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USE OF NETTED-CAGE TRAPS IN POPULATION MANAGEMENT AND RESEARCH OF URBAN WHITE-TAILED DEER

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Abstract: Growing populations of white-tailed deer (*Odocoileus virginianus*) in urban areas often conflict with local human interests and present challenges to natural resource managers. Netted-cage traps can be an important tool for management of urban deer populations where traditional control methods may not be appropriate or acceptable. We discuss the design of netted-cage traps, trapping techniques, and the handling of trapped deer.

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Key Words: *Odocoileus virginianus*, population management, trap, urban, white-tailed deer

Capturing white-tailed deer (*Odocoileus virginianus*) may be necessary for population management or research activities in urban situations. Recent conflicts with deer in urban settings have required non-traditional population control measures because hunting was not deemed appropriate or acceptable (Clark 1995, Deblinger and Rimmer 1995, Drummond 1995, Ishmael et al. 1995, Jones and Witham 1995, Jordan et al. 1995, Mayer et al. 1995, McAninch 1995, Stradtmann 1995, Warren et al. 1995). Capturing deer for population control through euthanization, translocation, or sterilization requires live capture. Capturing deer also allows biologists to equip individuals with identification tags or radio transmitters in order to study herd demographics and collect biological data, e.g. physical measurements, tissue samples, or blood samples.

Trapping large numbers of deer requires considerable time, effort, and expense (Rongstad and McCabe 1984, Clark 1995, Ishmael et al. 1995). The intent of any deer trapping program should be the efficient, safe, and humane capture of the number of deer required to meet predetermined goals. The most common methods of capturing deer are with cage traps, rocket nets, drop nets, and remote chemical immobilization.

Cage traps have successfully reduced deer populations in urban areas (Drummond 1995, Ishmael et al. 1995, Jordan et al. 1995, Mayer et al. 1995). Specifics of cage trap design and trapping, however, are seldom reported. This is likely because catching deer is usually not the primary goal of most management or research efforts. Also, many trapping programs are short term and sufficient data for rigorous statistical analysis are not available and therefore not reported in the literature. We have captured over 1,300 deer with cage traps over the past ten years. In this report we review the cage trapping experiences of others, synthesize their experiences with our own, and suggest

improved trap design and trapping techniques for capturing deer with cage traps.

CAGE TRAPS

Cage trap design and function have undergone a variety of changes and modifications since their inception in the 1930s. Wooden box traps, primarily Stephenson and Pisgah designs, were used in early restocking efforts (Rongstad and McCabe 1984).

By 1950 the need for a better deer trap was necessitated by increasing deer populations and translocation efforts. Clover (1954, 1956) developed more efficient single-catch deer traps. The Clover deer trap is essentially a steel pipe frame surrounded with netting. It is lighter and more portable than traditional wooden box traps and deer may more readily enter net-covered traps because they can see through the trap. In addition, the netted sides may absorb the shock of struggling deer and reduce injuries. Conversely, in netted-cage traps deer are unprotected from predators and may be easily excited by other disturbances.

Current traps are more efficient versions of Clover's original design. Roper et al. (1971) further developed Clover's trigger system. We have further modified the system to stand alone, trip more smoothly, have more adjustability, and require less maintenance. Our system consists of a trip string tied to a stake 10 cm outside the trap and about 46 cm from the back of the trap (Figure 1). The trip string should be far enough back in the trap to allow the door to close behind a large deer stretching to reach the bait that is placed near the back of the trap. The trip string is run through the trap about 35 cm above the ground, a cotter key attached to the trip string is inserted into a s-hook that is tied to a string supporting the door. Trip string tension determines the pressure required to release the door. The door drops when a feeding deer puts enough pressure on the trip string to pull the cotter key free and release the door. Heavy monofilament (20 kg) or dacron (40 kg) line works well for the trip string.

McCullough (1975) modified Clover's design to pivot at the corners, allowing trappers to collapse the trap flat to the ground when a deer is captured. We keep the trap erect by tying a length of nylon cord diagonally along each side from the front lower corner to the back upper corner and fastening with a quick-release knot (Figure 1). The trap can be collapsed quickly and folded backwards and downward to restrain the deer with minimum struggling.

Traps can be constructed with 1.9-cm diameter pipe. Optimal size is about 91 cm wide, 188 cm long, and 122 cm high. We recommend a #84 nylon netting with a 5 cm square mesh size. Cut the netting so that the sides and back are one piece. Net should fit loosely to allow the trap to collapse. The top and gate should also be a continuous length of netting. Lace netting to the frame with treated 0.6 cm nylon rope.

CAGE TRAPPING TECHNIQUES

Good trapsites receive high use by deer, trails between bedding and feeding areas are ideal. Trails in corridors and in open habitats can also be productive. Place traps so that the opening faces the direction from which the trapper will approach so that the trapped deer is forced to the back of the trap and movement is minimized.

Place traps far enough from roads or trails so they are not visible to the public. We concur with Rongstad and McCabe (1984) that it is not necessary to camouflage netted-cage traps because deer acclimate to them. We suggest, however, using brown- or green-colored netting so that traps are less obvious to people.

It is important to prebait a trapsite until deer are regularly using the area. Once the area is being visited by deer, set up a trap and tie open the door to allow free passage into and out of the trap. When deer are consuming the bait regularly, set the trap. The trap can be reset at the site repeatedly until success drops. Relocate a trap if it is unsuccessful for four consecutive days.

Trapping success is best January through March, when deer are food-stressed and easiest to attract to bait (Hirth 1977, Dusek et al. 1989, Fuller 1990, VerCauteren and Hygnstrom 1997). Throughout the Midwest, the bait of choice is shelled corn because it is highly attractive to deer and is relatively inexpensive and easy to obtain. Other baits, or combinations of baits, that have been used with some success include; alfalfa, apples, browse, and salt. Morgan and Dusek (1992) and Mattfeld et al. (1972) had success catching mule deer in summer with salt. The best bait may depend on what foods local deer are familiar with and the time of year.

When baiting a trap, spread a small amount of bait in front of the trap and leading into it. Place a larger pile under and behind the trip string. Keep bait away from the sides of the trap so that deer do not try to get at it through the net. Take care in setting the trap to ensure that it will trip and function properly.

DEER HANDLING TECHNIQUES

A variety of techniques have been used to restrain captured deer, including collapsing the trap, manual restraint, catch or purse nets, and chemical immobilization. Trapped deer are, in most cases, calm until they perceive the approach of a human. At this time they struggle inside the trap and it becomes important to quickly subdue the animal to minimize stress and injury.

Collapsing the trap is likely the most effective and safe method of restraining a trapped deer. The trap is approached from the front, forcing the deer to the back. Support lines are released and the top of the trap is laid upon the deer, pinning it. The door is slid open to gain access to the deer for processing.

We have also had excellent success at manually restraining deer for ear tagging and collaring. Our method is to quickly enter the trap and succumb the deer by grasping it in a "bear hug" fashion (trapper breast to deer back), grasping the fore legs and collapsing them close to the body.

Once restrained the deer is blindfolded with a 18 cm length of sweatshirt sleeve to help keep it calm. Minimize any noise or talking. Prepare all equipment in advance, so the deer is quickly and quietly processed. The optimum crew size is three: one person to handle the deer, one to euthanize, chemically immobilize, or mark, and one to assist. With an experienced crew, the time from reaching the trap to restraining the deer is less than five seconds. If marking is the goal, the animal can be tagged or radio-equipped and released in three minutes.

Deer should be chemically immobilized if they must be handled for more than ten minutes, or if invasive surgical procedures are necessary. To immobilize, collapse the trap onto the deer and restrain it with the weight of a trapper while another administers the immobilant.

If live deer are to be removed from a trapping site, they can be transferred to wooden transport crates and loaded onto a truck (Drummond 1995, Ishmael et al. 1995). They can then be transported to a meat processor, release site, or deer farm.

CONCLUSIONS

Control of deer populations in urban habitats is a complex social, economic, political, and biological issue. Because we are responsible for stewardship, we must consider all the options and tools available. Live capture may be more socially acceptable or practical than hunting or sharp shooting. Netted-cage traps may be the most appropriate method of live capture, especially in instances relating to the growing number of deer in urban areas. Unlike other methods, cage traps do not require constant monitoring and can be fitted with telemetry devices to notify biologists when the trap is sprung. Further, cage traps can be concealed and used in areas where rocket nets or drop nets will not work. Also, deer captured in cage traps have a lower incidence of capture myopathy than those captured in rocket nets (Beringer et al. 1996). The need for effective

cage traps, sound techniques, and expertise will become even more important in the future.

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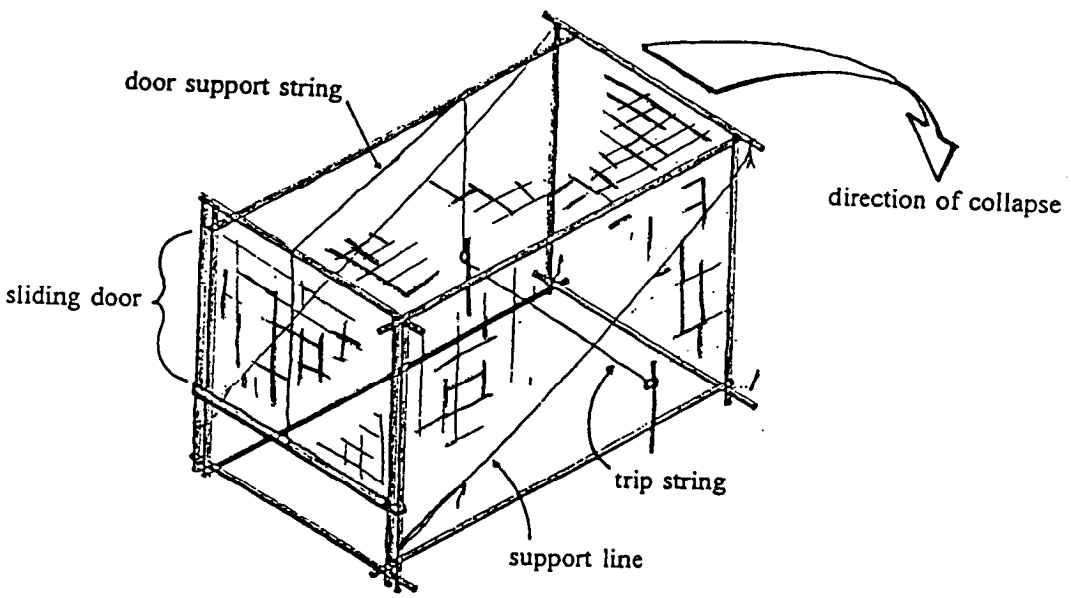
Figure 1. Cage Trap for Deer