

# Managing Urban Deer in Connecticut

A Guide for Residents and Communities  
Second Edition



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Connecticut Department of Environmental Protection  
Bureau of Natural Resources - Wildlife Division





*This booklet was designed to provide communities and residents concerned about overabundant deer populations with facts about deer and deer management in urban and suburban areas.*

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**Conflicts between overabundant white-tailed deer populations and humans have become a prominent wildlife management concern, especially in urban and suburban areas.**

## Introduction

Following the passage of the Deer Management Act in 1974, Connecticut established a limited, conservative hunting season to allow for use of the deer resource and for continued population growth. Not until the early 1990s, when deer populations began to rapidly increase, was the hunting season framework modified to adapt to changing circumstances and focus on the taking of antlerless deer (does) to control population growth. Liberalizations in the hunting season caused deer herd growth to begin to stabilize in rural areas of Connecticut where hunters had good access to land. However, in southwest Connecticut and the shoreline towns where hunter access was limited, deer populations continued to grow. Opportunities to harvest additional antlerless deer continued to be liberalized in these areas.

Today, conflicts between white-tailed deer and humans have become a prominent wildlife management concern, especially in urban and suburban areas.<sup>(10, 20)</sup> Overabundant deer populations in residential areas are associated with high rates of deer-vehicle accidents, increased risk of contracting Lyme disease and other tick-borne diseases,<sup>(26, 35)</sup> and damage to natural plant communities and landscape plantings.

Many communities have struggled with the difficult task of selecting a publicly-acceptable management strategy to safely and effectively reduce overabundant deer populations.<sup>(25, 35)</sup> This booklet was designed to provide communities and residents concerned about overabundant deer populations with facts about deer and deer management in urban and suburban areas.

# Consequences of Deer Overabundance

## *Deer-vehicle Accidents*

Nationwide deer-vehicle accidents cause about 29,000 human injuries, 200 human fatalities, and \$1 billion in property damage annually.<sup>(11, 12)</sup> In Connecticut, the Department of Environmental Protection (DEP) receives reports from law enforcement officers of about 3,000 deer killed on Connecticut roadways annually.<sup>(27)</sup> However, many deer-vehicle accidents are not reported, including those where deer survive or die away from the road. Based on deer carcass removal data from the Connecticut Department of Transportation (DOT 2001-2002), for every dead deer picked up off the road and reported to the DEP, 5 additional deer go unreported. Therefore, about 18,000 deer are actually killed along Connecticut's roadways each year (49 deer per day). The total number of deer actually struck by motor vehicles whose fate is unknown (some may survive and some may die away from the road) is much higher. Using an average repair cost for deer-vehicle accidents of \$1,577,<sup>(11)</sup> about \$28 million in damage is caused by deer-vehicle accidents in Connecticut annually. In 2000, 172 human injuries resulted from motorists hitting wildlife (primarily deer) crossing roads<sup>(9)</sup> and several human fatalities have occurred from deer-vehicle collisions in Connecticut over the past 15 years.

## *Lyme Disease*

Another issue associated with deer overabundance is the increased risk of contracting tick-borne diseases such as Lyme disease. Since 1996, over 29,000 human cases of Lyme disease have been reported in Connecticut.<sup>(2, 8)</sup> Two other tick-borne diseases,



**An estimated 18,000 deer are killed each year on Connecticut roadways.**



**Deer are the primary host for the adult deer tick and are key to the reproductive success of the tick. Deer have been documented with up to 100 ticks on them during peak adult tick activity.**

Babesiosis and Ehrlichiosis, recently have become more common in the United States.<sup>(3)</sup> Since Babesiosis and Ehrlichiosis were first documented in Connecticut in 1991 and 1995, over 250 cases of Babesiosis and 500 cases of Ehrlichiosis have been documented.<sup>(8)</sup>

High incidences of Lyme disease have been associated with deer overabundance. Larval and nymph stages of the deer tick feed on birds and mammals. The adult tick, however, requires a blood meal from a medium to large size mammal to reproduce and lay thousands of eggs. Deer are the primary host for the adult deer tick and are key to the reproductive success of the tick.<sup>(44)</sup>

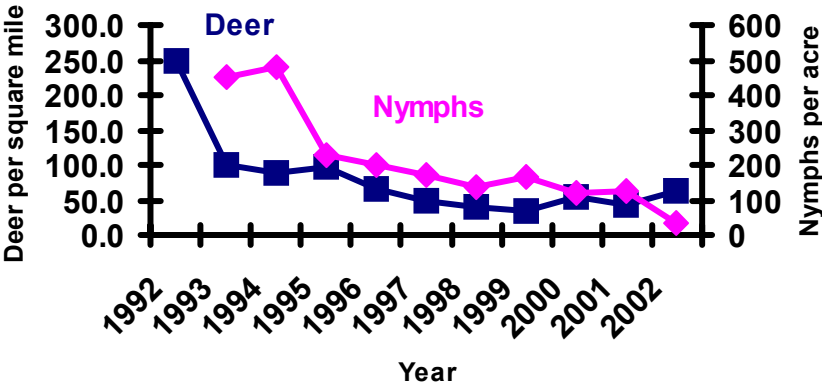
Numerous studies have shown that abundance and distribution of ticks are correlated with deer densities.<sup>(42, 44, 49, 50)</sup> For example, when the deer population was reduced by 74% (from 249 to 64 deer per square mile) at a 248-acre study site in Bridgeport, Connecticut, the number of nymphal ticks collected at the site decreased by 92%<sup>(44)</sup> (Figure 1). On Monhegan Island in Maine, where the deer population was eliminated, tick abundance was significantly reduced, as was the infection rate of remaining ticks 3 years later.<sup>(42)</sup>

Although the threshold at which deer densities need to be reduced to document a significant reduction in transmission rates of Lyme disease to humans is unknown, the relationship between deer abundance and human cases of Lyme disease was well documented in the Mumford Cove community in Groton, Connecticut, from 1996-2004. The deer population in Mumford Cove was reduced from about 77 deer per square mile to about 10 deer per square mile after 2 years of controlled hunting. After the initial reduction, the deer population was maintained at low levels using bowhunters. Incidences of Lyme disease among residents decreased 83% and have remained at low levels (Figure 2). Reducing deer densities to 10 deer per square mile was adequate to significantly reduce the risk of humans contracting Lyme disease in Mumford Cove. Deer population management must serve as the main tool in any long-term strategy to reduce human incidences of Lyme disease.<sup>(48)</sup>

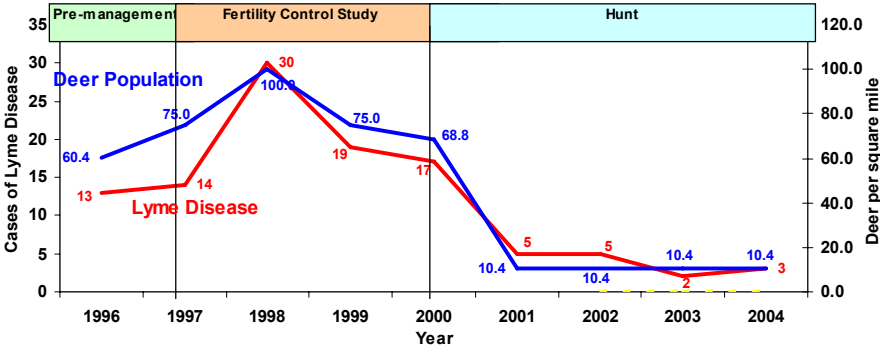


**Since 1996, over 29,000 human cases of Lyme disease have been reported in Connecticut.<sup>(2, 8)</sup> Ticks are abundant in brushy areas.**

**Figure 1. Changes in deer and nymphal tick densities in Bridgeport, Connecticut, 1992-2002 (Stafford et al. 2003).**



**Figure 2. Changes in deer density and cases of Lyme disease in Mumford Cove, Connecticut, 1996-2004 (CT DEP data).**



**Ecological Damage**

Overabundant deer populations also negatively impact native plant communities<sup>(4)</sup> and landscape plantings in residential areas.<sup>(26, 35)</sup> Because deer can eat 5-10 pounds of forage per day, overabundant deer herds can eliminate native plant species and change the structure and diversity of plant communities. Changes in the structure and diversity of plant communities affect the diversity and abundance of other wildlife species, such as small mammals and birds.<sup>(14, 39)</sup> Deer densities that exceed 20 deer per square mile can significantly impact ground and shrub nesting birds and change composition and abundance of plant species within forest ecosystems.<sup>(14, 39)</sup>



Bluff Point Coastal Reserve in Groton, Connecticut, serves as a good example of how overabundant deer herds can impact plant communities. In 1975, the Connecticut General Assembly designated Bluff Point as a Coastal Reserve to protect its unique plant and animal communities for the benefit of present and future generations. Deer hunting was not permitted at Bluff Point. In the late 1980s, the DEP documented severe deer overbrowsing of vegetation, and in the mid-1990s, surveys estimated the deer population exceeded 200 deer per square mile. Deer exclosures (8-foot high fenced areas) were constructed in 1990 to visually document the impacts of overabundant deer populations on the plant ecosystem. After 5 years of no deer management (1995), vegetation outside the exclosure remained unchanged, while vegetation structure and diversity within the deer exclosure increased dramatically. In January 1996, a deer reduction program was initiated at Bluff Point. During the following 5-year period (1996-2001), the deer population was reduced from about 222 to 20 deer per square mile. The reduced deer population resulted in a significant increase in vegetation structure and diversity outside the deer exclosure.

In residential areas, overabundant deer herds can impact flower and vegetable gardens and defoliate landscape plantings. Some homeowners who enjoy observing deer occasionally feed deer during winter. Deer also will take advantage of bird feeders in residential areas as a source of food during winter.<sup>(33)</sup> Supplemental feed may enhance deer productivity and artificially congregate deer into small areas, which increases damage to natural vegetation<sup>(16)</sup> and the potential of bringing ticks into residential areas.



**Deer exclosures (fenced area) were constructed at Bluff Point Coastal Reserve in 1990 to visually document the impacts of the deer population (220 deer/mi<sup>2</sup>) on the ecosystem.**



**After 5 years of no deer management (1995), vegetation outside the exclosure at Bluff Point remained unchanged, while vegetation inside the exclosure increased.**



**After 5 years of implementing a deer management program at Bluff Point (2001), the vegetation structure and diversity increased dramatically inside and outside the deer exclosure.**



**Supplemental feed may enhance deer productivity and artificially congregate deer into small areas, which increases damage to natural vegetation and increases the potential of bringing ticks into residential areas.**

## Non-lethal Management Options

### *Birth Control*

Immunocontraception is a birth control method that uses the body's immune system to prevent pregnancy. It is the most common method of inducing infertility in deer. Most earlier experiments with immunocontraception used porcine zona pellucida (PZP), a vaccine extracted from pig ovaries. The original PZP vaccines required 2 doses, delivered remotely with a dart gun the first year, followed by a booster dose each year thereafter. A 3-year study (1997-1999) evaluating the effectiveness of PZP was conducted by The Humane Society of the United States in cooperation with the Connecticut Wildlife Division and University of New Hampshire. The study demonstrated that, even with good access to a relatively small and isolated free-ranging deer population (about 30 females), an adequate number of female deer could not be successfully treated to limit population growth. It is believed that 70-90% of females need to be treated to effectively limit population growth.<sup>(21, 43, 47, 49)</sup> Aside from the difficulties of treating enough deer, the estimated cost was over \$1,000 per deer treated.<sup>(49)</sup>

**SpayVac™:** SpayVac™, a new formulation of PZP developed in the early 1990s for seals, requires only a single-dose vaccine. At a captive deer research facility at Pennsylvania State University, SpayVac™ was nearly 100% effective for 3 years and 80% effective for 5 years at preventing fertility in deer. However, failure in

more recent clinical trials stemming from changes in how the vaccine was manufactured, combined with limited financial resources, has slowed down the testing and development of SpayVac™.



**A dart gun is most commonly used to remotely deliver birth control agents to free-ranging deer.**

**GonaCon™;** Recently, the United States Department of Agriculture's National Wildlife Research Center developed a fertility control agent similar to SpayVac™ called GonaCon™. GonaCon™ only requires a single treatment and initial studies have shown it to be effective in some deer for up to 4 years. Current studies in Maryland, New Jersey, and Pennsylvania are examining the practicality and efficiency of administering GonaCon™ to free-ranging and captive deer. Studies with free-ranging deer have provided poor results. Despite increased failure rates in current studies using GonaCon™, a proposal is expected to be submitted for federal approval to allow limited use in 2007. To learn more about GonaCon™, visit [www.aphis.usda.gov/ws/nwrc/research/reproductive\\_control](http://www.aphis.usda.gov/ws/nwrc/research/reproductive_control).

**Summary:** As of May 2007, no fertility control agents have been federally approved for commercial use on free-ranging deer populations in the United States. If such agents receive federal approval in the future, a state permit would be required prior to their use in Connecticut because DEP regulates the application of any chemicals, including fertility control agents, to wildlife (C.G.S. 26-70). Recent increases in the efficiency of birth control agents improve the prospect for limited applications of wildlife contraception in the future. However, the cost and practicality of treating an adequate number of deer to effectively reduce free-ranging deer populations likely will limit the practical use of birth control agents. A survey of residents in Greenwich, Connecticut, found that most homeowners were unaware of the cost or effectiveness associated with administering birth control agents to free-ranging deer populations.<sup>(29)</sup> The high cost associated with administering birth control agents may require communities to raise funds. For birth control methods to be effective at limiting population growth, it may be necessary to first reduce deer populations to desired densities using lethal methods. Birth control may be of value on small isolated deer populations, but will not replace hunting for controlling free-ranging deer populations on a large scale.

### ***Trap and Relocate***

Studies have shown that about half of all deer trapped and relocated die from capture-related stress or from wandering extensive distances after release, resulting in highway mortality.<sup>(24)</sup> Relocation can spread diseases, and it costs \$400 to \$3,000 per deer.<sup>(17, 22, 23)</sup> In addition, because deer are abundant throughout most of the United States, there is no suitable place to release Connecticut's excess deer. Recent

concerns about Chronic Wasting Disease (CWD) have caused most states to ban the importation of live deer and elk. To learn more about CWD and changes in regulations pertaining to CWD, visit the DEP's website at [www.ct.gov/dep](http://www.ct.gov/dep) or the CWD Alliance website at [www.cwd-info.org](http://www.cwd-info.org).

### ***Fencing and Deterrents***

Many different types of fencing (electric, woven wire, chain-link, stockade, PVC, rubber-coated chicken wire) can be used to exclude deer from specific areas. Fencing, if properly installed and maintained, can be very effective in restricting deer activity around houses and reducing damage to plantings. Initial costs for fencing materials and installation are substantial, and fencing usually requires periodic maintenance.

Many different types of taste and odor repellents (Deer Off®, Tree Guard®, Hinder®, Deer Away®) are available to reduce deer damage to plantings. Generally, repellents are relatively effective at low deer densities, but become less effective as deer densities increase. Repellents can be costly and labor intensive, have varying degrees of effectiveness, and require multiple applications. Recently, ultrasonic devices have been used as an alternative to standard fencing and repellents. The detection of motion triggers the emission of sound waves at frequencies mostly inaudible to



**Trapping and relocation require the use of traps, nets, or immobilization equipment to capture deer.**



**Many different types of fencing can be used to exclude deer from specific areas.**



**Motion-activated ultrasonic devices emit high-frequency sound waves to deter deer as an alternative to standard fencing and repellents.**

humans, but disturbing to deer. Sound configurations on devices need to be adjusted frequently to minimize the likelihood of deer habituating to one particular sound. To date, no scientific studies have evaluated the effectiveness of these devices. Fencing, repellents, and ultrasonic devices provide varying degrees of success at protecting specific areas from deer damage; however, they do not address the underlying problem of deer overpopulation.

### ***Deer Resistant Plants***

Deer preferences for specific plants vary seasonally and geographically. Deer are considered generalists; however, they do have preferences for certain plant species. When deer populations are low and food is abundant, deer select more desirable plant species. As deer populations increase or food becomes less available, less desirable species will be consumed. Planting less desirable plant species around homes may reduce the likelihood of damage caused by deer. In areas with high deer densities, almost all plant species are at risk. Check with your local nursery or landscaper for recommendations on landscape plantings for your area.



**Several different types of deterrents (taste, sound, or noise) are available to reduce deer damage to plantings.**

### ***Use of a "4-Poster Device" to Reduce Lyme Disease***

A "4-poster device" consists of a supplemental feeding station with 4 rollers that apply a pesticide to kill ticks on deer as they feed. In 2004, the "4-poster device" was patented and became commercially available to the public to help kill ticks on deer as a means of reducing tick populations. According to the manufacturer's recommendations, this device cannot be used within 100 yards of any home, apartment, playground, or place where children may be present without adult supervision or applied directly to water or where water is present. Caution signs must be posted at each device, and anyone who comes in contact with the device or a treated animal is required to wear protective gloves. Other limitations or concerns about this device include: providing supplemental feed (up to 1 ton of corn per year per device) and cost (devices are only sold in packages of 9 at a cost of \$425 each, or \$3,825 per package, excluding cost of corn, rollers, tickicide, signs, applicator gun, and shipping) (American Lyme Disease Foundation, [www.aldf.com](http://www.aldf.com)). Costs of hiring a licensed pesticide operator to "treat" the rollers once every 7-10 days and feeder maintenance also must be added. Studies in Lyme, Connecticut, have shown a reduction in tick populations when 4-poster devices were used.<sup>(45)</sup> However, infection rates of the remaining ticks increased, and it is unknown if the treatment of deer reduced human incidence of Lyme disease in the treatment area.<sup>(45)</sup> Ability to treat an adequate number of deer each year to affect tick populations varied

annually and was influenced by abundance of alternate food sources such as acorns. DEP permits are required for use of 4-poster devices (C.G.S. 26-70) and may be issued experimentally on a site-specific basis. Contact the DEP Wildlife Division (see page 26) for additional information.



**A “4-poster” device consists of a bait station that supplies corn to attract deer and 4 rollers that apply a pesticide to deer as they feed. The pesticide is meant to kill ticks.**

## Deer Herd Reduction Options

### *Sharpshooting*

"Sharpshooting" usually means hiring experienced marksmen who have special authorization from the state wildlife agency to remove overabundant deer. Sharpshooting has been successful in addressing small-scale deer problems in many states.<sup>(13, 15, 17, 25)</sup> For sharpshooting to be successful, special equipment and techniques, such as silencers, bait, and the ability to shoot deer at night with the aid of lights or night-vision equipment, are required. Deer harvested during sharpshooting programs often are donated to food charities.

In 2003, the Connecticut General Assembly passed a bill (Public Act 03-192) that allows municipalities, homeowner associations, and nonprofit land holding organizations to use methods, such as sharpshooting, when severe nuisance or ecological damage can be demonstrated (C.G.S. 26-82). Individual landowners are not eligible under the law to implement sharpshooting programs. Authorization to conduct a sharpshooting program must be obtained from the Connecticut DEP. Applicants must be experiencing severe nuisance (deer-vehicle accidents, property damage, agricultural damage) or ecosystem damage caused by deer. Applicants must prepare and submit a deer management plan to the DEP for review and approval. For complete details about requirements for implementing a sharpshooting program, log onto the DEP's website at [www.ct.gov/dep](http://www.ct.gov/dep) or contact the DEP's Deer Management Program (see page 25).

In March 2005, the Town of Greenwich contracted sharpshooters who removed 80 deer in 4 nights at an estimated cost to the community of \$646 per deer. A total of 2,400 pounds of venison was donated to the lower Fairfield County food pantry.

## ***Regulated Hunting***

Hunting results in immediate removal of animals from the population, is cost-effective, and is the principal management tool used by all state agencies to manage free-ranging deer. Deer spend their life in a defined area called a home range. In urban-suburban areas in Connecticut, deer home ranges are relatively small (about 100-300 acres). Research on urban deer has shown that when deer are removed from an area, other deer will not abandon their home range to fill that void.<sup>(34, 38, 41)</sup> However, over time, young deer searching for their own home range will disperse in random directions, slowly repopulating the area. Because urban deer typically have small home ranges, hunting can produce localized reductions in deer populations.

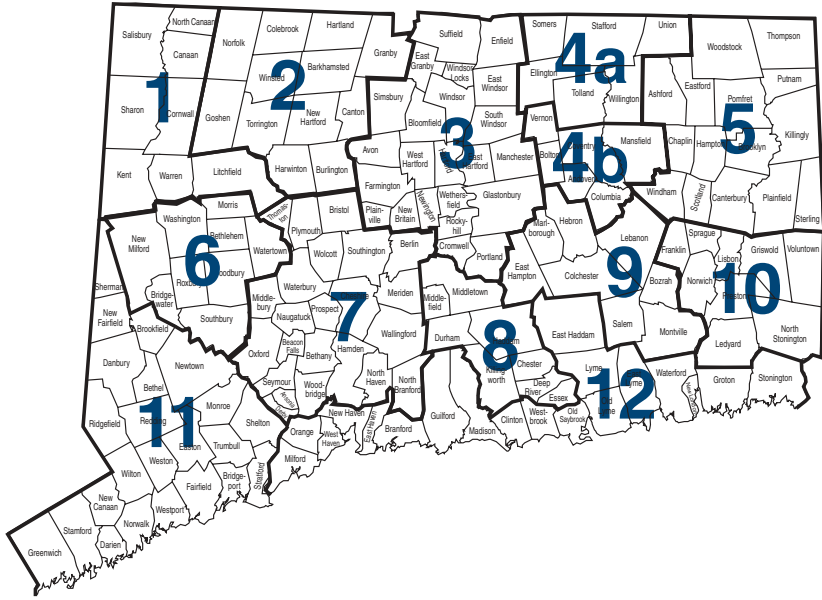
In Connecticut, all new hunters are required to take a 16-hour Conservation Education/ Firearms Safety (CE/FS) course administered by the DEP before they can purchase a hunting license. All Connecticut bowhunters are required to pass an 8-hour CE/FS bowhunting safety course before they can purchase an archery permit. No hunting accidents have occurred during special controlled hunts implemented in residential communities.<sup>(13, 32, 36)</sup> In many circumstances, additional hunting requirements, such as passing a shooting proficiency test, hunter interviews, and restricting hunting hours or hunting methods (i.e., archery only or hunting from tree stands), have been imposed to address specific concerns of communities.<sup>(13, 32, 36)</sup>

The DEP continues to liberalize the regulated deer hunting season framework to control population growth especially in urban-suburban areas (deer management zones 11 and 12) where deer populations are high (Figure 3). In 1998, a new antlerless replacement tag program allowed hunters to harvest unlimited numbers of antlerless deer in these zones. The reported annual archery harvest increased four-fold during the first 6 years of the antlerless tag program. Removal of antlerless



**Sharpshooters are experienced marksmen with special equipment who have authorization from the state wildlife agency to remove deer outside the normal regulated hunting season.**

**Figure 3. Statewide map of hunting requirements and opportunities in Connecticut, 2007.**



	Statewide	Zones 11 & 12
Hunter safety course required	Yes	Yes
Landowner permission required	Yes	Yes
Archery season length	9/15-12/31	9/15-1/31
Use of bait	No	Yes
Unlimited antlerless tags	No	Yes
Earn-a-buck program	No	Yes
Minimum property size	No	No
Minimum distance from house	None	None
Special crossbow season	No	Under consideration

deer (primarily adult females) is the most effective method for reducing population growth. In 2002, the archery season was extended to include the month of January (27 extra days) and in 2003, hunters were allowed to hunt over bait (private land only). Using bait during the hunting season increases hunter ability to position deer for better shot placement, shooting safety, and hunter success. During the 2003 season, the deer harvest in areas where baiting was allowed increased nearly 17%, while harvest in other zones increased less than 2%.

A survey of deer hunters in Connecticut found that the opportunity to earn an



additional buck tag was an important incentive for hunters to harvest additional antlerless deer.<sup>(29)</sup> Based on this information, an earn-a-buck program was initiated in 2005 to provide hunters an incentive to harvest additional antlerless deer. After harvesting 3 antlerless deer from zones 11 and 12 during the same hunting season, hunters were eligible to receive an extra either-sex tag that allows a buck to be harvested. These liberalizations have reduced population growth in these areas. The DEP Wildlife Division will continue to monitor harvest trends and develop innovative strategies for controlling deer population growth.



**Using bait during the hunting season increases hunter ability to position deer for better shot placement, shooting safety, and hunter success.**

### ***Controlled Hunts***

Controlled deer hunts are specialized hunts tailored to meet the needs and objectives of landowners. Controlled hunts usually include restrictions imposed by the landowner, such as limiting hunter numbers, restricting days or times for hunting, requiring shooting proficiency tests, and strategically distributing hunters on the property, often in



**An “earn-a-buck” program was initiated in 2005 to provide hunters incentives to harvest antlerless deer. In special deer management zones, hunters can earn an either-sex tag for harvesting an extra buck after harvesting 3 antlerless deer.**

elevated tree stands.<sup>(37)</sup> The DEP may provide technical assistance to large landowners in developing effective controlled hunt programs.

## Common Questions About Hunting

### *Why use hunters?*

Licensed hunters take to the woods each year to harvest deer for food and enjoy the outdoors with friends and family. Most hunters are willing to help landowners who are experiencing problems with deer, free of charge. Harvested deer provide families with lean healthy meat for the dinner table and hides for making leather goods. Hunters who harvest more deer than their families and friends can consume may offer venison to landowners or may donate excess venison to food charities. On average, Connecticut hunters spend \$7-8 million annually on deer hunting-related goods and services, contributing significantly to the state's economy.<sup>(27)</sup>



**Controlled hunts are special hunts designed to meet the needs and objectives of landowners.**

### *Will hunting cause deer populations to rebound?*

Removing deer from healthy populations will not increase reproductive rates of the remaining deer. Healthy females typically produce 2 fawns and occasionally will produce 3. Only if a deer herd is in poor health due to lack of food will it be possible for reproductive rates to change from an unnaturally suppressed level back to a normal reproductive level. Reproduction in a nutritionally-stressed herd may increase to normal levels if a significant number of deer are removed and the habitat improves. However, deer reproduction physiologically cannot increase to supernormal levels to compensate for reduced deer densities.

### *Will hunting cause an increase in deer-vehicle accidents?*

During fall, deer naturally move more due to increased activity associated with the breeding season (rut). Some hunting opponents have claimed that deer-vehicle accidents are highest during fall because hunters are chasing deer through the woods and these deer are crossing roads, causing an increase in deer-vehicle accidents. The DEP Wildlife Division investigated the frequency, distribution, and timing of deer-vehicle accidents during fall, based on reports received from state and local police departments. The distribution and timing of vehicular traffic also was investigated. During the fall season, deer hunting occurs Monday through Saturday from 1/2-hour before sunrise to sunset. Hunting is prohibited on Sundays. If hunting activity contributed to deer-vehicle accidents, it would be expected that more deer-vehicle accidents would occur on Saturday when most hunting occurs.

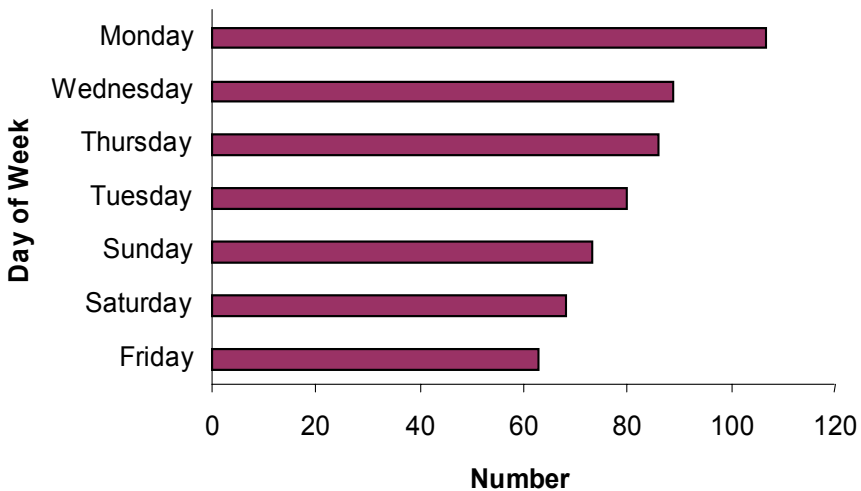
During the five-week firearms deer hunting season in November and December, Fridays and Saturdays had the lowest number of deer-vehicle accidents. More accidents actually occurred on Sundays when no hunting is allowed. Interestingly, deer-vehicle accidents were relatively high on weekdays and relatively low on weekends (Figure 4). This closely corresponds with vehicular traffic patterns. Vehicle traffic volume was higher on weekdays and lower on weekends. This suggests that traffic volume was an important factor in deer-vehicle accident rates.

If hunting activity contributed to deer-vehicle accidents, then it would also be expected that deer-vehicle accidents would be highest during hunting hours (1/2-hour before sunrise to sunset) when hunters are in the woods and lowest at night when hunting is prohibited. Data on time-of-day of deer-vehicle accidents do not support this concept. Deer-vehicle accidents actually peak about 1-4 hours after dark (Figure 5). Again, this peak closely corresponds with peak traffic volume at the end of the workday. These data suggest that vehicular traffic patterns have a significant influence on deer-vehicle accidents. Removing deer through hunting or other deer management techniques are effective methods for reducing deer populations. Reducing deer populations will reduce the risk of deer-vehicle accidents.

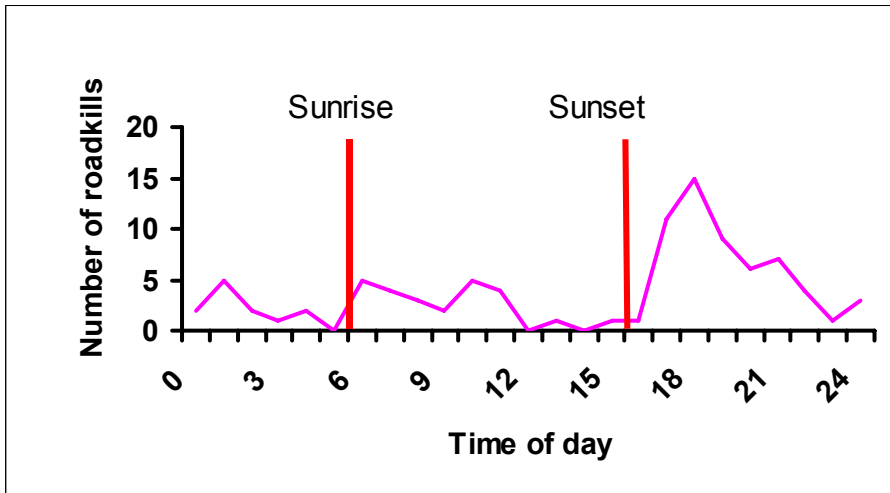
### *Where can I find hunters to hunt on my property?*

Connecticut issues over 60,000 deer hunting permits each year. Landowners who would like to use hunters on their property should talk to friends or neighbors who may hunt or know someone who hunts, or contact a local sportsmen's club. Homeowners and communities can interview hunters and select only those hunters they are comfortable with.

**Figure 4. Deer-vehicle accidents during the 5-week firearms deer hunting season (Nov-Dec 2005) by day of week.**



**Figure 5. Number of deer-vehicle accidents relative to time of day (24 hours).**



### ***How much land do I need to allow hunting?***

No minimum property size is required for hunting with a shotgun or bow and arrow. However, loaded firearms cannot be carried or discharged within 500 feet of an occupied dwelling while deer hunting (Regulations of Connecticut State Agencies Sec. 26-66-1d) unless written permission from the owner of the dwelling is obtained. No minimum discharge distance exists for bowhunters. A minimum of 10 acres is required for hunting with a rifle. Homeowners also have the option of placing additional restrictions (beyond existing hunting laws) on hunters before allowing access to their property, such as time of day or days of the week that hunting can occur. Persons who hunt deer on private property are required to obtain and carry written consent from the landowner dated for the current year. Hunting consent forms can be found in the current Connecticut Hunting and Trapping Field Guide, which is available at town halls or on the DEP's website ([www.ct.gov/dep/hunting](http://www.ct.gov/dep/hunting)).

### ***When can I allow hunting on my property?***

Archery hunting is permitted from mid-September to the end of December state-wide and until the end of January in zones 11 and 12 (Figure 3). The firearms season occurs from mid-November to late December. Deer hunting is permitted from 1/2-hour before sunrise until sunset. Currently, all hunting is prohibited on Sundays in Connecticut. For specific season dates and hunting laws, consult the current Connecticut Hunting and Trapping Guide, which is available from town halls or on the DEP's website ([www.ct.gov/dep/hunting](http://www.ct.gov/dep/hunting)).

### ***What is done with excess game?***

Several organizations assist in distributing donated game meat to food charities. Farmers and Hunters Feeding the Hungry (FHFTH) processed and distributed over

750 tons of deer meat over a 4-year period (1997-2000) to food shelters throughout the United States.<sup>(52)</sup> In Connecticut, the Hunters for the Hungry Program (HFTH) assists in distributing donated game to food charities. Over a 10-year period (1995-2005), Connecticut hunters have donated over 41,000 pounds of venison to food charities, which contributed over 164,000 meals valued at over \$204,000. Most hunters either pay to have deer processed or butchers may volunteer their services at little or no cost. A program that would help pay for the cost of processing donated venison may increase hunter interest in donating harvested deer. Food charities are extremely grateful for the donations they receive, and demand far exceeds supply.



### ***Can hunters use crossbows?***

**Archery hunting is the preferred method of hunting in developed areas. The archery season is 4 1/2 months long and there is no minimum property size requirement.**

Currently, crossbows may be used in Connecticut by physically disabled hunters only. Crossbows have technological advantages over traditional archery equipment, including scopes, mechanical releases, and pre-drawn arrows that are mechanically held. Crossbows typically are more powerful than traditional bows, resulting in greater arrow speed and slightly greater effective range. These advantages may increase hunter efficiency through increased range, accuracy, and precision of arrow placement. They also may make crossbows an effective tool for managing urban-suburban deer populations. In 2003, legislation allowing crossbow hunting in special urban deer management zones was approved in Pennsylvania and Maryland. Currently, the

DEP is evaluating the potential of crossbows to further increase deer harvest levels in urban-suburban areas in Connecticut.

### ***What about liability?***

Private landowners who make land available to the public without charge, rent, fee, or commercial service for recreational purposes, such as hunting, receive protection from liability pursuant to the Connecticut Recreational Land Use Act (C.G.S. 52-557f).

Non-private landowners (such as municipalities) do not receive protection from liability under the Connecticut Recreational Land Use Act and may want to consult with their town attorney before allowing hunting on their property. Some towns have addressed liability concerns by requiring hunters to sign an indemnity agreement similar to one drafted by an attorney for a town-sponsored hunt in Darien (Appendix 1).

### ***Can my town pass an ordinance restricting hunting?***

The courts have concluded that towns have no authority to regulate hunting on federal, state, or private property within their borders. This conclusion was affirmed by the Appellate Court, which concluded that local ordinances that seek to regulate hunting are illegal. Towns may restrict hunting on town-owned land only. Ordinances that restrict or prohibit hunting on private and state-owned lands are illegal. The only exception is the Town of Westport. In 1933, Special Act 33-254 empowered the Town of Westport to determine when and where hunting could occur. Currently, a town ordinance prohibits all deer hunting within Westport's boundaries.

### ***How can I initiate a deer management program?***

Individual homeowners, neighborhood groups, homeowner associations, and communities throughout Connecticut have initiated deer management programs. The towns of Darien, New Canaan, Redding, Ridgefield, Weston, and Wilton have appointed "deer committees" to assess the deer situation and explore options to manage the deer herds. The towns of Greenwich, New Canaan, and Wilton conducted studies to assess the distribution and abundance of deer and to assess residents' perceptions about deer and deer management. The towns of Darien, Redding, Ridgefield, and Wilton have implemented controlled deer hunting programs.



**Crossbows have technological advances over traditional archery equipment, including scopes, mechanical releases, and pre-drawn arrows that are mechanically held.**



**The DEP's Deer Management Program has worked with communities and neighborhoods to design hunts that have safely and successfully reduced deer populations in residential areas.**

Concerned citizens interested in developing regional deer management programs should contact local officials, the Fairfield County Municipal Deer Management Alliance (FCMDMA), or the Connecticut DEP Deer Management Program (see pages 25 and 26).

## **Examples of Special Deer Reduction Programs in Connecticut**

Cooperative deer hunts have been designed specifically for communities and conservation organizations to reduce deer populations while addressing safety concerns of residents. The following case studies illustrate hunt programs designed for sensitive areas or residential communities in Connecticut. These customized hunts have successfully and safely reduced deer populations with minimal impact to existing uses of the properties.

**Devils Den (2001-present):** Over a 15-year period, the director of the Connecticut Chapter of The Nature Conservancy's (TNC) Devil's Den Preserve observed the gradual loss of native flowering plants, such as pink lady slipper and red trillium, throughout the Preserve except on inaccessible ledge sites. Many tree species, especially oaks, were unable to regenerate because deer consumed acorns and saplings. Because deer at Devil's Den were having a long-term deleterious effect on

the Preserve's forest ecology, TNC initiated an annual controlled deer management program during the shotgun/rifle hunting season in 2001. The Connecticut DEP provided technical assistance to initiate the management program. Between 2001 and 2005, no hunting accidents occurred and 127 deer were removed. Damage to the ecosystem caused by deer can take years to recover; however, reemergence of some wildflowers, shrubs, and oak seedlings has been observed since the deer management program was implemented.

**Greenwich Audubon (2003-present):** In 2003, a deer management program was implemented on portions of the Audubon property in Greenwich to reduce the local deer population that was impacting native flora and fauna ([Greenwich.center.audubon.org/deermanagement.doc](http://Greenwich.center.audubon.org/deermanagement.doc)). The program used archery hunters from a local sportsmen's club. Hunting was limited to specific days and specific time periods. During the first year of the hunt, 16 hunters harvested 31 deer from the 285-acre sanctuary, reducing deer densities by about 50%. In 2004, an additional 135 acres were opened up for hunting. In 2004 and 2005, a total of 25 and 19 deer were removed from Audubon properties in Greenwich.

**Mansfield Hollow (2002-2003):** In 2002 and 2003, a deer management program was implemented in Windham on the Army Corps of Engineers property to reduce the local deer population, which was impacting a scrub oak and pitch pine barren ecosystem. This ecosystem provides critical habitat to several rare and endangered species of moths and butterflies. Licensed hunters were used to remove deer on 6 days during the 3-week shotgun deer hunting season. Hunters were required to be graduates of the DEP hunter safety course, pass a shooting proficiency test, and attend a mandatory orientation meeting. Over a 2-year period, 30 deer were removed from approximately 100 acres, reducing deer densities by about 83%.

**Mumford Cove and Groton Long Point (1996-present):** Mumford Cove and Groton Long Point are adjacent communities in southeastern Connecticut that voted to implement deer management programs in cooperation with the DEP to significantly reduce the resident deer population. The DEP assisted the Mumford Cove Deer Committee in designing a safe and effective hunt for both communities.



**Removing antlerless deer (primarily adult females) is the most effective method of reducing population growth.**

reducing the resident deer population. The DEP assisted the Mumford Cove Deer Committee in designing a safe and effective hunt for both communities.

In 1996 and 1997, an archery hunt was conducted in Groton Long Point due to limited areas where firearms could be used and the quiet nature of bowhunting. During



a 9-week period, 50% of the deer population was removed.<sup>(36)</sup> After the hunt, few residents experienced damage to landscape plantings and those experiencing damage indicated damage was less severe than before the hunt.<sup>(36)</sup>

In 2000, a combined shotgun-archery hunt was conducted in Mumford Cove. Thirty-nine residents were approached by the Mumford Cove Wildlife Management Committee, comprised of residents, and agreed to waive the 500-foot firearms discharge restriction to increase the amount of land available to firearms hunters. Hunters were assigned to elevated tree stands and distributed at a density of 1 hunter per 2.5 acres. In 6 days, 92% of the deer population was removed.<sup>(32)</sup> A post-hunt survey indicated that residents were satisfied with the success of the hunt, observed fewer deer in the community, and reported less damage to plantings. In addition, the number of residents who contracted Lyme disease in the community was greatly reduced in subsequent years (from 30 cases per year to 3-5 cases per year).<sup>(28)</sup>

In 2001, Mumford Cove and Groton Long Point conducted a joint shotgun-archery deer hunt to increase the area open to hunting and to target all deer impacting both communities. During the 3-day hunt, 82% of the deer population was removed.<sup>(7)</sup> Since 2001, a few bowhunters using bait have maintained the deer population at low levels by removing deer during the archery season. Opinion surveys conducted in the community over the past 10 years have shown that the frequency of daily deer sightings in the community decreased from 79% before deer management activities were initiated to only 1% after deer management activities were completed. Residents strongly supported hunting to control the deer population in their community.

## Examples of Local Deer Reduction Efforts by Municipalities

**Darien:** In 1997, Darien's First Selectman formed a Deer Management Committee. In March 2005, the committee presented a deer management plan to the Board of Selectmen to allow hunting on Sellecks Woods (28 acres), owned by the town, and on Dunlap Woods (22 acres), owned by the Darien Land Trust. Liability issues surrounding the hunt prevented hunting at Dunlap Woods and delayed hunting at Sellecks Woods until mid-December. To address local liability issues, the town acquired additional insurance at minimal cost and required hunters to sign an indemnity agreement (Appendix 1). A late start, unfavorable weather conditions, and unauthorized human disturbance resulted in a decision to end the hunt early. Over 150 pounds of venison were processed and donated to food shelters. In 2006, the second hunt at Sellecks Woods ran for 8 days and was expanded to include land owned by the Darien Land Trust. In 2006, 350 pounds of venison were processed and donated to food shelters.

**Greenwich:** In 2004-2005, the Town of Greenwich developed and implemented a herd reduction and monitoring program approved by the DEP on select town-owned land. The herd reduction consisted of a 4-night sharpshooting program on 3 town-owned properties, which resulted in the removal of 80 deer. From this removal, 2,400 pounds of venison were donated to local food pantries. Town cost was

estimated at \$646 per deer removed (total cost = \$51,680). In addition, the Conservation Commission identified large landowners and encouraged them to allow hunting, and continued to promote hunting as the main tool for reducing and maintaining the deer population. The town plans to conduct aerial deer surveys every 5 years to monitor the deer population. The town will review herd reduction progress and update goals for reduction or maintenance annually, and monitor and assess the impact of herd reduction on forest ecology, incidence of Lyme disease, and deer-vehicle accidents. Greenwich continues to work with the Fairfield County Municipal Deer Management Alliance, DEP, University of Connecticut, and other agencies.

**New Canaan:** The town-appointed a deer committee in 1998. The committee collected information on deer and deer management, evaluated all possible deer management options, and recommended to town residents that bowhunting be used as a means to reduce the deer herd. The town allocated funds to conduct surveys of the deer population and residents' opinions about deer. The town also hired a deer manager to contact all homeowners who owned at least 6 acres to encourage them to allow bowhunting. A sportsmen's group assisted the community by making hunters available to landowners interested in reducing the deer population in their area. During the first 2 years of the program, the number of deer removed by hunting tripled.<sup>(29)</sup>

**Redding:** In 2005, a subcommittee of the Conservation Commission prepared a report that examined the effects of deer on forest ecology. In October 2005, the Redding Conservation Commission voted unanimously to allow controlled hunting on town-owned land (about 1,000 acres) to protect and preserve the land from the effects of deer overabundance. Due to the late approval, the controlled hunts did not occur in 2005. However, limited bowhunting was allowed on some town-owned properties, resulting in the removal of 32 deer. In 2005, Redding appointed a deer warden and assistant deer warden to further deer management efforts by overseeing deer reduction efforts. Bowhunting on private property has been the primary means of reducing deer numbers. Owners of larger properties have been encouraged to allow hunting on their land. Controlled hunts are being planned over the next 5 years on large parcels of open space throughout the town to achieve deer densities of 10 deer per square mile, reduce prevalence of ticks and Lyme disease, and allow vegetation to recover. Tick studies will be conducted over the next 5 years to assess Lyme disease prevalence in ticks.

**Ridgefield:** In 2004 the Board of Selectmen (BOS) established the Ridgefield Deer Committee to determine the extent of deer overpopulation in Ridgefield and assess how the town should address the problem. In June 2005, the committee voted 17 to 1 to approve a report containing many recommendations, including controlled hunting on town-owned property. In July 2005, the report was presented to the BOS. In November 2005, the BOS appointed a 5-member deer management committee to implement the recommendations. In May 2006, the residents of Ridgefield voted in support (73%) of modifying the local ordinance to allow hunting on town-owned land. In 2006, the town implemented its first hunt and removed 25 deer in an area just less than one-half square mile. Additionally, the Land Conservancy, a private non-profit landholding organization, is considering opening a portion of its 500 acres to deer hunting.

**Wilton:** In 2001, a deer committee was assembled to research perceived problems associated with deer. The committee sponsored public meetings, conducted a town-wide survey of residents, and created a newsletter dedicated to deer issues. In 2002, the first controlled deer hunt administered by Wilton was conducted on water company lands within the town and the committee sent a letter to large landowners encouraging them to allow hunting. In 2003, the deer committee produced a final report and began implementing recommendations from the report. In 2004, Wilton initiated the formation of the Fairfield County Municipal Deer Management Alliance and added a second year for controlled hunting. In 2005, the town changed an ordinance that previously prohibited hunting on town-owned properties to allow hunting for the purpose of reducing nuisance wildlife that threatens public health and safety or threatens the town's natural resources. The town initiated its first hunt on town-owned open space in 2005 and added a second town-owned property in 2006. The Wilton Land Conservation Trust also has authorized hunting on one of its parcels. Public educational efforts and controlled hunts on reservoir land continued in 2006.

**The Fairfield County Municipal Deer Management Alliance:** In 2004, representatives from 10 towns in southwestern Connecticut (New Canaan, Ridgefield, Wilton, Redding, Greenwich, Norwalk, Darien, Westport, Weston, Stamford) formed the Fairfield County Municipal Deer Management Alliance (FCMDMA, [www.deeralliance.com](http://www.deeralliance.com)). Bethel and Danbury joined the alliance soon after and, more recently, Easton, Fairfield, and Bridgeport became members. The mission of the group is to "protect our people and our environment from problems caused by excess deer in our area by fostering a cooperative approach to effective deer management." This includes research, legislation, inter-town coordinator liaison, and public education. The Alliance has grown to include 15 of the 23 Fairfield County towns since its establishment.

## Facts About Deer and Deer Management

- In a healthy population, most female deer can breed as fawns (6-7 months of age) and produce young at 1 year of age.
- On average, healthy adult does produce 2 fawns annually.
- Deer can live up to 18 years of age.
- Deer populations can double in size every 2-3 years.
- Deer eat about 5-10 pounds of food daily.
- Motor vehicles kill a minimum of 18,000 deer a year in Connecticut.
- Deer home ranges are relatively small in urban areas (100-300 acres).
- Since 1996, over 26,000 cases of Lyme disease were reported in Connecticut.
- High rates of Lyme disease are correlated with high deer populations.
- Current birth control practices are costly and ineffective in controlling free-ranging deer populations over a large area.
- Fencing and repellents are limited in application, costly, and have varying degrees of effectiveness.
- Sharpshooting has been effective on a small scale, but is costly. In Connecticut, sharpshooting can only be conducted by municipalities, homeowner associations, and non-profit land holding organizations experiencing significant impacts from deer and requires a permit from the DEP.
- Hunters can assist landowners at no cost.
- Landowners who allow the use of their property without fee are protected from liability.
- Hunters can impact the deer herd at a local level, and sustained hunting can regulate population growth.
- Hunting in Connecticut deer management zones 11 and 12 (Figure 3) is permitted from 15 September - 31 January. Unlimited antlerless deer tags are available, hunting over bait is allowed, and hunters can earn a buck tag for every 3 antlerless deer harvested.
- There is no minimum acreage required to hunt with a shotgun or bow and arrow.
- Written landowner permission is required for all hunters on private land.



**Hunting is the most cost-effective management tool used by all state wildlife agencies to manage free-ranging deer populations.**

- Deer hunters can not carry a loaded firearm within 500 feet of an occupied dwelling
- Homeowners can waive the 500-foot restriction for firearms hunting.
- No minimum distance from an occupied dwelling is required for bowhunters.
- Landowners can impose additional hunting restrictions on their property.
- Controlled hunts have safely and effectively reduced deer populations in urban and suburban areas in Connecticut.
- Hunting is safe, effective, practical, and the most efficient management tool available today.
- All deer management programs require long-term maintenance.
- Typically, the removal of 1 adult doe during the hunting season equates to 3 less deer the following spring (adult does typically produce twins the following spring).
- Town ordinances cannot prohibit or regulate the legal act of hunting on private or state land.



## Recommendations for Developing Management Programs

- Build community support by providing residents with facts about hunting and other management options.
- Work with adjacent landowners to encourage hunting on their property.
- Identify responsible hunters willing to assist the community.
- Focus removal efforts by targeting large blocks of undeveloped land first.
- Use firearms where possible to maximize deer harvest in the shortest time interval.
- Use archery hunting in areas where gun hunting is not permitted or when a quiet method is preferred.
- Design hunts to maximize harvest opportunity.
- All deer management programs should be maintained annually.
- All deer should be targeted for removal, but efforts should encourage the taking of antlerless deer (does).
- Encourage accurate record keeping of deer-vehicle accidents, deer roadkills, and cases of Lyme disease so that these parameters can be followed as a measure of progress in deer management programs.
- Provide refrigerated storage for deer and develop a fund to cover cost of donating venison.



## Contact Information

### Deer Management Program

Connecticut DEP Wildlife Division  
Franklin Wildlife Management Area  
391 Route 32  
N. Franklin, CT 06254  
Phone: (860) 642-7239  
Fax: (860) 642-7964  
Email: [howard.kilpatrick@po.state.ct.us](mailto:howard.kilpatrick@po.state.ct.us)  
[www.ct.gov/dep](http://www.ct.gov/dep)

DEP Wildlife Division  
Hartford Office  
79 Elm Street  
Hartford, CT 06106  
Phone: (860) 424-3011  
Fax: (860) 424-4078  
[www.ct.gov/dep](http://www.ct.gov/dep)

### Fairfield County Municipal Deer Management Alliance

[www.deeralliance.com](http://www.deeralliance.com)

### Connecticut Hunters for the Hungry, Program Contacts

Website: <http://hfhct.expage.com>

- \*Warren Speh, N. Stonington (860) 536-6640
- \*Al Jacquemin, Falls Village (860) 824-1330
- \*Paul Cichowski, East Hampton (860) 267-0857
- John Fusaro, Salem (860) 859-0741
- \*Don Messier, Willimantic (860) 456-7475
- \*William Lacey, New London (860) 447-8381, (860) 444-7509
- Calvin Nodine, Torrington (860) 489-3309
- Steve Boyer, Ellington (860) 875-5352
- Mark Hiller, Milford (203) 877-3662
- Gary Breton, South Windsor (860) 644-5019
- Gary Olewnik, Prospect (203) 758-4665
- Lee Sabo, Oxford (203) 888-3860
- John Sanzo, Monroe (203) 268-0458
- Jeff Storms, New Milford (203) 354-3844
- Mike Amato, Katonah, NY (914) 232-4772
- United Bowhunters of Connecticut, Shelton, (203) 736-0399
- Foodshare (860) 688-6500 (Tolland/ Hartford Co.)
- Connecticut Food Bank (203) 469-5000
- \*Southington Packaging Company Inc. (860) 628-9544

*\* No cost for processing deer if whole deer is donated*

## References and Suggested Readings

- 1 Beringer, J., L. P. Hansen, W. Welding, J. Fisher, and S. L. Sheriff. 1996. Factors affecting capture myopathy in white-tailed deer. *Journal of Wildlife Management* 60:373-380.
- 2 Center for Disease Control and Prevention. 1999. Lyme disease in the United States. *Morbidity and Mortality Weekly Report* 50(10) 181-185.
- 3 Center for Disease Control and Prevention. 2000. Human ehrlichiosis in the United States. Atlanta, Georgia, USA.
- 4 Connecticut Department of Environmental Protection. 1996. Assessment of the 1996 deer reduction plan and future management at Bluff Point Coastal Reserve Groton, Connecticut. Bureau of Natural Resources, Wildlife Division, Hartford, Connecticut, USA.
- 5 Connecticut Department of Environmental Protection. 2001. Connecticut hunting incident report. Bureau of Natural Resources, Wildlife Division, Hartford, Connecticut, USA.
- 6 Connecticut Department of Environmental Protection. 2002. Connecticut hunting and trapping guide 2000. Bureau of Natural Resources, Wildlife Division, Hartford, Connecticut, USA.
- 7 Connecticut Department of Environmental Protection. 2002. Assessment of the 2001 shotgun-archery deer hunt in Mumford Cove and Groton Long Point Connecticut. Bureau of Natural Resources, Wildlife Division, Hartford, Connecticut, USA.
- 8 Connecticut Department of Public Health. 2001. Lyme disease statistics from the Connecticut Department of Public Health for 2001. Hartford, Connecticut, USA.
- 9 Connecticut Department of Transportation. 2002. Connecticut accident summary, motor vehicle traffic accident data. Connecticut Department of Transportation, Bureau of Policy and Planning, Newington, Connecticut, USA.







- 10 Conover, M. R. 1995. What is the urban deer problem and where did it come from? Pages 11-18 in J. B. McAninch, editor. Urban deer: A manageable resource? Proceedings of the Symposium of the North Central Section, The Wildlife Society, 12-14 December 1993, St. Louis, Missouri, USA.
- 11 Conover, M. R. 1997. Monetary and intangible valuation of deer in the United States. *Wildlife Society Bulletin* 25:298-305.
- 12 Conover, M. R., W. C. Pitt, K. K. Kessler, T. J. DuBow, and W. A. Sanborn. 1995. Review of human injuries, illnesses, and economic losses caused by wildlife in the United States. *Wildlife Society Bulletin* 23:407-414.
- 13 Deblinger R. D., D. W. Rimmer, J. J. Vaske, and G. M. Vecellio. 1995. Efficiency of controlled, limited hunting at the Crane Reservation in Ipswich, Massachusetts. Pages 75-89 in J. B. McAninch, editor. Urban deer: A manageable resource? Proceedings of the Symposium of the North Central Section, The Wildlife Society, 12-14 December 1993, St. Louis, Missouri, USA.
- 14 DeCalesta, D. S. 1994. Effect of white-tailed deer on songbirds within managed forests in Pennsylvania. *Journal of Wildlife Management*. 58:711-718.
- 15 DeNicola, A. J., K. C. VerCauteren, P. D. Curtis, and S. E. Hygnstrom. 2000. Managing white-tailed deer in suburban environments: a technical guide. Media and technology services, Ithaca, New York, USA.
- 16 Doenier, P. B., G. D. DelGiudice, and M. R. Riggs. 1997. Effects of winter supplemental feeding on browse consumption by white-tailed deer. *Wildlife Society Bulletin* 25: 235-243.



- 17 Drummond, F. 1995. Lethal and nonlethal deer management at Ryerson Conservation Area, Northeastern Illinois. Pages 105-109 in J. B. McAninch, editor. *Urban deer: A manageable resource?* Proceedings of the Symposium of the North Central Section, The Wildlife Society, 12-14 December 1993, St. Louis, Missouri, USA.
- 18 Ellingwood, M. R. 1991. A guide to implementing a controlled deer hunt; a companion to "An evaluation of deer management options." State of Connecticut, Department of Environmental Protection, Wildlife Division DR-16.
- 19 Ellingwood, M. R., and S. L. Caturano. 1988. An evaluation of deer management options. Bureau of Natural Resources, Wildlife Division, Hartford, Connecticut No. DR-11.
- 20 Flyger, V., D. L. Leedy, and T. M. Franklin. 1983. Wildlife damage control in eastern cities and suburbs. Proceedings of the Eastern Wildlife Damage Control Conference 1:27-32.
- 21 Hobbs, N. T., D. C. Bowden, and D. L. Baker. 2000. Effects of fertility control on populations of ungulates: general stage-structured models. *Journal of Wildlife Management* 64:473-491.
- 22 Ishmael, W. E., D. E. Katsma, T. A. Isaac, and B. K. Bryant. 1995. Live-capture and translocation of suburban white-tailed deer in River Mills, Wisconsin. Pages 87-96 in J. B. McAninch, editor. *Urban deer: A manageable resource?* Proceedings of the Symposium of the North Central Section, The Wildlife Society, 12-14 December 1993, St. Louis, Missouri, USA.
- 23 Ishmael, W. E., and O. J. Rongstad. 1984. Economics of an urban deer-removal program. *Wildlife Society Bulletin* 12:394-398.
- 24 Jones, J. M., and J. H. Witham. 1990. Post-translocation survival and movements of metropolitan white-tailed deer. *Wildlife Society Bulletin* 18:434-441.
- 25 Jones, J. M., and J. H. Witham. 1995. Urban deer "problem solving" in northeast Illinois: An overview. Pages 58-65 in J. B. McAninch, editor. *Urban deer: A manageable resource?* Proceedings of the Symposium of the North Central



- Section, The Wildlife Society, 12-14 December 1993, St. Louis, Missouri, USA.
- 26 Kilpatrick, H. J., K. A. Eccleston, and M. R. Ellingwood. 1996. Attitudes and perceptions of a suburban community experiencing deer/human conflicts. *Transactions Northeast Fish and Wildlife Conference*, Harford, Connecticut 52:19.
- 27 Kilpatrick, H. J., M. A. Gregonis, J. A. Seymour, A. M. LaBonte, and J. Traylor. 2000. Connecticut deer program summary 2000. Connecticut Department of Environmental Protection, Bureau of Natural Resources, Hartford, Connecticut, USA.
- 28 Kilpatrick, H. J., and A. M. LaBonte. 2003. Deer hunting in a residential community: the community's perspective. *Wildlife Society Bulletin* 31:340-348.
- 29 Kilpatrick, H. J., A. M. LaBonte, and J. S. Barclay. 2007. Acceptability of lethal and non-lethal deer management strategies: perspectives of homeowners and bowhunters in a suburban community. *Journal of Wildlife Management* (in press).
- 30 Kilpatrick, H. J., A. M. LaBonte, J. S. Barclay, and G. Warner. 2004. Assessing strategies to improve bowhunting as an urban deer management tool. *Wildlife Society Bulletin* 32:1177-1184.
- 31 Kilpatrick, H. J., A. M. LaBonte, and M. A. Gregonis. 2002. Approaches to managing urban white-tailed deer with bowhunters in Connecticut. Pages 45-50 in R.J. Warner, editor. *Proceedings of the First National Bowhunting Conference*. Archery Manufacturers and Merchants Organization, Comfrey, Minnesota, USA.
- 32 Kilpatrick, H. J., A. M. LaBonte, and J. T. Seymour. 2002. A shotgun-archery deer hunt in a residential community: evaluation of hunt strategies and effectiveness. *Wildlife Society Bulletin* 30:478-486.

- 33 Kilpatrick, H. J., and S. M. Spohr. 2000. Spatial and temporal use of a suburban landscape by female white-tailed deer. *Wildlife Society Bulletin* 28:1023-1029.
- 34 Kilpatrick, H. J., S. M. Spohr, and K. K. Lima. 2001. Effects of population reduction on home ranges of female white-tailed deer at high densities. *Canadian Journal of Zoology* 79:949-954.
- 35 Kilpatrick, H. J., and W. D. Walter. 1997. Urban deer management: a community vote. *Wildlife Society Bulletin* 26:388-391.
- 36 Kilpatrick, H. J., and W. D. Walter. 1999. A controlled archery deer hunt in a residential community: cost, effectiveness, and deer recovery rates. *Wildlife Society Bulletin* 27:115-123.
- 37 McDonald, J. E., M. R. Ellingwood, and G. M. Vecellio. 1998. Case studies in controlled deer hunting. New Hampshire Fish and Game Department, Concord, New Hampshire, USA.
- 38 McNulty, S. A., W. F. Porter, N. E. Mathews, and J. A. Hill. 1997. Localized management for reducing white-tailed deer populations. *Wildlife Society Bulletin* 25:265-271.
- 39 McShea, W. J., and J. H. Rappole. 2000. Managing the abundance and diversity of breeding bird populations through manipulation of deer populations. *Conservation Biology* 14:1161-1170.
- 40 National Safety Council, 2001. Injury facts, 2001 edition. National Safety Council, Itasca, Illinois, USA.
- 41 Porter, W. F., N. E. Mathews, H. B. Underwood, R. W. Sage Jr., and D. F. Behrend. 1991. Social organization in deer: implications for localized management. *Environmental Management* 15:809-814.
- 42 Rand, P. W., C. Lubelczyk, M. S. Holman, Eleanor H. Lacombe, and R. P. Smith Jr. 2004. Abundance of *Ixodes scapularis* (acari:Ixodidae) after complete removal of deer from an isolated offshore island, endemic for Lyme disease. *Journal of Medical Entomology* 41:779-784.
- 43 Rudolph, B. A., W. F. Porter, and H. B. Underwood. 2000. Evaluating immunocontraception for managing suburban white-tailed deer in Irondequoit, New York. *Journal of Wildlife Management* 64:463-473.
- 44 Stafford, K. C. 2004. Tick management handbook: an integrated guide for homeowners, pest control operators, and public health officials for the prevention of tick-associated disease. The Connecticut Agricultural Experiment Station, New Haven, Connecticut, USA.
- 45 Stafford, K. C., and A. J. DeNicola. 2002. USDA northeast area-wide tick control project; Connecticut site. Final progress report for USDA Regional Tick Control Project/Connecticut.
- 46 Stafford, K. C., A. J. DeNicola, and H. J. Kilpatrick. 2003. Reduced abundance of *Ixodes scapularis* (acari: Ixodidae) and the tick parasitoid *Ixodiphagus hookeri* (Hymenoptera: Encyrtidae) with reduction of white-tailed deer. *Journal of Medical Entomology* 40:642-652.

- 47 Swihart, R. K., and A. J. DeNicola. 1995. Modeling the impacts of contraception on populations of white-tailed deer. Pages 151-163 in J. B. McAninch, Editor. Urban deer: a manageable resource? Proceedings of the Symposium of the North Central Section, The Wildlife Society, 12-14, December 1993, St. Louis, Missouri, USA.
- 48 Telford, S. R. 1993. Forum: perspectives on the environmental management of ticks and Lyme disease. Pages 164-167 in Howard S. Ginsberg, Ecology and environmental management of Lyme disease. New Brunswick, N.J. Rutgers University Press.
- 49 Walter, W. D., P. J. Pekins, A. T. Rutberg, and H. J. Kilpatrick. 2002. Evaluation of immunocontraception in a free-ranging suburban white-tailed deer herd. *Wildlife Society Bulletin* 30:186-192.
- 50 Wilson, M. L., A. M. Ducey, T. S. Litwin, T. A. Gavin, and A. Spielman. 1990. Microgeographic distribution of immature *Ixodes dammini* ticks correlated with deer. *Medical and Veterinary Entomology* 4:151-159.
- 51 Wilson, M. L., S. R. Telford III, J. Piesman, and A. Spielman. 1988. Reduced abundance of immature *Ixodes dammini* (Acari Ixodidae) following elimination of deer. *Journal of Medical Entomology* 25:224-228.
- 52 Winand C. J. 2001. Farmers and hunters feeding the hungry. 57th Northeast Fish and Wildlife Conference, Saratoga Springs, New York. 38:24



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*Photos by Marija Beqaj, Paul J. Fusco, Raymond Hardy, Ann Kilpatrick, Howard J. Kilpatrick, Andrew M. LaBonte, Rob Lucas, Wayne Ryan, Georgina Scholl, Marquis Walsh, and W. David Walter*

# Appendix 1

Hunter's Name: \_\_\_\_\_ Telephone \_\_\_\_\_

Hunter's Address: \_\_\_\_\_

## AGREEMENT TO INDEMNIFY AND HOLD HARMLESS

In exchange for permission to enter and hunt upon property owned and/or controlled by the Town of Darien, or any public Land Trust or Conservation property, I hereby agree to indemnify and hold harmless the said Town of Darien and any said Land Trust or Conservation Property and to provide for my own defense against any and all claims by any person who may claim injury as a result of my negligence.

\_\_\_\_\_  
Hunter's Signature

\_\_\_\_\_  
Date

Subscribed and sworn to be before me this \_\_\_\_\_ day of \_\_\_\_\_, 2005.

\_\_\_\_\_  
Commissioner of the Superior Court/Notary Public



