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DEVELOPING URBAN DEER MANAGEMENT PLANS: THE NEED FOR PUBLIC EDUCATION

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Abstract: Independent public opinion surveys concerning urban deer (*Odocoileus virginianus*) management were conducted in two Virginia communities. A total of 346 citizens were interviewed in two Random Digit Dial telephone surveys. In addition to questions concerning management techniques and their administration, participants were asked about their experience with deer, their awareness of problems with deer in the area, and their enjoyment of deer. In both localities, non-lethal controls were preferred over lethal controls; trapping and relocation, fencing, repellents, and birth control measures were favored by a majority of residents. The only lethal control acceptable to residents in both communities was the use of controlled hunts. There was no consensus about who should administer deer management or who should be fiscally responsible. Those aware of deer problems are less likely to report enjoying having deer in the area. Preferences for non-lethal controls and lack of consensus on responsibility for deer management demonstrate the need for public education concerning the costs, consequences, and accountability for deer control. Survey results regarding citizens' preferences for various management practices demonstrate the challenges wildlife professionals face in assisting communities in developing deer management plans. Wildlife professionals saddled with managing human-wildlife conflicts need to recognize that part of their role is educating the public about the ecology of the animal(s), management techniques, and their implications. As experience with deer problem increases, citizens are likely to enjoy deer less and become increasingly interested in deer management.

Key Words: deer damage, *Odocoileus virginianus*, public education, urban deer, Virginia, white-tailed deer

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Public education has long been advocated as a means to achieve public acceptance of wildlife management practices. At the North American Wildlife Conference in 1953, Huber stated that "The key to successful wildlife management in any state lies in an informed and cooperative public" (Huber 1953: 631). In the discussion that followed his presentation, Saults commented (about the experience of the Game Department in Missouri): "...we originally started out so we could manage game; then we came to the idea that that was not quite so simple; that what we had to do was manage land; but basically the only thing we can manage is people..." (Huber 1953:637). Educational efforts focused specifically on white-tailed deer (*Odocoileus virginianus*) damage also span several decades. In Virginia, for example, an article dealing with deer damage appeared in the

former Game Commission's *Virginia Wildlife* magazine over 30 years ago (Carpenter 1967).

As deer populations increase in the eastern United States, the nature of deer damage, the types of deer management, and the public's role in wildlife management are becoming more complex. The phrase "deer damage" used to refer to agricultural crop losses, but now includes destruction of ornamental plants in suburban and urban areas, property damage (particularly to motor vehicles), and threats to human welfare, from both injury and disease. Deer have become nuisance animals in many locales, but wildlife agencies continue to treat them primarily as a game species. The growing prevalence of urban values is making hunting unacceptable as a management approach in many communities (Matthews 1992). Finally, public involvement in wildlife management

involves diverse groups of stakeholders and increasingly has become political, especially where animal rights groups view deer as needing protection from hunting and other lethal population control methods (Girard et al. 1993, Curtis et al. 1995, Decker and Richmond 1995).

Deer damage issues have been the focus of a number of public opinion surveys (Kuser and Applegate, 1985, Cornicelli et al. 1993, Stout et al. 1994, Green et al. 1997), many of which have been used to shape deer management plans as well as public education efforts. Curtis (1995) noted that wildlife managers can be leaders in public policy education, and emphasized the need for both decision-makers and their constituents to be aware of the costs, benefits, and outcomes of different deer management options.

Although wildlife managers increasingly have materials available for public education concerning urban deer management (e.g., the video "White-tails at the Crossroads" produced by the Northeast Deer Technical Committee [1996]; currently available from Committee Chair Steve Webber, New Hampshire Fish and Game, 2 Hazen Drive, Concord, NH 03301), we still need additional research concerning how deer population control methods vary in their acceptability to different stakeholder groups (Decker and Richmond 1995), and how attitudes and experience with deer interact to determine individuals' capacity for wildlife acceptance (Decker and Purdy 1988).

The purpose of our paper is to discuss the results of public opinion surveys in 2 Virginia communities and illustrate how such survey data can be used to identify what citizens need to know about deer management.

STUDY AREAS

Chincoteague and Williamsburg are heavily developed residential and tourist communities in southeast Virginia. Chincoteague is a 1,500-ha coastal island, where developed areas are interspersed with loblolly pine (*Pinus taeda*), common reed (*Phragmites* spp.), high-tide bush (*Iva frutescens*), and other emergent vegetation characteristic of mid-Atlantic tidal salt marsh

ecosystems. Williamsburg lies within the Virginia coastal plain and is comprised of the City of Williamsburg, as well as portions of James City and York Counties. It is a mosaic of undeveloped woodlands (mixed deciduous with loblolly pine), residential subdivisions (characterized by 1/8 to 5-ac lots), intensely developed commercial corridors, recreational open areas (e.g., golf courses), and tidal wetlands.

METHODS

Census data and estimates from local officials were used to estimate the adult populations at approximately 30,000 for Williamsburg, VA, and 3000 for Chincoteague, VA. Target samples of 300 participants for Williamsburg and 100 for Chincoteague represented 1% of the population and 2% of households for Williamsburg and 3% of the population and 6% of households for Chincoteague. Computer-generated, random-digit telephone numbers were used to contact residents in both communities. In Williamsburg, interviewers were undergraduate student volunteers from the College of William and Mary, whereas, in Chincoteague, interviewers were town employees being paid overtime. Both sets of interviewers received brief training sessions. Each interview included a series of questions about the participant's experience with local deer and opinions about deer management. Each interview took about 5-10 minutes to complete. All interviews were conducted during weekday-evening calling sessions during October and November 1995 in Williamsburg, and October 1996 in Chincoteague. Data were tabulated using a simple database and spreadsheet in Microsoft Works.

RESULTS AND DISCUSSION

A total of 504 citizens were contacted by telephone during the 2 surveys. In Williamsburg, 302 citizens were reached; in Chincoteague, 102. Eighty-one percent (n=244) of those contacted in Williamsburg agreed to participate, and 79% (n=237) completed all questions. In Chincoteague, 86% (n=88) agreed to the interview and 85% (n=87) completed it. Because these response rates were high, even for telephone surveys (Frey 1989), we were unconcerned about non-response bias. In both

communities, 55% of the participants were identified as female. In Williamsburg, 41% of the participants were male and the interviewers did not classify the remaining 4% of respondents. Males made up 43% of the Chincoteague sample; the interviewers did not identify the sex of the remaining 2%. Participants provided information on whether they had hunting experience (Table 1).

Experience with Deer

In both communities, majorities of those surveyed had seen deer and were aware of deer problems (Table 2). Enjoyment of deer also was high (Table 3). Chi-square analyses revealed that those aware of deer problems were less likely to report enjoying deer in both Williamsburg and Chincoteague ($X^2=6.15$, $df=2$, $p<0.05$, and $X^2=4.81$, $df=1$, $p<0.05$, respectively).

Management Preferences

Despite differences between the 2 communities surveyed, preferences for non-lethal management techniques were very similar (Table 4). In both Williamsburg and Chincoteague, a majority of residents heavily favored trapping and relocation, as well as the use of fencing, repellents, and birth control; controlled hunts were only widely accepted lethal control. Extending the hunting season marginally was acceptable to most participants in both surveys, as was extending the doe season to those in Chincoteague. The remaining techniques offered for participants to consider were not acceptable to most residents; doing nothing, requiring hunters to kill a doe before they killed a buck, and reintroducing predators were the least favored methods in both communities.

Experience with hunting affects management preferences (Table 5). Because non-hunters made up the majority of those interviewed in both study areas, they mirror expressed community preferences to a large extent. Those with anti-hunting views also favored trapping and relocation, use of fencing, repellents, and birth control, but not controlled hunts. Instead, providing food for deer was preferred. A

majority of hunters in both Williamsburg and Chincoteague favored extending the general hunting season, use of controlled hunts, and extending the doe season, but did not support the use of fencing and repellents. In Williamsburg, hunters also favored trapping and relocation. Not surprisingly, Chincoteague hunters were the only subgroup in that community who favored modifying the existing ordinance that prohibits hunting. The group of former hunters in Chincoteague favored methods endorsed by both non-hunters and hunters in their community, as well being the only subgroup in either community to favor trapping and euthanizing.

Responsibility for Deer Management

There was little consensus about who was responsible for deer management or who should pay for it. In both Williamsburg and Chincoteague, many respondents acknowledged that they did not know who was responsible for managing deer (31.5% and 39.1%, respectively) and few (25.3% and 9.2%, respectively) identified the Virginia Department of Game and Inland Fisheries as the responsible agency. When asked who should pay for management, some (9.3% in Williamsburg, 27.6% in Chincoteague) cited local government, but a substantial number did not know (17.4% in Williamsburg; 17.2% in Chincoteague).

CONCLUSIONS

Survey results from these 2 communities confirm that experiences with deer do affect attitudes, where those aware of deer problems enjoy deer less. Preferences for non-lethal controls and lack of consensus on responsibility for deer management demonstrate the need for public education concerning the costs, consequences, and accountability for deer control.

WILDLIFE MANAGERS' ROLE IN PUBLIC EDUCATION

Although some researchers (e.g., Curtis 1995) see public policy education concerning deer management as an opportunity for wildlife managers, the issue of advocacy of specific management practices by agency personnel in urban deer situations remains controversial. Nearly everyone agrees that urban deer

situations have complex human dimensions. In discussing the politics of wildlife damage management, Schmidt (1995:12) stated that “Wildlife policies are what the public allows the biologists to do in the public’s name. Whenever science conflicts with political and social concerns, science always loses.” We see public education as the mechanism through which science can have a greater impact on policy.

McMullin (1996) describes a prescriptive framework for resource managers to use in involving the public in decision-making. Such a framework, combined with specific information about what the public does and does not know about the issues, provides managers with a blueprint for public education.

Education Concerning Non-Lethal Management Techniques

The overwhelming popularity of trapping and relocation in both communities is an obvious target for public education. Informing citizens of the absence of release sites, high cost, low efficiency, and high mortality rates associated with trap and transfer (Jones and Witham 1990; Ismael et al. 1993) hopefully will reduce the attractiveness of this method. Current limitations and reservations about the use of birth control as a management technique provide another opportunity for education. Citizens do not understand the cost, difficulty of application, or the physiological effects of this management technique. In addition, the political aspects of this approach, particularly the absence of FDA approval for any of the current reproductive inhibitors, must be addressed (Kirkpatrick 1996, Warren and White 1995).

The consequences of feeding deer are another important issue for educational efforts, especially with anti-hunting constituencies. Communicating that feeding deer not only fosters dependency on humans, and artificially inflates the biological carrying capacity, but also contributes to further deterioration of the habitat. These facts should help residents realize the long-term effects their actions may have on the environment.

Fencing often is prescribed as a management option in moderate deer density areas where deer prefer highly palatable yard ornamentals to native browse. Hunters may need to learn more about the potential benefits of fencing and repellents. The aesthetic drawbacks of fencing sufficiently tall to deter deer and costs associated with installing fencing both can limit the use of this technique. Wildlife managers also must educate the general public that fencing alone will not solve deer population problems.

Need for Lethal Controls

Lethal controls currently are the most effective methods to reduce populations of urban white-tailed deer. Cost benefits, as well as physiological and biological considerations, make killing deer preferable to trapping and relocation and birth control. In addition to educating the general public about the efficacy of lethal controls, wildlife managers need to stress to hunters, in particular, the correct implementation of such methods. The inverse relationship between extending deer seasons and hunter effort, as well as the lingering negativity among some hunters about killing doe deer, are issues that need to be addressed.

FUTURE RESEARCH

The need for public education concerning deer ecology, management techniques, and their implications is demonstrated by public opinions revealed in 2 Virginia communities. Further research is needed to demonstrate the effectiveness of such educational efforts as well as the costs and benefits of involving wildlife managers in public education. Much of the information the public receives concerning wildlife damage management comes from wildlife rehabilitators (Siemer et al. 1992), the media, and animal rights groups. As urban deer problems become increasingly politicized, the necessity of a marketing approach (Wright et al. 1991) to wildlife management will increase. As experience with deer problem increases, citizens enjoy deer less and become more interested in deer management. Wildlife managers committed to public education need to integrate the science of wildlife damage management with wildlife policy more effectively to build public

support and ensure that white-tailed deer remain an asset in urban settings.

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Table 1. Respondents' experience with hunting.

| | Williamsburg | Chincoteague |
|---------------|--------------|--------------|
| Hunter | 13.6% | 11.5% |
| Former hunter | 1.7% | 19.5 % |
| Non-hunter | 60.6% | 56.3% |
| Anti-hunter | 13.6% | 10.3% |
| Animal rights | 6.8% | 1.1% |
| Other | 3.8% | 1.1% |

Table 2. Respondents' stated prior experience with deer.

| | Williamsburg | | Chincoteague | |
|-------------------------------|--------------|-----|--------------|-------|
| | Yes | No | Yes | No |
| Seen a deer in the past year? | 81% | 19% | 95.5% | 4.5% |
| Aware of deer problems? | 50% | 50% | 69.3% | 39.7% |

Table 3. Respondents' stated enjoyment of deer.

| | Williamsburg | | | Chincoteague | | |
|-------------|--------------|-------|-------|--------------|-------|-------|
| | Yes | No | Other | Yes | No | Other |
| Enjoy deer? | 75% | 12.7% | 12.3% | 69.3% | 29.5% | 1.1% |

Table 4. Management techniques favored by respondents.

| | Williamsburg | Chincoteague |
|-----------------------|--------------|--------------|
| Trap and Relocate | 78% | 77% |
| Fencing/Repellents | 65% | 58% |
| Controlled Hunting | 56% | 59% |
| Birth Control | 53% | 68% |
| Extend Hunting Season | 50% | 52% |
| Feed Deer | 43% | 39% |
| Extend Doe Season | 40% | 51% |
| Sharpshooters | 37% | 38% |
| Trap and Euthanize | 27% | 47% |
| Do Nothing | 21% | 17% |
| Kill Doe First | 16% | 31% |
| Introduce Predators | 14% | 16% |

Table 5. Management preferences of respondents, characterized by stated hunting experience.

| | Non-Hunters | Non-Hunters | Anti-Hunters | Anti-Hunters | Hunters | Hunters | Animal Rights | Animal Rights | Former Hunters |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------|
| Method | Williamsburg | Chincoteague | Williamsburg | Chincoteague | Williamsburg | Chincoteague | Williamsburg | Chincoteague | Chincoteague |
| Trap/Relocate | 78% | 82% | 88% | 89% | 66% | 40% | 94% | 100% | 76% |
| Birth Control | 56% | 78% | 60% | 78% | 28% | 50% | 75% | 0% | 47% |
| Controlled Hunt | 58% | 61% | 34% | 0% | 81% | 80% | 44% | 100% | 53% |
| Fencing/Repellents | 65% | 57% | 81% | 72.5% | 44% | 40% | 75% | 100% | 62% |
| Sharpshooters | 38% | 51% | 34% | 11% | 31% | 20% | 31% | 0% | 35% |
| Trap/Euthanize | 37% | 49% | 34% | 33% | 41% | 40% | 13% | 0% | 53% |
| Extend Season | 52% | 49% | 16% | 44% | 96% | 70% | 25% | 0% | 59% |
| Extend Doe Season | 43% | 47% | 9% | 33% | 66% | 70% | 19% | 100% | 65% |
| Modify Law | NA | 37% | NA | 11% | NA | 60% | NA | 0% | 47% |
| Feed Deer | 33% | 33% | 72% | 56% | 31% | 50% | 81% | 0% | 41% |
| Kill Doe First | 12% | 31% | 13% | 11% | 25% | 40% | 19% | 0% | 41% |
| Do Nothing | 17% | 20% | 28% | 11% | 22% | 0% | 25% | 100% | 12% |
| Introduce Predators | 10% | 16% | 31% | 11% | 6% | 10% | 25% | 0% | 24% |