

## URBAN DEER CONTROL – APPLICABLE TECHNOLOGIES

EARL L. HODNETT, Fairfax County Police Department, 4500 W. Ox Road, Fairfax, VA 22030, USA

**Abstract:** White-tailed deer (*Odocoileus virginianus*) populations have grown to unprecedented levels in suburban areas throughout the eastern United States. Deer have adapted to the fragmented habitats of suburbia and have brought with them a variety of problems. Control of white-tailed deer in suburban and urban areas brings its own set of problems and unique challenges. Fairfax County, Virginia is a suburb of Washington, D.C. and is home to over one million residents. The deer herd in Fairfax county reached its peak in 1998 when nearly 5,000 deer/automobile collisions occurred. Since 1998, snipers from the Fairfax County Police Department Tactical Team have successfully harvested deer from suburban parklands. Many technologies utilized by special ops teams in both law enforcement and the military are equally applicable to urban deer control. Special weapons, remote sensing devices, lasers and many more mundane items have been incorporated into the program. The ultimate results are a safe, economical, successful deer control program, and a more highly skilled corps of snipers.

**Key words:** Fairfax County, *Odocoileus virginianus*, urban deer control, white-tailed deer

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### INTRODUCTION

Most police departments around the world are responsible for protecting the citizenry from harm as well as promoting general civil order. The familiar phrase "Protect and Serve" often comes to mind when one pauses to consider the function and purpose of a police department. The Fairfax County Police Department and a growing number of other departments across the nation have experienced a broadening of their mission. This new task resulted from a relatively new threat to public safety. This threat literally invaded quiet suburbs. Unlike traditional threats to public safety, this one walked right into our backyards.

With the help of a human population weaned on Walt Disney's *Bambi*, these invaders were eagerly welcomed into their new habitat. Some people even left offerings of corn or apples in the yard in

hopes that these new visitors might favor their yard or at least visit more frequently. These were not invaders from another planet. No, these invaders just strolled in from the adjoining stream valley park. Deer had moved on up and into the suburbs and they loved what they had found.

Local governments across the United States are grappling with the problems associated with a rapidly expanding deer population. Many local officials have not yet decided how to respond to this issue. Some local governments prefer private contractors which provide services as well as some political insulation. With a growing market for such services, the private sector will respond. DeNicola et al. (1997) listed three primary reasons for a lack of deer management in suburban communities. These were: (1) real or perceived safety

concerns, (2) conflicting social attitudes and perceptions about wildlife, and (3) firearm-discharge ordinances.

In Fairfax County, a position of wildlife biologist was established with the primary responsibility of developing and implementing a plan to address these issues. The Fairfax County Wildlife Biologist position was placed within the Animal Services Division of the Fairfax County Police Department since deer problems are viewed as public safety issues. Positioning a control program within a police department alleviates or eliminates many of the inherent problems associated with such programs. Possible advantages might include budgetary, equipment, man power, safety, public perception, political or any combination of these. The greatest advantage can be the existing rapport between the police public information office and the media.

The unchecked growth of a suburban deer herd brings with it an array of related problems. The protection from predators and hunting coupled with the lack of other significant sources of mortality for deer in urban environments contributes to the problems. Annual survivorship of urban deer has been found to be greater than 80% (Etter et al., 2002). A growing deer herd often results in public safety issues such as deer/automobile collisions and increases in a variety of tick-borne diseases. Annual automobile damage in Virginia is calculated to be \$4.2 million and more than \$1 billion nationally (West et al., 1999). In 1998, the Fairfax County deer herd reached its peak. That year 1131 road killed deer were removed from the county's highways. Environmental issues include degradation of habitats, loss of plant species, impacts upon forest regeneration and detrimental affects upon other wildlife species. Deer also cause considerable damage to landscape plants and vegetable gardens which results

in an increase in complaints to local officials and county staff.

The key challenge is that of decreasing the number of deer/automobile accidents within Fairfax County. A study conducted in Kent County, Michigan, determined that the highest number of deer-automobile collisions involve drivers between the ages of 30 and 39. This group also represents the highest percentage of registered drivers. Drivers between the ages of 15 and 19 hit disproportionately more deer for the number of registered drivers in their age group (Hindelang et al. 1999). This mirrors the findings of Mike Uram, a Crime Analyst with the Fairfax County Police Department (personal communication).

Mike Uram has also found that Friday afternoons are the most likely time of the week for deer/automobile collisions to occur. This follows the statistical trends of automobile accidents in general. The actual cause(s) of this phenomenon are unknown. Perhaps people are anxious to get home and begin their weekend and are driving a little faster than usual. Maybe they have already begun their weekend by participating in a Friday afternoon happy hour.

With all the problems that large deer herds have brought to the suburbs, one might expect that deer would hold the same status as the rat. This has not been the case. While the majority of people enjoy seeing deer, a growing number would like to experience that joy less frequently. A survey of Fairfax County residents found that 73.6 % would support a direct reduction of the deer herd if deer damage resulted in a decrease in biodiversity within public parks (NRC 1999). When control measures are recommended, local governments often brace for a backlash from animal rights and animal welfare groups. This is due, in part, to the media coverage commonly provided. Nationwide, about 15% of Americans hold

an animal rights attitude yet only 3% actually do not use animals for any purpose (Duda 2000).

Residents of a Virginia coastal island, Chincoteague, were surveyed to determine their attitudes, experience and knowledge with regard to white-tailed deer. The survey determined that: "Interestingly, 82% of those who thought deer required management were aware of problems with deer. Only 41% of those believing that deer did not require management and 50% of those unsure about deer needing management were aware of problems with deer" (Green et al. 1997).

## **SITE DESCRIPTION**

Fairfax County, Virginia encompasses 103,341 ha (399 square miles) and lies to the southwest of Washington, D.C. With scattered urban centers of its own, Fairfax County is home to over one million residents. There are seven states with populations less than that of Fairfax County. A population of this size requires a great deal of infrastructure. There are 7,500 lane miles of roads (1995 FCPD figures) and over 800,000 registered automobiles in the county. Commuters from bedroom communities in adjacent counties add significantly to the traffic load. When a large deer population and a growing automobile population intersect, the public safety is at risk.

## **MANAGEMENT HISTORY**

The problem is complex and requires an integrated approach. Managers must develop an understanding of the local dynamics of the issues. Elected officials must be tutored in the terminology and techniques of an urban wildlife management program. Residents of the area must be included in the process. Managers must invest time to identify common fears, misunderstandings and misconceptions held

by local residents. In Fairfax County, many residents would seek the assistance of archers to cull the neighborhood deer herd. However, most believe that bow hunting would be illegal and fear that if the hunter injured himself they might be sued. Bow hunting is legal throughout Fairfax County. Section 29.1-509 of the Virginia Game, Inland Fish and Boat Laws (Virginia Game 2001) provides protection to landowners who permit access to their property for activities such as hunting. A well designed education and public information campaign will address such concerns.

Urban deer control has unique requirements. Frost et al. (1997) listed safety as the primary feature of a successful control program. Human safety is always paramount but in an urban setting, even the perception of a breach of safety can terminate a program. Urban deer control is held to a higher standard than even police shootings. If a police sharpshooter accidentally shoots an innocent hostage, the media would certainly provide extensive coverage. It is unlikely to result in the abolishment of special ops teams and it certainly will not close down the police department. However, any accident or even a close call could terminate an urban deer control program.

There is an absolute imperative that any deer shot be recovered. Noise must also be minimized. Ideally, deer control activities should be transparent to the public. This is not to say that they need to be covert. The public and particularly the adjacent neighbors need to be informed of all planned activities. However, such notifications can be general in nature. A letter advising that sharpshooting, for the purpose of herd reduction, may occur any night between September 1 and January 31 conveys the notification.

Since 1998, Fairfax County has implemented the Fairfax County Integrated

Deer Management Program (FCIDMP). An aggressive removal of adult does has resulted in acceptable herd densities. The recovery of park vegetation in treated parks is well underway. A rapid repopulation was predicted by those opposed to the program. This has not occurred since the ability of local herds to have high fecundity rates has been greatly reduced. McNulty et al. (1997) trapped deer from the Huntington Wildlife Forest in Newcomb, New York and relocated them to Dubuar Forest some 80 km away. Deer occupying home ranges adjacent to the removal area were monitored to study their response to this lowered density. They found that: "After removal, no deer in the adjacent area moved its home range significantly closer to the removal area, despite the reduction in population density. Our findings suggest that localized management is possible in parks and suburban areas where deer have undesired effects on vegetation and other components of the ecosystem" (McNulty et al. 1997).

## DISCUSSION

Faced with the daunting task of overabundant deer problems, urban wildlife managers could certainly use some technological advantages. Many state-of-the-art devices carry with them an impressive price tag. Managers should not be discouraged or restricted by budgetary limitations. Local law enforcement, state police, state game agencies, fire departments and military are all potential partners. Many of these agencies possess equipment which could be employed in an urban deer control program. Some military installations employ personnel responsible for finding civilian applications for military equipment.

Fort Belvoir is one such installation located in Fairfax County. Fort Belvoir is home of the Night Vision Laboratory where night vision devices were first developed. Above their front door is a sign which reads:

"We Own The Night." Night vision equipment gathers ambient light from the moon and stars. These photons are converted and amplified by a special tube into electrons which are then projected onto a liquid diode screen. During the early stages of the Fairfax County Deer Management Program (FCDMP), three Litton AN/PVS-10 Day/Night rifle scopes were field tested for the U. S. Army by snipers from the Fairfax County Police Tactical Team. These scopes proved to be a valuable asset to the program.

Later ITT Enforcer Night Vision rifle scopes were purchased by the Team. These scopes had a lower profile and could be adapted from day use to night use by removing the ocular end of the scope and replacing it with a night vision module. The use of night vision sights and hand-held monoculars has enabled sharpshooters to operate in areas where artificial light would be undesirable. Spotlight activity can draw curious investigation or it can be distracting to drivers on highways. Another obvious negative attribute of spotlights is the warning it provides to yet unseen deer.

With all the advantages that night vision devices provide, they cannot compare with thermal imaging devices. Thermal imagers (TI) detect thermal radiation and allow the user to view an unknown dimension of the world. With this technology you not only see the deer, but you can see the spot where it was bedded down. Footprints across a cold lawn become visible. This technology has long been used as FLIR (Forward Looking Infrared) mounted on aircraft. FLIR is commonly used in aerial surveys.

Hand-held thermal imagers are routinely employed by the military, law enforcement and fire departments. Each discipline has its own set of needs and there are a variety of TI designs available. Urban deer control is particularly suited for this



technology. The FCDMP has used both FLIR and hand-held TI's since the program began in 1998. Recently a vehicle-mounted thermal imager has been added to the tool box. All three versions are useful in deer herd census counts. We employ hand-held imagers to locate deer from a truck which has been modified to be a mobile shooting platform.

The primary vehicle utilized in the FCDMP is a modified GMC 4x4 pickup truck with an extended cab. This truck has been painted olive drab and the bed has been treated with a permanent spray-on liner. A steel ladder rack was retro-fitted with additional welded bracing and a sharpshooter platform was constructed over the truck cab. This platform is carpeted to provide a quiet and stable surface. The forward edge and both sides of the platform have a wooden rim. This provides a brace for sharpshooters using bipods but also prevents brass from spent rounds from falling to the ground (a good urban control program should be transparent).

The truck also has a winch and brush guard because it is frequently used off road. An auxiliary battery, a heavy-duty alternator, a bank of 12 volt receptacles, auxiliary loading lights and a white light/red light dome light have also been added. The most recent upgrade has been the addition of a Raytheon Marine Thermal Imager. This is mounted on a fabricated bracket positioned low on the brush guard. This low position allows the imager to scan below the browseline. Deer can be detected much farther in this fashion than is possible with spotlights or night vision equipment.

While there are many technologies which urban deer control can borrow from law enforcement and the military, the flow is often reversed. Techniques and adaptations developed in the FCDMP have been adopted by the Tactical Team. Radio Shack™ sells a laser pointer which is flat and measures

approximately 25 mm x 60 mm. This was attached to the side of a hand-held thermal imager using camouflaged duct tape. When the operator spots deer through the imager, the switch on the laser is depressed. The emitted light produces a dotted red line affect through the understory. The sharpshooter and the spotlight operator (if a spotlight is to be used) can then index off this line and be properly positioned before a light is ever turned on. This adaptation has remained as a permanent accessory to the thermal imager for its other applications in law enforcement.

The most valuable use for hand-held thermal imagers is in the recovery of lost or wounded deer. Deer which have fallen in tall grass, downed timber or other obstructive cover are more easily located. Very dense tall grass, cattails or phragmites can be difficult for thermal detection equipment to search. If tall grass is particularly dense, it is best to conduct a thermal search from an elevated position such as the bed of a truck.

The use of hand-held spotlights for finding deer at night is one universally accepted method. There are limitations with this method when employed in forest habitats. The branches of understory trees and shrubs reflect a large amount of light back toward the shooter (splash back). This reduces the effective range of the light but also can interfere with the sharpshooter's ability to see. Some special law enforcement teams utilize a MaxaBeam™ Searchlight. This is a 6 million candle power hand-held spotlight with a focusable beam. The light beam can be adjusted from a 40° wide angle to a pinpoint by use of a power-assisted switch. With its 75 watt Xenon lamp, this light can define a clear route through thick brush which a sharpshooter could utilize. Splash back light is minimal with the MaxaBeam™ focused to a pinpoint.

FCDMP has utilized a variety of suppressed weapons. These range from .22 caliber to the .375 H&H magnum "Suburban." Urban deer control demands versatility and adaptability. The more variety found in the toolbox, the easier it is to match the proper resource to each new situation. This holds true with regard to ammunition as well. Bullet design, weight and velocity must all be properly selected to match the demands being placed upon the sharpshooter. If there is a concern about noise, a sub-sonic round is likely in order. Slower bullets will have a shorter effective range. If longer range accuracy is more critical, then velocity becomes a major consideration. A frangible bullet might be the proper choice if there are downrange concerns.

IR-activated cameras are used to conduct deer census estimates both before and after control efforts. Cameras are placed at baited sites beginning in late summer after bucks have essentially completed antler growth. This technique is fully described by Jacobson et al. (1997) who found this method to be economical and comparable to Lincoln-Petersen Index results. If baited sites are later used for herd reduction, a sharpshooter can find the site by use of a Garmin RINO 120. This is a 12 channel hand-held GPS receiver with an integrated FRS/GMRS radio. A user can plot a route to the bait station and then transmit that route map to someone else.

A more low tech approach is equally applicable to urban deer management. The FCDMP has utilized managed shotgun hunts as part of an integrated plan. Larger parks often have portions which, due to infrastructure or proximity of neighboring houses, preclude hunter utilization. If left untreated, these areas can become deer sinks. Grund (1998) found urban deer to have smaller home ranges than rural deer and noted the seasonal variations in both

core area and home range sizes. Affinity shown by deer for smaller urban areas and natural corridors can be used to advantage. FCDMP has successfully used various forms of diversionary devices to direct or restrict deer movements. Mylar balloons resembling cartoon characters with large eyes were attached to clothes hangers. The hangers were then used to hang an orange vest with an attached pair of blue jeans. This artificial hunter was then placed directly on a deer trail and a portable radio was placed at its feet. Deer attempting to use this trail repeatedly turned away from this noisy effigy. Large strips of aluminum foil have also been used successfully to create a "visual drift fence" diverting deer from using a cover strip.

Adaptive strategies and innovative technologies are two key elements of a successful urban deer control program. Deer are very adaptive and control methods and technologies must keep pace. The urban wildlife manager would be wise to explore some of the available technologies presently in use by law enforcement agencies and the military.

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