

The Hendersonville Urban Deer Committee has determined that the City of Hendersonville deer herd is over populated. If left unmanaged the herd is expected to double in the next five years. The following is the committee's recommended solution to over population.

- 1) Public works to coordinate with appropriate agencies to construct and place deer warning/crossing signs in high deer collision areas of the city.
- 2) Committee to develop an information resource for the public, describing non-lethal options to repel/deter deer, as well as inform the public to the dangers of wildlife/human contact.
- 3) Implement a deer control program with USDA certified deer management personnel using lethal techniques.
- 4) Harvested deer will be distributed by Hunters for the Hungry to local food pantries, such as Hendersonville Samaritan Association.
- 5) Recommend this Urban Deer Committee be established, by ordinance, as an ongoing city committee to monitor progress, collect data and recommend future deer herd management.

# **City of Hendersonville, Tennessee**

## **Urban Deer Report**

### **Introduction**

The City of Hendersonville, Tennessee was first incorporated in 1969 with a population of about 250 people. Over the last 45 years, the City has expanded dramatically to include more than 54,000 people at a density of 1,978 people per square mile. The City encompasses 27.3 square miles of residential housing, commercial development, wooded and fallow undeveloped areas, as well as pasture and agriculture. This mixture of land use provides ideal habitat for white-tailed deer populations which have grown significantly during this time.

Explosive white-tailed deer growth has occurred Statewide since the late 1960s. This is particularly true in urban/suburban areas of the state where there is little or no natural mortality and hunting pressure is non-existent. In addition, these areas provide excellent cover, an overabundance of food, and otherwise perfect conditions for white-tailed deer to thrive.

The City of Hendersonville, like many other cities, is now faced with the problem of what to do with burgeoning populations of white-tailed deer within their city limits. Common complaints include:

- Increased deer-vehicle collisions causing property damage and injury
- Landscaping damages from deer browsing and bucks rubbing trees
- Increased citizen complaints from gardeners and homeowners with extensive landscaping
- Recreational deer feeders causing deer to congregate in specific areas
- Potential disease transmission concerns

In addition, the issue of urban deer management can be very controversial. Each individual citizen has their own opinion of what should and shouldn't be done to address the issue of overabundance of white-tailed deer. They may have philosophical issues with killing animals in general, they may enjoy recreational feeding of deer, they may have taken a financial loss from deer damage to their property or hit one with their car, or they may want deer populations reduced but are uncomfortable with the means by which this may be accomplished. All of these opinions are valid and should be considered as part of the City-wide management discussion.

## **Hendersonville Urban Deer Committee**

The Hendersonville Urban Deer Committee was created to evaluate this issue on behalf of the City Board of Mayor and Aldermen and citizens of Hendersonville at large. The creation of this committee was prompted by the number of deer-vehicle collisions that have occurred within the City over the last several years and the increased number of citizen complaints of large deer populations and the damages that they cause to landscapes, gardens and property in general. The Committee's charge was to look into options for dealing with the urban deer problem and provide recommendations to the Board on how to proceed. Several options were considered including:

- Take No Action
- Install Deer Crossing Signs in High Risk Areas
- Promote Non-lethal Control of Deer - Chemical Repellents, Habitat Modifications and Scare Devices
- Establish a City-Wide or Targeted High Density Deer Hunt
- Establish a Deer Capture/Translocation Program
- Establish a Deer Chemo-sterilization Program
- Establish an Integrated Deer Management/Control Program

### *Take No Action*

The option of taking no action was discussed at length and was ultimately considered to be unfeasible and irresponsible. Many people enjoy watching wildlife within their neighborhoods and the personal satisfaction derived from watching deer seems directly proportional to the number of deer observed. However, the deer population is growing rapidly and problems currently being experienced will only worsen if no action is taken.

Many residents have the misconception that deer control measures will result in deer eradication, thus eliminating wildlife watching opportunities. They seem to believe there are only two options, no deer at all or the current situation. This is simply not true. Urban deer management can take many forms and have many outcomes depending upon the type of management and the intensity with which it is conducted.

The Hendersonville Police Department reported an average of 47 deer-vehicle collisions for the years of 2011-2013 (Table 1). State Farm reported that the average deer-vehicle collision cost for this time frame was \$3,305 per incident. These deer-vehicle collisions included at least one injury each year (up to five in 2013) as well, and the committee felt that this level of potential damage and injury was unacceptable.

**Table 1:** Reported Deer-Vehicle Collisions and Deer Carcasses Collected within Hendersonville, TN City Limits, January 2011 through June 2014. (Source: Hendersonville Police Department Crash Data Statistics and All Paws Wildlife Removal Report to the City of Hendersonville)

Year	Reported # of Deer-Vehicle Collisions	Reported # of Collisions w/Property Damage	# Collisions with Human Injuries	# Human Injuries	# Deer Carcasses Collected
2011	45	43	2	2	33
2012	48	47	1	4	31
2013	48	44	4	5	56
2014*	12	10	2	2	17

\*Data is incomplete for 2014 but is not significantly different from previous years on a month by month basis.

In addition, the option of no action does nothing for those individuals that have experienced damage to their property by the large number of deer that have browsed trees, consumed landscapes and gardens, and destroyed trees with their annual rubbing and marking of territory. Research also indicates that deer herds can double in size every three years escalating out of control and making the existing problem only that much worse if no action is taken. The committee believes that deer densities have exceeded society's ability to tolerate them. These unnaturally high deer densities present significant ecological, social and economic problems for a variety of stakeholders.

#### *Install Deer Crossing Signs in High Risk Areas*

The committee considered the option to install Deer Crossing signs along high risk areas of the City. The expense of these signs was not exorbitant but there was concern that this action simply was not enough. These signs really do not address the underlying problem of too many deer at all. As a single act, this option would have no effect on the deer issue in Hendersonville. However, it could be effective and important as part of the larger option ultimately recommended by the committee.

#### *Promote Non-lethal Control of Deer - Chemical Repellents, Habitat Modifications and Scare Devices*

The committee considered the option to promote non-lethal control of deer, including chemical repellents, habitat modifications and scare devices. There are a number of resources available to the public from numerous sources online. These resources provide detailed instruction on chemical repellents, habitat modifications and scare devices. Some specific details on each of these non-lethal control methods are available below.

- *Chemical Repellents* – there are a number of chemical repellents available commercially that can be sprayed on landscape plants and gardens that may deter deer from browsing on them. Chemical repellents must be reapplied after every rain or even heavy dew. They will keep deer from eating specific plant but all plants need to be treated. Chemical repellents will frequently move offending deer from one treated yard to another untreated yard.
- *Fencing* – there are multiple designs available for fencing out deer. The most important aspect of deer-proof fencing is the height. Deer-proof fences should be 8 feet high at minimum, causing fences to be extremely expensive to build and frequently unsightly. Like chemical repellents, fencing would potentially solve the problem of keeping deer out of a garden, however, landscape plants would still be susceptible to browsing and fencing would have no impact on vehicle collisions.
- *Deer-resistant landscapes* – many landscape plants are now labelled as deer resistant. These plants usually have thorns, smells or tastes that deter deer from eating them. However, in high-density deer areas, these plants will be consumed as well. Deer, like any other animal, will eat undesirable plants if given no other option.
- *Scare devices* – Motion activated sensors are commonly used with loud noise devices and sprinklers to scare wildlife away. These devices can work in specific situations for a short time but deer very readily grow accustomed to these devices and will simply ignore them if there are no real consequences to their activation.
- *Dogs* – Dogs can be a great deterrent to keep deer out of a specific yard. They too come with inherent problems. They must be fenced in or tied up within the City leaving them to be useful in a very small area. This is clearly not a solution for everyone sustaining deer damage and will not resolve any issues with deer-vehicle collisions.

The committee agrees that none of these non-lethal control methods will solve the long-term problem of too many deer and while they may help specific landowners address their specific issues, implementation of these methods will simply move deer into someone else's yard. Non-lethal methods will provide no abatement to the deer-vehicle collision issue in Hendersonville.

As a single option, non-lethal control of deer is not feasible for the city of Hendersonville. However, it could be an important part of the larger option ultimately recommended by the Committee.

### *Establish a City-Wide or Targeted High Density Deer Hunt*

The option to conduct a City-wide Deer Hunt or a Targeted Deer Hunt by licensed deer hunters from within the hunting public was explored as well. However, it was not recommended by any of the State or Federal agencies that worked with the Committee through these discussions. These type hunts require someone to:

- Solicit landowners for hunting permission
- Screen hunters and confirm safe hunting practices
- Deal with hunter applications and raffles
- Maintain records
- Respond to hunter questions and landowner concerns
- Consider City liability involved with these types of activities

As a result of these requirements, the committee did not feel comfortable with recommending this option.

### *Establish a Deer Capture/Translocation Program*

The option to establish a deer capture/translocation program was also explored by the committee. In this option, deer would be live captured by trap or tranquilizer, transported elsewhere and released. Capture and translocation has been demonstrated to be impractical, expensive, stressful to the deer handled and may result in high post-release mortality. Deaths of translocated deer have been attributed to capture myopathy, unfamiliarity with the release site, and encounters with novel mortality agents. Capture myopathy is a stress related disease that results in delayed mortality of captured deer and some studies have documented an 85% mortality rate.

In addition, the majority of the state of TN is considered the Liberal Zone in which up to 3 does can be killed by hunters a day. The establishment of this zone indicates that there is no need for additional deer in surrounding areas and in fact, deer populations are too high throughout the entire region.

Lastly, this option is by far one of the more expensive options. A realistic estimate to conduct such a program is around \$200,000 annually. The total costs for labor, time, immobilizing drugs, veterinary services and transport of deer would easily be a 6 to 10 fold increase over other available options.

### *Establish a Deer Chemo-sterilization Program*

Deer sterilization is considered to be experimental deer management. Fertility control agents function by reducing the reproductive output so that is equal to or less than the mortality rate. Because annual mortality rates for suburban deer populations are often

very low, a large proportion of the does (70-90%) need to be effectively treated to curb or reduce population growth. Also, there are currently no FDA-approved fertility-control drugs available. This is important because the FDA has very high concerns about the safety of consuming deer treated with experimental drugs and currently requires all treated, free range deer be marked with warning tags that stipulate consumption restrictions. The committee felt that to use something that was not FDA approved would be holding the city liable for possible law suits.

#### *Establish an Integrated Deer Management/Control Program*

The option to establish an integrated deer management/control program was the most feasible and palatable option that the committee considered. This option provides a safe, humane, effective, and responsible way for the City to 1) promote non-lethal ways to minimize deer damage, 2) document and mitigate damage caused by deer, 3) decrease the risk of deer-vehicle collisions and human injuries/fatalities resulting from these collisions, and 4) ultimately manage the City's deer population over the long-term with targeted deer control.

This integrated deer management program would incorporate portions of many of the previously discussed options, including installation of Deer Crossing signs, education of citizens on non-lethal methods to reduce deer damage, public outreach to better understand deer populations and deer damage within the City, and finally targeted and limited control of deer populations. Deer control would be conducted by USDA Wildlife Services personnel in coordination with the Tennessee Wildlife Resources Agency, Hendersonville Police Department, and the Hendersonville Urban Deer Committee.

## **Proposal for Integrated Deer Management/Control Program**

A City-wide deer management program would have several major components in which, private citizens, city officials, law enforcement personnel, and state and federal agencies would all be involved. These major components include:

- Creating a deer management plan with clearly defined and measurable goals
- Evaluating deer damage and deer populations within the City and utilizing this information to make educated and informed decisions on deer management
- Reaching out to citizens through the City website and other media in an effort to educate on deer management issues
- Utilizing all methods (both non-lethal and lethal) as part of the integrated program
- Establishing appropriate procedures for handling deer carcasses
- Reporting annually on the integrated management program

### *Hendersonville Deer Management Plan*

A deer management plan is a document that establishes the basis for deer management; outlines clearly defined and measurable goals; identifies the roles and responsibilities of all interested and engaged parties; outlines how the goals will be accomplished; and establishes a means for reporting the completion or progress toward these goals. This proposal could serve directly as a deer management plan for the City of Hendersonville or as the basis of one.

### *Evaluation of Deer Damage*

In order to document the need for deer management and identify high risk areas that may need control, a few pieces of information must be collected. City officials already collect a great amount of data pertaining to deer-vehicle collisions. This should be continued and built upon. The three major components required for evaluation of deer damage include:

- Deer-Vehicle Collisions
- Deer Carcass Collections
- Deer Damage Complaints and Concerns

These three datasets will provide valuable trend information, identify localized areas of concern, and provide valuable information in the decision of how to implement this deer management program from year to year.

For instance, from 2011 through 2013 an average of 47 deer-vehicle collisions was reported in Hendersonville (Table 1). Of these collisions, 55% occurred on or in close proximity to Highways 386 and 31E. In order to reduce the number of vehicle collisions,



a possible control scenario would be to focus on a ¼ mile buffer zone of these two main roads. The remaining 45% of deer-vehicle collisions all occurred on a few other main roads. If the City's only concern were to reduce deer-vehicle collisions then control efforts could simply focus within this expanded buffer zone.

Carcass collection data and damage complaints could be utilized in a similar manner. In conjunction, these three pieces of information could give a very good picture of where control efforts need to be focused and actual concerns and costs associated with this damage. Table 2 illustrates a possible example of a damage complaint dataset. As control efforts are implemented, these data sets should illustrate the effectiveness of the program.

**Table 2: Example of damage complaint data collection table**

Date of Call	Name of Caller	Address of Caller	Phone Number of Caller	Nature of Damage	Estimated Cost of Damage	Location of Damage (if different)
7/10/2014	Jane Doe	698 Indian Lake Road	822-1234	Damage - rubbed landscape trees	\$300	694 Indian Lake Road
7/10/2014	John Public	123 Rockland Road	826-4321	Damage - consumed garden plants	\$850	Same
6/15/2014	Mrs. Henderson	823 Shute Lane	431-2468	Nuisance – too many deer around	\$0	Same

### *Evaluation of Deer Populations*

In addition to collecting information about deer damages, a baseline survey of deer populations should be conducted. In order to accurately measure the success and effectiveness of any control efforts, a city-wide deer survey should be conducted at least once before efforts begin and again at the completion of these efforts.

Deer surveys can be done either by ground or by air. Ground surveys of Hendersonville would require 3-5 vehicles and 6-10 personnel utilizing night-vision and FLIR technology. This survey should be conducted over a four-hour period focusing around dusk. Ground surveys will provide a fairly accurate number of deer per given area with the understanding that ground surveys are conducted from roads and many areas inaccessible from roads would not be adequately surveyed.

Aerial surveys are best done by a helicopter during daylight hours in the fall and winter, after leaves have fallen for the year. Aerial surveys provide a much more accurate number of deer per given area due to the fact that all areas are visible from the air. Typical aerial surveys are conducted using 500 m transect lines and the helicopter is

traveling about 300 feet above the ground. Aerial surveys are more expensive but provide a more accurate count than ground surveys would.

### *Public Outreach*

Public outreach and openness is critical to the success of a deer management program. Providing information to the public on non-lethal methods to reduce damage can be done through websites and publications. Publicizing what the city is doing with respect to deer management (installation of Deer Crossing signs, collecting data, cooperating with State and federal agencies) is important as well. Allowing concerned citizens to voice opinions and provide input can be done through online surveys or more traditional phone call surveys.

Population objectives for the deer herd and control methods should be publicized before implementation to minimize potential conflicts. Presentations to civic groups and local schools could be useful in presenting facts, dispelling myths, and providing science-related information. Press releases to Hendersonville and Gallatin papers could maximize media support and help ensure that important information is made available to the community.

### *Annual Planning*

Urban deer management is a long-term issue. The issue is simply too complex to fix in one year and deer populations rebound quickly in the absence of control. Once initiated, deer management efforts should be reviewed, planned, and implemented annually. The basic process for annual planning and operations includes:

- Conduct a city wide deer population survey in the fall once the foliage has fallen
- Compare survey estimates to established goals to determine the number of deer that should be removed in that year
- Conduct control efforts where deer populations exceed established goals
- Conduct a city wide deer population survey to measure success of control efforts

Rural estimates of deer populations conducted by TWRA indicate that in hunted areas of middle TN deer populations occur at 19-20 deer per square mile. These areas allow hunting and have relatively low densities of humans compared to urban/suburban areas like Hendersonville. In general, most other urban areas in the US have a pre-fawn target goal of 10 deer per square mile. A quick calculation would indicate that under these circumstances an urban area the size of Hendersonville should hold 273 deer (10 deer per square mile) but it likely holds at least 546 deer (middle TN average density of 19-20 deer per square mile) or more at this time. This can only really be determined by a city wide survey and most Committee members suspect that deer numbers are likely to be much higher.

Once a goal has been set for deer removal, the Urban Deer Committee would work with USDA Wildlife Services and TWRA to identify specific areas of high densities. Specific tracts would be selected on which this work can be done safely and are willing to work with the City on this issue. Landowner permission and communication with adjacent and potentially affected landowners would be required.

#### *Proposed Methods and Procedures for Lethal Deer Management*

The safest and most humane way to remove deer from these settings is to harvest them from elevated platforms with suppressed rifles. This work would be done on weekdays at dusk and after, due to increased deer movement and less human interference.

In most cases, deer would be lured into these safe and approved areas with the use of bait. By drawing them into these areas, deer would also be removed from view of the general public and deer management personnel gain more control over the given situation. Personnel conducting this work would be specially trained and certified prior to conducting this work.

Deer control would focus specifically on the take of does not bucks. Harvesting only does minimizes the total number of deer harvested but maximizes the impact to deer populations. Control efforts would be conducted during January and February, after the annual rut has ended, removing both the doe and the following spring's young of the year. Control efforts would cease in late February before bucks begin to drop their antlers.

Any control activities would be coordinated with individual landowners and Hendersonville Police Department. A system of check-in/check-out would be established with Hendersonville PD to ensure that all necessary parties would be aware of operations at all times.

#### *Operational Timetable*

Conduct pre-control survey	late November – early December
Set annual goals for deer control	mid – December
Conduct removal efforts	January – February
Conduct post-control survey	March
Annual report prepared	April

#### *Deer Carcass Utilization or Disposal*

Deer carcasses would be utilized or disposed of depending on the situation and the status of the animal. There are a number of programs that provide a means for the carcass to be utilized such as Hunters for the Hungry. Hunters for the Hungry provide venison meat to needy families in the local area and according to TWRA officials may

be at no cost to the City of Hendersonville. The Hendersonville Samaritan Association is willing and ready to receive, store and distribute to local people in need. Hope Food Bank, Gallatin Cares, Portland Cares and other Sumner County food pantries, food banks, and soup kitchens would also be considered.

Carcasses can also be utilized by zoos and nature centers that house carnivores. For example, the Nashville Zoo does accept carcasses at no cost if they are fresh or immediately cooled to prevent spoiling. Disposal in a landfill would be the least desirable option and last resort.

### *Costs*

Deer management at this scale can be very expensive. In addition, with no good idea of the actual deer population within Hendersonville and the resulting amount of effort that might be required to impact this population, it would be difficult to provide an accurate estimate. Deer management programs are not finite in nature. Research indicates that at least 30% of the population needs to be removed annually simply to keep the population at a standard level.

However, based upon other similar projects in other states an initial cost of \$18,000 would be a reasonable estimate. This price would be considered a not-to-exceed price and would include an initial helicopter survey conducted prior to control operations and one ground survey upon completion of control. If the program succeeds, the cost borne by the city would be partially offset by lower incidence of recovering carcasses and fewer phone calls to City officials and equipment use by public safety officials.

This program would require annual expenditures and planning projects. At minimum, an initial survey would need to be conducted each year. Once this is completed the decision can be made as to whether or not to actually conduct operational control. If for instance the deer population survey is lower or equal to the population goal, then no operational control would need to be conducted during that year. Annual agreements with USDA Wildlife Services are billed only for actual expenses, so in these cases the only expense would be the initial survey. It should also be expected that control efforts may take several years to get deer populations in line with the suggested goals of 10 deer per square mile.