

The Report of the Ridgefield Deer Committee



Ridgefield, Connecticut

June 27, 2005

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Part 1: Executive Summary

The Board of Selectmen appointed the Ridgefield Deer Committee in the summer of 2004 and the committee began meeting Sept. 29, 2004. The committee consists of 19 volunteer members, including both hunters and non-hunters. Some have links to town organizations, such as the Parks and Recreation Department, the Land Conservancy of Ridgefield, and Lyme Disease Task Force. Others are simply ordinary citizens interested in the issue.

The charge

The selectmen told the committee to:

- Study various ways to manage deer.
- Conduct research, especially into statistics that the police, the Lyme Disease Task Force, and State Department of Environmental Protection might have.
- Investigate deer management in other area towns.
- Work with other agencies and organizations that might be affected by deer management.
- Investigate the town's geography and how that might affect approaches to deer management.
- Gauge Ridgefield's public interest in deer management, how that management might be handled, and interact with the largest practical number of residents to obtain input.
- Disseminate and publicize its findings to the citizens and officials to help them make "considered judgments."

(See appendices for complete "charge.")

The work

To these ends, the committee had 16 meetings from September to June during which it discussed the issues. The committee process strove to be inclusive, using consensus as the decision-making tool and offering the opportunity for public comment at each meeting, with the press covering many meetings. Committee members were directly responsible for offering their desired speakers and circulating written documentation.

Expert speakers the committee heard included: Howard Kilpatrick from the State Department of Environmental Protection, Wildlife Division; Dr. Oswald Schmitz from Yale School of Forestry; Conservation Directors from Greenwich and Wilton where deer committees have issued findings; Steve Patton, Director of The Nature Conservancy's Devil's Den, which allows controlled hunts; Dr. Kirby Stafford of the Connecticut Agricultural Experiment Station, the state's leading expert on deer ticks; Laura Simons from Friends of Animals; and Tom Renzulli, state certified hunter safety instructor (*see Part 7 for description of presentations*). Major John Roche, Ridgefield Police Department; and the first selectman were frequent participants at meetings.

The committee also received a large quantity of research and literature, provided by the speakers, state and local agencies, and citizens.

In addition, the committee has maintained a website, linked to the town's site, which contains all of its minutes, other information and sources on the deer debate, and a link that allowed members

of the public to easily e-mail the committee with their thoughts on the issue [*see appendices*].

Since the committee had no budget, it could not undertake such activities as aerial deer counts or formal public opinion surveys.

Findings

On June 27, the committee issued its report, which was approved by a vote of 17 to one, with one member absent. In summary, the committee found that:

- Ridgefield does have a serious problem with deer overpopulation.
- The problem manifests itself in elevated rates of Lyme disease, unacceptably large numbers of auto accidents involving deer, and extensive damage to the plant life and, as a result, to the ecology and environment in the community.
- Estimates of existing deer densities range from 40 to 80 per square mile.
- The density of deer in Ridgefield should be 20 or fewer deer per square mile.
- There is no FDA approved deer contraception available for use.
- At this time trapping and moving deer is impractical and given concerns regarding chronic wasting disease, it may be impossible.
- At this time the only effective tool to reduce the deer population is hunting.
- Other techniques, such as effective landscaping and safer driving, can be employed to reduce some of the deleterious effects of deer overpopulation.

Major Recommendations

In its report, the committee makes the following major recommendations.

1. The town should allow and control the hunting of deer on appropriate town-owned properties.
 2. The town should create a *deer management committee* to oversee controlled hunting on town-owned land; to screen and select hunters with safety, skill, knowledge, and reliability in mind; to establish rules for hunts; and to determine which lands are suitable for controlled hunts, giving priority to tracts in zones of higher deer concentrations if and when those are known.
3. The town, through its deer management committee, should proactively encourage hunting on private land by providing advice, by helping landowners or stewards evaluate the need and methods for hunting, and by helping them find suitable hunters from a list to be maintained by the committee.
4. The town should modify its ordinances to allow hunting on town-owned land, under the supervision of the town and/or deer management committee.
5. Working with Yale School of Forestry (or other suitable and willing institution), the town should collect data on deer impacts, population densities, and trends. This information would be important in educating the public about where deer concentrations are the highest, and in focusing herd reduction on key areas.
6. The town should conduct an aerial survey to more accurately estimate deer densities in town, in order to help locate "hot spots," and to help in assessing the effectiveness of culling efforts. These data would be combined with data obtained from ground surveys in Number 5.
7. The deer management committee should work with the town's Lyme Disease Task Force, helping it educate the public about the relation between deer and Lyme disease, about how to discourage deer from visiting home lots, and about how to control ticks and mice on

properties.

8. To reduce the number of car-deer accidents, the deer management committee or other agency of the town should steward a driver awareness program on deer movement patterns, on areas of high deer concentration, and on how to modify driving habits – especially with respect to speed.
9. Devices to discourage deer from crossing highways should be investigated for installation in locations that the police records show are at high risk for deer accidents.
10. The deer management committee should work with the highway department on developing a plan for management of roadside vegetation that attracts deer dangerously close to highways.
11. With the help of the Conservation Commission and garden clubs, the town should promote a message that encourages residents to landscape properties in ways that are less attractive to deer.
12. The deer management committee or other agency of the town should keep up to date on and publicize emerging technologies that may be used to control deer populations, and/or that deter deer from yards and from damaging public lands.
13. The town, through its deer management committee or other agencies, should make use of websites, press releases, and a “speakers bureau” in efforts to educate the public about deer management, deer tick reduction, deer “unfriendly” yards, traffic safety, hunting, and other aspects of the deer problem.

The committee has other recommendations that are more specific and/or limited in nature. These are described in the following chapters of the report.

Part 2: Deer and Lyme Disease

Our growing deer population has had a clear and direct effect upon the incidence of Lyme disease in Ridgefield, which is now among the highest in the State.

The Problem: Lyme disease has become a serious health problem in Ridgefield. Reported cases^[1] grew from 39 in 1991 to 95 in 2002, the last year for which we have comparable data. In 2002, Ridgefield had the second highest number of reported cases in the State, just below Danbury (104), which has a much larger population.^[2] Due to diagnostic challenges and underreporting by physicians, experts believe that the reported numbers understate the true incidence of Lyme by a factor of ten^[3], such that the real incidence would be closer to 900 new cases per year. This higher estimate is supported by a 2002 Wilton survey in which 54% of households reported at least one clinically diagnosed case of Lyme disease, 90% of the cases occurring within the previous five years.^[4]

Lyme disease can be devastating to people of all ages, but particularly to children who often play outdoors and don't take proper precautions. When diagnosed early, Lyme disease can usually be successfully treated with a course of oral antibiotics. However, because ticks are difficult to spot and symptoms mimic many other diseases, Lyme disease often goes undiagnosed and untreated. As the disease progresses, it becomes more difficult to treat and the symptoms become more severe, often leading to disability or incapacitation, and sometimes to death.

Lyme disease, and frequently other dangerous infections such as babesiosis, ehrlichiosis, and

bartonella, is transmitted by the black-legged tick, *Ixodes scapularis*, also known as the deer tick. The adult tick's preferred host is the white-tailed deer. As the number of deer in the region has increased, so have the tick population and the risk of tick-borne infection.

A number of tick control measures are available to individual homeowners and communities. However, these measures are not cost-effective or environmentally prudent for large areas or an entire town. And, as the deer and tick populations increase, tick control becomes more difficult and expensive, and human exposure to tick-borne infection in untreated areas becomes more likely.

The evidence: Because of the deer tick's mating habits, reducing the deer population has a direct effect on tick reproduction and the number of ticks that enter our environment each year. The Connecticut Agricultural Experiment Station reports a direct correlation between deer density and tick density throughout the State.^[5] In other words, where there are fewer deer, there are fewer ticks, and vice versa.

Recent research studies clearly demonstrate the relationship between deer, ticks, and Lyme disease. In a study involving islands in Narragansett Bay, two of which were inhabited by deer and mice and four of which had no deer, the mice on the islands with deer were infested with ticks and Lyme bacteria. In the islands without deer, neither ticks nor Lyme bacteria were present, suggesting that, in the absence of deer, host substitution could not sustain the tick in sufficient numbers to transmit disease.^[6] In another study involving a section of Bridgeport and the Bluff Point Coastal Reserve in Groton, two areas with high deer densities, "tick densities declined with sustained reductions in the population of white-tailed deer."^[7] At Mumford Cove in Groton, a dramatic reduction in the deer population led to a dramatic reduction in the number of reported Lyme disease cases.^[8] On Great Island in Massachusetts, where all deer were removed, the incidence of Lyme disease dropped from 30 cases per thousand to 2 per thousand.^[9]

There are still some things we don't fully understand: first, whether the relationship between deer, ticks and Lyme disease is proportional, and second, the threshold level of deer and tick density below which transmission of disease pathogens to humans no longer occurs. In the latter case, the best estimate of the threshold for human transmission is eight deer per square mile.^[10] While it is unlikely that we will reach and sustain that threshold any time soon, it is reassuring to know that reducing the deer population is likely to significantly lower the risk of tick-borne infection.

Recommendation: The bottom line is that, when there were fewer deer in Ridgefield, there were fewer Lyme disease cases. Research supports the fact that, if we again lower the deer population, there will be fewer ticks and consequently fewer cases of Lyme disease. The committee recommends reducing the deer population to 20 or fewer deer per square mile. We believe this, in combination with other prophylactic measures (see below), will significantly reduce tick exposure and the incidence of Lyme disease.

Recommendation: Assuming that it will take several years to bring our deer population down to 20 or fewer per square mile, and that even after we do so there will still be some risk of contracting tick-borne diseases, we strongly endorse the initiatives being undertaken by the Ridgefield Lyme Disease Task Force to safeguard the community, including:

- Educating residents about the risk of tick-borne infection, tick control and personal protection measures, signs and symptoms of infection, and health care resources
- Implementing an integrated tick control program at high-risk public sites, including school playgrounds, parks, and ball fields.

Part 3: Deer and Vehicle Collisions

Each year, there are more than 1.5-million reported crashes involving deer in America, causing an estimated \$1.1 billion in vehicle damages. And, most people involved in auto insurance say the figures are much higher.^[11]

The problem: The Connecticut Department of Transportation has ranked the town of Ridgefield as the highest in the number of deer/vehicle accidents in the state. Over the five-year period between April 2000 and May 2005, 883 deer on or along Ridgefield's roads were tagged by the Ridgefield police and reported dead to the State of Connecticut. Though very high, the total of 883 is estimated to be only a fraction of the actual total kills.^[12]

Most deer/vehicle accidents occur at dusk or dawn and the accidents are more frequent during the November peak of the rut or mating season. During this time of year the deer are moving around more. Deer migrate between areas of food and water sources. When these areas of open spaces and wildlife habitat are dissected by roadways it becomes a hazard.

The number of deer killed in accidents though high, is actually just a fraction of the overall number of accidents. The town is only required to submit state reporting cards to the DEP for tagged dead deer and it is also known that many towns are not fulfilling this requirement. There is no state requirement for reporting accidents that did not result in the deer's death. Further, many deer/vehicle collisions go unreported to the police. When an accident occurs and the vehicle is still in operational condition the driver will sometimes leave the scene and the collision is not recorded. When a deer/vehicle accident does occur there is a real possibility of injury to the vehicle occupants and probability of a painful death to the animal. In a deer/vehicle accident there is always a monetary expense that must be noted as well. The average front-end collision with a deer causes \$4,500 to \$7,500 worth of repairs.^[13]

The Cause: The statistics show the possibility of a deer/vehicle collision to be greater in Ridgefield than anywhere else in the state. The aspects of our town's character that make it such a desirable place to live also cause the elevated number of deer/vehicle collisions. The numerous patches of green space separated by tree lined rural roads that make deer crossings likely and visibility often difficult. Making matters worse is the reality that these rural roads have become more heavily traveled. The lack of an area highway and heavier north/south commuter traffic coupled with a much larger deer population^[14] has created the inevitable situation of Ridgefield's enormously high collision rate.

There are other factors that contribute to deer/vehicle collisions and should be noted. Inattention and speed^[15] can slow a driver's reaction time making them unable to avoid a collision. Uninformed motorists are also more likely to be surprised and unable to react to a crossing deer. Excessive roadside vegetation can reduce visibility making it difficult to avoid hitting a deer and the palatability of the vegetation may attract deer to the roadside.

Recommendation: A reduction in deer population would reduce the number of animals in the roadways. The committee recommends the town strive to attain a level of 20 *or fewer* deer per square mile.

Recommendation: Increase driver awareness of the defensive driving techniques and

knowledge of deer characteristics^[16]. This could be done through the local media and town agencies as well as making it part of the any driver's education curriculum.

Recommendation: Using current police data and possibly the help of the Yale School of Forestry, the town should establish a map to identify the areas of greatest deer activity. The town should review whether these areas require "Deer Crossing"^[17] signs at frequently crossed roads. Another measure that may be helpful in areas where applicable, are reflector systems that reflect auto headlights into the roadside to frighten deer of an oncoming car. These systems have been proven effective in reducing animal/vehicle accidents^[18] and may be appropriate for historically hazardous areas. The possibility of additional funds for these improvements from insurance company grants should be reviewed.

Recommendation: Encourage the Department of Public Works to effectively manage roadside vegetation. Deer use roadside shrubbery for cover and food sources, which increases the risk of collision. Effectively mowed and managed roadside shrubbery will increase visibility and reduce accidents.

Part 4: Deer and the Environment

While Lyme disease, auto accidents and yard damage are obvious results of deer overpopulation, an often less noticed but no less serious form of damage is taking place in the public and private open spaces of Ridgefield.

The problem: Overbrowsing has changed the ecology of our woodlands and fields in the past 20 years. Many herbaceous plants, including our native wildflowers^[19], have been decimated; some may have been eaten into extinction in Ridgefield. Seedling trees are being destroyed before they have a chance to be saplings and are unable to grow to replace dead trees and to provide food and nesting sites for birds and other creatures.^[20] This also threatens the ability of the soil to absorb rainfall.

In their places, alien species of herbaceous and woody plants are spreading – species the deer usually will not eat. Repairing the damage already done could take decades.^[21]

Native plants are just one link in the chain of life affected by overbrowsing. Insects that depend on the plants for food and shelter are disappearing. Birds, amphibians, reptiles, and small mammals that depend on the insects as well as on plants can no longer find food, and are disappearing.

Migratory songbirds, in particular, suffer from the lack of insects. Whether they are birds that arrive from the South to nest here, or stop by for food on their way north, they are finding fewer native insects to eat. This lack of food is especially affecting nesting populations.

Native woodland plants that bear berries and seeds that feed many birds are also being destroyed.^[22]

In addition, many understory plants provide nesting sites for songbirds. When the understory is gone, so are the nesting sites. There are indications that some bird species, formerly regulars in our woods, are now disappearing^[23].

Ridgefield's woods are becoming stands of trees and alien understory, supporting little

biodiversity. And as they die the trees are not being replaced by needed native species.

The evidence: In Ridgefield, the evidence of these changes is mostly visual. No scientific surveys have been taken; such a survey would be difficult since there is no official benchmark of what was here before deer overpopulated. (An early 1970s wildlife survey looked only at species found in Ridgefield, not their numbers. One committee member who took part in a this survey and specialized in wildflowers has revisited many areas that were once haunts of orchids and other native wildflowers, and found most species have disappeared.)

However, in nearby communities where large tracts are overseen by reputable national conservation organizations, the damage to the environment has been documented. The Nature Conservancy at Devil's Den^[24] in Weston and the National Audubon Society at Greenwich^[25] have both determined that environmental damage is so widespread and pervasive that they have decided not only to allow, but to encourage hunting or culling (hunting by paid professionals) on their lands.

Recent studies by the Audubon societies in New Jersey and Pennsylvania have documented extensive damage to the wild lands in their states.

Recommendation: Experts indicate that for natural reforestation to take place, the deer population should be between 18 and 25 per square mile. For herbaceous regeneration, experts recommend even fewer deer: around 12 per square mile.^[26] The committee-recommended level of 20 *or fewer* deer per square mile should permit the natural reforestation of woodlands and should at least reduce the threat to herbaceous plants and allow some degree of plant regeneration.

Recommendation: Even if these levels of deer density were attained, it would take many years for nature to restore the town's open spaces with native species that have been lost or drastically reduced in numbers. Local garden clubs and conservation organizations should be encouraged to undertake programs of reintroducing native plants to open spaces. Data are available on the species that were found here 30 years ago.

Recommendation: Presumably with the assistance of the Yale School of Forestry, the town should establish a system of monitoring open spaces to determine the effect of reduced deer populations on vegetation. This would help determine the success of the proposed culling and/or hunting, and whether additional killing will be needed.

Recommendation: As a means of discouraging deer overpopulation over the long term, the town should establish a continuing program of education through lectures, publications, print and online media, encouraging the use of ornamental and garden plants that deer find distasteful. The program should point out the hazards of maintaining large lawns with long wood-edges, which are favored haunts of deer, and encourage landscape design that discourages deer (*see section on Deer and the Yard*).

Note: Deer are not the only source of change in our woodlands: As forests grow older, the size and nature of the trees can change, and the seasonal light they admit to the ground changes with them. This affects the types of species inhabiting woodlands floors and edges. In addition scientists have recently discovered that earthworms – none of which are native to the Northeast – are invading some woodlands in our region, consuming the layer of forest floor that is rich in leaf litter and leaving a less porous soil that is unable to support some native plants. Nonetheless, there is no doubt that deer have had a devastating effect on open spaces.

Part 5: Deer and the Yard

While perhaps the least serious of the four problems created by deer overpopulation, yard damage is the most widespread and visible effect. Hardly a household exists that has not had cultivated plants eaten by deer.

The problem: Being creatures that forage the forest edge, deer find suburban communities like Ridgefield attractive. Pockets of woods provide shelter while yards offer a bounty of food.^[27] Due to the nature of our large-lot zoning, deer feel safe browsing yards because they have a fairly unobstructed view and can quickly escape to another yard or to nearby woods.

In addition, until the town began seriously enforcing the “leash law” in the 1970s and early 1980s, roaming pet dogs helped keep deer from entering not only their owners’ yards, but also probably whole neighborhoods. What’s more, 25 or more years ago, roaming packs of dogs^[28], some of them wild, were not unusual and probably helped reduce the suburban deer population, either through direct attacks or the threat of attack.

Because Ridgefield is a wealthy community, its residents often landscape their yards with valuable shrubs and garden plants. Scores of cultivated plant species attract deer, which have done more and more damage as their population has increased. And as their numbers increased, the available supply of food has become more limited, and deer have taken to eating some species they had previously avoided; holly, rhododendrons, and laurel are three examples.

The economic effect of deer on yards is extensive, but incalculable. On the one hand, they damage or kill many cultivated species. On the other, they inspire homeowners to spend money fighting the problem with everything from chemicals to deer fencing.

Fencing can create problems of its own. While fencing can solve an individual family’s problem with deer, it is not a community solution. The more yards that are fenced, the less territory the deer have to roam. This can tend to increase their damage to unfenced properties and open spaces by creating larger densities of deer per square mile. Fencing has another effect; it’s often unattractive, and sometimes unneighborly.

The deer overpopulation has also led some people to hire or invite bow hunters to their yards in an effort to reduce local populations of deer. This has resulted in considerable controversy, with neighbors fearing for the safety of their children and themselves, and complaining of wounded and/or dying deer showing up on their property.

Deer in the yard also contribute to the threat of Lyme disease, which is addressed earlier in this report [*see page 6*].

The evidence: Anyone who has lived in Ridgefield since the 1970s has probably said something to the effect: “Thirty years ago, seeing a deer in the yard was a big deal. Now, it’s an everyday event.”

That the deer have decimated many varieties of yard and garden plants needs no documentation; every Ridgefield homeowner has experienced this effect of overpopulation.

The problems of bowhunting on small lots have been documented in the pages of The Ridgefield Press^[29], both in news stories and in many letters to the editors.

Recommendation: At least until deer populations are reduced, homeowners should be encouraged to plant species that deer do not eat. Forsythia and daffodils are two spring examples^[30].

Recommendation: The town should encourage homeowners to consider landscaping design techniques that make their yards less attractive to deer, such as avoiding vast expanses of lawn.

Recommendation: The town via its Conservation Commission and/or garden clubs should consider creating a corps of trained volunteers, who would be available by appointment to visit yards and make suggestions on plantings and designs that discourage deer.

Recommendation: A deer education website established by the town should list deer resistant species and offer other information and techniques for discouraging deer. (This website would also address Lyme disease, traffic safety, and other deer-related issues.)

Recommendation: A series of educational columns on landscaping for deer should be provided to the local media [\[31\]](#).

Recommendation: The Ridgefield Continuing Education Program (adult education) should be encouraged to offer courses or workshops every semester in landscaping for deer [\[32\]](#). Other organizations, such as the Conservation Commission or garden clubs, might also offer seminars.

Recommendation: In its education efforts, the town should make an effort to warn against planting species that are considered invasive, and that might lead to biodiversity problems of their own. Lists of these species should be made available. [\[33\]](#)

Recommendation: A town-appointed deer management committee should work with homeowners who wish to control deer locally to find reputable bow hunters.

Part 6: General findings and recommendations

As described in the preceding sections, there is a direct correlation between the density of deer and the level of Lyme disease, forest damage, auto vs. deer collisions, and residential landscape damage. By way of consensus, the committee concluded that the rates of Lyme disease, auto accidents and forest impact are unacceptable in Ridgefield. In response to this consensus, the overwhelming majority of the committee members concluded that action was warranted

The means by which the community deals with deer overpopulation need to as varied as the circumstances that brought about deer overpopulation. The committee clearly recognizes that in order to accommodate the differing comfort levels of residents, constraints of a suburban landscape, and historic land use patterns, multiple recommendations must be included. Like most complex problems, the solution tends to be equally complex.

The recommendations fall into three main categories; gathering Ridgefield specific data, deer herd reduction, and land use practices. It is expected that an implementation committee will be formed by the Board of Selectmen to further define and apply these recommendations.

Ridgefield Data

Much is known regionally regarding density of deer herds. However, only one aerial survey has been conducted along the southeastern boundary of the town.^[34] That Connecticut Department of Environmental Protection survey estimated that there were 79 deer per square mile in that area. Other aerial surveys in areas with similar development patterns yielded 40-60 deer per square mile, with differing concentrations throughout a given town.

In order to increase our knowledge regarding the definition of the problem the committee recommends:

1. Follow up with Professor Os Schmitz of Yale University regarding his conceptual offer to identify areas of particularly high deer densities. In the event Yale University is unable to work with Ridgefield, such a survey should be pursued through other institutions. It was Dr. Schmitz's concept that through the University, students could collect data related to deer impacts and evidence of population densities and plot trends for Ridgefield. With information depicting areas with denser populations, the implantation committee could be more effective in educating residents and facilitating herd reduction in key locations.
2. Ascertain the estimated deer population for Ridgefield by conducting an aerial survey. This information in combination with ground surveys to locate "hot spots" as recommended above is paramount in assessing the scope of a culling effort and will allow for a more focused and effective program. This information will also be used as baseline information for future assessments of culling efficacy.

Herd Reduction

Conclusions regarding the extent of Ridgefield's deer overpopulation are drawn based on region-wide surveys and an acknowledgement of unacceptable levels of forest damage, Lyme Disease, and auto collisions, which are attributable to elevated deer density. In response to these conclusions herd reduction is recommended. The committee has investigated both lethal and

non-lethal methods to reduce the population and has found that there are no non-lethal means available to cull herds. Consequently, and in keeping with information provided by various experts who gave presentations to the committee, it is recommended that the town initiate measures to lethally reduce the deer herd to fewer than 20 deer per square mile.

Historically, hunting regulations were devised to facilitate herd growth to compensate for a nearly extirpated Connecticut deer population. Regulations gave preference for harvesting males, acknowledging that one male could impregnate just as many does as five males. Thus, the herd could continue to grow, albeit at a slower pace than today. As the century wore on, development patterns and a drop in the number of hunters allowed for continued robust herd growth. Development creates "edge habitat," that being the lush growth of vegetation that occurs at the boundary between lawns and forest. This robust growth provides more foraging opportunities as compared to a forest floral community. With suburban edge habitat also came a social shift away from hunting, whether for recreation or for sustenance. Consequently, like other predators of deer, humans were no longer exerting a meaningful influence on the deer population.

Today's elevated levels were not created quickly nor will they be resolved quickly. All recommendations regarding herd reduction assume multiple years of more intense effort followed by ongoing hunting or another population management tool, should one become available.

Proactively encourage hunting on private land

1. Provide public education regarding the impacts of deer overpopulation, applicable hunting regulations, and how to facilitate hunting on their property. Current levels of recreational hunting are inadequate to reverse the trend of a growing herd and as such appropriate residential properties should be hunted. Further, many residents seek to influence the herd that impacts their property. Given our knowledge regarding the propensity of a herd to firmly stay within a particular home range, hunting can have positive impacts within a given extended neighborhood. While not legally required, residents should be strongly encouraged to inform their neighbors and incorporate any concerns to the extent practical.
2. Establish a cadre of informed individuals to assist property owners in assessing the opportunities and constraints of their land for hunting, how to secure a hunter, and provide general assistance to residents' inquiries. Inasmuch as many residents are unfamiliar with hunting or how to find someone knowledgeable, these accessible, informed individuals will be an important first step in educating the homeowner and setting in motion responsible decision making.
3. Maintain a list of hunters for residents to refer to. Since finding a hunter is a struggle for some, having a list available to the public would be helpful.
4. Work with the Ridgefield Land Trust to facilitate hunting on their land. As stewards of natural resource diversity, including forest health, the implementation committee should provide information and assistance to the Land Trust to enable a hunting program on the property. Due to the distribution of their property throughout the town, adjoining properties would benefit as well as the targeted parcel.

Assess the suitability of publicly owned lands for Controlled Hunts

1. A Controlled Hunt means a hunt organized by the implementing committee that consists of invited hunters hunting the publicly owned parcel for specific days during the hunting season. Rules regarding the use of tree stands, points of entry, park closure, etc. shall be established. The implementation committee should be aware of community

sensitivity with respect to baiting of deer and sharpshooting. It is also within the discretion of the town to require all or part of the harvested meat be donated.

2. Each town-owned parcel will offer advantages and disadvantages for conducting a safe and effective controlled hunt. Components such as parcel size, topography, proximity of neighboring homes, type and extent of public use, extent of deer damage, among others, must be evaluated. Once the parcels have been assessed and findings recorded, the implementing committee will have sufficient information to determine suitability.
3. Modify the town ordinance that restricts hunting on town-owned land to allow hunting under the supervision of the town for the purpose of addressing nuisance wildlife.
4. Give priority consideration to publicly owned land that fall within zones of higher deer concentration as that information becomes available.

Land Use Practices

The recommendation to reduce the density of white tailed deer in Ridgefield will not address the impacts of an elevated population for many years. Further, for many residents the concept of hunting on their properties is unacceptable and/or impractical. In response to these realities and concerns, there are recommended actions for residents who desire to limit their exposure to Lyme disease, reduce the risks of an auto accident, and reduce impacts to the yard from browsing.

Lyme Disease

1. Provide support to Ridgefield's Lyme Disease Task Force education efforts. The Task Force is a well-developed organization with a public education program that addresses the link between white-tailed deer and deer tick reproduction, and Lyme disease prevention. The implementation committee should actively partner with the Task Force to support and strengthen these aspects of their program.
2. Educate residents and town departments on tick habitat and the appropriate preventive measures to reduce/eliminate this habitat.
 - a. Remove leaf litter and piled brush from frequently used areas.
 - b. Move woodpiles and birdfeeders away from houses.
 - c. Install a woodchip border between woodland edges and lawns.
 - d. Place swing sets and other play areas in open, sunny areas away from woodlands.
3. Promote the use of Integrated Pest Management (IPM) on public lands. IPM is a multifaceted approach to pest management in that it encompasses physical, chemical, and logistical strategies with the intent to ultimately reduce the use of chemicals.
4. Increase public awareness and encourage the use of rodent bait boxes that reduce tick populations on mice and other small rodents. The boxes have the potential to locally impact tick densities by applying insecticides to rodents that enter the box to access the bait. The boxes are best utilized when multiple properties cooperatively protect an area. To date, the expense of bait boxes still exceeds that of spraying insecticides, however they have the major advantage of limiting our exposure to pesticides.
5. Inform the public of the efficacy of spraying pesticides for tick control. With this message, it is paramount to include information regarding the unintended impacts on other insects, birds, fish, amphibians and the food chain in general.

Auto/deer Collisions

1. The implementation committee shall steward a driver awareness program to educate residents on deer movement patterns, areas of concentration, and most importantly, how their own driving habits such as speed and attentiveness can help avoid accidents.
2. Use data gathered regarding population densities and accident reports to identify zones with concentrated deer activity. These areas should then be posted and publicized.
3. Work with DPW to use appropriate roadside vegetation management techniques and identify priority areas. Roadside vegetation is particularly attractive to deer in composition and salt content. Therefore, efforts to manage this vegetation to be less attractive to deer should be implemented by the town's Public Works Department.
4. Monitor and recommend use of techniques to keep deer off travelways. Increased research and roadside installations of reflectors, flashing lights, and other means to discourage deer from entering the roadways are well underway in the northeast. The use of some of these methods may be of value to Ridgefield and should be investigated for efficacy, cost, and maintenance issues, among other considerations.

Residential Landscape Management

1. Promote an overall message that encourages residents to create yards that are less attractive to deer. This will discourage deer from frequenting the property and as more properties are managed prudently, collectively they have the potential to diminish the carrying capacity of the area. Of particular importance, prudent yard management needs to include a reduced perimeter of woodland fringe, accomplished principally by reducing lawn area.
2. Inform the public on the efficacy of installing deer fence to exclude deer from all or portions of their property. Information should include minimum specifications, measures to improve effectiveness, its limitations regarding tick management, potential impairment to the movement of other wildlife depending on the fence type, and the general maintenance needs.
3. Publicize updated lists of deer resistant plantings and encourage responsible plant selection. Recommendations need to include warnings against the use of non-native invasive species, despite their known deer resistance.
4. Publicize information regarding deer deterrent sprays including success rates of particular ingredients and the need to rotate product usage.
5. Keep up to date and publicize emerging technologies that deter deer from yard areas.

Part 7: Summary of Speakers

This is a summary of presentations made to the committee:

Howard Kilpatrick, senior biologist with state DEP, presented to the committee on Oct. 25, 2004. Mr. Kilpatrick noted that white-tailed deer consume between 5-10 lbs. of vegetation each day, have a typical lifespan of 18 years, and that their population can double in size every 2-3 years. He noted that the relative absence of predation and the beneficial habitat created by fragmentation promote their rapid population growth, particularly in areas like Ridgefield and the rest of DEP Zone 11. He pointed out that hunters were the only serious deer predator, and that coyotes or other animals posed no serious predation threat. Mr. Kilpatrick presented evidence for the increasing levels of deer population in Fairfield County, and also presented a variety of evidence for the damaging effects deer

have on levels of vegetation and in plant and animal biodiversity.

Mr. Kilpatrick estimated that the deer population in Ridgefield was in the 100+ deer per square mile range, and that it appears the population could keep increasing vigorously based on the food available and the lack of predation risk. He advised that a population of fewer than 20 deer per square mile was needed for forestation, and a population of 10-15 was desired to protect herbaceous cover.

Mr. Kilpatrick presented figures on the public safety impact of the overpopulation of the deer including deer/vehicle accidents and the increase in Lyme disease, noting that Ridgefield ranked #1 in the number of deer/vehicle accidents in the state.

Mr. Kilpatrick advised that the use of fencing and repellents were only practicable for small, enclosed areas, that relocation was no longer a viable option, and fertility control was not practicable (especially on free-ranging herds). He noted that hunting was the principal management tool used on free ranging herds, and that Connecticut just recently adopted regulations that would allow restricted sharpshooting.

Mr. Kilpatrick presented data supporting the safety of hunting, noting for example that that over 11 years and over 600,000 deer hunting permits issued, there were only 18 serious incidents.

Georgina Scholl, MD, presented to the Committee on October 25, 2004. She covered deer contraception techniques. Dr. Scholl has been in charge of the Fairfield County group's investigation into deer contraception and an alternative deer management methodology.

Dr. Scholl advised that deer management through contraception remains very experimental from a variety of perspectives, and that there are no FDA-approved methods. She also noted that since contraception has no effect on the short-term population numbers, other methods of herd management would be need to be used to have a near-term effect.

Pat Sesto, Director of Environmental Affairs for Wilton, and also co-chair of the Ridgefield Deer Committee, presented to the committee on November 22, 2004. She covered the process that Wilton used to define their deer problem and to make recommendations. Eight pages of recommendations were made, including recommendations for hunting on reservoir lands using controlled bow and gun hunts, and the encouragement of hunting on privately-held parcels.

Steve Patton, Director of Devil's Den, presented to the Committee on November 22, 2004. Mr. Patton, whose primary interest is the ecology of the forest system, noted that increasing deer numbers has resulted in loss of ground floor in the forest and a decrease in animal diversity. He has organized programs to cull the deer from the 1700-acre Devil's Den area. Nine to fifteen rifle hunters participate each year, and the preserve is closed to visitors to ensure safety. On average, 30-35 deer are taken over eight or nine days. Mr. Patton has cautioned that it may take five to ten years for substantial plant recovery to occur.

Tom Renzulli, Master Senior Firearms and Bow Instructor for Connecticut DEP, spoke to the Committee on November 22, 2004. Mr. Renzulli displayed actual bows, arrows, firearms and ammunition. He pointed out that bows are typically accurate for a distance of 30-35 yards, while a shotgun can be accurate for 80 yards. He talked extensively about safety practices, and stressed the importance of safety and good stewardship of the land.

Laura Simons, Urban Wildlife Director at the Fund for Animals, presented to the Committee

on Dec. 14, 2004 (Note: citing copyright restrictions, Ms. Simons would not provide the Committee with a copy of her presentation materials for future reference.)

Ms. Simons presented data demonstrating that following a one-time reduction in deer population through hunting, the deer population rebounds after a few years. Thus, she concluded, if hunting is to be used as a deer population control methodology, it would need to be done every year in order to be effective. Ms. Simons also cited a recent study suggesting that earth worms eat plant cover and are a threat to biodiversity. She explained that this provides an example of how complex our ecosystems are, and that it can be difficult to narrow the cause of problems to only a single cause. Ms. Simons also raised questions concerning whether recreational hunting would reduce Lyme Disease, because recreational hunting may have only a limited ability to reduce the deer population, and because ticks might be able to adapt to other hosts. She advised that Kirby Stafford is the expert to consult concerning deer ticks.

She suggested that a major focus should be educating the public on how to protect themselves and on controlling ticks directly instead of deer. Ms. Simons further presented several options involving deterrents and fencing that could help property owners protect their landscaping and gardens.

Ms Simons questioned whether hunting would reduce deer-car collisions, citing that hunting pressure, in addition to roadside vegetation and development patterns, can cause deer to move about more actively and potentially cause deer-car collisions. Ms. Simons also questioned the safety of hunting, particularly bow-hunting, and presented accident statistics to demonstrate risks associated with hunting. Ms. Simons advised that comprehensive planning should be done, goals should be defined, and it should be recognized that different solutions would be successful on different sites, and so a comprehensive solution will involve a number of approaches. She also pointed out the importance of public education.

Dr. Kirby Stafford, Vice Director of the Connecticut Agricultural Experiment Station and a widely recognized expert on deer ticks, spoke to the Committee on Dec. 20, 2004. He covered the most current knowledge concerning deer ticks and their transmission of Lyme Disease.

Dr. Stafford noted that deer ticks feed on three hosts as they mature from larvae to nymphs to adults. The preferred host of larvae is mice, which act as a reservoir for the bacteria that cause Lyme Disease. Adult females, however, feed only on large animals, with deer as the preferred host. According to Dr. Stafford, the abundance and distribution of the deer tick has been directly related to the size of the deer population, and that contained communities with extremely high deer densities have superabundant tick populations, and that isolated areas without deer do not appear to support deer ticks or the bacteria that cause Lyme Disease. He noted that deer are key to the reproductive success of ticks, and that deer transport blood-engorged female ticks into areas where they can lay thousands of eggs. According to Dr. Stafford, while decreasing the deer population should lead to a reduction in Lyme disease, it has been estimated that the deer population would have to fall to about eight deer per square mile to completely break the transmission cycle of Lyme Disease.

When queried about the possibility that a reduction in deer would lead to host substitution rather than a real reduction in the tick population, Dr. Stafford indicated that this effect is short-lived, and that tick populations do in fact decline with a reduction in herd size.

Dr. Stafford discussed alternative ways for controlling ticks, including habitat or vegetative

modifications (e.g., mowing, brush and litter removal, landscape barriers, deer-resistant plantings); spraying regularly with pesticides effective against ticks; and host reduction or exclusion. He also discussed methods of applying pesticides to deer via special feeding stations. He noted, however, that these need to be refreshed with food and pesticide regularly, and that they may encourage an actual growth in the deer population. In addition, he discussed, "bait boxes" that can be distributed and used to apply pesticides to white-footed mice. This has been effective in reducing tick population in one isolated area studied.

When asked about the application of these alternative methods on a town-wide scale, Dr. Stafford acknowledged that they are effective in protecting only individual properties or groups of adjacent properties (e.g., homeowner associations), and that they alone would not be effective to control the tick population in a town the size of Ridgefield with a free-ranging deer herd.

Dr. Stafford also noted that many preventative measures against Lyme Disease, such as protective clothing and repellent, are not universally adopted, and that children aged five to fourteen have the highest incidence of Lyme Disease.

Dr. Os Schmitz, of the Yale Forestry School, spoke to the Committee on Jan. 24, 2005. Dr. Schmitz discussed the idea of ecosystem "balance." He pointed out that the fact that deer populations are still increasing implies that we have not yet reached their carrying capacity, i.e., that technically speaking, we are still below the balanced level for deer. He argued that "balance" in this sense is not reached until the mortality rate (e.g., via starvation, predators) balances the reproductive generation rate. He pointed out that balance in this sense and biodiversity are different things.

Dr. Schmitz pointed out that one reason for Connecticut's deer population increase is vegetation change, i.e., that edge habitats, which are appealing to deer, are on the increase as homeowners landscape their properties. He stated that biodiversity loss can be correlated with rise in deer abundance, and that changing landscaping practice may be able to help reduce deer populations.

Dr. Schmitz described a project he conducted in Northern Canada to manage the effects of moose on the tree population in order to enable the continuing production of paper pulp. A company clear cuts trees, replants, and has a 60% failure rate because moose eat the seedlings. The result is that moose are hunted or chased away. Aspens then take over the new forest because it is a dominant competitor with spruce. The company needed to get the right mix of trees. It was decided to try to understand how moose interact with the forest and enlist them as agents to manage a mixed forest. Since moose prefer aspens, the company was able to exclude the moose from some areas to promote the desired level of aspen growth, while allowing them to browse others to foster the spruce. This produced the desired balance of plant densities. Clear cutting, however, scares moose away. So they will manage a forest only on the edges where they feel safe. It was found that patch-cut harvesting enabled the moose to feel safe and be able to hide. Dr. Schmitz cited this as an example of using alternative methods to hunting for addressing environmental issues, but he conceded that it was not clear how the results can be applied to address deer overpopulation problems.

Dr. Schmitz commented that there is no "silver bullet," and that there is always a tradeoff between deer density and plant density. He suggested that before we take action, we should have clear articulations of human values that shape decisions about hunting; what constitutes unacceptable problems caused by deer; what kind of biodiversity we want; what we mean by ecosystem health; and what the location and scale of the deer problem is. He further suggested that for any hunting-based methodologies that may be adopted, that we have a clear definition of their goals, and have a clear

idea for how we will be able to decide whether the goals have been met.

In order to focus resources in the most impactful areas, Dr. Schmitz suggested that the town gather and synthesize a variety of data concerning deer and vegetation throughout Ridgefield, and use this data to construct a Geographical Information System (GIS), i.e., a computerized, multi-layer, interactive map. He indicated that Yale students might be available to help with this work.

Dr. Schmitz noted that hunting cannot solve the deer-related problems alone, and that while it may be necessary initially, other steps should be taken as well. He pointed out that reducing lawn sizes and choosing ornamentals that do not attract deer are advisable, but may actually increase Lyme Disease risk. He further pointed out that contraceptives work only in closed population areas, and that he does not believe they will ever be a viable solution in an unrestricted setting.

Denise Savageau, Director of conservation in Greenwich, spoke to the Committee on Feb. 8, 2005. Ms. Savageau presented a copy of the "Report on Managing Greenwich's Deer Population" to the Committee. She summarized the steps that Greenwich took to arrive at the decision to cull the deer population as part of a larger deer management plan for the city.

A research group comprising the Connecticut Department of Environmental Protection and the University of Connecticut recommended reduction of the deer population in order to address the growing problems of diminishing biodiversity, Lyme Disease, and automobile accidents. It was noted that problems associated with deer are long-term, and the corresponding solutions should likewise be long term. A major part of Greenwich's plan is to cull the deer population using lethal methods, and to then try to maintain the lower numbers using contraceptive methods and additional hunting as necessary. Greenwich applied for two permits from the DEP: a sharpshooting permit, which allows hunting outside the normal season and at night with different types of firearms, and a second permit that allows research in fertility control. One of their goals is to reduce the deer population to 10-25 deer per square mile in three-five years.

Part 8: Appendices

Deer committee members

Douglas Barile (U) 34 Market Street (Lyme Disease Task Force rep)
Patricia Hutchings (D) 146 Peaceable Street
Tom Belote (D) 24 Bailey Avenue, co-chair
Peter Lyman Keeler (R) 741 Ridgebury Road
Guy Bocchino (R) 286 Great Hill Road
Sid Kelley (R), 316 Florida Hill Road (Land Conservancy of Ridgefield rep)
Andy Bodner (R) 105 Branchville Road
Lee Pepin (R) 12 Bates Farm Road
John Borger (U) 5 Honeysuckle Lane
Jack Sanders (D) 91 Olmstead Lane
Tom Castellani (R) 237 North Salem Road
Raymond Sementini (U) Old Wagon Road
Helene Daly (D) 47 East Farm Lane
Pat Sesto (R) 115 Nod Hill Road, co-chair (Conservation Commission rep)
Donald Damoth (R) 32 Peaceable Street
Gwen Thaxter (R) 57 Round Lake Road
Dr. Matthew Denesuk (R) 123 High Ridge Avenue
Tom Venus (D) 23 Limestone Road
Penny Hoffman (R) 29 Memory Lane

Major John Roche, ex-officio member from the police department
First Selectman Rudy Marconi, ex officio member from the Board of Selectmen

Deer committee website:

jackfsanders.tripod.com/deer/ (as of Sept. 19, 2005)

Deer Committee e-mail

ridgefielddeer-ideas@yahoo.com

Brief summaries of meetings

Note that some scheduled meetings were cancelled due to weather or holidays.

Sept. 29, 2004: First meeting; organization; issues to consider.
Oct. 12, 2004: General organizational issues; plans; Lyme disease discussion; complaint about bow hunting.
Oct. 25, 2004: Presentations by Howard Kilpatrick, senior biologist with state DEP, on

- deer population and effects of overpopulation, plus hunting information; and Georgina Scholl, MD, on deer contraception techniques.
- Nov. 9, 2004: Is there a deer problem -- a straw vote; how should committee proceed; deer-car accidents in town.
- Nov. 22, 2004: Wilton's deer program; description of deer hunting program at The Nature Conservancy's Devil's Den in Weston; demonstration of hunting gear.
- Dec. 14, 2004: Laura Simons of the Fund for Animals speaks about many deer-related issues and control alternatives to hunting.
- Dec. 20, 2004: Dr. Kirby Stafford of Connecticut Agricultural Experiment Stations speaks on research into deer ticks.
- Jan. 24, 2005: Dr. Os Schmitz of Yale Forestry School on long-range planning for deer reduction.
- Feb. 8, 2005: Denise Savageau, director of conservation in Greenwich, describes that town's plans to cull deer by using paid bow hunters.
- March 28, 2005: The committee agrees by consensus that cases of Lyme disease, car-deer accidents and wild vegetation damage are all too high to be acceptable. Reports will be written on each.
- April 14, 2005: The committee agrees the town deer populations should be 20 or fewer per square mile and hopes Yale Forestry School will help find "hot spots." Aerial deer surveys are recommended.
- April 24, 2005: The committee discusses and assigns some work on its final report.
- May 10, 2005: Committee votes in favor of controlled hunts on town-owned property; accepts subreports; hears objections to its operations and data.
- May 23, 2005: Committee discusses tick and deer control techniques, Lyme disease, auto accidents, landscaping; agrees to draft final report
- June 7, 2005: Preparing for the final report; how to deal with a minority report.
- June 27, 2005: Final action on the report.

The Charge

The following is the charge given to the committee by the selectmen:

- Membership not to exceed 19 members; Major John Roche being an ex-officio member
- Investigate deer management activities of other towns in southwestern Connecticut
- Gauge the current interest of Ridgefield residents and organizations regarding deer management and their views as to effective controls on the deer population, consistent with public safety, health and ecological integrity.
- Interface with other town agencies, committees and organizations that would be affected by deer management methodologies.
- Conduct research, including the development of statistics from the Ridgefield Police Department, and coordinate and amass information from the Lyme Disease Task Force, State Department of Environmental Protection agency and conservation-related organization.
- Investigate the geography of the town to decide the best approach to deer management in Ridgefield.
- Interact with the largest practical number of residents in order to obtain input.

- Disseminate its research and findings in an effective manner such that the residents and officials of the Town of Ridgefield may make considered judgments.
- Maximize efforts to provide the community with information regarding the findings, research and proposals of the deer management committee.
- Report back to the Board of Selectmen with the committee's analysis and recommendations.

Part 9: Citations in the report

[1] 'Reported cases' are those that meet the CDC surveillance criteria and are more restrictive than the clinical criteria used for treatment.

[2] Connecticut Department of Public Health data, www.dph.state.ct.us.

[3] Consensus of Lyme disease experts at Center for Disease Control and CT Agricultural Experiment Station is that surveillance cases represent approximately 10% of physician diagnosed cases. See Kirby Stafford, *Tick Management Handbook*, CT Agricultural Experiment Station, New Haven, 2004.

[4] *Wilton Residential Study*, Town of Wilton, CT, October 2002.

[5] M.L. Wilson, A.M. Ducey, T.S. Litwin, T.A. Gavin, and A. Spielman, "Microgeographic distribution of immature *Ixodes dammini* ticks correlated with that of deer," *Med. Vet. Entomol.* 4: 151-159 as reported in Stafford, *op. cit.*, p. 43.

[6] Kirby Stafford, "An increasing deer population is linked to the rising incidence of Lyme disease," *Frontiers of Plant Science* 53 (2), Spring 2001.

[7] Kirby C. Stafford III, Anthony J. Denicola, and Howard J. Kilpatrick, "Reduced Abundance of *Ixodes scapularis* and the Tick Parasitoid *Ixodiphagus hookeri* with Reduction of White-tailed Deer," *Journal of Medical Entomology* 40 (5), 2003, pp. 642-652.

[8] H.J. Kilpatrick and A.M. LaBonte, "Deer Hunting in a Residential Community: A Community's Perspective," *Wildlife Society Bulletin* 31 (2), pp. 340-348 as reported in Report on Managing Greenwich's Deer Population, Greenwich Conservation Commission.

[9] M.L. Wilson and J.E. Childs, "Vertebrate Abundance and the Epidemiology of Zoonotic Diseases," in *The Science of Overabundance: Deer Ecology and Population Management*, W.J. McShea, H.B. Underwood, and J.H. Rappole, Eds., Smithsonian Institution Press: Washington, D.C., 1997, as reported in Report on Managing Greenwich's Deer Population, Greenwich Conservation Commission.

[10] According to Kirby Stafford, "Based on the deer reductions at Great Island, Dr. Sam Telford estimated that "zoonotic overflow" does not exist at a deer density of 6 per 200ha (8 deer/square mile). He cites a reference in *Ecology and Environmental Management of Lyme Disease*, Howard S. Ginsberg, ed., 1993.

[11] "The National Highway Traffic Safety Administration (NHTSA) keeps annual figures for car-deer accidents, the figures lack a measure of exactness and certainty because there's currently no standardization in the reporting of deer-related accidents throughout the country, and because what constitutes a "reportable accident" varies so much between states."

[12] "Howard Kilpatrick, senior biologist with the Connecticut Department of Environmental Protection, stated

that “too many fatally injured deer disappear into the woods”.”

[13] Joel Tobias of Girard Motors, Groton, CT.

[14] The Connecticut Department of Environmental Protection estimates the number of deer to be over 100 per square mile. This greatly exceeds the 20 per square mile recommended for reforestation.

[15] A survey conducted by Major John Roche of the Ridgefield Police Department concluded that speed has not been a significant factor in Ridgefield’s deer/vehicle accidents. The officers reported these conclusions due to the absence of skid marks which would have been evident had the speed been excessive. As well as examination of the vehicle damage and location of the animal carcass after impact.

[16] These characteristics would include most likely times for deer movement, the most active seasons for deer and the likelihood of movement in groups.

[17] It should be noted that standard “Deer Crossing” signs have in some areas proven ineffectual. However, when these signs have been accompanied with flashing lights drivers generally do tend to slow down. National Highway Traffic Safety Administration (NHTSA)

[18] The Strieter-Lite reflector system has been proven to reduce wild life/vehicle accidents by 80% in areas where used. Such a system where in place would have an added benefit of reducing the kill ratio of other wild life and domestic pets.

[19] “While trees eventually grow out of a deer’s reach, many other plants never do. With time, trillium, bluebead lilies, Canada mayflowers and many other native plants may be eliminated from a forest. In the famous Heart’s Content Scenic Area, an old-growth tract in Allegheny National Forest that has been overbrowsed for decades, researchers recently discovered that the number of plant species on some study plots has declined from 41 to just eight.” *Managing White-tailed Deer in Forest Habitat From an Ecosystem Perspective (Pennsylvania Case Study)*, Roger Earl Latham et al., Audubon Pennsylvania, January 2005

[20] “Deer are selective browsers, and over time, herds can eat some plants out of existence in overpopulated areas, and slow the growth or reduce the height of others. In hard hit areas, the shrub layer and intermediate canopy can almost disappear, replaced by a carpet of ferns, which deer avoid eating. Because tree seedlings are especially vulnerable to hungry deer, the future health of forests can be endangered by overbrowsing. Scientists have documented a lack of regeneration in many locations, including oak forests in the Northeast and hemlock/white cedar forests in the Great Lakes region. In the Allegheny National Forest of northwest Pennsylvania, large, fenced enclosures stocked at deer densities equal to 10 to 64 per square mile, clearly show that whitetails can alter the composition and structure of the forest. Enclosures with high deer densities were dominated by black cherry and beech, tree species that are less palatable to deer while preferred species were absent. One study suggests that densities greater than 25 per square mile aren’t compatible with oak regeneration.” -- Audubon Pennsylvania, *ibid*.

[21] “Overbrowsing by deer has effects that ripple through the forest community, shaping the structure, composition and health of a woodland for generations-perhaps even permanently, scientists now realize. Some of the effects are direct, while others are less obvious.” –*The Ecological Effect of White-tailed Deer*, Audubon Pennsylvania,

[22] “For example, removing a plant such as wild sarsaparilla takes away a valuable food source for the wood thrush and hermit thrush,” according to Thomas Rooney, senior scientist, University of Wisconsin, Madison. Rooney plus researchers Shannon Wiegmann and David Rogers examined forest tracts mapped in the 1950s to compare species. “The new survey of 62 carefully selected sites found less variety in plant life, which could mean there also is less habitat for

insects, animals and birds. Researchers noted that when deer feed on plants, the plants that replace them tend to be the so-called 'generalists' such as ferns, sedges and grasses, as well as invasive species such as orange hawkweed, Kentucky bluegrass and hemp nettle." The study also found that parcels on tribal lands, where development is more tightly controlled and deer herds are smaller due to year-round hunting, had an increase in native species. –Associated Press, June 10, 2004

[23] Among the species threatened by this loss of understory plants are the Hermit Thrush, Wood Thrush, Veery, Ovenbird, and various low-nesting wood warblers. Some of these, such as the Wood Thrush and Veery, have been noticeably declining in populations in our area in recent years. The exact cause is not known, but lack of nesting habitat may be a significant factor.

[24] Steve Patton, director of Devil's Den, speaking to the committee; minutes, Nov. 22, 2004

[25] "The picture is very different today," Audubon Greenwich says, comparing the understory of their conservation property in 2003 to that of 1966 when a survey was done by botany professor William A. Niering and others. "The understory is sparse of herbaceous cover and is much more open. Maple-leaved viburnum that used to dominate the shrub layer has been entirely eliminated. There has been an increase in groundcover of ferns and some invasive species such as the barberry. Dramatic declines in species diversity of wildflowers have been observed. Canada mayflower, trout lily, lady slippers, and other species of orchids and lilies are much less common. Trilliums have been eliminated altogether. Common spring wildflowers that numbered tens, even hundreds of species in the 1950s can now be counted on two hands. The only species of wildflowers commonly seen today include Jack-in-the-pulpit, blue cohosh, wild leek, mayapple, garlic mustard, and dwarf ginseng. –*Management Plan for the Control of White-tailed Deer at the Audubon Center in Greenwich, Connecticut*, Endorsed by the Audubon Greenwich Board, Aug. 5, 2003

[26] Howard Kilpatrick, senior biologist with the Connecticut Department of Environmental Protection, said a population of less than 20 deer per square mile was required for forestation and a population of 10-15 was desired to protect herbaceous cover (minutes, Oct. 25, 2004). Dr. Os Schmitz of Yale indicated the density for ecological balance could be higher than 25 (minutes, Jan. 24, 2005). Audubon Pennsylvania says: "Wildlife managers are coming to realize that there is no magic number of deer, no single ideal density for every mountain or woodlot. The proper density varies with the habitat, and with what values are considered most important for that area. For example, deer densities of more than 10-15 per square mile often have a negative impact on populations of native wildflowers and nesting birds but if the goal is tree regeneration, densities of 18-20 deer per square mile may be acceptable. Today, some ecologists feel it makes sense to measure deer impacts rather than the simple population density."

[27] "Deer consume 5-10 pounds of forage per day, or up to 2,000 pounds per year. Their favorite foods are grasses and forbs, acorns, apples, twigs and buds from wide variety of hardwood trees, and leaves from conifers such as white pine and hemlock. Their favored habitats are edge and early successional forests with gaps and grassy openings." –*Management Plan for the Control of White-tailed Deer at the Audubon Center in Greenwich, Connecticut*, Endorsed by the Audubon Greenwich Board, August 5, 2003

[28] Packs of dogs, both wild and domestic, were a problem in Ridgefield before around 1985. At least one sizable pack of wild dogs that was threatening both humans and wildlife lived in Great Swamp off Farmingville Road until its members were captured or killed by the dog warden. Police and canine control officials often received reports of several dogs chasing deer. Such reports today are very rare.

[29] The Ridgefield Press, various issues from October 2004 through April 2005.

[30] Lists of deer resistant plants are readily available from reputable sources on the World Wide Web.

[31] The Lyme Disease Task Force wrote nearly two dozen columns on all aspects of the disease for The Ridgefield Press during the years 2003 and 2004.

[32] Such a course has been offered from time to time in the past; the spring 2005 semester includes “Imagine the Possibilities in Deer Resistant Design,” taught by Ellen Hughes-Sonnenfroh, owner of The Plant School.

[33] Extensive information on invasive species is available from the National Park Service at www.nps.gov/plants/alien/

[34] CT DEP, “Aerial Deer Survey of the Devil’s Den and Weir Preserve.” December 26, 2002