William & Mary Environmental Review

In the past ten years, white-tailed deer populations have exploded, resulting in surprisingly devastating effects on the environment. Entire forests are disappearing as unchecked deer herds literally eat the forests to the ground. Songbird species are all but disappearing from certain areas as deer destroy their habitats. As a relatively new environmental threat, the growing white-tailed deer issue remained out of the spotlight and beyond the realm of legislative concern. However, the problem recently caught the eye of several large organizations in a major way. In a 2013 article, the Nature Conservancy declared deer a greater threat to eastern forests than global climate change. The sobering reality is that unchecked white-tailed deer populations have the capacity to drive numerous plant and animal species to extinction. Without prompt legislative action, the deer overpopulation problem is likely to change the state of eastern forests forever. With hardy reproductive abilities and few natural predators, the white-tailed deer overpopulation problem shows no signs of slowing on its own. Hunting is one of the only ways to actively control the fast growing deer populations in many eastern states.

Direct Ecological Effects

As white-tailed deer populations rise, their negative ecological effects become more pronounced. Areas in the northeastern United States are currently experiencing a phenomenon known as ghost forests. A white-tailed deers diet consists of forest understory plants that grow from the ground level to six feet. While forests can typically regenerate this understory growth fast enough to sustain normal deer densities, most eastern forests cannot regenerate fast enough for the current over- saturated deer densities. The resulting ghost forests, those that have been stripped bare of ground coverings, provide inadequate habitat for many species of birds and other woodland creatures. Without the thick understory they require, these animals are forced to relocate or die. The increased deer density also has a negative ecological effect on carbon sequestration. With many plant species killed off by over-feeding, areas of high deer populations are experiencing poorer air qualities.

High deer populations also affect the forests ability to regenerate. High foot traffic caused by large deer populations negatively affect seedling recruitment, which is a critical component of forest regeneration and community structure. The inability of the forest plants to regenerate causes a deadly domino effect for other forest-dwelling species. As their habitat disappears, many species are left without the proper environment necessary for feeding or reproduction.

By bringing deer herd populations back to manageable numbers, previously damaged forest ecosystems will be able to return to a healthy state. As previously damaged forest ecosystems return to healthy states, other species affected by the forest ecosystem decline would also be given the chance to return to their natural state of health.
Many species of woodland birds are suffering from the white-tailed deer overpopulation problem, with some species facing possible extinction. Over the past forty years, when deer populations showed the most growth, songbird populations steadily declined in eastern states. A recent study examining the relationship between white-tailed deer and songbird species showed a direct correlation between white-tailed deer overpopulation and songbird species decline. In seven different eastern localities, the deer overpopulation affected songbird species, of which (89%) could be identified a priori as potentially deer-sensitive (i.e., they depend on the understory for feeding and nesting). Experts believe the ghost forest effect is causing the decline in bird populations as the birds natural habitat is stripped away.

Dr. Martha Case, a professor of biology at the College of William and Mary, says that the white-tailed deer overpopulation problem in eastern states is especially concerning because much of the resulting damage is irreversible. Dr. Case first began studying the ecological effects of the deer overpopulation problem about ten years ago after the numbers of wild orchids in her forest research population began to rapidly decline. Many eastern forests are temperate forests, which is characterized by a shrub layer of herbaceous vegetation lining the forest floor. In temperate forests, there are many tight associations between plants and animals, which creates a symbiotic ecological relationship. Species are interdependent and rely on a delicate ecological balance to sustain existence. Deer are part of this balance when in average population sizes, but when the deer population becomes far too large, as it is currently, this balance begins to collapse. For example, as perennial and annual plant species are destroyed by deer, certain species of moths and butterflies that lay their eggs on the leaves of these plants lose their reproductive environment. As there ceases to be moth and butterfly larvae, the birds that rely on this food source begin to decline. The plants whose seeds are spread by these birds fail to regenerate. In order to restore the balance of eastern forests and prevent further ecological decline, the deer overpopulation problem the source of this domino effect must be addressed. Dr. Case believes that the deer overpopulation problem must be addressed as soon as possible to avoid losing more forest ecology forever. Dr. Case is a strong supporter of hunting as a method of deer population control.

Disease

Lyme disease is a major concern associated with the white-tailed deer overpopulation. Overpopulation in a given area coupled with the presence of a disease can give rise to the possibility of an epidemic. Because deer can cover large amounts of ground and are herd-bound animals, the potential for rapid spread of disease is even more pronounced. The spread of Lyme disease is particularly concerning, as this illness affects the human population as well. Lyme disease is an infection caused by Borrelia burgdorferi, a type of bacterium carried by deer ticks. Lyme disease can cause serious health problems in humans, such as paralysis, arthritis, cardiac abnormalities, and damage to the central nervous system, sometimes leading to mental impairment. The disease is transmitted from deer to deer and from deer to human through infected deer ticks (Ixodes scapularis, also known as black legged ticks). Deer are used as reproductive hosts for parasitic arthropods, such as ticks, which require a blood meal in order to reproduce. Because of this reproductive relationship, higher density deer populations often lead to higher tick populations and, in turn, greater prevalence and faster spread of Lyme disease..

“Ticks spread more different kinds of infectious microbes to people and animals than any other arthropod group,” said NIAID Director Anthony S. Fauci, M.D. “The spiral-shaped bacterium that causes Lyme disease is perhaps the best known microbe transmitted by ticks; however, ticks also transmit infectious agents that cause human babesiosis, anaplasmosis, tick-borne encephalitis and other diseases.