EFFECTS OF A SUBURBAN DEER MANAGEMENT COMMUNICATION PROGRAM, WITH EMPHASIS ON ATTITUDES AND OPINIONS OF SUBURBAN RESIDENTS

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INTRODUCTION

Deer populations are increasing in many suburban environments in North America, especially in communities in which forest and park lands are interspersed with residential neighborhoods (Decker and Gavin 1987, Povilitis 1989, Schneider and Kuser 1989, Curtis and Richmond 1992, Grady 1993). Many people enjoy seeing deer on their property, until the risk of deer-related vehicle accidents (Stout et al. 1993), plant damage to landscape shrubbery, gardens and parks (Povilitis 1989, Diamond 1992, Sayre et al. 1992), incidence of Lyme disease (Siener et al. 1992), and other conditions become unacceptable or intolerable (Decker 1991). Localized effects of deer can be reduced through micro-management techniques that modify human behaviors, such as driving vehicles at slower speeds to avoid deer-related vehicle accidents (Decker and Loconti 1989, Povilitis 1999), or that modify deer behaviors, such as fencing and administering repellents to plants (Povilitis 1989, Sayre et al. 1992), or planting shrub species that are less desirable to deer (Fargione et al. 1991). These alternatives, however, do little to address widespread concerns about the deer population at large and its effect on the community.

Managing deer populations in suburban environments is complicated by laws and regulations administered by state, city, county, and town governments that limit the use of the traditional management techniques of firearm and archery hunting (Brush and Ehrenfeld 1991, Hauber 1993). Social values about the treatment of animals, increased public awareness of violence and fear associated with guns, and attitudes about hunters and hunting have changed in the past two or three decades. For some suburban communities, regulated hunting may no longer be an option for managing deer populations (Brush and Ehrenfeld 1991).
The purpose of this study was to assess changes in attitudes and opinions of suburban residents about deer and deer management after the New York State Department of Environmental Conservation (DEC) Bureau of Wildlife implemented a communication plan. The intent of DEC's communications was to increase the knowledge of residents about various management options, so that the community could make informed responses when a Citizen Task Force (CTF) issued its recommendations addressing deer management issues. The CTF was charged with producing recommendations about (1) the size of the deer population preferred by the community, and (2) management techniques to achieve that deer population level (Curtis 1992).

Deer Management in DMU 96

The study area for assessing the attitudes and opinions of suburban residents was deer management unit (DMU) 96 located in the Greater Rochester area in central-western New York State (Fig. 1). Prior to the study, legal and sociological factors impeded several attempts by DEC, grassroots organizations, and local governments to implement deer management solutions. Most of the controversy about deer management centered on Durand Eastman Park in Irondequoit. In the 1990's, Irondequoit government officials and grassroots organizations proposed alternative solutions for managing its deer population. County and town government officials developed an economically-feasible deer management plan to trap and transfer deer to venison farms. DEC rejected the plan because it would set a legal precedent that allowed deer, a public resource, to be used for commercial profit. Some of the grassroots organizations proposed nonhunting solutions, but these were either blocked or ineffective in reducing deer-related problems.

Meanwhile, DEC had successfully implemented Citizen Task Forces (CTFs) in rural DMUs throughout the region (Nelson 1992, Curtis et al. 1993, Stout et al. 1994). CTFs
Fig. 1 Location of DMU 96 in New York State with designated hunting and no hunting areas
involved a variety of people in recommending to DEC a deer population objective for the DMU. DEC used these recommendations to manage the deer herd via hunting techniques in rural areas.

DEC relied on the successful CTF approach as it developed a decision-making strategy and public communication plan for DMU 96. The cornerstone of this plan was implementing a modified CTF approach that would involve the community in developing solutions to address concerns about the deer population, coupled with efforts to extend the deer management information discussed in the CTF process to the larger community.

Development of the Communication Plan

In October 1991, DEC and Cornell Cooperative Extension (CCE) met to plan the CTF approach, a primary component of the communication plan in DMU 96. The purpose of the CTF was to provide a forum in which recommendations for setting deer population objectives and deer management techniques in the DMU could be developed, and to educate CTF members about deer biology and management, and the consequences of implementing various deer management techniques. CTF members reflected various deer management stakeholder interests within the community.

The first step of the communication plan (i.e., the CTF) was to provide a forum for a variety of stakeholders in the DMU to engage in face-to-face discussions about deer management alternatives, and potentially for members to reach a consensus concerning recommended actions to address deer management issues. DEC intended the communication plan would evolve as the CTF progressed toward reaching agreements among its members. The direction of the communication plan during and after the CTF operated, whether it be news releases, press conferences, workshops, public meetings,
reports to government officials, or other communication mechanisms, would depend in part on the willingness of CTF members to participate in the communication activities.

In January 1992, DEC and CCE convened CTF members and distributed a news release about the CTF approach to Rochester newspapers (Appendix A). The CTF involved key stakeholders in recommending a deer population objective as in rural CTFs, and identifying deer management techniques to achieve the objective (Curtis et al. 1993). In an informal setting, citizens discussed the benefits and consequences of changes in the deer population level and alternative management techniques (Stout and Knuth 1994).

CTF Recommendations

By August 1992 (seven meetings later), the CTF developed deer management recommendations for DMU 96. CTF members were concerned about reducing the number of deer-car accidents and plant damage complaints, and reestablishing a diversity of vegetation in Durand Eastman Park. CTF members recommended dividing the DMU into two parts, the north and south (Fig. 2a), because CTF members perceived these areas held different deer densities and damage problems. Based on input from DEC and deer management literature, members recommended that a long-term goal for the size of the deer herd be 20 deer/mile$^2$ for DMU 96.

To achieve this goal, the CTF recommended measures be taken to estimate the size of the deer herd. In portions of DMU 96 where archery hunting was allowed, deer managers used data from harvested deer and damage complaints to estimate the size of the deer population. Estimating numbers of deer in Irodequoit, where archery hunting was not allowed, was more difficult. As the CTF was underway, through a county-sponsored survey, wildlife biologists counted 178 deer from helicopter in Durand Eastman Park and surrounding areas of deer habitat in Irodequoit. This count represented a minimum number of deer
Management Techniques

1 = Selectively culling deer, Contraception

2 = Bowhunting

Fig. 2 Division of DMU 96 based on recommendations of the Citizen Task force about deer population objectives and deer management techniques
present in an approximately 2.5 mile\(^2\) area, as biologists indicated that the topography and
conifer cover in Irondequoit precluded an accurate count of the deer population. DEC staff
had advised the county prior to the survey that it was unlikely that even half of the deer in the
area could be counted with this method.

CTF members recommended the continued use of archery hunting as allowed in
about three-fourths of DMU 96 (Fig. 2b). In the southern portion, CTF members
recommended no or slight reductions in the deer population (0-5%) for a herd size of 20
deer/mile\(^2\). CTF members perceived the number of deer and damage complaints were
higher in a portion of northern DMU 96 in the town of Greece. Deer managers indicated that
they would increase hunting permits to harvest more deer to achieve a herd size of 20
deer/mile\(^2\).

In Irondequoit where archery hunting was banned, the CTF recommended that deer
be attracted to bait sites and selectively culled by expert marksmen at night. CTF members
recognized the social and political ramifications of implementing this deer management
technique in Irondequoit, and proposed that a conservative number of deer be removed the
first year. CTF members recommended that the number of deer removed should equal the
number of deer-car accidents that occurred that year. They recommended deer removal
should be increased in subsequent years until an estimated 20 deer/mile\(^2\) inhabit the town.
Once the deer population reached an acceptable level, the CTF recommended using
contraception as a long-term solution for maintaining the deer population size.

Finalizing the Communication Plan

The communication plan became formalized once the direction of the CTF and
outcomes were discernable. At the last official meeting of the CTF, DEC presented the CTF
with a draft of an action plan to communicate the CTF's recommendations to the public. The purpose and objectives of the "Public Involvement Plan" (Appendix B) were to develop:

... a strategy of action for DEC and the Task Force in a combined effort to meet the DMU 96 communication goals and objectives.

The communication goal was:

...to build support of the Task Force constituency and the community for the Task Force recommendations and future agreements for action developed by local government decision-makers.

The communication objectives were:

- to continue communication with and facilitate the cooperation of local governments, in order to provide a safe and cost-effective suburban deer management program for DMU 96;
- to provide education and information opportunities on deer and other wildlife management issues for affected and interested people and policy-makers; and
- to keep the media fact-informed and encourage high visibility of the Task Force.

DEC implemented several activities specifically mentioned in the plan. DEC developed and distributed two press releases about deer and deer management to educate the community before the recommendations of the CTF were finalized (Appendix C). After the CTF had completed its report in September, DEC announced and held a press conference attended by television, magazine, and newspaper reporters. DEC and CTF members presented the recommendations and encouraged local government officials to act on these recommendations. DEC provided reporters with packets of information that included a press release about the recommendations of the CTF, a copy of the CTF report, and information about deer management.

After the press conference, DEC continued meeting with government officials responsible for decisions that affected implementation of the CTF's recommendation in
Irondequoit. The short-term solution, to cull deer at bait sites, was implemented the following spring. The implementation of the recommendations received much publicity, and was followed by DEC holding several informational workshops for the public and the media to assess the status of the deer population.

Relationship of the Communication Efforts and Local Opinion

The purpose of this study was to assess changes in the attitudes and opinions of suburban residents about deer management after implementation of the CTF and subsequent communication efforts. We also assessed the degree to which the communication plan achieved its goals of (1) building public support of the CTF recommendations, (2) keeping the media fact-informed about deer and deer management, and (3) encouraging high media visibility of the CTF.

The goals of the communication plan were based on a framework of public policy education (Curtis 1993). The premise is that the resolution of community conflicts and issues is enhanced through public input and involvement in decision-making, rather than relying on an authority or political leader to make a decision. Michael Briand (1993) has stated that,

> Clearly, when public problems...arise, simply having the authority or power to influence public decisions does not guarantee that solutions will be effective or widely supported. Problems such as these require citizens to work together—to do the hard work of making choices based on a shared perspective. (p.23)

Implementation of the CTF approach in a suburban area exemplifies a shift in agency philosophy from an authority willing to listen to public-initiated input to one that teaches and involves the public in making choices among biologically-, technically-, legally-, politically-, and socially-acceptable deer management alternatives (Stout et al. 1994).
The purpose of public policy education is to teach people about community issues and policy-making, and how they can be involved in influencing decisions regarding these issues from a shared perspective (Hahn 1990). Alan Hahn (1990) has stated,

Such education has two principle objectives—one at the individual level, the other at the community level. The first is to provide people with knowledge and skills necessary for effective participation in public affairs; the second is to contribute to the effective and equitable resolution of pressing public issues and concerns. (p. 15)

Theoretically individuals undergo several stages when confronted with issues that lead to participation in a policy education process. The issue evolution-educational intervention model (Hahn 1988) indicates first people need to be aware or concerned about a problem or envision ways to improve the current status quo. Second, people contact decision-makers and become involved in the issue. Third, the issue is identified and defined. Fourth, various alternative solutions are studied. Fifth, the consequences of the solutions are analyzed. Sixth, people make choices about the best possible solution. Seventh, the decision is implemented, and eighth, people evaluate the outcomes. The sequence may differ for some people, and stages may be repeated. Often members of the community will be at different stages of the issue evolution process. One role of policy educators is to assist those people who are working through the earlier stages for the first time, while keeping others who perhaps have cycled several times through the eight stages from becoming disinterested or dissatisfied before a decision is reached.

In DMU 96, the CTF approach applied the issue evolution-educational intervention model using a diversity of key individuals (e.g., citizen members, local government officials) in the community who reflected various concerns and perceptions about deer. As Briand (1993) stated,
any solution that stands a chance of being both effective and supported widely must emerge from a decision-making process that enables everyone affected by the problem and the attempt to solve it to feel they have been able to influence the decision so it is acceptable to them, making it possible for them to go along with it. (p. 21).

The premise of the communication plan was that the learning opportunities, involvement, and feedback from a diversity of key individuals would be relayed to people in the community, which along with media visibility, would lead to public support for a solution that would be both effective and widely-accepted by the community. Changes in attitudes and opinions of residential property owners would reflect the degree to which the communication plan built community support for the CTF’s recommendations.

We assessed the effect of the communication plan using a combination of evaluation and conventional survey methodologies. The results from evaluating the CTF are detailed in a report by Stout and Knuth (1994). In this report, we describe findings from assessing suburban residents’ attitudes, opinions, preferences, and acceptance of deer and alternative deer management techniques, and their use of information sources before and after DEC’s implementation of a communication plan.

We anticipate these data will provide deer managers with information to assist with the development of communication strategies in creating an informed public for making deer management decisions. This study also helps identify communication channels for relaying such information and provides insights as to the important considerations that suburban residents hold about particular deer management techniques. Such knowledge on the part of the agency could be used to improve its ability to inform suburban communities with significant deer populations and address misconceptions that people may have about deer management and various management techniques.
Description of the Study Area

DMU 96 is located within Monroe County in the Greater Rochester area of central-western New York (Fig. 1). DMU 96 encompasses all or portions of five towns containing different human densities and deer population indices (Table 1). In all but one town in 1990, the number of deer carcass tags issued to motorists claiming vehicle-killed deer exceeded the number of harvested deer.

Historically, DMU 96 did not open to hunting until the deer herd existed in significant numbers (Curtis et al. 1993, Hauber 1993). In 1976 archery hunting was permitted throughout the DMU, but by 1978 the town of Irondequoit passed an ordinance prohibiting the discharge of bow and arrows. Regulations also prohibit hunting in county parks throughout the county. Irondequoit contains Durand Eastman Park, the largest area of contiguous deer habitat in the DMU, which is managed by the Monroe County Parks Department. The 900-acre Durand Eastman County Park includes a golf course, picnic areas, meeting facilities, and hiking trails. Houses abut the steep ridges or ravines surrounding the perimeter of the park.

METHODS

We used two methods to assess the degree to which the communication plan affected public opinion about deer management, and to assess the extent of media coverage during the time that the communication plan was underway.

Mail Questionnaires

Public opinion about deer management was assessed in February and November, 1992. Questionnaires were mailed using standard survey practices (Dillman 1978, Brown et
Table 1. Human and deer population characteristics for towns located within DMU 96.

<table>
<thead>
<tr>
<th>Name of Town</th>
<th>Portion of town within DMU (estimate)</th>
<th>Description of DMU 96 from 1990 Data per 1000 km²&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Land area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Human population</td>
<td>Vehicle-killed deer report tags</td>
<td>Archery total deer take</td>
</tr>
<tr>
<td>Brighton</td>
<td>50%</td>
<td>860</td>
<td>.85</td>
</tr>
<tr>
<td>Greece</td>
<td>50%</td>
<td>730</td>
<td>.74</td>
</tr>
<tr>
<td>Irondequoit</td>
<td>100%</td>
<td>1,330</td>
<td>.71</td>
</tr>
<tr>
<td>Pittsford</td>
<td>15%</td>
<td>410</td>
<td>.18</td>
</tr>
<tr>
<td>Rochester City</td>
<td>100%</td>
<td>2,500</td>
<td>.23</td>
</tr>
</tbody>
</table>

<sup>a</sup>Data about human population/km² derived from Bureau of the Census (1990), reported vehicle-killed deer and deer take based on data from J. Hauber, DEC, pers. commun.

al. 1989) to samples of 1992 residential property owners in DMU 96 obtained from a list purchased from the Real Property Tax Service of Monroe County. For the first questionnaire, we drew about 280 names from each of three strata identified by a wildlife biologist. The wildlife biologist identified areas in each town where a high, moderate, or low deer population size existed relative to the remainder of the town (Fig. 3). We used a city map to identify streets and addresses that fell within the DMU and each strata. Names were drawn systematically from each sample strata. When two or more names appeared as property owners (e.g., husband and wife), we randomly-selected one of the names.

Once the 280 names were drawn in each strata and entered into a computer database, we eliminated duplicate listings and those with incomplete addresses, and corrected errors. We repeated the systematic sampling procedure on the sample of
Fig 3  Map of DMU 96 depicting areas with relatively high, moderate, and low deer densities as identified by a DEC wildlife biologist.
remaining names until 265 were drawn in each strata (Kish 1965). A total of 795 property owners were mailed questionnaires in the DMU.

We used the same sample procedure for drawing residential property owners for the second questionnaire mailed in November. Because Real Property Tax Services update their lists only once per year, we used the same list as in February to sample residential property owners for the November questionnaire. We cross-checked the February with the November sample, and deleted those property owners who had received a questionnaire in February. By selecting a different sample for the November questionnaire, we reduced the potential effect of the survey instrument causing increased awareness among respondents, and thus biasing results about their opinions of deer management issues.

We developed questionnaire items (Appendix D) based on input from DEC staff. The objectives of the mail survey were to: (1) assess attitudes and values about deer (Purdy and Decker 1989); (2) assess deer population preferences and perceptions about deer; (3) assess perceptions about deer management and the agency; (4) assess perceptions of deer management techniques and important considerations as to the acceptability of various options; (5) determine the credibility and importance of various channels for communicating deer management options; and (6) measure demographics and other characteristics in relation to perceptions about deer and deer management techniques. We developed a list of items describing various deer management techniques that were proposed or discussed by DEC, grassroots organizations, and the media in DMU 96. For the November questionnaire (Appendix E), we added items to conform to the CTF recommendations.

We conducted the analysis using SPSS-X to calculate frequencies, means, correlations, factor analysis, chi-square tests, and t-tests (SPSS Inc., 1990). Pearson product moment correlations were used to test the association between the importance of
considerations related to deer management techniques and the acceptability of deer management techniques. When generalizing responses to all property owners in the DMU 96 population, responses were weighted if significant differences were detected between groups of respondents in different sample strata (Appendix F). Responses were weighted according to the prevalence of the particular attribute in the sample stratum compared to the total population. For example, relatively few respondents who lived in areas with low deer densities responded to the questionnaire. When generalizing to DMU 96 property owners, responses from respondents in low deer density areas received more weight than those with property in moderate or high deer density areas, reflecting the actual amount of each density area in the DMU.

We coded responses by time of implementation of the survey (February or November) and the deer density relative to the surrounding area in the DMU (high, moderate, and low). We planned in advance to conduct follow-up telephone interviews of nonrespondents in deer density strata which fell below a 60% response rate for the February or November questionnaires.

Content Analysis

Television and newspaper media were studied to assess media coverage about the CTF recommendations and deer-related issues. The objectives were to: (1) assess the balance of coverage about the CTF in terms of stakeholder interests, and the positive and negative reactions to the CTF recommendation; (2) determine the type and frequency of references to information sources; (3) determine the utility of information that DEC provided to the media; and (4) identify impediments to effective communications about the CTF.

We conducted a content analysis of newspaper articles about deer and deer management that were published in the DMU from January 1 through December 31, 1992,
during which time the DEC communication activities were underway. The purpose of the content analysis was to supplement information about the effect of the communication activities by focusing on media coverage about deer and deer management. Although we believe media reports do not necessarily portray the opinions of people in the community accurately, respondents in other studies (Connelly and Brown 1990, Enck et al. 1992, Knuth et al. 1993) have indicated newspapers and television are important sources of information about fish and wildlife topics.

We obtained articles primarily from Mr. Al Cristy, a librarian for one of the local grassroots organizations. Mr. Cristy collected newspaper articles from members of his organization and other sources, and filed copies at local libraries and government offices. DEC staff also provided articles for this analysis, as did individuals with whom the evaluators were acquainted who lived in the area.

To test the adequacy of our newspaper clippings file of 180 items, we reviewed articles found during five one-week periods in three local newspapers between January 1 and December 31, 1992. We sampled weeks in which we predicted local deer management actions would result in substantial newspaper coverage, and therefore in which we would be more likely to find overlooked articles.

From this search, we found an additional thirteen articles that were not in our collection previously, seven of which were from the *Times Union*. Because both the *Rochester Democrat and Chronicle* and *Rochester Times Union* are owned by the Gannett News Service, we noted that articles from the *Times Union* were often similar, if not the same, article found in the *Democrat and Chronicle*. Several other articles were not prominent and somewhat incidental, such as police chasing deer away from hazardous roadways or letters to the editor amidst other letters about various topics. Based on these findings, we believe
that although our analysis does not include every mention of deer in the newspapers during 1992, the articles did reflect the major themes and actions that were reported about deer and deer management during the year.

We analyzed television broadcasts’ portrayal of deer management. We purchased a copy of television broadcasts in the DMU 96 Rochester area resulting from the CTF press conference from Broadcast News Files, Inc. We analyzed the broadcasts by transcribing the audio, and by describing in detail the visual segments corresponding to the audio. These words and images were analyzed using an inductive, qualitative approach (Patton 1980). We analyzed the broadcasts for patterns and categories that would describe the media’s perceptions about the deer management issue, the CTF, and its recommendations.

RESULTS

Response Rates

Response rates for both surveys (Table 2) were > 65% in areas with a relatively higher deer population size for the February and November questionnaires. Response rates were < 65% in the moderate and low deer density areas. Subsequently, we conducted a follow-up telephone interview of nonrespondents in areas with moderate and low deer densities (Table 3). Only about one-fourth to one-third of contacts with nonrespondents resulted in completed interviews. About one-fifth refused to participate, and the remainder were unreachable despite our efforts.

Nonrespondents tended to be more apathetic than respondents about deer-related problems and issues. At least one-third of those contacted by telephone were unwilling to be interviewed. Interviewers commented that several nonrespondents had difficulty understanding the question, the English language, or the subject of the interview, white-tailed deer. Proportionately more respondents worried about deer-related problems than
Table 2. Mail questionnaire response rates for the sample of property owners in areas with high, moderate, or low deer densities in DMU 96.

<table>
<thead>
<tr>
<th>ESTIMATED DEER DENSITY</th>
<th>RESPONSE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEBRUARY\textsuperscript{a}</td>
</tr>
<tr>
<td>HIGH</td>
<td>68%</td>
</tr>
<tr>
<td>MODERATE</td>
<td>52%</td>
</tr>
<tr>
<td>LOW</td>
<td>41%</td>
</tr>
</tbody>
</table>

\textsuperscript{a} High: \textit{n}=172 of 252 usable and deliverable questionnaires. Moderate: \textit{n}=120 of 231 usable and deliverable questionnaires. Low: \textit{n}=95 of 234 usable and deliverable questionnaires.

\textsuperscript{b} High: \textit{n}=178 of 252 usable and deliverable questionnaires. Moderate: \textit{n}=126 of 257 usable and deliverable questionnaires. Low: \textit{n}=104 of 255 usable and deliverable questionnaires.

Table 3. Response rates from telephone interviews of those who did not return a mail questionnaire, based on residence in areas with moderate or low deer densities in DMU 96.

<table>
<thead>
<tr>
<th>OUTCOME FROM INTERVIEW</th>
<th>FEBRUARY</th>
<th>NOVEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MODERATE</td>
<td>LOW</td>
</tr>
<tr>
<td>UNREACHABLE OR UNAVAILABLE (e.g., unlisted or wrong number, deceased, no answer after 4 or more attempts)</td>
<td>46%</td>
<td>51%</td>
</tr>
<tr>
<td>REFUSAL (e.g., not interested, too busy, unwilling to participate)</td>
<td>22%</td>
<td>20%</td>
</tr>
<tr>
<td>COMPLETED</td>
<td>32%</td>
<td>29%</td>
</tr>
</tbody>
</table>
Nonrespondents. Nonrespondents who indicated concern about deer-related problems (i.e., deer-car accidents, plant damage) were similar to respondents on most characteristics.

Overall, nonrespondents desired less reduction in the size of the deer herd than did respondents. Results about preferences for various deer management techniques were not completely comparable between respondents and nonrespondents; however, in general, management preferences of nonrespondents were similar to those reported by respondents.

Differences between respondents and nonrespondents imply results from this study reflect more strongly those property owners who are more concerned about deer and deer management activities in DMU 96. The sample used in this study describes the attitudes and opinions of residential property owners in DMU 96 who are interested in the deer population.

Description of Respondents

We compared the characteristics of respondents residing in areas with high, moderate, and low deer densities, pooling responses from the February and November questionnaires. Slightly fewer females than males responded to the questionnaires (46% female, 54% male). We detected no significant differences in gender between areas with various deer densities ($\chi^2 = 0.64$, 1 df, $p = 0.72$); however, significant differences were detected in the ages of respondents ($F = 5.46$, 2 df, $p = 0.004$). Respondents from areas with lower deer densities tended to be younger on average ($\bar{X} = 49.95$, s.d. = 16.01) than respondents in moderate ($\bar{X} = 53.71$, s.d. = 14.05) and higher deer density areas ($\bar{X} = 54.39$, s.d. = 15.12). A comparison of responses to the February and November surveys indicated no significant differences ($F = 0.43$, 1 df, $p = 0.51$).

A similar relationship was evident for household income (in thousands of dollars) compared to deer density areas. Significant differences were detected ($F = 6.20$, 2 df, $p = 0.002$), in which those from areas with lower deer densities ($\bar{X} = 48.55$, s.d. = 31.58)
reported lower income than those in areas with moderate ($\bar{X} = 60.43$, s.d. = 35.04) and high ($\bar{X} = 54.55$, s.d. = 30.33) deer densities. Significant differences were detected between respondents' income from the February ($\bar{X} = 45.50$, s.d. = 25.71) and November ($\bar{X} = 52.50$, s.d. = 36.10) questionnaires ($X^2 = 8.28, 1$ df, $p = 0.004$).

Respondents reported the human population size of the place they lived for the most time between ages 6 to 16 years, and where they currently lived. The composition of respondents who grew up in urban, suburban, and rural areas was similar, i.e., no significant differences, in the three deer density areas. One-fourth (25%) grew up in rural areas and villages with 5,000 or less people. Respondents' perceptions of the human population size of their current residence was significantly different in the three deer density areas. More respondents living in areas with high deer population densities reported living in villages or small cities of 5,000 to 24,999 people (24%) than those from areas with moderate (20%) and low (11%) deer population densities. More respondents living in the city with 100,000 or more people were classified as existing with a moderate (44%) or low (54%) population of deer, compared to areas with a high deer population (35%). A significant difference was detected between the February and November respondents, in which more February respondents reported residing in rural areas (farm-15%, 6% and nonfarm-11%, 8%, respectively), while more November respondents reported residing in areas of 5,000 to 99,999 people (5,000 to 24,999-18%, 21%; 25,000 to 99,999 - 13%, 20%, respectively) ($X^2 = 18.37, 5$ df, $p = 0.002$).

Respondents expressed a range of feelings about the presence of deer in DMU 96 (Table 4). About two-thirds (66%) of respondents enjoyed deer being present in the DMU, although they were concerned about problems that deer might cause. Proportionately more respondents in the high (14%) compared to areas with moderate (8%) and low (4%) deer
Table 4. Respondents’ feelings about deer in DMU 96, pooled for February and November responses.

<table>
<thead>
<tr>
<th>ITEM RESPONSES</th>
<th>DEER DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td><strong>I ENJOY THE PRESENCE OF DEER AND I DO NOT WORRY ABOUT PROBLEMS DEER MAY CAUSE.</strong></td>
<td>19%</td>
</tr>
<tr>
<td><strong>I ENJOY THE PRESENCE OF DEER BUT I WORRY ABOUT PROBLEMS DEER MAY CAUSE.</strong></td>
<td>66%</td>
</tr>
<tr>
<td><strong>I DO NOT ENJOY THE PRESENCE OF DEER AND REGARD THEM AS A NUISANCE.</strong></td>
<td>14%</td>
</tr>
<tr>
<td><strong>I HAVE NO PARTICULAR FEELINGS ABOUT DEER.</strong></td>
<td>1%</td>
</tr>
</tbody>
</table>

densities regarded deer as a nuisance. Differences were not significant when comparing responses to the February and November questionnaires ($\chi^2 = 7.33, 3$ df, $p = 0.06$).

Over 90% of the respondents identified one or more concerns related to deer (Table 5). More respondents in areas with high deer densities were concerned about deer-car accidents, Lyme disease transmission, and damage to gardens, ornamental yard plantings, and park foliage than those residing in areas with moderate and low deer densities. As expected, more respondents experienced problems with deer in areas with high deer densities (76%) than in areas with moderate (38%) or low (33%) deer population densities ($\chi^2 = 124.59, 2$ df, $p = 0.000001$). More respondents were concerned about deer-related problems than reported having actually experienced the problems. When assessing changes in responses from February to November (weighting for high, moderate, and low deer density areas), more respondents were concerned about the transmission of Lyme disease in November (54%) than in February (46%) ($\chi^2 = 4.95, 1$ df, $p = 0.03$). No significant differences were detected for concerns about deer-related vehicle accidents ($\chi^2 = 0.55, 1$ df, $p = 0.45$), damage to vegetable gardens ($\chi^2 = 0.37, 1$ df, $p = 0.54$), yard plantings ($\chi^2 = \ldots$
Table 5. Respondents' reported interactions and encounters with deer in areas estimated to have high, moderate, and low deer densities, pooled for February and November responses.

<table>
<thead>
<tr>
<th>PROBLEMS WITH DEER</th>
<th>CONCERNS</th>
<th>PRIMARY CONCERNS</th>
<th>ACTUAL EXPERIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIGH</td>
<td>MODERATE</td>
<td>LOW</td>
</tr>
<tr>
<td>DEER-CAR ACCIDENTS</td>
<td>91%</td>
<td>83%</td>
<td>82%</td>
</tr>
<tr>
<td>LYME DISEASE TRANSMISSION</td>
<td>78%</td>
<td>70%</td>
<td>68%</td>
</tr>
<tr>
<td>DAMAGE TO VEGETABLE GARDENS</td>
<td>48%</td>
<td>34%</td>
<td>20%</td>
</tr>
<tr>
<td>DAMAGE TO YARD PLANTINGS</td>
<td>65%</td>
<td>45%</td>
<td>30%</td>
</tr>
<tr>
<td>DAMAGE TO FARM CROPS AND ORCHARDS</td>
<td>33%</td>
<td>40%</td>
<td>32%</td>
</tr>
<tr>
<td>DAMAGE TO PLANT SPECIES IN COUNTY PARKS AND UNDEVELOPED AREAS</td>
<td>51%</td>
<td>34%</td>
<td>26%</td>
</tr>
<tr>
<td>HAVE NONE OF THESE CONCERNS AT THIS TIME</td>
<td>5%</td>
<td>9%</td>
<td>8%</td>
</tr>
</tbody>
</table>
2.74, 1 df, p = 0.10), or farm crops ($X^2 = 3.43, 1 df, p = 0.06$), or damage to plant species in parks ($X^2 = 0.64, 1 df, p = 0.42$). However, significantly more respondents in February (37%) than November (31%) indicated they or a family member had experienced problems with deer ($X^2 = 3.83, 1 df, 0.05$). Of six possible experiences, only one proved significantly different. More respondents reported plant damage in county parks and underdeveloped areas in February (19%) (the time of year when less forage is available to deer) compared to November (2%) ($X^2 = 19.68, 1 df, p = 0.00001$).

A primary concern of almost two-thirds of the respondents were deer-car accidents (Table 5). More respondents in the moderate and low deer density areas were concerned primarily about Lyme disease transmission than those living in areas with higher deer densities. Two to eight times more respondents in the high compared to the moderate and low deer density areas considered damage to yard plantings as a primary concern. A significant difference was detected in respondents' primary concern from February to November ($X^2 = 48.07, 6 df, p = 0.000001$). More respondents were concerned primarily about deer-related vehicle accidents in November (70%) (when these types of accidents are more prevalent) compared to February (56%).

One-fifth (20%) of the respondents had taken actions to make their opinions about deer and deer management known to government officials, citizen committees, and/or state wildlife biologists during the preceding two years. More respondents living in areas with high deer densities (33%) indicated they had taken actions compared to those in moderate (9%) and lower (9%) deer density areas ($X^2 = 68.84, 2 df, p = 0.000001$). Because of the small sample sizes for those who took some action in the moderate and low deer density areas, the respondents who took some action were combined, forming a moderate/low group that was compared with the high group. Those residing in areas with higher deer densities were
more likely NOT to contact a state wildlife agency representative or biologist than those in moderate and lower deer density areas ($X^2 = 7.18$, 1 df, $p = 0.007$), but they were more likely to attend or participate in a government or citizen committee meeting about deer ($X^2 = 10.33$, 1 df, $p = 0.001$) or donate money to a political lobbying group ($X^2 = 4.52$, 1 df, $p = 0.03$) (Table 6).

Table 6. Among respondents who took action to make their deer management opinions known to government officials, citizen committees, or DEC wildlife biologists, % engaging in each activity during the preceding two years, pooled for February and November responses.

<table>
<thead>
<tr>
<th>ACTION OPTIONS</th>
<th>DEER DENSITY OF RESIDENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>JOINED CONSERVATION OR ENVIRONMENTAL ORGANIZATION TO INCREASE POLITICAL INPUT.</td>
<td>22%</td>
</tr>
<tr>
<td>WROTE LETTERS TO THE EDITOR TO BE PRINTED IN AREA NEWSPAPER OR MAGAZINE.</td>
<td>14%</td>
</tr>
<tr>
<td>DONATED MONEY TO A POLITICAL LOBBYING GROUP THAT SUPPORTS MY VIEWS.</td>
<td>32%</td>
</tr>
<tr>
<td>CONTACTED A DEC REPRESENTATIVE OR WILDLIFE BIOL OLOGIST.</td>
<td>17%</td>
</tr>
<tr>
<td>CONTACTED MY STATE SENATOR OR ASSEMBLYMAN.</td>
<td>15%</td>
</tr>
<tr>
<td>CONTACTED COUNTY OR TOWN GOVERNMENT OFFICIALS.</td>
<td>44%</td>
</tr>
<tr>
<td>VOTED FOR OR AGAINST A POLITICAL CANDIDATE PRIMARILY BECAUSE OF HIS/HER VIEWS ON DEER OR DEER MANAGEMENT ISSUES.</td>
<td>38%</td>
</tr>
<tr>
<td>SIGNED A PETITION RELATING TO DEER OR A DEER MANAGEMENT ISSUE.</td>
<td>52%</td>
</tr>
<tr>
<td>ATTENDED OR PARTICIPATED IN A GOVERNMENT OR CITIZEN COMMITTEE ABOUT DEER.</td>
<td>49%</td>
</tr>
</tbody>
</table>
No significant difference was detected between those indicating whether they had taken actions (Appendix E, Question 18) when comparing responses to the February and November questionnaire ($X^2 = 3.12, 1 \text{ df}, p = 0.08$).

We asked respondents about their membership in organizations with deer-related interests. More respondents living in high deer density areas reported being a member of such organizations (16%) than those living in the moderate (8%) and low (8%) deer density areas ($X^2 = 14.07, 2 \text{ df}, p = 0.001$). No significant differences were detected in responses from the February and November questionnaires ($X^2 = 3.26, 1 \text{ df}, p = 0.07$). Although less than 5% of the respondents were members of a grassroots organization (i.e. "Irondequoit Deer Action Committee, "Monroe County Alliance for Wildlife Protection," "Save Our Deer"), more of them resided in high compared to moderate deer density areas. No respondent from the low deer density areas reported membership in a grassroots organization.

We also analyzed the percent of respondents who were members of each grassroots organization. Seven percent of those respondents residing in areas with high deer densities and 1% in areas with moderate deer densities were members of the "Irondequoit Deer Action Committee." Two percent living in areas with high deer densities were members of "Save Our Deer." None reported membership in the "Monroe Alliance for Wildlife Protection."

Respondents were asked about their association with deer-related activities, occupations, or interests that might be affected by the size of the deer herd in the DMU. Almost all (95%) indicated they drove a car or truck, implying they held a stake in the deer population (whether recognized or not) because of the risk of being involved in a deer-related vehicle accident. One-third (34%) grew fruits and vegetables for their household. Seven percent owned rural land, but not a farm, in DMU 98. About 2% owned or worked in a profession related to natural resources, 1% in a business serving deer hunters, and 1% in a
business related to nuisance deer problems. Less than 1% owned or worked in an agricultural industry.

Several of the respondents’ associations with and interests in deer were significantly different in the three deer density areas (Table 7). More respondents owned ornamental shrubs in high and moderate deer density areas than in low deer density areas ($X^2 = 58.69$, $2 \text{ df}, p = 0.000001$). Slightly more respondents enjoyed seeing deer ($X^2 = 7.97$, $2 \text{ df}, p = 0.02$) and hunting deer ($X^2 = 17.31$, $2 \text{ df}, p = 0.0002$) in the DMU in areas with low deer densities than those living in areas with moderate and high deer densities. More respondents in areas with high deer densities indicated they provided deer with food or cover

Table 7. Involvement in work-related and leisure activities that describe interactions of respondents with deer, pooled for February and November responses.

<table>
<thead>
<tr>
<th>STAKEHOLDER ATTRIBUTES</th>
<th>DEER DENSITY OF RESIDENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>DRIVE A CAR OR TRUCK.</td>
<td>96%</td>
</tr>
<tr>
<td>ORNAMENTAL SHRUBS AROUND HOME</td>
<td>85%</td>
</tr>
<tr>
<td>GROW FRUITS/VEGETABLES FOR HOUSEHOLD.</td>
<td>36%</td>
</tr>
<tr>
<td>ENJOY SEEING DEER IN DMU.</td>
<td>75%</td>
</tr>
<tr>
<td>PROVIDE DEER WITH FOOD OR COVER TO ATTRACT THEM ONTO PROPERTY.</td>
<td>10%</td>
</tr>
<tr>
<td>HUNT DEER IN DMU 96.</td>
<td>1%</td>
</tr>
<tr>
<td>OWN RURAL LAND IN DMU 96, BUT NOT A FARM.</td>
<td>8%</td>
</tr>
<tr>
<td>WORK IN AN AGRICULTURAL INDUSTRY.</td>
<td>1%</td>
</tr>
<tr>
<td>WORK IN A NATURAL RESOURCES PROFESSION.</td>
<td>3%</td>
</tr>
<tr>
<td>WORK IN BUSINESS SERVING DEER HUNTERS.</td>
<td>1%</td>
</tr>
<tr>
<td>WORK IN BUSINESS RELATED TO NUISANCE DEER PROBLEMS.</td>
<td>2%</td>
</tr>
</tbody>
</table>
to attract them onto their property, compared to respondents in areas with moderate or low
deer densities ($X^2 = 15.28, 2$ df, $p = 0.0005$).

We asked several questions to ascertain the degree of respondents' involvement in
hunting white-tailed deer. Respondents' affiliation with deer hunting was similar (i.e., no
significant differences) in areas with high, moderate, and low deer densities. However,
significant differences were detected between respondents in February and November ($X^2 =
6.09, 1$ df, $p = .01$), with more in February indicating they had hunted deer sometime in the
past (26%) than in November (19%). Of those respondents who hunted deer, more had
participated the season prior to the questionnaire's implementation in February (67%) than in
November (57%), although this difference was not statistically significant ($X^2 = 1.93, 1$ df, $p =
0.16$). In contrast, more of these active hunters responding to the November questionnaire
hunted in DMU 96 (26%) compared to the active hunters responding to the February
questionnaire (11%) ($X^2 = 4.05, 1$ df, $p = .04$).

After using weighting procedures for the deer density area and time of questionnaire
implementation (Appendix F), results indicated that 11% of the respondents in DMU 96
hunted deer during the season prior to the survey. Another 11% had hunted deer sometime
in the past, other than the prior deer hunting season. Fifteen percent had never hunted deer,
but a member of the immediate family had. The remainder (63%) had little or no affiliation
with deer hunting.

Preferences for the Size of the Deer Population

We asked respondents their preferences for the size of the deer herd in DMU 96
(Table 8). Significant differences were detected, depending on whether respondents resided
in areas with high, moderate, or low densities of deer relative to the deer population in the
town and the surrounding DMU. Results indicated even respondents living in areas with low
deer densities desired a reduction in the size of the deer herd. We analyzed results from February and November separately, because questionnaire items were modified in November to better reflect the CTF’s recommendation to divide the DMU into a northern and southern deer management area.

Respondents’ desire for a lower deer population was evident when asking respondents in general whether they preferred the deer population to increase, decrease, or remain the same in February or November (Fig. 4). In areas with high deer densities, most respondents preferred that the deer population decrease. An exception were respondents residing in areas with low deer densities in the southern portion of the DMU. Results from the November mail questionnaire indicated about two-thirds (64%) of the respondents who resided in areas with low deer densities preferred the deer herd to remain the same size.

Table 8. Respondents’ preferences for a percent change in the size of the deer population based on residence in different deer density areas.

<table>
<thead>
<tr>
<th>QUESTIONNAIRE</th>
<th>PORTION OF DMU 96</th>
<th>ESTIMATED DEER DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>February</td>
<td>Total(^a)</td>
<td>-37%</td>
</tr>
<tr>
<td>November</td>
<td>North(^b)</td>
<td>-40%</td>
</tr>
<tr>
<td></td>
<td>South(^c)</td>
<td>-31%</td>
</tr>
</tbody>
</table>

\(^a\) Significant differences were detected between high and moderate/low densities, where F = 17.26, 4 df, p = 0.002, Scheffe’s test at 0.05 level of significance.

\(^b\) Significant differences were detected between high and moderate/low densities, where F = 11.03, 4 df, p = 0.03 for November in the northern portion of the DMU, Scheffe’s test at 0.05 level of significance.

\(^c\) Significant differences were detected between low and high/moderate densities, where F = 12.24, 4 df, p = 0.02 for November in the southern portion of the DMU, Scheffe’s test at 0.05 level of significance.
Fig. 4 Respondents' preferences for an increase, decrease, or no change in the size of the deer herd in areas with high, moderate, and low deer densities.
We compared deer population preferences of respondents to the November questionnaire with the recommendations made by the CTF for the northern and southern portions of the DMU (Table 9). Respondents with property in northern DMU 96 preferred a 35% reduction in herd size; respondents with property in southern DMU 96 preferred a 16% reduction. The CTF recommended a slight reduction (5%) in the size of the deer herd in the southern portion of the DMU, and an unspecified but substantial percent reduction of the deer herd in the northern portion of the DMU. These reductions were to be conducted incrementally until both management areas achieved 20 deer/mi² of quality habitat.

We used deer population estimates from the DEC (state wildlife management agency) to compare the CTF recommendations with property owners' preferences from the questionnaire. These results should be interpreted cautiously, since preferences of property

<table>
<thead>
<tr>
<th>DEER MANAGEMENT AREA</th>
<th>PROPERTY OWNERSHIP</th>
<th>CTF RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RESIDENT</td>
<td>NONRESIDENT</td>
</tr>
<tr>
<td>North*</td>
<td>-35%</td>
<td>-25%</td>
</tr>
<tr>
<td>Southb</td>
<td>-16%</td>
<td>-27%</td>
</tr>
</tbody>
</table>

* Significant differences detected between residents and nonresidents at F = 4.89, 1 df, p = 0.03.

b Significant differences detected between residents and nonresidents at F = 4.55, 1 df, p = 0.03.

c Arbitrary estimate of percent change based on helicopter count indicating a minimum of 178 deer in the town of Irondequoit only, not the entire northern management area.
owners and the CTF were measured differently. CTF members recommended incremental changes until a reduction of deer-related accidents and a population objective of 20 deer/mi² was achieved, whereas property owners based their preferences on perceptions of the current deer population size. A wildlife biologist estimated conservatively that at least 100 deer/mi² of deer range existed in the town of Irondequoit (J. Hauber, pers. commun.). The town, 15 mi² total, contained 2.5 mi² of deer range. Thus, at least 250 deer were estimated to be present. In fall, 1993, DEC staff used a spotlight count on approximately 40% of the 2.5 mi² of deer range, and counted 238 separate, individual deer. The CTF recommended removing 80 deer during the first-year implementation of the CTF plan, which represented a 32% reduction in the deer herd, based on the conservative population estimate.

Results indicated significant differences in the preferences of those residing inside compared to those residing outside the two management areas designated by the CTF (see Fig. 2). However, in each instance nonresidents’ preferences reflected to some degree the change desired by residents. For example, residents in the southern portion of the DMU (where deer density tended to be lower) recommended that the deer population in the northern portion (where deer density tended to be higher) be reduced to a greater degree than they preferred for their own residence.

Preferences for Deer Management Techniques

Respondents were asked in February and November which deer management techniques they preferred most and least as long-term and short-term solutions for the deer population in DMU 96 (Tables 10-13). Culling deer at bait sites was added to the November questionnaire to reflect the recommendations of the CTF.

Of the 12 (February) or 13 (November) options presented in the questionnaires, responses about short-term solutions were mixed (Table 10), but most respondents preferred
Table 10. Opinions of DMU 96 residential property owners about their most-preferred deer management options as a short-term solution (% response).<sup>a</sup>

<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>FEBRUARY</th>
<th></th>
<th></th>
<th>NOVEMBER</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Trap and transfer to another location</td>
<td>16.5%</td>
<td>36%</td>
<td>24.7%</td>
<td>22.0%</td>
<td>23.7%</td>
<td>25.3%</td>
</tr>
<tr>
<td>Trap and transfer to venison farm</td>
<td>15.8%</td>
<td>10.5%</td>
<td>—</td>
<td>—</td>
<td>12.7%</td>
<td>—</td>
</tr>
<tr>
<td>Bow hunting</td>
<td>12.0%</td>
<td>—</td>
<td>13.5%</td>
<td>—</td>
<td>—</td>
<td>19.2%</td>
</tr>
<tr>
<td>Hunting by qualified volunteers</td>
<td>13.3%</td>
<td>—</td>
<td>12.4%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Educate property owners</td>
<td>—</td>
<td>—</td>
<td>18.0%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Culling at bait sites&lt;sup&gt;b&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>13.3%</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<sup>a</sup>Deer management options with greater than or equal to 10% responses are reported.

<sup>b</sup>Selective culling of deer at bait sites<sup>a</sup> was not listed as an option in the February questionnaire.

contraception research as a long-term solution (Table 11). In February most respondents preferred techniques that relocated live deer from the premises (i.e., trapping and transferring deer to another location or venison farms) as short-term solutions. By November, preferences for these techniques remained high, but more respondents who resided in areas with high deer densities preferred culling deer at bait sites. This option had been recommended by the CTF in September.

In both February and November, hunting options were preferred as a short-term solution by a significant percent of respondents (Table 10). In high and low deer density
areas, about one-fourth preferred a form of hunting (either bow hunting or qualified volunteers) as a short-term solution. Fewer respondents preferred hunting as a long-term solution (Table 11). Firearms hunting was the least-preferred hunting technique by respondents in both February and November (Tables 12-13).

Other least-preferred techniques were hiring sharpshooters, and tranquilizing and euthanizing deer (Tables 12-13). Also unappealing to respondents was allowing nature to take its course and reintroducing natural predators, both for the February and November

Table 11. Opinions of DMU 96 residential property owners about their most-preferred deer management options as a long-term solution (% response).a

<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>FEBRUARY</th>
<th>NOVEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Contraception research</td>
<td>41.8%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Trap and transfer to another location</td>
<td>12.7%</td>
<td></td>
</tr>
<tr>
<td>Trap and transfer to venison farm</td>
<td>12.0%</td>
<td></td>
</tr>
<tr>
<td>Hunting by qualified volunteers</td>
<td></td>
<td>10.0%</td>
</tr>
<tr>
<td>Bow hunting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow nature to take its course</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Deer management options with greater than or equal to 10% response are reported.
Table 12. Opinions of DMU 96 residential property owners about their least-preferred deer management options as a short-term solution (% response).

<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>FEBRUARY</th>
<th></th>
<th>NOVEMBER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Firearms hunting</td>
<td>26.4%</td>
<td>19.4%</td>
<td>18.2%</td>
<td>24.4%</td>
</tr>
<tr>
<td>Hire sharpshooters</td>
<td>17.6%</td>
<td>17.6%</td>
<td>17.0%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Tranquilize and euthanize</td>
<td>10.7%</td>
<td>18.5%</td>
<td>19.3%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Reintroduce predators</td>
<td>---</td>
<td>13.9%</td>
<td>---</td>
<td>11.9%</td>
</tr>
<tr>
<td>Trap and transfer to venison farm</td>
<td>---</td>
<td>---</td>
<td>14.8%</td>
<td>---</td>
</tr>
<tr>
<td>Nature take its course</td>
<td>10.7%</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

*Deer management options with greater than or equal to 10% response are reported.*
Table 13. Opinions of DMU 96 residential property owners about their least-preferred deer management options as a long-term solution (% response).

<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>FEBRUARY</th>
<th></th>
<th>NOVEMBER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Reintroduce predators</td>
<td>16.6%</td>
<td>14.5%</td>
<td>14.6%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Tranquillize and euthanize</td>
<td>14.0%</td>
<td>17.3%</td>
<td>19.1%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Firearms hunting</td>
<td>19.7%</td>
<td>16.4%</td>
<td>---</td>
<td>19.6%</td>
</tr>
<tr>
<td>Trap and transfer to venison farm</td>
<td>10.2%</td>
<td>10.0%</td>
<td>12.4%</td>
<td>---</td>
</tr>
<tr>
<td>Hire sharpshooters</td>
<td>---</td>
<td>10.9%</td>
<td>13.5%</td>
<td>---</td>
</tr>
<tr>
<td>Nature take its course</td>
<td>10.8%</td>
<td>---</td>
<td>---</td>
<td>14.3%</td>
</tr>
</tbody>
</table>

*Deer management options with greater than or equal to 10% response are reported.*
questionnaires, either as a short-term or long-term technique. A few more respondents indicated opposition to trapping and transferring deer to venison farms in February compared to November.

Respondents' opinions about the most effective short-term and long-term deer management techniques were mixed (Tables 14-15). In both February and November, many respondents believed the most effective short-term techniques resulted in the lethal removal of deer (i.e., culling deer at bait sites, hiring sharpshooters, hunting) (Table 14). Others believed that removing live deer was the most effective technique (i.e., trap and transfer to another locale or venison farm). More respondents in November than February indicated contraception research was the most effective long-term technique, particularly in the high deer density area (Table 15).

A few deer management options were not included in the preceding tables, because less than 10% of the respondents indicated the options were most or least effective as a short- or long-term solutions. These management methods with moderate support were (1) educating property owners about fencing, repellents, and less desirable plant species, and (2) providing supplemental food for deer during winter. Few respondents either supported or opposed these micro-management techniques that affected individual property owners and deer, compared to the other techniques that affected the community or deer population at large.

As previously stated, the CTF recommended different management techniques for two areas composed primarily of the town of Irondequoit versus the remainder of the DMU (see Fig. 2). We analyzed the responses of November respondents who lived in and outside of the deer management technique areas specified by the CTF. Results indicated more
Table 14. Opinions of DMU 96 residential property owners about the most effective deer management options as a short-term solution.

<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>FEBRUARY</th>
<th></th>
<th>NOVEMBER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Trap and transfer to another location</td>
<td>15.4%</td>
<td>18.1%</td>
<td>18.6%</td>
<td>16.5%</td>
</tr>
<tr>
<td>Hunting by qualified volunteers</td>
<td>13.5%</td>
<td>18.1%</td>
<td>18.6%</td>
<td>17.1%</td>
</tr>
<tr>
<td>Hire sharpshooters</td>
<td>13.5%</td>
<td>---</td>
<td>---</td>
<td>12.9%</td>
</tr>
<tr>
<td>Bow hunting</td>
<td>10.3%</td>
<td>10.5%</td>
<td>15.1%</td>
<td>---</td>
</tr>
<tr>
<td>Trap and transfer to venison farm</td>
<td>16.0%</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Firearms hunting</td>
<td>---</td>
<td>14.3%</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Educate property owners</td>
<td>---</td>
<td>---</td>
<td>15.1%</td>
<td>---</td>
</tr>
<tr>
<td>Culling at bait sites(^b)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>16.5%</td>
</tr>
</tbody>
</table>

\(^a\) Deer management options with greater than or equal to 10% response are reported.

\(^b\) Selective culling of deer at bait sites\(^a\) was not listed as an option in the February questionnaire.
Table 15. Opinions of DMU 96 residential property owners about the most effective deer management options as a long-term solution.

<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>FEBRUARY</th>
<th></th>
<th></th>
<th>NOVEMBER</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Contraception research</td>
<td>29.2%</td>
<td>28.8%</td>
<td>25.6%</td>
<td>44.0%</td>
<td>31.6%</td>
<td>30.6%</td>
</tr>
<tr>
<td>Bow hunting</td>
<td>---</td>
<td>---</td>
<td>16.3%</td>
<td>11.3%</td>
<td>10.5%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Trap and transfer to venison farm</td>
<td>15.6%</td>
<td>13.5%</td>
<td>---</td>
<td>---</td>
<td>13.2%</td>
<td>---</td>
</tr>
<tr>
<td>Hunting by qualified volunteers</td>
<td>13.0%</td>
<td>10.6%</td>
<td>10.5%</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Trap and transfer to another location</td>
<td>---</td>
<td>---</td>
<td>11.6%</td>
<td>---</td>
<td>12.3%</td>
<td>---</td>
</tr>
<tr>
<td>Firearms hunting</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>10.2%</td>
</tr>
</tbody>
</table>

*Deer management options with greater than or equal to 10% response are reported.

Residents than nonresidents supported the deer management recommendations of the CTF (Table 16).

Acceptability of Deer Management Techniques

We assessed the acceptability of deer management techniques, even though a particular technique may not have been the most preferred technique of respondents.

First, we assessed changes in responses regarding the acceptability of techniques between February and November while communication efforts and the CTF were underway (Table 17). Slight but significant changes in acceptability were detected for five deer management techniques among respondents with property in areas with high (three techniques) and moderate (two techniques) deer densities. Slightly more respondents disapproved of
Table 16. Preferences of respondents who were resident or nonresident in the two CTF management areas who responded to the November questionnaire about the use of deer management techniques in areas designated by the DMU 96 Citizen Task Force.

<table>
<thead>
<tr>
<th>PREFERRED DEER MANAGEMENT TECHNIQUE&lt;sup&gt;a&lt;/sup&gt;</th>
<th>PROPERTY OWNERSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RESIDENT</td>
</tr>
<tr>
<td><strong>AREA 1: IRONDEQUOIT</strong></td>
<td></td>
</tr>
<tr>
<td>Allow selective culling of deer at bait sites (short term)</td>
<td>15%</td>
</tr>
<tr>
<td>Support research for birth control or sterilization techniques to reduce the number of fawns born (long term)</td>
<td>48%</td>
</tr>
<tr>
<td><strong>AREA 2: PART OF IRONDEQUOIT AND REMAINDER OF DMU</strong></td>
<td></td>
</tr>
<tr>
<td>Allow regulated bow and arrow hunting by licensed hunters (short term)</td>
<td>16%</td>
</tr>
<tr>
<td>Allow regulated bow and arrow hunting by licensed hunters (long term)</td>
<td>11%</td>
</tr>
</tbody>
</table>

<sup>a</sup> Respondents selected preference from a list of 13 possible deer management techniques. Techniques listed are those recommended by the DMU 96 Citizen Task Force.
Table 17. Change in acceptability of deer management techniques showing a significant difference from February to November.

<table>
<thead>
<tr>
<th>DEER MANAGEMENT TECHNIQUE*</th>
<th>AREA</th>
<th>SIG. DIFF.</th>
<th>TIME OF SURVEY</th>
<th>DEGREE OF ACCEPTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reintroduce natural predators (e.g., wolves)</td>
<td>High</td>
<td>$X^2=9.84$; 4 df; $p=0.04$</td>
<td>February</td>
<td>EXTREME: 6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>2%</td>
</tr>
<tr>
<td>Support research for birth control or sterilization techniques to reduce the number of fawns born.</td>
<td>Moderate</td>
<td>$X^2=9.70$; 4 df; $p=0.04$</td>
<td>February</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>33%</td>
</tr>
<tr>
<td>Provide supplemental food for deer during winter.</td>
<td>High</td>
<td>$X^2=10.44$; 4 df; $p=0.03$</td>
<td>February</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>14%</td>
</tr>
<tr>
<td>Trap and transfer deer for release at another location</td>
<td>Moderate</td>
<td>$X^2=9.50$; 4 df; $p=0.05$</td>
<td>February</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>31%</td>
</tr>
<tr>
<td>Hire sharpshooters to shoot deer</td>
<td>High</td>
<td>$X^2=12.01$; 4 df; $p=0.02$</td>
<td>February</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>17%</td>
</tr>
</tbody>
</table>

* Technique for selective culling of deer at bait sites was an option in the November questionnaire only, and therefore no analysis was made for detecting change in acceptability.
reintroducing natural predators, providing supplemental food for deer, and trapping and transferring deer to another location in November than February. Slightly more respondents in November approved of research for birth control or sterilization techniques, and hiring sharpshooters to shoot deer.

In both February and November, the acceptability of various deer management techniques was significantly different between respondents from areas with high, moderate, and low deer densities (6 of 12 techniques in February, and 7 of 13 techniques in November) (Table 18). Conversely, respondents' acceptability of trapping and transferring deer to another location, regulated bowhunting, and regulated hunting by highly-qualified volunteers was similar, regardless of the relative deer density of the area in which they owned property.

We calculated the degree of acceptability of management techniques for property owners in DMU 96 based on results from Tables 17 and 18. Responses were weighted according to the presence or absence of significant differences in responses from February and November (Table 17) and from areas with various deer densities (Table 18, Appendix F). Techniques with low intervention or which maintained deer in natural surroundings were more acceptable to the DMU 96 community of property owners than the lethal removal of deer. Most acceptable were efforts to educate property owners about ways to avoid deer damage to plants, trap and transfer deer to another location, research birth control or sterilization techniques, and provide supplemental food for deer. Least acceptable were tranquilizing and euthanizing deer, reintroducing natural predators, and hiring sharpshooters to shoot deer. Of all options for lethal removal of deer, the most acceptable was selectively culling deer at bait sites.

We conducted a factor analysis of the various deer management techniques, of which three items were dropped to improve reliability (Table 19). The factor analysis indicated three
Table 18. Acceptability of deer management techniques in deer density areas, and adjusted percent of acceptability for the DMU.

<table>
<thead>
<tr>
<th>DEER MANAGEMENT TECHNIQUE</th>
<th>SIGNIFICANT DIFFERENCES BETWEEN AREAS&lt;sup&gt;a&lt;/sup&gt;</th>
<th>DEGREE OF ACCEPTABILITY IN DMU&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEBRUARY NOVEMBER</td>
<td>EXTREME MODERATE SLIGHT NOT AT ALL DON'T KNOW</td>
</tr>
<tr>
<td>Allow nature to take its course.</td>
<td>$X^2 = 24.20, 8 df, p = 0.002$</td>
<td>18% 23% 28% 27% 4%</td>
</tr>
<tr>
<td>Reintroduce natural predators (e.g., wolves).</td>
<td>N.S.</td>
<td>$X^2 = 29.39, 8 df, p = 0.0003$</td>
</tr>
<tr>
<td>Educate property owners about fencing, repellents and plant species that are less desirable food for deer.</td>
<td>$X^2 = 34.36, 8 df, p = 0.00003$</td>
<td>N.S.</td>
</tr>
<tr>
<td>Support research for birth control or sterilization techniques to reduce the number of fawns born.</td>
<td>$X^2 = 15.47, 8 df, p = 0.05$</td>
<td>N.S.</td>
</tr>
<tr>
<td>Provide supplemental food for deer during winter.</td>
<td>N.S.</td>
<td>$X^2 = 25.21, 8 df, p = 0.001$</td>
</tr>
<tr>
<td>Trap and transfer deer for release at another location.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Allow deer farmers to trap and transfer deer to farms.</td>
<td>$X^2 = 16.60, 8 df, p = 0.03$</td>
<td>N.S.</td>
</tr>
<tr>
<td>DEER MANAGEMENT TECHNIQUE</td>
<td>SIGNIFICANT DIFFERENCES BETWEEN AREAS&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DEGREE OF ACCEPTABILITY IN DMU&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>FEBRUARY</td>
<td>NOVEMBER</td>
</tr>
<tr>
<td>Hire sharpshooters to shoot deer.</td>
<td>$X^2=24.74, 8\ df, p=0.002$</td>
<td>$X^2=25.25, 8\ df, p=0.001$</td>
</tr>
<tr>
<td>Allow regulated firearms hunting by licensed hunters.</td>
<td>$X^2=23.21, 8\ df, p=0.003$</td>
<td>$X^2=17.42, 8\ df, p=0.03$</td>
</tr>
<tr>
<td>Allow regulated bow and arrow hunting by licensed hunters.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Allow regulated hunting by selected, highly-qualified volunteer hunters.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Tranquilize deer using dart guns, and euthanize them with a lethal injection.</td>
<td>N.S.</td>
<td>$X^2=18.24, 8\ df, p=0.02$</td>
</tr>
<tr>
<td>Allow selective culling of deer at bait sites.</td>
<td>N.A.</td>
<td>$X^2=35.8, 8\ df, p=0.00002$</td>
</tr>
</tbody>
</table>

<sup>a</sup> N.S. = not significant; N.A. = not applicable, because item was not part of the February questionnaire.

<sup>b</sup> The samples were weighted depending on whether significant differences were detected between responses for the February and November questionnaires (Table 17) and the deer density areas (high, moderate, low) (Appendix F).
Table 19. Three dimensions of respondents’ acceptability of various deer management techniques, identified by factor analysis.

<table>
<thead>
<tr>
<th>FACTOR LABEL AND ITEMS</th>
<th>FACTOR LOADING</th>
<th>MEAN SCORE°</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Hunting Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulated bow and arrow hunting by licensed hunters</td>
<td>.85</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Regulated hunting by selected, highly-qualified volunteers</td>
<td>.77</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Regulated firearms hunting by licensed hunters</td>
<td>.85</td>
<td>1.8**</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Nonhunting Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research for birth control or sterilization techniques to reduce the number of fawns born(^b)</td>
<td>.40</td>
<td>2.8***</td>
<td>1.1</td>
</tr>
<tr>
<td>Deer farmers trap and transfer deer to farms for use in the venison industry</td>
<td>.71</td>
<td>2.2**</td>
<td>1.1</td>
</tr>
<tr>
<td>Selective culling of deer at bait sites</td>
<td>.69</td>
<td>2.2*</td>
<td>1.1</td>
</tr>
<tr>
<td>Sharpshooters shoot deer</td>
<td>.59</td>
<td>1.8***</td>
<td>1.1</td>
</tr>
<tr>
<td>Tranquilize deer using dart guns, and euthanize them with a lethal injection</td>
<td>.64</td>
<td>1.6***</td>
<td>0.96</td>
</tr>
<tr>
<td><strong>Natural Survival Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trap and transfer deer for release at another location</td>
<td>.77</td>
<td>2.6**</td>
<td>1.1</td>
</tr>
<tr>
<td>Reintroduce natural predators (e.g., wolves)</td>
<td>.59</td>
<td>1.4**</td>
<td>0.78</td>
</tr>
<tr>
<td><strong>Items Removed from Factor Analysis (low reliability)(^b)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educate property owners about fencing, repellents, and plant species that are less desirable food for deer</td>
<td></td>
<td>2.9***</td>
<td>1.1</td>
</tr>
<tr>
<td>Provide supplemental food for deer during winter</td>
<td></td>
<td>2.3***</td>
<td>1.1</td>
</tr>
<tr>
<td>Allow nature to take its course</td>
<td></td>
<td>2.1***</td>
<td>1.1</td>
</tr>
</tbody>
</table>

° Scores were derived from a 4-point scale, with 4 indicating extremely acceptable and 1 indicating not at all acceptable, and were weighted for the deer density area (high, medium, low) and the time of questionnaire implementation (February or November).
\(^b\) Dropping 3 items raised reliability from alpha = 0.4138 to alpha = 0.6254.
* = significant difference between deer density areas at $0.01 < p \leq 0.05$.
** = significant difference between deer density areas at $0.001 < p \leq 0.01$.
*** = significant difference between deer density areas at $p \leq 0.001$.

management classifications: hunting, nonhunting, and natural survival. Hunting management techniques involved lethal removal of deer by hunters either through bowhunting, firearms hunting, or selected volunteers. Most nonhunting management techniques were also lethal but were not employed by hunters. Birth control or sterilization of deer was the weakest item in this factor, and arguably is a lethal technique which controls future generations of deer. Natural survival management techniques relied on the environment for population control, such that deer are trapped and transferred to other locations, or predators are reintroduced to the area. Nonlethal techniques of educating property owners about methods to reduce deer damage, providing supplemental food for deer, and allowing nature to take its course, lowered the reliability of the scale and therefore were removed from analysis.

**Factors Influencing Choice of Deer Management Techniques**

**Underlying Considerations About Techniques**

We combined responses to the February and November questionnaires to assess the importance of several considerations in influencing attitudes about deer management techniques. A factor analysis of an 11-item scale indicated three dimensions: risks of deer to people, benefits of deer to people, and deer in the natural world (Table 20). When considering different deer management techniques, of most importance to people were the health and safety risks that deer cause to people, the suffering of deer, the health of the deer population, and the impact of the deer population on other plants and animals. Of least
Table 20. Three dimensions of important considerations that enter into respondents' attitudes toward deer management techniques, identified by factor analysis.

<table>
<thead>
<tr>
<th>FACTOR LABEL AND TOPIC LABEL</th>
<th>FACTOR LOADING</th>
<th>MEAN SCORE&lt;sup&gt;a&lt;/sup&gt;</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Risks of Deer to People</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health and safety risks</td>
<td>.58</td>
<td></td>
<td>3.5**</td>
</tr>
<tr>
<td>Economic costs to society</td>
<td>.83</td>
<td></td>
<td>2.9</td>
</tr>
<tr>
<td>Economic costs to individuals</td>
<td>.86</td>
<td></td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Benefits of Deer to People</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic benefits to society</td>
<td>.60</td>
<td></td>
<td>2.6</td>
</tr>
<tr>
<td>Economic benefits to individuals</td>
<td>.67</td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>Use of deer as a public resource</td>
<td>.82</td>
<td></td>
<td>2.4***</td>
</tr>
<tr>
<td>Recreational opportunities for hunters</td>
<td>.75</td>
<td></td>
<td>1.9*</td>
</tr>
<tr>
<td><strong>Deer In the Natural World</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy deer population</td>
<td></td>
<td>.81</td>
<td>3.3***</td>
</tr>
<tr>
<td>Diversity of plant and animal species in the DMU</td>
<td>.62</td>
<td>3.3</td>
<td>0.80</td>
</tr>
<tr>
<td>Suffering of deer</td>
<td>.71</td>
<td></td>
<td>3.5</td>
</tr>
<tr>
<td>Minimize human influence on deer</td>
<td>.57</td>
<td></td>
<td>2.6*</td>
</tr>
</tbody>
</table>

<sup>a</sup> Scores were derived from a 4-point scale, with 4 indicating extremely important and 1 indicating not at all important, weighted for the deer density area (high, medium, low) and the time of questionnaire implementation (February or November).

<sup>b</sup> Reliability of the scale was alpha = 0.7610.

* = significant difference between deer density areas at 0.01 < p ≤ 0.05.
** = significant difference between deer density areas at 0.001 < p ≤ 0.01.
*** = significant difference between deer density areas at p ≤ 0.001.
importance were the economic, public use, and recreational benefits that deer provide to people.

An assessment of changes in considerations between February and November (Table 21) indicated significant differences for two considerations. Percent responses changed slightly in November compared to February, with more respondents placing importance on health and safety issues in low deer density areas, and gravitating toward moderate or slight importance in minimizing human influence in high deer density areas.

The importance of considerations with regard to selecting deer management techniques varied between deer density areas for five of the considerations (Table 22). We adjusted the sample to weight for differences based on residence in deer density areas and time of questionnaire implementation. Changes in significance occurred between the February and November questionnaires. Respondents with property in various deer density areas became more uniform in their opinions regarding three deer management considerations in November, after the communication strategy was implemented. Results regarding degree of importance indicated many respondents considered minimizing the suffering of deer, maintaining a healthy deer population, and minimizing health and safety risks to people as extremely important when selecting a deer management technique. Maximizing recreational opportunities was not at all important to almost half (48%) the respondents. Maximizing economic benefits of deer and using deer as a public resource were of slight or no importance to over one-third of the respondents.

We assessed associations between the importance of underlying considerations with the respondent's acceptability of various deer management techniques (Table 23). We assessed unweighted responses, because this relationship was independent of the deer density level or time of questionnaire implementation. None of the correlations were
Table 21. Change in the importance of various considerations with regard to deer management techniques, reporting only management considerations with significant differences between February and November.

<table>
<thead>
<tr>
<th>DEER MANAGEMENT CONSIDERATION</th>
<th>AREA</th>
<th>SIG. DIFF.</th>
<th>TIME OF SURVEY</th>
<th>DEGREE OF IMPORTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimizes health and safety risks to people.</td>
<td>Low</td>
<td>$X^2=10.15$ 4 df; p=0.04</td>
<td>February</td>
<td>EXTREME 64% MODERATE 24% SLIGHT 7% NOT AT ALL 3% DON'T KNOW 2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>65% 25% 9% 0% 1%</td>
</tr>
<tr>
<td>Minimizes human influence on the deer population.</td>
<td>High</td>
<td>$X^2=12.53$ 4 df; p=0.01</td>
<td>February</td>
<td>24% 26% 23% 20% 7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>November</td>
<td>20% 30% 25% 16% 9%</td>
</tr>
</tbody>
</table>
Table 22. Importance of considerations relative to selecting a deer management technique, adjusted for significant differences between time of questionnaire implementation and deer density areas.

<table>
<thead>
<tr>
<th>DEER MANAGEMENT CONSIDERATION</th>
<th>SIGNIFICANT DIFFERENCES BETWEEN AREAS*</th>
<th>DEGREE OF IMPORTANCEb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEBRUARY</td>
<td>NOVEMBER</td>
</tr>
<tr>
<td>Maintains a healthy deer population.</td>
<td>$X^2=18.50$, 8 df, $p=0.02$</td>
<td>N.S.</td>
</tr>
<tr>
<td>Maintains a diversity of plant and animal species in the DMU.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Minimizes health and safety risks to people.</td>
<td>N.S.</td>
<td>$X^2=19.17$, 8 df, $p=0.01$</td>
</tr>
<tr>
<td>Minimizes the suffering of deer.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Minimizes human influence on the deer population.</td>
<td>$X^2=26.17$, 8 df, $p=0.001$</td>
<td>N.S.</td>
</tr>
<tr>
<td>Minimizes economic costs to society.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Minimize economic costs to individuals.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Maximizes economic benefits for society.</td>
<td>$X^2=16.14$, 8 df, $p=0.04$</td>
<td>N.S.</td>
</tr>
<tr>
<td>Maximizes economic benefits for individuals.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Maximizes the use of deer as a public resource.</td>
<td>$X^2=16.99$, 8 df, $p=0.03$</td>
<td>$X^2=17.62$, 8 df, $p=0.02$</td>
</tr>
<tr>
<td>Maximizes recreational opportunities for hunters.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>
a N.S. = not significant; N.A. = not applicable, because item was not part of the February questionnaire.

b The samples were weighted depending on whether significant differences were detected between responses for the February and November questionnaires (Table 19) and the deer density areas (high, moderate, low) (Appendix F).
Table 23. Correlation between acceptability of deer management techniques and importance of considerations associated with deer management techniques.

<table>
<thead>
<tr>
<th>ACCEPTABILITY OF DEER MANAGEMENT TECHNIQUES</th>
<th>IMPORTANCE OF CONSIDERATIONS*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HEALTH OF DEER HERD</td>
</tr>
<tr>
<td>Allow nature to take its course.</td>
<td>.22***</td>
</tr>
<tr>
<td>Reintroduce natural predators (e.g., wolves).</td>
<td>.04</td>
</tr>
<tr>
<td>Educate property owners about fencing, repellents and plant species that are less desirable food for deer.</td>
<td>.29***</td>
</tr>
<tr>
<td>Support research for birth control or sterilization techniques to reduce the number of fawns born.</td>
<td>.08*</td>
</tr>
<tr>
<td>Provide supplemental food for deer during winter.</td>
<td>.26***</td>
</tr>
<tr>
<td>Trap and transfer deer for release at another location.</td>
<td>&lt;-.01</td>
</tr>
<tr>
<td>Allow deer farmers to trap and transfer deer to farms for use in the venison industry.</td>
<td>.27***</td>
</tr>
<tr>
<td>Hire sharpshooters to shoot deer.</td>
<td>-.23***</td>
</tr>
<tr>
<td>Allow selective culling of deer at bait sites.</td>
<td>-.19**</td>
</tr>
<tr>
<td>Allow regulated firearms hunting by licensed hunters.</td>
<td>-.01</td>
</tr>
<tr>
<td>Allow regulated bow and arrow hunting by licensed hunters.</td>
<td>-.01</td>
</tr>
<tr>
<td>Allow regulated hunting by selected, highly qualified volunteer hunters</td>
<td>-.10**</td>
</tr>
<tr>
<td>Tranquilize deer using dart guns, and euthanize them with a lethal injection.</td>
<td>-.24***</td>
</tr>
</tbody>
</table>
Table 23 (continued).

<table>
<thead>
<tr>
<th>ACCEPTABILITY OF DEER MANAGEMENT TECHNIQUES</th>
<th>IMPORTANCE OF CONSIDERATIONS&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COSTS TO SOCIETY</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Allow nature to take its course.</td>
<td>-.11**</td>
</tr>
<tr>
<td>Reintroduce natural predators (e.g., wolves).</td>
<td>-.06</td>
</tr>
<tr>
<td>Educate property owners about fencing, repellents and plant species that are less desirable food for deer.</td>
<td>-.11**</td>
</tr>
<tr>
<td>Support research for birth control or sterilization techniques to reduce the number of fawns born.</td>
<td>-.08</td>
</tr>
<tr>
<td>Provide supplemental food for deer during winter.</td>
<td>-.11**</td>
</tr>
<tr>
<td>Trap and transfer deer for release at another location.</td>
<td>-.04</td>
</tr>
<tr>
<td>Allow deer farmers to trap and transfer deer to farms for use in the venison industry.</td>
<td>.13**</td>
</tr>
<tr>
<td>Hire sharpshooters to shoot deer.</td>
<td>.02</td>
</tr>
<tr>
<td>Allow selective culling of deer at bait sites.</td>
<td>.10</td>
</tr>
<tr>
<td>Allow regulated firearms hunting by licensed hunters.</td>
<td>.17***</td>
</tr>
<tr>
<td>Allow regulated bow and arrow hunting by licensed hunters.</td>
<td>.19***</td>
</tr>
<tr>
<td>Allow regulated hunting by selected, highly qualified volunteer hunters</td>
<td>.16***</td>
</tr>
<tr>
<td>Tranquilize deer using dart guns, and euthanize them with a lethal injection.</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>
Table 23 (continued).

<table>
<thead>
<tr>
<th>Acceptability of Deer Management Techniques</th>
<th>Importance of Considerations*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use of Deer as Public Resource</td>
</tr>
<tr>
<td>Allow nature to take its course.</td>
<td>-.05</td>
</tr>
<tr>
<td>Reintroduce natural predators (e.g., wolves).</td>
<td>-.02</td>
</tr>
<tr>
<td>Educate property owners about fencing, repellents and plant species that are less desirable food for deer.</td>
<td>-.05</td>
</tr>
<tr>
<td>Support research for birth control or sterilization techniques to reduce the number of fawns born.</td>
<td>-.11**</td>
</tr>
<tr>
<td>Provide supplemental food for deer during winter.</td>
<td>.05</td>
</tr>
<tr>
<td>Trap and transfer deer for release at another location.</td>
<td>-.13**</td>
</tr>
<tr>
<td>Allow deer farmers to trap and transfer deer to farms for use in the venison industry.</td>
<td>.05</td>
</tr>
<tr>
<td>Hire sharpshooters to shoot deer.</td>
<td>&lt;-.01</td>
</tr>
<tr>
<td>Allow selective culling of deer at bait sites.</td>
<td>.03</td>
</tr>
<tr>
<td>Allow regulated firearms hunting by licensed hunters.</td>
<td>.25***</td>
</tr>
<tr>
<td>Allow regulated bow and arrow hunting by licensed hunters.</td>
<td>.27***</td>
</tr>
<tr>
<td>Allow regulated hunting by selected, highly qualified volunteer hunters</td>
<td>.21***</td>
</tr>
<tr>
<td>Tranquilize deer using dart guns, and euthanize them with a lethal injection.</td>
<td>-.16***</td>
</tr>
</tbody>
</table>
a Respondents were asked the importance of each consideration when thinking about techniques used for managing deer in DMU 96.

* = significant difference between deer density areas at $0.01 < p \leq 0.05$.

** = significant difference between deer density areas at $0.001 < p \leq 0.01$.

*** = significant difference between deer density areas at $p \leq 0.001$. 
extremely strong (i.e., > .50), but many were significant, implying the presence of linear relationships. For many techniques, a relationship was evident between the importance of considerations and the acceptability of techniques.

Correlations between the importance of considerations and acceptability of management techniques were somewhat related to whether the outcomes were lethal or a nonlethal/natural existence for deer. Of the 10 considerations listed, the importance of minimizing human influence on the deer population was significantly associated with every deer management technique listed. Minimizing human influence on the deer population was negatively correlated with the acceptability of techniques resulting in lethal removal of deer, and positively correlated with the acceptability of techniques resulting in a nonlethal/natural existence for deer. A similar finding was noted for those concerned about minimizing the suffering of deer. Respondents who were more accepting of lethal management techniques indicated that important considerations were economic costs and benefits to individuals and society, the use of deer as a public resource, and hunting opportunities.

Attitudes and Values Toward Deer

We analyzed the attitudes and values of respondents toward deer using a modified version of the Wildlife Attitudes and Values Scale (Purdy and Decker 1989). A factor analysis of responses to the scale indicated four dimensions (Table 24) which were similar to those found in other studies (Purdy and Decker 1989). Strong agreement was associated with social benefits derived from the ecological, educational, existence, and artistic values of deer. Respondents from areas with high, moderate, and low deer densities were more uniform in their attitudes and values about these social benefits. Significant differences were detected between deer density strata for the other three factors. Many respondents placed little or no
Table 24. Four dimensions of respondents' attitudes toward deer, identified by factor analysis.

<table>
<thead>
<tr>
<th>FACTOR LABEL AND TOPIC LABEL&lt;sup&gt;a&lt;/sup&gt;</th>
<th>FACTOR LOADING</th>
<th>MEAN SCORE&lt;sup&gt;b&lt;/sup&gt;</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Social Benefits B</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existence value</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecological value</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational value</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artistic value</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social Benefits A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deer behavior value</td>
<td>.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversational value</td>
<td>.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observational value</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social action value</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Problem Acceptance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental quality value</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuisance problems</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety risks</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damage problems</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease transmission</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Traditional Conservation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustained harvest value</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic benefit value</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunting (food) value</td>
<td>.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunting (recreation) value</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Items were modified from the Wildlife Attitudes and Values Scale (Purdy and Decker 1989a).

<sup>b</sup> Scores were derived from a 5-point scale, with 5 indicating strong agreement and 1 indicating strong disagreement, and were weighted for the deer density area (high, medium, low) and the time of questionnaire implementation (February or November).
Table 24 (continued).

○ Reliability of the scale was alpha = 0.8344

* = significant difference between deer density areas at 0.01 < p ≤ 0.05.
** = significant difference between deer density areas at 0.001 < p ≤ 0.01.
*** = significant difference between deer density areas at p ≤ 0.001.

personal importance on hunting deer for food and recreation, regardless of the deer density area in which they owned property.

Believability of Information Sources

In DMU 96 a variety of government and nongovernment, state and local agencies and organizations conveyed information about deer and deer management techniques. We asked respondents to assess how believable various information sources were with regard to options for deer management. These communications could influence the attitudes and opinions of people about deer management techniques in the DMU, especially those who hold no opinion about which technique is more appropriate for their community.

Respondents indicated the most believable sources of information were Cornell Cooperative Extension, the state deer management agency, and the U.S. Fish and Wildlife Service (Table 25). Local government officials, newspaper reporters, activists and homeowners groups tended to be less believable to respondents than other information sources. A factor analysis of the information sources indicated five dimensions of agencies and organizations related to deer management techniques: state and national agencies, local organizations and government A and B, local activist groups, and local homeowners groups. Significant differences were found between respondents from areas with higher, moderate, and lower deer densities when rating primarily local government agencies, activist groups, and homeowners associations.
Table 25. Five dimensions of respondents' believability of information sources about deer management techniques, identified by factor analysis.

<table>
<thead>
<tr>
<th>FACTOR LABEL AND ITEMS</th>
<th>FACTOR LOADING</th>
<th>MEAN SCORE*</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>State and National Agencies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cornell Cooperative Extension</td>
<td>.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NYSDEC, Bureau of Wildlife</td>
<td>.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Fish and Wildlife Service</td>
<td>.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local Organizations/Government A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe Co. Conservation Council</td>
<td>.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center for Environmental Information</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe Co. Farm Bureau</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMU 96 Citizen Task Force</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Management Council</td>
<td>.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local sportsmen’s club</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local Organizations/Government B</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humane Society of Rochester and Monroe Co.</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local nature center</td>
<td>.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University scientist</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe Co. Parks Department</td>
<td>.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Town government</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe County government</td>
<td>.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspaper reporters or writers</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local Activist Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe Co. Alliance for Wildlife Protection</td>
<td></td>
<td>.69</td>
<td></td>
</tr>
</tbody>
</table>
Table 25 (continued).

<table>
<thead>
<tr>
<th>FACTOR LABEL AND ITEMS</th>
<th>FACTOR LOADING</th>
<th>MEAN SCORE</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Save Our Deer</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local environmental organization</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local animal rights association</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local Homeowners Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irondequoit Deer Action Committee</td>
<td></td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>Local homeowners association</td>
<td></td>
<td>.73</td>
<td></td>
</tr>
</tbody>
</table>

* Scores were derived from a 4-point scale, with 4 indicating extremely believable and 1 indicating not at all believable.

b Reliability of the scale was alpha = 0.9411

* = significant difference between deer density areas at 0.01 < p ≤ 0.05.
** = significant difference between deer density areas at 0.001 < p ≤ 0.01.
*** = significant difference between deer density areas at p ≤ 0.001.

We found little evidence to support that changes in attitudes and opinions about information sources had occurred between February and November. No significant differences were detected between responses to the February and November questionnaires from respondents in areas with high, moderate, and low deer densities in their perceptions of the state deer management agency regarding its importance or believability as a communication channel. No change was evident in respondents who (1) would contact the DEC first about deer-related issues, (2) considered DEC the best information source, or (3) contacted a wildlife biologist to make their opinions known.

Of particular interest is the believability of the CTF to respondents after recommending deer management techniques. The CTF served as the cornerstone of the communication
plan implemented by the state deer management agency. Results imply that over half (54%) of the respondents did not know enough about the CTF to assess its believability as an information source (Table 26). However, CTF members were an extremely or moderately important source of information for one-fourth (25%) of the respondents from high deer density areas.

Table 26. Believability and importance of the Citizen Task Force (CTF) and its members as information sources about options for managing deer to respondents of the November questionnaire who own property in areas with various deer densities (high, moderate, low).

<table>
<thead>
<tr>
<th>DEGREE OF AGREEMENT</th>
<th>BELIEVABILITY OF CTF AS AN INFORMATION SOURCEa</th>
<th>IMPORTANCE OF CTF MEMBERS AS INFORMATION SOURCESb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>EXTREMELY</td>
<td>4%</td>
<td>11%</td>
</tr>
<tr>
<td>MODERATELY</td>
<td>13%</td>
<td>15%</td>
</tr>
<tr>
<td>SLIGHTLY</td>
<td>20%</td>
<td>26%</td>
</tr>
<tr>
<td>NOT AT ALL</td>
<td>9%</td>
<td>27%</td>
</tr>
<tr>
<td>DON'T KNOW</td>
<td>54%</td>
<td>21%</td>
</tr>
</tbody>
</table>

a No significant differences were detected when analyzing respondents living in areas with various deer densities.

b Significant differences were detected between respondents living in areas with relatively high, moderate and low deer densities, whereas $X^2 = 30.10, 8$ df, $p = 0.0002$.

Role of Communications

Identifying Communication Channels

For a communication plan to be effective, the message must be received through a communication channel. A factor analysis indicated communication channels could be grouped into four dimensions: formal and agency networks, mass media, local leaders, and
informal networks (Table 27). Mean scores from respondents indicated none of these communication channels were extremely or moderately important in helping respondents learn about deer management techniques. It is unclear whether the list of communication channels was inadequate, or that respondents lacked interest in learning about deer through these communication channels.

Significant differences were detected in the importance of three information sources for respondents living in areas with high, moderate, or low deer density. A deer-related workshop, seminar, or forum was slightly more important to those residing in areas with high deer densities ($\bar{X} = 2.29$, s.d. = 1.10) than those living in areas with moderate ($\bar{X} = 1.96$, s.d. = 1.09) and low ($\bar{X} = 2.12$, s.d. = 1.11) deer density areas. Local nongovernment citizens groups were more important information sources to respondents in areas with high deer densities ($\bar{X} = 2.30$, s.d. = 1.05) than those from areas with moderate ($\bar{X} = 1.76$, s.d. = 0.80) and low ($\bar{X} = 1.78$, s.d. = 0.83) deer densities. The importance of CTF members as an information source was discussed in the previous section (Table 26).

Respondents were asked which information source would be the best way for the wildlife management agency to distribute information about deer management options to them. Most indicated information from mass media sources, such as newspaper articles or editorials (41%) and television or radio reports (18%), were the best avenues for communicating information. Some reported that communication from the wildlife management agency (11%) would be the best way for them to receive information.

**Portrayal of Deer Population Issues by Local Newspapers**

Our content analysis of newspapers produced a total of 180 articles. More articles were from the *Rochester Democrat and Chronicle* (50%) than the *Irondequoit Free Press* (32%) and the *Rochester Times Union* (16%) (Table 28). The *Democrat and Chronicle*
Table 27. Four dimensions of important information sources in helping respondents learn about deer management techniques, identified by factor analysis.

<table>
<thead>
<tr>
<th>FACTOR LABEL AND ITEM</th>
<th>FACTOR LOADING</th>
<th>MEAN SCORE*</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Formal Agency Networks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NYSDEC</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cornell Cooperative Extension</td>
<td>.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deer-related workshop, seminar, or forum</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humane Society of Rochester and Monroe County</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mass Media</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspaper articles or editorials</td>
<td>.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television or radio reports</td>
<td>.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magazine articles</td>
<td>.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local Leaders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local government (county or town)</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local citizens group (nongovernment)</td>
<td>.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citizen Task Force members</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Informal Networks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family and/or friends who hunt deer</td>
<td>.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family and/or friends who do not hunt deer</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Scores were derived from a 4-point scale, with 4 indicating extremely important and 1 indicating not at all important.

b Reliability of the scale was alpha = 0.7918

* = significant difference between deer density areas at 0.01 < p ≤ 0.05.
** = significant difference between deer density areas at 0.001 < p ≤ 0.01.
*** = significant difference between deer density areas at p ≤ 0.001.
(circulation 130,000 to 260,000) was a daily morning newspaper, the *Times Union* (circulation 83,000) was a daily evening newspaper, and the *Irondequoit Free Press* (circulation 8,000) was a weekly newspaper.

Most articles that we analyzed were news stories focusing on deer and deer management in Irondequoit (28%) or Rochester (19%), or letters to the editor concerning Irondequoit (19%) (Table 29). A minimum of 55 letters to the editor about deer and deer management were published during 1992.

The theme of many articles was deer population management techniques (45%) and the controversy surrounding management of the deer population (43%) (Table 30). For example, headlines of articles were:

*Residents Scold Town Over Deer (5/20/92)*

*IDAC Holds Town Responsible For Deer Incidents (6/1/92)*

*Deer Kill Plan Fans Debate (9/4/92)*

*Board To Take Action On Longstanding Deer Issue (9/21/92)*

*Speaking Out: The Deer Controversy (10/13/92)*

*A Year of Controversy, Accomplishment: Residents Speak on Development, Deer, Town Finances (12/21/92)*

*Wildlife Group Urges King To Oppose Bait And Shoot (12/31/92)*

Secondary themes were problems associated with deer (52%) and increasing knowledge about deer biology and management (47%). Fewer articles focused on mechanisms or methods to reduce deer damage (22%), or the benefits of deer (26%). An exception was that periodically, articles were published to focus attention on avoidance techniques for deer-car accidents. Only about 18% of the articles mentioned the CTF; however, these articles tended to be greater in length (20.8 inches) than other articles (Table 30).
Table 28. Number and percent of articles from three Rochester newspapers.

<table>
<thead>
<tr>
<th>NAME OF NEWSPAPER</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rochester Democrat and Chronicle</td>
<td>90</td>
<td>50</td>
</tr>
<tr>
<td>Irondequoit Free Press</td>
<td>58</td>
<td>32</td>
</tr>
<tr>
<td>Rochester Times Union</td>
<td>29</td>
<td>16</td>
</tr>
<tr>
<td>Unknown Rochester paper</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>180</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 29. Type of article and geographic scope (n=179).

<table>
<thead>
<tr>
<th>TYPE OF ARTICLE</th>
<th>SCOPE OF ARTICLE (frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National</td>
</tr>
<tr>
<td>News</td>
<td>2</td>
</tr>
<tr>
<td>Editorial or columnist</td>
<td>1</td>
</tr>
<tr>
<td>Letter to the editor</td>
<td>0</td>
</tr>
<tr>
<td>Cartoon</td>
<td>0</td>
</tr>
<tr>
<td>Meeting announcement</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 30. Extent to which article presented information about deer management (n=180).

<table>
<thead>
<tr>
<th>TOPIC OF ARTICLE</th>
<th>RATING (Percent of Articles)</th>
<th>MEAN LENGTH IN INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRIMARY</td>
<td>SECONDARY</td>
</tr>
<tr>
<td>DEER POPULATION MANAGEMENT TECHNIQUES—e.g., contraception, trap and transfer,</td>
<td>45</td>
<td>27</td>
</tr>
<tr>
<td>selective culling, bow hunting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONTROVERSY—conflict, difference of opinion between people, organizations, and/or</td>
<td>43</td>
<td>27</td>
</tr>
<tr>
<td>politicians, election campaigns, personal attacks on character.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROBLEMS ASSOCIATED WITH DEER—e.g., report about a person hurt in a deer-vehicle</td>
<td>18</td>
<td>52</td>
</tr>
<tr>
<td>accident, deer crashing through windows, potential for transmitting Lyme disease,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>poor hunter ethics, poaching.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEER BIOLOGY AND MANAGEMENT—e.g., habitat, food, deer behavior, ranges, measuring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>size of deer herd, population census, helicopter counts.</td>
<td>15</td>
<td>47</td>
</tr>
<tr>
<td>MECHANISMS OR METHODS TO REDUCE LOCALIZED DEER DAMAGE PROBLEMS—e.g., deer</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>whistles, roadside reflectors, repellents, less desirable plant species.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CITIZEN TASK FORCE—e.g., composition of membership, recommendation for selective</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>culling over bait. (May be referred to as task force, citizen advisory committee,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or some other name.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BENEFITS OF DEER—e.g., economics, aesthetics, existence value, venison for</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>charities.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Over three-fourths (77%) of the articles reported stakeholders' interests and concerns about deer (Table 31). Deer-vehicle accidents received the most news coverage of these types of articles (71%). For example, an article headed "Car-Deer Crashes Prompt Shoot Plan" included the following:

Town board member Dan Aureli yesterday announced he will push for a bait-end-shoot program in Durand Eastman Park to reduce the risk of car accidents with deer. (8/4/92)

Hunting-related topics, such as unethical hunter behavior, threats to safety, and opposition to hunting, received a significant amount of news coverage (24%). Damage to yard plantings (29%), issues about animal welfare (24%), and the aesthetic appeal of deer (19%) tended to be a secondary focus of the articles.

Many newspaper articles portrayed the position of organizations about deer management techniques (Table 32). Most articles indicated the CTF supported plans to selectively cull deer for Irondequoit, whereas fewer articles reported the CTF supported birth control (i.e., immunococontraception as a long term solution). The newspapers coined the term "bait and shoot" to describe the CTF's selective culling plan. Only one article referred to the CTF's recommendation of archery hunting for most of DMU 96. This confirms previous findings in which the theme of many articles focused on the controversy generated, rather than the substance of the deer management recommendations.

Newspapers indicated DEC supported licensed archery hunting, hiring sharpshooters, licensed firearms hunting and hunting in general. DEC was reported to oppose trapping and transferring deer to venison farms, allowing nature to take its course, and birth control techniques to manage the deer population.
Table 31. Stakeholders' interests and concerns presented in newspaper articles.\(^a\)

<table>
<thead>
<tr>
<th>STAKEHOLDERS' INTERESTS AND CONCERNS</th>
<th>PERCENT(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
</tr>
<tr>
<td>Deer-vehicle accidents</td>
<td>11</td>
</tr>
<tr>
<td>Safety threats from firearm use and abuse, increased poaching, poor hunter ethics</td>
<td>4</td>
</tr>
<tr>
<td>Lyme disease transmission</td>
<td>4</td>
</tr>
<tr>
<td>Damage to yard plantings, flowers, shrubs</td>
<td>1</td>
</tr>
<tr>
<td>Concern for animal welfare, suffering of deer</td>
<td>1</td>
</tr>
<tr>
<td>Anti-hunting, philosophical opposition to killing deer</td>
<td>1</td>
</tr>
<tr>
<td>Appreciation for aesthetic appeal and beauty of deer</td>
<td>0</td>
</tr>
<tr>
<td>Damage to vegetable gardens</td>
<td>0</td>
</tr>
<tr>
<td>Damage to plant species in the county parks and other undeveloped areas, concern for ecological balance</td>
<td>0</td>
</tr>
<tr>
<td>Support for deer-related businesses and tourism</td>
<td>0</td>
</tr>
<tr>
<td>Purposefully attract deer to homes, feed deer</td>
<td>0</td>
</tr>
<tr>
<td>Reverence for the environment, nature appreciation, deer here first therefore people should tolerate deer</td>
<td>0</td>
</tr>
<tr>
<td>Rabies transmission</td>
<td>0</td>
</tr>
</tbody>
</table>

\(^a\)About 2/3 of articles (n=139, 77\%) mentioned one or more stakeholder interests or concerns.

\(^b\)Assessment based on whether stakeholders' interests and concerns were the focus of the article (primary) or supplemented an alternative topic (secondary).
Table 32. Newspaper accounts referring to organizations and their position toward deer management techniques (n=180).

<table>
<thead>
<tr>
<th>DEER MANAGEMENT TECHNIQUES</th>
<th>NUMBER OF ARTICLES INDICATING SUPPORT (S), OPPOSITION (O), OR NEUTRALITY (N) OF ORGANIZATIONS TOWARD TECHNIQUES*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CTF</td>
</tr>
<tr>
<td>Allow nature to take its course, no action</td>
<td></td>
</tr>
<tr>
<td>Birth control or sterilization</td>
<td>S=9</td>
</tr>
<tr>
<td>Trap &amp; transfer to another location</td>
<td>N=1</td>
</tr>
<tr>
<td>Trap &amp; transfer to venison farm</td>
<td>O=6</td>
</tr>
<tr>
<td>Hire sharpshooters</td>
<td>S=2</td>
</tr>
<tr>
<td>Bait and shoot, selectively cull over bait sites</td>
<td>S=30</td>
</tr>
<tr>
<td>Licensed firearm hunters</td>
<td>S=1</td>
</tr>
<tr>
<td>Licensed archery hunters</td>
<td>S=1</td>
</tr>
<tr>
<td>Selected, highly qualified volunteer hunters</td>
<td>N=1</td>
</tr>
<tr>
<td>Hunting in general</td>
<td>S=1</td>
</tr>
<tr>
<td>Lethal injection</td>
<td>S=1</td>
</tr>
<tr>
<td>Education to reduce deer-related vehicle accidents</td>
<td>S=1</td>
</tr>
<tr>
<td>Education to reduce property damage including plants, homes, and vehicles</td>
<td>S=2</td>
</tr>
<tr>
<td>DEER MANAGEMENT TECHNIQUES</td>
<td>NUMBER OF ARTICLES INDICATING SUPPORT (S), OPPOSITION (O), OR NEUTRALITY (N) OF ORGANIZATIONS TOWARD TECHNIQUES*</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>CTF</td>
</tr>
<tr>
<td>More research</td>
<td></td>
</tr>
</tbody>
</table>

* CTF=Citizen Task Force, DEC=Dept. of Environmental Conservation and other wildlife professionals, HSRMC=Humane Society of Rochester and Monroe County, IDAC=Irondequoit Deer Action Committee, MCAWP=Monroe County Alliance for Wildlife Protection, SOD=Save Our Deer.

* Shaded areas indicate 10 or more newspaper references about organizations and opinions about deer management techniques.
Newspapers reported both the "Irondequoit Deer Action Committee" and local government supported the "bait-and-shoot" plan, whereas the "Monroe County Alliance for Wildlife Protection" and "Save Our Deer" opposed bait-and-shoot. An article reported:

Laramie Brown, IDAC chairwoman and former DMU 96 member, said she believes the entire community is happy with the decision, with the exception of a few. She said the bait-and-shoot plan is one of three recommendations IDAC made to the town board in June, 1991. "There are far too many deer/car accidents, and devastation to the park and people's property to sit back and do nothing," she said Friday. "The intent is to have deer killed humanely in the park than inhumanely, costly, and dangerously at people's bumpers." (9/7/92)

The "Alliance" was characterized as supporting birth control techniques (as both a short- and long-term solution), increased public safety and education, and additional research about the deer in Irondequoit. The "Alliance" was portrayed as opposing trapping and transferring deer, and hunting in general. "Save Our Deer" was characterized as approving birth control techniques, but opposing the "bait and shoot" proposal because of a lack of data about the size of the deer population. When discussing the "bait and shoot" plan:

Marianne Haas, co-chair of the Save Our Deer group, said she believes Aureli's plan "puts the cart before the horse." "Why is there the urgency to shoot X number of deer when we don't know how many are in the park?" she asked. Haas said the Spring census figure of 130 is the only firm figure to work with. Any other numbers are "speculative, exaggerated, and personal opinion." Haas said the group firmly supports a deer contraception plan, the likes of which could be implemented this Fall..."Irondequoit can be in the forefront of exciting, fast-developing technology," Haas said. "Save Our Deer believes this is the only proper long-term solution. It is a real solution." (8/10/92)

The Humane Society received little coverage, with only a few citations indicating that they opposed the "bait-and-shoot" plan. The Humane Society was the only organization characterized as supporting lethal injection of deer. Newspapers also published editorials about the deer management issue, in which most supported the "bait-and-shoot" plan.
We also assessed newspapers' portrayal of what people considered important when defending or opposing particular deer management techniques (Table 33). Those who supported birth control indicated the technique would maintain a healthy deer population, minimize the health and safety risks that deer cause to people, and was a humane treatment of deer. Supporters indicated that birth control also minimized economic costs, although some did not agree.

Newspapers indicated those supporting the bait-and-shoot plan believed in the same benefits as those supporting birth control—that is, bait-and-shoot would maintain a healthy deer herd, minimize health and safety risks to people, and was a humane treatment of deer. But, newspapers reported opposition to "baiting and shooting" based on these same considerations. Newspapers reported more supporters of the "bait-and-shoot" plan disagreed that people should tolerate deer and that deer have rights like people, compared to those supporting birth control. A few more quotes favored the effectiveness of birth control compared to "baiting-and-shooting" deer.

Newspapers quoted many people about their support for or opposition to deer management techniques in 1992. However, a few people were quoted ten or more times (Table 34). These tended to be representatives of local grassroots organizations and local government officials. The person quoted most often was a spokesperson for the "Monroe County Alliance for Wildlife Protection," who was also a CTF member. People quoted most often were Irondequoit residents who did not indicate an affiliation with an animal-related organization, and local government officials (Table 35). Although only three "Alliance" and seven "Deer Action Committee" members were quoted, these members were quoted a substantial number of times.
Table 33. People’s most important consideration about deer compared to the deer management technique as presented in newspapers.

<table>
<thead>
<tr>
<th>IMPORTANT CONSIDERATION</th>
<th>BIRTH CONTROL</th>
<th>TRAP &amp; RELOCATE</th>
<th>TRAP &amp; FARM</th>
<th>SHARP SHOOT</th>
<th>BAIT &amp; SHOOT’</th>
<th>FIREARM HUNT</th>
<th>BOWHUNT</th>
<th>CONTROL HUNT</th>
<th>ANY HUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>maintain (healthy) deer population</td>
<td>S=8, O=1</td>
<td>S=2, O=7</td>
<td>S=2, O=1</td>
<td>S=1</td>
<td>S=12, O=6, N=1</td>
<td>O=1</td>
<td>S=5</td>
<td>S=1, O=4</td>
<td></td>
</tr>
<tr>
<td>maintain diversity of plants and animals</td>
<td></td>
<td>S=2</td>
<td>S=2, O=1</td>
<td>O=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize health and safety risks to people</td>
<td>S=6, O=1, N=1</td>
<td>S=3</td>
<td>S=1, N=1</td>
<td>S=20, O=13, N=2</td>
<td>O=1</td>
<td>S=1, O=3, N=1</td>
<td>S=1</td>
<td>S=1, O=2</td>
<td></td>
</tr>
<tr>
<td>minimize suffering of deer (i.e., humane treatment)</td>
<td>S=18, N=1</td>
<td>S=7, O=1</td>
<td>S=1, O=2</td>
<td>S=12, O=6</td>
<td></td>
<td>S=1, O=1</td>
<td>O=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize human influence on deer population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize economic costs</td>
<td>S=6, O=3</td>
<td>S=2, O=4</td>
<td>S=3, O=1</td>
<td>S=18, O=1</td>
<td>S=2</td>
<td>S=1</td>
<td>S=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maximize economic benefits</td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maximize use of deer as public resource (e.g., venison for charity)</td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S=1</td>
<td></td>
</tr>
<tr>
<td>maximize recreational opportunities for hunters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O=7, N=3</td>
<td></td>
<td></td>
<td>O=1</td>
<td></td>
</tr>
<tr>
<td>maximize people’s tolerance for deer damage (e.g., deer here first)</td>
<td>S=3, O=1</td>
<td></td>
<td></td>
<td></td>
<td>O=4</td>
<td></td>
<td></td>
<td>O=2</td>
<td></td>
</tr>
<tr>
<td>maximize respect for life (animal rights)</td>
<td>S=2, O=1</td>
<td>S=2</td>
<td>O=3</td>
<td>S=19, O=9</td>
<td></td>
<td></td>
<td></td>
<td>O=2</td>
<td></td>
</tr>
<tr>
<td>protect wilderness or naturalness of deer</td>
<td>S=3, O=1</td>
<td></td>
<td></td>
<td></td>
<td>O=3</td>
<td></td>
<td></td>
<td>S=1</td>
<td></td>
</tr>
<tr>
<td>effectiveness or ineffectiveness of technique</td>
<td>S=16, O=13, N=2</td>
<td>O=4</td>
<td>S=1, O=1</td>
<td>S=15, O=16</td>
<td>S=2, O=5</td>
<td>S=1</td>
<td>S=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>S=1, O=1</td>
<td>S=2, O=2</td>
<td></td>
<td>S=1, O=3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMPORTANT CONSIDERATION</td>
<td>NATURE</td>
<td>PREDATOR</td>
<td>FEED DEER</td>
<td>LETHAL INJECT</td>
<td>AVOID DEER-CAR</td>
<td>EDUCATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>--------</td>
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<td>---------------</td>
<td>----------------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maintain (healthy) deer population</td>
<td>S=3</td>
<td>S=1</td>
<td></td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maintain diversity of plants and animals</td>
<td></td>
<td>S=1</td>
<td></td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize health and safety risks to people</td>
<td>O=1</td>
<td>S=1</td>
<td></td>
<td>S=1</td>
<td></td>
<td>S=40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize suffering of deer (i.e., humane treatment)</td>
<td>O=1</td>
<td>S=1</td>
<td></td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize human influence on deer population</td>
<td>S=2</td>
<td></td>
<td></td>
<td>S=3</td>
<td>O=4</td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimize economic costs</td>
<td>O=1</td>
<td>S=1</td>
<td></td>
<td></td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maximize economic benefits</td>
<td></td>
<td></td>
<td></td>
<td>S=1</td>
<td></td>
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<tr>
<td>maximize use of deer as public resource (e.g., venison for</td>
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<tr>
<td>maximize recreational opportunities for hunters</td>
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<tr>
<td>maximize people's tolerance for deer damage (e.g., deer</td>
<td>S=1</td>
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<tr>
<td>maximize respect for life (animal rights)</td>
<td>S=1</td>
<td></td>
<td></td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>protect wilderness or naturalness of deer</td>
<td>S=1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>effectiveness or ineffectiveness of technique</td>
<td></td>
<td></td>
<td></td>
<td>O=18</td>
<td>O=1</td>
<td></td>
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<td></td>
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<tr>
<td>other</td>
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<td></td>
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</tr>
</tbody>
</table>

* BIRTH CONTROL = contraception or sterilization of deer, TRAP & REDUCE = trap and transfer to another location, TRAP & FARM = trap and transfer to venison farm, SHARPSHOOT = hire sharpshooters, BAIT & SHOOT = cull or shoot deer over bait sites, FIREARM HUNT = licensed firearm hunters, BOWHUNT = licensed archery hunters, CONTROL HUNT = select and monitor volunteer hunters, ANY HUNT = hunting in general

* NATURE = allow nature to take its course, PREDATOR = introduce natural predators, FEED DEER = provide supplemental food, LETHAL INJECT = shoot deer with a lethal injection of a drug, AVOID DEER-CAR = install mechanisms to reduce deer-car accidents, e.g., Swareflex reflectors, deer whistles or sirens, EDUCATE = educate motorists or homeowners about avoiding or tolerating deer damage.
Table 34. People quoted ten or more times in Rochester newspapers regarding deer management techniques during 1992.

<table>
<thead>
<tr>
<th>NAME OF PERSON QUOTED</th>
<th>AFFILIATION</th>
<th>NUMBER OF QUOTATIONS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy Baker</td>
<td>Monroe Co. Alliance for Wildlife Protection, member of Citizen Task Force</td>
<td>45</td>
</tr>
<tr>
<td>Dan Aureli</td>
<td>Irondequoit Town Councilman</td>
<td>29</td>
</tr>
<tr>
<td>Laramie Brown</td>
<td>Irondequoit Deer Action Committee</td>
<td>28</td>
</tr>
<tr>
<td>Mary Ambrose</td>
<td>Resident</td>
<td>20</td>
</tr>
<tr>
<td>Fred Lappel</td>
<td>Irondequoit Town Supervisor</td>
<td>20</td>
</tr>
<tr>
<td>Rick Blevins</td>
<td>Brighton Homeowners Association, member of Citizen Task Force</td>
<td>19</td>
</tr>
<tr>
<td>Bob Brown</td>
<td>Irondequoit Deer Action Committee</td>
<td>14</td>
</tr>
<tr>
<td>Dorothy Louis</td>
<td>Resident</td>
<td>12</td>
</tr>
<tr>
<td>Mary Ann Haas</td>
<td>Save Our Deer</td>
<td>10</td>
</tr>
</tbody>
</table>

*Number of times a person was quoted about a deer management technique, e.g., one person may have been quoted about hunting and contraception for deer within one article. This would be counted as two quotations.
Table 35. Affiliation of people quoted in Rochester newspapers about deer management techniques during 1992.

<table>
<thead>
<tr>
<th>AFFILIATION</th>
<th>NUMBER OF PEOPLE QUOTED</th>
<th>NUMBER OF QUOTATIONS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irondequoit resident</td>
<td>33</td>
<td>73</td>
</tr>
<tr>
<td>Local government official</td>
<td>14</td>
<td>87</td>
</tr>
<tr>
<td>Rochester resident</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>Irondequoit Deer Action Committee member</td>
<td>7</td>
<td>58</td>
</tr>
<tr>
<td>Save Our Deer member</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Brighton resident</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Newspaper writer</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Monroe County Alliance for Wildlife Protection member</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>DEC wildlife professional</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

* Number of times a person linked with an affiliation in the article was quoted about a deer management technique, e.g., a person may be quoted once while another person with the same affiliation may be quoted 15 times.

Portraiture of CTF Recommendations by Local Television News

We analyzed television broadcasts that were aired during the local news the day that the CTF held a press conference and announced its recommendations (Table 36). (A search indicated no other broadcasts were aired the following day.) One of the primary themes evident in each broadcast was the controversy generated by part of the CTF’s recommendations to selectively cull deer over bait in the town of Irondequoit. Reporters stated:

It’s hard to find anyone in Irondequoit who doesn’t feel passionately about the deer, one way or another. (Channel 9)

Homeowners and wildlife advocates have butted heads over this issue for quite some time. (Channel 8)
The final question on whether the task force recommendations will be adopted will be made by county legislators, most likely after much more debate and controversy. (Channel 8)

Table 36. Description of television broadcasts about the press conference held by the Citizen Task Force.

<table>
<thead>
<tr>
<th>Station</th>
<th>Time of Day</th>
<th>Duration of Segment (in seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>noon</td>
<td>42</td>
</tr>
<tr>
<td>8</td>
<td>evening</td>
<td>110</td>
</tr>
<tr>
<td>8</td>
<td>night</td>
<td>47</td>
</tr>
<tr>
<td>9</td>
<td>night</td>
<td>110</td>
</tr>
<tr>
<td>10</td>
<td>noon</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>evening</td>
<td>61</td>
</tr>
<tr>
<td>10</td>
<td>evening</td>
<td>100</td>
</tr>
<tr>
<td>13</td>
<td>noon</td>
<td>104</td>
</tr>
<tr>
<td>13</td>
<td>evening</td>
<td>43</td>
</tr>
<tr>
<td>13</td>
<td>evening</td>
<td>141</td>
</tr>
<tr>
<td>13</td>
<td>night</td>
<td>53</td>
</tr>
</tbody>
</table>

*Total time is 829 seconds = 13 minutes, 49 seconds.

The focus of the controversy was the short-term deer management option recommended for Irondequoit. Reporters invented phrases such as "bait and shoot," "lure and kill," and "shoot to kill" to describe the CTF's recommendation for selectively culling deer over bait. One reporter stated,

The term is "selective culling"—it's a fancy way of saying "shoot to kill." That's the recommendation of a task force created to solve the deer population problem in Durand Eastman Park. The killings would take place under controlled circumstances to help ensure safety. But as Bill Murray reports, some are concerned that there are no guarantees.... (Channel 13)
Other evidence indicated that reporters did not provide viewers with the complete story, perhaps to enhance the impression of conflict in the community. With few exceptions, reporters did not present other, less controversial CTF recommendations, i.e., to continue archery hunting for most of the unit, and the long-term solution of contraception for deer in Irondequoit. Yet, contraception was a management option that people on both sides of the issue agreed should be implemented. Reporters provided misinformation at the expense of the CTF's credibility. For example, one reporter indicated:

Ten of the eleven members decided bait and shoot was the best option over sterilization, trap and transfer, or making it legal to hunt in Irondequoit for the first time in sixteen years. Sandy Baker is the only black sheep of the deer issue who voted for contraceptive control. (Channel 13)

While it is true that the CTF recommended "bait and shoot" rather than contraception as a short-term solution, the CTF did recommend that contraception be used as a long-term solution once the technology became available. The underlying conflict was each side's perception of contraception's availability for application in Durand Eastman Park. The majority of task force members believed that contraception would be available in the future, but was currently unavailable except on an experimental basis. Those opposed to "bait and shoot" believed contraception technology was available for immediate application in the park. By overlooking this debate, reporters misinformed the public about the CTF's recommended long-term solution for Irondequoit.

Some information presented in the reports clearly was not the intent of the press conference. The composition of the CTF was reported by some as a panel comprised of "environmental officials" and "area residents." Instead, "environmental officials" from the state, county and town governments served as technical experts and advisors to CTF members.
One station in particular reported "DEC's recommendations" instead of the "CTF's recommendations" for Irondequoit. Channel 10 news indicated:

The task force has been working since January at the direction of the state's DEC... Today for the first time the Department of Environmental Conservation endorsed a proposal to shoot deer to control the population. A Citizen Task Force is going along with the recommendation to kill 80 deer in Irondequoit and 120 deer in Greece the first year... The Department of Environmental Conservation said the best way to control the population is to kill the deer during the winter using professional marksmen. [Underlines added for emphasis.]

The misinformation may have resulted from DEC's involvement in developing news releases, issuing invitations to the press conference, and formally introducing CTF members at the press conference.

Even though reporters focused on the controversy, we found that for the most part reporters presented a balanced perspective about the reasons people supported or opposed the CTF's recommendations. Reporters interviewed four CTF members (three supporting and one opposing the CTF recommendations), one non-member who supported the CTF recommendations, and three non-members who opposed the CTF recommendations. Themes of car accidents involving deer, destruction of private property, cost effectiveness, humaneness, safety, practicality, and biodiversity were arguments that reporters used to support the recommendation for "bait and shoot." For example, one reporter indicated:

... it was no friend that was doing this damage. Ann Van Dam claims the four-legged vandals are destroying her property. [Ann Van Dam says:] They get hungry. You can't blame the deer, they're starving to death. And they're in poor physical condition and they're going to find anything they can to eat. (Channel 13)

Laramie Brown has lived next to Durand Eastman Park for 24 years. She has spent thousands of dollars to protect her treasured flowers and plants, but it's not just her foliage she's worried about. She says the high deer population is destroying the natural habitat of the area. [Laramie Brown says:] I want deer, I want them to stay here, I want them to be in balance with the ecosystem so that the plants and deer can live together, and so that the deer aren't being killed in this inhumane way on our streets. And when one animal is allowed to
destroy the ecosystem, it is at the expense of every other species of plant and animal that lives here. (Channel 9)

Shooting them is much more humane, and it’s much safer for the people, and it’s much more cost effective. (Channel 10)

Reporters used themes of humaneness, lack of information about the effect of the "bait and shoot" technique, safety, the need for more information about alternative techniques, and the "Bambi factor" to describe reasons for those opposed to the recommendations. As some of the people interviewed indicated,

The deer have no rights, and ah we’re here for the deer, and ah I think there could be contraception is a wonderful idea . . . but that’s about all, you know, what other way would there be? A humane way of taking care of them. I don’t believe in shooting. (Channel 10)

Any ah drastic reduction of the herd will accelerate the birth rate, leaving us with a younger inexperienced heard, therefore increasing your incidence of deer-car accidents. (Channel 8)

[Reporter voice:] Yvonne Cupolo is also angry at the recommendation, arguing bullets aren’t the answer to anything. [Cupolo says:] My concern is that someone’s child is going to be hurt, and secondly, I don’t think it’s a solution to the problem. (Channel 13)

[Reporter voice:] Part of the reason this is such an emotional issue is you have to take into account the Bambi factor. Many people are taught as small children that deer are defenseless, cute, wild animals that are also our friends. (Channel 13)

We also assessed the visual attributes of the broadcasts. The media used film footage of deer throughout the broadcasts, but primarily in the opening remarks while describing the CTF recommendations to "bait and shoot" the deer. The deer tended to be docile or peacefully grazing in park-like surroundings, or staring wide-eyed at the camera.

One of the more unique broadcasts filmed deer just outside the park pavilion where the press conference was being held. The reporter’s anthropomorphic lead-in was:
It's life as usual for the deer at Durand Eastman Park today, but little did they know that not 100 yards from lunch, people were plotting to have some of them killed. (Channel 13)

Some deer were filmed near homes, yards, or fences. One station used a film clip in several of its broadcasts that showed a deer running toward a car on a roadway, appearing as if a deer-car accident were about to occur. Interviews of people at the press conference were used in many broadcasts. A poster developed by a protester attending the press conference was broadcast on two of the stations. The poster read “not in our park,” picturing the silhouette of a man looking through a rifle aimed at an antlered deer. Some footage of plant damage was taken at the homes of people who supported the CTF recommendations.

DISCUSSION

Outcomes from the Communication Plan

The purpose of this study was to assess changes in the attitudes and opinions of suburban residents about deer and deer management before and after the DEC implemented a communication plan in DMU 96. We detected small, but sometimes significant, changes in attitudes and opinions of residential property owners between February and November, 1992, subsequent to the implementation of the communication plan.

Our findings provided some evidence that the communication plan built public support for certain elements of the CTF recommendations. Support for birth control or sterilization techniques as a long-term management strategy increased somewhat following the CTF’s recommendation. Respondents in high, moderate, and low deer density areas became more homogenous in their opinions about some deer management techniques and important considerations after the communication plan took place. However, for other management techniques, respondents became significantly different after the communication plan was implemented. Reduced public support was evident after the communication plan
for management techniques such as reintroducing predators, supplementing the deer food supply, and relocating deer. Increased public support after the communication plan was evident for birth control/sterilization and for hiring sharpshooters. Finally, the perceived importance of minimizing health and safety risks to people increased after the communication plan, whereas the perceived importance of minimizing human influence over deer decreased after the communication plan.

Although the communication plan seems to have had some impacts, in many cases these impacts were slight. One possibility for the lack of major change in opinions during 1992 is that people in this particular community had formed opinions prior to the organization of the CTF and the implementation of the communication plan. Theoretically, people in the community who were interested in deer had completed a policy education cycle (Hahn 1988) of awareness, information gathering, and/or proposed solutions to problems with deer during the past 15-20 years. These people had adequate time and opportunities in advance to learn about the deer management situation and alternative solutions.

People who had formed opinions about deer management techniques may not change their opinion unless an experience or event creates an incongruity in their reasoning. For example, newspapers in DMU 96 reported a change in opinions of one woman who opposed the plan to "bait and shoot" deer until experiencing a deer-vehicle accident:

I looked at them as being beautiful animals, but not really how big they are and the damage that they can cause. I've had a change of heart because my kids could have been in the car and been really hurt. (4/13/93)

Another possibility is that public opinion may not change greatly until after the technique has been operationalized. Assessing a relatively new management technique is difficult because of the variations and uncertainties associated with implementation and outcomes. Important considerations, such as the degree of humaneness, effect on health and safety of people,
and effect on deer population, can be better assessed after the public becomes more familiar and knowledgeable about the technique. It may be unrealistic to expect changes in public opinions without first providing detailed information about the technique, or results from a trial experience that gives the public an opportunity to assess outcomes.

In addition, specific attributes of the technique may not be important individually, but may become important collectively when assessing the technique as a whole. Who implements the technique, or what happens to the deer, may be very important when comparing two techniques with a perceived similarity in humaneness, personal safety, and effect on the deer population. For example, respondents rated differently the acceptability of trapping and transferring deer to another location compared to a venison farm.

An explanation of why little change in opinions was detected is in the communication plan itself. DEC's communication plan relied on CTF members' willingness to participate in the communication activities. Initially CTF members were reluctant to be identified publicly for contact by people in the community. This is understandable given the duration and volatility of the deer management issue in the community. Therefore, DEC delayed recommending a communication plan to CTF members (beyond their role on the CTF) until the last formal CTF meeting.

Results from this study indicate that the communication plan may have been too dependent on obtaining support from the CTF membership before communication actions took place. In addition, it appears that the political and organizational structure within which the DEC operates constrains staff from communicating extensively with the public. An option is to enlist the aide of a person unaffiliated with state or local government who is willing to take a public relations role in attending CTF meetings, and can communicate fairly the information learned and generated by the CTF to the media and general public.
The role of the public relations member would be to inform and update the community about the learning and educational opportunities that CTF members undergo. This person could serve as a liaison for those CTF members or organizational leaders who are willing to be interviewed by the media while the CTF is underway. In DMU 96, CTF members were advised to avoid making statements about the CTF to the press with the intent of facilitating the process for reaching agreements. However, CTF members could have spoken to the press without impeding consensus by discussing information that the CTF had learned, rather than the issues discussed by the CTF, although the members might have been pressed for details by aggressive journalists.

Building community support could be a matter of enlightening the public using the same policy education process used in the CTF. Members were provided general information about deer biology and management, and specific information about deer in the community from a variety of local and national experts. Not only the deer management agency, but scientists, government officials, and CTF members took part in the education effort during the CTF meetings. A public that is kept apprised of the developments and learning opportunities of the CTF would be more informed and perhaps supportive when the CTF recommendations were announced. It is important to note that the CTF recommendation for an effective 32% reduction in the deer population in the northern area (based on conservative estimates) corresponded substantially to the 36% reduction preferred by northern residents. The CTF recommendation for the southern area, however, (5% reduction) was somewhat different from the preference of southern residents (16% reduction). In future communications, it may be useful to highlight the correspondence of CTF recommendations and northern resident preferences to improve the acceptability and confidence placed in the CTF process.
Achievement of Communication Goals and Objectives

Although the communication plan did little to change public attitudes and opinions measured in this study, we believe the communication plan was worthwhile for several other reasons. Some of the communication goals and objectives listed in the DEC document were accomplished to various degrees.

Informing the Public and Policy-makers

The communication plan provided educational and informational opportunities for those members of the public and policy-makers who were most interested in deer and the CTF recommendations. Primarily, these were residents and policy-makers in Irondequoit. A part of the communication plan was for DEC to issue news releases about deer and deer management, and the CTF process. Only the Irondequoit paper carried DEC’s news releases verbatim. The press conference resulted in more coverage by major newspapers and television stations in DMU 96, but these focused mainly on the CTF recommendations for Irondequoit and the resulting controversy.

Although the media overplayed the controversy in Irondequoit, the benefit of these communications was that the CTF recommendations and communication plan focused what had been muddled debates about the implementation of multiple deer management techniques in Irondequoit. Prior to developing the CTF recommendations, several deer management techniques had been proposed to government officials, with none reaching the implementation stage. By focusing on a particular deer management technique, the media, government officials, and the public could better assess the advantages and disadvantages of implementing that particular technique. The resulting implementation of part of the CTF recommendations indicates the support the CTF garnered from policy-makers.
Media Relations

The communication plan for the media consisted primarily of news releases, a press conference, and distribution of a report developed by the CTF (Appendix E). Although news releases informed a limited portion of the public, it appears news releases kept the media informed. The press releases, press conference, and CTF report summarized the CTF recommendations to the media as a single message, rather than relying on reporters to research the story and report outcomes based on sundry interviews.

The analysis of the television broadcasts and newspaper articles generated about the CTF indicated that the media messages were similar. The press conference provided the media with access to people on both sides of the deer management issue for collecting information and performing interviews. The media and the public were informed about the work of DEC and Cornell Cooperative Extension in developing and organizing the CTF approach as a way to address deer management issues in DMU 96.

Providing reporters with opportunities for gathering news stories was beneficial in promoting balanced views between those on different sides of deer management issues in Irondequoit. However, viewpoints presented by the media differed from those of the public at large. The media simplified deer management issues into whether or not the person interviewed favored or opposed the "bait-and-shoot" plan, whereas the public at large displayed various degrees of acceptability and preferences toward "bait and shoot" as a short-term or long-term solution, which for some depended on whether they lived in areas with high, moderate, or low deer densities. As a former president of a national news program indicated,

Our reporters do not cover stories from their point of view. They are presenting them from nobody's point of view... (Epstein 1973, p. i).
This "news from nowhere" has been interpreted by some to reflect a media-controlled view of the world in which reality is distorted for the purpose of creating an entertaining story (Epstein 1973). As an executive news producer stated:

Every news story should, without any sacrifice of probity or responsibility, display the attributes of fiction, of drama. It should have structure and conflict, problem and denouement, rising action and falling action, a beginning, a middle and an end. These are not only the essentials of drama; they are the essentials of narrative... The picture is not a fact but a symbol... the real child and its real crying become symbols of all children (Epstein 1973, p. 4-5).

The intent of the media was to create a story rather than provide the public with information. The communication message that the media sent to the public in DMU 96 was different from that outlined in DEC's communication plan. Pictures of deer grazing peacefully in the park or gazing wide-eyed into the camera symbolized the innocence of deer with a death sentence. The media focused on the controversy generated in Irondequoit, rather than on informing the public about deer and other wildlife management issues, or facilitating cooperation of local governments. Very little was publicized about other agreements reached (i.e. long-term solution of contraception in Irondequoit, and archery hunting in the remainder of the DMU). The media provided few opportunities for educating the public about deer and other wildlife management issues.

When developing a communication plan, the competitive nature of the news business should be considered, specifically the importance of being the first to publish a story. A Rochester newspaper relied on unidentified sources to leak information about the CTF recommendations on two occasions—one time a month before the CTF finalized the recommendations, and a second time on the day of the press conference. Television reporters who attended the press conference were disgruntled that the morning newspaper had "scooped" the story in advance of the noon press conference. This impropriety created poor rapport between those organizing the press conference and television reporters, but the
incident did not appear to affect their media messages. However, future communication plans should take precautions in releasing information simultaneously to all stations to achieve wide-spread media coverage. Otherwise, some stations may not report what has become "old news" because of another station's prior coverage.

Another objective of the communication plan was to encourage high visibility of the CTF through the media. The communication plan, especially the press conference, was successful in this regard, and encouraged media visibility of the CTF for a short period of time. Once government officials began modifying the CTF recommendations for implementation in Irondequoit, the media began associating "bait and shoot" with a particular town representative who proposed the plan. Occasionally the "bait-and-shoot" plan was referred to as an adaptation of recommendations developed by the then-disbanded CTF.

**Building Support from Local Government**

The communication plan indicated part of the goal was to build future agreements for action by local government policy-makers. The communication plan delineated that local government policy-makers receive copies of the CTF report, and be invited to the press conference. DEC would "continue to meet with government officials in DMU 96 responsible for implementing a deer management action in the Town of Irondequoit," which the agency did. As a result, in 1992-93 after the press conference and release of the CTF report, town and county government officials began passing legislation that eventually allowed for implementation of a modified version of the CTF recommendation in March-April 1992 and January-February 1993.

The communication plan and its emphasis on building support from local government policy-makers was a key component in the successful implementation of the short-term technique recommended by the CTF for Irondequoit. However, perhaps as important as the
communication plan was the involvement of local government representatives who served as technical advisors at a few pivotal CTF meetings. Their participation as technical advisors perhaps did more to build local government support than the meetings following the announcement of the CTF's recommendations. Once the CTF report was released, government policy-makers were aware of the CTF efforts and were ready to listen and consider the CTF's recommendations.

Communicating About Deer Management Techniques

Despite the controversy in Irondequoit, respondents in DMU 96 rated the DEC as a highly believable source of information about deer and deer management. Based on the preceding discussion, we recommend that wildlife management agencies consider the following steps when planning and developing a communication plan:

1. Analyze the historical context and situational factors to anticipate and understand people's perceptions about the size of the deer herd and alternative deer management techniques.
   - What is the history of deer management in the area?
   - How credible is the wildlife management agency?
   - Who are the key stakeholders, grassroots organizations, and government officials that have been involved in deer management issues in the past? What are their positions about deer-related issues?
   - What is the nature and degree of conflict that has occurred about deer and deer management in the community?

2. Collect data about deer biology and management, public opinion about deer in the suburban community, and deer/people interactions from which risk assessments may be calculated.
   - What types and how much deer damage has occurred?
   - What deer population trends are available? Have the police kept track of deer-car accidents?
- What information or surveys exist about residents' attitudes and concerns about deer or deer management techniques?

3. Inform the public about the status of deer biology and management and risks and benefits associated with the deer herd that pertain to the suburban community.

- What communication outlets are most effective in informing the community (e.g., paid newspaper advertisements, radio interviews, television news broadcasts, organizational newsletters)?

- How much money and staff time will be devoted to the communication plan? How can these resources be used most effectively and efficiently?

- What are potential deer management techniques and their likely consequences (e.g., on health of deer herd, on overall risk estimates)?

4. Plan and implement a mechanism (e.g., survey, public meeting, Citizen Task Force) to obtain input about public perceptions of the preferred size of the deer population and management techniques. (See Young 1991 for information about alternative mechanisms.)

- What are the goals and objectives for obtaining public input?

- Does the level of concern about the size of the deer herd warrant management actions, or is the deer population at an acceptable level at this time? If management actions are warranted,

- To what degree and in what manner should the public be involved in recommending deer management techniques?

- Who are the decision makers and how should they be involved?

- What are the information needs of those who are recommending management actions? How can this information be collected?

5. Communicate the outcomes from #4 (regardless of whether a management technique is warranted) regarding public preferences and the subsequent management decision.

- Who are the stakeholders targeted for the communication?
• What outlets are best to inform stakeholders about the outcomes (e.g., press conference, paid advertisements, public meeting, workshop, personal communication, organizational newsletters)?

6. If management actions are warranted, continue follow-up communication activities to ensure support for implementation of the management techniques.

• Who needs to be involved in implementing the techniques?
• What partnerships should be created, laws changed, or financial support acquired?
• What outlets can be used to keep the public informed about progress toward implementing management techniques?

7. Assess outcomes from implementing the management techniques, and the need to continue the communication plan. Report the agency’s evaluation to the community at large.

• What outlets are best to inform stakeholders about results? (e.g., press conference, public meeting, workshop, personal communication, organizational newsletters)?

Results from this study can provide agencies with clues to anticipate the types of information that people will need in response to a communication plan. Respondents in DMU 96 assessed management techniques based on a variety of considerations, the more important of which were maximizing the health and safety of people, maximizing the health of the deer herd, and minimizing the suffering of deer.

In response to these considerations, wildlife managers and biologists can plan to provide the following information to assist the public with assessing alternative deer management techniques:

(1) biological, technical, and management information that addresses the degree to which the technique improves the health of the deer herd;

(2) risk assessments of the management technique’s effect on the health and safety of people; and
(3) the degree to which the technique minimizes suffering of deer.

The DEC's communication plan for DMU 96 included information to address the first consideration, the degree to which the health of the deer herd is improved. However, the second and third considerations could be a challenge for agencies lacking sufficient measurements or perceived as favoring a particular deer management technique.

Agencies should evaluate their credibility as risk messengers before communicating about a deer management technique. The agency may decide to work with an organization which can present the message in a less biased manner. The risk message should indicate clearly how the risk assessment was conducted, and provide several levels to allow the person to judge whether a risk is acceptable or unacceptable (because what may be an acceptable risk for one person may be quite unacceptable to another). A simplistic example based on hypothetical data is:

Cornell University conducted a survey of residents in Podunk County, and found that 1 in 20 respondents living within the city limits had been involved in a deer-related vehicle accident in the county, and 1 in 50 respondents living outside the city limits had been involved in a deer-vehicle accident in the county during the previous 12 months.

The risk message from the agency could be to notify the community of the results from the study, and to warn motorists the degree to which each type of motorist is at risk for being in a deer-related vehicle accident. Whether the level of risk demands a deer management action can be assessed by the community and the agency.

The third type of information that people consider is the degree of suffering that the technique causes deer. Because people's perceptions vary about defining what is humane or inhumane, it would be inappropriate for an agency to assess a technique by assigning one or the other of these labels. However, the agency could communicate the characteristics of the technique in terms reflecting people's perceptions of humaneness. An example is
communicating the consequences if no management action is taken in a suburban environment with a high deer population. Agency staff can collect information from examining carcasses of deer in late winter or early spring, and report to the media the estimated number of deer that starved as a consequence of the inaction. If the level of starvation is unacceptable to the community, then it is the agency’s role to suggest alternatives that would reduce the starvation of deer.

Implications for Future Studies

The results from this study offer implications for future studies. We detected significant differences in respondents’ perceptions of deer management techniques and important considerations based on the relative density of deer in the area in which respondents owned property. Respondents who lived in areas with relatively higher deer densities than the surrounding area tended to prefer lethal deer management techniques and were more concerned about human health and safety than those residing in areas with fewer deer. The importance of minimizing the human influence on deer and the suffering of deer was related to the acceptability of various lethal and nonlethal techniques. Future studies could reassess these findings and their relation, if any, to the "wildlife acceptance capacity" concept (Decker 1991). For example, respondents who have reached their "deer acceptance capacity" may be more supportive of a lethal alternative.

A second important finding is that future researchers studying communities with long-standing deer problems should not expect changes in opinions to be detected before a management action has taken place. In DMU 96, respondents’ acceptability of various deer management techniques changed little based on a communication plan that relied on a Citizen Task Force and the mass media to provide the public with information about deer management alternatives. Studies about changes in public opinion about deer management
techniques should take into account the duration and intensity of the issue's presence in the community prior to survey implementation. Results from this study support the utility of testing whether communities which have had adequate time to cycle through an issues evolution process (Hahn 1988) are less likely to change opinions than communities in which deer management issues are a relatively new phenomena.

Conclusions

Managing deer in suburban neighborhoods is a growing problem in the United States. In suburban communities agencies often need support from the public and local government officials to change laws and regulations that limit the use of management alternatives, and to implement management techniques. In 1991-92, the New York State DEC developed a communication plan to inform both local government officials and the public about various deer management alternatives. The cornerstone of the communication plan was a Citizen Task Force approach in which a group of 11 residents reflecting various stakeholders in the community learned about deer and deer management, then made recommendations to local government officials. During the duration of the communication activities, we detected few changes in public preferences for various deer management techniques.

In 1993 and 1994, the DEC implemented a deer management plan in DMU 96 with support from local government officials amidst a mix of public opinion about management alternatives. Without definitive public support, the ebb and tide of politics and elections could result in haphazard deer management practices. Therefore, DEC's communication plan is ongoing in DMU 96. DEC continues to update and inform the public about deer management techniques and their effect on the deer herd and the community through workshops, press releases, and guest appearances at community meetings. It may be impossible for the agency to respond to all the disparate opinions of people in the
community. By continuing communications, however, the agency is equipping stakeholders who are interested in deer management with knowledge about the outcomes of deer management practices. This increased knowledge of stakeholders will, in turn, benefit the agency and local government officials when stakeholders provide informed input about deer and deer management alternatives in the suburban environment in the future.

LITERATURE CITED


APPENDIX A:

Newspaper Articles Announcing Formation of CTF
Task force hunts for answers on deer

Cornell appoints 11-member panel to study the options

By William Coon
Democrat and Chronicle

At the invitation of the state Department of Environmental Conservation, Cornell University has formed a citizens task force to look at the volatile issue of the deer population in north central Monroe County.

The task force, which held its first meeting Monday, consists of 11 "stakeholders," or representatives of groups that have an interest in the controversy over the deer, said Paul Curtis, a wildlife specialist with Cornell Cooperative Extension. Curtis will be the task force's facilitator.

These groups include the Monroe County Alliance for Wildlife Protection, the Irondequoit Deer Action Committee, the Western New York Fruit Growers Association, Helen Nature Center, neighborhood associations and individual homeowners, hunters and farmers.

Several task force members asked not to be identified, Curtis said. "They were concerned they would be overwhelmed with phone calls," he said.

Curtis said invitations to join the task force were given mostly to groups who had previous contacts with DEC and Cornell Cooperative Extension about the deer issue.

The cooperative extension is overseeing the task force through the university's department of natural resources.

Curtis said the panel represents a broad range of opinion on all sides of the deer controversy, which has centered around the Durand Eastman Park area in Irondequoit.

Many residents there have long been concerned about the deer causing traffic safety problems, destroying their gardens and shrubbery and potentially adding to the spread of Lyme disease.

Most factions agree that the deer population needs to be reduced, but disagree over how to do so.

The area that stakeholders task force will look at extends beyond Irondequoit's boundaries. The DEC has divided the state into 10 Deer Management Units. The panel will study the entire deer population within DMU 96, which includes all of Rochester, Greece and Irondequoit, plus parts of Brighton and Pittsford.

The group will meet once a month through March with the purpose of determining what the deer population density in DMU 96 is and what it should be. At Monday's meeting, experts from the county parks and sheriff's departments, the DEC and other agencies spoke about such topics as deer-car collision trends.

If, as expected, the task force decides that the deer population needs to be reduced, the group will meet three more times to try to reach a consensus on the best way to manage the deer population. That recommendation will be given to the DEC.

Among the management options currently being discussed by different factions are bow hunting; trap and transfer to a venison farm; and sterilization and birth control.

Some task force members expressed doubt that a consensus could be reached on a solution to the deer problem.

"I don't think we're going to come up with any new ideas that haven't been out there for a long time," said Richard Blevins, representing the Meadowbrook Neighborhood Association in Brighton.

Cornell formed 16 similar task forces last year for the DEC in areas that were more rural and less controversial than Monroe County, Curtis said.

One task force looked at the Deer Management Unit that covered mostly Chautauqua County, plus parts of Steuben and Tioga counties. Another one looked at DMU 87, which included most of Orleans County, with parts of Monroe and Niagara counties.

Encouraged by the results from those task forces, Cornell and the DEC plan to form 18 more panels this year, Curtis said. Deer control has been controversial in several of these areas, he said. One stakeholders group will look at DMUs 84 and 85 in Steuben County.
Deer task force aims for solution

By Barbara Enos

Nothing draws more attention than a four-letter word. And in Ironequiot, that four-letter word is “deer.”

There are currently three groups working to find some solution to the deer overpopulation problem plaguing the area.

Although they don’t all agree on the means, the groups agree there is a problem that needs action.

Members of the Ironequiot Deer Action Committee, Monroe County Alliance for Wildlife Protection, and the recently formed Save Our Deer group (also a local Ironequiot group) have plans to push full steam ahead for a solution.

Representatives are hoping that a new task force formed in January in conjunction with the Department of Environmental Conservation will bring about a solution agreeable to all.

The new citizens’ task force, formed to look at the issue of deer population in Deer Management Unit 96, was convened at the request of the DBC and will be facilitated by Dr. Paul Curtis of the Cornell Cooperative Extension.

DMU 96 comprises north-central Monroe County, including the towns of Ironequiot and Greece, the city of Rochester, and parts of Brighton.

Representatives from Ironequiot are Laramie Brown, IDAC; Larry and Ann VanDyke, Oakridge Master Gardeners; Sue Meberry, Helmer Nature Center; and Sandra Baker, MCAWP.

Although the task force exists on an experimental basis, there are 15 units currently meeting in rural areas that have worked out well, according to Curtis.

The local group was formed loosely last Fall with its first meeting in January. Its next meeting is scheduled for Tuesday, Feb. 18.

Curtis, who was in town last week for an MCAWP seminar pertaining to protecting landscapes from deer damage, said members in the unit represent stakeholder interest and are those impacted on a broad spectrum by the deer problem.

Two goals of the task force are to set a deer population objective, which consists of finding how many deer are in this DMU and making recommendations as to how many there should be, and secondly, to make recommendations about how to get the desired number.

With a deer census planned by the county for the end of this month, reaching their first goal may be met sooner than they think.

Monroe County parks officials said they would hire an Ohio deer census specialist to assist in the census planned for this month as long as conditions for the aerial survey are right.

There needs to be snow cover of four to six inches to provide contrast for the deer to stand out, and there needs to be a warming trend so that the deer will be out browsing and can be easily counted.

John Clem, aviation program manager in the Division of Wildlife, continued on Page 4

He said because of that, there will be more differences in opinion regarding possible solutions.

“It is not unusual to have differing opinions,” he said. “In a relatively suburban area it is difficult at times to manage and not uncommon to disagree.”

But, he said, there is hope, and he has faith a solution will be agreed upon.

The plan is to reach a population objective by March and reach consensus for a solution by June.

Then it lies in the hands of the local, county, and state governments and the DBC.

Curtis said the DBC will aim to help the task force’s solution.

Although they are not a part of the DMU 96 task force, Save Our Deer members have expressed an interest in being part of another one at some point in the future.

“We are in the process of formalizing the group’s structure and guidelines,” Haas said. “We want to work in a manner that will pull the community together and find ways of meeting a complex problem.”

Haas said SOD wants to expedite its energies in a positive manner and make a fresh start so that there can be a positive force in the community.

Brown, too, believes a solution would be closer at hand if all groups worked together.

“There is nothing to be gained from taking shots at one another,” she said.
APPENDIX B:

DEC's Proposal for a Communication Plan
Presented to CTF Members
July 23, 1992

*DEC PROPOSED DRAFT*
(For Review and Comment by the Citizen Task Force)

DMU 96
PUBLIC INVOLVEMENT PLAN

The following plan is a strategy of action for DEC and the Task Force in a combined effort to meet DMU 96 communication goals and objectives. To meet the communication objectives, various activities are being considered.

Program Goal

To provide DEC with deer population objectives for DMU 96, and to foster action to resolve problems created by too many deer, particularly in the Town of Irondequoit.

Communication Goal

To build support of the Task Force constituency and the community for the Task Force recommendations and future agreements for action developed by local government decision-makers.

Communication Objectives

To continue communication with and facilitate the cooperation of local governments, in order to provide a safe and cost-effective suburban deer management program for DMU 96.

To provide education and information opportunities on deer and other wildlife management issues for affected and interested people and policy-makers.

To keep the media fact-informed and encourage high visibility of the Task Force.

Public Identification

The primary publics targeted include:

The membership of organizations and interests reflected by Task Force members who are directly affected or concerned about deer management in DMU 96.

The residents and landowners in DMU 96 directly affected by the current deer population.

Local government officials.

Other individuals and groups with general interest.

DEC COMMUNICATION ACTIVITIES

A. Local Government and Task Force Support Efforts:

1. DEC will continue to meet with government officials in DMU 96 responsible for implementing a deer management action in the Town of Irondequoit.
2. DEC highly supports the work accomplished by the DMU 96 Task Force in researching and discussing preferred options and interfacing with municipal officials.

3. DEC would like to support a deer management activity that is agreeable to both the Task Force, which reflects a diversity of interests in DMU 96, and local government.

4. DEC supports continuing the Task Force process into fall in order to finalize the recommendations, and encourage further discussion with municipal officials, who should be invited to participate in the process as technical advisors and observers.

B. Increase and Improve the Information in the Community about Deer Management:

DEC and the Task Force recognize the need for the DMU 96 community to understand why deer population regulation is an important aspect of DEC’s Wildlife program, and why wildlife management is necessary in suburban areas like DMU 96 where deer-people conflicts are increasing.

1. DEC will produce at least three informational articles for general publication and distribution covering key topics that were addressed at Task Force meetings. Distribution will occur through Task Force members and the media.

2. DEC officials encourage Task Force members to invite DEC staff to their membership meetings as part of a program to improve the level of information on deer management to key audiences in the community.

3. DEC will update its slide presentation for use at presentations in the fall.

4. DEC will hold an informational workshop on suburban deer management problems and solutions, which will include a presentation by the Task Force on their recommendations (See C, No. 3).

C. Encourage High Visibility of the Task Force and Their Recommendations:

DEC will provide written materials and plan public and media events to encourage high visibility of the Task Force, their recommendations, and their role in the deer management process.

1. DEC visualizes the activities of the Task Force to begin in late August with a meeting (including the technical and municipal advisors) to finalize the Task Force recommendations. These recommendations will be distributed to all government levels soon after they are finalized (with an invitation to participate in a press conference two weeks following).

2. DEC will arrange a press conference with the Task Force to:
   a. officially present their recommendations to the press;
   b. make a statement encouraging support and action on the deer management issue by government officials;
e. be available for questions and discussion on the Task Force process and the resulting recommendations; and

d. local officials will be encouraged to join DEC and provide their own statements regarding the recommendations. Ideally, the recommendations will reflect a near-to-confirmed action agreeable to all local officials, and each official will be able to provide a similar statement supporting a preferred action and the Task Force process.

3. DEC will coordinate a three-hour public workshop on deer management. The purpose is to provide Task Force member organizations and other interested citizens to become better acquainted with deer management in suburban areas, and learn about the Task Force's role in addressing DMU 96 concerns. The workshop would ideally provide an overview of suburban deer problems and solutions including:

a. an updated deer management slide show (by DEC);

b. examples of suburban deer problems in other areas and how they were resolved;

c. statistics and key facts about DMU 96 and what factors are considered when dealing with the DMU 96 deer population (by Cornell professor perhaps);

d. a report from the Task Force members on the Task Force process, the information that was assessed, the deer management options considered, and the reasons for selecting specific actions;

e. time for participants to ask questions and provide input; and

f. a field trip sign-up. If interest warrants, a field trip would be scheduled.

4. DEC will prepare an executive summary of the Task Force recommendations for distribution to the Task Force member constituency, the workshop participants, and other interested groups or individuals.

5. DEC would like to schedule a set of television and radio interviews with Task Force members and DEC staff to talk about the Task Force process and the recommendations.

6. DEC will review the final recommendations and issue a public response supporting the process.
APPENDIX C:

News Releases Developed by DEC
On September 4, 1992, a Citizen Task Force (CTF) in the Greater Rochester area released a report "Deer Management Recommendations for State and Local Government, and the Citizens of DMU." The eleven-member CTF was organized by Cornell Cooperative Extension at the request of the New York State Department of Environmental Conservation (DEC) in January 1992 to provide input on deer management activities for Deer Management Unit (DMU) 96, an area covering the Towns of Irondequoit, Greece, Brighton, and the City of Rochester.

The CTF members are residents and organization representatives with a specific interest related to the deer population within DMU 96. They were also selected because they exhibited leadership in the community and desired to take action to resolve deer-related problems. The CTF, which has met since January 2992, includes the following individuals:

S. Baker  Monroe County Alliance for Wildlife Protection
R. Blevis  Brighton/Meadowbrook Homeowners Association
J. Carpenter  Archery Hunter Instructor
D. Habes  Monroe County Conservation Council
J. Krebs  NYS Forest Owners Association
R. Lehman  Monroe County Farm Bureau
C. Michaloski  Orchardist/General Farmer
S. Mooberry  Helmer Nature Center
D. Ophardt  Western NY Apple and Cherry Growers Association
J. Smitley  Irondequoit Deer Action Committee
A. VanDam  Irondequoit Resident/Master Gardener

The task force was given two tasks. First, to provide a recommendation on what the deer population level should be in DMU 96. Second, what deer management option should be used to reach and maintain that level. The task force members heard from many technical advisors and invited speakers: DEC, various local government agencies including the health and sheriff departments, NY Cooperative Extension Fish and Wildlife Research Unit, and Eastern Montana College. The CTF reviewed current research reports and discussed case studies. In addition to the deer population and Management Options recommended, the report includes background, historical, and supporting information on suburban deer management and the rationale for action in DMU 96. The report identifies
existing problems, where the responsibility rests to address these issues, and the need to build consensus with citizens.

Citizen Task Force members anticipate that not everyone will endorse the recommendations but believe these suggestions offer the best opportunity for broad community support and will enable government to quickly begin resolving deer management concerns.

Deer Population Objectives

The long-term population recommendation for DMU 96 is to maintain a maximum deer density of 20 deer per square mile of quality deer habitat. In the short term (1 to 5 years), the CTF divided the unit area into north (north of 104 and Irondequoit) and south parts, perceiving that deer densities and damage complaints were different for these two portions of DMU 96.

The CTF recommends reducing the current deer population using a conservative approach that would allow time to evaluate its effects on the deer population, as well as deer/car collision rates and damage complaints.

In DMU 96 North, a short-term, five-year plan for reducing the deer herd would begin by removing the number of deer equal to the best annual estimate of vehicle-killed deer reported (using a combination of data from DEC carcass tags issued and DOT carcass removals). This total is potentially 80 deer from Irondequoit and 120 from Greece. In year two, deer population indicators would be evaluated (deer/car collisions, vegetation damage, aerial census, deer physical condition, etc.), and if little change exists from the previous year, the effort to reduce the deer would double. Similar evaluation of indicators and deer removal adjustments would occur for years three through five to reach the long-term goal of 20 deer/mile² of quality habitat.

In DMU 96 South, a stable target or a slight reduction (0-5%) in deer numbers during the next five years is needed to reach the long-term population goal.

Deer Management Options

CTF members reviewed the use of hunting, passive management, trapping and removal, fencing and repellents, reproductive inhibition, supplemental feeding, and selective culling as potential deer management alternatives. DMU 96 North includes the Town of Irondequoit and the Town of Greece. Selective culling is the preferred option for short-term deer removal in the Town of Irondequoit. CTF members indicated the primary goal is to reduce deer numbers as safely, humanely, and cost effectively as possible. Of the techniques discussed, one possible technique for this selective culling is to recruit expert marksman to shoot deer at
Urban deer management, here and there

By Larry Meyers

The whitetail deer has become the topic of much attention in recent years because of dramatic increases in its population.

Even urban areas are often populated with large numbers of deer that have caused media interests to share various individual and group concerns.

Most of the concerns relate to the danger of motor vehicle-deer accidents and damage to landscaping and natural-area vegetation.

It is interesting to reflect back in time and trace the changes that have occurred in the last century with deer populations in New York state.

By the mid-1800s, deer had been eliminated from central and western New York, primarily because of the intensive clearing for agricultural use of the land. A remnant population continued to exist in northern Pennsylvania.

In the early 1900s that population slowly expanded into southern New York state as agriculture declined. By 1938 it was felt that deer populations were high enough to provide for hunting seasons in western New York. The first county to open was Steuben County.

Each year additional counties were opened to hunting, progressing northward to Lake Ontario until all counties in western New York were open.

The deer management history of three counties with an urban population base can be compared and contrasted.

With the exception of the more urban city of Rochester and the adjacent towns that make up the current Deer Management Unit 96, Monroe County was opened to hunting in 1945.

State legislation to hunt with bow and arrow in DMU 96 was not enacted until 1976, after the deer population in the area increased dramatically and caused problems to residents and motorists alike.

In 1978, local legislation restored the ban on archery within the town of Irondequoit.

The Buffalo area in Erie County was not opened to hunting in 1942 when the remainder of the county opened.

Even though the deer population rapidly increased, hunting has never been allowed in Buffalo.

Either Monroe or Erie County has led the state in car-deer accidents for the past 10 years.

In contrast to Monroe and Erie counties, all of Onondaga County, including its urban Syracuse population center, was opened to deer hunting.

Both gun and archery hunting have been allowed since its opening in 1942.

As a result, Onondaga County has never experienced the severe deer problems prevalent in Monroe and Erie counties.

Over the last decade, many studies have been conducted to determine feasible and economical solutions to the urban deer quandary.

A 1982 report from the University of Wisconsin-Madison provides a cost comparison for several methods of deer removal from their arboretum.

Methods of live-deer capture were most expensive, averaging $411.96 per deer. Shooting the deer over bait dropped the cost to $73.95 per deer. The major expense here was payment of shooters working at night with lights over the baited areas.

They concluded that the shooting over bait was the most cost-effective and least labor-intensive method, averaging 13.5 hours per deer.

Another report from the Illinois Department of Conservation concerns reduction of the Rock Cut State Park deer herd.

At this 3,000-acre state park located in a developed area northwest of Chicago, Ill., a combination of deer management methods was used to achieve the population goal of 25 deer per square mile.

Prior population densities were a minimum of 70 deer per square mile.

Initially, a 39-day archery hunt was conducted; it required hunters to obtain a special permit. Hunters were required to shoot two antlerless deer before they could shoot an antlered deer.

A total of 30 deer were taken by archers at an estimated cost of $135 per deer.

This cost includes expenses from personnel salaries to material cost, to administer the hunt.

Because of a concern that some deer would be wounded and not recovered, a large-scale carcass search was conducted using more than 100 volunteers and staff.

This concern was quickly alleviated when not a single deer could be found that died later as a result of being wounded during the bowhunt.

The next management method was volunteer shooting over bait. During a 29-day period, these shooters killed 105 deer at an average cost of $237 per deer.

The volunteer shooting program did not complete the reduction wanted, and it became necessary for the project leader to shoot the final 31 deer to reach the goal.

The Rock Cut State Park was successful in achieving its deer reduction goal by using a combination of methods.
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The Rock Cut State Park was successful in achieving its deer reduction goal by using a combination of methods. However, similar methods will have to be used annually, but on a reduced scale, to maintain the population level desired. This entire process was documented on video, which is available to the public for review.

The urban deer problem of the Rochester area has achieved extensive publicity for the past decade.

Many potential actions have been discussed and explored, but, to date, none have been implemented.

The New York State Department of Environmental Conservation has consistently recommended hunting as a proven and preferred method to solve the problem.

The DEC believes this method to be the most cost-effective, efficient, and realistic solution. The DEC, however, is willing to consider and approve other management methods that may solve the problem.

In January, 1992, the DEC initiated the formation of an 11-member Citizen Task Force for Deer Management Unit 96.

This diverse group, representing many deer interests in the community, has met numerous times and is expected to recommend deer population-level objectives and a management strategy to reach that population level by late summer.

It is anticipated that with the support of the community and local government, action can be taken to address the deer problem in Deer Management Unit 96 and the Irondequoit area within the next few months.

Larry Meyers is the regional wildlife manager for the Department of Environmental Conservation.
night during winter (when park use is reduced) at preselected bait sites with special lighting.

Reproductive inhibition is the preferred long-term strategy for the Town of Irondequoit. Currently, reproductive drugs and delivery systems for free-ranging deer are experimental. A contraceptive study could begin in the fall of 1993 following some baseline deer data research on the deer and the use of a PZP vaccine which is scheduled to be available after December 1992. The CTF encourages state and local government agencies to collect baseline deer population data now to prepare for implementation of a reproductive inhibition program as soon as possible.

In the Town of Greece, short- and long-term deer population goals may be met by issuing additional antlerless archery deer hunting permits. Other methods will be considered if the technique fails to reach the target population.

In DMU 96 South; DEC biologists indicate they will be able to reach the population goals by issuing additional antlerless archery deer hunting permits.

Additional Recommendations

Additional data is needed to further define deer densities and condition, and to evaluate the management strategies used in DMU 96. Deer culled or removed from the Town of Irondequoit should be used to model baseline deer population levels and data gathering should be coordinated for determining the number of deer killed by vehicles.

The CTF feels public education and communication efforts are necessary about deer management and the choices for DMU 96. They encourage a cooperative working relationship between state, county, and town governments to resolve DMU 96 deer management issues.
Citizen task force – a deer management tool

By Jim Fodge

Many factors influence the setting of population objectives in deer management. By law, wildlife managers must manage deer populations in ecological balance while considering human health and welfare, land use by humans, and recreational needs.

A wide range of people have an interest in deer management. An interested person may be a deer hunter, a farmer whose corn crop is being damaged, or a person who simply enjoys seeing deer.

Each of these people views deer populations and deer management in a different light.

It is the responsibility of the deer manager to try and integrate the views and interests of all citizens into a comprehensive deer-management program tailored for a specific area.

This is not always an easy task, but utilizing citizen groups to provide more input on the concerns and wishes of various deer stakeholder groups has made it less difficult.

Thus, the Citizen Task Force on Deer Management was born.

The state is currently divided into deer-management units (DMU). These are geographic areas chosen for the most part because of the uniform characteristics of the deer habitat within. In addition, units may be delineated to deal with specific problems relating to deer, such as agricultural crop damage.

Each DMU has a deer population objective established to define the most desirable population level for that unit.

The job of the Citizen Task Force is to decide what population is most desirable for a particular unit while taking into consideration all the various interests involved as well as biological constraints.

In at least one case (DMU 96 – the Greater Rochester area) the task force was asked to go a step further.

Once a population objective was agreed upon, they were asked to consider the various management techniques available and recommend those they felt were most appropriate in dealing with the special problems associated with a large deer population in a highly urbanized area.

In the past, deer managers solicited input from various deer stakeholder interests individually, and then integrated this information, along with biological data such as habitat quality and deer physical condition, into a workable population objective.

Input came from various surveys conducted by DEC’s Bureau of Wildlife and others, contact with interested groups and individuals, and nuisance complaints from those suffering damage caused by deer.

The current approach is to select a group of citizens in a particular deer-management unit who represent various deer stakeholder interests in that unit.

In most units, county cooperative extension agents have acted as facilitators in the process, thus utilizing their broad knowledge of the issues involved and the local people who might best represent a stakeholder interest.

DEC staff members work with the task force as advisory members only.

As advisory members, wildlife personnel provide technical information and forecasts on the predicted results of proposals, but will not otherwise attempt to influence opinions.

Most task forces include 10 to 15 members and require two or three meetings over several months to arrive at a consensus on a deer population objective.

Task force members are provided relevant biological and social data applicable to deer population in their area.

They are encouraged to solicit input from members of the stakeholder group they represent and to share this with the task force. The final decision on a deer population objective is reached only by consensus – no voting or weighting of one interest over another; everyone must agree.

If a consensus cannot be reached through compromise, the effort in not in vain, however. The ideas and information brought together by the task force still provide valuable insight that the deer manager can draw upon to make decisions.

MANAGING OUR DEER

This is the first of three articles about the Department of Environmental Conservation’s deer-management techniques.

Once a task force reaches a decision, the DEC will adopt its recommendation if it falls within the bounds of the legislatively mandated responsibility for management of natural resources.

These bounds are interpreted by the department of limits to meet legal mandates to perpetuate the white-tailed deer populations at levels that afford optimal recreational opportunity commensurate with range-carrying capacity and tolerable conflicts with other land uses.

Once the population objective is set, the department will strive to manage at that level for at least five years, at which time the objective will be reviewed again.

The task force process has been completed in six of the 14 deer-management units located in DEC Region 8. The remaining units are expected to be completed in the next two years.

Jim Fodge is a senior wildlife biologist with the state’s DEC.

12-Week of August 17, 1982-Irondequoit Press
A Survey of Public Attitudes
About the Management
of White-tailed Deer

This questionnaire is part of a study to assist the New York State Department of Environmental Conservation with developing new approaches to obtain citizen input for setting deer population objectives and selecting management options. We would like to understand your views about deer and deer management. Information you provide will help guide the deer management program.

Please complete this questionnaire at your earliest convenience. When finished, simply seal this questionnaire and drop it in any mailbox—return postage has been provided. Your responses to the questions will remain confidential and will never be associated with your name.

THANK YOU FOR YOUR ASSISTANCE!

HDRU
Human Dimensions Research Unit
First, please examine the map and written description of the area designated as deer management unit 96 (DMU 96) located in the Greater Rochester area, then answer Question 1.

Description of DMU 96: The western border begins at Rt. 261 at Manitou Beach to Manitou Road to the Barge Canal. The southern border follows the bank of the Barge Canal to East Ave. in the village of Pittsford. The eastern boundary continues from East Ave. to Allen Creek at Brighton, then follows Irondequoit Creek into the Irondequoit Bay. The east shore of Irondequoit Bay is the boundary into Lake Ontario.

1. Do you live or own property in DMU 96? (Please check [✓] all of those statements that apply to you.)

[ ] I live in DMU 96 throughout the year.

[ ] I live in DMU 96 for only a few months of the year.

[ ] I own or lease property in DMU 96.

[ ] None of the above applies to me. (If none of the above applies to you, then do not go any further, but please return this questionnaire by mail to cancel additional mailings. Thank you for your assistance.)
APPENDIX D:

Mail Questionnaire Used to Survey DMU 96 Property Owners in February
A Survey of Public Attitudes About the Management of White-tailed Deer
**PEOPLE AND DEER**

2. People differ in the ways they interact with deer. Some of these ways are listed below. Please indicate how you feel by expressing your agreement or disagreement with each statement. (Circle one number for each statement.)

**IT IS IMPORTANT FOR ME PERSONALLY:**

<table>
<thead>
<tr>
<th>That I talk about deer with family and friends</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I observe or photograph deer</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I tolerate most deer nuisance problems</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I consider the presence of deer as a sign of the quality of the natural environment</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I hunt deer for recreation</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>That I see deer in books, movies, paintings, or photographs</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I tolerate most levels of property damage by deer</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I express opinions about deer and their management to public officials or to officers of private conservation organizations</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<td>5</td>
</tr>
</tbody>
</table>

**IT IS IMPORTANT FOR ME PERSONALLY:**

<table>
<thead>
<tr>
<th>That I know that deer exist in nature</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>That I tolerate the risk of deer transmitting disease to humans or domestic animals</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I hunt deer for food</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That local economies benefit from the sale of equipment, supplies, or services for deer-related recreation</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I appreciate the role that deer play in the natural environment</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That deer are included in educational materials as the subject for learning more about nature</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That deer are managed for an annual harvest for human use without harming the future of the deer population</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I tolerate the personal safety hazards associated with some deer</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>That I understand more about the behavior of deer</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
3. Please check any of the items below that are a concern you or your family have about deer in DMU 96. (Check [✓] all that apply.)
   a. ______ Deer-car accidents
   b. ______ Lyme disease transmission
   c. ______ Damage to vegetable gardens
   d. ______ Damage to yard plantings (shrubs, flowers, etc.)
   e. ______ Damage to farm crops and orchards
   f. ______ Damage to plant species in the county parks and other undeveloped areas
   g. ______ I have none of these concerns about deer at this time.

4. If you checked more than one response in Question 3, which item is of greatest concern to you? 
   ______ (Please write one letter from the list above.)

5. Have you or your family experienced any of the problems listed in Question 3?
   ______ No
   ______ Yes ➔ Please list the letter(s) in Question 3 corresponding to those problems you or your family have experienced.

6. Generally, how do you personally feel about deer in DMU 96? (Check [✓] one.)
   ______ I enjoy the presence of deer AND I do not worry about problems deer may cause.
   ______ I enjoy the presence of deer BUT I worry about problems deer may cause.
   ______ I do not enjoy the presence of deer and regard them as a nuisance.
   ______ I have no particular feelings about deer.

7. Based on your perceptions about the present size of the deer herd in DMU 96, would you prefer that the deer herd increase, decrease or remain at the current level for the next 5 years? (Check [✓] ONE.)
   1. Increase ➔ By what percent would you prefer the deer herd to increase? ___%
   2. Same size as the present deer herd
   3. Decrease ➔ By what percent would you prefer the deer herd to decrease? ___%

DEER MANAGEMENT

The New York State Department of Environmental Conservation (NYSDEC), Bureau of Wildlife is legally responsible for monitoring the health and status of the deer herd, and for implementing strategies to manage the size of the deer herd. In portions of DMU 96, county and town laws restrict NYSDEC's ability to implement management strategies that are used in other areas of the state. NYSDEC wildlife biologists would like to know your opinions about different ways to manage deer.

8. How satisfied are you with the current deer management program NYSDEC (New York State Department of Environmental Conservation) uses in DMU 96? (Check [✓] ONE.)
   ______ I am generally satisfied.
   ______ I have mixed feelings.
   ______ I am generally dissatisfied.
   ______ I have no opinion.
14. Please rate how believable you think each of the following are as sources of information about options for managing deer. (Circle one number for each information source.)

<table>
<thead>
<tr>
<th>Source</th>
<th>Extremely Believable</th>
<th>Moderately Believable</th>
<th>Slightly Believable</th>
<th>Not At All Believable</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. NYSDEC, Bureau of Wildlife</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. U.S. Fish and Wildlife Service</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. Cornell Cooperative Extension</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Humane Society of Rochester and Monroe Co.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e. Irondequoit Deer Action Committee</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f. Monroe Co. Alliance for Wildlife Protection</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>g. Save Our Deer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>h. Monroe Co. Farm Bureau</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>i. Monroe Co. Conservation Council</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>j. Environmental Management Council</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>k. Center for Environmental Information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>l. Monroe Co. Parks Department</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>m. Monroe Co. government</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>n. Town (e.g., Greece) government</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>o. Local sportsmen's club</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>p. Local animal rights association</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>q. Local environmental organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>r. Local nature center</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>s. Local homeowners association</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>t. University scientist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>u. Newspaper reporters or writers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15. If you wanted to know more about options for managing deer, which one of the sources of information listed in Question 14 would you contact first?  

(Please write one letter from the list in Question 14.)

16. How Important were the following information sources in helping you learn about options for managing deer? (Circle one number for each information source.)

<table>
<thead>
<tr>
<th>Source</th>
<th>Extremely Important</th>
<th>Moderately Important</th>
<th>Slightly Important</th>
<th>Not At All Important</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Newspaper articles or editorials</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. Magazine articles</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. Television or radio reports</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Deer-related workshop, seminar or forum</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e. Family and/or friends who hunt deer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f. Family and/or friends who do not hunt deer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>g. Humane Society of Rochester and Monroe Co.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>h. NYSDEC</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>i. Cornell Cooperative Extension</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>j. Local government (county or town)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>k. Local citizens group (nongovernment)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

17. If the NYSDEC, Bureau of Wildlife decided to make a greater effort to let citizens know about deer management options, which one of the sources listed in Question 16 would be the best way to get information to you?  

(Please write one letter from the list above.)
18. Have you taken actions to make your opinions known to government officials or NYSDEC wildlife biologists about deer and deer management during the past 2 years?

   ______ No (SKIP TO QUESTION 20)
   ______ Yes

19. In what ways have you made your opinions known? (Check [x] all that apply.)

   ______ Joined a conservation or environmental organization to increase my political input.
   ______ Wrote letters to the editor to be printed in an area newspaper or magazine.
   ______ Donated money to a political lobbying group that supports my views.
   ______ Contacted a NYSDEC representative or wildlife biologist.
   ______ Contacted my State Senator or Assemblyman.
   ______ Contacted my county or town government officials.
   ______ Voted for or against a political candidate primarily because of his/her views on deer or deer management issues.
   ______ Signed a petition relating to deer or a deer management issue.
   ______ Attended or participated in a governmental or citizen committee about deer.

YOUR STAKE IN DEER AND DEER MANAGEMENT

20. Listed below are descriptions of ways in which people might interact with deer or be affected by the size of the deer herd in DMU 96. Which pertain to you? (Check [x] all of those which apply to you.)

   ______ I drive a car or truck.
   ______ I have ornamental shrubs around my home.
   ______ I grow fruits and/or vegetables for my household.
   ______ I enjoy seeing deer in DMU 96.
   ______ I provide deer with food or cover to attract them onto my property.
   ______ I hunt deer in DMU 96.
   ______ I own rural land in DMU 96, but not a farm.
   ______ I own or work in an agricultural industry.
   ______ I own or work in a profession related to natural resources.
   ______ I own or work in a business serving deer hunters.
   ______ I own or work in a business related to nuisance deer problems.

21. Have you ever hunted white-tailed deer?

   ______ No (GO TO QUESTION 22)
   ______ Yes → If "yes," did you hunt deer in 1991?

   ______ No (GO TO QUESTION 22)
   ______ Yes → If "yes," did you hunt deer in DMU 96?

22. Do any members of your immediate family hunt white-tailed deer?

   ______ No
   ______ Yes
9. Do you agree or disagree with the following statement? (Check [✓] ONE.)

The size of the deer herd should be guided by nature alone—people should NOT try to change the size of the deer herd at all.

___ Agree
___ Disagree
___ I have no opinion or am unsure.

10. Many considerations may enter into a person's attitudes about methods that can be used to manage the size of the deer herd. How important is each of the following considerations when you think about the methods that can be used for deer management in DMU 96? (Please circle one number to rate how important each of the following considerations are to you.)

HOW IMPORTANT IS IT TO YOU THAT A DEER MANAGEMENT METHOD:

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Extremely Important</th>
<th>Moderately Important</th>
<th>Slightly Important</th>
<th>Not At All Important</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>f. minimizes economic costs to society</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. minimizes economic costs to individuals</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. maximizes economic benefits for society</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. maximizes economic benefits for individuals</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. maximizes the use of deer as a public resource</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. maximizes recreational opportunities for hunters</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11a. Which consideration listed in Question 10 is of primary importance?

___ (Please write one letter.)

b. Which consideration listed in Question 10 is of least importance?

___ (Please write one letter.)
12. Following is a list of 12 items that are sometimes suggested as management options for deer. We would like to know how acceptable these options are to you personally for DMU 96. (Please indicate the acceptability of the options by circling one number for each option.)

<table>
<thead>
<tr>
<th>Option</th>
<th>Extremely Acceptable</th>
<th>Moderately Acceptable</th>
<th>Slightly Acceptable</th>
<th>Not At All Acceptable</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Allow nature to take its course ........................................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. Reintroduce natural predators (e.g., wolves) ............................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. Educate property owners about fencing, repellents and plant species that are less desirable food for deer .................................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Support research for birth control or sterilization techniques to reduce the number of fawns born ..................................................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e. Provide supplemental food for deer during winter ........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f. Trap and transfer deer for release at another location .................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>g. Allow deer farmers to trap and transfer deer to farms for use in the venison industry .................................................................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>h. Hire sharpshooters to shoot deer ...........................................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>i. Allow regulated firearms hunting by licensed hunters .....................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>j. Allow regulated bow and arrow hunting by licensed hunters .............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>k. Allow regulated hunting by selected, highly-qualified volunteer hunters</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>l. Tranquilize deer using dart guns, and euthanize them with a lethal injection .............................................................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

13a. Which deer management options listed in Question 12 would you most prefer as short-term and long-term solutions? (Please write the letter of the option you most prefer for each type of solution.)

- most preferred short-term solution to reach a specific deer population size
- most preferred long-term solution to maintain a specific deer population size

b. Which deer management options listed in Question 12 would you least prefer as short-term and long-term solutions? (Please write the letter of the option you least prefer for each type of solution.)

- least preferred short-term solution to reach a specific deer population size
- least preferred long-term solution to maintain a specific deer population size

c. Which deer management options listed in Question 12 do you believe are the most effective short-term and long-term solutions? That is, which options are the least expensive and the most efficient use of time, staff, and other resources? (Please write the letter of the option you believe is most effective.)

- most effective short-term solution to reach a specific deer population size
- most effective long-term solution to maintain a specific deer population size
23. In what year were you born? 19_____

24. Are you female or male? _____ female  _____ male

25. Are you a member of an organization that is interested in deer and/or deer management (such as a local homeowners association, an animal rights association, or a sportsmen's club)?
   _____ No
   _____ Yes—What is the name of the organization(s)?

26. Which of the following best describes the population of the area where you (a) lived most of the time when you were between the ages of 6 and 16, and (b) currently live? (Check [✓] one item in column "a" and one item in column "b.")

<table>
<thead>
<tr>
<th>Residence Area</th>
<th>(a) Residence between age 6-16 years</th>
<th>(b) Current residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural—farm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural—nonfarm</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Village of under 5,000 people</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Village or small city of 5,000 to 24,999 people</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>City of 25,000 to 99,999 people</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>City of 100,000 people or more</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

27. Please circle your approximate 1991 TOTAL HOUSEHOLD INCOME before taxes in thousands of dollars:

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
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</thead>
<tbody>
<tr>
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<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
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<td>60</td>
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<td>80</td>
<td>90</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>175</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Please use the space below for any comments you may have.

THANK YOU FOR YOUR COOPERATION!

TO RETURN THIS QUESTIONNAIRE, simply seal it and deposit it in any mailbox. Return postage has been provided.
APPENDIX E:

Mail Questionnaire Used to Survey DMU 96 Property Owners in November