

Wildlife Populations: White-tailed Deer

Background

New Jersey's white-tailed deer (*Odocoileus virginianus*) herd is a major component of the landscape throughout all but the most urbanized areas of the state. "White-tailed" refers to the white underside of the tail, which is held conspicuously erect like a flag when the animal is alarmed or running. The adult white-tailed deer has a bright, reddish-brown summer coat and a duller, grayish-brown winter coat. White fur is located in a band behind the nose, in circles around the eyes, inside the ears, over the chin and throat, on the upper insides of the legs and beneath the tail. The young, called fawns, have reddish coats with white spots.¹ Deer affect our forests, farms, gardens, back yards, health and roadways. In the early 1900s, there was only a handful of deer in the state, but the population rebounded during the 20th century.

Deer are photographed, watched, and hunted by many New Jersey residents and visitors. In New Jersey, hunters spend more than 100 million dollars each year², which benefits a wide variety of New Jersey businesses.

Deer also have negative impacts on humans, including car collisions, depredation of agricultural and ornamental plantings, and the potential for harboring diseases that are transmissible to man or domestic animals. Deer are selective browsers, and, over time, herds can eat some plants out of existence and reduce the populations of other plants. Because tree seedlings are especially vulnerable to hungry deer, the future species composition of forests can be determined by deer browsing. While trees eventually grow out of a deer's reach, many other plants never do. Because deer browsing can significantly change habitat composition, it also exerts a strong influence on other animal populations.

The size of the deer herd is managed through controlled sport hunting. The goal is to maintain healthy deer populations at a density tolerable to New Jersey residents and to maximize the recreational and economic benefits derived from this renewable natural resource.

Deer are managed in New Jersey according to deer management zones, which are areas with similar land-use, ecological and deer-herd characteristics. The zone boundaries include highways, rivers and other easily identifiable landmarks.

Trends

Figure 1 shows the deer population estimates for 1984-2013.³ Although the trend appears to be decreasing, there are at least two factors which make it difficult to accurately determine statewide populations. First, changes in hunting regulations

over the years introduce variability into the population estimates since the basic data is derived from hunter-harvested deer whose hunting behavior is affected by the regulations. Second, estimates for populations in non-hunting areas are not available, and this lack of information makes the population estimates conservative.⁴ Deer populations vary geographically in the state. If deer were evenly distributed throughout the state, the 2013 population would average about 14 deer per square mile. However, urban areas typically have relatively few deer, and some suburban and rural areas with good deer habitat have more. For example, before recent culling efforts, Princeton Township had an estimated deer population of 114 per square mile and nearby Hopewell Township estimated its deer population in 2010, prior to hunting season, as 54 per square mile.⁵

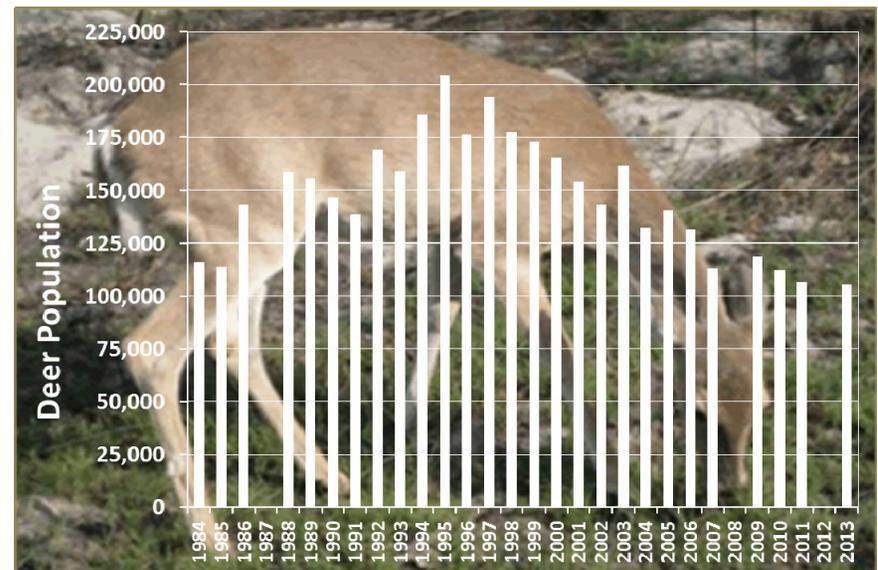


Photo credits: NJDEP, Division of Fish and Wildlife

Figure 1: New Jersey estimated deer population. Estimates are made prior to hunting seasons. Estimates are not available for 1987, 2008, or 2012.

Outlook & Implications

Deer populations have reached problematic numbers in numerous areas of the state. In an effort to help reduce these populations, the NJDEP Division of Fish and Wildlife (Division) has lengthened hunting seasons, increased limits on the number of deer that can be harvested, increased the number of hunting permits issued, and



Photo credits: NJDEP, Division of Fish and Wildlife

offered incentives for hunters to harvest more does and fawns. However, in some areas, factors such as development patterns, establishment of parks where hunting is prohibited, regulations that severely restrict or preclude hunting, and landowner decisions not to allow hunting have reduced the effectiveness of hunting. Although New Jersey has some of the most liberal deer hunting regulations in the nation, lack of or restricted hunter

access results in undesirable deer densities in many areas of the state. In areas where sport hunting is not considered to be a practical management tool, the Division has permitted alternative methods of controlling deer populations under the Community-Based Deer Management Permit program.⁶ These alternative methods include controlled hunting, shooting by authorized agents, capture and euthanization, capture and removal, and fertility control.

Deer are an “ecosystem engineer” species that, in conjunction with other species, appears capable of affecting the ecosystem at many levels and of degrading deciduous forests in New Jersey.⁷ Studies in Pennsylvania involving enclosed areas have revealed a loss in animal and plant diversity as deer populations exceeded 10 per square mile. The depletion increased in a nearly linear fashion as deer density increased.^{8,9,10,11} Based on these studies, in a situation where maximum biodiversity is the goal, a population above 10 per square mile would be undesirable. A major concern that is related to biodiversity is forest regeneration. It is clear that browsing of deer does inhibit the growth of some species of trees. However, it should be noted that because many other factors affect forest regeneration, no blanket assumptions should be made about what is a desirable density of deer. Deer density as it relates to ecosystem health is site dependent. A 2004 study by DEP biologists found greater diversity of plant species, but not a higher stem density, in areas of lower deer density than in areas of higher deer density, within a given physiogeographic region and in areas of comparable soil and habitat.¹² More recent research by DEP involving approximately 30 deer exclosures has found that plant stewardship indices and diversity indices are generally higher inside the deer exclosures than outside, but that those indices are not necessarily correlated with deer densities between sites.¹³ These studies are complicated by a variety of factors, including soil types, prior land use, slope, and canopy cover.

More Information

www.nj.gov/dep/fgw/deer.htm, NJDEP Division of Fish and Wildlife

www.nhptv.org/natureworks/whitetaileddeer.htm, a public television site

<http://njaes.rutgers.edu/pubs/fs1202/white-tailed-deer.asp>, NJ Agricultural Experiment Station

References

Much of the information in this report was provided by the NJDEP Division of Fish and Wildlife Web site at www.nj.gov/dep/fgw/deer.htm

¹www.desertusa.com/mag99/june/papr/wtdeer.html, 12/28/04.

²U.S. Fish and Wildlife Service and U.S. Census Bureau, 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation- New Jersey. Revised December 2013. Accessed online on 8/11/2015 at:

<https://www.census.gov/prod/2013pubs/fhw11-nj.pdf>

³NJDEP Division of Fish and Wildlife, 2011, Carole Stanko, NJDEP Division of Fish and Wildlife, personal communication, 11/7/14. Data not available for 1987, 2008 or 2012.

⁴Joseph Penkala, NJDEP Division of Fish and Wildlife, Bureau of Wildlife Management, personal communication.

⁵Hopewell Valley Deer Management Task Force, 2010, Hopewell Valley Deer Management Plan, submitted to Hopewell Township Committee, September, 2010, http://www.hopewelltpw.org/Final_Deer_Task_Force_Report_092710.pdf

⁶NJDEP Division of Fish and Wildlife, 2011, Community-Based Deer Management, <http://www.state.nj.us/dep/fgw/cbdmp.htm>

⁷Baiser, B., J. Lockwood, D. LaPuma, and M. Aronson, 2008, A perfect storm: two ecosystem engineers interact to degrade deciduous forests of New Jersey, *Biol Invasions*, 10, 785-795

⁸Katz, Larry, 2004, Rutgers University, personal communication.

⁹Tilghman, Nancy, 1989, Impacts of white-tailed deer on forest regeneration in Northwestern Pennsylvania, *Journal of Wildlife Management*, 53, 524-532.

¹⁰deCalesta, David, 1994, Effects of white-tailed deer on songbirds within managed forests in Pennsylvania, *Journal of Wildlife Management*, 58, 711

¹¹See <http://www.fs.fed.us/ne/global/litedb/catalogs/cat50.html>

¹²NJDEP, 2004, Unpublished study, personal communication, Susan Predl, NJDEP Division of Fish and Wildlife

¹³NJDEP, 2008, Unpublished study, personal communication, Susan Predl, NJDEP Division of Fish and Wildlife