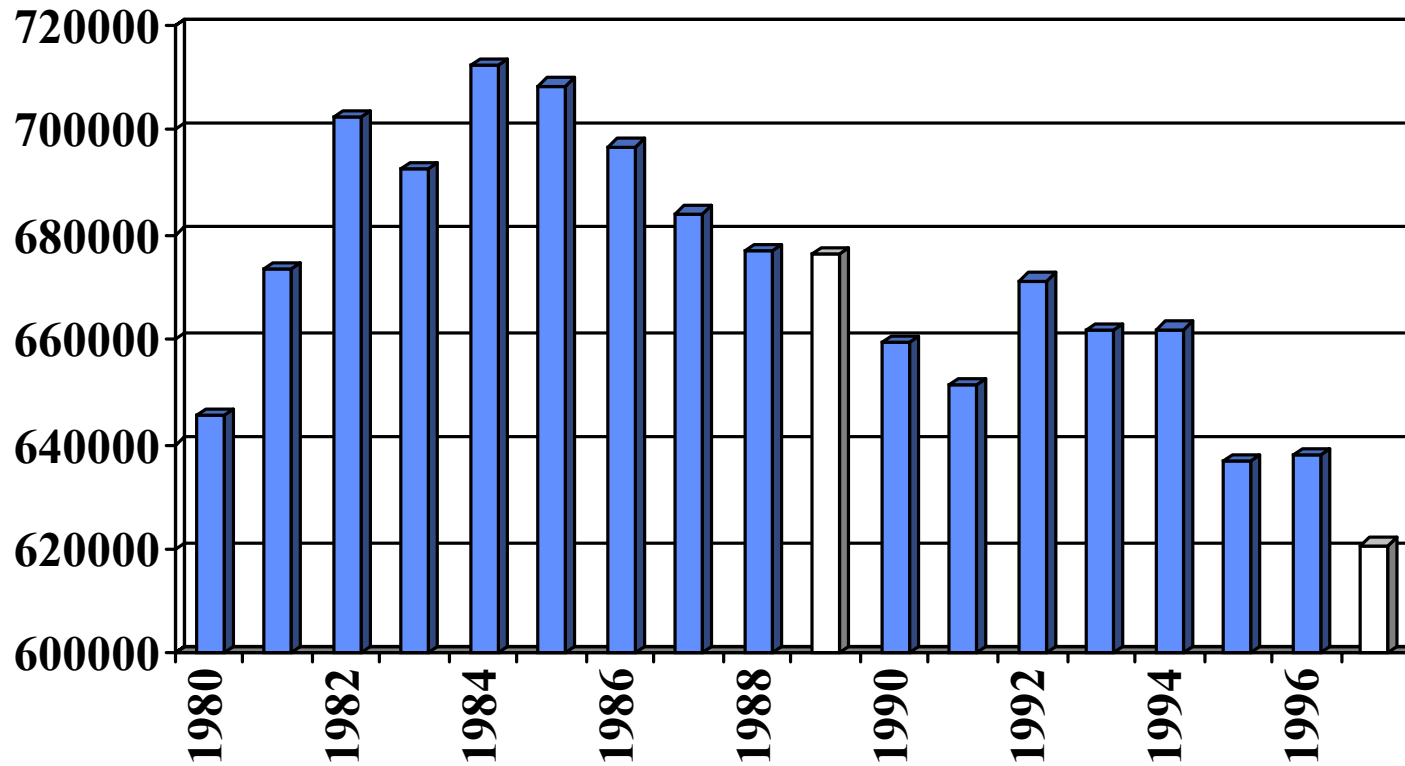


Figure 3. Percentage of resident deer hunters in each age class.

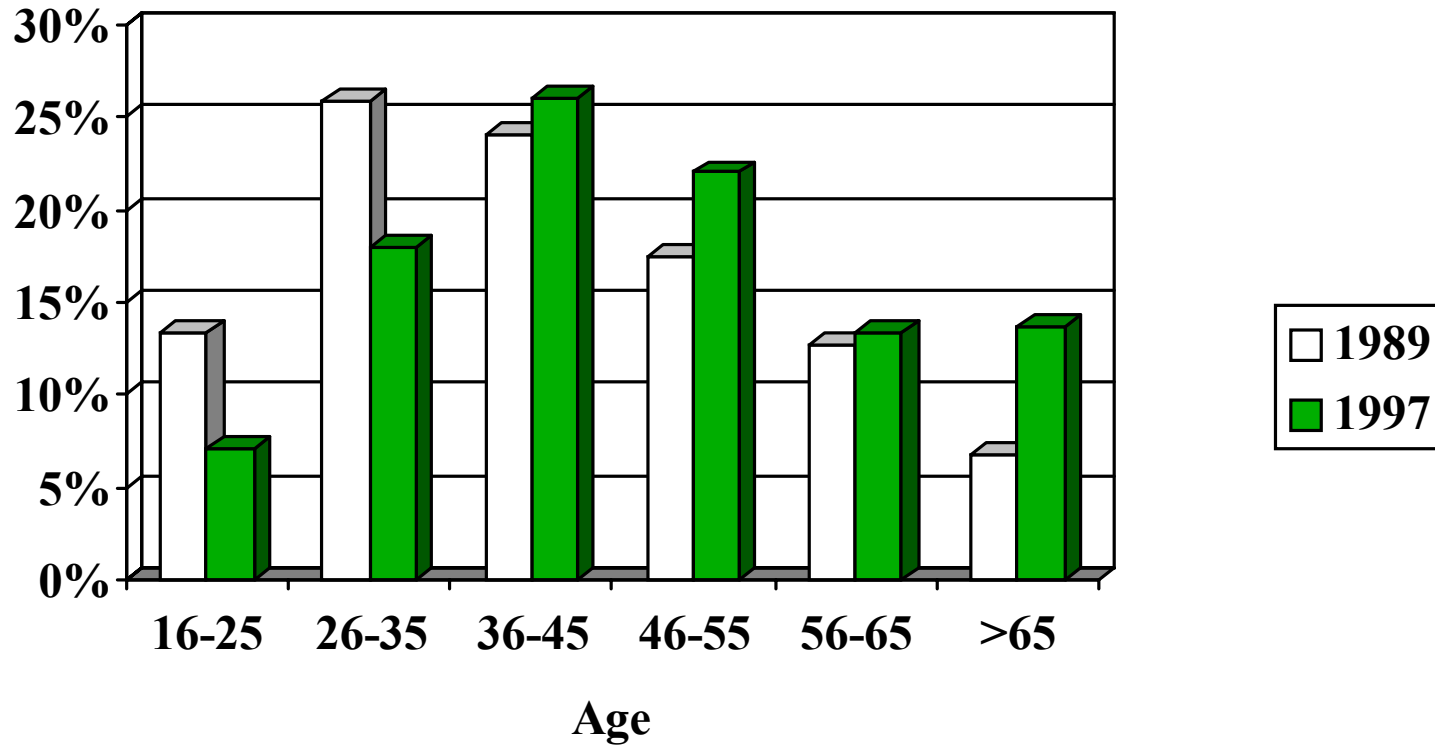
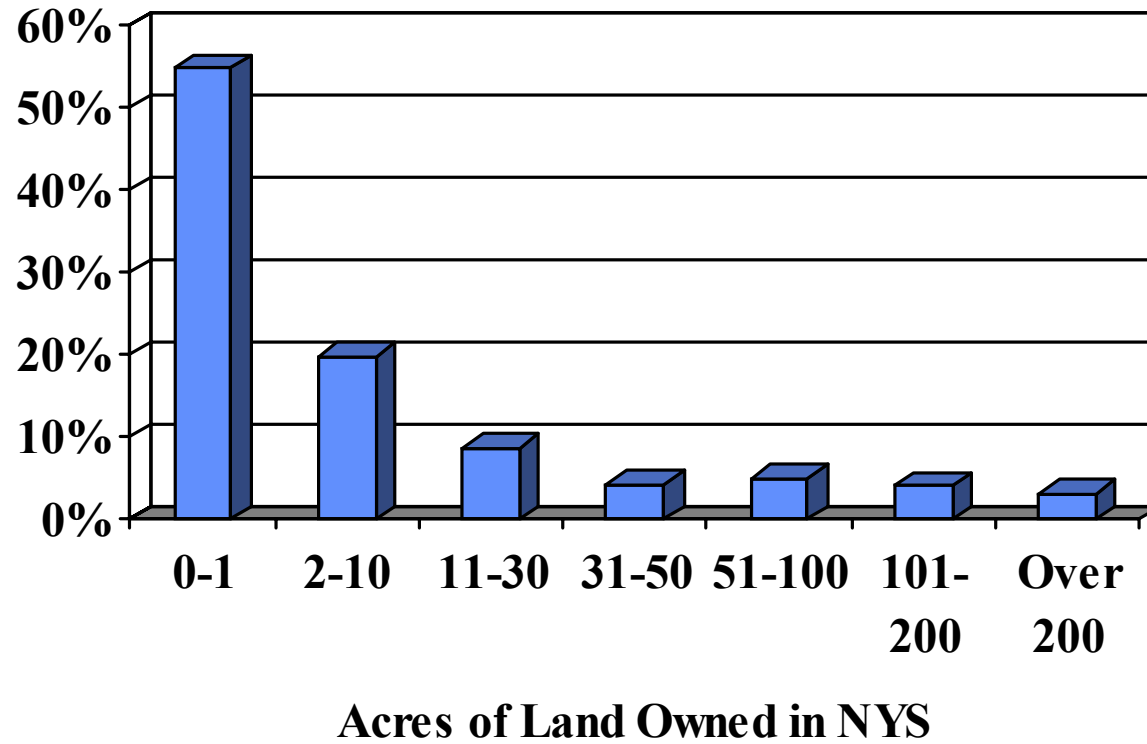


Figure 4. Amount of New York State land owned by New York State deer hunters in 1997.



Almost half of license buyers bought their licenses in western New York¹ (Table 3). About one-fifth came from the Catskills and one-fifth from the Adirondacks. The remaining 12.2% bought licenses in the Metro/Long Island region. The number of deer hunters from each region marks a substantial shift from the distribution of hunters in 1989. Since the late 1980s there has been a drop of 24-31% in resident license buyers in both the Metro/Long Island area and the Catskills. Over the same period, small increases (2-5%) in resident hunters in the Adirondacks and Western New York have occurred.

A change in the license structure for nonresidents since 1989 prevented us from making an accurate estimate of how the numbers of nonresident hunters have changed. In 1997, the same nonresident hunter could purchase up to 3 different deer hunting licenses. This license structure did not exist in 1989. Thus, a tally of nonresident deer hunting licenses in 1997 would overestimate the number of nonresident hunters.

We did, however, compare the region of origin of nonresident hunters in New York State (Table 4). In making this comparison, we used the U.S. Fish and Wildlife Service's 9 geographic regions for the United States:

- New England: Vermont, New Hampshire, Maine, Massachusetts, Connecticut and Rhode Island;
- Middle Atlantic: New York, Pennsylvania, and New Jersey;
- South Atlantic: West Virginia, Maryland, Delaware, Virginia, North Carolina, South Carolina, Georgia, and Florida;
- East North Central: Wisconsin, Michigan, Illinois, Indiana, and Ohio;
- West North Central: North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, and Missouri;
- Mountain: Montana, Idaho, Wyoming, Utah, Colorado, Arizona, and New Mexico; and
- Pacific: Washington, Oregon, California, Nevada, Alaska, and Hawaii.

Most nonresident hunters come from adjoining states and regions. At least half of nonresident hunters came from New Jersey and Pennsylvania in both 1989 and 1997. At least another one-quarter came from New England both years. The most notable change between 1989 and 1997 was the drop in the percentage of nonresident hunters coming from Pennsylvania.

Area of Residence

The types of communities in which deer hunters live have shifted (Table 5). Deer hunters in New York State are predominantly from rural areas, an observation reported by many others (Decker et al. 1991; Bissell et al. 1998). The likelihood of resident hunters living in rural farm areas increased substantially between 1989 and 1997. Meanwhile, the percentage of hunters from communities of under 5,000 people has dropped sharply.

¹ We assumed that resident deer hunters in New York State in 1997 resided in the same geographic regions where they purchased their licenses.

Table 3. Number of resident license buyers from each region of New York State¹.

Region	1989		1997	
	Number	%	Number	%
Metro/Long Island	109,439	16.2	75,965	12.2
Catskills	160,909	23.8	121,697	19.6
Adirondacks	114,791	17.0	117,861	19.0
Western New York	291,030	43.0	305,349	49.2
Total	676,169		620,872	

¹Data from records supplied by DEC on hunting license sales.

Table 4. Percentage of nonresident hunters from each region.

Region	Year	
	1989	1997
New England		
Connecticut	8.7	11.0
Massachusetts	9.2	9.0
Vermont	3.1	6.5
Other NE	5.3	3.2
Middle Atlantic		
New Jersey	22.7	24.8
Pennsylvania	36.7	25.2
South Atlantic	8.7	11.6
East North Central	4.2	4.8
East South Central	0.3	1.0
West North Central	0.0	0.0
West South Central	0.3	1.6
Mountain	0.3	0.3
Pacific	0.6	1.0

Table 5. Area of residence of New York State resident deer hunters in 1989 and 1997.

Residence	1989		1997	
	%	Estimated Number	%	Estimated Number
Rural, farm	26.9	181,867	36.4	225,997
Rural, nonfarm	17.6	118,991	18.4	114,240
Community under 5,000	16.1	108,850	10.4	64,571
Community 5,000 – 24,999	19.2	129,809	18.5	114,861
City 25,000 – 100,000	9.8	66,256	8.0	49,670
City over 100,000	10.4	70,313	8.3	51,532
		676,086		620,872

Overall, the percentage of hunters coming from rural areas has increased to over half of the hunting population. In fact, even though resident license sales declined during this period, we estimate that the total number of resident deer hunters who say that they live in rural farm areas has increased by 24.3%. This finding is striking, and several possible explanations exist for it.

- Despite the statewide decline in the number of deer hunters, the recruitment and/or retention of hunters in rural farm areas is substantially better than in other types of communities.
- Although the conventional wisdom is that rural farm communities are declining, a recent shift in population to rural farm counties in New York State may be occurring, with an accompanying increase in the number of deer hunters.
- Deer hunters may be living in the same or nearby counties in New York State, but may be shifting their residences from population centers to rural areas. Thus, the increase in the number of hunters saying they live in rural farm areas may be related to a change in where hunters are choosing to live rather than to a change in the overall population in farming communities in New York.

We examined each of these hypotheses.

If recruitment or retention of hunters were substantially better in rural farm areas than other areas, it would likely lead to a different age distribution of hunters in rural farm areas compared to other areas. For example, better recruitment of hunters in rural farm areas would lead to a higher number of younger hunters in rural farm areas compared to other areas. We did not find a different age distribution of hunters in rural farm areas, however, (Figure 5, $\chi^2(5)=3.295$, $P=0.655$) suggesting that the larger number of hunters in rural farm areas is not due to differences in the recruitment or retention of hunters in these areas.

To judge whether the increase in hunters from rural farm areas was due to a shift in population to farming areas, we classified all New York State counties according to the percentage of land area in farming (Nelson A. Rockefeller Institute of Government 1998). Although there has been a small increase in the total population in the counties with the most farmland, this increase is not of the order of the 24.3% increase in deer hunters we found in rural farm areas (Table 6). Furthermore, the deer hunter population has decreased by 5.4% in the counties with the most land in farming, and it has not increased by more than 2% in any of the counties classified according to land in farming. Therefore, it appears as if the increase in the number of deer hunters from rural farm areas was not caused by a population shift to these areas in New York State.

Our remaining hypothesis was that deer hunters were not changing the regions of the state in which they lived, but were simply shifting from population centers to rural farming areas within these regions. One piece of evidence that supports this hypothesis is that the percentage of hunters saying they are from rural farm areas has increased both in counties with little land in

Figure 5. Percentage of deer hunters from rural farm and other areas in each age class.

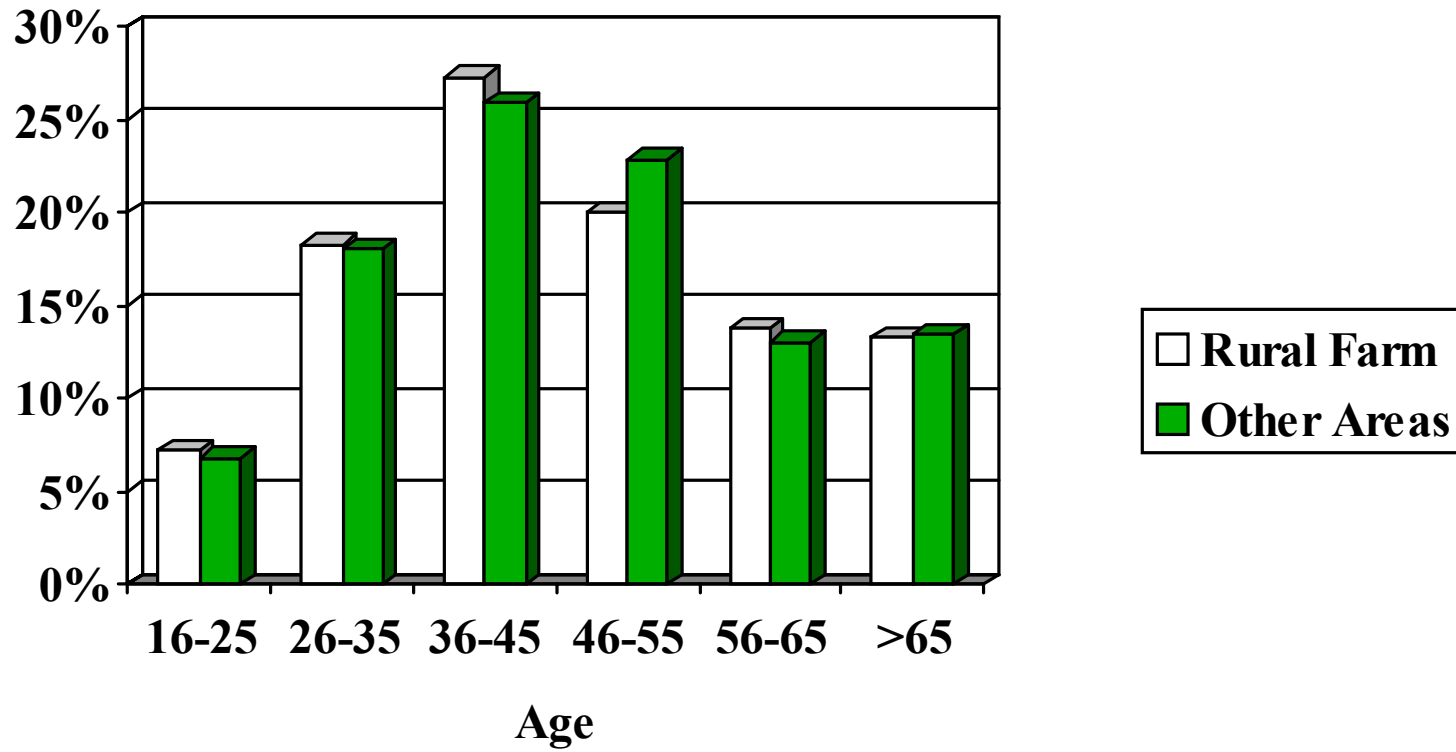


Table 6. Change in total population and hunter population in farming and non-farming counties^a.

Land area in farms:	Change in Total Population 1990-1996	Change in Deer Hunter Population 1989-1997
< 10%	+1.3%	-15.3%
10-19%	+3.2%	-5.9%
20-29%	-0.9%	+0.6%
30-39%	-0.5%	-11.8%
40-49%	+2.1%	+1.4%
≥ 50%	+2.2%	-5.4%

^aData on land area in farms and total population change drawn from Nelson A. Rockefeller Institute of Government (1998).

farms and counties with much land in farms (Table 7), demonstrating a general shift of hunters to rural farm areas throughout New York State.

To further explore this hypothesis, we classified New York State counties according to the U.S.D.A. Economic Research Service's rural/urban continuum codes (Butler and Beale 1993). Based on our survey data, we estimated that the numbers of deer hunters living in several of these groups of counties were increasing, specifically:

- fringe counties of metropolitan areas of 1 million population or more;
- counties in metropolitan areas of less than 250,000 population;
- nonmetropolitan counties with urban population of 20,000 or more, adjacent to a metropolitan area; and
- nonmetropolitan counties with urban population of 20,000 or more, not adjacent to a metropolitan area.

We found that the numbers of deer hunters are increasing in counties associated with population centers (Table 8), suggesting that a shift in the hunting population from population centers to more rural areas may indeed be occurring. Furthermore, a map of the percentage change in the number of deer hunters living in each county in New York State (Figure 6) shows that all of the areas of increase are in the vicinity of metropolitan areas (Albany-Schenectady-Troy, Plattsburgh, Watertown, Binghamton-Elmira, and Rochester-Buffalo).

Without additional data, we can not conclusively determine the cause of the increased number of deer hunters saying they are from rural farm areas. However, this finding does not appear to be explained by better hunter recruitment or retention in rural areas or from large scale population shifts to farming communities.

Hunting History

1997 resident license buyers had hunted for an average of 24.4 years (SD = 14.0) starting in 1971 (SD = 15). They had taken an average of 15.1 deer (SD = 22.9) during their lifetimes. 1989 hunters had less experience, having hunted deer for 19.9 years (SD = 13.4) and taking 9.4 deer (SD = 12.4). The higher level of experience of 1997 deer hunters is consistent with the aging of the hunting population we detected.

A total of 90.0% 1997 deer hunters said having friends who hunt was a strong or moderate influence on their interest in hunting. Some 74.6% said growing up in a hunting family was a strong or moderate influence. Serving in the armed services or national guard did not play as important a role. Still, 18.6% said it had a strong or moderate influence on their interest in hunting. The importance of social support in the development and maintenance of a commitment to hunting has been noted frequently in the literature (Purdy and Decker 1986; Enck and Decker 1989; Enck and Decker 1990; Decker et al. 1991).

Table 7. Percentage of deer hunters living in rural farm areas in farming and non-farming counties^a.

Land area in farms:	Deer Hunters Living in Rural Farm Areas	
	1989	1997
< 10%	7.1%	10.5%
10-19%	25.7%	29.5%
20-29%	46.2%	56.9%
30-39%	24.7%	32.7%
40-49%	37.5%	51.9%
≥ 50%	42.2%	67.0%

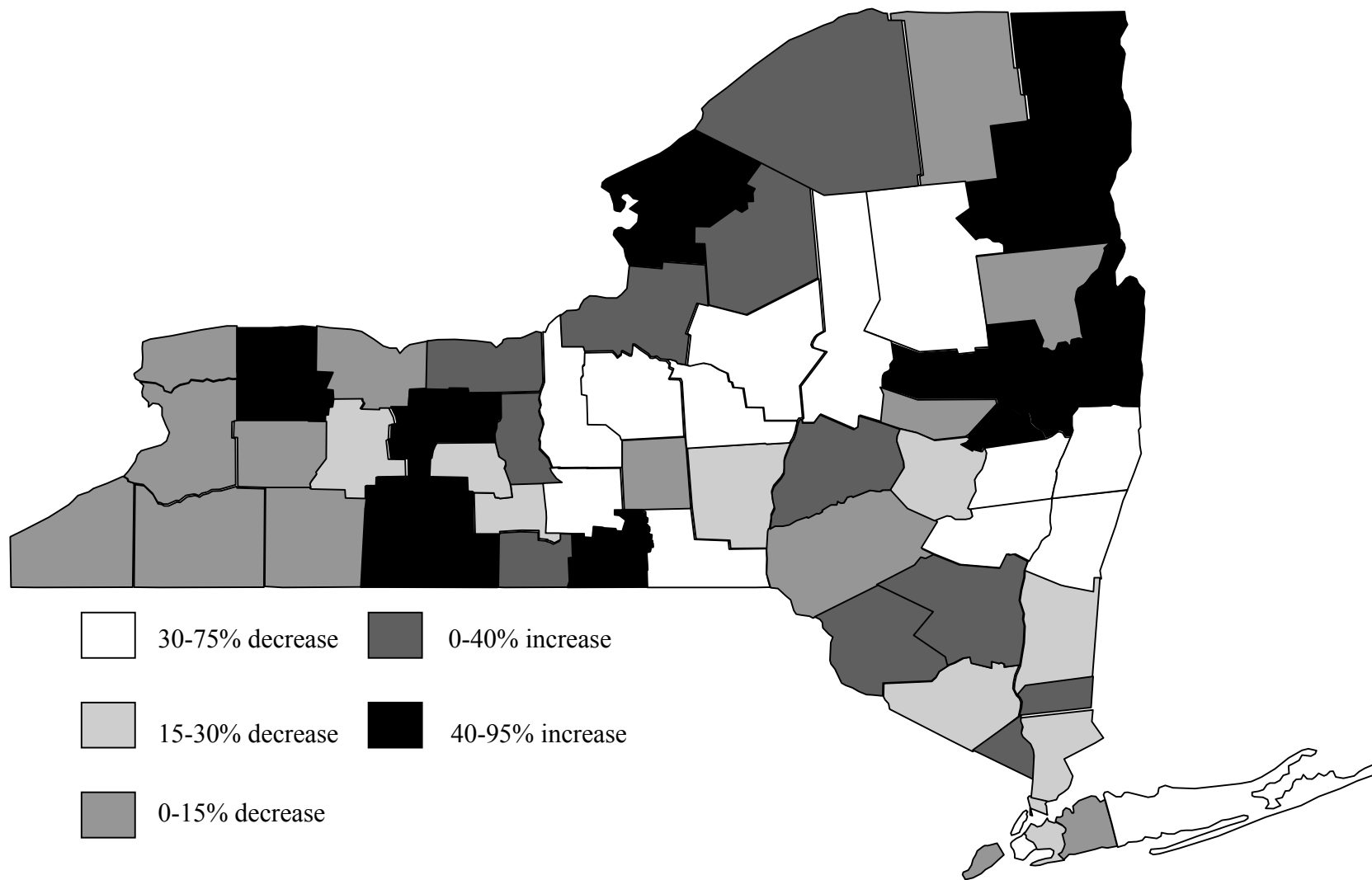
^aData on land area in farms drawn from Nelson A. Rockefeller Institute of Government (1998).

Table 8. Change in total population and deer hunter population (1989-1997) in metropolitan and nonmetropolitan counties^a.

County Classification	Change in:	
	Total Population	Deer Hunter Population
Metropolitan Counties		
Central counties of metropolitan areas of 1 million population or more	+1.0%	-15.0%
Fringe counties of metropolitan areas of 1 million population or more	+5.7%	+13.1%
Counties in metropolitan areas of 250,000 to 1 million population	+0.6%	-19.6%
Counties in metropolitan areas of less than 250,000 population	+0.2%	+10.3%
Nonmetropolitan counties		
Urban population of 20,000 or more, adjacent to a metropolitan area	+0.6%	+15.8%
Urban population of 20,000 or more, not adjacent to a metropolitan area	+0.6%	+16.2%
Urban population of 2,500 to 19,999, adjacent to a metropolitan area	+1.9%	-5.2%
Urban population of 2,500 to 19,999, not adjacent to a metropolitan area	+3.7%	-10.9%
Completely rural or less than 2,500 urban population, adjacent to a metropolitan area	+1.7%	-37.9%

^aData on total population change drawn from Nelson A. Rockefeller Institute of Government (1998).

Figure 6. Change in percentage of deer hunters living in NYS counties between 1989 and 1997.



Characteristics of Participation

Of those residents who bought 1997 deer hunting licenses, 92.6% actually hunted², similar to the 93.2% participation rate in 1989. Most 1997 license buyers also hunted in 1998. A total of 93.4% purchased a 1998 deer hunting license.

In 1989 and 1997, at least 84% of resident hunters took part in the regular gun season (Figure 7). Participation in the special seasons has been increasing. Between 1989 and 1997, resident hunters taking part in the bow season increased from 25.5% to 33.4% and those participating in the muzzleloader season increased from 4.2% to 14.4%.

Comparing DMP use in 1989 and 1997 requires a caveat. Although the use of DMPs provides some indication of interest in deer management and antlerless deer harvest, regulations governing the use of DMPs changed between 1989 (when hunters could apply for 1 DMP and DMPs could be used to take any deer) and 1997 (when hunters could apply for more than 1 DMP and DMPs could be used to take only antlerless deer). These changes, as well as changes in hunters' interest in deer management and antlerless deer harvest could have influenced DMP use.

The number of resident license buyers applying for, receiving, and filling DMPs did not change dramatically between 1989 and 1997 (Table 9), but small decreases occurred in the percentages of resident license buyers applying for and receiving DMPs. A small increase occurred in the percentage of resident license buyers filling DMPs. This finding suggests that those who received DMPs in 1997 either were more interested in filling them or found them easier to fill.

We also compared the percentage of DMP recipients who filled them in 1989 and 1997. In making a comparison, we considered only whether hunters were able to fill the first DMP that they received because we assumed that hunters would have lower interest and success at filling second DMPs. In 1989, 36.2% of resident hunters who received a DMP filled it. In 1997, the percentage filling first DMPs increased to 46.7%. Although we had no comparable data for 1989, we found that 25.9% of resident hunters who received a second DMP in 1997 filled it. The average overall rate of filling DMPs in 1997 was 44.0%³.

The increased percentage of hunters filling DMPs suggests either greater interest or ease in filling DMPs. One factor that could contribute to greater hunter willingness to fill DMPs is that in 1997 hunters could receive more than one DMP, but they could not in 1989. Decker and Connelly (1988) found that many hunters applied for DMPs as insurance so that they could continue hunting after they shot a buck. With some hunters holding more than one DMP, they can fill one and still have the second for insurance. In fact, we found that 1997 hunters were

² When adjusted for nonresponse bias, 89.7% (+/- 3.8%) of license buyers hunted in 1997. Since the participation rate for 1989 license buyers was based on mail survey respondents only, however, we reported the figure based only on mail survey respondents in our study.

³ This figure is considerably higher than DEC's estimate that 28.3% of DMPs were filled in 1997. Mail surveys tend to overestimate hunters' success at bagging deer because those who bag deer are more likely to respond to surveys.

Figure 7. Percentage of resident deer hunters participating in different seasons.

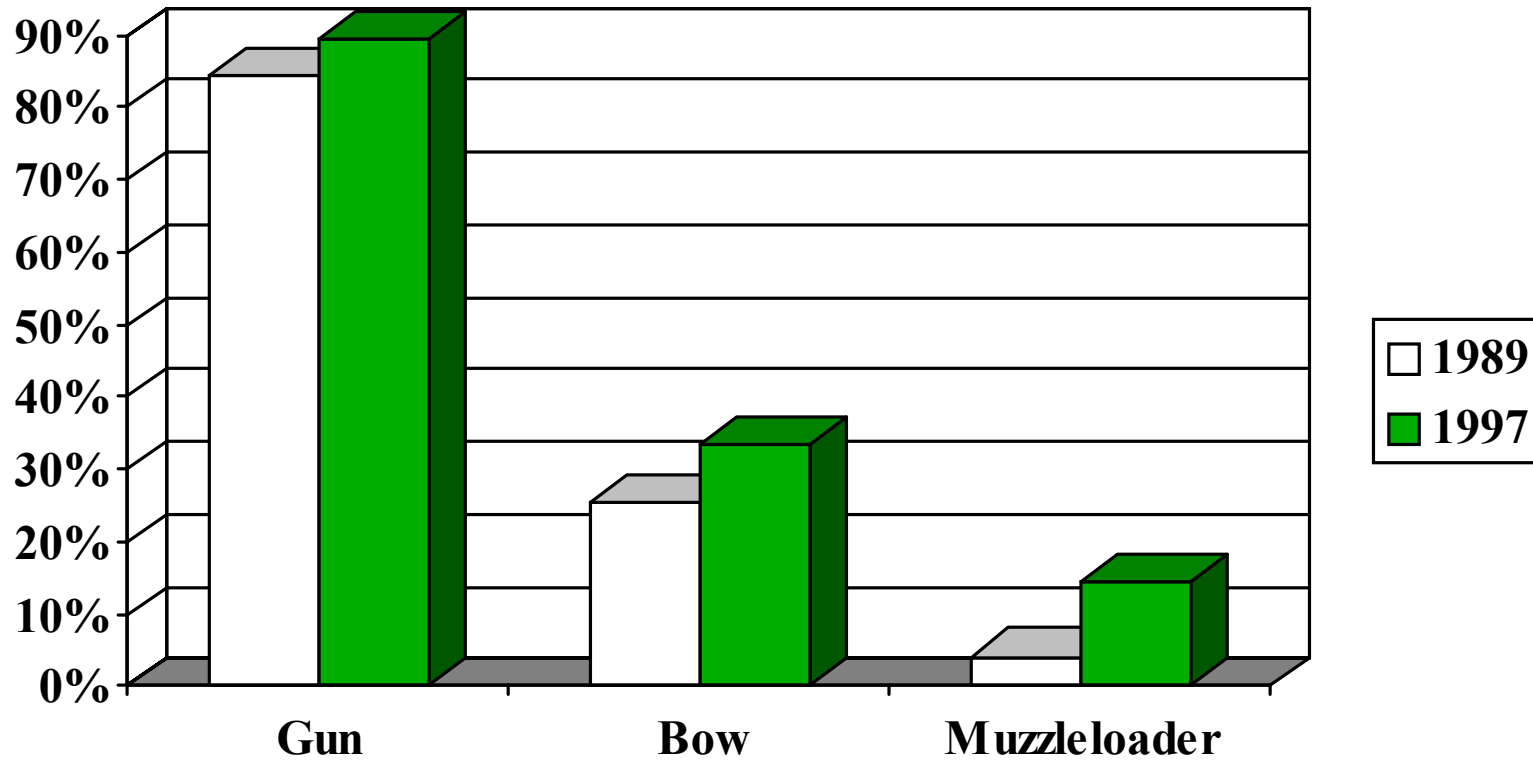


Table 9. Percentage of resident license buyers applying for, receiving, and filling at least 1 deer management permit.

	Year	
	1989	1997
DMPs applied for	57.8	56.8
DMPs received	49.7	47.5
DMPs filled	18.0	22.7

more likely to fill at least one DMP if they were issued at least 2 DMPs. Of 1997 hunters holding 1 DMP, 47.6% filled it. Of those holding 2 DMPs, 55.1% filled at least one of them.

Where Deer Hunters Hunt

Within New York State, the highest densities of hunters afield occur in the Southern Zone, particularly in the Appalachian Plateau, the Binghamton-Elmira area, and parts of the Catskills (Figure 8). The statewide distribution of hunting pressure has changed since 1989 (Figure 9). The number of hunters afield in the Binghamton-Elmira area, the Lake Plains, and the peripheral Adirondacks has increased. The number of hunters has decreased in the Catskills, parts of Region 7, and parts of the Allegheny Plateau and Finger Lakes region.

Some counties experienced more hunters afield but fewer license buyers and vice versa. Counties with a decrease in license buyers but an increase in hunters included Erie, Chautauqua, Wayne, Ontario, Saratoga, Washington, and Sullivan. It is possible that many people bought licenses in these counties in 1989 but traveled to other counties to hunt. In 1997, with a larger local deer population, however, license buyers from these counties may have been less likely than in 1989 to travel to other places.

The types of land on which hunting occurred were varied. Most deer hunters, 61.9%, did all or most of their hunting on private land they did not own. Some 25.5% did all or most of their hunting on their own land. The smallest percentage, 22.2%, did all or most of their hunting on public land.

Deer Take

In any given season (regular gun, bow, or muzzleloading), deer hunters had at most a 1 in 3 probability of taking antlered deer and a 1 in 3 probability of taking antlerless deer (Table 10). Hunters were most likely to take deer during the regular gun season and, on average, took slightly more antlered deer than antlerless deer during this season. Hunters in the bow season were more than twice as likely to take antlered deer as antlerless deer. Hunters in the muzzleloading season were the only group with approximately the same likelihood of taking antlerless deer as antlered deer.

Since 1989, the likelihood of hunters taking deer during each of the seasons has increased considerably (Table 11), particularly during the special seasons. Success during the bowhunting seasons has increased 50%, from 13.9% to 21.8%. Success during the muzzleloading season has doubled, from 11.6% to 23.9%.

On average, license buyers took 0.68 deer (SD = 0.92) in 1997 but would like to take more. If their deer take were not restricted, they would like to take an average of 2.04 deer each year (SD = 1.87) with a minimum of 1.37 bucks (SD = 1.71). Because these desires may be limited by what hunters believe they can consume, we also asked hunters how many deer they would like to take if they could take as many as they wanted and they had the opportunity to donate unneeded meat to a worthy cause. Under these conditions, 41.8% of hunters would want

Figure 8. Density of hunters afield in New York State counties in 1997 (hunters/square mile).

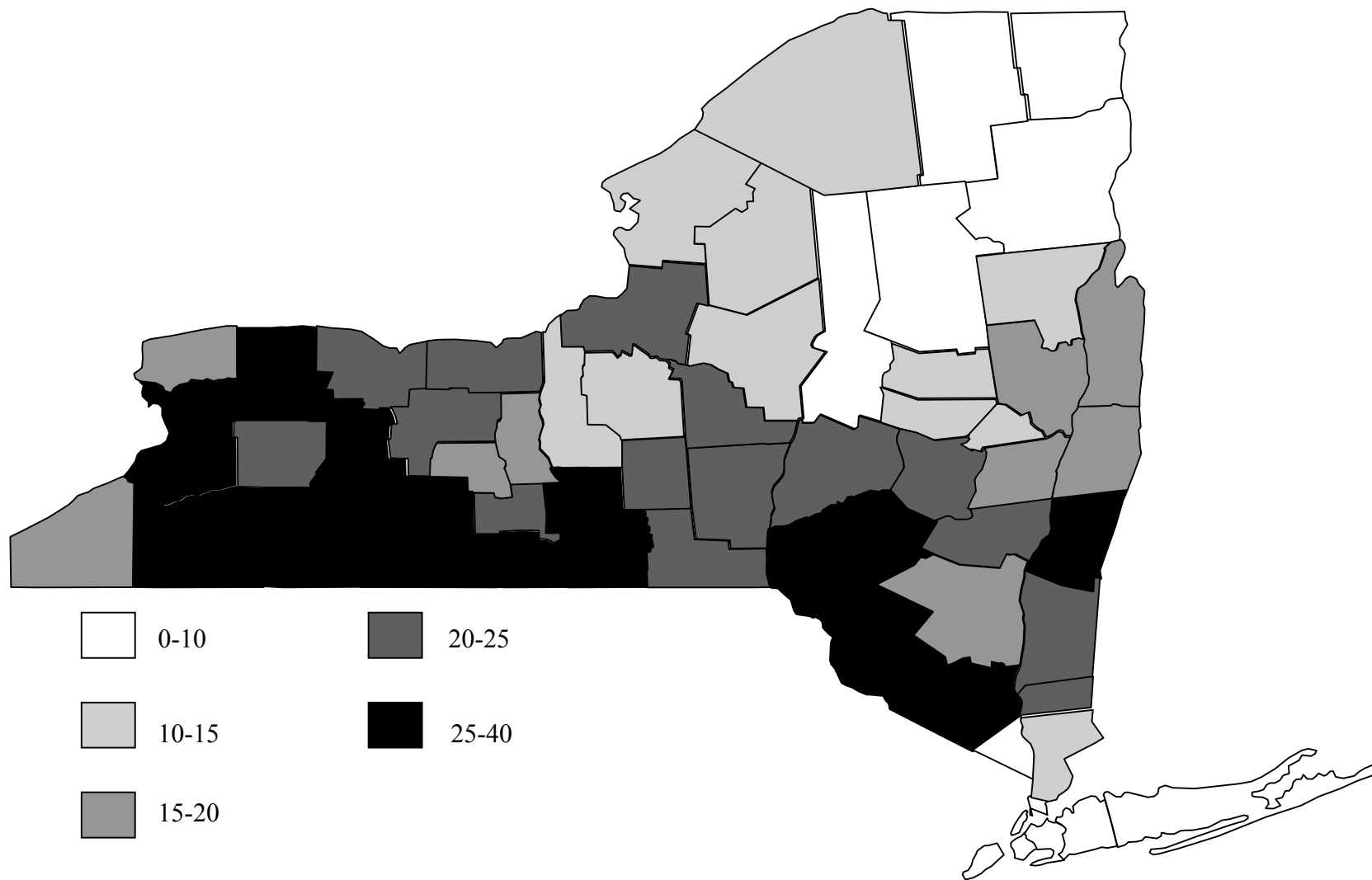


Figure 9. Change in percentage of resident deer hunters afield in each New York State county between 1989 and 1997.

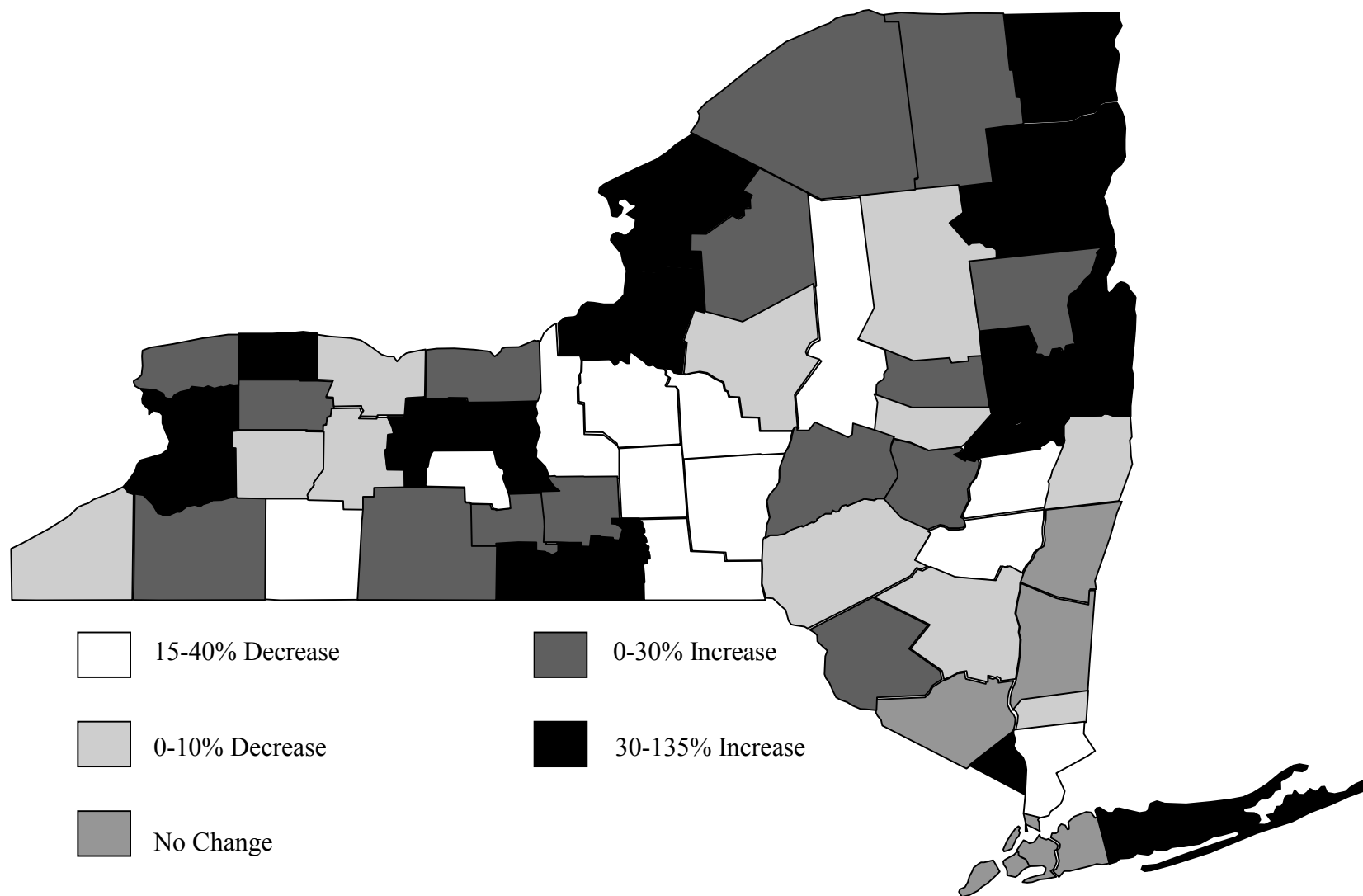


Table 10. Mean number of deer taken by hunters afield, by season.

Season	Antlered Deer		Antlerless Deer	
	M	SD	M	SD
Bow	0.14	0.36	0.07	0.28
Muzzleloader	0.07	0.25	0.10	0.30
Gun	0.34	0.52	0.28	0.52

Table 11. Percentage of hunters afield who took deer, by season.

Season	Year	
	1989	1997
Bow	13.9	21.8
Muzzleloader	11.6	23.9
Gun	36.0	47.1

to take more deer; on average, they would like to take 2.69 deer (SD = 3.18) with a minimum of 1.65 bucks (SD = 2.89).

Differences between Hunters

Regional Differences

Deer hunters from the Metro/Long Island region were the least likely to live in rural areas and the most likely to live in communities of 5,000 or larger (Table 12, chi-square(15)=751.5, P=0.000). On average, Metro/Long Island hunters owned only 18.9 acres of New York State land, which was significantly less than the average amount of land owned by hunters from other regions (ANOVA, F(3,2947) = 5.118, P = 0.002). The average amount of land owned by hunters from other regions ranged between 27 and 43 acres.

Hunters from different regions tended to hunt on different types of land. Some 72.3% of Metro/Long Island hunters did not hunt at all on land they owned. Between 55% and 61% of hunters from other regions did not hunt at all on land they owned. In all regions but the Adirondacks, 62-67% of hunters did most or all of their hunting on private land they did not own. Within the Adirondacks, 55.5% did most or all of their hunting on private land they did not own. Hunters from the Adirondacks were most likely to use public land for hunting. Only 37.5% did not hunt on public land at all. More than half (53-57%) of hunters from other regions did not hunt on public land at all.

With respect to gender, the Metro/Long Island region was the region with the lowest percentage of female license buyers (Table 13, chi-square (7) = 28.0, P = 0.000). The Adirondack region and Western New York had the highest percentage of female license buyers.

The mean first year deer hunting for Metro/Long Island hunters was 1974, significantly later than the mean of 1970 or 1971 for other hunters (ANOVA, F(3,2954) = 10.329, P = 0.000). The mean number of years deer hunting experience of Metro/Long Island hunters was 21.9 (SD = 13.0), significantly less than the mean of 24 to 26 years for hunters from other regions (ANOVA, F(3,2911) = 10.892, P = 0.000). The mean number of deer that Metro/Long Island hunters had bagged in their lifetime was 11.4 (SD = 15.2), which was also significantly less than the mean of 15 to 18 for other hunters (ANOVA, F(3,2910) = 8.615, P = 0.000).

Metro/Long Island hunters were least likely to have had their family play a strong role in the development of their interest in hunting. Some 45.9% of Metro/Long Island hunters indicated that their family had a strong influence on their interest in hunting. In other regions, significantly more hunters (59-64%) said family played a strong influence (chi-square (12) = 70.240, P = 0.000). The lower influence of family on Metro/Long Island hunters could help to explain our finding that Metro/Long Island hunters had less experience and lower lifetime deer take than other hunters. Several studies have reported that family support is critical for hunters to adopt hunting at a young age (Decker et al. 1991; Bissell 1995; Bissell et al. 1998; Purdy and Decker 1986) suggesting that those for whom family support was not important would be more likely to adopt hunting at a later age and have less experience.

Table 12. Percentage of deer hunters in community types by region.

	Region			
	Metro/ Long Island	Catskills	Adirondacks	Western NY
Residence:				
Rural, farm	5.8	32.7	42.5	39.9
Rural, nonfarm	8.9	23.9	21.4	17.8
Community under 5,000	7.1	10.8	12.9	9.8
Community 5,000 – 24,999	29.7	19.0	15.0	17.8
City 25,000 – 100,000	16.0	6.3	7.3	7.5
City over 100,000	32.6	2.9	0.9	7.1

Table 13. Percentage of male and female deer hunters by region.

	Region			
	Metro/ Long Island	Catskills	Adirondacks	Western NY
Gender:				
Male	97.4	93.4	90.9	92.2
Female	2.6	6.6	9.1	7.8

Only 88.5% of license buyers from the Metro/Long Island region actually hunted, which was significantly less than the 92-96% who hunted in each of the other regions. Again, this finding could be related to the lower influence of family on hunters from this region. Decker et al. (1984) reported that hunters who were not initiated into hunting by family members at a young age tended to be less committed hunters.

Participation in particular seasons was quite variable regionally, with fewer hunters from the Adirondacks (22.3%) than from other regions participating in the bow season (Figure 10). The region with the highest percentage of hunters participating in the bow season was Western New York (37.5%). On the other hand, the Adirondack region had the highest participation in the muzzleloading season (35.6%). No more than 12% of hunters from any of the other regions participated in the muzzleloading season.

With regard to DMP use, the highest application rate for DMPs was among Western New York hunters, who applied for a mean of nearly 1 DMP per license buyer (Table 14). The lowest application rate was among hunters from the Adirondacks who applied for a mean of only 0.6 DMPs per license buyer. As expected, the rate of DMPs issued parallels the application rates. The mean number of DMPs filled per license buyer also generally followed the same pattern. Metro/Long Island hunters, however, filled fewer DMPs than expected, based on their application rate. In each of the other regions, each DMP issued resulted in 0.32 DMPs filled. Among hunters from the Metro/Long Island region, each DMP issued resulted in 0.23 DMPs filled.

The mean deer take per hunter during the regular gun season also differed by region (Table 15). Of those who hunted during the regular gun season, the highest take of antlered deer was among hunters from the Catskills and Adirondacks. The lowest take of antlered deer was among hunters from the Metro/Long Island region. The highest take of antlerless deer was among hunters from Western New York and the Catskills. The lowest take of antlerless deer was among hunters from the Adirondacks.

Differences by Season

We divided respondents into 4 groups based on the seasons during which they hunted deer. Because most hunters took part in the regular gun season, we distinguished those who hunted only during the regular gun season from those who hunted during one or more special seasons (but also may have participated in the regular gun season).

- Gun hunters hunted only during the regular gun season.
- Bow hunters hunted during the bowhunting season, but not the muzzleloading season.
- Muzzleloader hunters hunted during the muzzleloading season, but not the bowhunting season.
- Combination hunters hunted during both the bowhunting and muzzleloading seasons.

We found that these hunters differed from each other in several respects.

Figure 10. Percentages of hunters participating in special seasons by region.

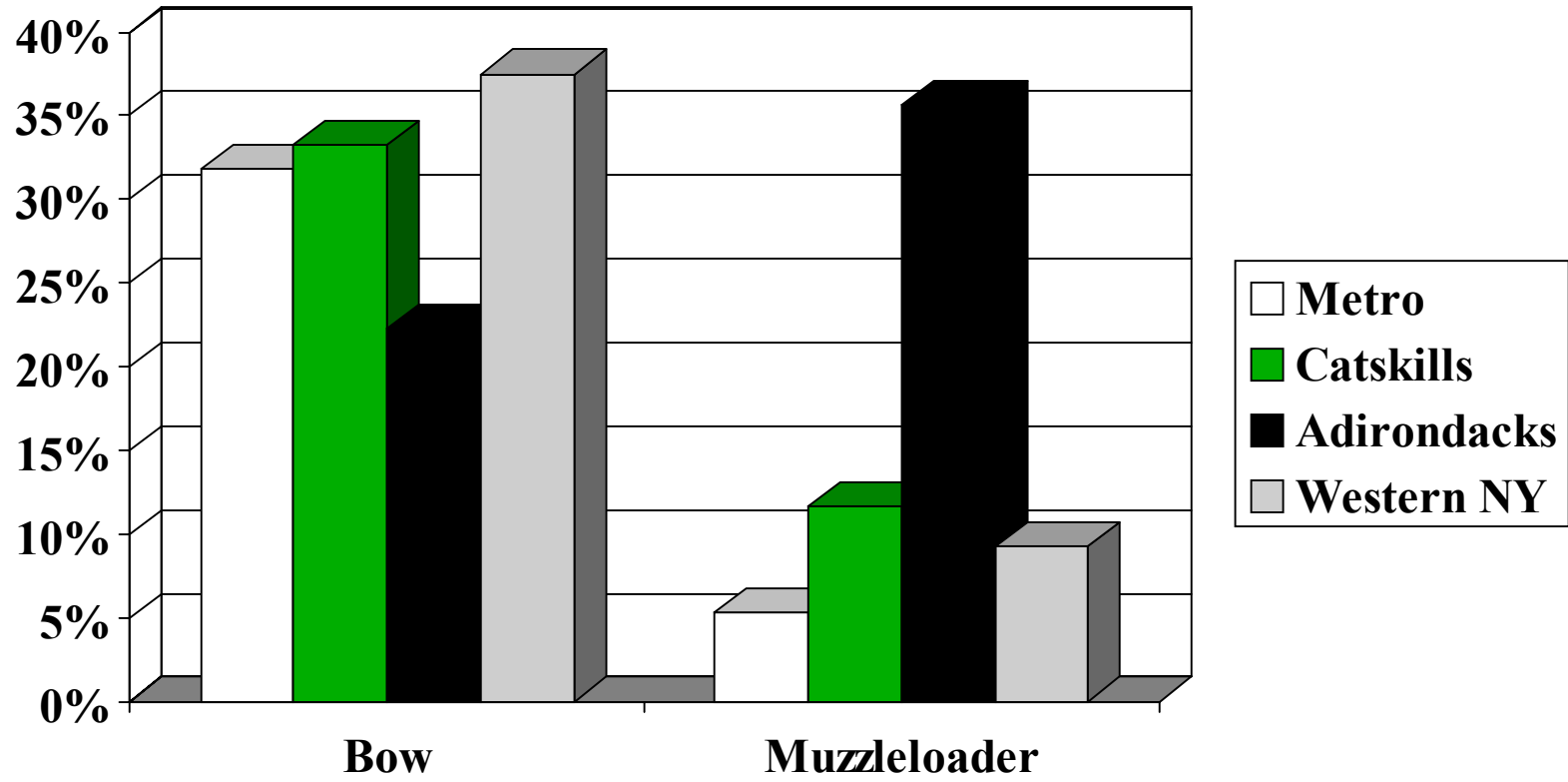


Table 14. DMP use by hunter from different geographic regions. Means with same superscript within a row do not differ significantly.

	Metro/ Long Island		Region					
	M	SD	Catskills		Adirondacks		Western NY	
	M	SD	M	SD	M	SD	M	SD
DMPs applied for ^a	0.88 ^{1,2}	0.78	0.79 ¹	0.80	0.60 ³	0.88	0.98 ²	0.92
DMPs received ^b	0.63 ¹	0.78	0.53 ²	0.73	0.37 ²	0.66	0.67 ¹	0.75
DMPs filled ^c	0.20 ¹	0.46	0.25 ^{1,2}	0.58	0.19 ¹	0.64	0.31 ²	0.60

^aF(3,2978) = 27.944, P = 0.000

^bF(3,2978) = 24.799, P = 0.000

^cF(3,2978) = 6.874, P = 0.000

Table 15. Take of deer by hunters from different regions during gun season. Means with same superscript within a row do not differ significantly.

	Metro/ Long Island		Region					
	M	SD	Catskills		Adirondacks		Western NY	
	M	SD	M	SD	M	SD	M	SD
Antlered deer ^a	0.24 ¹	0.56	0.40 ²	0.59	0.39 ^{2,3}	0.51	0.32 ³	0.48
Antlerless deer ^b	0.24 ^{1,2}	0.50	0.27 ^{2,3}	0.51	0.18 ¹	0.43	0.33 ³	0.55

^aF(3,2691) = 12.828, P = 0.000

^bF(3,2695) = 12.025, P = 0.000

Bow hunters and combination hunters were younger, on average, than other hunters (ANOVA, $F(3,2704) = 42.983$, $P = 0.000$). Bow hunters and combination hunters averaged 41-42 years old. Gun hunters and muzzleloader hunters averaged 47-48 years old.

Hunters who participated in at least one special season were more likely to be male (chi-square(3) = 21.130, $P = 0.000$). Among gun hunters, 90.8% were male. Among other hunters, 93.9-95.9% were male.

Given that bow hunters were younger than gun and combination hunters, it is not surprising that they had less deer hunting experience. Bow hunters began hunting deer more recently (ANOVA, $F(3,2721) = 19.439$, $P = 0.000$) and had hunted deer in fewer years (ANOVA, $F(3,2684) = 10.803$, $P = 0.000$). The average bow hunter began hunting in 1975 and had 22.2 years deer hunting experience (SD = 11.6). Gun and muzzleloader hunters began hunting in 1970, on average, and had 25-27 years of deer hunting experience.

Lifetime deer take increased with the number of seasons in which hunters participated (ANOVA, $F(3,2677) = 32.609$, $P = 0.000$). Gun hunters had taken a mean of 13.2 deer over their lifetime (SD = 14.9). Bow hunters had taken a mean of 17.5 deer (SD = 16.7) and muzzleloader hunters had taken a mean of 19.4 (SD = 18.7), numbers which did not differ significantly. Combination hunters had taken a mean of 23.0 deer (SD = 18.3).

Those hunters who participated in special seasons were more likely to be "continuous" hunters, as defined in this study (to have bought licenses in both 1997 and 1998); they were more likely to buy a license in 1998 (chi-square(3) = 31.700, $P = 0.000$). Among 1997 gun hunters, 92.0% purchased a license to hunt in 1998, but 95.9% of bow hunters, 97.4% of muzzleloader hunters, and 99.5% of combination hunters bought licenses to hunt in 1998.

Among those who hunted during one or more special seasons, bow hunters were the least likely to also hunt during the regular gun season (chi-square (3) = 125.036, $P = 0.000$). While 92.2% of bow hunters also hunted during the gun season, 96.5% of muzzleloader hunters and 98.0% of combination hunters hunted during the regular season.

Bow hunters and combination hunters, on the other hand, applied for, received, and filled more DMPs on average than other hunters (Table 16). Gun hunters filled the fewest DMPs on average.

Those who hunted during the special seasons were more successful at taking deer, even when they were hunting during the regular gun season. Bow, muzzleloader, and combination hunters took significantly more antlered and antlerless deer during the regular gun season than gun hunters (Table 17). Gun hunters took a mean of 0.30 antlered deer during the 1997 gun season, while other hunters took a mean of 0.36-0.50 antlered deer during this season. Gun hunters took a mean of 0.23 antlerless deer during the regular gun season while other hunters took a mean of 0.28-0.36 during this season.

The higher deer take of those hunting during the special seasons may be related to both their skill and their desire. Bow hunters and combination hunters were interested in taking

Table 16. DMP usage by those hunting in different seasons. Means with the same superscript within a row do not differ significantly.

	Seasons Hunted In							
	Gun		Bow		Muzzleloader		Combination	
	M	SD	M	SD	M	SD	M	SD
DMPs applied for ^a	0.79 ¹	0.82	1.08 ²	0.89	0.76 ¹	0.96	1.23 ²	0.85
DMPs received ^b	0.54 ¹	0.71	0.73 ²	0.73	0.50 ¹	0.66	0.83 ²	0.83
DMPs filled ^c	0.21 ¹	0.53	0.35 ^{2,3}	0.62	0.30 ^{1,2}	0.54	0.44 ³	0.64

^aF(3,2736) = 31.130, P = 0.000

^bF(3,2736) = 18.822, P = 0.000

^cF(3,2736) = 16.435, P = 0.000

Table 17. Deer take during the regular gun season by those hunting in different seasons. Means with the same superscript within a row do not differ significantly.

	Seasons Hunted In							
	Gun		Bow		Muzzleloader		Combination	
	M	SD	M	SD	M	SD	M	SD
Antlered deer taken ^a	0.30 ¹	0.50	0.36 ^{1,2}	0.54	0.44 ^{2,3}	0.51	0.50 ³	0.59
Antlerless deer taken ^b	0.23 ¹	0.47	0.36 ²	0.58	0.28 ^{1,2}	0.50	0.34 ²	0.60

^aF(3,2677) = 12.056, P = 0.000

^bF(3,2678) = 11.749, P = 0.000

significantly more deer than gun hunters (Table 18). Bow and combination hunters wanted to take a mean of at least 2 deer each season while gun hunters wanted to take fewer than 2 deer. When asked how many deer they would like to take if they had the opportunity to give unneeded meat to a worthy cause, the desires of hunters in all groups increased but a significant difference between bow and combination hunters and gun hunters still remained.

Resident and Nonresident Hunters

We detected a variety of differences between resident and nonresident hunters. Nonresident hunters were more likely than resident hunters to come from larger communities (Table 19). About twice as many resident hunters (36.4%) as nonresident hunters (18.4%) lived in rural farm areas. About half of nonresidents came from communities of 5,000 or more. Only about 1 in 3 resident hunters came from these larger communities.

Nonresident hunters were almost exclusively male. Some 99.0% of nonresident hunters were male, while 92.5% of resident hunters were male ($\chi^2(1) = 18.842, P = 0.000$).

Nonresident hunters were particularly likely to buy their hunting licenses in the Catskills and Western New York:

- 40.4% purchased licenses in the Catskill region;
- 33.7% purchased licenses in Western New York;
- 13.1% purchase licenses in the Adirondacks; and
- 12.8% purchased licenses in the Metro/Long Island region.

The average resident hunter began hunting in 1971 and the average nonresident began hunting in 1974 ($t(3138) = 3.235, P = 0.001$). Nevertheless, the number of years during which deer were hunted did not differ significantly between residents and nonresidents. This finding suggests that nonresidents may hunt more consistently than residents. Differences in the number of deer residents and nonresidents had taken in their lifetime supports this conclusion. Nonresidents had taken a mean of 20.9 deer over their lifetime ($SD = 20.5$) while residents had taken a mean of 15.1 deer ($SD = 22.9$) ($t(388) = 4.599, P = 0.000$).

Nonresidents were more likely to have had certain influences play a strong role in shaping their interests in hunting. Some 67.9% of nonresidents and 59.1% of residents indicated that family had a strong influence on their interest in hunting ($\chi^2(4) = 13.059, P = 0.011$). Some 79.0% of nonresidents and 69.6% of residents indicated that friends had a strong influence on their interest in hunting ($\chi^2(4) = 13.065, P = 0.011$).

These data provide several indications that nonresidents are more committed hunters than residents. Nonresidents hunt in more years, have taken more deer over their lifetime, and are more likely to have been influenced by family and friends. It is logical that nonresidents are more committed hunters given that nonresident licenses cost more and they have to make more of an effort than resident hunters to travel to New York State. Indeed, Mazzaresse et al. (1993) used the number of hunting trips taken out of state as one indication of commitment to hunting.

Table 18. Desired deer take of those hunting in different seasons. Means with the same superscript within a row do not differ significantly.

	Seasons Hunted In							
	Gun		Bow		Muzzleloader		Combination	
	M	SD	M	SD	M	SD	M	SD
Without opportunity to give unneeded meat to worthy cause ^a	1.86 ¹	0.89	2.39 ²	3.26	2.14 ^{1,2}	0.86	2.52 ²	1.07
With opportunity to give unneeded meat to worthy cause ^b	2.51 ¹	3.73	3.09 ^{1,2}	2.92	2.67 ¹	1.38	3.39 ²	2.09

^aF(3,2689) = 16.433, P = 0.000

^bF(3,2658) = 7.913, P = 0.000

Table 19. Percentage of resident and nonresident hunters living in different types of communities^a.

Type of area hunters live	Residency Status	
	Resident	Nonresident
Rural, farm	36.4	18.4
Rural, nonfarm	18.3	22.1
Community under 5,000	10.4	9.4
Community 5,000 – 24,999	18.5	27.4
City 25,000 – 100,000	8.0	12.4
City over 100,000	8.3	10.4

^aPercentages for residents and nonresidents significantly different, chi-square(5)=45.961, P = 0.000.

Nonresidents' patterns of participation during the season also differed from those of residents. Nonresidents were more likely to hunt during the year in which they purchased a license (chi-square(1) = 14.495, $P = 0.000$). Some 98.4% of nonresidents and 92.6% of residents hunted during the year in which they bought a license. This difference is logical. Preparing to hunt in New York State requires more effort from nonresidents. It is reasonable that nonresidents would not purchase a license unless they planned to hunt deer.

Nonresidents, on the other hand, were less likely than residents to hunt in New York State again the year after they purchased a license. While 79.5% of nonresidents who purchased licenses in 1997 also purchased a license in 1998, 93.4% of 1997 resident license buyers bought a license in 1998 (chi-square(1) = 73.564, $P = 0.000$).

Nonresidents were significantly less likely to participate in special deer hunting opportunities. They were only about 2/3 as likely as residents to participate in special seasons (Table 20). They applied for, received, and filled significantly fewer DMPs than residents (Table 21), a finding which is likely related to how difficult it is for nonresidents to obtain DMPs.

Nonresident hunters made less use of private land than resident hunters. A total of 73.3% of nonresident hunters did not hunt at all on their own land, compared to 59.2% of residents (chi-square(4) = 41.136, $P = 0.000$). Only 36.0% of nonresident hunters did all of their hunting in New York State on private land which they did not own, while 50.3% of residents hunted only on private land they did not own (chi-square(4) = 41.136, $P = 0.000$). Consequently, nonresident hunters were more dependent on public land. While 47.7% of nonresidents did at least some of their hunting on public land, only 40.0% of residents did so (chi-square(4) = 16.532, $P = 0.002$).

Mean deer take during the 1997 season did not differ between residents and nonresidents. Nonresidents, however, were less likely to take antlerless deer during the regular gun season. Nonresidents who hunted during the regular gun season took an average of 0.15 antlerless deer. The average for residents, 0.28, was nearly twice as high ($t(420) = -5.326$, $P = 0.000$).

Continuous and Sporadic Hunters

Several ways of measuring commitment to hunting exist (Mazzarese et al. 1993). One of these is the number of years during which people hunt deer. For the purposes of this study, we defined "continuous hunters" as those who bought licenses both in 1997 and 1998 and "sporadic hunters" as those who bought licenses only in 1997. A total of 7.2% of 1997 license buyers were sporadic hunters according to this definition, which is more narrow than those used in previous studies.

Continuous hunters were more likely than sporadic hunters to come from rural areas (chi-square(5) = 14.251, $P = 0.014$). Among continuous hunters, 36.5% lived in rural farm areas, while only 24.6% of sporadic hunters lived in these areas.

Continuous and sporadic hunters tended to buy different types of deer hunting licenses (Table 22). Sporadic hunters were more likely than continuous hunters to buy big game licenses and less likely to buy sportsman's licenses. Given that sportsman's licenses allow people to take

Table 20. Percentages of resident and nonresident hunters hunting in special seasons.

Season	Residency Status	
	Resident	Nonresident
Bow ^a	33.4	22.1
Muzzleloader ^b	14.4	10.3

^aPercentages differ significantly, chi-square(1)=16.297, P = 0.000.

^bPercentages differ significantly, chi-square(1)=4.023, P = 0.045.

Table 21. DMPs usage by resident and nonresident license buyers.

Season	Residency Status			
	Resident		Nonresident	
	M	SD	M	SD
DMPs applied for ^a	0.87	0.89	0.49	0.71
DMPs received ^b	0.60	0.75	0.25	0.51
DMPs filled ^c	0.27	0.60	0.14	0.39

^aMeans differ significantly, $t(424) = -8.656$, P = 0.000.

^bMeans differ significantly, $t(473) = -10.821$, P = 0.000.

^cMeans differ significantly, $t(491) = -5.268$, P = 0.000.

Table 22. Percentages of continuous and sporadic hunters buying each license type. Percentages in two columns differ significantly, chi-square(4)=67.490, P = 0.000.

License Type	Hunter Type	
	Continuous	Sporadic
Senior	14.7	12.6
Big Game	19.9	34.1
Sportsman	61.0	39.7
Nonresident	3.8	11.7
Junior Archery	0.7	1.5

part in more types of hunting and fishing opportunities than big game licenses, this finding suggests that continuous hunters may have broader interests in fish and wildlife related recreation.

Continuous and sporadic hunters have different deer hunting histories. Although both groups began hunting at about the same time, sporadic hunters have hunted in fewer years on average (20.1, SD = 14.3) than continuous hunters (24.8, SD = 13.9) ($t(2917) = -4.648$, $P = 0.000$). Sporadic hunters also have taken fewer deer in their lifetime (9.3, SD = 13.2) than continuous hunters (15.8, SD = 23.3) ($t(325) = -6.420$, $P = 0.000$).

Sporadic hunters were less likely actually to hunt deer during 1997. Some 76.3% hunted deer, compared to 94.1% of continuous hunters ($\text{chi-square}(1) = 95.131$, $P = 0.000$). Given that sporadic hunters were less likely to hunt, it is not surprising that they were less likely to participate in any of the 1997 deer seasons, particularly the special seasons (Table 23). They were also less likely to apply for, receive, and fill DMPs than continuous hunters (Table 24). For every DMP received, continuous hunters filled 0.46 and sporadic hunters filled only 0.35.

Sporadic hunters participating in the 1997 season were less likely than continuous hunters to hunt on land they owned ($\text{chi-square}(4) = 9.641$, $P = 0.047$). While 68.6% of sporadic hunters did not hunt at all on land they owned, 59.1% of continuous hunters did not hunt at all on their own land. This finding suggests that a lack of access to lands on which to hunt could contribute to sporadic hunting. Indeed, Enck and Decker (1991) reported that deer hunters prefer to hunt on private land for free. Duda and Young (1995) and Bissell et al. (1998) found that a lack of access and places to hunt was one of the most important causes of dissatisfaction for hunters.

Sporadic hunters were less likely to take both antlered and antlerless deer during the regular gun season (Table 25). In fact, they wanted on average to take fewer deer than continuous hunters. Sporadic hunters wanted to take a mean of 1.76 deer (SD = 0.89) during each hunting season while continuous hunters wanted to take a mean of 2.06 deer (SD = 1.92). On the other hand, the minimum number of bucks continuous and sporadic hunters wanted to take each year did not differ significantly.

Gender Differences

Female hunters were much more likely than males to come from rural farm areas (Table 26). More than half of female hunters came from rural farm areas while only about 1 in 3 male hunters did. Female hunters were also less likely to come from communities of 5,000 or more. Only 16.7% of female hunters came from communities of 5,000 or more while 37.0% of male hunters did.

Women tended to purchase different types of deer hunting licenses than men. Women were more likely to buy big game licenses and less likely to buy sportsman's licenses than men (Table 27).

Female hunters had less deer hunting experience than males. Although we found no significant difference in their mean age, the average female began hunting in 1979 while the

Table 23. Percentages of continuous and sporadic hunters participating in each season.

Season	Hunter Type	
	Continuous	Sporadic
Bow ^a	34.4	15.3
Muzzleloader ^b	15.1	3.3
Gun ^c	91.0	69.8

^aPercentages differ significantly, chi-square(1)=32.861, P = 0.000

^bPercentages differ significantly, chi-square(1)=22.779, P = 0.000

^cPercentages differ significantly, chi-square(1)=95.323, P = 0.000

Table 24. DMP usage by continuous and sporadic hunters.

Season	Hunter Type			
	Continuous		Sporadic	
	Mean	SD	Mean	SD
DMPs applied for ^a	0.90	0.89	0.36	0.63
DMPs received ^b	0.61	0.74	0.26	0.70
DMPs filled ^c	0.28	0.61	0.09	0.29

^aMeans differ significantly, t(284) = -11.514, P = 0.000.

^bMeans differ significantly, t(252) = -6.919, P = 0.000.

^cMeans differ significantly, t(382) = -8.058, P = 0.000.

Table 25. Deer take during the regular gun season by continuous and sporadic hunters.

	Hunter Type			
	Continuous		Sporadic	
	M	SD	M	SD
Antlered deer taken ^a	0.35	0.53	0.22	0.41
Antlerless deer taken ^b	0.29	0.52	0.13	0.34

^a Means differ significantly, t(185) = -3.762, P = 0.000

^b Means differ significantly, t(200) = -5.226, P = 0.000

Table 26. Percentage of hunters living in different types of communities, by gender^a.

Type of area hunters live	Gender	
	Male	Female
Rural, farm	34.3	53.6
Rural, nonfarm	18.4	19.7
Community under 5,000	10.2	10.1
Community 5,000 – 24,999	19.7	10.1
City 25,000 – 100,000	8.5	5.1
City over 100,000	8.8	1.5

^aPercentages differ significantly, chi-square(5)=42.696, P = 0.000.

Table 27. Percentages of hunters buying different license types, by gender^a.

License Type	Gender	
	Male	Female
Senior	14.8	10.7
Big Game	19.2	43.9
Sportsman	60.5	44.9
Nonresident	4.7	0.0
Junior Archery	0.8	0.5

^aPercentages differ significantly, chi-square(4)=78.757, P = 0.000.

average male began hunting in 1970 ($t(251) = -9.015, P = 0.000$). Females on average had hunted deer in 16.5 years ($SD = 12.6$) while males had hunted deer in 25.0 years ($SD = 13.9$) ($t(2917) = 8.470, P = 0.000$). The lifetime deer take of women was lower than that of men. Women had taken an average of 9.7 deer ($SD = 13.0$) while men had taken an average of 15.7 deer ($SD = 23.3$) ($t(310) = 5.894, P = 0.000$). These findings are consistent with previously reported work on female hunters. Adams and Steen (1997) reported that female hunters in Texas were most likely to be initiated into hunting as adults by their husbands while men were most likely to be initiated as children by their fathers. Therefore, female hunters of the same age as male hunters would be expected to have less hunting experience.

Few other significant differences existed between men and women. Women were no more or less likely than men to hunt after they had purchased a license, nor were they more or less likely to be continuous hunters. Women were, however, less likely than men to hunt during the bow season ($\text{chi-square}(1) = 17.133, P = 0.000$). While 20.4% of women hunters hunted during the bow season, 34.0% of men did. Women were not more or less likely than men to hunt during the muzzleloading or regular gun seasons. The rate of applying for, receiving, and filling DMPs was also similar between women and men. Furthermore, neither the total 1997 deer take of women nor their desired deer take significantly different from that of men.

Women did show differences from men in the types of land on which they hunted. Women were more likely than men to hunt on their own land. Only 51.1% of women did not hunt at all on their own land while the comparable figure for men was 60.2% ($\text{chi-square}(4) = 26.255, P = 0.000$). Women were less likely to hunt on private land they did not own. While 24.8% of women did not hunt at all on private land they did not own, only 15.9% of men did not hunt at all on this type of land ($\text{chi-square}(4) = 12.156, P = 0.016$).

Age Differences

A variety of differences among hunters were correlated with age. Hunters of different age were unequally influenced by several social factors (Table 28). Family influence on interest in hunting was strongest among the youngest hunters. Among hunters 25 and under, 73.9% said family had a strong influence, while no more than 64% of hunters in any of the other age groups said family had a strong influence. This finding suggests that family may be particularly important to youth taking up hunting. The influence of friends, however, appears to become more important with age. More than 70% of those over 45 said friends had a strong influence on their interest in hunting, while less than 70% of those 45 and under said friends had a strong influence. Possibly friends are important in encouraging people to continue hunting. Previous research has concluded that the influence of family is indeed critical for initiation into hunting (Purdy and Decker 1986; Decker et al. 1991; Bissell 1995; Bissell et al. 1998) but that the influence of family is less important than the influence of peers for adult hunters (Decker et al. 1984). Serving in the armed services or national guard did not play a strong role in encouraging an interest in hunting among most hunters, but it was most likely to play a strong role among older hunters.

Older license buyers are less likely to actually hunt. Logistic regression models showed that age did not influence the likelihood of 1997 license buyers purchasing a license in 1998

Table 28. Percentage of hunters strongly influenced by various social factors, by age.

	Age					
	Under 26	26-35	36-45	46-55	56-65	Over 65
Family ^a :	73.9	63.5	55.9	57.3	60.4	55.8
Armed Services ^b :	4.6	5.7	7.2	14.4	16.3	12.3
Friends ^c :	64.9	67.5	68.4	74.0	70.2	72.8

^aPercentages significantly different, chi-square(20)=66.725, P = 0.000

^bPercentages significantly different, chi-square(20)=273.305, P = 0.000

^cPercentages significantly different, chi-square(20)=52.506, P = 0.000

(Figure 11). The percentage of 1997 license buyers who actually hunted, however, declined steadily with age (Figure 11). This finding suggests that hunters' interest in hunting or their ability to do so may decline with age. Perhaps the low price of senior licenses, however, encourages hunters to continue buying licenses. Logistic regression models also predicted a steady decline in the percentage of license buyers hunting during any given season (Figure 12). U.S. Fish and Wildlife data (USDOJ and USDOC 1996) demonstrates that the proportion of the population who hunts declines with age after middle age.

The average number of DMPs applied for per license buyer also varied with age. This variation was best explained by a quadratic model (Figure 13). The number of DMPs applied for was lowest for young and old hunters and highest for the middle-aged. The average number of DMPs filled per license buyer did not vary significantly with age, however. Nor did the overall take of antlered and antlerless deer within any given season vary with age.

Interest in taking deer varied with age. We asked hunters the total number of deer they would like to take if they could take as many as they wanted. These desires declined linearly with age. Although the number of deer desired increased if hunters were offered the opportunity to donate unneeded meat to a worthy cause, that desire also declined linearly with age (Figure 14). The same pattern was true for the minimum number of bucks that hunters wanted each year (Figure 15), although the decline with age was not as steep. All linear relationships were highly significant ($P = 0.000$).

CONCLUSIONS AND IMPLICATIONS

Through this study, we were able to identify a number of recent trends in deer hunting in New York State. These trends are consistent with expectations established by previously published studies, but we were able to paint a more detailed picture of their nature in some cases.

Deer hunting is declining in New York State. It is not declining in all communities and geographic regions, however. The largest decline is occurring among residents of urban and suburban areas. Deer hunting is more stable in rural communities. Not only has the percentage of deer hunters coming from rural areas increased, but the number of hunters coming from rural areas has increased. Although this finding may be partially attributable to some deer hunters choosing to move from population centers to rural farm areas, it is also consistent with past research which has found that rural hunters tend to be more committed to hunting (Decker et al. 1991; Bissell et al. 1998). Indeed, we found that rural hunters were more likely than nonrural hunters to be continuous hunters.

Deer hunting has also been stable in the Adirondacks and western New York. The decline in New York State is focused in the Metro/Long Island and Catskill regions. Deer hunters from the Metro/Long Island region appeared to be the least invested in hunting – they had the least experience and lowest rates of participation and success. Our study was not designed to determine the reasons for these regional differences, but they may be related to the heavily urbanized nature of much of the Metro/Long Island region and the rapid urban and suburban development taking place in parts of the Catskill region.

Figure 11. Probability of 1997 license buyers hunting in 1997 and buying a license in 1998.



Figure 12. Probability of 1997 license buyers hunting during the bow, muzzleloader, and regular gun seasons.

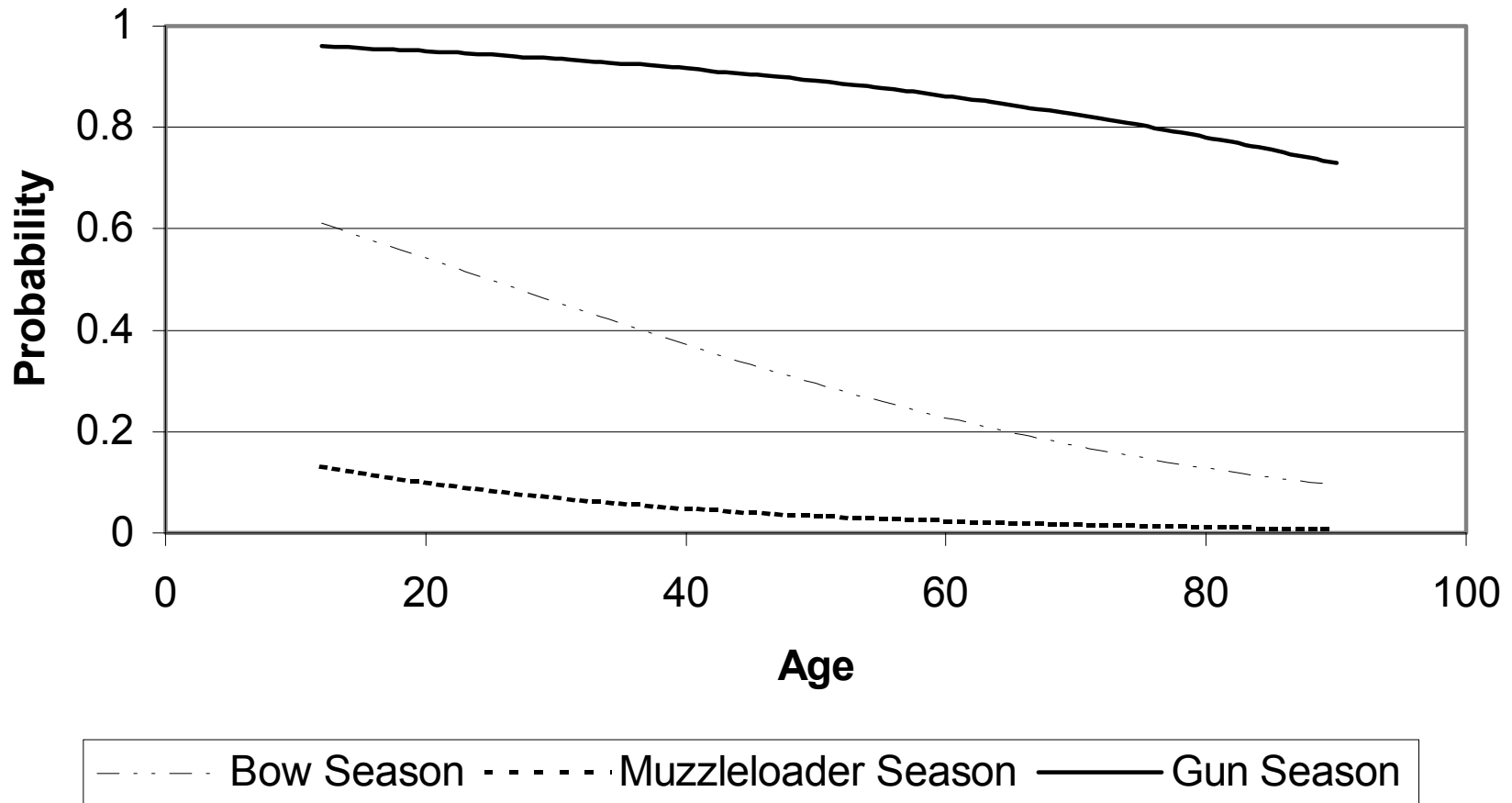


Figure 13. Quadratic model of number of deer management permits applied for by age. $F(2744)=5.90$, $P=0.003$.

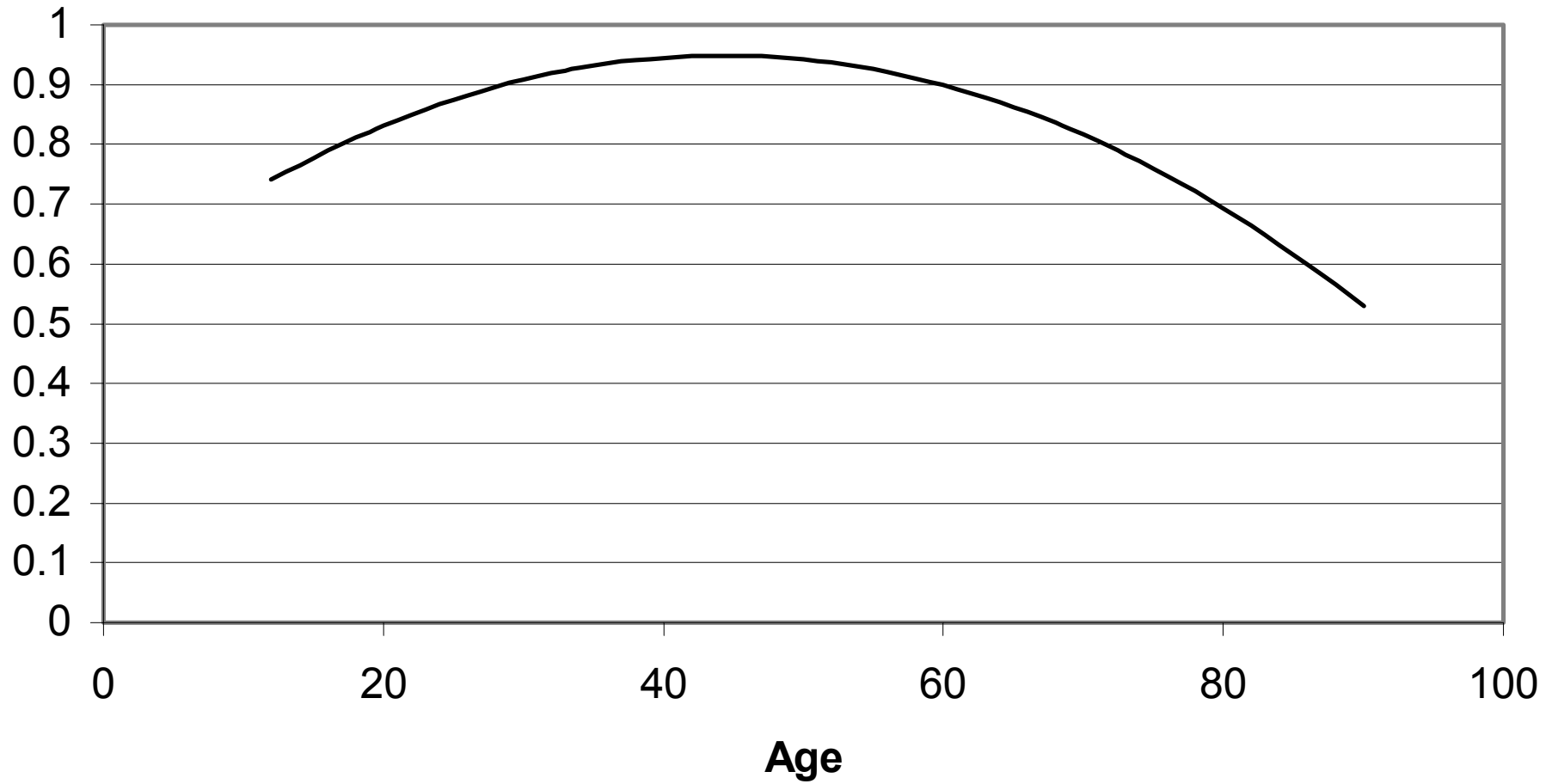


Figure 14. Variation in number of deer desired each hunting season with age (without and with the opportunity to donate unneeded meat to a worthy cause).

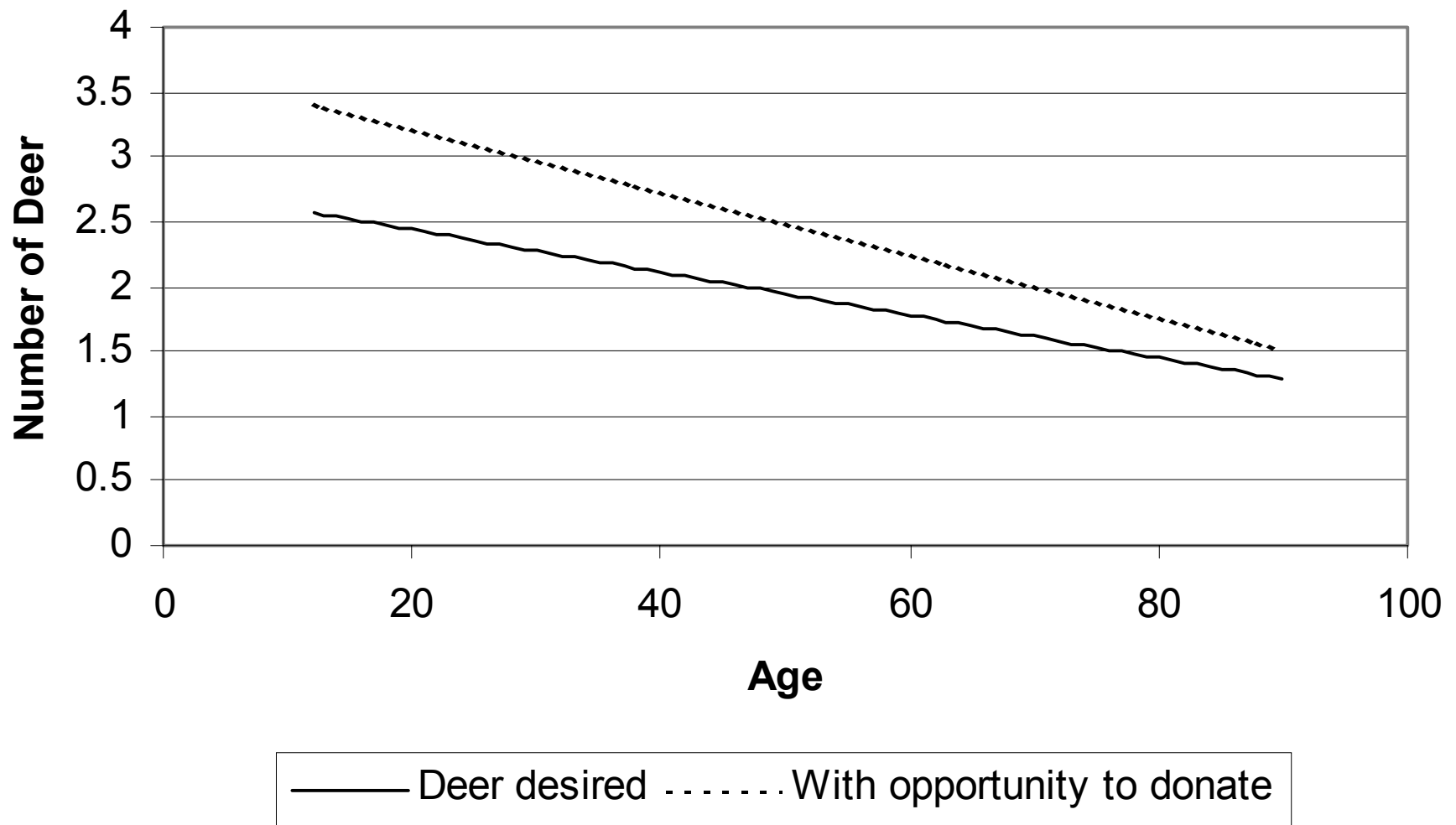
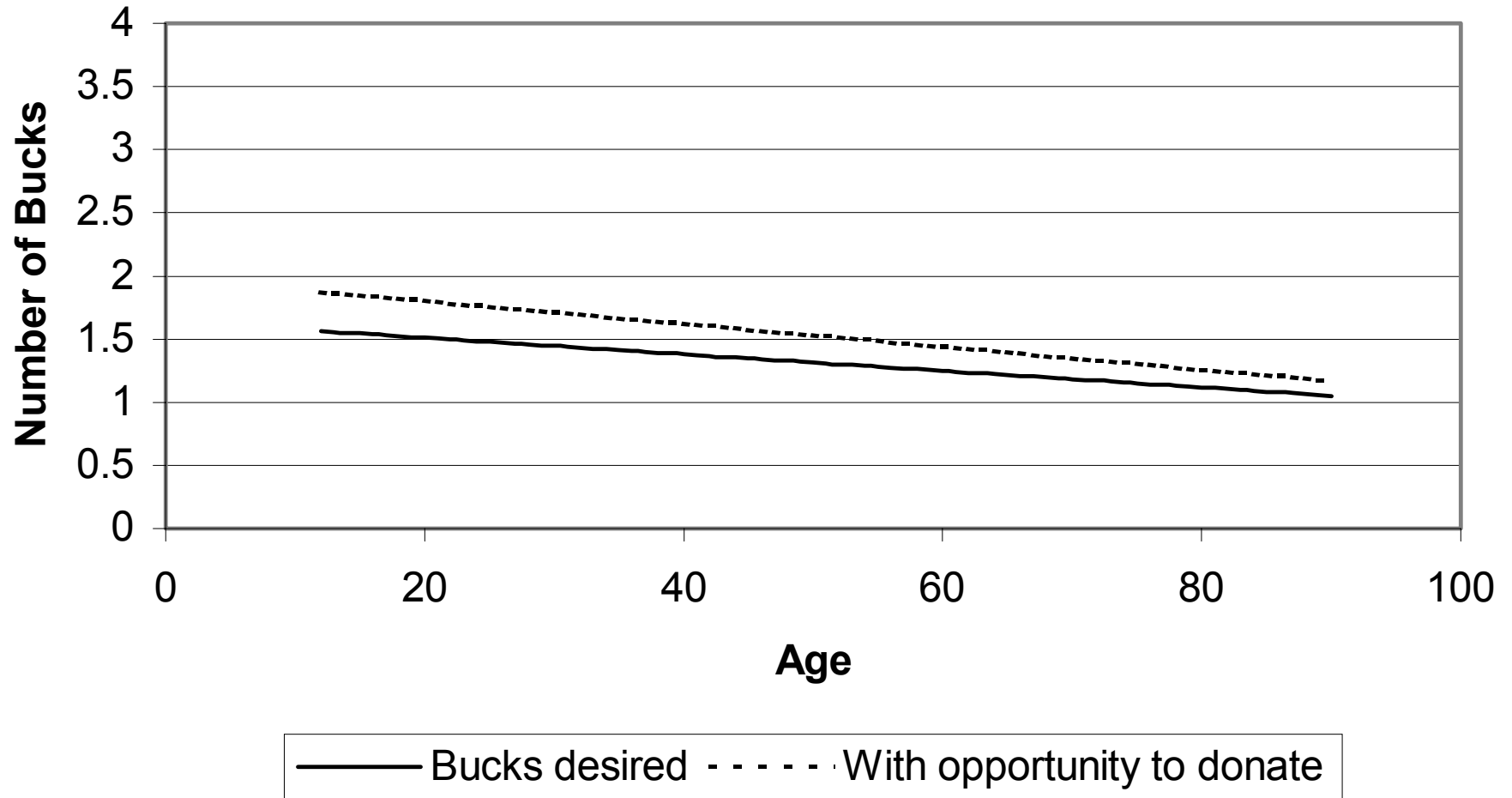


Figure 15. Variation in the minimum number of bucks desired each hunting season with age (without and with the opportunity to donate unneeded meat to a worthy cause).



The trends have important implications for managers:

- Given managers' dependence on hunters for controlling the size of the deer herd, the decline in hunters will make it increasingly difficult for the size of the deer herd to be managed through recreational hunting. Successful management in the future will depend on restructuring hunting regulations; educating hunters to make them more committed to helping to manage deer; and exploring other avenues to achieve management goals besides recreational hunting.
- Because hunting is declining primarily in the Catskill and Metro/Long Island regions, deer management problems are likely to be more intensive and difficult to address in these areas.

Important research questions to explore in the future may include:

- What forces are most responsible for the decline of deer hunters in the Metro/Long Island and Catskill regions? Is this decline attributable to a lower proportion of consistent hunters in these areas? The loss of lands which can be hunted to development? A decline in the social acceptability of hunting?
- Why has the total number of hunters living in rural farm areas increased? Is our hypothesis that hunters are moving from population centers to rural farm areas correct? Or are other social forces at work?

Deer hunters are aging. This trend is related to both the aging of the "baby boomer" generation, which makes up a large segment of the population, and the increased difficulty of recruiting younger hunters. Older license buyers are less likely to go afield, are less interested in taking deer, and apply for fewer DMPs. On the other hand, hunters today have more experience and are more successful at taking deer than in the late 1980's. We could not determine the reasons for these increases based on our data alone. They could simply be the result of older hunters having more opportunity to accumulate experience (such as locating good hunting lands to which they have access), and using this experience to increase their success. It also could be the result of a larger deer population, making it easier for hunters to take deer. Alternatively, the decline in the number of deer hunters could be marked by the attrition of less accomplished hunters making the remaining hunters more successful on average.

The aging of hunters will likely impact deer management:

- Despite the higher success at taking deer today, older hunters' lower interest in hunting, taking deer, and using DMPs will likely make it increasingly difficult for managers to manage deer as the hunting population continues to age.

Important questions for further research might include:

- What types of hunting opportunities are older hunters most likely to prefer?

- How can today's higher success at taking deer be harnessed by managers to help control the deer herd?

Interest in special seasons and harvest opportunities is increasing. Success in special seasons is also increasing as is the likelihood of hunters filling DMPs. These changes may indicate an increased commitment to hunting of the average hunter. Hunters who hunt during special seasons show several indications of having more commitment to hunting than other hunters. They are more likely to buy a license the following seasons. They want to take more deer on average. They are more successful at taking deer, particularly those hunters who hunt during one of the bowhunting seasons. Whether participating in special seasons makes a hunter more committed to hunting or whether a greater commitment to hunting promotes participation in special seasons is not something we could determine, however.

Interest in special seasons and opportunities is not uniform. Hunters participating in special seasons are more likely to be younger, resident males.

A management implication of these trends is:

- The increased interest in special seasons and opportunities may help to improve BOW's deer management capability because hunters taking part in these opportunities are more successful than other hunters at taking deer.

Research questions worth exploring include:

- Does involvement in special hunting opportunities lead to a greater commitment to hunting? Or does commitment to hunting lead to involvement in special opportunities?
- If taking part in special opportunities increases commitment to hunting, how can hunters be involved in these opportunities?

Hunters are hunting in different regions. We noted some marked geographic shifts in where hunters are hunting within New York State. Among nonresident hunters, we found that fewer were coming from Pennsylvania. One hypothesis to explain both these findings is that hunters are more likely to hunt close to home. Shifts within New York State could be in response to growing deer populations in many regions. More data would be needed to support or refute this hypothesis.

A possible management implication of these findings is:

- Nonresident hunters may be lost as more of this group chooses to hunt closer to home in response to growing deer populations in their states, particularly given the high cost of nonresident licenses.

Additional research questions to explore include:

- What causes hunters to choose the regions where they will hunt? Proximity to their homes? Access to land? The size of the deer population? How have these and other factors influenced the change in the distribution of hunters afield in New York State?

Hunters are not taking as many deer as they would like to. Many hunters, however, would not be able to take as many deer as they would like even if they had that opportunity. Furthermore, even if hunters were able to take as many deer as they would like, it might not be enough to control the deer population in all areas. An exploration of that question will serve as the basis for the second report to come out of this study.

An important implication of this finding is:

- Hunters may be willing to increase their take of deer if given the opportunity.

Questions which remain include:

- Can hunters success at taking deer be increased to more closely match their interests?
If so, how?
- Can hunters willingness to take does be increased by regulatory changes or education?
If so, how?

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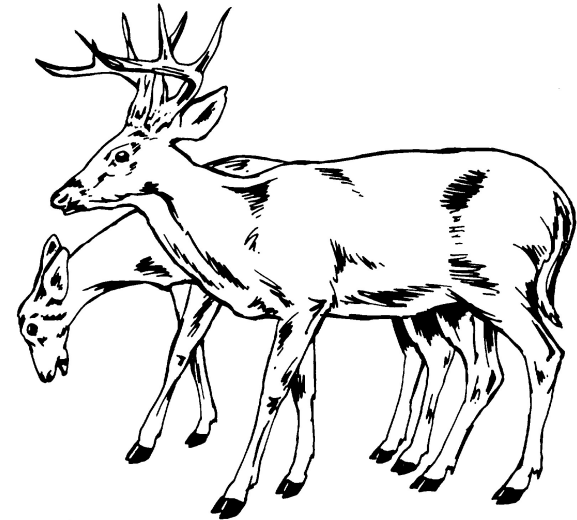
APPENDIX A
MAIL SURVEY INSTRUMENT

DEER HUNTING

IN

NEW YORK:

A SURVEY OF HUNTERS



Human Dimensions Research Unit
Department of Natural Resources
College of Agriculture and Life Sciences
Cornell University, Ithaca, NY 14853

DEER HUNTING IN NEW YORK:

A SURVEY OF HUNTERS

Research conducted by the
Human Dimensions Research Unit
in the
Department of Natural Resources
College of Agriculture and Life Sciences
Cornell University

Sponsored by the
Bureau of Wildlife
in the
New York State Department of Environmental Conservation

Your answers to this questionnaire will help the New York State Department of Environmental Conservation make decisions about deer management. Please complete this questionnaire at your earliest convenience, seal it, and drop it in any mailbox (no envelope needed); return postage has been provided. **Your responses will remain confidential and will never be associated with your name.**

THANK YOU FOR YOUR ASSISTANCE!

General Information

1. In approximately what year did you first hunt deer in New York or elsewhere?

19 _____

2. In approximately how many different years have you hunted deer in New York or other places?

_____ Years

3. Approximately how many deer have you bagged in New York or other places since you started deer hunting?

_____ Deer

Participation in 1997 and 1998 New York Deer Hunting Seasons

4. Did you purchase a license that allowed you to hunt for deer in New York State during the 1998 deer hunting season? (Check one.)

_____ No

_____ Yes

5. Did you hunt for deer in New York State during the 1997 or 1998 deer hunting seasons?

<u>Year</u>	<u>No</u>	<u>Yes</u>
1997	<input type="checkbox"/>	<input type="checkbox"/>
1998	<input type="checkbox"/>	<input type="checkbox"/>

If you answered "No" for both years, skip to Question 10.

6. In which New York counties did you hunt deer during the 1997 and 1998 deer hunting seasons? (If you do not know the county name, write in a city or village near where you hunted. If you did not hunt deer during the season, write in "none.")

List all NY counties hunted in

1997 _____
 1998 _____

7. How much of your deer hunting in New York did you do on each of the following types of land during the 1997 and 1998 deer hunting seasons? (Circle one number for each item.)

	None	Some	Most	All	Don't Know
a. Land that I own.	0	1	2	3	5
b. Private land that I do <u>not</u> own.	0	1	2	3	5
c. Public land.	0	1	2	3	5

8. During which of the following seasons did you hunt for deer in New York in 1997 or 1998? (Check all that apply.)

Season	1997	1998
Bow	<input type="checkbox"/>	<input type="checkbox"/>
Muzzleloader	<input type="checkbox"/>	<input type="checkbox"/>
Gun	<input type="checkbox"/>	<input type="checkbox"/>

9a. How many antlered deer and antlerless deer did you bag during each of the following 1997 New York deer hunting seasons? (Circle "NA" if you did not hunt during that season.)

Season	Number of deer bagged in 1997		
	Antlered Deer	Antlerless Deer	
Bow	_____	_____	NA
Muzzleloader	_____	_____	NA
Gun	_____	_____	NA

9b. How many antlered deer and antlerless deer did you bag during each of the following 1998 New York deer hunting seasons? (Circle "NA" if you did not hunt during that season.)

Season	Number of deer bagged in 1998		
	Antlered Deer	Antlerless Deer	
Bow	_____	_____	NA
Muzzleloader	_____	_____	NA
Gun	_____	_____	NA

Use of Deer Management Permits

10. How many deer management permits (DMP's) did you apply for, receive, and fill in 1997 and 1998? (If none, write "0.")

DMP's	1997	1998
Applied for	_____	_____
Received	_____	_____
Filled	_____	_____

If you did not apply for any deer management permits in either 1997 or 1998, skip to Question 13.

11a. Why did you apply for a deer management permit in 1997 and/or 1998? (Check all that apply.)

- _____ To increase my chances of taking at least one deer.
- _____ To be able to take an additional deer after filling my buck tag.
- _____ To allow me to hunt legally with friends and family after filling my buck tag.
- _____ To help manage the size of the deer herd.
- _____ To keep someone else from taking a doe.
- _____ Other (please specify): _____

11b. Please circle the one response you checked in question 11a that was your most important reason for applying for a deer management permit?

12. **How serious were you about shooting a deer using the deer management permit(s) you applied for? (Check one.)**
- _____ No intention of shooting a deer using the permit.
- _____ Not too serious about shooting a deer using the permit.
- _____ Moderately serious about shooting a deer using the permit.
- _____ Very serious about shooting a deer using the permit.

Skip to Question 14.

- 13a. **If you did not apply for a deer management permit in 1997 or 1998, why not? (Check all that apply.)**

I wanted to apply, but:

- _____ I did not get around to it.
- _____ I did not think I would have enough time to hunt.
- _____ I did not think my chances of getting a permit were good.
- _____ the permit application period was too short.
- _____ other (please specify reason): _____
- _____

I did not want to apply, because:

- _____ I was concerned about too many does being shot in my hunting area.
- _____ I did not need or want an extra deer.
- _____ other (please specify reason): _____
- _____

- 13b. **Please circle the one reason you checked in question 13a that was your most important reason for not applying for a deer management permit in 1997 or 1998?**

Your Opinions about Potential Changes in Deer Hunting Regulations

Each year, DEC deer managers, sportsmen's groups, landowners, and other individuals propose changes in regulations dealing with deer hunting. The merits of each proposal must be weighed carefully. Your responses in this section will help deer managers understand your opinions about different regulations and how they would affect your participation.

14. **Currently, Sunday hunting is legal in all of New York State. However, Sunday hunting was not legal in western New York until recently.**

- a. **Did you hunt on Sunday in New York State during either the 1997 or 1998 deer hunting seasons?**

<u>Year</u>	<u>No</u>	<u>Yes</u>
1997	<input type="checkbox"/>	<input type="checkbox"/>
1998	<input type="checkbox"/>	<input type="checkbox"/>

- b. **Do you support or oppose the continued opportunity for western New York deer hunters to hunt on Sundays? (Please circle the appropriate number below.)**

Strongly Oppose	Neutral					Strongly Support		
-4	-3	-2	-1	0	1	2	3	4

15. **Currently, DMP's may be used to take antlerless deer during the last 10 days of the Southern Zone early archery season or during the regular or special late seasons. A proposed regulation would allow DMP's to be used beginning on November 1 each year, which would give bow hunters more days during which they could hunt with DMP's.**

Would you support or oppose this proposal? (Please circle the appropriate number below.)

Strongly Oppose	Neutral					Strongly Support		
-4	-3	-2	-1	0	1	2	3	4

16. Currently, deer management permits (DMP's) are not transferable. Only the person to whom a DMP is issued may use it to take an antlerless deer. A proposed change would allow a DMP holder to let another hunter use his or her DMP. In other words, a permit holder could let another hunter have an unused DMP to take an antlerless deer.

Hunters have different beliefs about what effects this change would cause.

- Some people support this change because they believe it would improve DEC's ability to manage the size of the deer herd AND/OR because it would provide more hunting opportunities for hunters who did not receive a DMP or who had already filled one.
 - Some people oppose this change because they believe it would allow some hunters to take more than their fair share of deer AND/OR they believe that it could hurt the public image of hunters for this reason.

a. If it had been legal for hunters to let other hunters use their DMP's, would you have EITHER let another hunter use your DMP OR used another hunter's DMP during either of the last two years?

- Definitely not
- Possibly
- Probably
- Definitely

- Don't Know

b. Would you support or oppose this proposal? (Please circle the appropriate number below.)

Strongly Oppose				Neutral				Strongly Support
-4	-3	-2	-1	0	1	2	3	4

17. Currently, only antlered deer may be taken during the Southern Zone muzzleloader season, unless a hunter is filling a deer management permit. A proposed change would allow a deer of either sex to be taken during the Southern Zone muzzleloader season.

Would you support or oppose this proposal? (Please circle the appropriate number below.)

Strongly Oppose				Neutral				Strongly Support
-4	-3	-2	-1	0	1	2	3	4

18. Currently, the opening day of the regular deer season is the first Monday after November 15. Sometimes opening day falls the week before Thanksgiving, and sometimes it falls the week of Thanksgiving. Some people have proposed that opening day be set in relation to Thanksgiving. One change would set opening day so that it always occurs the Monday of the week before Thanksgiving. Another change would set opening day so that it always occurs the Monday of Thanksgiving week.

Which of the following options do you think is best? (Check one.)

- Keep the current system in which opening day is on the first Monday after November 15.
- Always start the season the Monday of the week before Thanksgiving week.
- Always start the season the Monday of Thanksgiving week.

- Don't Know.

19. **Currently, crossbows are not legal for deer hunting in New York State. A proposed change would legalize crossbows during one or more seasons.**

a. **If it had been legal, would you have hunted deer with a crossbow during either of the last two years?**

- Definitely not
- Possibly
- Probably
- Definitely

- Don't Know

b. **Which of the following options would you support? (Check all that apply.)**

- Legalize crossbows during the archery seasons.
- Legalize crossbows during the regular season.
- Legalize crossbows during a new special season.
- Do not legalize crossbows.

- Don't Know

20. **Currently, muzzleloader hunters are not allowed to use telescopic scopes (optical sights) during the muzzleloader season. A proposed change would allow telescopic scopes to be used on muzzleloaders.**

a. **If it had been legal, would you have hunted using a telescopic scope on a muzzleloader during either of the last two years?**

- Definitely not
- Possibly
- Probably
- Definitely

- Don't Know

b. **Would you support or oppose this proposal? (Please circle the appropriate number below.)**

Strongly Oppose				Neutral					Strongly Support
-4	-3	-2	-1	0	1	2	3	4	

21. **Currently, the Southern Zone late archery season takes place during the 5 days immediately following the close of the regular season, and the Southern Zone late muzzleloader season takes place during the 7 days immediately following the close of the regular season. One proposed change would extend both the late archery and muzzleloader seasons. Another proposal would separate the late archery and muzzleloader seasons so that bow hunters and muzzleloader hunters were not in the field at the same time.**

Which of the following options would you support? (Check one.)

- Keep the current system.
- Extend, but do not separate, the late archery and muzzleloader seasons.
- Separate, but do not extend, the late archery and muzzleloader seasons.
- Separate and extend, the late archery and muzzleloader seasons.

- Don't Know

22. People have different reasons for supporting or opposing new hunting regulations. Please tell us how important to you each of the following reasons are for supporting or opposing new hunting regulations.

When I consider proposed deer hunting regulatory changes, it is important to me that these changes: (Please circle one number for each item.)

	<u>Strongly Disagree</u>	<u>Neutral</u>	<u>Strongly Agree</u>	<u>Don't Know</u>		
a. Do <u>not</u> result in an increased total buck harvest.	1	2	3	4	5	6
b. Do <u>not</u> result in an increased total doe harvest.	1	2	3	4	5	6
c. <u>Increase</u> DEC's ability to control the size of the deer population.	1	2	3	4	5	6
d. <u>Improve</u> the health of the deer population.	1	2	3	4	5	6
e. <u>Increase</u> hunting opportunities for bow hunters.	1	2	3	4	5	6
f. <u>Increase</u> hunting opportunities for muzzleloader hunters.	1	2	3	4	5	6
g. <u>Increase</u> hunting opportunities for firearm hunters.	1	2	3	4	5	6
h. Keep a strict limit on the number of deer that individual hunters can take.	1	2	3	4	5	6
i. Increase opportunities for New York State <u>landowners</u> to harvest deer.	1	2	3	4	5	6
j. Increase deer hunting opportunities for hunters who have trouble taking time off from work.	1	2	3	4	5	6
k. Increase <u>my own</u> chances of taking bucks.	1	2	3	4	5	6
l. Increase <u>my own</u> chances of taking large bucks.	1	2	3	4	5	6
m. Increase <u>my own</u> chances of taking does.	1	2	3	4	5	6

	<u>Strongly Disagree</u>	<u>Neutral</u>	<u>Strongly Agree</u>	<u>Don't Know</u>		
n. Allow me more opportunity to spend time in the field.	1	2	3	4	5	6
o. Encourage new people to take up deer hunting.	1	2	3	4	5	6
p. Increase the total number of deer hunters in New York.	1	2	3	4	5	6
q. Lead to a better public image of hunters and hunting.	1	2	3	4	5	6
r. Protect the interests of farmers and other landowners.	1	2	3	4	5	6
s. Promote clean, humane kills.	1	2	3	4	5	6
t. Make deer hunting a <u>safer</u> sport.	1	2	3	4	5	6
u. <u>Reduce</u> crowding of hunters on particular days.	1	2	3	4	5	6
v. <u>Reduce</u> crowding of hunters in particular areas.	1	2	3	4	5	6
w. <u>Increase</u> revenue for DEC's deer management programs.	1	2	3	4	5	6

Your Deer Hunting Preferences

23. If you were allowed to take as many deer as you wanted using whatever implements you wanted . . .

a. how many deer would you like to take each license year?

_____ Deer

b. what is the minimum number of bucks you would like to take each license year?

_____ Bucks

24. If you were allowed to take as many deer as you wanted using whatever implements you wanted and you had the opportunity to donate meat you could not use to a worthy cause . . .

a. how many deer would you like to take each license year?

_____ Deer

b. what is the minimum number of bucks you would like to take each license year?

_____ Bucks

Please use the space below for any additional comments you may wish to make.

Background Information

25. How much has each of the following factors contributed to your interest in hunting? (Circle one number for each item.)

Effect on interest in hunting:

	<u>None</u>	<u>Slight</u>	<u>Moderate</u>	<u>Strong</u>	<u>Don't Know</u>
a. Growing up in a hunting family	0	1	2	3	5
b. Being in the armed services or national guard	0	1	2	3	5
c. Having friends who hunt	0	1	2	3	5

26. How much land do you own in New York State? (Enter "0" if you do not own any land. Enter "1" for anything 1 acre or less.)

_____ acres

27. How would you describe the type of area in which you live? (Check one.)

- _____ rural, farm
- _____ rural, nonfarm
- _____ community with under 5,000 people
- _____ community with 5,000 to 24,999 people
- _____ city with 25,000 to 100,000 people
- _____ city with over 100,000 people

Thank You For Your Time and Effort!

To return this questionnaire, simply seal it (postage has been provided) and drop it in the nearest mailbox.

APPENDIX B

NONRESPONDENT TELEPHONE SURVEY INSTRUMENT

**1999 Deer Hunter
Follow-up Telephone Survey
of Non-respondents**

Good (Morning, Afternoon, Evening):

My name is _____. I work for the Department of Natural Resources at Cornell University. May I speak to _____.

(IF INDIVIDUAL IS UNAVAILABLE, FIND OUT WHEN IT WOULD BE CONVENIENT TO CALL AGAIN AND ENTER ON COVER SHEET.)

I'm calling about the questionnaire we mailed to you recently about deer hunting in New York State. We realize that you may have been too busy to fill it out or that you may not hunt very frequently, but we still would like to get your ideas on a few key questions so our study is more representative of what deer hunters think. The Department of Environmental Conservation (also known as the "DEC") wants to find out how hunters think about deer management. This survey will help DEC to make decisions that are most satisfactory to hunters.

Would you be willing to spend about 5 minutes now answering a few questions? (IF **NO**, ASK FOR A MORE CONVENIENT TIME TO CALL BACK AND ENTER ON COVER SHEET. IF **YES**, SAY: "**THANK YOU.**")

1a. Did you hunt for deer in New York State during the 1998 deer hunting season?

- _____ No
 _____ Yes
 _____ Can't remember

1b. And what about in the previous year, in 1997?

- _____ No
 _____ Yes
 _____ Can't remember

If respondent answered "No" to Question 1a, skip to Question 3a.

2a. How many antlered deer did you bag in 1998? (Record "can't remember" as "9.")

_____ antlered deer

2b. And what about antlerless deer? How many did you bag in 1998? (Record "can't remember" as "9.")

_____ antlerless deer

If respondent answered "No" to Question 1b, skip to Question 4a.

3a. How many antlered deer did you bag in 1997? (Record "can't remember" as "9.")

_____ antlered deer

3b. And how many antlerless deer did you bag in 1997? (Record "can't remember" as "9.")

_____ antlerless deer

If respondent answered "No" to Question 1a, skip to Question 5a.

4a. Now, in 1998, in which seasons did you hunt deer in New York State? Did you hunt for deer during the bow hunting season?

_____ No

_____ Yes

_____ Can't remember

4b. What about during the muzzleloader season?

_____ No

_____ Yes

_____ Can't remember

4c. And did you hunt during the gun season in 1998?

- No
- Yes
- Can't remember

If respondent answered "No" to Question 1b, skip to Question 6a.

5a. Which seasons did you hunt for deer in New York State during 1997? Did you hunt for deer during the bow hunting season in 1997?

- No
- Yes
- Can't remember

5b. Did you hunt deer during the muzzleloader season in 1997?

- No
- Yes
- Can't remember

5c. How about the gun season?

- No
- Yes
- Can't remember

6a. Now I'd like to ask you about your use of deer management permits. How many deer management permits did you apply for in 1998? (Record "can't remember" as "9.")

_____ deer management permits

If respondent answered "0" to Question 6a, skip to Question 7a.

6b. And how many deer management permits did you receive in 1998? (Record "can't remember" as "9.")

_____ deer management permits

If respondent answered "0" to Question 6b, skip to Question 7.

6c. And how many of these permits did you fill? (Record "can't remember" as "9.")

_____ deer management permits

7a. How about during the previous year, during 1997? How many deer management permits did you apply for? (Record "can't remember" as "9.")

_____ deer management permits

If respondent answered "0" to Question 7a, skip to Question 8.

7b. And how many deer management permits did you receive? (Record "can't remember" as "9.")

_____ deer management permits

If respondent answered "0" to Question 7b, skip to Question 8.

7c. And how many of these permits did you fill? (Record "can't remember" as "9.")

_____ deer management permits

8. Each year, DEC deer managers, sportsmen's groups, landowners, and other individuals propose changes in regulations dealing with deer hunting. I'm going to ask you whether you would support or oppose two regulations changes that have been proposed.

First . . .

Currently, deer management permits are not transferable. Only the person to whom a deer management permit is issued may use it to take an antlerless deer. A proposed change would allow a deer management permit holder to let another hunter use his or her deer management permit. In other words, a permit holder could let another hunter have an unused DMP to take an antlerless deer.

Would you support or oppose this proposal, or are you neutral?

_____ Support

Would you just support it or would you strongly support it?

_____ Support

_____ Strongly Support

_____ Oppose

Would you just oppose it or would you strongly oppose it?

_____ Oppose

_____ Strongly Oppose

_____ Neutral

_____ Don't Know

9. Currently, crossbows are not legal for deer hunting in New York State. A proposed change would legalize crossbows during one or more seasons. Crossbows could be legalized during the archery season, they could be legalized during the regular season, or they could be legalized during a new special season. They could also be legalized during 2 or even all 3 of these seasons.

Which of the following options would you support?

a. Would you support the legalization of crossbows during the archery seasons?

_____ Yes

_____ No

_____ Don't Know

b. Would you support the legalization of crossbows during the regular season?

_____ Yes

_____ No

_____ Don't Know

c. Would you support the legalization of crossbows during a new special season?

_____ Yes

_____ No

_____ Don't Know

d. Would you oppose the legalization of crossbows?

_____ Yes

_____ No

_____ Don't Know

10. If you were allowed to take as many deer as you wanted using whatever implements you wanted. . .

a. How many deer would you like to take each license year? (Record "don't know" as "9.")

_____ deer

b. What is the minimum number of bucks you would like to take each license year? (Record "don't know" as "9.")

_____ bucks

11. If you were allowed to take as many deer as you wanted using whatever implements you wanted and you had the opportunity to donate meat you could not use to a worthy cause .

. .

a. How many deer would you like to take each license year? (Record "don't know" as "9.")

_____ deer

b. What is the minimum number of bucks you would like to take each license year? (Record "don't know" as "9.")

_____ bucks

Thank you very much for taking the time to answer my questions.

APPENDIX C

COMPLETE RECORD OF ANALYSES

Table A-1. Age and land ownership.

	Statewide		Metro/ Long Island		Region						Gender			
	M	SD	M	SD	Catskills		Adirondacks		Central/ Western		Male		Female	
Age ^a	46.4	15.1	47.2 ¹	14.0	47.3 ¹	14.5	46.0 ¹	14.7	45.9 ¹	15.7	46.4	15.1	45.5	14.3
Land owned in NYS (acres) ^b	30.2	111.9	18.9 ¹	83.8	31.9 ^{1,2}	113.1	42.4 ²	155.3	27.6 ^{1,2}	96.1	29.7	113.9	36.8	83.2

	Gun Only		Implement Bow		Muzzleloader		Bow and Muzzleloader		Residency				Consistency			
	M	SD	M	SD	M	SD	M	SD	Resident		Nonresident		Consistent		Inconsistent	
Age ^a	48.0 ¹	15.2	41.3 ²	13.0	47.2 ¹	13.9	41.9 ²	12.0	46.3 ¹	15.1	46.2 ¹	13.3	46.3 ¹	15.1	46.4 ¹	14.6
Land owned in NYS (acres) ^b	30.3 ¹	111.6	23.7 ¹	98.0	54.6 ^{1,2}	181.1	38.9 ²	86.0	30.0 ¹	111.9	33.9 ¹	117.5	30.9 ¹	110.9	21.0 ¹	124.9

	Under 26		26-35		36-45		Age 46-55		56-65		Over 65		Trend (Residents Only)			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	1989		1997	
Age ^a	-	-	-	-	-	-	-	-	-	-	-	-	41.4	14.6	46.3	15.1
Land owned in NYS (acres) ^b	17.8 ^{1,2}	53.3	14.7 ¹	50.6	25.7 ^{1,2}	92.9	42.2 ²	142.6	43.0 ²	129.2	34.2 ^{1,2}	145.9	-	-	-	-

Table A-1. Age and land ownership. (Continued.)

ANOVA/t-test Results

Region:

^aF(3,2937) = 1.594, P = 0.119 (nonsignificant)

^bF(3,2947) = 5.118, P = 0.002

Gender:

^at(2946) = 0.896, P = 0.370 (nonsignificant)

^bt(2950) = -0.890, P = 0.373 (nonsignificant)

Implement:

^aF(3,2704) = 42.983, P = 0.000

^bF(3,2712) = 4.675, P = 0.003

Residency:

^at(395) = -0.206, P = 0.837 (nonsignificant)

^bt(3130) = 0.618, P = 0.537 (nonsignificant)

Consistency:

^at(2944) = 0.078, P = 0.938 (nonsignificant)

^bt(2947) = -1.249, P = 0.212 (nonsignificant)

Age:

^bF(5,2901) = 5.376, P = 0.000

Table A-2. Age, gender, community of residence, geographic region of license purchase and license type.

	Statewide	Metro/ Long Island	Region			Gender	
			Catskills	Adirondacks	Central/ Western	Male	Female
Age^a:							
Under 26	7.1	4.1	6.4	7.7	7.9	7.2	5.7
26-35	17.7	17.7	16.5	16.8	18.6	17.5	20.3
36-45	25.9	25.6	23.7	28.7	25.9	25.7	29.7
46-55	22.1	22.2	25.2	20.3	21.6	22.1	22.2
56-65	13.5	18.0	13.8	14.2	12.0	13.7	11.3
Over 65	13.6	12.3	14.5	12.3	14.1	13.8	10.8
Gender^b:							
Male	92.8	97.4	93.4	90.9	92.2	-	-
Female	7.2	2.6	6.6	9.1	7.8	-	-
Residence^c:							
Rural, farm	35.6	5.8	32.7	42.5	39.9	34.3	53.6
Rural, nonfarm	18.5	8.9	23.9	21.4	17.8	18.4	19.7
Community under 5,000	10.2	7.1	10.8	12.9	9.8	10.2	10.1
Community 5,000 – 24,999	19.0	29.7	19.0	15.0	17.8	19.7	10.1
City 25,000 – 100,000	8.3	16.0	6.3	7.3	7.5	8.5	5.1
City over 100,000	8.3	32.6	2.9	0.9	7.1	8.8	1.5
Geographic Region^d:							
Metro/Long Island	12.2	-	-	-	-	12.8	4.2
Catskills	19.6	-	-	-	-	19.7	17.8
Adirondacks	19.0	-	-	-	-	18.6	24.4
Central/Western New York	49.2	-	-	-	-	48.9	53.5
License Type^e:							
Senior	14.5	13.7	15.5	13.2	14.9	14.8	10.7
Big Game	21.0	30.8	21.3	21.9	18.1	19.2	43.9
Sportsman	59.4	50.7	55.0	61.4	62.5	60.5	44.9
Nonresident	4.3	4.3	7.1	3.2	3.7	4.7	0.0
Junior Archery	0.8	0.6	1.1	0.3	0.9	0.8	0.5

Table A-2. Age, gender, community of residence, geographic region of license purchase and license type. (Continued.)

	Gun Only	Implement			Residency		Consistency	
		Bow	Muzzleloader	Bow and Muzzleloader	Resident	Nonresident	Consistent	Inconsistent
Age^a:								
Under 26	-	-	-	-	7.1	5.2	-	-
26-35	-	-	-	-	17.9	17.0	-	-
36-45	-	-	-	-	25.9	29.7	-	-
46-55	-	-	-	-	22.1	21.6	-	-
56-65	-	-	-	-	13.3	18.3	-	-
Over 65	-	-	-	-	13.7	8.2	-	-
Gender^b:								
Male	90.8	95.6	93.9	95.9	92.5	99.0	93.1	90.2
Female	9.2	4.4	6.1	4.1	7.5	1.0	6.9	9.8
Residence^c:								
Rural, farm	37.1	32.2	40.0	43.6	36.4	18.4	36.5	24.6
Rural, nonfarm	17.9	18.3	20.9	20.4	18.3	22.1	18.4	19.3
Community under 5,000	9.8	9.7	13.5	8.3	10.4	9.4	9.9	14.5
Community 5,000 – 24,999	18.8	21.3	18.6	13.3	18.5	27.4	18.8	21.3
City 25,000 – 100,000	7.8	8.6	5.1	8.3	8.0	12.4	8.1	10.6
City over 100,000	8.6	9.9	1.9	6.1	8.3	10.4	8.2	9.7
Geographic Region^d:								
Metro/Long Island	-	-	-	-	12.2	12.8	12.3	11.7
Catskills	-	-	-	-	19.0	40.4	19.5	21.0
Adirondacks	-	-	-	-	19.2	13.1	19.0	18.2
Central/Western New York	-	-	-	-	49.5	33.7	49.2	49.1
License Type^e:								
Senior	17.8	4.0	11.4	5.1	-	-	14.7	12.6
Big Game	25.9	14.8	17.1	13.3	-	-	19.9	34.1
Sportsman	50.3	76.1	69.3	76.9	-	-	61.0	39.7
Nonresident	5.8	3.4	2.2	3.6	-	-	3.8	11.7
Junior Archery	0.3	1.6	0.0	1.0	-	-	0.7	1.5

Table A-2. Age, gender, community of residence, geographic region of license purchase and license type. (Continued.)

	Age					
	Under 26	26-35	36-45	46-55	56-65	Over 65
Age^a:						
Under 26	-	-	-	-	-	-
26-35	-	-	-	-	-	-
36-45	-	-	-	-	-	-
46-55	-	-	-	-	-	-
56-65	-	-	-	-	-	-
Over 65	-	-	-	-	-	-
Gender^b:						
Male	94.2	91.7	91.7	92.8	93.9	94.3
Female	5.8	8.3	8.3	7.2	6.1	5.8
Residence^c:						
Rural, farm	36.6	36.0	37.2	32.6	36.8	35.2
Rural, nonfarm	18.6	17.6	19.2	18.9	15.7	20.9
Community under 5,000	12.9	8.8	9.0	10.3	10.7	11.7
Community 5,000 – 24,999	19.1	22.6	17.4	19.5	18.1	17.1
City 25,000 – 100,000	9.3	8.2	9.4	8.0	8.3	6.2
City over 100,000	3.6	6.8	7.8	10.7	10.4	8.9
Geographic Region^d:						
Metro/Long Island	7.2	12.3	12.2	12.4	16.4	11.2
Catskills	18.3	18.5	18.2	22.6	20.5	21.2
Adirondacks	19.7	17.3	20.1	16.7	19.2	16.5
Central/Western New York	54.8	51.9	49.5	48.2	43.9	51.1
License Type^e:						
Senior	1.4	0.2	0.5	1.8	6.8	95.5
Big Game	31.6	27.4	24.5	22.2	19.2	0.3
Sportsman	61.2	68.7	70.1	71.0	67.4	1.0
Nonresident	4.3	3.3	4.5	4.5	5.6	3.3
Junior Archery	1.4	0.4	0.4	0.5	0.3	0.0

Table A-2. Age, gender, community of residence, geographic region of license purchase and license type. (Continued.)

Pearson Chi-square Results

Region:

^aChi-square(15)=30.534, P = 0.010

^bChi-square(15)=27.960, P = 0.000

^cChi-square(15)=751.516, P = 0.000

^eChi-square(12)=60.778, P = 0.000

Gender:

^aChi-square(5)=4.818, P = 0.439 (nonsignificant)

^cChi-square(5)=42.696, P = 0.000

^dChi-square(3)=16.770, P = 0.001

^eChi-square(4)=78.757, P = 0.000

Implement:

^bChi-square(3)=21.130, P = 0.000

^cChi-square(15)=34.340, P = 0.003

^cChi-square(12)=222.945, P = 0.000

Residency:

^aChi-square(5)=14.655, P = 0.012

^bChi-square(1)=18.842, P = 0.000

^cChi-square(5)=45.961, P = 0.000

^dChi-square(3)=80.998, P = 0.000

Consistency:

^bChi-square(1)=2.531, P = 0.112 (nonsignificant)

^cChi-square(5)=14.251, P = 0.014

^dChi-square(3)=0.360, P = 0.948 (nonsignificant)

^eChi-square(4)=67.490, P = 0.000

Age:

^bChi-square(5)=4.818, P = 0.439 (nonsignificant)

^cChi-square(25)=30.925, P = 0.192 (nonsignificant)

^dChi-square(15)=23.086, P = 0.082 (nonsignificant)

^eChi-square(20)=2472.334, P = 0.000

Table A-3. First year hunted and number of years hunted.

	Statewide		Metro/ Long Island		Region				Gender					
	M	SD	M	SD	Catskills		Adirondacks		Central/ Western		Male		Female	
First year hunted ^a	1971	15	1974 ¹	14	1970 ²	15	1970 ²	15	1971 ²	15	1970 ¹	14.9	1979 ²	13.6
Number of years deer hunting ^b	24.5	14.0	21.9 ¹	13.0	26.0 ²	13.8	24.9 ²	14.2	24.2 ²	14.2	25.0 ¹	13.9	16.5 ²	12.6

	Gun Only		Implement				Residency				Consistency					
	M	SD	Bow		Muzzleloader		Bow and Muzzleloader		Resident		Nonresident		Consistent		Inconsistent	
First year hunted ^a	1970 ¹	16	1975 ²	12	1970 ¹	14	1973 ^{1,2}	12	1971 ¹	15	1974 ²	14	1971	15	1972	14
Number of years deer hunting ^b	25.5 ¹	15.0	22.2 ²	11.6	26.4 ¹	13.9	24.5 ^{1,2}	11.2	24.4	14.0	25.9	13.8	24.8 ¹	13.9	20.1 ²	14.3

	Under 26		26-35		36-45		46-55		56-65		Over 65		Trend (Residents Only)			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	1989		1997	
First year hunted ^a	1988 ¹	10	1983 ²	7	1976 ³	8	1969 ⁴	10	1959 ⁵	11	1950 ⁶	12	-	-	1971	15
Number of years deer hunting ^b	9.8 ¹	9.8	14.2 ²	7.8	20.1 ³	8.0	27.3 ⁴	10.2	35.3 ⁵	12.1	38.8 ⁶	16.2	19.9	13.4	24.4	14.0

Table A-3. First year hunted and number of years hunted. (Continued.)

ANOVA/t-test Results

Region:

$${}^aF(3,2954) = 10.329, P = 0.000$$

$${}^bF(3,2911) = 10.892, P = 0.000$$

Gender:

$${}^at(251) = -9.015, P = 0.000$$

$${}^bt(2917) = 8.470, P = 0.000$$

Implement:

$${}^aF(3,2721) = 19.439, P = 0.000$$

$${}^bF(3,2684) = 10.803, P = 0.000$$

Residency:

$${}^at(3138) = 3.235, P = 0.001$$

$${}^bt(3099) = 0.591, P = 0.554$$

Consistency:

$${}^at(249) = 1.042, P = 0.298$$

$${}^bt(2917) = -4.648, P = 0.000$$

Age:

$${}^aF(5,2909) = 898.354, P = 0.000$$

$${}^bF(5,2868) = 431.773, P = 0.000$$

Table A-4. Influences on interest in hunting.

	Statewide	Metro/ Long Island	Region			Gender	
			Catskills	Adirondacks	Central/ Western	Male	Female
Family^a:							
None	18.2	30.1	19.6	15.2	16.7	18.8	15.5
Slight	6.8	7.3	7.1	6.3	6.6	6.7	7.7
Moderate	14.6	16.0	13.1	14.9	15.2	14.9	14.0
Strong	60.0	45.9	59.9	63.2	61.1	59.3	62.3
Don't Know	0.4	0.8	0.3	0.4	0.4	0.4	0.5
Armed Services^b:							
None	74.0	69.6	72.5	73.5	75.7	73.2	84.9
Slight	5.4	6.5	6.6	6.4	4.2	5.5	2.7
Moderate	6.8	9.7	5.6	6.3	6.8	7.1	2.7
Strong	11.8	12.5	13.4	12.1	10.8	12.3	5.4
Don't Know	2.1	1.8	1.8	1.7	2.4	2.0	4.3
Friends^c:							
None	4.3	4.6	2.8	5.6	4.4	4.3	5.2
Slight	5.3	5.0	5.5	4.7	5.6	5.3	5.7
Moderate	19.9	14.6	18.3	20.4	21.6	20.2	16.2
Strong	70.1	75.3	73.0	68.8	68.1	69.9	74.2
Don't Know	0.4	0.6	0.4	0.4	0.3	0.4	0.5

Table A-4. Influences on interest in hunting. (Continued.)

	Gun Only	Implement			Residency		Consistency	
		Bow	Muzzleloader	Bow and Muzzleloader	Resident	Nonresident	Consistent	Inconsistent
Family ^a :								
None	18.0	18.4	17.5	16.1	18.7	13.4	18.4	20.2
Slight	6.6	6.3	7.2	6.3	6.8	6.7	6.7	6.9
Moderate	15.2	14.1	11.7	10.9	15.0	11.0	14.4	19.2
Strong	59.6	61.0	63.7	66.1	59.1	67.9	60.1	52.7
Don't Know	0.6	0.3	0.0	0.5	0.4	1.0	0.4	1.0
Armed Services ^b :								
None	74.0	69.6	72.5	73.5	74.2	71.9	74.3	69.7
Slight	5.4	6.5	6.6	6.4	5.2	6.8	5.2	7.1
Moderate	6.8	9.7	5.6	6.3	6.8	6.8	6.5	10.1
Strong	11.8	12.5	13.4	12.1	11.7	11.5	12.0	8.6
Don't Know	2.1	1.8	1.8	1.7	2.1	2.9	1.9	4.5
Friends ^c :								
None	4.3	4.6	2.8	5.6	4.4	2.6	4.2	6.2
Slight	5.3	5.0	5.5	4.7	5.6	2.6	5.3	6.7
Moderate	19.9	14.6	18.3	20.4	20.1	15.4	19.8	21.4
Strong	70.1	75.3	73.0	68.8	69.6	79.0	70.4	65.2
Don't Know	0.4	0.6	0.4	0.4	0.4	0.3	0.4	0.5

Table A-4. Influences on interest in hunting. (Continued.)

	Age					
	Under 26	26-35	36-45	46-55	56-65	Over 65
Family^a:						
None	9.2	12.4	23.3	22.0	18.6	15.7
Slight	4.8	7.2	7.6	6.6	5.7	6.8
Moderate	11.6	16.1	12.8	13.8	15.3	21.1
Strong	73.9	63.5	55.9	57.3	60.4	55.8
Don't Know	0.5	0.8	0.4	0.3	0.0	0.6
Armed Services^b:						
None	88.2	82.0	83.9	68.2	66.2	73.2
Slight	2.6	3.4	3.4	8.7	6.2	5.5
Moderate	2.6	4.3	4.3	6.7	9.8	7.1
Strong	4.6	5.7	7.2	14.4	16.3	12.3
Don't Know	2.1	4.7	1.2	2.1	1.5	2.0
Friends^c:						
None	6.9	4.1	2.3	4.2	7.1	4.8
Slight	9.4	5.9	6.7	3.3	5.8	3.2
Moderate	18.8	21.9	22.5	18.2	16.8	18.0
Strong	64.9	67.5	68.4	74.0	70.2	72.8
Don't Know	0.0	0.6	0.1	0.3	0.3	1.1

Table A-4. Influences on interest in hunting. (Continued.)

Pearson Chi-square Results

Region:

^aChi-square(12)=70.240, P = 0.000

^bChi-square(12)=18.368, P = 0.105 (nonsignificant)

^cChi-square(12)=22.919, P = 0.028

Gender:

^aChi-square(4)=1.859, P = 0.762 (nonsignificant)

^bChi-square(4)=22.192, P = 0.000

^cChi-square(4)=2.259, P = 0.688 (nonsignificant)

Implement:

^aChi-square(12)=8.311, P = 0.760 (nonsignificant)

^bChi-square(12)=38.656, P = 0.000

^cChi-square(12)=11.214, P = 0.511 (nonsignificant)

Residency:

^aChi-square(4)=13.059, P = 0.011

^bChi-square(4)=2.140, P = 0.710 (nonsignificant)

^cChi-square(4)=13.065, P = 0.011

Consistency:

^aChi-square(4)=6.672, P = 0.154 (nonsignificant)

^bChi-square(4)=12.786, P = 0.012

^cChi-square(4)=3.627, P = 0.459 (nonsignificant)

Age:

^aChi-square(20)=66.725, P = 0.000

^bChi-square(20)=273.305, P = 0.000

^cChi-square(20)=52.506, P = 0.000

Table A-5. Use of Deer Management Permits.

	Statewide		Region						Gender					
	M	SD	Metro/ Long Island		Catskills		Adirondacks		Central/ Western		Male		Female	
DMP's applied for ^a	0.86	0.89	0.88 ^{1,2}	0.78	0.79 ¹	0.80	0.60 ³	0.88	0.98 ²	0.92	0.86 ¹	0.89	0.87 ¹	0.80
DMP's received ^b	0.58	0.74	0.63 ¹	0.78	0.53 ²	0.73	0.37 ²	0.66	0.67 ¹	0.75	0.58 ¹	0.75	0.61 ¹	0.72
DMP's filled ^c	0.26	0.59	0.20 ¹	0.46	0.25 ^{1,2}	0.58	0.19 ¹	0.64	0.31 ²	0.60	0.26 ¹	0.60	0.26 ¹	0.53

	Gun Only		Implement				Residency				Consistency					
	M	SD	Bow		Muzzleloader		Bow and Muzzleloader		Resident		Nonresident		Consistent		Inconsistent	
DMP's applied for ^a	0.79 ¹	0.82	1.08 ²	0.89	0.76 ¹	0.96	1.23 ²	0.85	0.87 ¹	0.89	0.49 ²	0.71	0.90 ¹	0.89	0.36 ²	0.63
DMP's received ^b	0.54 ¹	0.71	0.73 ²	0.73	0.50 ¹	0.66	0.83 ²	0.83	0.60 ¹	0.75	0.25 ²	0.51	0.61 ¹	0.74	0.26 ²	0.70
DMP's filled ^c	0.21 ¹	0.53	0.35 ^{2,3}	0.62	0.30 ^{1,2}	0.54	0.44 ³	0.64	0.27 ¹	0.60	0.14 ²	0.39	0.28 ¹	0.61	0.09 ²	0.29

	Under 26		26-35		36-45		46-55		56-65		Over 65		Trend (Residents Only)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	1989	1997
DMP's applied for ^a	0.78 ^{1,2}	0.84	0.94 ¹	0.95	0.92 ^{1,2}	0.89	0.87 ^{1,2}	0.94	0.81 ^{1,2}	0.81	0.73 ²	0.77	57.8	56.8
DMP's received ^b	0.49 ¹	0.66	0.63 ¹	0.71	0.61 ¹	0.89	0.60 ¹	0.87	0.56 ¹	0.67	0.53 ¹	0.78	49.7	47.5
DMP's filled ^c	0.25 ¹	0.51	0.30 ¹	0.54	0.28 ¹	0.57	0.28 ¹	0.75	0.25 ¹	0.63	0.20 ¹	0.42	18.0	22.7

Table A-5. Use of Deer Management Permits. (Continued.)

ANOVA/t-test Results

Region:

${}^aF(3,2978) = 27.944, P = 0.000$

${}^bF(3,2978) = 24.799, P = 0.000$

${}^bF(3,2978) = 6.874, P = 0.000$

Gender:

${}^at(255) = -0.230, P = 0.819$ (nonsignificant)

${}^bt(2979) = -0.716, P = 0.474$ (nonsignificant)

${}^ct(2979) = 0.056, P = 0.956$ (nonsignificant)

Implement:

${}^aF(3,2736) = 31.130, P = 0.000$

${}^bF(3,2736) = 18.822, P = 0.000$

${}^bF(3,2736) = 16.435, P = 0.000$

Residency:

${}^at(424) = -8.656, P = 0.000$

${}^bt(473) = -10.821, P = 0.000$

${}^ct(491) = -5.268, P = 0.000$

Consistent:

${}^at(284) = -11.514, P = 0.000$

${}^bt(252) = -6.919, P = 0.000$

${}^ct(382) = -8.058, P = 0.000$

Age:

${}^aF(5,2931) = 3.939, P = 0.001$

${}^bF(5,2931) = 1.757, P = 0.119$ (nonsignificant)

${}^cF(5,2931) = 1.596, P = 0.158$ (nonsignificant)

Table A-6. Participation data.

	Statewide	Region			Gender				
		Metro/ Long Island	Catskills	Adirondacks	Central/ Western	Male	Female		
Purchased license in 1998? ^a	92.8	93.2	92.2	93.1	92.8	93.0	90.1		
Hunted in 1997? ^b	92.8	88.5	95.8	94.6	92.0	92.8	93.4		
Hunted in 1998? ^c	88.1	85.0	89.1	90.2	87.6	88.3	85.6		
Bow? ^d	33.0	31.8	32.9	22.3	37.5	34.0	20.2		
Muzzleloader? ^e	14.2	5.3	11.6	35.6	9.2	14.5	10.3		
Gun? ^f	89.5	83.8	92.5	92.6	88.5	89.4	90.7		
Filled first DMP ^g	45.7	36.4	48.4	41.3	48.0	46.0	42.6		
Filled second DMP ^h	24.8	13.8	26.4	52.8	22.9	24.4	28.0		

	Gun Only	Implement		Residency		Consistent				
		Bow	Muzzleloader	Bow and Muzzleloader	Resident	Nonresident	Consistent	Inconsistent		
Purchased license in 1998? ^a	92.0	95.9	97.4	99.5	93.4	79.5	-	-		
Hunted in 1997? ^b	-	-	-	-	92.6	98.4	94.1	76.3		
Hunted in 1998? ^c	89.9	95.4	96.1	99.0	88.2	82.6	93.6	11.2		
Bow? ^d	-	-	-	-	33.4	22.1	34.4	15.3		
Muzzleloader? ^e	-	-	-	-	14.4	10.3	15.1	3.3		
Gun? ^f	100.0	92.2	96.5	98.5	89.4	91.3	91.0	69.8		
Filled first DMP ^g	39.3	52.5	57.9	55.3	45.5	55.2	45.9	40.4		
Filled second DMP ^h	20.2	23.3	36.8	41.2	24.1	62.5	25.0	0.0		

	Age						Trend (Residents Only)			
	Under 26	26-35	36-45	46-55	56-65	Over 65	1989	1997		
Purchased license in 1998? ^a	93.3	91.4	94.6	91.7	92.4	93.0	-	-		
Hunted in 1997? ^b	98.1	95.0	95.7	93.2	94.2	79.2	93.2	92.6		
Hunted in 1998? ^c	93.3	88.4	91.0	90.2	87.2	76.2	-	-		
Bow? ^d	44.7	42.4	41.5	30.6	25.8	9.5	25.5	33.4		
Muzzleloader? ^e	16.3	11.9	17.3	16.0	11.6	8.3	4.2	14.4		
Gun? ^f	95.7	92.1	92.1	89.5	91.4	77.3	84.4	89.5		
Filled first DMP ^g	51.2	50.8	49.1	43.5	41.8	35.4	41.9	45.5		
Filled second DMP ^h	30.0	30.2	20.7	24.7	25.6	16.0	-	-		

Table A-6. Participation data. (Continued.)

Pearson Chi-square Results

Region:

^aChi-square(3)=0.580, P = 0.901 (nonsignificant)

^bChi-square(3)=33.381, P = 0.000

^cChi-square(3)=10.232, P = 0.017

^dChi-square(3)=42.462, P = 0.000

^eChi-square(3)=316.072, P = 0.000

^fChi-square(3)=39.353, P = 0.000

^gChi-square(3)=14.067, P = 0.003

^hChi-square(3)=21.619, P = 0.000

Gender:

^aChi-square(1)=2.531, P = 0.112 (nonsignificant)

^bChi-square(1)=0.103, P = 0.749 (nonsignificant)

^cChi-square(1)=1.271, P = 0.260 (nonsignificant)

^dChi-square(1)=17.133, P = 0.000

^eChi-square(1)=2.766, P = 0.098 (nonsignificant)

^fChi-square(1)=0.345, P = 0.557 (nonsignificant)

^gChi-square(1)=0.447, P = 0.504 (nonsignificant)

^hChi-square(1)=0.162, P = 0.687 (nonsignificant)

Implement:

^aChi-square(3)=31.700, P = 0.000

^cChi-square(3)=40.970, P = 0.000

^fChi-square(3)=125.036, P = 0.000

^gChi-square(3)=29.380, P = 0.000

^hChi-square(3)=7.954, P = 0.047

Residency:

^aChi-square(1)=73.564, P = 0.000

^bChi-square(1)=14.495, P = 0.000

^cChi-square(1)=8.100, P = 0.004

^dChi-square(1)=16.297, P = 0.000

^eChi-square(1)=4.023, P = 0.045

^fChi-square(1)=1.089, P = 0.297 (nonsignificant)

^gChi-square(1)=2.422, P = 0.120 (nonsignificant)

^hChi-square(1)=6.119, P = 0.013

Table A-6. Participation data. (Continued.)

Pearson Chi-square Results (Continued.)

Consistent:

^bChi-square(1)=95.131, P = 0.000

^cChi-square(1)=1186.623, P = 0.000

^dChi-square(1)=32.861, P = 0.000

^eChi-square(1)=22.779, P = 0.000

^fChi-square(1)=95.323, P = 0.000

^gChi-square(1)=0.552, P = 0.458 (nonsignificant)

^hChi-square(1)=0.997, P = 0.318 (nonsignificant)

Age:

^aChi-square(5)=6.762, P = 0.239 (nonsignificant)

^bChi-square(5)=131.223, P = 0.000

^cChi-square(5)=66.246, P = 0.000

^dChi-square(5)=169.524, P = 0.000

^eChi-square(5)=24.817, P = 0.000

^fChi-square(5)=84.601, P = 0.000

^gChi-square(5)=14.560, P = 0.012

^hChi-square(5)=3.052, P = 0.692

Table A-7. Type of land hunted on.

	Statewide	Metro/ Long Island	Region			Gender	
			Catskills	Adirondacks	Central/ Western	Male	Female
Land that I own ^a :							
None	59.6	72.3	60.9	60.2	55.9	60.2	51.1
Some	14.6	8.2	14.9	17.2	14.9	14.9	10.1
Most	13.5	6.6	11.5	14.9	15.5	13.4	16.0
All	12.0	12.4	12.5	7.4	13.5	11.2	22.9
Don't Know	0.2	0.5	0.3	0.3	0.1	0.3	0.0
Private land that I do not own ^b :							
None	16.5	21.5	14.3	14.8	16.9	15.9	24.8
Some	21.2	14.6	19.2	29.4	20.4	21.1	21.8
Most	25.5	18.9	25.6	27.5	26.3	25.9	20.3
All	36.4	44.3	40.5	28.0	36.0	36.7	32.7
Don't Know	0.4	0.6	0.4	0.3	0.4	0.4	0.5
Public land ^c :							
None	51.7	57.0	53.5	37.5	55.3	50.9	61.2
Some	25.4	17.5	25.8	29.8	25.4	25.7	21.8
Most	11.9	10.3	11.6	19.1	9.5	12.0	10.6
All	10.3	14.1	8.6	13.0	8.9	10.6	6.4
Don't Know	0.8	1.2	0.6	0.6	0.9	0.9	0.0

Table A-7. Type of land hunted on. (Continued.)

	Gun Only	Implement			Residency		Consistent	
		Bow	Muzzleloader	Bow and Muzzleloader	Resident	Nonresident	Consistent	Inconsistent
Land that I own ^a :								
None	59.0	62.4	55.5	54.8	59.2	73.3	59.1	68.6
Some	13.4	15.8	20.6	15.8	14.9	7.2	14.7	12.8
Most	12.6	12.8	12.9	24.3	13.7	7.9	13.9	6.4
All	14.8	8.6	10.0	5.1	12.0	11.6	12.1	11.5
Don't Know	0.1	0.4	1.0	0.0	0.3	0.0	0.2	0.6
Private land that I do not own ^b :								
None	20.4	11.0	14.7	8.9	18.8	16.4	16.2	22.0
Some	19.7	19.3	27.6	31.1	19.4	21.0	21.2	20.1
Most	23.3	30.2	29.8	23.7	11.2	26.2	25.8	21.3
All	36.3	38.8	28.0	35.3	50.3	36.0	36.4	36.0
Don't Know	0.3	0.6	0.0	1.1	0.3	0.4	0.4	0.6
Public land ^c :								
None	55.5	50.3	36.1	42.2	59.0	51.6	51.6	52.9
Some	21.8	30.5	27.8	31.7	16.3	25.6	25.6	22.9
Most	11.1	10.0	21.8	15.0	10.0	12.0	12.0	10.2
All	11.1	8.3	13.0	8.9	13.7	10.1	10.2	12.0
Don't Know	0.5	0.8	1.4	2.2	1.0	0.7	0.7	1.9

Table A-7. Type of land hunted on. (Continued.)

	Age					
	Under 26	26-35	36-45	46-55	56-65	Over 65
Land that I own ^a :						
None	61.6	68.0	57.6	57.7	59.5	51.8
Some	11.1	13.2	18.9	12.9	12.8	14.4
Most	16.2	10.7	13.9	17.0	9.7	13.0
All	11.1	7.9	8.9	12.3	17.7	20.4
Don't Know	0.0	0.2	0.7	0.0	0.3	0.4
Private land that I do not own ^b :						
None	14.2	11.4	12.8	17.0	22.6	26.5
Some	22.1	19.8	23.5	25.0	15.3	16.8
Most	23.5	29.9	26.6	21.7	22.0	27.8
All	38.7	38.7	36.5	36.4	39.2	28.2
Don't Know	1.5	0.2	0.5	0.0	0.8	0.6
Public land ^c :						
None	52.0	48.8	52.9	51.9	57.7	47.4
Some	31.2	30.4	26.1	25.2	16.1	23.7
Most	7.9	11.4	12.6	11.8	11.0	13.7
All	7.4	9.0	7.7	10.8	14.1	13.4
Don't Know	1.5	0.4	0.7	0.4	1.1	1.7

Table A-7. Type of land hunted on. (Continued.)

Pearson Chi-square Results

Region:

^aChi-square(12)=74.527, P = 0.000

^bChi-square(12)=88.336, P = 0.000

^cChi-square(12)=97.115, P = 0.000

Gender:

^aChi-square(4)=26.255, P = 0.000

^bChi-square(4)=12.156, P = 0.016

^cChi-square(4)=9.414, P = 0.052 (nonsignificant)

Implement:

^aChi-square(12)=55.491, P = 0.000

^bChi-square(12)=71.380, P = 0.000

^cChi-square(12)=70.533, P = 0.000

Residency:

^aChi-square(4)=27.124, P = 0.000

^bChi-square(4)=41.136, P = 0.000

^cChi-square(4)=16.532, P = 0.002

Consistency:

^aChi-square(4)=9.641, P = 0.047

^bChi-square(4)=4.512, P = 0.341 (nonsignificant)

^cChi-square(4)=3.991, P = 0.407 (nonsignificant)

Age:

^aChi-square(20)=79.944, P = 0.000

^bChi-square(20)=84.508, P = 0.000

^cChi-square(20)=50.840, P = 0.000

Table A-8. Deer take, lifetime and in 1997.

	Region										Gender			
	Statewide		Metro/ Long Island		Catskills		Adirondacks		Central/ Western		Male		Female	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Total deer lifetime ^a	15.3	22.8	11.37 ¹	15.19	17.90 ²	40.11	14.96 ²	16.76	15.33 ²	15.59	15.7 ¹	23.3	9.7 ²	13.0
Antlered deer														
Bow ^b	0.14	0.36	0.11 ¹	0.37	0.16 ¹	0.38	0.08 ¹	0.28	0.15 ¹	0.37	0.14 ¹	0.36	0.16 ¹	0.40
Muzzleloader ^c	0.07	0.25	0.00 ¹	0.00	0.05 ^{1,2}	0.23	0.10 ²	0.31	0.05 ^{1,2}	0.23	0.07 ¹	0.25	0.09 ¹	0.29
Gun ^d	0.34	0.52	0.24 ¹	0.56	0.40 ²	0.59	0.39 ^{2,3}	0.51	0.32 ³	0.48	0.34 ¹	0.53	0.39 ¹	0.49
Antlerless deer														
Bow ^e	0.07	0.28	0.12 ¹	0.46	0.09 ^{1,2}	0.29	0.08 ^{1,2}	0.29	0.05 ²	0.21	0.07 ¹	0.27	0.13 ¹	0.37
Muzzleloader ^f	0.10	0.30	0.03 ¹	0.17	0.04 ¹	0.19	0.16 ²	0.37	0.07 ^{1,2}	0.26	0.10 ¹	0.29	0.11 ¹	0.32
Gun ^g	0.28	0.52	0.24 ^{1,2}	0.50	0.27 ^{2,3}	0.51	0.18 ¹	0.43	0.33 ³	0.55	0.28 ¹	0.52	0.25 ¹	0.51

	Gun Only		Implement				Residency				Consistency					
			Bow		Muzzleloader		Bow and Muzzleloader		Resident		Nonresident		Consistent		Inconsistent	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Total deer lifetime ^a	13.2 ¹	14.9	17.5 ²	16.7	19.4 ²	18.7	23.0 ³	18.3	15.1 ¹	22.9	20.9 ²	20.5	15.8 ¹	23.3	9.3 ²	13.2
Antlered deer																
Bow ^b	0.00 ¹	0.07	0.16 ^{1,2}	0.38	0.03 ¹	0.17	0.19 ²	0.42	0.14 ¹	0.36	0.16 ¹	0.37	0.14 ¹	0.36	0.11 ¹	0.32
Muzzleloader ^c	0.00 ¹	0.00	0.01 ¹	0.09	0.11 ²	0.31	0.12 ²	0.32	0.07 ¹	0.25	0.10 ¹	0.30	0.07 ¹	0.26	0.02 ²	0.14
Gun ^d	0.30 ¹	0.50	0.36 ^{1,2}	0.54	0.44 ^{2,3}	0.51	0.50 ³	0.59	0.34 ¹	0.52	0.38 ¹	0.49	0.35 ¹	0.53	0.22 ²	0.41
Antlerless deer																
Bow ^e	0.01 ¹	0.10	0.08 ¹	0.29	0.03 ¹	0.18	0.10 ¹	0.33	0.07 ¹	0.28	0.14 ¹	0.40	0.07 ¹	0.28	0.02 ²	0.15
Muzzleloader ^f	0.00 ¹	0.00	0.02 ¹	0.12	0.20 ²	0.40	0.11 ²	0.31	0.09 ¹	0.29	0.14 ¹	0.35	0.10 ¹	0.30	0.04 ¹	0.20
Gun ^g	0.23 ¹	0.47	0.36 ²	0.58	0.28 ^{1,2}	0.50	0.34 ²	0.60	0.28 ¹	0.52	0.15 ²	0.39	0.29 ¹	0.52	0.13 ²	0.34

Table A-8. Deer take, lifetime and in 1997. (Continued.)

	Age												Trend (Residents Only)			
	Under 26		26-35		36-45		46-55		56-65		Over 65		1989		1997	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Total deer lifetime ^a	6.4 ¹	10.4	10.0 ^{1,2}	11.4	13.9 ^{2,3}	14.4	18.2 ^{3,4}	17.8	20.9 ⁴	18.8	19.6 ⁴	47.9	9.7	12.4	15.1	22.9
Antlered deer													% (either sex)		% (either sex)	
Bow ^b	0.11 ¹	0.34	0.17 ¹	0.37	0.15 ¹	0.39	0.11 ¹	0.31	0.12 ¹	0.39	0.12 ¹	0.33	13.9		21.5	
Muzzleloader ^c	0.03 ¹	0.17	0.06 ¹	0.24	0.10 ¹	0.30	0.07 ¹	0.25	0.06 ¹	0.24	0.05 ¹	0.21	11.6		23.0	
Gun ^d	0.35 ¹	0.49	0.35 ¹	0.55	0.35 ¹	0.55	0.36 ¹	0.49	0.34 ¹	0.51	0.28 ¹	0.52	36.0		47.3	
Antlerless deer																
Bow ^e	0.05 ¹	0.21	0.09 ¹	0.29	0.05 ¹	0.25	0.05 ¹	0.27	0.12 ¹	0.36	0.08 ¹	0.28				
Muzzleloader ^f	0.08 ¹	0.28	0.07 ¹	0.25	0.07 ¹	0.26	0.08 ¹	0.28	0.20 ¹	0.40	0.14 ¹	0.35				
Gun ^g	0.20 ¹	0.47	0.29 ¹	0.52	0.30 ¹	0.54	0.30 ¹	0.52	0.24 ¹	0.48	0.28 ¹	0.52				

ANOVA/t-test Results

Region:

^aF(3,2910) = 8.615, P = 0.000

^bF(3,1158) = 2.985, P = 0.030

^cF(3,739) = 4.895, P = 0.002

^dF(3,2691) = 12.828, P = 0.000

^eF(3,1150) = 2.955, P = 0.032

^fF(3,735) = 9.270, P = 0.000

^gF(3,2695) = 12.025, P = 0.000

Gender:

^at(310) = 5.894, P = 0.000

^bt(1200) = -0.495, P = 0.621 (nonsignificant)

^ct(706) = -0.584, P = 0.559 (nonsignificant)

^dt(2697) = -1.371, P = 0.170 (nonsignificant)

^et(62) = -1.241, P = 0.219 (nonsignificant)

^ft(703) = -0.350, P = 0.727 (nonsignificant)

^gt(2703) = 0.933, P = 0.351 (nonsignificant)

Implement:

^aF(3,2677) = 32.609, P = 0.000

^bF(3,1183) = 11.372, P = 0.000

^cF(3,694) = 10.965, P = 0.000

^dF(3,2677) = 12.056, P = 0.000

^eF(3,1176) = 3.884, P = 0.009

^fF(3,690) = 18.738, P = 0.000

^gF(3,2678) = 11.749, P = 0.000

Table A-8. Deer take, lifetime and in 1997. (Continued.)

ANOVA/t-test Results (Continued.)

Residency:

^at(388) = 4.599, P = 0.000

^bt(1252) = 0.741, P = 0.459 (nonsignificant)

^ct(740) = 0.902, P = 0.367 (nonsignificant)

^dt(2871) = 1.199, P = 0.231 (nonsignificant)

^et(99) = 1.720, P = 0.089 (nonsignificant)

^ft(61) = 1.057, P = 0.295 (nonsignificant)

^gt(420) = -5.326, P = 0.000

Consistency:

^at(325) = -6.420, P = 0.000

^bt(1200) = -0.588, P = 0.557 (nonsignificant)

^ct(58) = -2.193, P = 0.032

^dt(185) = -3.762, P = 0.000

^et(85) = -2.432, P = 0.017

^ft(50) = -1.832, P = 0.073 (nonsignificant)

^gt(200) = -5.226, P = 0.000

Age:

^aF(5,2862) = 22.524, P = 0.000

^bF(5,1178) = 1.032, P = 0.397 (nonsignificant)

^cF(5,686) = 0.938, P = 0.456 (nonsignificant)

^dF(5,2658) = 1.067, P = 0.377 (nonsignificant)

^eF(5,1168) = 2.311, P = 0.042

^fF(5,683) = 3.051, P = 0.010 (nonsignificant)

^gF(5,2664) = 1.988, P = 0.078 (nonsignificant)

Table A-9. Desired deer take.

	Statewide		Metro/ Long Island		Region						Gender					
					Catskills		Adirondacks		Central/ Western		Male		Female			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD		
Without opportunity to give:																
Total deer ^a	2.04	1.87	1.91 ¹	1.02	2.14 ¹	3.75	2.04 ¹	0.91	2.03 ¹	0.96	2.03 ¹	1.92	2.23 ¹	1.02		
Minimum bucks ^b	1.37	1.71	1.30 ¹	0.55	1.50 ¹	3.70	1.41 ¹	0.61	1.31 ¹	0.56	1.37 ¹	1.77	1.38 ¹	0.52		
With opportunity to give:																
Total deer ^c	2.69	3.18	2.55 ¹	1.63	2.73 ¹	3.19	2.53 ¹	1.40	2.78 ¹	3.87	2.68 ¹	3.26	2.93 ¹	1.74		
Minimum bucks ^d	1.65	2.89	1.59 ¹	1.08	1.64 ¹	2.84	1.63 ¹	0.89	1.67 ¹	3.63	1.64 ¹	2.99	1.74 ¹	0.90		

	Gun Only		Implement				Residency				Consistency					
			Bow		Muzzleloader		Bow and Muzzleloader		Resident		Nonresident		Consistent		Inconsistent	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Without opportunity to give:																
Total deer ^a	1.86 ¹	0.89	2.39 ²	3.26	2.14 ^{1,2}	0.86	2.52 ²	1.07	2.04 ¹	1.90	2.13 ¹	0.91	2.06 ¹	1.92	1.78 ²	0.89
Minimum bucks ^b	1.27 ¹	0.51	1.58 ¹	3.17	1.38 ¹	0.59	1.56 ¹	0.73	1.36 ¹	1.74	1.46 ¹	0.67	1.38 ¹	1.77	1.24 ¹	0.54
With opportunity to give:																
Total deer ^c	2.51 ¹	3.73	3.09 ^{1,2}	2.92	2.67 ¹	1.38	3.39 ²	2.09	2.70 ¹	3.23	2.71 ¹	1.87	2.72 ¹	3.26	2.43 ¹	1.83
Minimum bucks ^d	1.61 ¹	3.54	1.79 ¹	2.55	1.52 ¹	0.83	1.84 ¹	1.05	1.65	2.95	1.57	0.75	1.65 ¹	2.99	1.60 ¹	0.95

	Under 26		26-35		36-45		46-55		56-65		Over 65	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Without opportunity to give:												
Total deer ^a	2.74 ¹	6.10	2.26 ²	1.11	2.10 ²	0.88	1.97 ²	0.96	1.84 ^{2,3}	0.82	1.52 ³	0.74
Minimum bucks ^b	1.90 ¹	6.10	1.41 ²	0.59	1.37 ²	0.60	1.33 ²	0.57	1.29 ²	0.51	1.14 ²	0.44
With opportunity to give:												
Total deer ^c	4.39 ¹	10.24	2.92 ²	1.67	2.82 ²	1.77	2.48 ^{2,3}	1.48	2.39 ^{2,3}	1.63	1.89 ³	1.29
Minimum bucks ^d	2.94 ¹	10.22	1.67 ²	0.98	1.60 ²	0.89	1.50 ²	0.88	1.53 ²	1.13	1.33 ²	0.70

Table A-9. Desired deer take. (Continued.)

ANOVA/t-test Results

Region:

^aF(3,2918) = 1.467, P = 0.222 (nonsignificant)

^bF(3,2919) = 1.774, P = 0.150 (nonsignificant)

^cF(3,2880) = 1.486, P = 0.217 (nonsignificant)

^dF(3,2908) = 0.147, P = 0.932 (nonsignificant)

Gender:

^at(2920) = -1.567, P = 0.117 (nonsignificant)

^bt(2923) = -0.135, P = 0.893 (nonsignificant)

^ct(2893) = -1.098, P = 0.272 (nonsignificant)

^dt(2919) = -0.458, P = 0.647 (nonsignificant)

Implement:

^aF(3,2689) = 16.433, P = 0.000

^bF(3,2694) = 6.010, P = 0.000

^cF(3,2658) = 7.913, P = 0.000

^dF(3,2687) = 1.029, P = 0.379 (nonsignificant)

Residency:

^at(3099) = 0.828, P = 0.408 (nonsignificant)

^bt(3103) = 0.994, P = 0.321 (nonsignificant)

^ct(3072) = 0.055, P = 0.956 (nonsignificant)

^dt(3099) = -0.432, P = 0.666 (nonsignificant)

Consistency:

^at(2918) = -2.079, P = 0.038

^bt(2922) = -1.123, P = 0.262 (nonsignificant)

^ct(2890) = -1.268, P = 0.205 (nonsignificant)

^dt(2916) = -0.217, P = 0.828 (nonsignificant)

Age:

^aF(5,2873) = 14.466, P = 0.000

^bF(5,2877) = 5.583, P = 0.000

^cF(5,2846) = 19.021, P = 0.000

^dF(5,2872) = 9.865, P = 0.000