DEER MANAGEMENT AT CORNELL UNIVERSITY

The Problem: Limiting damage to teaching and research and areas of high visibility and historic importance to campus, caused by local deer population, while minimizing impacts to our neighbors.

Three scales of Operations and Impacts:

1. At the Countywide level
2. CU research and teaching areas (extended campus)
3. Ithaca campus

We have committed to be a partner with the County and local municipalities in this endeavor. The University is affecting solutions to protect its assets and research and teaching in CU properties. To that end, we have developed a set of principles and an ongoing process.

Principles:

1. Protect University assets and research and teaching and activities related to CU educational mission.
2. Mitigate negative impacts to our campus neighbors.
3. Limits damage as much as practicable in areas of the campus not directly related to research or teaching, but with aesthetic value.
4. Engages the broader community in a discussion around managing the deer damage problem.
5. Educates the public and media.
6. Considers short-term approaches while developing long-term strategies that deal with both Cornell and non-Cornell properties.

Process and Efforts to Date:

I. Mapping to assess the level of damage and impact to various CU areas.

II. Typology/Classification of CU areas where damage is occurring:

- Woodlands
- Agricultural Fields and Plots
- Museum Collections and Rare Plant Species
- Campus Gardens
- Research Areas (wooded or fields)
- Areas of high visibility, iconic or historic importance

III. Criteria

(To Prioritize Areas of Importance)
- Teaching
- Research
- Historic Importance/Visual Prominence
- Economics/Cost
- Aesthetics
- Museum Specimens
- Ecological Integrity
- On-Off Ithaca campus

(To Consider, Evaluate Methodology, and Determine Types of Protection Effort)
- Regulatory Constraints
- Efficacy/Effectiveness
- Public Acceptance
- Impact of Land Use
- Lifecycle Costs
- Thresholds of tolerance

IV. Options

1. Fencing Strategies
2. Culling
3. Relocation
4. Hunting
5. Sterilization
6. Sprays/Repellents
7. Harassment

V. Adjacent Land Uses (Internal/External)

- Residential Neighborhoods
- Campus
- Research
- Natural Areas

The criteria and options will be filtered through the nature of adjacent land uses, on campus or with our neighbors, to determine impacts and best measures.

Measuring Results

Deer management strategies will need to be a nuanced and evolving approach. While we will be developing measures of success, the community has to be a partner in measuring impacts of management strategies. We invite your input and participation.

Forest Home Improvement Association Executive Board
Deer Management Overview

August 24, 2006

Background

In April of 2005, Forest Home and Cornell began a series of conversations regarding the management of the area's growing deer population. The impetus was Cornell Plantations' plan to install 2.3 miles of 10-foot high wire mesh fence along the Newman Arboretum's perimeter during that summer. Plantations officials acknowledged that fencing for the Mundy Wildflower and Botanical Gardens was likely to follow, if funding was available.

Two neighborhood forums and door-to-door canvassing revealed Forest Home's overwhelming opposition to perimeter fencing and the resulting impacts on the neighborhood. However, residents also expressed a widespread desire to partner with Cornell to find alternative solutions. The Plantations has a pressing problem: valuable plant specimens are being lost due to deer over-browsing. This problem is only going to grow. The resident deer population, estimated to be 18 during the spring of 2005, now approaches 30.

Alternatives Considered

Non-Intervention

Pros: Deer are appealing indigenous animals that bring many people pleasure. People are pleased to know that they have not directly acted to harm these creatures.

Cons: Given the favorable conditions in our area, the local deer population can be expected to continue to grow at an exponential rate, doubling every two to five years. Herds with high population densities experience increased incidences of Lyme disease, chronic wasting disease, bovine tuberculosis, fawn mortality, and malnutrition. Deer over-browsing compromises forest health by permanently changing the composition of plant and animal populations. Human health and safety are affected by exposure to Lyme disease, deer attacks on humans, and increased deer-vehicle collisions/fatalities (in New York State, 50,000 deer-vehicle collisions occur annually). Residential and commercial lands are damaged (statewide ornamental losses alone total more than $49,000,000 each year). Many communities around the country that have first chosen non-intervention have later found themselves culling hundreds of deer.

Fertility Control

Currently there is no legal and effective fertility control product available for populations of wild deer. Regulatory hurdles include strict FDA controls concerning the release/use of contraceptive, immunocontraceptive and contragestational chemicals, as well as state laws regarding the capture of deer. Fertility control remains technically problematic in free-ranging deer. The Cayuga Heights Deer Project was stopped because treated deer became

pregnant. Once a fertility control product becomes available, its best use will be to stabilize a herd's size, not to reduce the population. Culling could still be necessary prior to the application of fertility control measures.

Perimeter Fencing

Pros: Well-designed and executed fences protect all enclosed plantings from damage due to deer browsing.

Cons: Since the underlying cause of over-browsing is not addressed, the benefit to fenced properties comes at the expense of land that is not fenced. Feeding pressure is increased on adjacent properties. Blocked from their range, deer are forced onto roads, making roads more dangerous. Any deer trapped within exclosures are typically killed. Range and habitat of other animals (e.g., turtles) can be disrupted. Ten-foot high fences visually mar landscapes and severely limit access to visitors.

Culling

Pros: Annual culling of a limited number of antlerless deer (does) reduces and/or stabilizes deer populations. Because does are territorial and have relatively small ranges (200-600 acres), culling is an effective local management tool. Smaller herd sizes preserve deer and forest health, decrease over-browsing in gardens and on agricultural lands, reduce deer-vehicle collisions, and limit the spread of Lyme disease to humans. Animal experts consider sharpshooting a humane method of killing. Deer meat can be consumed locally. Nationally, no human injuries have been reported as a result of controlled hunts or sharpshooters.

Cons: Some oppose lethal measures on moral grounds; others worry about inflicting suffering on the animals. Laws concerning the discharge of firearms and bows can impede access to some properties. An ongoing commitment is required.

Selection and Location of Landscape Plantings

Pros: Planting preferred plant varieties away from known deer browsing routes can help decrease deer damage in a particular area, as can selecting less desirable plants for places where deer are known to feed.

Cons: Once food becomes scarce or the population density becomes high, deer will eat just about anything. Each deer eats several pounds of plant material per day.

Trapping and Relocation

New York State does not allow the trapping and relocation of wild deer. Among the reasons are the lack of suitable sites (land where deer densities are low) and the high mortality rate of relocated deer (more than 75% of those relocated die within a year).

Repellants, Frightening Devices, Small Exclosures

Pros: These are all non-lethal, highly localized, and readily available. Anecdotal evidence supports the efficacy of a number of new repellants and sonic devices.

Cons: These measures do not affect deer population, but merely transfer browsing damage from protected to unprotected plants and areas. Furthermore, their effectiveness decreases as feeding pressure increases. Repellants require the time-consuming process of application and re-application. Some products are noxious. Light- and noise-generating frightening devices can be disruptive to humans and other animals. Over time deer become desensitized. Small exclosures are time-consuming to set up and maintain, and many find them unattractive.

Deer Management Recommendations for Communities in Tompkins County[1]

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Overview:

Management of human-deer interactions is complex, and remarkably controversial, especially in suburban areas. Changes in land use and wildlife abundance, and increased traffic flows, have caused suburban neighborhoods to consider environmental issues. Individuals, neighborhoods, and local governments of all sizes across the region are struggling with their unique deer problems. Observation and directed research on community-based deer management have provided no sure-fire solutions. Citizens concerned with resolving local deer issues may find a few recurring themes useful as they embark on their own journey into community-based deer management. Based on experience in several communities in New York and other Northeastern states, there are several processes that are important to consider. Each community will need to evaluate its situation and determine specific goals and available resources prior to determining the best combination of management alternatives. These recommendations are intended to help community leaders and members think through potential processes so that time and funding can be used most efficiently to produce the desired management results.

Setting Goals and Planning:

1. Most communities have lengthy discussions before putting plans in place. They study issues, the history of efforts in other communities, and their environmental values. Elected officials and citizen groups take the time to weigh alternatives that will sustain institutional and social support. It usually takes several meetings to understand the complexity of deer management in order for community officials to make informed decisions. ***In most cases, communities jump to proposing solutions—management actions—prior to going through the more basic and essential process of identifying goals and objectives for management, which is a prerequisite to any action planning. Skipping or giving short shrift to this phase of the management process may be the most common flaw in community-based management of human-deer impacts, and is perhaps the greatest cause of inefficiency, confusion, and failed first attempts at management.*** There are several models for community-based education, participation, and decision-making which have been used for suburban deer management.[2]

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[1] This fact sheet was developed with helpful review comments and suggestions from Daniel Decker, Cornell University Office of Land Grant Affairs, Gwen Curtis, Graduate Student Representative, Cornell University Neighborhood Council, and Arthur Berkey, co-Chair, Cornell University Neighborhood Council.

[2] See pages 20-21 in the second publication listed in "Resources" at the end of this fact sheet.

2. Goals for a deer management plan should be clearly stated with respect to the desired impacts from human-deer interactions in the community. Goals need to be realistic, obtainable, and acceptable to the community (which does not mean acceptable to every individual—a seemingly impossible achievement). Measurable impact indicators (e.g., numbers of deer-car collisions, levels of plant damage, the potential for disease transfer) should be measured pre- and post-management so that the success of the program can be evaluated.
3. An open, fair, and credible decision-making process should be developed and carefully documented. Some deer management actions will require state permits (e.g., fertility control, culling), and the NYS Department of Environmental Conservation (DEC) will consider the level of public involvement before issuing a special permit for suburban deer management.
4. Communities that have successfully managed human-deer interactions have developed long-term plans with multiple solutions for areas of different sizes. The planning horizon should be at least 15-20 years.
5. Once a community makes the decision to manage deer, then an annual budget needs to be put in place to sustain the program. Short-term projects typically fail, and squander time, resources, and cooperation.
6. Deer move across political jurisdictions and individual property boundaries. Consequently, effective management often requires coordination of activities between public and private agencies, institutions, and municipalities. Isolated efforts typically fail.
7. Deer management programs that include sharp-shooting (culling) are often challenged in the court system. Such programs are sustained only with substantial community support and elected officials who are willing to fight lawsuits. (There is no reason to expect the situation will be different in the Ithaca area.)

Mortality Factors and Diseases:

1. Disease transfer from deer to humans is not an issue in Tompkins County. The nearest cases of bovine tuberculosis in deer are in Michigan. Chronic wasting disease is not likely transferred from deer to people, and is confined to the Oneida County area in NYS. The main vectors for Lyme disease are small rodents, and the prevalence of Lyme disease in Tompkins County is very low, in part due to the soil composition and climate (3 to 10 cases annually for the last 10 years). Typically cases in Tompkins County are from infections and tick bites that initially occurred elsewhere. The NYS Department of Health maintains a database of Lyme cases and actively manages diseases transmitted from animals to people.
2. There are no data to support the notion that deer culling is an effective tool for reduction of Lyme disease. As mentioned above, deer are not the primary vectors for the disease. Even if all deer were removed to lower tick abundance, the black-legged ticks also use other mammals as secondary hosts. Exclusion fencing is the best way to prevent deer from dropping ticks that carry Lyme disease in areas such as playgrounds or school yards.
3. Given the high-quality forage base in Tompkins County, deer are not likely to suffer from malnutrition related to overpopulation any time soon. Most adult does are having twin fawns in Cayuga Heights and Forest Home, for example, indicating their health and reproduction are not compromised in these developed environments.
4. Statewide data on deer-car collisions are unreliable and based on estimates made in the late 1980s. No agency currently collects reliable data on deer-car collisions,

neither DEC nor the NYS Department of Transportation. Collection of reliable data on deer-vehicle collisions could be a focus for Tompkins County.[3]

Fertility Control:

1. Effective fertility control vaccines (85-90% reduction in pregnancy rates) exist, but they are still available only for research trials. Registration of contraceptive vaccines has been moved to the US Environmental Protection Agency, and is no longer handled by the US Food and Drug Administration. It is anticipated that a contraceptive vaccine may be registered and commercially available in two years. This vaccine is currently available for approved research trials from the US Department of Agriculture, National Wildlife Research Center.
2. Permits from NYS DEC will be required to capture and treat any deer with experimental fertility control vaccines.
3. The Cayuga Heights (CH) deer project stopped because a denatured (inactive) batch of vaccine was received from the manufacturer. This impacted four other research projects nationwide, including Princeton, NJ, and Ohio Erie Canal near Cleveland. During the sterilization phase of the CH deer project, the deer population was reduced from about 150 deer in the community to about 90 after 18 months of trapping and sterilization surgery. If the vaccine had been active, and had worked as anticipated, the deer population would have continued to decline.

Fencing and other Physical Barriers:

1. Well designed fencing should last 20+ years with low annual maintenance costs.
2. Small exclosures (e.g., fencing, netting, burlap, etc.) are the best method for protecting limited areas with highly-valued plants, especially during winter.
3. Pedestrian access in fenced areas can be provided with gates and turnstiles. Well designed fencing can be attractive and is frequently used to protect community gardens.
4. Cattle guards can be installed at major road entrances to provide vehicle access.
5. There is no evidence to indicate that deer car collisions will increase if fencing is installed, especially if speed limits are low (30 mph or less).
6. The mesh of deer fencing is typically large (4x4 or 4x6 inches) and would likely not affect amphibians, turtles, or small mammals.
7. If deer found inside an enclosed area are removed (e.g., killed, or captured and euthanized), then plant damage on surrounding properties should not increase.
8. Some communities may have local regulations or ordinances limiting fence height, type, or location. Check with your local municipality before installing a fence.

Deer Population Control:

1. A municipality, institution, or agency will need to apply to DEC for a nuisance deer (culling) permit (individual permits are issued to landowners to address agriculture and forest management concerns). DEC will only approve a permit for culling suburban deer when they are satisfied with the level of public involvement and discussion, and the agency believes there is substantial community support.
2. An annual budget will be needed to support costs associated with a culling program and sustain this as a long-term solution. A similar budget line would be

[3] The Town of Amherst, NY, has developed a model program for GIS mapping of deer-vehicle accidents: http://www.amherst.ny.us/archive/govt/planning/deer_mgt/deer_1.htm

needed to fund contraception or other potential alternatives for suburban deer management.
3. Culling and hunting are not the same, and these terms can become confusing when used interchangeably. Hunting includes an element of fair chase and is regulated to balance deer densities with broad, larger-scale landscape quality. Hunting occurs during the daylight hours with sportspersons who are required to pass a hunter-safety course. Culling is a different exercise that often includes shooting deer over bait at night with firearms and lights, or night-vision scopes. The goal is to kill as many deer as quickly and efficiently as possible. Often military firearms with silencers are used by police officers to minimize noise at night. This is not a recreational activity sought by most members of the community who are traditional hunters, although some with appropriate skill may volunteer to participate as a civic duty.
4. Based on past experience in the Ithaca community, there is likely to be significant opposition to deer culling. Local elected officials typically need to be willing to challenge lawsuits to sustain a culling program.
5. A comprehensive and persistent educational program, and an informative communication effort, should precede and accompany community deer management actions. This has been demonstrated repeatedly in many communities.

Plant Selection:

1. Existing plant collections in the Plantations used for teaching, research, and outreach are unique. These cannot be easily changed, and some have zero tolerance for deer damage. Those that have zero tolerance will need to be fenced.
2. Very few woody ornamentals are resistant to deer damage during the winter months when there is snow cover. Signs of deer overabundance include a browse line on woody evergreens (yews, arborvitae, etc.) up to a height of six feet.
3. Ornamentals along major deer travel corridors will suffer heavier feeding pressure, and will likely need to be fenced if protection is desired.
4. Most spring bulbs, except tulips, tend to be resistant to deer damage and can be planted in areas with heavy feeding pressure from deer.

Trapping and Relocation:

1. Based on the capture of more than 400 deer for research projects conducted by Cornell University in central NYS, mortality rates for relocated deer should be less than 5%. Mortality rates as high as 75% have been reported in the literature for relocated deer (a single California project), where deer were in poor condition and near death at the time of capture.
2. Relocation of deer in NYS is currently not a viable management alternative. There is nowhere to move captured deer because many areas are already above goal densities established by NYSDEC and citizen task forces. Moving wildlife out of their established home ranges is a complex management issue.
3. Capturing wild deer and moving them to a game farm is not a possible option. There are regulations that prohibit privatizing a public resource (deer). Second, DEC strictly regulates existing captive deer herds because of concerns about chronic wasting disease.

Repellents and Scare Devices:

1. Few products on the market other than fencing will reliably protect plants from deer damage. The anecdotal evidence in trade journals is just that, and is not valid.

Cornell researchers have been involved in several deer repellent trials, and we have nothing new to recommend.
2. Repellents cannot be reapplied during periods with freezing temperatures in northern climates. Additionally, they are of little value to protect plants when there is snow on the ground limiting deer access to other forage.
3. Deer will habituate (acclimate) to light and noise devices. Ultrasonic devices that have been tested under scientific protocols have failed in all published research trials.

So how should communities proceed?

Each community must proceed at a pace and with a process that is familiar and effective for its situation. We suggest at minimum the following guidance:

1. Clarify whether human-deer interactions are a problem for relatively few individuals, or more broadly a "community issue."
2. If a community anticipates deer issues to become more prominent, an organized approach should be taken that reflects the diverse views of the community, grounded on a solid foundation of information. Bring expert advisors into the picture early on so that misinformation and momentum in faulty directions is avoided.
3. Do not start by considering actions to be taken. Instead, start by clear articulation of the impacts from human-deer interactions that are of concern, prioritize goals and objectives that the community can agree upon, and then start to consider alternatives. These may include as much emphasis on human behavior vis-à-vis deer, as on manipulating deer directly through reductions, repellents, etc.
4. Be prepared for long-term commitment to a management program with a budget to sustain it. Use measurable objectives that indicate the impacts of concern. Monitor progress and be willing to adapt if success is achieved early, or proves elusive, given the initial management program elements.
5. Be braced for controversy from known and unknown quarters—managing deer brings people with strong and diverse viewpoints to the table! Always keep in mind two classes of stakeholders in deer management—those impacted by deer who seek relief, and those impacted by the management response to the first set of problems, who are concerned about the methods and the philosophy of deer management.
6. Keep in mind that once an intervention is set into motion, the consequences are someone's responsibility—a community leader, a community overall, etc.
7. Remember that the deer belong to no one and everyone. The problem is "ours" not his or hers, or theirs. Deer go where they will or can.
8. Management of human-deer impacts in a community requires perseverance, patience, and discipline. Systems for management need to be institutionalized and preferably relegated to entities that are not subject to vagaries of rapid personnel or leadership change.

Resources for Community-based Deer Management:

http://wildlifecontrol.info/NEWDMC/PDFs/Deer_management_mechs.pdf

http://wildlifecontrol.info/NEWDMC/PDFs/DeerGuide.pdf

http://wildlifecontrol.info/NEWDMC/PDFs/H-W%20Guide.pdf

University Neighborhoods Council

"Cornell University administrators agree to meet regularly with a Cornell Neighborhood Council, modeled after the Collegetown Neighborhood Council, to discuss issues of shared interest. The proposed council should convene six times a year, starting by the end of the calendar year 2005. [From the agreement regarding the WCRI Replacement Parking Lot, July 18, 2005]

> Representatives from the neighborhoods adjacent to the campus will be selected by the communities themselves.
>
> The proposed council will provide reports, from time to time, to the Cornell Administration, which in turn will share such reports with the Community Communications Committee of the Board of Trustees."

University Neighborhoods Council Members
Art Berkey, co-chair
Gary Stewart, co-chair
Neighborhood representatives:
Byrant Park Neighborhood – Ken Carrier, David Levitsky
Collegetown Neighborhood Council - Joanne Trutko
Cornell Heights Neighborhood Association - Michael Decatur
Ellis Hollow Community Association - Christine Becraft
Forest Home Improvement Association - Jon Miller
Ithaca Neighborhoods Council - Leslie Chatterton
University Hill Neighborhood Association - Joanna Luks, John Schroeder*
Varna Community Association - Art Berkey, John Tottey
Cayuga Heights Neighborhood Issues Advisory Committee – Molly Shoemaker
Cornell representatives:
Campus Life - Emily Hurst (represents undergraduates), Jean Reese, Susan Riley
Community Relations – John Gutenberger, Gary Stewart
Dean of Students - Kent Hubbell
Graduate & Professional Student Assembly – Gwen Curtis, Daniel Roth
Greek Councils – Jonathan Feldman
Planning Design & Construction - John Kiefer
Sustainability Hub – Norah Kates (on leave), Alex Rakow (temporary seat)
Transportation - David Lieb, Bill Wendt

Topics of discussion in 2006:

- Cornell University (CU) Sustainability and Tompkins County (TC) Sustainability
- Proposed Cornell heating plant project
- Cornell Master Plan Initiative
- T-GEIS
- CU and TC Emergency Preparedness Plans
- Hasbrouck Graduate/Undergraduate residency plan
- Forest Home Improvement Association on Deer/Fence controversy

We have met about 10 times this year, summer meetings added ad hoc, 3rd Tuesdays.
Questions of representation:

*Are all persons duly elected by their constituency?

*Do representatives have a dedicated line of two-way communication between the representative body and those who are being represented?

*Should persons who serve as a part of their salaried position (or such persons who are appointed) be considered as autonomously-voting members?

*What weight or power does any vote of the body have?

*Is there any legitimating presumption that a report to this body constitutes approval of that reports indicated actions? (Does this body serve as a staging ground for implicit approval?)

*When issues that are too complex for the expertise of the body are presented, how should the representatives honor the concerns of those presentations?

*What is the time frame for identifying issues, framing them as agenda items, and then following through on some deliberation, action, recommendation, or advocacy position?

*What are the limits of this body and how do we know when we recognize new limits or powers?

*How should the integrity of the representative body be maintained without closure or ambiguousness?