

## **ISSUES – FIGURE SET**

### **Ecological Impacts of High Deer Densities**

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White-tailed deer, © Kelly Bolton

#### **Figure Set 3: Conflicting Stakes in Deer Management**

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**Purpose:** To understand the human dimensions of deer management, including the variety of stakes involved and complexity of decision-making processes.

**Teaching Approach:** citizen's argument

**Cognitive Skills:** (see Bloom's Taxonomy) — comprehension, interpretation, application

**Student Assessment:** reflective essay

#### **CITATION:**

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[http://tiee.ecoed.net/vol/v2/issues/figure\\_sets/deer/abstract.html](http://tiee.ecoed.net/vol/v2/issues/figure_sets/deer/abstract.html)

## BACKGROUND

Conflicts over management of abundant wildlife have increased dramatically over the past decade. Large herbivores are a particular source of controversy in many suburban communities. For example, some residents enjoy the presence of deer (*Odocoileus virginianus*) in their neighborhoods while others have become concerned about problems deer may cause, such as damage to landscaping and gardens or risk of vehicular accidents. In many communities, people's tolerance for negative impacts of deer has been exceeded. Wildlife agencies and communities are faced with the challenge of managing deer in areas where the traditional management method of hunting is infeasible or socially unacceptable. At issue are not only the technical aspects of wildlife population control but also regard for socially acceptable solutions and management of conflicts among community members with opposing viewpoints.

This issue focuses on challenges faced by wildlife managers and community decision-makers in reducing negative impacts associated with high deer densities. The issue uses the case study of Cayuga Heights, New York (Chase et al. 2002) to illustrate the multiple stakes in deer management and trade-offs between management alternatives.

Cayuga Heights (population 3,738) is a relatively affluent residential suburb bordering the city of Ithaca in Tompkins County, New York. About 520 acres in size, Cayuga Heights is situated on hilly topography east of Cayuga Lake, one of the Finger Lakes in central New York. Deer find suitable habitat in the village's numerous small woodlots covering side slopes as well as ravines unfavorable for home construction or maintenance as open lawn. Some Cayuga Heights residents conducted a petition drive in 1998 to document concerns about deer. In response, the mayor appointed a citizen committee to study the situation. Officially created in August 1998, the Cayuga Heights Deer Committee was charged to study the "deer problem" and develop recommendations for the mayor and village trustees. The situation in Cayuga Heights is not unlike that in many suburban communities in the northeastern and mid-western U.S. where controversy about management of deer is emerging; traditional management methods, such as hunting, are likely to be infeasible or socially unacceptable; and community members hold diverse wildlife values.

## STUDENT INSTRUCTIONS

For the purpose of this activity, you and your classmates will play the roles of citizens participating on the Village of Cayuga Heights Deer Committee. Cayuga Heights' elected officials have mandated your committee to study deer in the Village and recommend how the local government should proceed to reduce deer-related problems in the community. You are aware that numerous homeowners complain that deer ravage their landscaping, gardeners fight an ongoing battle to protect vegetables from decimation by deer, and motorists worry about the increasing likelihood of hitting a deer while driving. Yet many people — including some of those concerned about problems associated with deer — enjoy the presence of deer in their community.

The Deer Committee has worked closely with the state wildlife agency, which has the authority for managing deer. The state deer biologist has agreed to assist Cayuga Heights in managing its deer herd but the Village (i.e., YOU as the citizen committee tasked with addressing deer issues) must decide which management alternative is most suitable for your community and recommend it for approval by the Village's governing board. Your committee has been meeting monthly for two years. With assistance from wildlife biologists, you studied Cayuga Heights' deer population and deer management methods. Below are 5 potential methods for managing deer under discussion within your committee. A regular hunting season for deer is not an option, because the village is almost entirely residential and has an ordinance to protect human safety that prohibits the discharge of firearms. With assistance from social science researchers (Chase et al. 2002), you also conducted a scientific survey to learn how people living in Cayuga Heights felt about deer (see Figure 3). Having gathered all of this information, the time has come to make a decision and final recommendation to the Village board.

Review the survey results in Figure 3 and read about the management alternatives below. Then you and fellow citizens on the Deer Committee must decide on a management option. First, you should attempt to reach consensus on an option. Consensus means that the decision is one that everybody agrees with or, at least, can live with. If consensus cannot be reached then you will take a vote after a specified period of time for deliberations. During the vote, each committee member will explain her or his reasoning for selecting a particular option. In your decision-making, consider the effectiveness, cost, safety, acceptability, and humaneness of each option.

### Method 1: Selectively Cull Deer

The deer population could be reduced by selectively shooting deer attracted to a carefully designed bait site. The meat from a deer cull can be donated to charitable organizations. Deer could be culled by professional sharpshooters or village police. Sharpshooters could use shotguns or archery equipment (bow and arrow) to shoot deer. The cost of this technique is estimated to be around \$300 per each deer. Wildlife scientists say this technique is effective for immediate reduction of deer numbers in small areas. However, this technique may be difficult in Cayuga Heights because of the density of buildings and houses and because of safety concerns.

## **Method 2: Deer Contraception**

Contraception, or birth control, for female deer is in the experimental stage, so any decision to use contraception has to be part of a research project. The estimated cost of contraception is around \$1,000 per deer to administer two treatments per year for two years. Contamination of the food chain and meat butchered by hunters is possible. There are a couple of vaccines used and they are generally administered to deer with a dart gun. If any darts miss their mark and go unrecovered, they could be hazardous to humans. Effectiveness at reducing population levels using this method is uncertain, but estimated to result in between 80 and 90 percent reduction in fawning for treated females. At least 70% of all females in a local population must be treated every year in order for this technique to effect population reduction.

## **Method 3: Surgically Sterilize Deer**

Deciding to surgically sterilize female deer is another possible means to attempt to reduce the population of deer. The cost of this method is estimated to range between \$400 and \$600 per deer — depending on the success rate and the method used to capture deer — after an initial outlay of around \$20,000 for equipment. The long-term effects of this method on deer behavior and genetics are unknown. The sterilization itself is usually successful in over 90 percent of the cases, but in some instances the reproductive tissues have been observed to grow back. Individual deer only need to be treated once, but at least 70% of all females in the local population must be treated in order for this technique to effect population reduction.

## **Method 4: Deer Contraception**

This method is very dependent upon successful timing. Essentially, a chemical is administered as an abortion drug to female deer early in pregnancy. Consequently, this technique must be repeated every year. The cost of this method is estimated to be very similar to contraception, around \$1,000 per deer for two years of treatment. The drugs used have received FDA permits to be used in food animals. At least 70% of all females in a local population must be treated every year in order for this technique to effect population reduction.

## **Method 5: Educate People About Reducing Deer-related Problems**

One possible decision is to do nothing to reduce the deer population but try to teach people to reduce problem interactions by changing their own behavior or the behavior of deer. The village costs for this approach would depend on how much, if any, of an education campaign was funded by the village. Methods that could be promoted include: installing deer fencing, planting unpalatable landscape plants, using deer repellents, discouraging deer feeding, and hazing or frightening deer. Village ordinance prohibits installing fences over 4 feet in height within the first 15 feet of one's property. Most methods of problem prevention have various levels of effectiveness and none are considered fool-proof.

## FIGURES

<b>FACTORS</b>	<b>% respondents</b>
<b>Attitudes toward deer</b>	
Enjoy deer without reservations	11%
Enjoy deer but worry about problem	54%
Do not enjoy deer	34%
<b>Preferred change in population size</b>	
Decrease	81%
No change	12%
Increase	3%
<b>Acceptability of management actions</b>	
<b>Deer reproduction control</b>	
Very acceptable	55%
Not at all acceptable	14%
<b>Trap deer and move them to another area</b>	
Very acceptable	41%
Not at all acceptable	18%
<b>Use sharpshooters to kill deer at bait sites</b>	
Very acceptable	21%
Not at all acceptable	50%
<b>Educate people about living deer</b>	
Very acceptable	33%
Not at all acceptable	25%
<b>Restrict development to preserve habitat for deer</b>	
Very acceptable	19%
Not at all acceptable	31%
<b>Allow regulated archery hunting by licensed hunters</b>	
Very acceptable	19%
Not at all acceptable	52%

Figure 3. Factors important for understanding the context regarding deer management from a survey of residents in Cayuga Heights, New York, 1998 (n = 438). (From Chase, L. C., Siemer, W. F. and D. J. Decker. 2002. Designing stakeholder involvement strategies to resolve wildlife management controversies. *Wildlife Society Bulletin* 30(3):937-950.)

## NOTES TO FACULTY

In this exercise the "citizen's argument" simulates deliberations among a committee of citizens appointed by elected officials to study and recommend appropriate actions for deer management in a suburban community. Students are given results of a community attitude survey (Figure 3, adapted from Chase et al. 2002) and informational scenarios about different deer management options. After digesting these, students deliberate as a group and try to reach consensus on the preferred management option for the community. You can let students form their own opinions. Or, if you feel consensus would be reached quickly and students would not really get to grapple with diverse stakes in deer management decisions, you can assign specific roles (such as wildlife photographer, animal rights supporter, hunter, police officer responding to deer-vehicle collisions, gardener, homeowner, motorist, educator, etc.)

Help students understand the survey results in Figure 3. Surveys were sent to 550 randomly selected resident property owners in Cayuga Heights during November and December 1998. The researchers received an 81% response rate (adjusted for undeliverable questionnaires and nonresidents). Students should note that the majority (54%) of respondents said that they enjoy the presence of deer but worry about associated problems. Of particular interest is that 81% of respondents prefer a decrease in the deer population size; however, 50% and 52% find killing deer by sharpshooters or licensed archery hunters respectively to be "not at all acceptable." This posed a challenging dilemma for community decision-makers and wildlife managers: how to reduce negative impacts associated with deer with dubious public support for lethal control? This led to exploration of additional management options and the 5 scenarios included in the students' instructions. Let students read and digest the pros and cons of the five management scenarios.

Have students begin deliberating for a specified period of time (e.g., 10 minutes). After the designated time period, ask students if they have reached a consensus and, if so, for a group leader to articulate their decision. If not, ask students to prepare to vote. Vote orally or by written ballot. After the vote, if class size permits, ask each student to explain the reasoning behind her or his choice. Alternatively, facilitate a group discussion around challenges to reaching consensus and the trade-offs between different management options.

## Student Assessment: Reflective Essay

- (1) Oral presentation of students' reasoning behind selection of a management option.
- (2) Ask students to write a brief (1-2 paragraphs) essay on the thinking process behind their selection of a management option. Some questions to help guide students' reflection:
  - As an individual, what criteria (e.g., effectiveness, cost, safety, acceptability, humaneness) did you consider in selecting a management option? Which was most important to you and why?
  - As a group, how did you attempt to achieve consensus on a management option? Was consensus possible? Why or why not? What trade-offs were involved between different management options?

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