

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
P.O. Box 130 Moseley, VA 23120
(804) 739-7739 (804) 739-7738 fax

SUBJECT: Lake Monticello Deer Census Survey

TO: Lake Monticello Owners' Association

DATE: December 9, 2005

The Virginia Wildlife Services program (WS) conducted 3 nighttime whitetail deer population surveys on November 28th, 29th, and December 7th, 2005. The purpose of this population survey project was to gain an initial understanding of deer population densities in the Lake Monticello development, and to identify areas of highest deer densities. WS sampled along a 26.3 mile survey route, which was selected to provide a proportional representation of all habitat types in Lake Monticello and to include all of the different sections within the development. The same survey route was used each night, although we randomized the survey by alternating the direction of travel on the route each night. We also began the 3 surveys at different times (21:30, 19:00, and 18:30) to take into consideration any variation in deer movement patterns during the night. The duration of each survey was approximately 8 hours.

A Forward Looking InfraRed imaging monitor (FLIR) was used to spot deer along the survey route. The FLIR detects deer and other animals using infrared technology which differentiates between bodyheat and ambient temperatures. We used a FLIR rather than a spotlight during this survey in order to minimize disturbance to residents and to maximize the number of deer detected. FLIR devices have been shown to be more effective than spotlights in detecting deer. Once deer were detected with the FLIR, we used a spotlight and a laser rangefinder to quantify distance from the deer to our survey route (i.e. the distance to the road).

Deer density was calculated using the average number of deer observed within an estimated area of visibility. The estimated area of visibility was calculated using the length of the survey route and the average perpendicular distance of deer to the survey route. This data was then extrapolated to provide an estimate of total deer density per square mile and a population estimate of deer in Lake Monticello.

We observed an average of 79 deer along our survey route over the 3 nights. Deer densities for the 3 surveys were estimated at 135 deer/sq. mile, 143 deer/sq. mile, and 113 deer/sq. mile. Therefore, the average estimated deer density in the Lake Monticello development was 130 deer/sq. mile (50 deer/sq. kilometer), or 1 deer per 4.92 acres. Assuming that the Lake Monticello development has a total land mass size of 3,150 acres, or 4.9 square miles, we estimated a total population of approximately 635 deer. Deer densities varied within the development, with some sections having much higher deer densities than other sections.

It is very important to keep in mind that this estimate is *only an index to what is going on in the population* and is not an absolute count of all deer on the property. This survey data does, however, provide a starting point from which to begin the decision making process. Research has shown that deer population surveys tend to **underestimate** the actual deer density or population size. The survey data is

most valuable as trend data and when compared to future survey results will provide an index to changes in the deer population over time, particularly if a deer herd reduction program is implemented.

High deer densities may pose a risk to human safety and property damage via deer-vehicle collisions. Although reliable deer-vehicle collision data is not available for Virginia, the Virginia Department of Game and Inland Fisheries (VDGIF) conservatively reported that there may be tens of thousands of deer-vehicle collisions in the state each year (VDGIF 1999). From 1985-1994, there were 12 reported fatalities in Virginia that were the result of deer-vehicle collisions (VDGIF 1999). The Deer Damage Committee established by the VDGIF estimated that approximately \$4.2 million in damage to property resulted from deer-vehicle collisions in Virginia each year from 1987-1991 (Westt998).

In addition to damage to vehicles, deer can also damage property such as landscaping and ornamental plantings. As development expands into previously rural areas, deer habitat may actually be enhanced because fertilized lawns, gardens, and landscape plants serve as high quality sources of food (Swihart et al. 1995). Furthermore, deer are prolific and adaptable, characteristics which allow them to exploit and prosper in most suitable habitat near urban areas, including residential areas (Jones and Witham 1995). Although damage to landscaping and ornamental plants has not been quantified, deer can cause severe and very costly property damage for homeowners and in parks and common areas.

Deer overabundance can affect native vegetation and natural ecosystems in addition to private property and ornamental plantings. Numerous studies have shown that overbrowsing by deer can decrease tree reproduction, understory vegetation cover, plant density, and plant diversity (Warren 1991). For example, in the Great Smokey Mountains National Park in Tennessee, an area heavily populated by deer had a reduction in the number of plant species, a loss of hardwood species and a predominance of conifer species compared to an ecologically similar control area with *fewer* deer (Bratton 1979). This alteration and degradation of habitat *from* overbrowsing by deer can have a detrimental effect on deer herd health and may displace other wildlife communities (e.g., neotropical migrant songbirds and small mammals) that depend upon the understory vegetative habitat destroyed by deer browsing (VDGIF 1999). For example, deer browsing may affect vegetation that songbirds need *for* foraging surfaces, escape cover, and nesting (DeCalesta 1997). DeCalesta (1994) found that the species richness and abundance of intermediate canopy nesting songbirds was reduced in areas with higher deer densities. Casey and Hein (1983) found that 3 species of birds were lost in a research preserve stocked with high densities of ungulates and that the densities of several other species of birds were lower than in an adjacent area with lower deer density. The deer density in Lake Monticello was estimated at 130 deer/sq. mile *or* 50 deer/sq. kilometer. Deer densities of 10 deer/sq. kilometer and greater have been found to hinder the regeneration and maintenance of oak *forest* habitats (Healy 1997). Additionally, research has shown that deer densities above 7.9 deer/sq. kilometer may have significant negative effects *on* bird populations which rely *on* the habitat understory (DeCalesta 1994).

Please let us know if you have any further questions about the deer population survey results or a deer population reduction program.

Sincerely,

Jennifer Cromwell, Assistant State Director
Mark Robb, Wildlife Specialist
USDA, APHIS, Wildlife Services

Literature Cited

- Bratton, S.P. 1979. Impacts of white-tailed deer on the vegetation of Cades Cove, Great Smokey Mountains National Park. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies. 33: 305-312.
- Casey, D., and D. Hein. 1983. Effects of heavy browsing on a bird community in deciduous forest. *J. Wildl. Manage.* 47: 829-837.
- DeCalesta, D. 1997. Deer and ecosystem management. Pages 267-279 in W.J. McShea, H.B. Underwood, and J.H. Rappole, eds. *The science of overabundance: Deer ecology and population management.* Smithsonian Institution Press, Washington. 402 pp.
- DeCalesta, D. 1994. Effect of white-tailed deer on songbirds within managed forests in Pennsylvania. *J. Wildl. Manage.* 58(4):711-718.
- Healy, W. M. 1997. Influence of deer on the structure and composition of oak forests in central Massachusetts, Pages 249-266 in W.J. McShea, H.B. Underwood, and J.H. Rappole, eds. *The science of overabundance: Deer ecology and population management.* Smithsonian Institution Press, Washington. 402 pp.
- Jones, J.M., and J.H. Witham. 1995. Urban deer "problem"-solving in northeast Illinois: An overview. Pages 58- 65 in J.B. McAninch, ed., *Urban deer - A manageable resource?* Proc. 1993 Symp. North Central Section, The Wildlife Society. 175 pp.
- Swihart, R.K., P.M. Picone, A.J. DeNicola, and L. Comicelli. 1995. Ecology of urban and suburban white-tailed deer. Pages 35-44 in J.B. McAninch, ed., *Urban deer - A manageable resource?* Proc. 1993 Symp. North Central Section, The Wildlife Society. 175 pp.
- Warren, R.I. 1991. Ecological justification for controlling deer parks. *Trans. 56th N.A. Wildl. & Nat. Res. Conf.*: 56-66.
- West, B.C. 1998. Deer damage in Virginia: Implications for management. M.S. Thesis. Virginia Polytechnic Institute and State University, Blacksburg. 199 pp.
- VDGIF. 1999. Virginia deer management plan. VDGIF, Wildlife Division, Wildlife Information Publication No. 99-1. Richmond, VA. 68pp,