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LANDOWNER REPORTS OF DEER HUNTER DAMAGE IN ARKANSAS

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ABSTRACT

Damage to property from deer hunters, though usually not discovered immediately, is a problem for many Arkansans. A questionnaire survey was mailed to 3,773 rural landowners in Arkansas to determine the type and cost of damage suffered from hunters. Thirty-five percent reported minor problems, and 15% reported severe damage from hunters. The most common problems caused by hunters were fence cutting (33%), severe littering (16%), road damage (13%), crop damage (10%), cattle shot (8%), gates left open (6%), and trespassing (6%). Eighty-three (5%) of the landowners reported damage costs of \$500 or more; one sustained a \$15,000 loss. Total state-wide losses are estimated at almost \$15 million per year. Solutions lie in cultivating a stewardship position among landowners and a stronger ethic of respect among hunters. Mandatory hunter education programs can help instill hunter ethics, while posting laws can provide the administrative mechanism to control access and exposure.

INTRODUCTION

White-tailed deer (*Odocoileus virginianus*) are an important natural resource in Arkansas and a source of enjoyment for many residents. During the 1985-86 hunting season, the Arkansas Game and Fish Commission sold an estimated 217,600 resident hunting licenses. During the same year, Arkansans legally harvested about 60,100 deer (Pollock and Cornelius, 1986). The estimated number of deer in Arkansas has increased steadily since restocking efforts of the 1940s, from 500 in 1930 to 500,000 in 1986 (Low, 1986). While the total legal kill (checked kill) and herd size estimation is subject to error, the number of deer and the number of deer killed have increased over time. This is despite a steady decline in the number of licensed deer hunters in the state since 1981 (Kluender *et al.*, 1988).

Associated with the hunt, access to hunting areas and concurrent damage to landowners' property is a perennial question and source of problems. Beginning in the mid-1980s, forest industry landowners in southern Arkansas began leasing hunting rights to clubs. While leasing was initiated to improve access control and to generate additional revenue for the companies, it changed hunting patterns in the area. Leased areas are no longer on a first come basis, a policy that often lead to confrontations among groups of hunters and between hunters and landowners. Some companies have promoted surrogate ownership by lessees with corresponding good results. Many hunt clubs patrol leases and watch for vandalism or other problems. However, for many hunters without access to industry or public lands, finding a place to hunt is more involved and is dependent on the availability of nonindustrial lands.

A landowner's property is susceptible to both intentional and unwitting damage by the public. In a 1978 forest industry survey in the southeastern United States, Kluender (1978) found that hunting and off-road vehicle riding were the primary uses of industrial lands by sportsmen. Associated with these pursuits were various types of property abuse and damage ranging from fires that got out of control, trash dumping and, road damage during bad weather. While lessors can act against lease holders through contract provisions, landowners who do not lease have little or no protection from damage by known or unknown hunters. Often, damage is discovered long after it is committed, leaving the landowner with the costly problem of repair or replacement of fences, roads, and equipment.

Owens *et al.* (1985) found similar patterns in Arkansas for industrial and large, private ownerships (>405 ha) to those found by Kluender (1978). In their study they found that although public uses included, in decreasing frequency, hunting, trash dumping, firewood gathering, fishing, and ATV riding. The most important problems for landowners were litter, illegal firewood cutting, road damage, arson, and timber damage.

To date no one has measured the losses due to deer hunters in Arkansas on farms and small ownerships. There is adequate reason to believe that the public may hold different attitudes toward industrial and

large nonindustrial landowners (>405 ha) than toward small landowners. Kluender (1978) found that industrial ownerships are often viewed as quasi-public lands. Accordingly, one might expect to find a different type damage and severity of damage on nonindustrial private than forest industry lands. The objectives of this study were to determine the level of damage to nonindustrial lands and property sustained by landowners from hunters and to determine landowner attitudes toward hunting and hunters.

METHODS

A questionnaire survey was mailed to 3,773 rural landowners in Arkansas during January 1987. The questionnaire gathered basic information about the landowner, property use, attitudes toward deer, damage caused by hunters, and policies used to deal with hunters. Landowner variables included age, sex, household income, residence on property and principal land use. Questions about attitudes and perceptions relating to deer asked about the landowner's wishes for deer herd size and perception of the size and change in deer herd. Questions about hunters and policies questioned type and severity of damage by hunters and landowner attitudes toward leasing and access control.

Personnel from the Arkansas Cooperative Extension Service randomly selected names from lists of rural landowners maintained at each county Cooperative Extension Service office. The number of landowners selected from each county was proportional to the number of farm operators it contained, (U.S. Dept. Commerce, 1984) and ranged from 11 to 208. The sample size was selected to provide bounds on error of estimates for proportions (Mendenhall *et al.*, 1971) of 2% if all surveys were returned.

Data were summarized and analyzed using the statistical software SPSS/PC+ (Norusis, 1988). Contingency table analysis was used to evaluate associations between attitudes and perceptions of damage and landowner characteristics. Analysis of variance was used to test for differences in mean damage in dollars by region. Statistical significance was accepted at the 0.05 probability level.

RESULTS

DESCRIPTION OF RESPONDENTS AND FARMS

We received 1,695 (45%) responses to our survey, which provided 2.4% bounds on error of estimates for proportions. Normal response rates for mail surveys average around 10% (Alrek and Settle, 1985). Response rates did not differ by region of the state (Figure 1). We did not survey nonrespondents; however, the landowner described in this study was similar to that found by Greene and Blatner (1986) for Arkansas. Therefore, we conclude that the sample is sound, and statistical inference (Cochran, 1977) is acceptable within the prescribed bounds of error and, further, is adequate for comparison across regions.

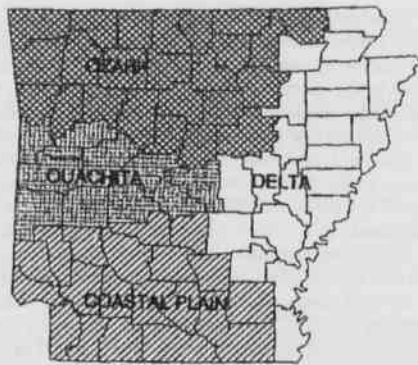


Figure 1. Regions of Arkansas used in the deer hunter damage survey.

Because of the small tracts of land and fragmented landownership patterns in the Ozark Mountains the greatest proportion (51%) of the total responding landowners was from this region. The Coastal Plain had 14% of the respondents with the Ouachita Mountains and the Delta consisting of 14% and 21%, respectively. Across regions, landowner descriptive statistics did not vary; most respondents were white (99%) ($X^2=12.19$, $p=.080$) and male (95%) ($X^2=6.02$, $p=.420$) with more than 12 years of education (46%) ($x=13$ yrs, $sd=3.13$) ($X^2=82.59$, $p=.256$). Statewide, most (87%) lived on their land. A small proportion (12%) had household incomes of less than \$10,000, 25% had incomes of \$10,001-\$20,000, 25% had incomes of \$20,001-\$30,000, and 37% had incomes of more than \$30,000. About one-third (31%) of respondents received less than 10% of their household income from their land. The second third (34%) received 10-75% of their income from their property, and the final third (35%) received more than 75% of their income from their land. Residents of the Delta were somewhat less likely than respondents from other regions to live on their land (77 vs. 89%, respectively) ($F=14.00$, $p<.001$). Delta residents also derived a higher proportion of their household income from the land itself than did residents of other regions ($F=71.60$, $p<.001$). For example, 70% of Delta respondents derived more than 75% of their income from their land, while only 26% of residents from other regions were similarly dependent on their property.

In an *ex post* test, landowners were divided into four groups based on whether they lived on their land and whether they were dependent (>50% of household income) on the land for their living. In the Ouachita and Ozark mountains, landowners were much less likely to be dependent on

the land for their living ($X^2=250.56$, $p<.001$). Respondents not dependent on their land accounted for 66% in the Ouachita and Ozark mountains versus 56% in the Coastal Plain and 22% in the Delta. Most of these were either small farmers who supplemented other income with farm proceeds or they were retired or otherwise independent individuals who owned the land for personal reasons.

DEER SIGHTINGS AND VALUE

Most respondents (77%) had seen deer on their property during the preceding year. The average respondent estimated seeing as many as 6 deer at one time on his or her land. The average Coastal Plain respondent saw over twice as many deer as residents of other regions (11 vs. 5 deer, respectively) ($F=33.760$, $p<.001$). The maximum number of deer sighted at one time did not differ among the Delta, Ouachita and Ozark mountains regions. Opinion was divided about changes in deer numbers during the previous five years, with 21% of the respondents estimating that deer numbers had decreased, 31% stated that the number had stayed the same and 28% stated that they had increased. Ouachita and Ozark residents most often felt that deer numbers had decreased. Residents of the Coastal Plain believed most often that deer numbers were the same as in the five previous years. Delta residents reported most often that deer numbers had increased ($X^2=58.978$, $p<.001$).

Most respondents (83%) acknowledged that deer had an aesthetic value and wanted deer on their land. Most respondents wished deer numbers in their county to increase (64%) or remain constant (30%). Only 6% of all respondents wanted deer numbers to decrease. Most of the people who wanted deer numbers to not increase or to decline were residents of the Coastal Plain ($X^2=200.189$, $p<.001$).

DEER HUNTING AND DAMAGE BY HUNTERS

Most respondents (60%) said they hunted deer, including 16% who had not hunted during the past year. Residents of the Coastal Plain and Delta were more likely than residents of the Ouachita and Ozark regions to hunt deer (68% and 72% vs. 57% and 53%, respectively) ($X^2=87.387$, $p<.001$).

Fifty percent of the landowners surveyed reported problems with deer hunters using their lands; 35% reported only minor problems, but 15% reported property damage from hunters. Landowners in the Coastal Plain were more likely to have had damage from hunters; respondents from the Ouachita and Ozark mountains were least likely to have had damage from hunters ($X^2=20.342$, $p=.016$).

Among the respondents with damage, the most common types were fence cutting (33%), severe littering (16%), road damage (13%), cattle shot (8%), crop damage (10%), gates left open (6%), and trespassing (6%). Other problems included careless shooting (3%), spotlighting deer (2%), stolen property (1%), locks cut (1%), and miscellaneous vandalism (1%) (Table 1). Landowners with damage related to deer hunting had an

Table 1. Distribution of damage cases and financial losses reported by Arkansas landowners who had damage caused by hunters.

	State	Coastal Plain	Ouachita	Ozark	Delta	Average Occurrence	Maximum Loss	Total Loss State Wide ¹
Number of responses	784	129	103	302	169	623	13,000	14,937,667
	Proportion of Responses (%)					Damage (\$)		
Problem								
Fence	33	39	36	34	17	358	4,000	2,834,089
Littering	16	8	10	20	18	90	200	345,518
Road Damage	13	15	7	4	30	1,622	13,000	5,059,443
Damage to Crop	10	11	9	9	14	1,006	6,000	2,413,829
Cattle Shot	8	11	9	8	4	831	3,000	1,633,533
Gates	6	4	9	7	1	157	350	226,027
Trespassing	6	2	4	4	8	350	1,000	791,813
Careless Shooters	3	5	4	3	2			
Spot Light Deer	2	0	1	2	5	166	320	79,661
Dogs Run Deer	2	0	4	2	1	38	50	18,236
Property Stolen	1	1	1	2	0	195	300	46,789
Locks Cut	1	1	0	1	1	202	400	48,469
Vandalize Property	1	0	3	0	0	6,000	7,000	1,439,660

¹Estimated total loss by category based on number of farm owners in the state and average cost of damage in a given category weighed by the likelihood of occurrence.

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average loss of \$623. Average loss did not differ by region ($F=828$, $p=.480$). The most expensive damages were vandalism, road damage, and crop damage (Table 1). Eighty-three landowners (5% of the total sample) reported damages of \$500 or more; four reported damages of \$5,000 or more, and one sustained a \$15,000 loss. Although there was not a significant difference in average losses by region for those with damages, totals were \$32,903 in the Coastal Plain, \$28,535 in the Ouachita Mountains, \$49,280 in the Ozark Mountains and \$30,948 in the Delta, for a state total of \$141,666 for the 216 respondents who reported monetary damage. Expanding these results to the 50,525 rural land owners in the state (U.S. Dept. Commerce, 1984) gives an estimated 23,994 owners with damage statewide and a total damage estimate of \$14,937,667 per year.

Despite problems with hunters, many landowners (43%) permitted public hunting at no charge. The percentage of landowners permitting free public access did not differ by region ($X^2=4.013$, $p=.675$). Those with hunter damage were less likely than those without to permit free public access for deer hunting (37% versus 45%).

Other respondents posted their land with "no hunting" (33%) or "hunting by permission only" signs (20%). Few landowners (14%) posted as specified in Arkansas Act 1090 of 1985, which requires boundaries to be marked with purple paint or with signs. Landowners with hunter damage were much more likely than those without damage to post their land ($X^2=205.24$, $p<.001$). Landowners most often posted their land because they wanted to know who was on the property (72%). Most (60%) said they posted because of problems with hunters; 12% posted because their land had been damaged by off-road vehicles. Other common reasons for posting were to reserve the land for family use (45%) and fear of liability (36%). Most respondents permitted friends (72%), family members (55%), and strangers who asked permission (27%) to hunt on their property.

Only 4% of the responding landowners leased their lands for deer hunting. Coastal Plain and Ouachita residents charged average fees of \$2.14 and \$2.33 per ac, respectively (\$5.29 and \$5.76 per ha, respectively). Ozark Mountain and Delta residents charged an average of \$9.38 and \$18.44 per ac, respectively (\$23.17 and \$45.54 per ha.).

DISCUSSION

The results of this study found types of property damage similar to previous studies of Kluender (1978) and Owen *et al.*, (1985), suggesting that damage associated with public use may not vary with the size of the holding or ownership class. Public agency efforts to control damage by hunters focus on improving relationships between hunters and landowners. Principal efforts are aimed at hunter education. The Arkansas Game and Fish Commission requires individuals born after December 31, 1968, to attend a 10-hour hunter education course to obtain a hunting license (AG&FC, 1986). The course covers game laws and regulations, but also teaches basic hunter skills and ethical responsibility for personal actions. The text for this course is provided by the National Rifle Association (NRA, 1982). Students spend 1 1/2 of the 10 hours on ethical responsibilities of hunting, including hunter-landowner relations. All the major types of hunter-caused damage listed by respondents are specifically covered in the student text. To date, however, there has been no broad-scale assessment of the success of this course.

Until the 1985 posting and trespass law (Act 1090, "The Purple Paint Law"), landowners who held timbered lands had no legal recourse for keeping individuals off their property; nonetheless, Act 1090 only applied to enclosed forest land. Act 35 of 1989 significantly tightened the terms of trespass by allowing all real property, including unenclosed forest land, to be posted. It is now a Class 'B' misdemeanor to enter onto land that is marked according to Act 35 without written permission of the owner. The two trespass laws were considered critical steps in the protection of landowners. Wider publicity of these laws and the fact that all property can now be legally posted should be expected to result in less damage, because hunters who obtain the required oral or written permission to hunt on posted land will be directly accountable to the landowner.

Kluender (1978) summarized, in three categories, industry attempts to cope with losses attributable to sportsmen: 1) limiting access by closing

some areas; 2) promoting surrogate ownership attitudes through leasing hunting rights and cooperation with other landowners, and 3) permit systems to regulate access by individuals. Owen *et al.* (1985) prescribed a two-fold approach to the sportsman-landowner problem. First, the development of positive non-abusive habits on the part of users, and second, public recognition that private landowners are "custodians of wildlife and stewards of the land" and, thus, need to be compensated and protected.

The similarities in the recommendations of these two studies suggest the dual nature of the problem and a workable solution. A stronger, widespread understanding of hunter responsibilities can be brought about by additional education programs and a more formalized contract between hunters and landowners. Leasing or daily permit systems may be advantageous. Several states now have such programs. For example, Virginia's Operation RESPECT (a hunter-landowner daily fee system) and Missouri's SPORT, (Sportsmen Policing Our Ranks Together) have helped reduce hunter-landowner problems.

Leopold (1933) viewed landowners as being responsible stewards of wildlife and the land. In this context the landowner becomes a protector of the land and wildlife resources, providing controlled access to those who will respect and not abuse the resources open to them. Without this attitude, it is apparent that conflicts between users and landowners will continue and may escalate. An additional factor is important. Consider the reduction in lands open to hunters. Access to forest industry lands has been severely restricted during the last five years through leasing arrangements. Some public lands have been set aside for uses incompatible with hunting (Kluender and Greene, 1990). And the nonindustrial forest land base has been declining since 1962 (Kluender and Willett, 1989). Pressure on nonindustrial lands will continue to increase. Owner-hunter relations must change to accommodate this pressure.

Targeted education programs can serve both hunters and landowners. Inculcation of ethical principles remains the purview of the individual. While social pressure can mitigate and even mandate behavior of both hunters and landowners, the roots of consistent ethical conduct reside in individual personal decisions reinforced by consistent practice. Controlled access can help provide the administrative mechanism within which both hunters and landowners can play out their roles. Benefits of control access include a reduction in landowner exposure to damage while permitting hunters to enjoy their sport.

A final, although least desirable, method of reducing damage to landowner property is stricter enforcement of trespass laws. In most situations, a verbal confrontation between a landowner and a trespasser is enough to cause an offender to leave peacefully. While landowners have always had the option of resorting to civil action for damages by hunters, this course has been used only occasionally because of legal problems and fear of retribution from hunters. Landowners are now in a stronger legal position regarding trespass; civil action for damages should decrease.

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