



Suburban White-Tailed Deer Management Using Sharpshooting

The Municipality of Princeton, New Jersey

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Submitted by

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Introduction

White-tailed deer (*Odocoileus virginianus*) overabundance and associated conflicts are pervasive throughout the eastern U.S. Alternative management techniques (i.e., controlled hunting, sharpshooting, trap and relocation/euthanasia, fertility control research) have been explored from Georgia to Texas, Minnesota to Maine, and nearly all the states contained therein. Throughout this large geographic region, deer are creating social, public safety, and ecological conflicts in suburban, corporate, and park environments. Many federal, state, and local agencies are struggling to address this ever-increasing problem. Most communities that are confronted with deer overabundance issues pursue a single dimensional approach to solve the problem. However, significant variations in landscape, deer populations, and negative impacts lend themselves to different solutions. We suggest that it is often optimal to use more than one mitigation technique and tailor the deer management plan to the spectrum of potential scenarios present in each unique community.

In areas where hunting has not reduced the local deer population to acceptable levels, and an immediate population decline is preferred, sharpshooting methods are often chosen. Sharpshooting has been proven to be effective at rapidly reducing local deer populations and maintaining the lower densities long-term, resulting in a reduction of deer-vehicle accidents (DeNicola and Williams 2008) and an increase in tree regeneration (Abella et al. 2021). Sharpshooting (i.e., use of trained professionals using culling techniques outside of permitted recreational hunting methods) can reduce local deer populations lower than what has been achieved historically using recreational hunters. Professional sharpshooting programs have been implemented throughout the U.S. over the past three decades without a public safety incident. However, the effectiveness of sharpshooting can be hampered by restrictions on discharge distances from occupied dwellings, limiting access to local deer populations. In these situations, trap and euthanasia or fertility control techniques have been used.

The Municipality of Princeton (hereafter Princeton) contains a matrix of suburban/commercial development, agricultural fields, parks and open grasslands. As a result of limited legal hunting opportunities and good deer habitat, the deer population had increased to a level incompatible with some land uses and human activities. Although deer physical condition was not a primary issue, there was concern regarding numerous DVCs and damage to garden and landscape plantings. In response, deer population reduction efforts via sharpshooting and managed archery hunting were implemented to augment recreational hunting in 2001–2010 and 2012–2025 under the New Jersey Division of Fish and Wildlife (NJDFW) community-based deer management program, and these efforts continue.



Management Area

Princeton is in central New Jersey and contains approximately 18.4 miles². The municipality represents one of the most challenging situations for deer managers. The community is densely developed in many areas, but still provides excellent deer habitat (as of 2022 census data, there were 30,377 people, 9,120 households). Within these development patterns the 450' firearm discharge restriction limits the amount of access and effectiveness of lethal options. There are no non-human predators present that can limit a deer population in Princeton.

Sharpshooting efforts will be applied across Princeton where habitat and permission dictate. We depict historical sharpshooting access locations within the polygons in Figure 1. For security reasons, we generalize these locations as shown rather than depict actual sharpshooting locations. We also note that we do not currently have access to all the locations depicted, and that additional locations may be added for future sharpshooting efforts. Every effort will be made to maximize the number of quality sharpshooting locations available in order to meet deer management objectives.

Management Objectives

The use of sharpshooting in deer management, as a supplement to hunting, focuses on limiting the number of DVC's, damage to forest health and landscape plantings, and maintaining a minimal number of homeowner complaints associated with deer.

Field Methods

Site Visit, Planning, and Permitting

We will partner with Princeton staff to coordinate public and private property access. Private property access throughout the community will be invaluable to the success of this program. It also would be beneficial to have access to all suitable public properties. We will facilitate obtaining all necessary permits from the NJDFW.

Pre-baiting and Site Selection

Deer will be drawn to select areas using bait for sharpshooting efforts. Access is preferably on private property to limit impacts on public land users and minimize disturbances by the public during field operations. Baiting should commence 3 weeks in advance of field operation efforts.



All baiting should be conducted daily at a consistent time in the late afternoon or evening. This acts as positive conditioning for the deer; they recognize a person as baiting and associate it with the appearance of food.

Deer Population Estimate

The most recent deer population estimate for Princeton was conducted in December 2023. The survey, which covered approximately 15.5 square miles, estimated a density of 42.6 deer/mi². We propose updating the population estimate to substantiate that targeted harvest numbers are on track to maintain the deer population at targeted levels (~30 deer/mile²). Budgets for both distance sampling and unmanned aerial vehicle systems (uAVS) surveys are attached for consideration.

Target harvest numbers for the 2024–2025 season, inclusive of all causes of mortality, were aligned with the management goals and likely resulted in a residual population of approximately 30–35 deer/mi² before fawning and recruitment. Assuming historical recruitment rates (~1.3 fawns per doe), and factoring in immigration, natural mortality, and hunter harvest, approximately 125 deer will likely need to be removed in 2025/2026 through sharpshooting to maintain the population target.

Deer-vehicle collisions (DVCs), a strong indicator of local deer density, have declined over the past three years. From July 1 to June 30, recorded roadway mortalities were:

- 2022–2023: 60
- 2023–2024: 77
- 2024–2025: 56

While not a perfect measure, DVC trends suggest a stabilized local deer population. However, the resilience of the Princeton deer herd should not be underestimated. Therefore, we recommend maintaining the sharpshooting target at 125 deer for the 2025–2026 season. This harvest number can be adjusted if updated population estimates indicate an unexpected deer density.

Sharpshooting

We intend to use suppressed .223 caliber bolt-action rifles for sharpshooting applications. All rifles are match-grade and specially designed for sharpshooting deer. We will shoot from elevated positions to ensure a steep angle of trajectory. All deer will be shot in the center of the brain (~95%) or the cervical spine (~5%). Cervical spine shots are taken only



when there is an obstruction between the shooter and the deer's brain, or if CWD testing is required by some municipalities.

We have all the necessary equipment with years of hands-on use including several U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) registered, suppressed, match-grade firearms (using highly frangible, projectiles), all necessary vehicles (including ATVs), and accessories (e.g., night-vision/thermal optics, spotlights, rangefinders, mobile shooting platforms, etc.).

Subsequent to a decision by Princeton to implement a lethal deer reduction program using WBI the following procedures are used:

- 1) Prior to initiating any field activities the target area/s and surrounding properties are thoroughly surveyed using digital aerial images followed by field confirmation. By knowing the location of every occupied structure and areas of human use we are better able to work safely, discreetly, and efficiently;
- 2) Bait sites are selected with the involvement of Princeton. Each site is selected based on safety concerns, discretion, and deer activity;
- 3) We try to prioritize field operations during hours of lowest human activity when possible. In addition, during the removal operation we search intensively for people and non-target animals to avoid mishaps;
- 4) Deer of all ages and sexes are harvested, however, adult females are prioritized. Deer are shot over bait from an elevated position with a rifle during the day or at night. Night-vision equipment and suppressed firearms (only in states where they are legal to possess) are used to expedite field procedures and to ensure discreet operations;
- 5) During deer reductions, there will be continuous open communication between Princeton and WBI staff to keep people well informed regarding field activities to avoid conflicts;
- 6) When in doubt, never shoot;
- 7) All deer carcasses are transported with the highest degree of discretion;

We will attempt to retain our traditional bait sites throughout Princeton and add new ones where possible. We would like to continue our activities on the public properties that we have used in the past and add any new properties that the municipality may have acquired. We prefer



the use of sharpshooting where it can be conducted safely and legally. Sharpshooting protocols will not differ from those used in the past.

We will integrate the Animal Control Officer in all phases of this program, including obtaining property access, 450' authorizations, baiting, and carcass delivery. We propose starting deer removal efforts in late-January or early-February to maximize baiting leverage and lessen the risk that weather conditions impede successful achievement of the management objective (i.e., spring green up).

Capture and Euthanasia

Drop nets and captive bolt guns may be used to supplement sharpshooting. These nets will be used in areas where 450' firearms discharge authorizations cannot be obtained and conducive sites with cooperative landowners exist.

Carcass Disposition

We have not included carcass processing or carcass transportation in the sharpshooting budget for 2025/2026. Separating these from the sharpshooting budget will allow the municipality to explore additional options for deer processing services.

Report Submission

We will be responsible for the submission of annual reports to designated agents of the NJDFW and Princeton. All data will be made available upon request at any time to authorized agents of the State and/or Princeton. A final report will be submitted within 30 days after completion of the project.

Project Supervisors

Dr. Anthony J. DeNicola is CEO of White Buffalo, Inc., a non-profit research organization dedicated to conserving ecosystems through wildlife population control. He received a M.S. degree from the Yale School of Forestry and Environmental Studies and a Ph.D. from Purdue University. Dr. DeNicola has conducted contraceptive and sterilization projects throughout the United States over the last 30 years. Dr. DeNicola's research interests include ecological approaches to control wildlife damage, control of introduced vertebrate species, and wildlife reproductive control.

Dr. Jason "Jay" R. Boulanger is head of Research, Grants and Administration at White Buffalo, Inc. He received his Ph.D. in Wildlife Science from Cornell University, M.S. in Wildlife and Fisheries Sciences from South Dakota State University, and B.S. in Natural Resources from the University of Vermont. His dissertation and post-doctoral research focused on controlling



suburban raccoon rabies via a novel bait station and overabundant deer populations via fertility control, respectively. Jay also served as a tenured wildlife professor at the University of North Dakota where he conducted applied research and taught courses on mammalogy, large mammal ecology and management, and human dimensions of wildlife. Jay is a long-standing member of The Wildlife Society and a Certified Wildlife Biologist®.



Literature Cited

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DeNicola, A. J., and S. C. Williams. 2008. Sharpshooting suburban white-tailed deer reduces deer-vehicle collisions. *Human-Wildlife Conflicts* 2:28-33.



Figure 1. Historical Sharpshooting Locations Princeton, NJ 2024

