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Perceived Damage by Elk in the Arkansas Ozarks

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Abstract

Wildlife managers in Arkansas are faced with managing a growing population of Rocky Mountain elk (*Cervus elaphus nelsoni*) that has extended its range to incorporate private lands near the Buffalo National River (BNR) in northcentral Arkansas. This range expansion has created conflicts between private landowners and wildlife management personnel. To document the extent of damage and assess attitudes of landowners with elk on their land, interviews were conducted with landowners who contacted us or the Arkansas Game and Fish Commission about problems with elk. A survey also was created and sent to landowners who live near the BNR in Boone and Newton counties and who may have elk on their land. Ten of 18 respondents with elk on their land reported having a problem with nuisance activity. Landowners indicated that most damage was to pastures, hay crops, and food plots. Damage appeared to occur more often in summer, when elk home ranges were smallest, than in other seasons. Landowners incurring damage from elk had a strong negative opinion. Continued research into effective management practices should be conducted to properly manage this growing population of elk and reduce conflicts between elk and Arkansas landowners.

Introduction

Rocky Mountain elk were introduced to Newton County, Arkansas, between 1981 and 1985 (Arkansas Game and Fish Commission [AGFC], unpubl. data). Infrared censuses conducted on the Buffalo National River (BNR) corridor and surrounding private lands indicated this population had grown from 112 animals in 1985 to an estimated 312 animals in winter of 1993-1994 (AGFC, unpubl. data). The present population may number as many as 450 elk (AGFC, unpubl. data).

Arkansas' elk herd inhabits 91,000 ha of the BNR as well as some state-owned lands (Cartwright, 1997). A portion of this growing herd has left the boundaries of state and federal land and ventured onto adjacent private lands. The estimated total elk range in northcentral Arkansas may be as large as 315,000 acres. Wildlife managers are now faced with a growing herd of elk that has the potential to cause significant conflicts between private landowners and the elk. These conflicts may increase as the perceived amount of damage due to elk increases (Craven et al., 1992).

Nuisance complaints by Arkansas' private landowners began in 1990. Since then, nuisance activity reported includes damage to pastures, hay crops, fences, fruit trees, food plots for white-tailed deer (*Odocoileus virginianus*), and human harassment (AGFC, unpubl. data). These nuisance activities have the potential to strain the relationship

between landowners and the AGFC (Gabrey et al., 1993).

Landowner perception of the extent of damage due to wildlife is important because it influences landowner attitudes about wildlife in general (Conover, 1994). Factual data regarding number of elk, range conditions, and extent of damage (Olsen, 1943), as well as information pertaining to attitudes of landowners with elk on their land can be used to help manage this growing elk population and reduce conflicts between elk and private landowners. We investigated attitudes of landowners with elk on their land and documented reported damage/nuisance occurrences to assess Arkansas landowner perceptions of elk damage.

Methods

In the summer of 1997, 160 surveys were sent to Conservation District Cooperators who owned land near the BNR and within the current elk range in Boone and Newton counties. Conservation District Cooperators are landowners collaborating with the National Park Service to improve their land or land practices for the benefit of wildlife. Questionnaires were modeled after a survey conducted by Gabrey et al. (1993). Landowners were asked to complete the surveys and return them in self-addressed stamped envelopes provided with the questionnaires. The survey consisted of questions regarding the presence of elk on private land, types of damage caused by elk, time of year

damage occurred, estimated economic costs, possible solutions to elk problems, and general tolerance of landowners to elk and other wildlife on their land.

In addition, all nuisance or damage complaints reported to the Arkansas Game and Fish Commission from fall 1997 to fall 1998 were documented with landowner interviews and photographs. Photographs taken were of elk signs, such as feces, tracks, hair, and damage thought to be caused by elk. Landowners were asked to estimate economic loss due to damage or nuisance, indicate if they had had problems with elk in the past, and give their general feelings about elk on their land.

To determine if landowner survey answers and inter-

views could be pooled, we checked for differences in responses using Chi-square statistics. Chi-square statistics were also used to test for seasonal differences.

Results

Landowner survey and interview results could not be pooled because responses to questions about types of damage and seasons in which damage occurred differed ($\chi^2 = 15.7$, $P = 0.02$). Therefore, the survey and interviews were analyzed separately.

Landowner Survey.--We mailed 160 surveys to landowners and had 30 returned as undeliverable. Forty-

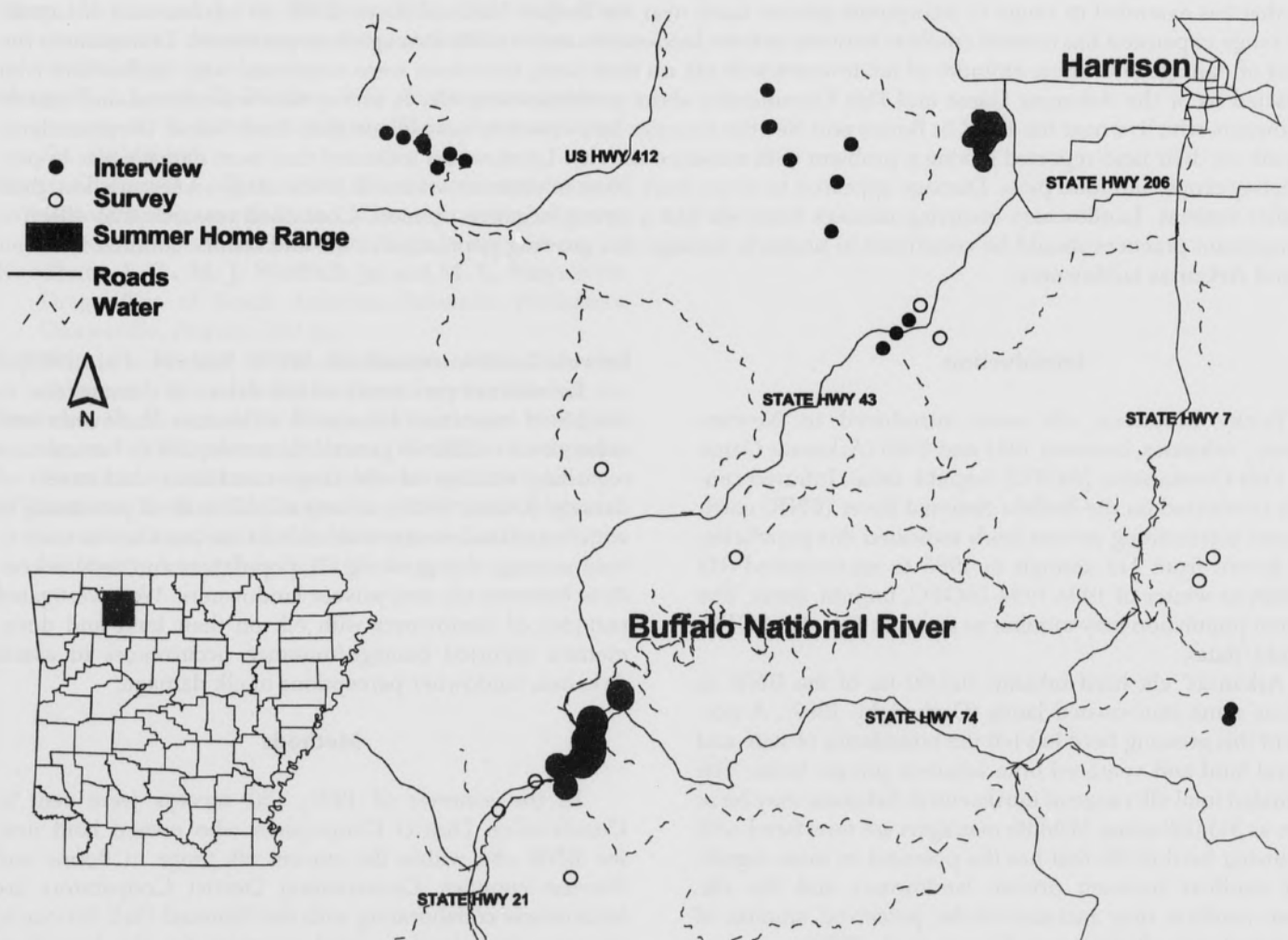


Fig. 1. Location of landowners from interviews and survey reporting nuisance problems with elk in north-central, Arkansas, fall 1997 to fall 1998. Summer home ranges are also included for 4 radio-collared elk. Two animals shared parts of their home range near the Buffalo National River.

even landowners (36%) returned surveys and 45 were deemed usable. Of the 45 usable surveys, 18 landowners reported elk on their land.

• Have you experienced any problems from elk on your land? If yes, please indicate what type of problems occurred and your estimate of the loss.

Of those landowners reporting elk on their land, 10 had problems with their presence (Fig. 1). These owners reported damage to pastures, hay crops, fences, gardens, and food plots for white-tailed deer and wild turkeys (*Meleagris gallopavo*). The 2 most commonly reported types of damage were to pastures and hay crops. In both cases, seven out of the ten landowners having problems with elk reported damage to pastures and/or hay crops.

• Please indicate the season the majority of each type of

nuisance has occurred.

Damage did not occur more in one season than in any other ($\chi^2 = 3.6, P > 0.10$); however, 7 of the 10 landowners having problems with elk reported damage in summer (Fig. 2).

• Have you called AGFC with a complaint about nuisance activities? If yes, when and what was the nuisance complaint reported? Have you used any methods to scare away elk? If yes, what methods were used and were they effective?

Four landowners filed complaints with the AGFC regarding elk damage. Only one landowner reported the use of any methods to deter elk. This landowner reported using noise, human scent, soap, and dogs, none of which were deemed successful.

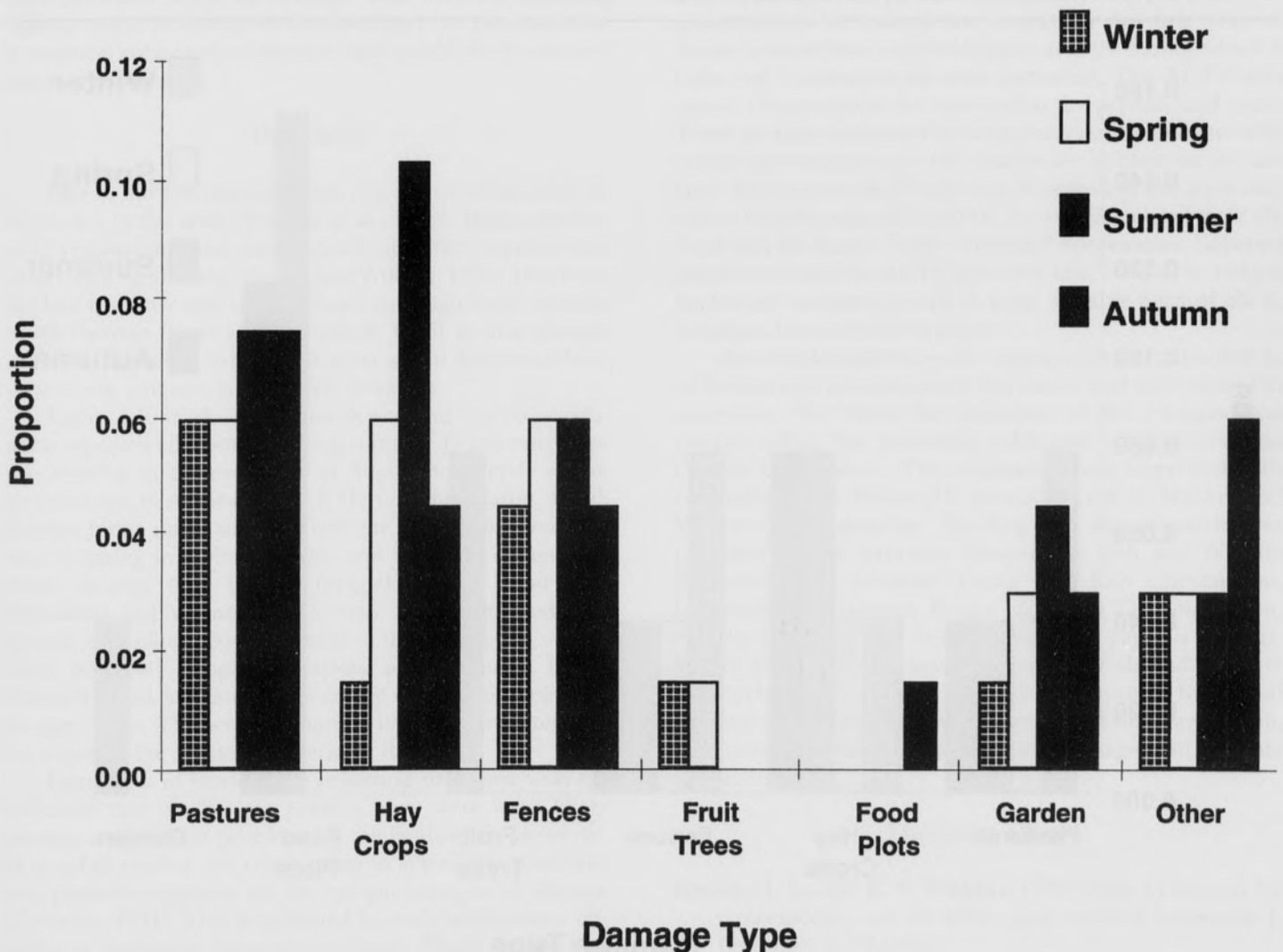


Fig. 2. Arkansas landowner survey results of predominant damage type reported for each season in north-central, Arkansas, fall 1997 to fall 1998.

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• What solutions to elk nuisances would you like to see?

Most landowners reported favoring all of the choices given as possible solutions to elk problems. These included a hunting season on elk ($n = 8$), monetary compensation from AGFC for damage due to elk ($n = 9$), and trapping and relocation of problem elk ($n = 8$).

• What is your best annual estimate of economic loss due to elk?

Eight landowners reported damage costs ranging from \$50–5,000. Five landowners estimated their loss at over \$500, 2 estimated their loss between \$251–500, and 1 estimated his loss between \$51–250.

• How do you feel about having elk on your land?

Eight landowners who had elk on their land said they disliked having elk on their land, 4 were indifferent, and 4 said they enjoyed having elk on their land. Two landowners

did not respond to this question.

Nuisance Complaint Interviews.—Ten landowners were personally interviewed regarding damage reported to us by the AGFC (Fig. 1). Reported damage occurred to pastures, hay crops, fences, gardens, fruit trees, wildlife feeders, and food plots for deer and turkey (Fig. 3). Most reported damage occurred to open fields (hay crops, $n = 3$; and food plots $n = 4$) in summer ($n = 8$) and autumn ($n = 5$; Fig. 3). Damage to fences, fruit trees, gardens, and wildlife feeders was easily documented, whereas damage to food plots, pastures, and hay crops was more difficult to assess. However, in all instances of reported damage due to elk, elk sign such as tracks and feces were found. In 8 of 10 incidences of perceived elk damage, we observed elk on the property of the interviewed landowner or monitored a radio-collared elk there.

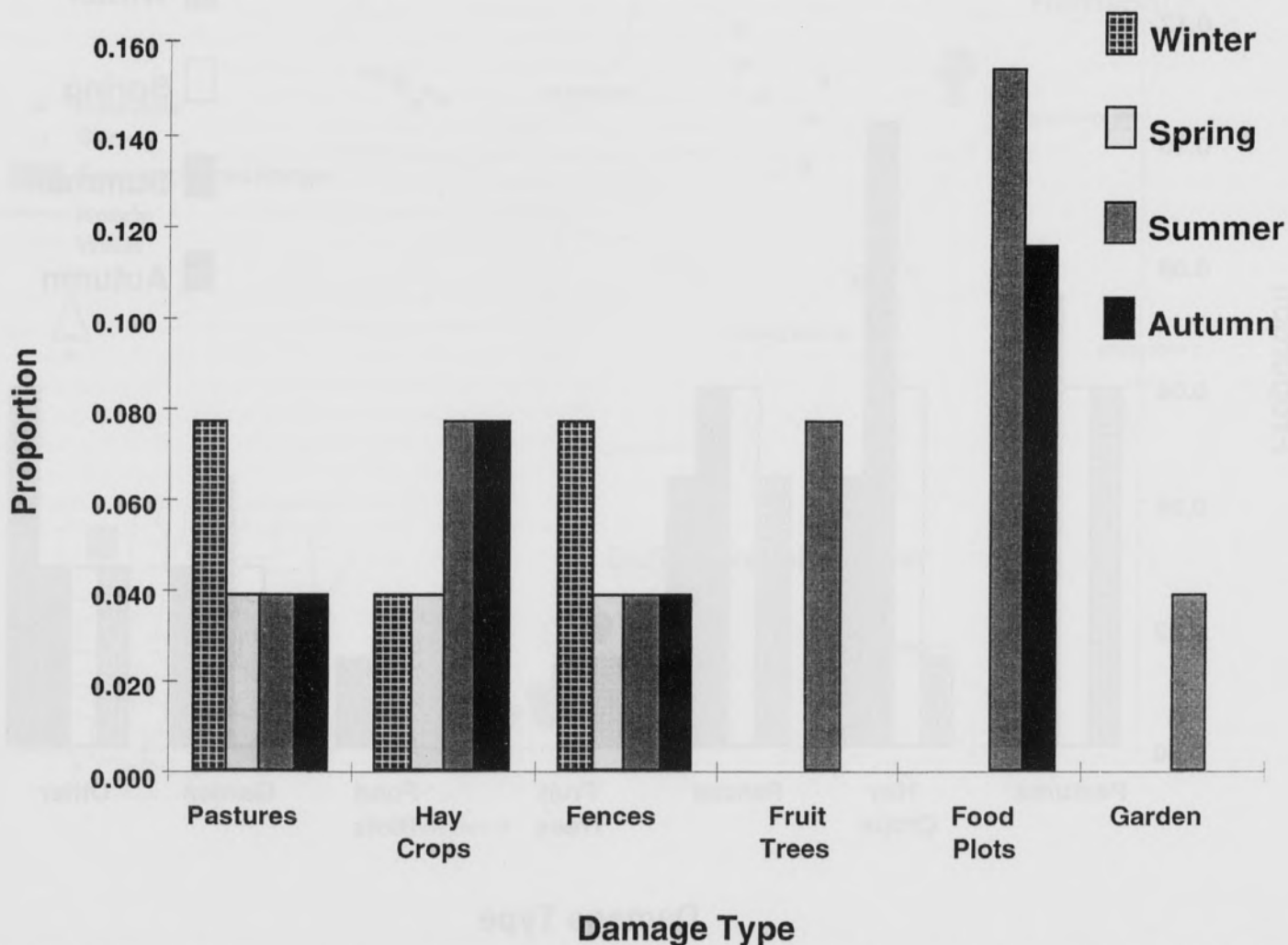


Fig. 3. Arkansas landowner interview results of predominant damage type reported for each season in north-central, Arkansas, fall 1997 to fall 1998.

Landowners had difficulty estimating the costs of reported damage to their property; however, 3 landowners made an attempt. One landowner estimated an annual loss of \$4,500 due to elk eating and trampling ≥ 12.14 ha of hay crop. The second landowner estimated elk consumed \$200/year of forage meant for cattle. The third estimated \$1,600/year for loss of forage in food plots and for loss of corn and protein feed placed in wildlife feeders and intended for deer and turkeys.

Only one landowner reported damage as a first time occurrence, whereas all others reported occurrence of nuisances at least once before. Landowners with elk on their land that were incurring damage had a strong negative opinion about elk. Of the 18 landowners who reported seeing elk on their land, 8 landowners experienced no problems from their presence. Some landowners who were not incurring damage enjoyed seeing elk on their land but reasoned that if numbers continued to increase they would likely perceive elk as a problem.

Discussion

Due to our low response rate, non-response bias may be a concern in this study (Craven et al., 1992). When attributes of respondents and non-respondents differ, variable estimates may be affected (Brown and Wilkins, 1978). However, the low response rate may indicate an insignificant amount of elk damage (Scott and Townsend, 1985) or that damage problems are restricted to a few areas within the private land zone of elk range in northcentral Arkansas.

Eight of 10 landowners interviewed and 7 of 10 respondents reported elk damage during summer. Home range size was smallest in summer (July to August) for female elk on private lands in Arkansas (Fig. 1, Herner-Thogmartin, 1999). Smaller home range size may indicate elk are concentrating their foraging in a smaller area, and therefore committing more damage than if they foraged over a larger area (deCalesta and Witmer, 1994). Also, because elk move in groups, trampling may contribute to the destruction of pastures and hay crops (deCalesta and Witmer, 1994). Telemetry data indicate elk spend the majority of their time in open fields (Herner-Thogmartin, 1999), where landowners reported the greatest concern for damage.

Interviews of landowners reporting problems with elk indicated that if elk were present, they were most likely causing a significant problem for the landowner. However, as in other studies, the relationship to actual loss is unclear and probably depends on the conspicuousness of damage (Conover, 1994). This is indicated by each landowner's difficulty in estimating his economic losses. Plants browsed by elk, deer, and cattle have a similar appearance, which may contribute to the difficulty in estimating damage due to elk (deCalesta and Witmer, 1994).

Cooney (1952) suggested special elk hunts are very effective in reducing damage on private land. Craven et al. (1992) reported that in 1985, 90% of wildlife agencies manipulated hunting seasons and bag limits to mitigate damage problems. In 1925, Utah's State Game Department attempted to relieve their nuisance elk problems by opening a hunting season, fencing haystacks, and paying damages. However, their efforts did not solve the problem and sentiments against elk grew increasingly negative (Olsen, 1943).

In 1998 and 1999 AGFC staff met with complaining landowners in order to receive their input regarding proposed hunting seasons. In fall of 1998, the AGFC held Arkansas' first limited permit elk season. Twenty permits were issued, and 7 cows and 10 bulls were harvested. One of the reasons for this hunt was to reduce perceived nuisance problems on private land. Unfortunately, access to private lands by hunters was limited in this first year. A limited permit hunt was held again in 1999 during which 9 bulls and 7 antlerless elk were harvested. The AGFC also issued 179 permits to be used within the private land zone. These permits were used by landowners or by persons with written permission from the landowner to hunt on private land. Twenty-two elk (7 bulls and 15 antlerless elk) were harvested on private lands. In 2000, harvest decreased to 12 elk from private lands. With continued cooperation between landowners and the AGFC, the state may be able to reduce landowner conflicts as well as keep a viable herd of elk in Arkansas for everyone to enjoy.

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