Deer, Communities & Quality of Life

A PUBLICATION OF THE ECOSYSTEM MANAGEMENT PROJECT

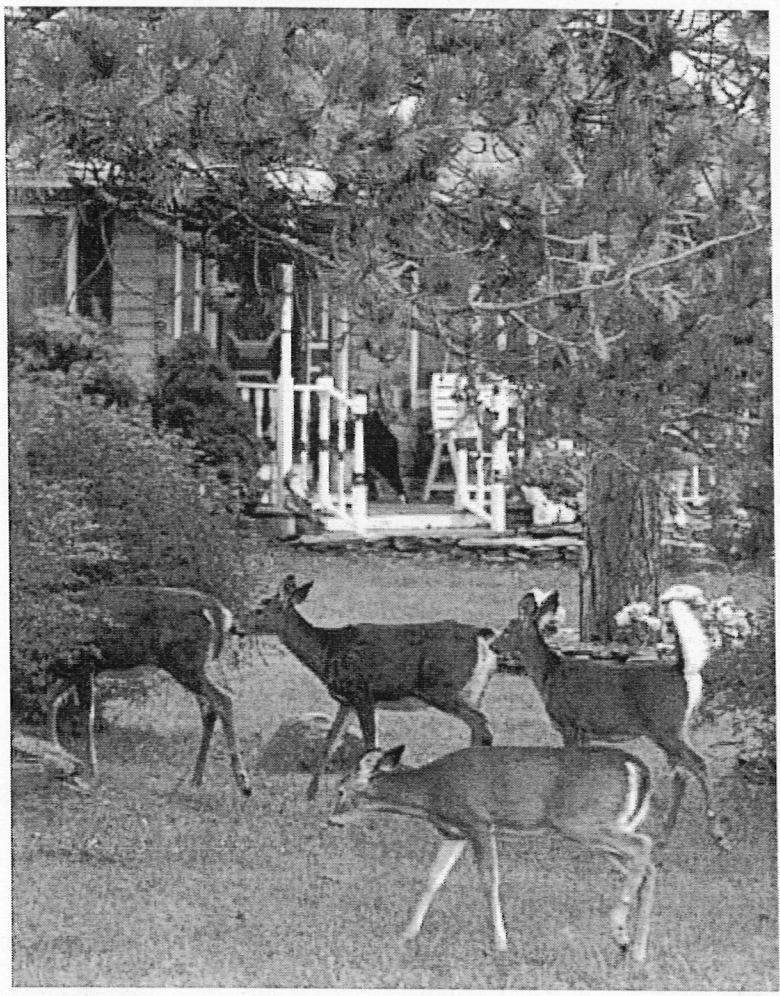
by Ben Moyer, Bryon Shissler and Roger Latham

The woods next door: haven or hazard?

Pennsylvania offers many attractive residential communities for families seeking a high quality of life. Abundant natural beauty, healthful air, a generally mild but varying climate, fertile soils and the serenity of nearby woodlands and fields make these communities desirable places to live, raise children or retire. But in a growing number of neighborhoods across the state, overabundant and poorly managed deer herds are degrading that quality of life for increasing numbers of Pennsylvania residents.

Nearly everyone enjoys the occasional sighting of a deer near home. Increasingly, though, deer herds in residential areas are growing so large that the animals over-browse their woodland habitats, decimate gardens, create hazards on the highways, and even pose threats to human health. Residents and municipal officials in suburban and residential communities all across Pennsylvania are finding that overabundant deer are a serious, expensive and persistent problem.

For a long time in Pennsylvania, few people except deer hunters, farmers and foresters had reason to be interested in the issue of deer abundance. Until recently abundant deer were mostly a rural problem, conflicting with farm and forestry interests but not the lives of people in residential communities. Within the past two decades, however, deer populations have surged state-wide and have spread into urban and suburban communities where they negatively affect the lives of motorists, gardeners and homeowners in every corner of the commonwealth. Few Pennsylvania drivers have not faced the unnerving challenge posed by deer bounding suddenly onto the road. Pennsylvania motorists kill more deer by accident on our roads than are killed intentionally by hunters in many states. Too often, it is the driver that loses his or her life. One major insurance company reported 18,000 deer-collision claims by Pennsylvania motorists from July 1, 2004, through June 30, 2005, the most of any state in the nation. According to the Pennsylvania Department of Transportation, the annual number of deer-vehicle crashes resulting in an injury or requiring towing has held steady at about 2,500 in recent years. From 2000 through 2004, 41 people died in deer-vehicle crashes in the state. Despite the highly publicized but very rare incidents involving wildlife such as bears or poisonous snakes, deer on the road are by far the most dangerous animal to humans. Police and transportation officials concede that hundreds of additional unexplained highway fatalities may also involve deer. In monetary terms alone, deer crashes cost Pennsylvania motorists, insurance companies, PennDOT and municipal governments hundreds of millions of dollars every year.



CHRISTOPHER MILLETTE (COURTESY OF HARRISBURG *PATRIOT-NEWS*)

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In a growing number of neighborhoods across the state, overabundant and poorly managed deer herds degrade the quality of life for increasing numbers of residents.

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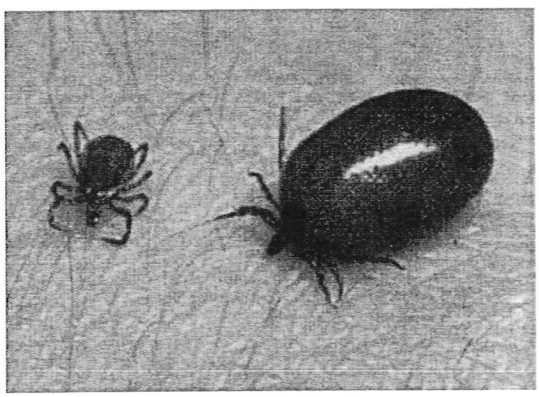
When not on the road, thousands of suburban Pennsylvanians look forward to gardening and ornamental landscaping as a way to enjoy their property and the outdoors. But as deer numbers mount, more gardeners are abandoning their flowers, ornamentals and vegetables because of the cost and frustration of dealing with deer. According to the Pennsylvania Landscape and Nursery Association, a professional trade group representing the horticulture industry, its members note declining sales in areas where deer have repeatedly stripped gardens and shrubs. "The average gardener will just give up," noted one PLNA member. Nursery owners deal with gardeners every day and say the deer crisis is rapidly becoming more urgent. In a survey, 80% of PLNA members said their deer problems had grown more severe over the past three years.

Pennsylvania now leads the country in the number of new Lyme disease cases.

Unfortunately, the potential consequences of overabundant deer in residential communities reach far beyond frustrated gardeners. The incidence of Lyme disease is increasing rapidly in Pennsylvania, surging from two known cases in 1982 to more than 5,700 in 2003. Since 1994, Pennsylvania physicians have reported more than 28,000 cases of Lyme disease, and Pennsylvania now leads the country in the number of new Lyme disease cases.



PFIZER CENTRAL RESEARCH

A black-legged tick (deer tick) injects the spirochete that causes Lyme disease as it engorges with the blood of a human host.

CHRISTOPHER MILLETTE (COURTESY OF HARRISBURG *PATRIOT-NEWS*)

Pennsylvania motorists kill more deer by accident on our roads (80,000 to 100,000 annually) than are killed intentionally by hunters in many states.

Named for the town of Lyme, Connecticut, where the illness was first described in 1977, Lyme disease results from a bacterial infection spread by the bite of the black-legged tick. White-tailed deer are the principal host for the adult form of this tick, and high tick densities occur only where deer densities are high. Lyme disease is seldom fatal but causes painful and debilitating symptoms, including chronic arthritis and neural damage if left untreated. More than 80% of all U. S. cases are reported from Pennsylvania, Maryland, Connecticut, New York, Rhode Island, Delaware, New Jersey, Massachusetts and Wisconsin. All these states contain areas of high deer density in developing regions with large and growing human populations.

"Hardly anybody goes into the woods anymore. People just stay inside. They avoid the woods to avoid the ticks."

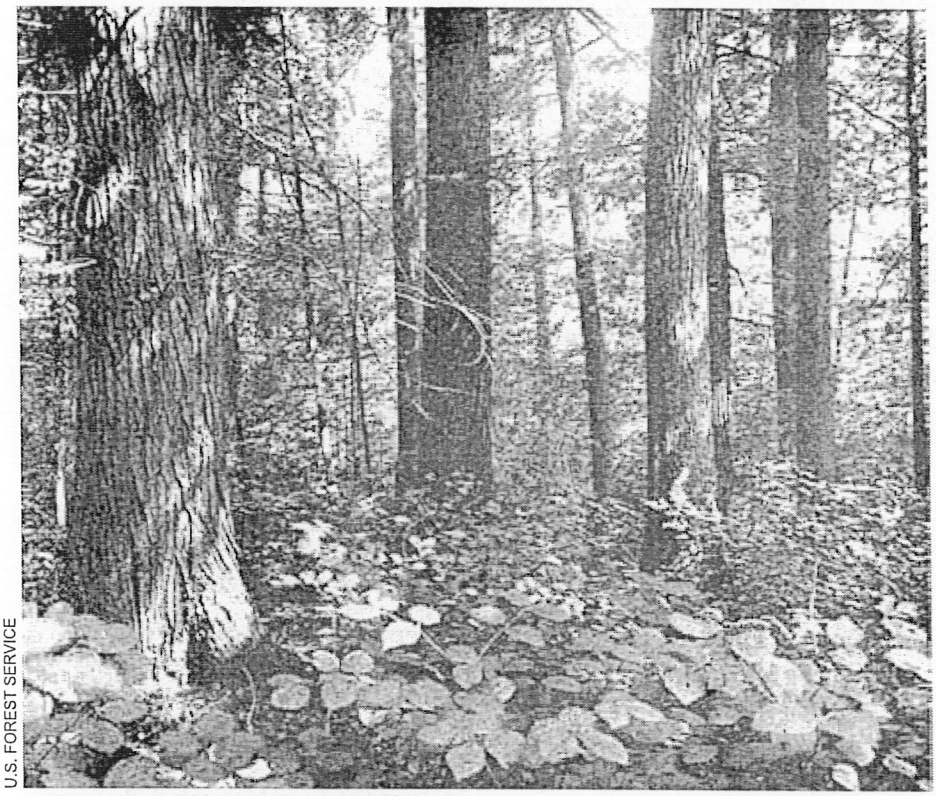
Currently most Pennsylvania cases occur in the southeastern counties, which exhibit some of the highest deer densities in the state. At a recent public forum on deer overabundance, Bucks County resident Debbie Plotnick said, "Seventy percent of the families in our community have been affected by Lyme disease, some more than once. Ours is a homestead community where diverse individuals live cooperatively with a shared intent to enjoy and interact with the outdoor environment. But this disease has changed the whole tenor of our community. Hardly anybody goes into the woods anymore. People just stay inside. They avoid the woods to avoid the ticks."

Health departments and the medical community have issued preventive steps homeowners can take to reduce the risk of Lyme disease. But the recommendations often conflict with

In many Pennsylvania communities, the simple healthful pleasures of gardening, children's outdoor play, and even casual walking represent risks people are no longer willing to take.

the values that originally drew homeowners to small towns and suburban communities. To reduce encounters with ticks, homeowners are warned to keep their children away from woodlands, and discouraged from allowing them to play in leaves and grass. Residents are advised to move swings and play equipment away from trees and brush, to locate firewood and bird feeders away from the house, trim branches, widen paths, apply pesticides, and to keep areas used by the family away from Pennsylvania's natural landscape — the forest. But like Debbie Plotnick in Bucks County, many homeowners enjoy the wooded parts of their property, and value the outdoor exercise and satisfaction derived from gardening and landscaping. Removing such natural features diminishes their enjoyment of their own outdoor environment, creating barriers that isolate people from nature and maroons them indoors or confines them to parking lots, driveways and streets. In many Pennsylvania communities, the simple healthful pleasures of gardening, children's outdoor play, and even casual walking represent risks people are no longer willing to take. Fear of Lyme disease would no longer dominate the lives of people who enjoy the outdoors if deer numbers could be kept below thresholds that promote the spread of disease-carrying ticks.

Long thought of as a creature of the backwoods, the adaptable white-tailed deer is now a familiar, abundant and not always welcome resident of small towns, cities and suburban communities across the state. Hunting is the traditional means of managing deer, but it is not always effective or appropriate in residential communities. Managing deer in community settings requires a range of strategies and the cooperation of residents and state and local government. It is possible to balance deer numbers with the health, safety and objectives of



U.S. FOREST SERVICE

ANN FOWLER RHOADS

ROGER EARL LATHAM

Hobblebush (*above*) and many other native shrubs once provided food and cover for birds and other wildlife living in the forest understory. Hearts Content, an old-growth stand of northern hardwoods in the Allegheny National Forest, had a typical rich understory of hobblebush and other native plants as recently as the 1940s (*above left*). Decades of chronic overbrowsing have since turned this and many other forest understories in Pennsylvania into a carpet of hay-scented and New York ferns (*left*) with no shrub layer and a complete failure of tree regeneration.

communities if a full range of deer management options are made available.

Deer impacts on our forests

The damage caused by abundant deer over longer periods of time can be clearly seen in Pennsylvania's forests. Throughout much of the twentieth century, large areas of Pennsylvania woodland harbored as many as 80 deer per square mile, exceeding by 10 times our best scientific estimates of deer densities in North America before the arrival of the first European explorers. Today, many parts of Pennsylvania still have deer populations of 50 or more per square mile.

At such high numbers, deer can gradually destroy the forest, reducing the diversity of plants and wildlife and threatening its future. Scientific research published in respected journals documents that the destruction is well underway in Pennsylvania's woodlands. Dr. Gary Alt, former supervisor of the Game Commission's Deer Management Section, described the situation involving deer and forests this way: "If the deer population is not controlled, we will lose the composition of forests; we'll lose the ability to grow wildlife, and we'll grossly change the commonwealth and be poorer because of it."

Today, thousands of square miles of Pennsylvania forests have mature oak trees but no young oak seedlings.

It is possible to balance deer numbers with the health, safety and objectives of communities if a full range of deer management options are made available.

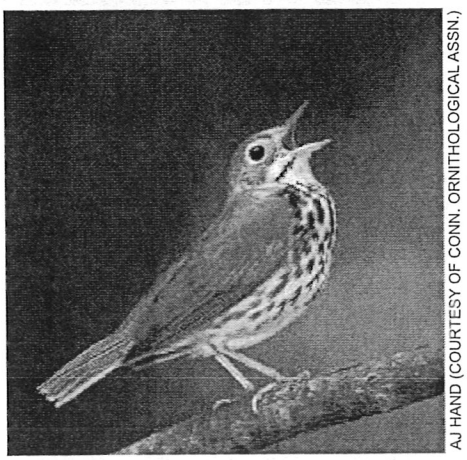
The most immediate impact of high deer numbers is the over-browsing of ecologically and economically important tree seedlings, such as Pennsylvania's 17 native species of oak. Oaks are the ecological cornerstone of our forests. Many species of wildlife, including deer, bears, turkeys, grouse, squirrels, wood ducks, mice, woodrats and numerous birds depend on the acorns that fall from oak trees each autumn. In turn, the predators of these animals — for instance, fishers, foxes, bobcats, hawks, owls and human hunters — reap the acorns' benefits indirectly. Acorns are a vital source of calories and other nutrients for woodland wildlife. But oak forests, like human civilizations, must produce younger generations to replace the old. Today, thousands of square miles of Pennsylvania forests have mature oak trees but no young oak seedlings. As the mature oaks die off in future years, there will be no young seedlings to take their place. Scientists refer to this condition as failed regeneration. Unless oak regeneration can be restored and protected, Pennsylvania forests will lose these vital trees that support so much of our wildlife heritage and our rural economy.

In many of our forests, plants that deer avoid because of their undesirable taste, texture or other characteristics are replacing oaks and other desirable species. Eventually the less-preferred species avoided by deer, such as hay-scented and New York ferns, striped maple, black birch and American beech, become dominant, and impede the germination and growth of other species, even if deer densities are reduced.

The destruction of the understory by deer is having a serious impact on forest wildlife.

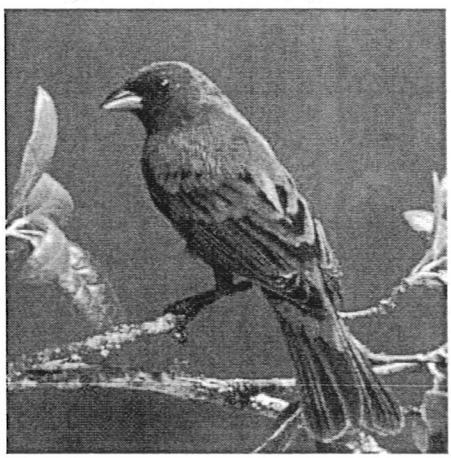
These species are rapidly increasing their abundance in Pennsylvania, while many desirable species that were historically present are in decline.

Overabundant deer have not only changed the makeup of tree species within our forests, they have altered



AJ HAND (COURTESY OF CONN. ORNITHOLOGICAL ASSN.)

J. HEIDECKER (COURTESY OF VIREO)



R. & N. BOWERS (COURTESY OF VIREO)

Overbrowsing in Pennsylvania's forests is a serious threat to native bird species that nest, feed or take cover in the forest understory, including (*from left*) ovenbird, eastern wood-pewee and indigo bunting.

the physical structure of forests as well, with documented impacts on other wildlife. Healthy hardwood forests have four major structural "layers." The canopy is the highest level, formed by the interlocking network of crowns of mature trees. Below the canopy is the subcanopy, smaller trees that will eventually take the place of taller ones in the canopy. Under the subcanopy are tree saplings and low-growing, shade-tolerant species such as dogwood, mountain-laurel, viburnum, hazel and rhododendron, which form the shrub layer. And growing at or near ground-level is the herbaceous layer, consisting of familiar grasses, wildflowers, ferns, tree seedlings, mosses and fungi. Scientists refer to the subcanopy, shrub and herbaceous layers collectively as the "understory."

Deer have completely removed the shrub layer and tree seedlings in huge expanses of Pennsylvania forests, and most forests today exhibit an unmistakable "browse line" about five feet above the ground, which is the height to which adult deer can easily browse. In forests across northern Pennsylvania, where deer numbers were extremely high for many decades, it is possible to see through the woods for hundreds of yards in any direction. Such a view would not be possible if a healthy understory were intact.

Hobblebush provides an example of the devastation that high deer populations have visited on Pennsylvania forests. Hobblebush is a flowering shrub that was once abundant across the northern half of the state and southward at higher elevations in the Allegheny Mountains. It was especially plentiful on the Allegheny Plateau in northwestern Pennsylvania, a region that has long held high numbers of deer. In 1929 researchers surveyed parts of the Allegheny National Forest and recorded hobblebush on 50% of sampled plots. A later survey of the same forests in 1995 failed to find hobblebush on any of the plots, and researchers found a 59 to 80% loss of shrubs and herbaceous plant species compared to the 1929 data. American yew, fly-honeysuckle, pinxter-flower and mountain maple are other native shrubs that have all but disappeared from many

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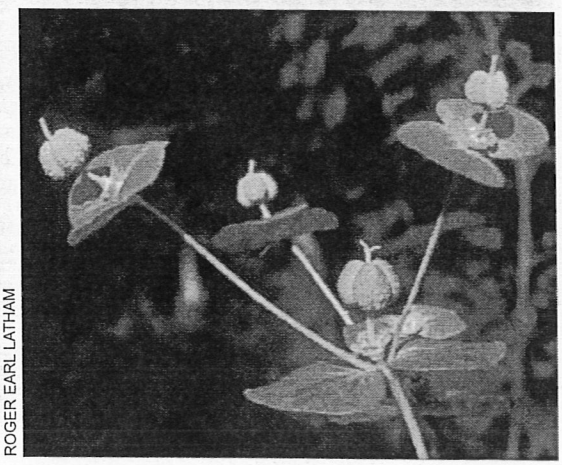
Scientific research published in respected journals documents that the destruction is well underway in Pennsylvania's woodlands.

Many of Pennsylvania's most popular wildflowers are also preferred deer foods and have disappeared entirely from large parts of the state.

VIRGINIA KLINE (COURTESY OF UNIV. OF WISCONSIN)

ROGER EARL LATHAM

ALLEN CHARTIER



ROGER EARL LATHAM

Species that are endangered or threatened in Pennsylvania partly due to deer overbrowsing include showy lady's-slipper (*top*), golden puccoon (*left*), yellow-fringed orchid (*center*) and glade spurge (*right*).

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areas of the state where deer numbers have been high for a long time.

The 1995 study found that hay-scented and New York ferns, which deer avoid, had increased in abundance on the survey plots from 3 to 21%. These ferns grow in a dense network, blocking out wildflowers, shrub and tree seedlings, and other plants that once graced the colorful and diverse web of life on the forest floor.

The destruction of the understory is having a serious impact on forest wildlife. More than 40 species of Pennsylvania birds nest within the shrub layer or on the ground, sheltered by low-growing plants. Careful experiments have shown that the abundance of many of these bird species drops as deer populations increase.

Abundant deer even affect woodland amphibians, insects and other life that depends on a moist environment. As deer strip away the understory, increased sunlight and wind movement dry out the leaf litter and soil, rendering the forest less hospitable to salamanders, frogs, snails and soil insects that need damp conditions to survive.

Deer have completely removed the shrub layer and tree seedlings in huge expanses of forest, which exhibit an unmistakable "browse line" at the height that adult deer can reach.

Many insects have highly restricted diets, depending on particular understory plant species for survival. Insects, in turn, are essential items in the diets of many birds, small mammals and other wildlife. When abundant deer destroy insects' host plants, the effects ripple throughout the food web, cutting the food base for many wildlife species.

Besides their ecological and economic benefits, forests provide many Pennsylvania residents with the pleasure of viewing wildflowers. But many of our most popular wildflowers are also preferred deer foods and have disappeared entirely from large parts of the state. Well-known wildflowers that deer graze heavily include large white trillium, Canada mayflower, turtlehead, and numerous wild lilies and orchids. Defoliation and the loss of their flowers to deer browsing can kill these plants outright or cause reproductive failure. Some rare plants such as showy lady's-

GARY ALT

The differences in species diversity, tree regeneration and wildlife habitat quality are dramatic between the outside and inside of deer exclosure fences all across the state. High deer populations are not the only problem facing Pennsylvania's forests, but experimental exclosures make it clear that overbrowsing has a devastating impact.

slipper and yellow fringed-orchid are especially threatened by deer because they now exist only in small, scattered locations, and their showy flowers attract deer in the same way they draw the attention of human admirers.

Though many factors, including plant diseases, insect outbreaks and acid precipitation can affect forest health, deer have been proven to be the overwhelming influence in numerous experiments using deer "exclosures." Experimental exclosures are fences erected around plots of forest to keep deer out. Scientists study the vegetation inside and outside the fence to determine its response in the absence of deer.

When allowed to become too abundant for too long, white-tailed deer can transform vibrant, productive and self-sustaining forests into degraded environments.

Since insects, disease and acid rain have the same impact on both sides of the fence, the influence of deer can be studied in isolation. Wherever exclosures are erected in Pennsylvania, they show remarkable recovery in the growth and diversity of plant species inside compared with outside the fence.

It is increasingly clear that deer, though valued and important, can be a destructive influence in the forests that support them. When allowed to become too abundant for too long, deer can transform vibrant, productive and self-sustaining forests into degraded environments that support only a fraction of their former diversity. Unfortunately, this is the condition today of much of Pennsylvania's forestland, including the Department of Conservation and Natural Resources' 2.1 million acres of State Forest, which even though certified by the Forest Stewardship Council as "well managed" remain seriously degraded by deer. The FSC report itself acknowledges that overbrowsing by deer has decimated the diversity and sustainability of State Forests' flora and fauna. These forests can recover their vitality. But that recovery depends upon a commitment to managing our forests as total ecosystems, not as deer habitat alone. In simplest terms, that means managing for fewer deer for the foreseeable future. ■

What you can do

The Pennsylvania Game Commission (PGC) is responsible for deer management throughout the Commonwealth. The Commission is staffed, funded and administered almost exclusively by hunters, 94% of which hunt deer. Vocal and powerful hunting organizations have long used their influence to demand that the Commission keep deer populations high to facilitate recreational hunting. Meanwhile, the agency devotes less than 5% of its budget to the conservation of endangered species and wildlife not pursued by hunters (non-game) and it has failed to develop an effective urban deer program. Dependent upon the sale of hunting licenses for its funding, the PGC has never been able to complement its traditional role of supporting and facilitating sport hunting with a true, comprehensive wildlife conservation program that strives to maintain balanced wildlife populations within healthy ecosystems.

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It is particularly difficult for the PGC to effectively address deer challenges in residential communities, since recreational hunting is often not a workable option near homes and businesses.

To successfully address the complexities of wildlife management in modern Pennsylvania, the state will need to broaden the representation on the eight-member Game Commission board to include not just hunting interests, but the views and needs of other stakeholders such as farmers, forest landowners, residential communities and environmental organizations. And Pennsylvania urgently needs new public funding sources for wildlife conservation and management that do not rely solely on hunting license sales. To make this happen the Governor, General Assembly, PGC and citizen stakeholders will need to work together.

You can encourage positive change by writing to Governor Rendell, your state Senator and Representative, and the PGC (see contact information on next page). In your letters, tell your story about how overabundant deer affect your quality of life and ask for a fresh approach to deer management that protects Pennsylvania's forests, receives the broad-based funding it deserves, and involves all the diverse stakeholders affected by deer. ■

Write to Governor Rendell:

Governor Edward G. Rendell's Office
225 Main Capitol Building
Harrisburg, PA 17120

Or telephone: (717) 787-2500

Write to your state Senator and Representative:

To contact your state Senator and Representative on-line, go to **www.state.pa.us** and click on *Contacting Your Legislator*.

Write to the Pennsylvania Game Commission:

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

Or telephone: (717) 787-4250
On-line: **www.pgc.state.pa.us**

The Ecosystem Management Project

The Ecosystem Management Project, in care of the Community Foundation for the Alleghenies, is an education initiative created to increase public awareness regarding the values of managing white-tailed deer from an ecosystem/habitat-based perspective and to supply the public with information about this issue. It is our goal to assist state agencies, landowners, hunters and communities towards that end and to publicize opportunities to be involved. We welcome your input and involvement.

For additional copies of this publication, contact:

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