

Attitudes of Illinois Farmers Regarding Deer and Deer Hunters, 1990

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Summary

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Gary W. Morgan, Charles M. Nixon, John C. van Es, John H. Kube

Summary

This survey assessed Illinois farmers' attitudes toward deer abundance, deer damage, and deer hunting. Conducted in January and February 1990, it consisted of a random selection of farm operators who owned at least 40 acres. Initially, 2,512 questionnaires were mailed to farmers in the 98 Illinois counties permitting firearm hunting; distribution was stratified so that questionnaires were sent in approximately equal numbers to each of nine Illinois Deer Management Regions. A second mailing, telephone solicitation, and removal of respondents with no knowledge of deer on their farms produced a usable sample of 1,609 respondents.

The principal findings were as follows:

- Ninety-two percent of the respondents reported that deer were present on their farms throughout the year. These farms had an average of 73 acres of permanent cover.

- Statewide, most respondents (51%) said that they enjoyed having deer on the farm, but a significant number in each region (23–42%) worried about potential crop damage from deer. Only 5% considered deer a nuisance.

- Most respondents (52%) appeared to be satisfied with deer densities in fall 1989 (estimated regional densities between 4 and 25 deer per square mile). Only 9% desired more deer.

- Thirty-two percent had attempted deer control. Although a small portion of this group had tried to limit deer access to the farm with fencing, repellent sprays or odors, or dogs, most had relied on archery or firearm hunting.

- Statewide, 76% allowed deer hunting on their farms in 1989; the percentage allowing hunting varied from 55% in east-central Illinois to 87% in west-central Illinois. There was a significant correlation ($r = 0.69$) between estimated deer density in a region and the percentage of farm operators who allowed hunting.

More than 90% of those allowing hunting permitted killing of both sexes of deer.

- Seventy-three percent statewide reported deer damage to crops in 1989. Reported deer damage was not a function of estimated deer density in the region.

- Most farmers (64% statewide) reported that deer caused less than \$300 damage on their farms in 1989. Dollar damage was highest in south-central Illinois, where 39% of farms had more than \$300 damage, and lowest in north-central Illinois, where 20% of farms had more than \$300 damage.

- Three-fourths of the farmers rated damage as light or too minor to notice. Only 6% reported severe damage caused by deer.

- Only 5% statewide reported serious problems with deer hunters. Problems were most common in southern Illinois.

- Eighty-two percent felt that there were either not enough archery hunters or about the right number in 1989.

- Three-fourths felt that there were not enough or about the right number of firearm hunters in 1989. The number of farmers in each region who felt that there were too many hunters ranged from 18 to 29%. Most farmers allowed deer hunting on their property even if they felt there were too many hunters.

- The distance from the farm to a city of more than 50,000 people did not affect the decision to allow hunting on the farm.

In sum, Illinois farmers appear to have adapted well to the large increase during the 1980s in the number of deer and deer hunters. Most farmers still enjoy the presence of deer, are not experiencing excessive crop damage, allow hunting on their farms, and believe the number of archers and firearm hunters is acceptable. Nonetheless, crop damage complaints may be expected to increase if deer numbers continue to rise.

Introduction

This survey of Illinois farmers' attitudes toward deer abundance, deer damage, and deer hunting follows up a study completed in 1982. In the earlier study, Kube (1983) surveyed 3,609 farmers who owned, leased, or rented 40 or more acres. Two-thirds of the respondents considered the deer herd about the right size, 12% thought it too large, and 21% believed it too small. Most landowners did not hunt deer (72%), felt that deer permit quotas were about right (69%), allowed some hunting on their property (71%), and indicated that they had not suffered significant crop damage from deer (97%) (Kube 1983).

Between 1982 and 1989, the Illinois deer herd grew from an estimated 300,000 to 540,000 animals (Nixon 1991). This rapidly growing deer population has the potential to cause significant problems for Illinois farmers, whether as hazards on rural roads or as competitors for crops. At times, in isolated fields, deer feeding may significantly reduce yields (Klimstra and Thomas 1964, Moore and Folk 1978, Tanner and Dimmick 1983, Putnam 1986). Because of the increasing potential for conflicts between farmers and deer and the increasing number of actual reports of crop damage, we decided to resurvey Illinois landowners to determine their attitudes toward deer abundance, extent of deer damage to farm crops, and tolerance of deer hunters.

Methods

Demarcation of Regions and Assessment of Regional Characteristics

Illinois was divided into nine regions of various sizes for studying and managing the white-tailed deer population (Figure 1). Data describing land use within the nine regions are presented in Table 1. These land-use attributes were selected because they were expected to contribute to variation in deer numbers among regions. Land use may also influence farmers' attitudes toward deer and deer hunting.

There was considerable variation among regions in the land-use variables. The amount of forest, the principal deer habitat, ranged

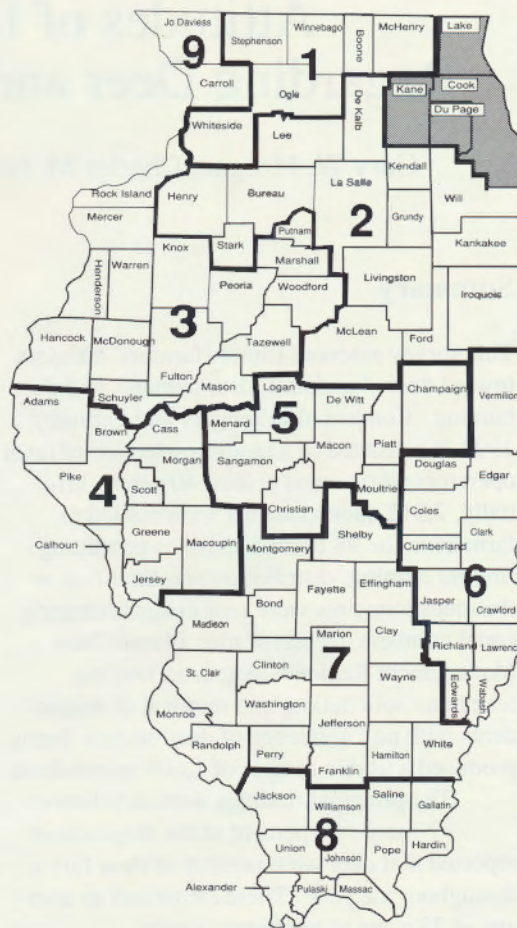


Figure 1. Illinois Deer Management Regions.

from <4% in Region 2 to near 36% in Region 8. The portion of land devoted to farms and to crops ranged from 51% and 28%, respectively, in Region 8 to 92% and 72%, respectively, in Region 5. The average farm size ranged from 277 acres in Regions 1 and 7 to 388 acres in Region 5.

Regional variations in farm values were also evident (Table 1). Regions with the highest percentage of land in crops (Regions 2 and 5) also had higher values for land and equipment, indicating a high level of specialization in row crop production.

Average farm size and farm acreage in crops were considerably larger for our sample than for farms counted in the 1987 Census of Agriculture (for regional figures, see Table A1 in Appendix 1). Our sample data thus

Table 1. Agricultural characteristics of Illinois Deer Management Regions.

Regional characteristic	Region								
	1	2	3	4	5	6	7	8	9
Total land area, <i>acres</i>	2,182,110	6,770,964	4,396,777	3,334,979	3,359,976	3,470,087	6,744,381	2,382,191	670,079
Number of farms in 1987	6,342	17,352	13,424	8,591	7,933	8,552	18,211	4,425	1,845
Area in farms, %	81.1	90.7	85.5	84.8	91.9	85.8	75.1	51.1	85.6
Average farm size, <i>acres</i>	277	352	334	329	388	347	277	373	311
Average per acre value of land and buildings, \$	1,404	1,503	1,225	939	1,621	1,168	942	720	956
Average per farm value of machinery and equipment, \$	63,729	72,566	58,728	55,350	76,467	64,442	51,185	37,267	58,805
Area in forests, %	5.6	3.8	13.2	19.2	4.0	10.6	15.1	35.6	15.7
Area in crops, %	56.4	68.9	56.5	52.0	72.2	63.8	53.4	28.3	47.7
Area in corn, %	42.3	35.7	29.4	21.7	33.0	27.1	17.0	9.0	29.9
Area in soybeans, %	11.5	30.2	31.9	23.9	37.6	40.7	25.4	12.5	3.38
Area in wheat, %	0.6	0.5	1.3	3.6	0.7	3.3	7.6	2.6	0.1
Area in pasture, %	6.2	2.9	10.8	13.6	3.0	3.4	5.8	8.7	19.9
Farms with pasture, %	51.6	26.1	52.1	58.7	28.1	30.8	47.5	62.6	71.1
Farms with cattle, %	47.8	23.1	42.9	49.0	24.1	29.2	41.8	52.2	71.6
Farms with hogs, %	20.7	19.1	22.4	30.2	11.6	18.9	20.0	15.0	27.5

All data are for 1987 except for forest data, which are for 1985 (Iverson et al. 1989). Farmland data include all lands in farms used for pasture and crops (U. S. Department of Commerce 1989).

Table 2. Estimated number and density of deer by region in 1982 and 1989.

Region	Total no. of deer		Deer density		Change
	1982	1989	1982	1989	
			no. / sq. mile		%
1	7,923	14,788	2.32	4.34	86.7
2	25,752	56,940	2.43	5.38	121.1
3	55,618	94,285	8.10	13.72	69.5
4	50,836	83,952	9.76	16.11	65.1
5	12,130	24,905	2.31	4.74	105.3
6	22,305	44,194	4.11	8.15	98.1
7	60,740	112,299	5.76	10.66	84.9
8	55,171	92,606	14.82	24.88	67.9
9	9,018	15,675	8.61	14.97	73.8
State	299,493	539,644	5.75	10.37	80.2

The deer estimates are for October 1 each year and are based upon survival and natality data from marked deer in east-central and southern Illinois (Nixon 1991). These data suggest a prehunt (Oct. 1) statewide population of over 539,000 deer in 1989.

substantially underrepresent the smaller farms included in the 1987 census. It is important to recognize this underrepresentation because deer are more likely to be present on larger farms with more cover for deer than on smaller farms. Our results, therefore, represent attitudes of farmers where deer are present, and the results likely exaggerate the presence of deer and the extent of damage from deer. Our findings are more likely to represent larger, full-time farm operators, not the opinions of all Illinois farmers, many of whom work part or full time off the farm.

Regions with the greatest increase in numbers of deer were those with the highest numbers in 1982 (Table 2). Region 7, for example, had the highest number of deer in 1982 (about 61,000) and had the greatest increase by 1989 (>51,000). Regions 2 and 5, which had relatively small populations in 1982, showed the greatest percentage increases (121% and 105%, respectively). Statewide, the deer population increased by more than 80% from 1982 to 1989. Deer density (deer per square mile) in 1989 was highest in Region 8 and lowest in Region 1 (Table 2).

The regional variations in physical and agricultural characteristics corresponded

closely to the size of the deer populations. For example, regions with higher levels of forest coverage (e.g., Regions 4 and 8) had higher densities of deer (Table 2).

Survey of Farm Operators

The Illinois Natural History Survey, with significant input from the Illinois Department of Conservation, prepared a list of questions pertaining to deer, deer damage, and tolerance for hunters. The Illinois Agricultural Statistics Service designed the questionnaire (see Appendix 2), randomly selected farm operators to be contacted from an up-to-date list maintained by the Service, and administered the survey. The Service also prepared the initial tabulations of the raw data and provided these data for further analysis.

The survey was conducted in early 1990, and responses related to trends in deer and deer hunters in 1988 and 1989. Questionnaires (2,512) were mailed to farm operators in the 98 Illinois counties in which deer firearm hunting is permitted. The four not included in the survey were the Chicago-area counties of Cook, DuPage, Lake, and Kane. Sample selection was stratified so that an approximately equal number of farmers were contacted in each of nine previously defined Illinois Deer Management Regions (Figure 1). With a second mailing and subsequent telephone solicitation, 1,931 usable forms were returned, for a response rate of 77%. Among these respondents, 322 (21%) reported either that they had no deer on their property or that they did not know whether deer were on their property. Thus, the usable sample was reduced to 1,609.

The distribution of respondents among regions and the number of respondents as a percentage of the number of farms in each region are shown in Table 3. Although the sample size was approximately equal in all regions, the sampling rate varied substantially among regions (Table 3).

Data Analysis

Response data were organized by region. Chi-square analysis, a test of the relationship between two or more categorical variables, was used to test the independence of variables in each region. This statistic was used for both

Table 3. Distribution of the number of farms

Region	Co
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9	
State	9

*Source: 1987 Census

dependent and independent variables. In statistics not reported here, the authors on request used F statistic ratios to test for regional differences in variance analysis and analysis of variance analysis was used to test for differences.

Regional trends in deer densities in the 1980s were similar to those in the time-specific recruitment and survival and recruitment in east-central Illinois. A simple model, which incorporates density-dependent effects of social behavior on recruitment, added to the base population dynamics, has been present in Illinois since the 1950s (chiefly between fall 1980 and

Results

Comparing the 1982 and 1990

Only a few questions from the 1982 survey were directly comparable to the 1990 survey. In 1982, 10% of farms had abundant deer, and the percentage of farms with more deer than in 1982 increased greatly

Table 3. Distribution of respondents in 1990 survey as a percentage of total returns and as a percentage of the number of farms in each deer management region.

Region	Counties	No. of respondents	Respondents as % of total return	No. of farms in region*	Respondents as % of farms in region
1	6	209	10.8	5,160	4.1
2	14	207	10.7	17,434	1.2
3	15	224	11.6	13,442	1.7
4	10	222	11.5	8,597	2.6
5	9	223	11.5	7,965	2.8
6	12	212	11.0	8,572	2.5
7	19	218	11.3	17,045	1.3
8	11	191	9.9	4,454	4.3
9	2	225	11.7	3,121	7.2
State	98	1,931	100.0	85,790	2.2

*Source: 1987 Census of Agriculture, Part 13, Illinois (U.S. Department of Commerce 1989).

dependent and independent variables. Further, in statistics not reported here but available from the authors on request, analysis of variance using F statistic ratios was used to test for regional differences in responses. As part of the analysis of variance, least significant differences analysis was used to isolate regional differences.

Regional trends in deer numbers in the 1980s were simulated using a sex-, age-, and time-specific recruitment model based upon survival and recruitment rates for deer marked in east-central Illinois during 1980–1985. This simple model, which does not include any density-dependent factors such as weather or effects of social behaviors on survival and recruitment, added and subtracted deer from a base population derived by trial and error from minimum numbers of both sexes that must have been present in 1980 to support known mortality rates (chiefly losses to legal hunting) between fall 1980 and fall 1989.

Results

Comparing the 1982 and 1990 Data

Only a few questions asked of landowners in 1982 were directly comparable to those used in the 1990 survey. Deer were generally more abundant on farms in 1989 than in 1982, and the percentage of respondents who reported more deer on their farm "than five years ago" increased greatly from 1982 to 1990 (Table 4).

Not surprisingly, higher percentages of farmers reported crop damage from deer in 1989 and felt that the damage was excessive.

Deer Sightings

Of the farm operators in the 1990 survey who reported seeing deer on their farms, 92% reported seeing them throughout the year. The 8% who saw deer exclusively in the summer were concentrated in Regions 2 and 5, the major agricultural zones in Illinois (see Table A2 in Appendix 1 for additional data).

Permanent cover (e.g., forest) provides a relatively safe haven for deer during all seasons, and it was expected that farm operators having a small acreage in permanent cover would be less likely to see deer. Data not shown here indicate that nearly 30% of the farms with deer only in summer had no permanent cover, and >50% with deer only in summer had <10 acres of permanent cover. The mean acreage of permanent cover for all operators seeing deer only in summer was 25.9 acres, compared to 94.5 acres for those seeing deer throughout the year. When one extreme case (1,700 acres of permanent cover) was excluded from the sample, the mean acreage of permanent cover for farms with deer all year was 72.5 acres.

Slightly over two-thirds (69%) of all respondents indicated that deer numbers had increased over the previous five years, and only 3% reported fewer deer in 1989 than in 1984. The portion who reported increases in deer

Table 4. Responses for comparable items from 1982 and 1990 surveys.

Comparable item		Region									State
		1	2	3	4	5	6	7	8	9	
		% of respondents									
Have deer on farm	1982	80	54	79	88	59	77	79	86	89	73
	1990	84	67	81	91	70	88	88	93	88	83
Have more deer than 5 years ago	1982	21	26	28	46	39	50	35	22	13	35
	1990	63	68	59	74	72	79	77	73	55	65
No deer damage on farm	1982	44	61	43	42	42	61	54	60	58	53
	1990	27	29	26	21	34	29	26	34	23	28
Excessive damage on farm	1982	3	2	9	9	4	6	5	4	8	6
	1990	24	22	27	31	26	29	27	38	24	28
Allow hunting	1982	66	54	72	75	56	73	75	78	79	67
	1990	71	56	78	87	55	82	83	84	85	77

Responses in the 1990 survey related to trends in deer numbers and deer hunting in 1988 and 1989.

numbers varied from 55% in Region 9 to 79% in Region 6 (see Table A3 in Appendix 1).

Attitudes Toward Deer and Desired Changes in Deer Numbers

Farm operators were asked if they considered deer on their property "enjoyable," considered them "enjoyable but are worried about damage from the deer," or considered deer to be a "nuisance." Statewide, 51% of farm operators said they considered the presence of deer enjoyable. Thirty-nine percent, however, indicated that they either worry about the damage caused by deer or consider deer a nuisance (Figure 2; see also Table A4 in Appendix 1).

Although most respondents (52%) were satisfied with the number of deer in their area, 33% thought there were too many. Only 9% said that they would like to see an increase in deer numbers over the next five years (Figure 3; see also Table A5 in Appendix 1).

Farmers who reported more deer in 1989 than five years earlier were about equally split between those who would like the number of deer to remain the same and those who would like fewer deer (47% vs. 46%; see Table A6 in Appendix 1). Seven percent of those reporting an increase in deer numbers said they would like to see a further increase. Among respondents who reported seeing either the same number of deer or fewer deer in 1989 than in the past, 74% wanted deer numbers to remain the same. Only in Regions 6, 8, and 9 did >9% of

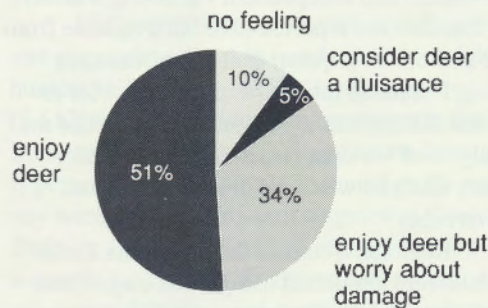


Figure 2. Illinois farmers' attitudes in 1990 about deer on their farms.

these respondents see further declines in deer numbers as desirable; in each of these regions, however, similar or greater percentages of the respondents favored an increase in deer numbers.

There was a strong relationship between how the respondents felt about deer on their property and the trend they wanted to see in future deer numbers. Among those who enjoyed the presence of deer, 93% wanted the deer population to remain stable or increase. As anticipated, farm operators who worry about deer damage or perceive deer as a nuisance were more likely (58%) to want fewer deer in the future (see Table A7 in Appendix 1).

Controlling Deer on the Farm

Statewide, 32% of the respondents reported using some type of deer control. More than 40% in Regions 4 and 9 had attempted deer

more deer

about the same number of deer

Figure 3. Illinois farmers' attitudes regarding future deer numbers

control, compared to 2 and 5 (Figure 4). Region 1, with the lowest deer numbers, had the highest deer numbers in the middle in terms of deer numbers. Operators reporting a decrease in deer (only 29) responded to the Department of Conservation in controlling deer.

The frequency of various deer control methods used in various deer control methods (see also Table A5 in Appendix 1). Plodders, commercial hunters, and nuisance deer permits were used. Fencing was used by 33% of those attempting to control deer, deemed ineffective by 33% of those who used it. For regional data, the frequency was too low (< 6% in Region 1) (for example, electric fencing, Archery hunting, and traps) to control deer, with 58% of many farmers. Fencing was the most effective.

Allowing Hunting

The decision to allow hunting may be affected by a variety of factors. Negative factors on a farm, a sense of closure, damage caused by deer, and the presence of hunters may all play a role in the decision as to whether to allow hunting.

In the previous survey, hunting was the most common deer control and the

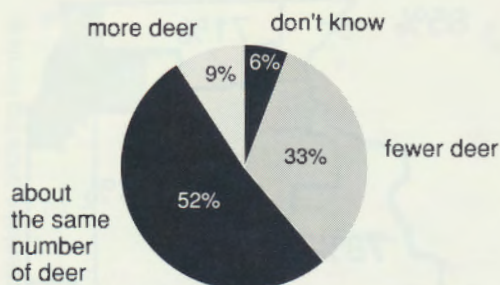


Figure 3. Illinois farmers' preferences in 1990 regarding future numbers of deer.

control, compared to only 22–23% in Regions 2 and 5 (Figure 4). It is interesting that Region 1, with the lowest deer density, and Region 8, with the highest deer density, were in the middle in terms of the percentage of farm operators reporting attempts to control deer. Few (only 29) respondents looked to the Illinois Department of Conservation to obtain assistance in controlling deer.

The frequency with which farmers used various deer control methods is shown in Figure 5 (see also Table A8 in Appendix 1). Exploders, commercial or natural repellents, nuisance deer permits, or dogs were rarely used. Fencing was used by approximately one-third of those attempting to control deer but was deemed ineffective by more than four-fifths of those who used it (see Table A9 in Appendix 1 for regional data). It is likely that most fencing was too low (< 6 feet) or not properly installed (for example, electric fencing) to repel deer. Archery hunting, used by 66% of those trying to control deer, was considered ineffective by many farmers. Firearm hunting, used by 91% of those attempting deer control, was deemed most effective.

Allowing Hunting on the Farm

The decision to allow hunting on the farm may be affected by a variety of attitudes and experiences. Negative feelings about deer on the farm, a sense of changing deer numbers, damage caused by deer, and the availability of hunters may all play a role in the ultimate decision as to whether to allow hunting.

In the previous section, it was shown that hunting was the most frequently used form of deer control and that it was considered the most

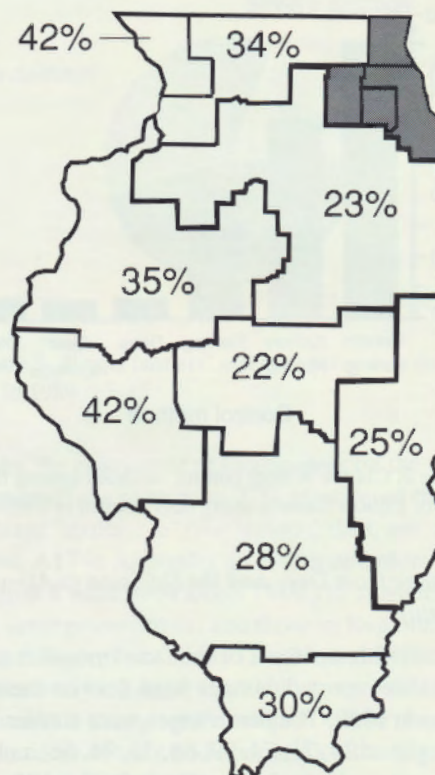


Figure 4. Percentage of farmers in each region using some type of deer control in 1989.

effective. Seventy-six percent of farm operators statewide allowed hunting. The percentage allowing hunting varied from 55% in Region 5 to 87% in Region 4 (Figure 6). The percentage of farm operators who allowed deer hunting tended to increase as deer density increased (Figure 7). The correlation ($r = 0.69$) was significant ($P < 0.05$, $df = 7$).

Farmers who reported increases in deer numbers over the past five years were more likely to allow hunting than those reporting the same or fewer deer (83 vs. 68%; see Table A10 in Appendix 1). Among farmers who reported the same or fewer deer in 1989 than in 1984, the percentage who allowed hunting was ≥ 50 percent in all regions except Region 2.

Although not shown in the tables or figures included in this report, $>92\%$ of farmers allowing hunting permitted hunters to kill either bucks or does. The percentage of farmers who restricted hunters to antlered bucks varied from 4% in Region 6 to 17% in Region 2.

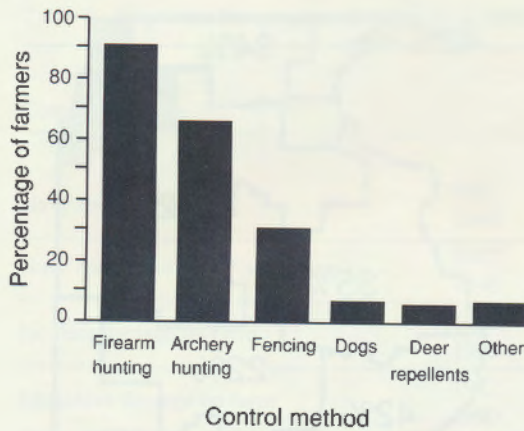


Figure 5. Choice of deer control methods among the 32% of Illinois farmers using deer control in 1989.

Damage from Deer and the Decision to Allow Hunting

Seventy-three percent of the farm operators statewide reported damage from deer on their farms in 1989. The percentages were similar in all regions: 73, 71, 74, 79, 66, 71, 74, 66, and 77%, respectively, in Regions 1-9 (N = 175, 142, 181, 202, 156, 186, 193, 177, and 197, respectively). The reports of deer damage were not a function of regional deer densities; the correlation between deer density and reported deer damage was not significant ($r = 0.495, P > 0.05$) (Figure 8). Region 8, for example, had the highest deer density but a relatively low incidence of reported deer damage. Thus, reports of damage from deer were at least partially the result of different land-use patterns among regions, with more livestock pasture than row crops (thus reducing deer damage to row crops) in Regions 4, 7, and 8.

Farm operators were further asked to report the amount of damage deer had caused in 1989. Statewide, 37% who reported an amount indicated that the damage was <\$100, and 36% indicated that it was >\$300 (see Table A11 in Appendix 1 for regional data). The amount of deer damage was not apparently related to regional deer density; there were no significant correlations between deer density and the dollar amount of damage (see Table A12 in Appendix 1).

The data were cross-tabulated to determine whether the extent of damage encouraged

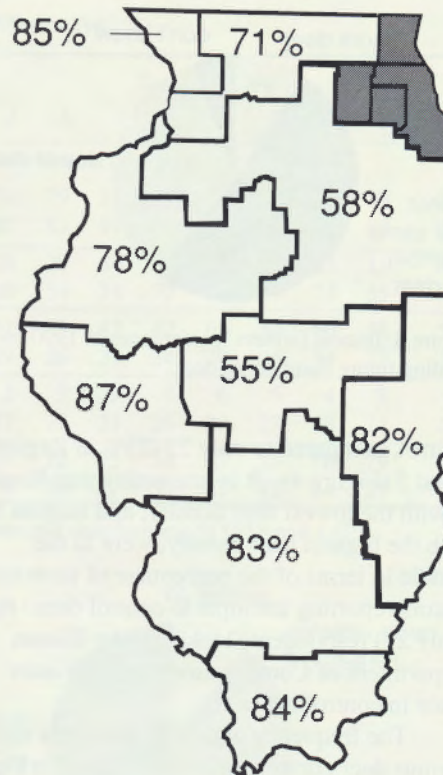


Figure 6. Percentage of farmers in each region who allowed hunting on their farms in 1989.

farmers to allow hunting on their farms. Although the percentage of farmers allowing hunting tended to increase with the amount of damage (the percentages allowing hunting were 76, 88, and 90% for ≤\$100, \$100-300, and >\$300 damage, respectively), this relationship was statistically significant for only two regions (2 and 3). Also, for these regions, the reliability of the results is questionable because of the very small number of respondents with damage >\$300 (see Table A13 in Appendix 1 for regional data).

The farm operators were also asked to rate the level of deer damage. Three-fourths either reported no damage or considered the damage to be light (Figure 9; see also Table A14 in Appendix 1). Only 6% reported severe damage, and 19% reported moderate damage. Interestingly, Region 8, with the highest deer density, registered both the highest percentage of farm operators reporting no damage and the highest percentage reporting severe damage. There was no relationship between deer density

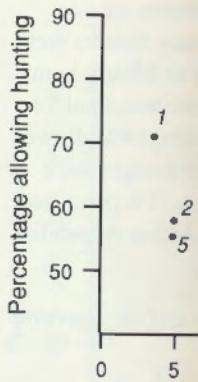


Figure 7. Regression allowing hunting on amount of damage in each region in 1989. Values in italics.

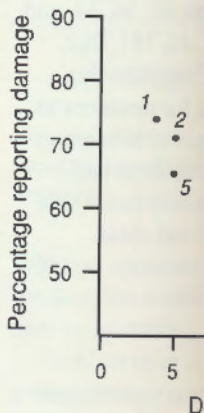


Figure 8. Regression of reporting deer damage on amount of damage in each region in 1989. Values in italics.

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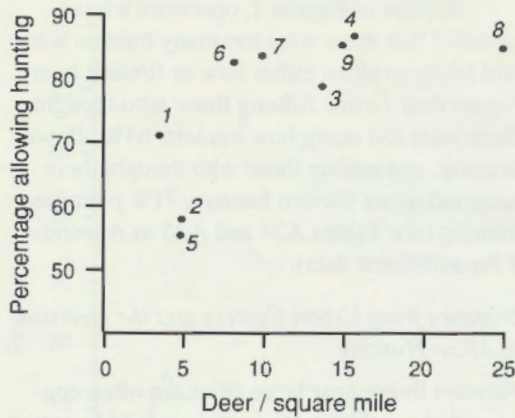


Figure 7. Regression of the percentage of farmers allowing hunting on the estimated density of deer in each region in 1989. Region numbers are shown in italics.

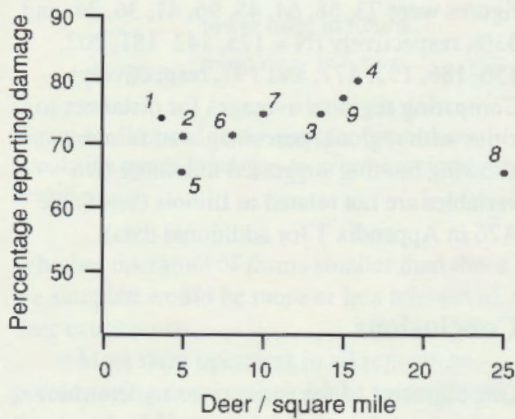


Figure 8. Regression of the percentage of farmers reporting deer damage on the estimated density of deer in each region in 1989. Region numbers are shown in italics.

and the operators' evaluations of damage (see Table A15 in Appendix 1 for regional data).

Fifty-eight percent of those who classified the damage as moderate or severe allowed hunting. Even among those who reported no damage, most farmers allowed hunting; only operators in Regions 2 and 5 reporting no damage were more likely to prohibit hunting than to allow it (see Table A16 in Appendix 1 for regional data).

Farm operators suffering the same amount of deer damage may have different attitudes toward deer. Although 73% of those reporting damages agreed that they were "off-

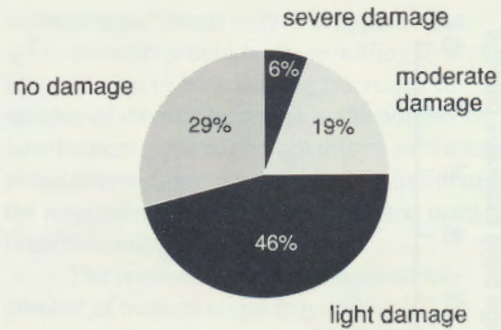


Figure 9. Illinois farmers' assessments of deer damage in 1989.

set by the enjoyment of having deer on the property," the remaining 27% considered the damage "excessive" (for regional data, see Table A17 in Appendix 1). Farm operators in Region 8 were most likely (38%) to consider the damage excessive, and those in Regions 1, 2, and 9 were least likely (24, 22, and 24%, respectively). Linear correlation ($r = 0.807$) indicates a strong relationship ($P < 0.01$) between deer density and operator's attitude toward deer damage (Figure 10).

Farmers who reported more deer in 1989 than in the past were more likely than others to perceive the damage as excessive. Statewide, 35% of farmers who reported increases in deer numbers considered the damage excessive, compared to only 8% of those who reported no increase in deer numbers (see Table A18 in Appendix 1 for regional data). Because some of the samples were small, these results need to be interpreted with caution. Nonetheless, it is apparent that farmers' perceptions of damage were closely related to their perceptions of changes in deer numbers.

Attitudes toward deer damage seemed to be related to operators' willingness to allow hunting on their farms. Whereas 88% of farmers who considered the damage excessive allowed hunting on the farm, hunting was permitted by only 78% of those who said the damage was offset by the pleasure of having deer on the property (see Table A19 in Appendix 1).

Desired Deer Numbers and the Decision to Allow Hunting

A farmer's preference for future changes in deer numbers might affect his or her decision

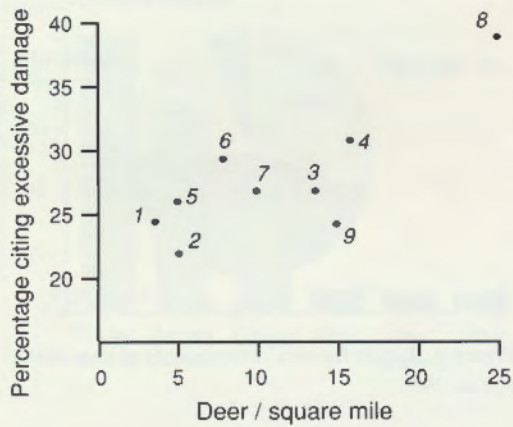


Figure 10. Regression of the percentage of farmers who considered deer damage excessive on the estimated density of deer in each region in 1989. Region numbers are shown in italics.

about whether to allow hunting on the farm. An operator who would like to see the deer population increase would be less likely to allow hunting; one who would like fewer deer would be more likely to allow hunting. This hypothesis was supported by the data in seven of nine regions (the exceptions were Regions 4 and 7). Although relatively few farm operators desired more deer on their farms in the future, even 62% of these farmers allowed hunting (see Table A20 in Appendix 1 for regional data).

Attitudes Toward Hunters and Hunting

Because hunting is widespread in all regions, most respondents had had first-hand experience with hunters on their farms. Only 5% reported having serious problems with hunters. About 29%, however, reported minor problems, although the nature of these problems is unknown (see Table A21 in Appendix 1 for regional data).

Sixty-five percent of the farm operators thought the number of bow hunters in 1989 was about right. The remainder were about equally divided between those saying there were not enough bow hunters and those judging the number to be too high (see Table A22 in Appendix 1). Sixty-five percent judged the number of firearm hunters to be about right, 25% said there were too many, and 10% reported that there were not enough (see Table A23 in Appendix 1 for regional data).

Except in Region 2, operators who responded that there were too many hunters were still likely to allow either bow or firearm hunting on their farms. Among those who thought there were too many bow hunters, 64% allowed hunting, and among those who thought there were too many firearm hunters, 71% permitted hunting (see Tables A24 and A25 in Appendix 1 for additional data).

Distance from Urban Centers and the Decision to Allow Hunting

Farmers living near large cities are often concerned about the invasion of their land by urban hunters. In the current survey, 52% of the respondents statewide lived within 40 miles of a city with a population of 50,000 or more. The percentage living near a city varied greatly among regions, however. In Regions 1-9 the figures were 73, 58, 64, 48, 96, 41, 36, 34, and 33%, respectively (N = 175, 142, 181, 202, 156, 186, 193, 177, and 197, respectively). Comparing regional averages for distances to cities with regional percentages of farmers allowing hunting suggested that these two variables are not related in Illinois (see Table A26 in Appendix 1 for additional data).

Conclusions

One objective of the survey was to determine landowner tolerance of deer densities by plotting replies to Question 5 (prefer to increase, decrease, or maintain current numbers) against 1989 deer densities in each region. The optimum deer population is defined as the point at which most farmers want the deer population to remain stable and the balance of farmers are equally divided between those wanting an increase and those favoring a decrease in deer abundance (Stoll and Mountz 1986).

Although most farmers in our survey indicated that the number of deer was about right, those wishing for fewer deer (33%) greatly outnumbered those wishing for more deer (9%) (see Figure 11, as well as Table A5 in Appendix 1). Illinois farmers appear to be less tolerant of deer at lower densities than farmers in New York (Brown and Decker 1979) or Ohio (Stoll and Mountz 1986).

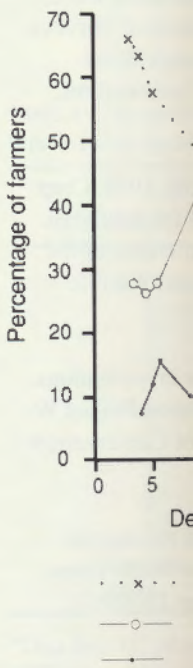


Figure 11. Farmers' population trends in densities.

Whether operators we sampled would allow hunting if deer is unknown.

Most farm operators reported seeing deer the year, and most deer on their property damage to crops and frequently reported if operators did not co-

Deer hunting majority of our regions with a relation, however, we allow hunting that deer were more n who allowed hunt to kill either buck

Respondent opinions about the than about the nu were also somew the number of fir although a majori

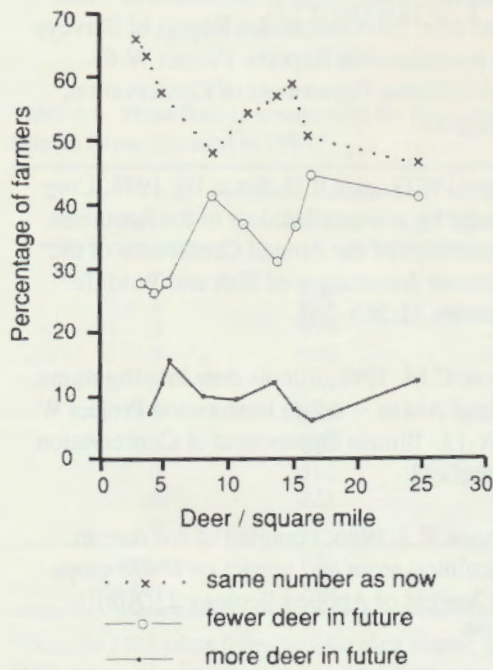


Figure 11. Farmers' preferences for future deer population trends in relation to average regional deer densities.

Whether operators of farms smaller than those we sampled would be more or less tolerant of deer is unknown.

Most farm operators in all regions reported seeing deer on their farms throughout the year, and most said that they enjoy having deer on their property. Although deer-related damage to crops and farm property was frequently reported in all regions, most farm operators did not consider deer a nuisance.

Deer hunting was allowed by the vast majority of our respondents. Farmers in regions with a relatively low total deer population, however, were somewhat less likely to allow hunting than their counterparts where deer were more numerous. Farm operators who allowed hunting generally allowed hunters to kill either bucks or does.

Respondents were more likely to express opinions about the number of firearm hunters than about the number of bow hunters. They were also somewhat more likely to report that the number of firearm hunters was excessive although a majority in all regions reported the

number to be "about right." It appears that farm operators would be more willing to accept liberalization of bow hunting (increases in number of days or increases in the number of bow hunters allowed) before they would accept alterations to firearm hunting. One-fourth of the respondents felt that there were too many firearm hunters in 1989.

The respondents' opinions about the number of hunters afield may reflect hunter-related problems experienced by farm operators. Although only 5% of farmers reported serious problems with hunters, 29% reported minor problems.

At least two-thirds of farm operators in all regions reported some deer damage on their farms in 1989. This level of damage is considerably higher than that reported in 1982 and is perhaps a function of the combination of an increased number of deer and an increased awareness of deer. The extent of damage reported was not a function of regional deer densities.

For most respondents reporting damage, the amount was considered light to moderate. Thirty-seven percent reported that the amount of damage was less than \$100, and 64% said it was less than \$300. The reported dollar amounts of damage were not significantly correlated with regional deer densities.

Most respondents did not consider damage serious enough to undertake methods of deer control. Among those who did, firearm hunting was considered the most effective method.

There was a weak relationship between damage evaluation and whether a respondent allowed hunting. Respondents who reported moderate or severe damage were more likely to allow hunting than those who reported light damage or no damage. Among those who reported no damage, only the farmers in Regions 2 and 5 were likely to prohibit hunting. There was no significant relationship between the evaluation of deer damage severity and deer density in the fall of 1989.

Among those reporting damage, 73% said the damage was offset by the enjoyment of having deer on their property. There was a significant relationship between deer density and operators' attitudes toward deer damage.

In addition, in most regions, the higher the percentage of farm operators who wanted fewer deer in the future, the higher the percentage allowing hunting on their farms. Contrary to expectations, the distance to a city of >50,000 residents was not significantly related to the likelihood that farm operators would allow hunting on their farms. The decision to allow hunting appeared to be a complex interaction of the size of the deer population, the attitudes of the farm operator toward the deer population, the occurrence of deer damage on the farm, and problems with hunters.

In summary, most surveyed farmers felt that deer were still enjoyable to have on their farms, that deer damage to crops was a growing but not excessive problem, and that archery and firearm hunters were still welcome on their farms. Most farmers recognized firearm hunting as the most effective means of controlling deer populations.

The Illinois Department of Conservation appears to have been successful in keeping most farms open to hunting in most regions of the state. There should be some concern about the large percentage of farms closed to hunting in Regions 5 (45%) and 2 (42%). Because these farms often serve as refuges, it will be more difficult to stabilize or reduce deer numbers using firearm hunting in these regions.

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Table A1. Mean farm Illinois farms censused

Region
1
2
3
4
5
6
7
8
9
Statewide totals

*Data for 1987 taken from 1987 census of agriculture. Government Printing Office.

Table A2. Time of year

Time of year
Summer only
All year

Number of respondents. Total number interviewed.

Table A3. Perceived change in n

Perceived change in n
Increase
About the same
Decrease

Number of respondents. Total number interviewed.

Appendix 1: Tables A1-A26

Table A1. Mean farm characteristics for farm operators sampled in 1990 compared with mean values for Illinois farms censused in 1987.*

Region	Mean sample farm size	Mean census farm size	Mean sample area in crops	Mean census area in crops
<i>acres</i>				
1	419	277	343	252
2	498	352	426	333
3	574	334	449	281
4	476	329	348	257
5	668	388	594	368
6	625	347	537	314
7	512	277	448	242
8	422	373	264	217
9	419	311	298	234
Statewide totals	510	321	408	251

*Data for 1987 taken from the following source: U.S. Department of Commerce, Bureau of the Census. 1989. 1987 census of agriculture, vol. 1. Geographic area series, part 13, Illinois state and county data. U.S. Government Printing Office, Washington, DC.

Table A2. Time of year of deer sightings on the farm.

Time of year	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
<i>% of respondents</i>										
Summer only	10	16	9	4	14	7	6	1	9	8
All year	90	84	91	96	86	93	94	99	91	92

Number of respondents in Regions 1 through 9: 173, 135, 180, 200, 153, 183, 190, 176, and 196, respectively. Total number in the state: 1,586.

Table A3. Perceived change in deer numbers during the past five years.

Perceived change in numbers	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
<i>% of respondents</i>										
Increase	63	68	59	74	72	79	77	73	55	69
About the same	35	28	36	22	27	19	20	25	39	28
Decrease	2	4	5	4	1	2	3	2	6	3

Number of respondents in Regions 1 through 9: 165, 136, 163, 196, 142, 179, 175, 168, and 186, respectively. Total number in the state: 1,510.

Table A4. Attitudes toward deer on the farm.

Attitude toward deer	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
	<i>% of respondents</i>									
Enjoy	56	54	55	43	55	44	49	54	51	51
Enjoy but worry about damage	30	35	29	40	31	39	33	23	42	34
Nuisance	6	5	7	4	6	7	7	7	2	5
No feeling	8	6	9	13	8	10	11	16	5	10

Number of respondents in Regions 1 through 9: 173, 140, 181, 201, 155, 186, 192, 177, and 194, respectively. Total number in the state: 1,599.

Table A5. Desired change in the number of deer in the future.

Desired change in deer numbers	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
	<i>% of respondents</i>									
More	6	14	12	6	11	10	9	12	7	9
About the same	62	56	53	48	60	46	48	44	55	52
Fewer	26	26	29	41	24	39	33	38	34	33
Don't know	6	4	7	5	6	5	10	7	4	6

Number of respondents in Regions 1 through 9: 174, 140, 181, 201, 153, 186, 190, 174, and 195, respectively. Total number in the state: 1,594.

Table A6. Desired change in numbers of deer relative to perceptions about past changes in deer numbers.

Region	How have deer numbers changed?						Regional statistics	
	Increased			No change or decreased				
	More	Same	Fewer	More	Same	Fewer	X ²	SIG X ²
	<i>% (#) of respondents*</i>							
1	5 (5)	58 (58)	37 (37)	9 (5)	81 (46)	10 (6)	12.92600	0.0046
2	9 (8)	55 (47)	40 (36)	29 (12)	71 (29)	0 (0)	25.82984	0.0000
3	15 (14)	40 (38)	45 (43)	9 (6)	82 (53)	9 (6)	26.00605	0.0000
4	4 (5)	41 (58)	55 (78)	13 (6)	78 (36)	9 (4)	32.02297	0.0000
5	5 (5)	61 (60)	34 (33)	26 (10)	71 (27)	3 (1)	22.14028	0.0000
6	6 (9)	46 (64)	48 (67)	18 (6)	64 (21)	18 (6)	11.57377	0.0000
7	8 (11)	46 (59)	46 (59)	17 (6)	74 (26)	9 (3)	16.35943	0.0003
8	6 (7)	43 (50)	51 (60)	30 (12)	56 (24)	14 (6)	26.57692	0.0000
9	3 (3)	43 (44)	54 (55)	12 (10)	78 (62)	10 (8)	39.81170	0.0000
Unweighted state totals	7 (67)	47 (478)	46 (468)	17 (73)	74 (324)	9 (40)		

*Percentage (number) of respondents in each region with the same perception of changes in deer numbers (either increase or no change/decrease).

Table A7. Attitudes

Region	Future ch numbe	
	More	S
1	11 (10)	80
2	26 (19)	60
3	21 (20)	75
4	10 (8)	80
5	20 (16)	70
6	22 (17)	69
7	18 (15)	73
8	23 (20)	69
9	15 (14)	79
State	18 (139)	75

* Percentage (numbe

Table A8. Preferred

Control method
Exploders
Commercial repellent
Nuisance deer permit
Natural deer repellent
Dogs
Fencing
Archery hunting
Firearm hunting

Number of responde
number in the state: 5

Table A9. Farmers

Control method	1
Fences	89 (16)
Archery	61 (25)
Firearms	26 (13)

Table A7. Attitudes toward deer on the farm relative to desired change in the number of deer.

How do you feel about having deer on your farm?											
Region	Enjoy			Enjoy but worry about damage			Nuisance			Regional statistics	
	Future change in deer numbers desired			Future change in deer numbers desired			Future change in deer numbers desired			X ²	Sig X ²
	More	Same	Fewer	More	Same	Fewer	More	Same	Fewer		
% (#) of respondents*											
1	11 (10)	86 (79)	3 (3)	0 (0)	44 (22)	56 (28)	8 (1)	0 (0)	92 (12)	77.16	0.000
2	26 (19)	66 (49)	8 (6)	2 (1)	56 (27)	42 (20)	0 (0)	11 (1)	89 (8)	43.70	0.000
3	21 (20)	75 (71)	4 (4)	2 (1)	35 (18)	63 (32)	0 (0)	0 (0)	100 (17)	93.28	0.000
4	10 (8)	80 (64)	10 (8)	4 (3)	37 (29)	59 (47)	0 (0)	4 (1)	96 (26)	75.44	0.000
5	20 (16)	76 (62)	4 (3)	0 (0)	55 (24)	45 (20)	0 (0)	8 (1)	92 (11)	63.25	0.000
6	22 (17)	69 (54)	9 (7)	1 (1)	40 (28)	59 (41)	0 (0)	0 (0)	100 (19)	75.24	0.000
7	18 (15)	73 (63)	9 (8)	3 (2)	36 (22)	61 (37)	0 (0)	0 (0)	100 (17)	72.53	0.000
8	23 (20)	69 (61)	8 (7)	0 (0)	28 (11)	72 (28)	0 (0)	0 (0)	100 (26)	95.25	0.000
9	15 (14)	79 (75)	6 (6)	0 (0)	39 (31)	61 (48)	0 (0)	0 (0)	100 (10)	80.70	0.000
State	18 (139)	75 (578)	7 (52)	1 (8)	41 (212)	58 (301)	1 (1)	2 (3)	97 (146)		

* Percentage (number) of respondents in each region with the same attitude toward deer on the farm.

Table A8. Preferred control methods of farmers attempting deer control.

Control method	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
% of respondents attempting deer control										
Exploders	2	0	3	5	0	2	0	6	0	2
Commercial repellent	0	3	2	5	0	7	0	4	0	2
Nuisance deer permit	0	0	3	6	3	4	0	4	1	3
Natural deer repellents	2	3	6	7	3	13	4	11	2	6
Dogs	3	0	8	9	6	7	6	13	7	7
Fencing	30	44	24	33	26	33	30	25	34	31
Archery hunting	68	56	68	69	70	65	70	53	66	66
Firearm hunting	85	78	89	93	85	96	93	93	95	91

Number of respondents in Regions 1 through 9: 60, 32, 62, 85, 34, 46, 54, 53, and 83, respectively. Total number in the state: 509. Overall, 32% of respondents reported using deer control methods.

Table A9. Farmers' ratings of ineffectiveness of deer control methods.

Control method	Region									State totals
	1	2	3	4	5	6	7	8	9	
% (#) of respondents considering method ineffective										
Fences	89 (16)	86 (12)	87 (13)	79 (22)	89 (8)	87 (13)	81 (13)	92 (12)	82 (23)	85 (132)
Archery	61 (25)	33 (6)	49 (21)	44 (26)	29 (7)	43 (13)	51 (19)	61 (17)	44 (24)	47 (158)
Firearms	26 (13)	8 (2)	20 (11)	20 (16)	21 (6)	27 (12)	24 (12)	22 (11)	10 (8)	20 (91)

Table A10. Decision to allow hunting relative to perception of how deer numbers have changed.

Region	How have deer numbers changed?		Regional statistics	
	Increased	No change or decreased	X ²	SIG X ²
	<i>% (#) allowing hunting</i>			
1	79 (82)	59 (36)	6.48017	0.0109
2	68 (63)	40 (17)	8.52945	0.0035
3	86 (83)	78 (52)	1.59331	0.2069
4	89 (129)	82 (42)	0.94784	0.3303
5	59 (60)	50 (20)	0.58606	0.4439
6	84 (120)	76 (28)	1.04146	0.3075
7	88 (119)	75 (30)	3.24163	0.0718
8	91 (111)	70 (32)	10.46644	0.0012
9	91 (94)	78 (65)	5.21090	0.0224
Unweighted state totals	83 (861)	68 (322)		

Table A11. Reported dollar amounts of deer damage.

Amount of damage	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
	<i>% of respondents</i>									
\$1 to \$100	39	38	32	36	37	38	45	38	35	37
\$101 to \$300	21	42	29	27	26	17	28	24	27	27
>\$300	39	20	39	37	37	45	27	38	38	36

Number of respondents in Regions 1 through 9: 76, 55, 76, 92, 63, 69, 71, 61, and 94, respectively. Total number in the state: 657.

Table A12. Reported dollar amounts of deer damage, presented according to regional deer density.

Amount of damage	Deer per square mile*									
	25	16	15	14	11	8	5	5	4	
	<i>% (#) of respondents</i>									
\$1 to \$100	38 (23)	36 (33)	35 (33)	32 (24)	45 (32)	38 (26)	38 (21)	37 (23)	39 (30)	
\$101 to \$300	25 (15)	27 (25)	27 (25)	29 (22)	28 (20)	17 (12)	42 (23)	27 (17)	21 (16)	
>\$300	38 (23)	37 (34)	38 (36)	39 (30)	27 (19)	45 (31)	20 (11)	37 (23)	39 (30)	

*Read from left to right, values for deer densities represent Regions 8, 4, 9, 3, 7, 6, 2, 5, and 1, respectively.

Table A13. Decision

Region
1
2
3
4
5
6
7
8
9
Unweighted state totals

Table A14. Farmers'

Level of deer damage
No damage
Light damage
Moderate damage
Severe damage
Number of respondents
tively. Total number

Table A15. Farmers'

Level of deer damage	
No damage	37
Light damage	34
Moderate damage	21
Severe damage	8
*Read from left to right	

Table A13. Decision to allow hunting relative to reported dollar amount of damage from deer.

Region	Dollar amount of damage			Regional statistics	
	≤ \$100	\$101 to \$300	> \$300	X ²	SIG X ²
<i>% (#) of respondents allowing hunting</i>					
1	60 (18)	88 (14)	83 (25)	6.04444	0.0487
2	48 (10)	78 (18)	91 (10)	7.89134	0.0193
3	71 (17)	86 (19)	100 (3)	9.93269	0.0070
4	88 (29)	96 (24)	94 (32)	1.56316	0.4577
5	57 (13)	82 (14)	74 (17)	3.38170	0.1844
6	81 (21)	92 (11)	87 (27)	0.90157	0.6371
7	84 (27)	90 (18)	100 (19)	3.27563	0.1944
8	91 (21)	93 (14)	96 (22)	0.35517	0.8373
9	88 (29)	96 (24)	97 (35)	2.83903	0.2418
Unweighted state totals	76 (185)	88 (156)	90 (190)		

Table A14. Farmers' evaluations of level of deer damage on their farms.

Level of deer damage	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
<i>% of respondents</i>										
No damage	29	32	28	23	37	31	27	37	24	29
Light damage	49	49	47	45	43	43	55	34	50	46
Moderate damage	19	17	18	26	15	19	12	21	20	19
Severe damage	2	2	8	6	5	8	6	8	5	6

Number of respondents in Regions 1 through 9: 164, 130, 175, 187, 142, 177, 186, 162, and 187, respectively. Total number in the state: 1,510.

Table A15. Farmers' evaluations of level of deer damage on their farms, presented according to deer density.

Level of deer damage	Deer per square mile*								
	25	16	15	14	11	8	5	5	4
<i>% (#) of respondents</i>									
No damage	37 (60)	23 (43)	24 (45)	28 (47)	27 (51)	31 (54)	32 (41)	37 (53)	29 (48)
Light damage	34 (55)	45 (84)	50 (94)	47 (80)	55 (102)	43 (76)	49 (64)	43 (61)	49 (81)
Moderate damage	21 (34)	26 (49)	20 (38)	18 (31)	12 (22)	19 (33)	17 (22)	15 (21)	19 (31)
Severe damage	8 (13)	6 (11)	5 (10)	8 (17)	6 (11)	8 (14)	2 (3)	5 (7)	2 (4)

*Read from left to right, values for deer densities represent Regions 8, 4, 9, 3, 7, 6, 2, 5, and 1, respectively.

Table A16. Decision to allow hunting relative to evaluation of level of deer damage.

Region	Evaluation of deer damage on farm				Regional statistics	
	No damage	Light damage	Moderate damage	Severe damage	X ²	SIG X ²
<i>% (#) of respondents allowing hunting</i>						
1	69 (33)	69 (56)	81 (25)	100 (4)	3.28223	0.3501
2	39 (16)	69 (44)	64 (14)	100 (3)	11.57574	0.0090
3	60 (28)	79 (63)	94 (29)	92 (12)	14.79414	0.0020
4	79 (34)	88 (74)	88 (43)	91 (10)	2.37939	0.4975
5	36 (19)	56 (34)	90 (19)	43 (3)	18.56153	0.0003
6	65 (35)	88 (67)	88 (29)	93 (13)	14.20557	0.0026
7	72 (37)	86 (88)	96 (21)	100 (11)	9.79185	0.0204
8	70 (42)	93 (51)	85 (29)	100 (13)	13.86866	0.0031
9	62 (28)	89 (84)	95 (36)	100 (10)	23.61277	0.0000
Unweighted state totals	62 (272)	80 (561)	87 (245)	92 (79)		

Table A17. Farmers' attitudes toward deer damage.

Attitude toward damage	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
<i>% of respondents</i>										
Offset by enjoyment	76	79	73	69	74	71	73	62	76	73
Damage was excessive	24	22	27	31	26	29	27	38	24	27

Number of respondents for Regions 1 through 9: 112, 79, 118, 131, 88, 111, 123, 90, and 130, respectively.
Total number for the state: 982.

Table A18. Attitudes toward deer damage relative to perceived changes in deer numbers.

Region	How have deer numbers changed?				Regional statistics	
	Increased		No change or decreased			
	How do you feel about damage?		How do you feel about damage?			
	Offset by enjoyment	Excessive	Offset by enjoyment	Excessive	X ²	SIG X ²
<i>% (#) of respondents</i>						
1	67 (50)	33 (25)	94 (30)	6 (2)	7.34412	0.0067
2	73 (45)	27 (17)	100 (15)	0 (0)	4.11539	0.0425
3	63 (44)	37 (26)	85 (37)	15 (6)	5.02443	0.0250
4	64 (67)	36 (38)	87 (20)	13 (3)	3.54083	0.0564
5	67 (43)	33 (21)	94 (15)	6 (1)	3.28545	0.0595
6	66 (61)	34 (32)	100 (18)	0 (0)	7.10611	0.0077
7	68 (64)	32 (30)	90 (18)	10 (2)	2.91233	0.0879
8	55 (39)	45 (32)	88 (15)	12 (2)	5.08943	0.0241
9	67 (52)	33 (26)	93 (41)	7 (3)	9.50051	0.0021
Unweighted state totals	65 (465)	35 (247)	44 (209)	8 (19)		

Table A19. Decision

Region
1
2
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9
Unweighted state totals

Table A20. Decision

Region
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8
9
Unweighted state totals

Table A21. Farmers'

Level of problems
No problems
Minor problems
Serious problems
Number of respondents tively. Total number f

Table A19. Decision to allow hunting relative to attitude toward deer damage.

Region	Attitude toward damage		Regional statistics	
	Offset by enjoyment	Damage was excessive	X ²	SIG X ²
<i>% (#) allowing hunting</i>				
1	66 (61)	96 (22)	6.49744	0.0108
2	60 (36)	79 (15)	1.51176	0.2189
3	79 (69)	97 (31)	4.15002	0.0416
4	89 (83)	95 (38)	0.53571	0.4642
5	59 (39)	71 (15)	0.57262	0.4492
6	86 (70)	90 (28)	0.05735	0.8107
7	83 (74)	100 (33)	4.87484	0.0273
8	100 (2)	84 (146)	0.00000	1.0000
9	89 (90)	96 (26)	0.58753	0.4434
Unweighted state totals	78 (524)	88 (354)		

Table A20. Decision to allow hunting relative to desired change in deer numbers in the future.

Region	Desired future change in deer numbers			Regional statistics	
	Increase	No change	Decrease	X ²	SIG X ²
<i>% (#) allowing hunting</i>					
1	46 (5)	68 (73)	80 (37)	5.71375	0.057
2	35 (7)	51 (40)	83 (30)	15.20492	0.000
3	76 (16)	77 (73)	91 (48)	4.54565	0.103
4	100 (11)	86 (83)	89 (74)	2.14211	0.342
5	38 (6)	53 (48)	70 (26)	5.64775	0.059
6	50 (9)	79 (68)	94 (69)	21.16224	0.000
7	82 (14)	79 (73)	98 (62)	12.03057	0.002
8	75 (15)	84 (64)	89 (59)	2.62761	0.268
9	71 (10)	81 (87)	95 (63)	9.40672	0.009
Unweighted state totals	62 (93)	73 (609)	89 (468)		

Table A21. Farmers' reports of problems with hunters.

Level of problems	Region									Unweighted state total
	1	2	3	4	5	6	7	8	9	
<i>% of respondents</i>										
No problems	67	68	58	67	75	74	68	58	61	66
Minor problems	28	29	35	29	20	21	28	34	33	29
Serious problems	5	3	6	4	5	5	4	8	6	5

Number of respondents in Regions 1 through 9: 171, 135, 175, 194, 150, 179, 186, 175, and 192, respectively. Total number for the state: 1,557.

Table A22. Attitudes toward the number of bow hunters.

Attitude toward number of bow hunters	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
	<i>% of respondents</i>									
Not enough	14	11	12	20	13	19	20	19	21	17
About right	73	63	70	66	65	60	63	61	62	65
Too many	13	25	18	14	23	21	17	20	17	18

Number of respondents for Regions 1 through 9: 104, 68, 114, 137, 88, 118, 120, 99, and 126, respectively.
Total number in the state: 974.

Table A23. Attitudes toward the number of firearm hunters.

Attitude toward number of firearm hunters	Region									Unweighted state totals
	1	2	3	4	5	6	7	8	9	
	<i>% of respondents</i>									
Not enough	5	6	7	13	6	17	18	11	7	10
About right	77	65	64	62	72	59	59	71	61	65
Too many	18	29	29	26	21	25	23	18	32	25

Number of respondents for regions 1 through 9: 127, 89, 136, 157, 94, 126, 137, 127, and 158, respectively.
Total number for the state: 1,151.

Table A24. Decision to allow hunting on the farm relative to attitude toward the number of bow hunters.

Region	Attitude about the number of bow hunters			Regional statistics	
	Not enough	About right	Too many	X ²	SIG X ²
	<i>% (#) allowing hunting*</i>				
1	100 (15)	86 (65)	54 (7)	11.57283	0.0031
2	100 (8)	70 (30)	24 (4)	16.64230	0.0002
3	86 (12)	86 (69)	70 (14)	3.10714	0.2115
4	96 (26)	91 (83)	63 (12)	14.06384	0.0009
5	73 (8)	61 (35)	55 (11)	1.59019	0.4515
6	91 (20)	89 (63)	80 (20)	1.59019	0.4151
7	100 (24)	90 (68)	85 (17)	3.40810	0.1819
8	95 (18)	90 (54)	70 (14)	6.53599	0.0381
9	100 (27)	96 (75)	62 (13)	27.64415	0.0000
Unweighted state totals	95 (158)	86 (542)	64 (112)		

* Percentage (number) or respondents in each region with each attitude.

Table A25. Decis

Region
1
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Unweighted state totals

*Percentage (num

Table A26. Decis

Region
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6
7
8
9
Unweighted state totals

Table A25. Decision to allow hunting on the farm relative to attitude toward the number of firearm hunters.

Region	Attitude about the number of firearm hunters			Regional statistics	
	Not enough	About right	Too many	X ²	SIG X ²
	% (#) allowing hunting*				
1	100 (6)	86 (84)	61 (14)	9.14596	0.0103
2	100 (5)	76 (44)	38 (10)	13.93158	0.0009
3	90 (9)	87 (76)	85 (33)	0.27455	0.8717
4	95 (19)	93 (90)	75 (30)	9.76759	0.0076
5	67 (4)	63 (43)	55 (11)	0.51039	0.7748
6	95 (20)	89 (66)	77 (24)	4.16188	0.1248
7	100 (25)	90 (73)	81 (25)	5.67601	0.0585
8	93 (13)	92 (83)	74 (17)	6.50241	0.0387
9	100 (11)	98 (94)	74 (38)	22.47739	0.0000
Unweighted state totals	95 (112)	87 (653)	71 (202)		

*Percentage (number) of respondents in each region with each attitude.

Table A26. Decision to allow hunting and distance from an urban center.

Region	Miles from a city of $\geq 50,000$ population		Regional statistics	
	≤ 40 miles	> 40 miles	X ²	SIG X ²
	% (#) allowing hunting			
1	73 (93)	68 (32)	0.16363	0.6858
2	56 (46)	60 (36)	0.08589	0.7695
3	77 (89)	80 (52)	0.10425	0.7468
4	81 (79)	91 (96)	3.52192	0.0608
5	53 (80)	100 (70)	3.36773	0.0665
6	76 (58)	86 (95)	2.45891	0.1169
7	80 (56)	85 (105)	1.31154	0.2521
8	78 (47)	86 (101)	1.31154	0.2521
9	89 (57)	84 (111)	0.68055	0.4094
Unweighted state totals	77 (605)	84 (698)		

Appendix 2: The Survey Instrument

Dear Farm Operator:

The Illinois Department of Conservation and the Natural History Survey want to measure farm operator attitudes relative to whitetail deer numbers, damage caused, hunting seasons and hunter densities and behavior. Our office has agreed to conduct the survey and summarize the results. Your name was selected at random from among farm operators in the State. Please answer the question for your farm operations and return the form in the prepaid envelope. Your report will be kept confidential and will only be used in summary with all other reports. A prompt response will be appreciated.

Sincerely,

Fred S. Barrett
State Statistician

Please make corrections in name, address, SSN, EIN, phone and zip code if necessary.

The following questions on this page will be used only to classify the survey results by type of operation and to update our farm operator list. Please complete the following questions for your farming operation.

1. On land operated by the farm, ranch or individual(s) listed on the label:
- | | | |
|--|--------------------------|--------------------------|
| | YES | NO |
| a. Will crops be grown or hay cut at any time during 1990? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Will grain or soybeans be stored at any time during 1990, or do you have storage facilities used for storing grain? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Are there now or will there be any hogs, cattle, sheep or poultry on this operation during 1990? | <input type="checkbox"/> | <input type="checkbox"/> |

If NO to all items, please provide name and address of new operator and return the questionnaire.

2. Does this operation do business under any name other than as shown on label?
 NO YES - Enter name:
 (Do you want this name to appear on the label?)
 YES NO
3. Is your SSN and EIN printed correctly on the address label?
 YES NO

If no, to assist in identifying duplication with our list of farm operators, please report your Social Security Number. If your operation has a Federal Identification Number, this would be helpful. Disclosure of your SSN is voluntary and is collected under the general authority of Title 7, Section 2204 of the U.S. code.

Operator's Social Security Number - -

Operator's Employer ID Number

4. ACRES OPERATED IN 1990
- | | |
|--|--------------------------|
| How many acres are in your total farm operation in 1990? | <input type="text"/> |
| What was the GRAIN STORAGE CAPACITY on the total acres operated on January 1, 1990? (Include all structures normally used for storing grain) | <input type="text"/> bu. |
5. ACRES PLANTED IN 1989
- | | |
|--|----------------------|
| CORN-all purposes (including silage) | <input type="text"/> |
| SOYBEANS (include doublecrop soybeans) | <input type="text"/> |
| OATS for grain | <input type="text"/> |
| ALL WHEAT (for harvest in 1990) | <input type="text"/> |
| ALFALFA & ALFALFA MIXTURES (cut for hay) | <input type="text"/> |
| ALL OTHER HAY CUT | <input type="text"/> |

6. NUMBER OF LIVESTOCK AND POULTRY ON FARM JANUARY 1, 1990

	NUMBER
ALL CATTLE & CALVES (including dairy type)	108
MILK COWS (dry & in milk)	109
BEEF COWS	110
ALL HOGS & PIGS	111
ALL SHEEP (including lambs on feed)	112
HENS & PULLETS of laying age	113
What was the largest number of CATTLE ON FEED (for slaughter) on the operation at any one time in the past year?	114

7. To determine possible duplication in reporting, which one of the following best describes the management of your farming or ranching operation?

- INDIVIDUALLY operated land.
- HIRED MANAGER of land owned by someone else.
- PARTNERSHIP, please list partners' names in boxes below.

(Partners jointly operate land and share in decision-making DO NOT include landlord as partner.)

Number of persons in partnership, including self.

Name

Address

City Zip

Phone (____) SSN

Name

Address

City Zip

Phone (____) SSN

DEER NUMBER

Please check the appropriate box.

1. Do you have deer on your farm?
 200 Yes
2. When are deer most abundant?
 a. Only in summer
 b. All year
 c. I consider deer to be too numerous
 d. I have no deer
3. How do you feel about deer?
 a. I consider deer to be a pest
 b. I enjoy a few deer but not too many
 c. I consider deer to be a nuisance
 d. I have no opinion
4. Over the past year, how have deer numbers changed?
 a. More deer
 b. About the same
 c. Fewer deer
 d. Don't know
5. How would you rate the damage to your farm from deer?
 a. More deer
 b. About the same
 c. Fewer deer
 d. No opinion
11. For those deer you have not used for hunting, what do you do with them?
 a. Archery hunt
 b. Firearm hunt
 c. Fencing around
 d. Deer repellent
 e. Commercial hunting
 f. Exploders
 g. Dogs
 h. Nuisance deer

DEER NUMBERS

Please check the appropriate answer.

1. Do you have deer on your farm?
 200 Yes 201 No (End Questionnaire)
 ↓
 202 Don't Know (End Questionnaire)
2. When are deer present on your farm?
 a. Only in summer 203
 b. All year 204
3. How do you feel about deer on your farm?
 a. I consider deer on my farm enjoyable 205
 b. I enjoy a few deer but I worry about too much damage to my crops 206
 c. I consider deer as a nuisance on the farm 207
 d. I have no particular feeling about deer 208
4. Over the past five years, how have deer numbers changed on your farm?
 a. More deer than five years ago 209
 b. About the same number as five years ago 210
 c. Fewer deer than five years ago 211
 d. Don't Know 212
5. How would you like to see the number of deer on your farm change in the future?
 a. More deer than at present 213
 b. About the same number as at present 214
 c. Fewer deer than at present 215
 d. No opinion 216

DEER DAMAGE

6. How would you describe the amount of crop and fence damage caused by deer on your farm in 1988 and 1989?

<input type="checkbox"/> 217 No damage (Go to question 9.)	1988	1989
a. Light damage	<input type="checkbox"/> 218	<input type="checkbox"/> 219
b. Moderate damage	<input type="checkbox"/> 220	<input type="checkbox"/> 221
c. Severe damage	<input type="checkbox"/> 222	<input type="checkbox"/> 223
7. How do you feel about the amount of damage from deer in 1988 and 1989?

	1988	1989
a. Damage was offset by the enjoyment of having deer on the farm.	<input type="checkbox"/> 224	<input type="checkbox"/> 225
b. Damage was excessive	<input type="checkbox"/> 226	<input type="checkbox"/> 227
8. What was the approximate cost to you for damage to crops and/or fences for the years 1988 and 1989?

	1988	1989
Amount \$	<input type="checkbox"/> 228	<input type="checkbox"/> 229
9. Have you contacted the State Department of Conservation for help in controlling deer on your farm?
 230 No (Go to question 10.) 231 Yes

 How satisfied were you with the Department's response to your deer control problems?
 a. Very satisfied 232
 b. Somewhat satisfied 233
 c. Not satisfied 234
10. Have you used any deer control methods on your farm?
 235 Yes 236 No (Go to question 12.)

11. For those deer control methods you have used, indicate below how effective each method has been. For those methods you have not used, check the not used box.

	Not used	Very effective	Somewhat effective	Not effective
a. Archery hunting	<input type="checkbox"/> 237	<input type="checkbox"/> 238	<input type="checkbox"/> 239	<input type="checkbox"/> 240
b. Firearm hunting	<input type="checkbox"/> 241	<input type="checkbox"/> 242	<input type="checkbox"/> 243	<input type="checkbox"/> 244
c. Fencing around plants or fields	<input type="checkbox"/> 245	<input type="checkbox"/> 246	<input type="checkbox"/> 247	<input type="checkbox"/> 248
d. Deer repellents such as human or animal hair	<input type="checkbox"/> 249	<input type="checkbox"/> 250	<input type="checkbox"/> 251	<input type="checkbox"/> 252
e. Commercial deer repellent spray	<input type="checkbox"/> 253	<input type="checkbox"/> 254	<input type="checkbox"/> 255	<input type="checkbox"/> 256
f. Exploders	<input type="checkbox"/> 257	<input type="checkbox"/> 258	<input type="checkbox"/> 259	<input type="checkbox"/> 260
g. Dogs	<input type="checkbox"/> 261	<input type="checkbox"/> 262	<input type="checkbox"/> 263	<input type="checkbox"/> 264
h. Nuisance deer permit from Department of Conservation	<input type="checkbox"/> 265	<input type="checkbox"/> 266	<input type="checkbox"/> 267	<input type="checkbox"/> 268

DEER HUNTING AND HUNTERS

12. Who do you allow to hunt deer on your farm? (Check all that apply to your farm.)
- a. Farm is closed to deer hunting
 - b. Anyone who asks permission
 - c. Immediate family only
 - d. Relatives
 - e. A few friends and neighbors
 - f. Hunting lease members

13. How many deer have been killed in recent years on your farm? (Enter one answer for bow and for firearm. Place a check mark under "don't know" for each year if you do not know the deer kill.)
- | | Bow | Firearm | Don't know |
|----------------------|----------------------------------|----------------------------------|----------------------------------|
| a. In 1986 | <input type="text" value="275"/> | <input type="text" value="276"/> | <input type="text" value="277"/> |
| b. In 1987 | <input type="text" value="278"/> | <input type="text" value="279"/> | <input type="text" value="280"/> |
| c. In 1988 | <input type="text" value="281"/> | <input type="text" value="282"/> | <input type="text" value="283"/> |
| d. In 1989 | <input type="text" value="284"/> | <input type="text" value="285"/> | <input type="text" value="286"/> |

14. On your farm, do you allow:
- a. Hunters to kill only bucks
 - b. Hunters to kill only does
 - c. Hunters to kill either bucks or does

15. How do you feel about the number of hunters who hunt deer on or near your farm? (Select one answer each for bow hunting and for firearm hunting.)
- | | Bow | Firearm |
|-------------------------------------|----------------------------------|----------------------------------|
| a. Not enough hunters | <input type="text" value="290"/> | <input type="text" value="291"/> |
| b. About the right number | <input type="text" value="292"/> | <input type="text" value="293"/> |
| c. Too many hunters | <input type="text" value="294"/> | <input type="text" value="295"/> |
| d. Don't know | <input type="text" value="296"/> | <input type="text" value="297"/> |

16. Within the past three years, have you experienced any problems with deer hunters on your farm?
- No problems (Go to question 18.)
- a. Minor problems
 - b. Serious problems

17. If you experienced problems with deer hunters, what was the nature of these problems? (Check all that apply.)
- a. Trespassing
 - b. Trash and litter
 - c. Damage to crops
 - d. Damage to fences
 - e. Damage to farm machinery
 - f. Damage to livestock

18. Have you requested a law enforcement agency (police, Sheriff, conservation officer) to remove trespassing deer hunters from your farm during the past three deer hunting seasons?
- Yes No

19. Is deer poaching a problem on your farm or in the vicinity of your farm?
- a. We do not have poaching problems
 - b. We occasionally have poaching problems
 - c. We have poaching problems every year
 - d. Don't know

20. Have you reported deer poaching activities to a law enforcement agency within the past three year?
- Yes No

21. What is your feeling about the present Illinois deer hunting seasons? (Check one each for bow hunting and for firearm hunting.)
- | | Bow | Firearm |
|-------------------------------------|----------------------------------|----------------------------------|
| a. Too long | <input type="text" value="315"/> | <input type="text" value="316"/> |
| b. About the right length | <input type="text" value="317"/> | <input type="text" value="318"/> |
| c. Too short | <input type="text" value="319"/> | <input type="text" value="320"/> |
| d. Don't know | <input type="text" value="321"/> | <input type="text" value="322"/> |

22. Do you lease your farm for deer hunting?
- Yes No

23. Are you familiar with the recent change in the landowner liability law?
- Yes No

24. Would you be interested in leasing your farm for deer hunting in future years?
- Yes No

25. Are you in favor of the 40-acre requirement for a free landowner/tenant firearm/archery permit?
- Yes No

26. If not, do you favor a change in the acreage requirement for a free landowner permit?
- Yes No

27. How many acres in your total farm operation are in permanent cover? (timber, pasture, CRP, etc.)

28. How far do you live from a city of over 50,000 population?
- Miles

29. What is the name of the nearest city of over 50,000 population?
-

This completes the survey. Thank you for your help.
 If you would like to receive a report of the results of this survey, PLEASE CHECK HERE.

COMMENTS ON BACK PAGE

Illinois Department of Conservation
Springfield