Spying On Deer

PART 2

The ability to count and even identify whitetails with infrared-triggered cameras has opened up a new world to hunters and landowners who want to know more about deer. Here's some of what this technology is teaching us.

by Dr. James C. Kroll

Last month, I discussed the principles behind infrared-triggered monitors, devices I think eventually will contribute as much to our knowledge of whitetails as radio-tracking has. Over the last few years, we at the Institute for White-tailed Deer Management and Research have used these monitors to study the animals in ways never before possible, and we've come up with some fascinating results. Here, I will present new findings on how these monitors have helped us census whitetails more effectively.

THE PROBLEMS WITH TRYING TO COUNT DEER

One of the questions we often get at the Institute is "How do I accurately count the deer on my land?" That's a sticky problem we biologists have been trying to solve for many years now.

Long ago, a man named Hahn decided the best way to count deer in fairly open country would be by simply walking a set distance down a predetermined line and counting the number of deer "flushed" within a set distance to each side of that line. By knowing the average flushing distance and the length of the line, he then could compute the area (in acres) surveyed and plug in



The larger photo above shows an enormous 3 1/2-year-old Louisiana buck that was photographed with an unmanned camera just before he came out of velvet. As part of a scientific study, the landowners and the author's research team later used a dart gun to tranquilize the buck at that same location and move him into a breeding facility (inset photo). Such successes with infrared-triggered monitors have opened up many new possibilities for research. Photos courtesy of the Institute for White-tailed Deer Management and Research.

the number of deer seen, making it simple to calculate the deer density (expressing it either as "deer per square mile" or "acres per deer.") Unfortunately, several factors compromised the accuracy of Hahn's method, including density of vegetation, flightiness of deer and observer error.

Later, other researchers proposed using track counts. In this technique, the surveyor used an implement similar to a farm harrow. It was dragged along a straight road for a long distance to produce a clean soil bed. Twenty-four hours later, the biologist would return and count the number of track lines completely crossing the road. If you know how far the average deer travels in a day, it again is a simple matter to convert "crossings per mile" to "deer per square mile." A great deal of our radio-tracking data were obtained in order to determine the average daily "cruising radius" of a whitetail.

Once more, however, there were pitfalls. For starters, the cruising radius is different for bucks versus does and for fawns versus adult deer. There also had to be some type of road or right of way present, and few of these fully represent the entire land area. Again, accuracy problems arose.

Then came spotlight counts, which also limited us to a road or right of way over which to travel at night. A spotlight was used to produce the familiar eye shine resulting from light reflecting off a membrane in the back of a deer's eyes.

The observers traveled a road over a predetermined course, again keeping track of the lateral visibility and the number of deer seen. The average visibility width, plus the total distance, was used to estimate the total area covered. Problems with this method included the variable detectability of deer, the need for roads, observer error and activity patterns of deer. So we again fell short of our goals for accuracy.

Then, along came aerial censusing. First with fixed-wing aircraft and later with helicopters, biologists developed a technique in which an observer would fly a fixed path at a fixed height and count deer within a certain distance to each side of the aircraft's line of flight. Just as with the other methods, it then was an easy task to come up with a

A Picture-Perfect Year For Whitetail Hunting

(Editor's Note: The following account of a hunter's experiences with infrared-triggered cameras was sent in by a reader who, due to problems with poachers in her area, prefers to remain anonymous.)

The fourth morning of Wisconsin's gun season found me in my tree stand, hoping for a shot at one of the big bucks I knew was in the area. As I sat there, my mind drifted back over an eventful year of using several infrared-triggered cameras to study deer on our small farm.

Each family group of does and fawns had its subtle differences, making it possible to tell them apart with careful study of the photos. And the bucks, both large and small, had gone from having dark bumps on their heads to displaying the bony splendor of autumn. Thanks to photos acquired earlier in the fall, I'd memorized every antler feature of one buck in particular, a deer nicknamed "The Wide One."

Suddenly, the sound of deer approaching snapped me back into the present. Two small does 150 yards away were being trailed by a much larger deer, and all three were heading my way. Glimpsing antler, I readied myself for a possible shot.

When the does reached a point 60 yards in front of me, they split up, with one heading downhill and the other running to a point 20 yards behind me. The buck, still in hot pursuit, stopped 40 yards away. His vitals were hidden behind a tree, with only his head visible.

The standoff gave me a chance to confirm what I suspected; his telltale width, plus a short G-4 point on the left antler, left no

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This photo, among others, helped the author identify the wide Wisconsin buck when the buck later chased two does beneath her stand. Studying photos of deer on your land can help your hunting, add hours of enjoyment and let you assess herd health.

number representing the deer density.

But again, there were problems. Researchers at Texas A&M-Kingsville later showed large errors in some aerial estimates, as great as plus or minus 30 percent! We also have found that the number of times a property has been censused in this way affects the accuracy of the estimates. Deer learn to hide from view and are missed by the observer.

COUNTING WITH CAMERAS

There was little in the way of new censusing techniques until Dr. Harry Jacobson of Mississippi State University, along with Randy Browning, Ben Koerth and myself of the Institute, decided to test infrared-triggered cameras as a way to get better counts. We initiated our work at southern Mississippi's Longleaf Plantation, a 10,000-acre privately owned forested property.

In order to test our methodology, we first captured deer and either marked or radio-collared them. We focused on mature bucks but also used does. The idea was twofold: first, to determine the home-range size of the deer, and second to find out how many of these deer could be "recaptured" (photographed).

The results were extremely encouraging: We photographed every marked deer out there one year and the vast majority (88 percent) the next. What this implied was that we could reasonably expect to be able to photograph almost all of the deer on the property in a given year.

Using this method, we learned we could obtain photos of most bucks in an area in 14 days or less.

(This is based on the assumption that a marked mature deer would have the same probability of being photographed as would an unmarked mature deer, which further studies later proved to be the case.)

This was, without a doubt, the most significant development in deer censusing since the advent of radio-telemetry. We now had a valuable tool that would allow us to determine the number of deer on a given property. We based the estimate on the number of different forked-antlered bucks photographed. We did this because every buck out there, no matter how generic he might look, has a unique set of antlers, akin to the way each human has a unique fingerprint. We carefully reviewed each photo to determine an individual identity for each non-spike, then assigned him a number.

Once we know how many fork-antlered bucks we have, it is necessary to estimate the total number of bucks. Because spike-antlered bucks (mostly yearlings) are difficult to distinguish from each other, we calculate the fork:spike ratio. To do this, we refer to the photos and add all the fork-antlered bucks to the number of spikes, then divide the spikes into the forks.

Thus, if we have photos of 100 fork-antlered bucks and 50 spikes, the fork:spike ratio is 1:0.5. We know there are approximately 150 bucks present. We use the same procedure to come up with buck:doe and doe:fawn ratios, then add them all up for a total population estimate.

Our cameras were placed on a grid pattern, with bait (corn) in front of each monitor. Initially, we used one camera per 80 acres, but we now feel it is possible to get good counts with wider spacing. Using this method, we learned we could obtain photos of most bucks in an area in 14 days or less. What's more, we also could obtain accurate buck:doe and doe:fawn ratios in roughly *four* days.

Later, using this technique on a population of known size at Fort Perry Plantation in Georgia, we determined that the method was indeed quite accurate. For the first time ever, there was a reliable way to determine deer population size.

THE BOTTOM LINE

What does all of this science mean to you, the hunter? First, if you are actively managing the deer on your land, you now have a tool with which to obtain photos of virtually every buck that lives on or regularly visits the property. You also have a statistically accurate way to assess reproduction and sex ratios in the herd. We even can age deer just by looking at the photos.

Not only can you accurately obtain the above information about the herd in general, you also can make decisions about individual animals. On many properties, we have used these photos to help manager-hunters decide which deer to try to harvest in a given year. One landowner we know even gives his hunters photos of the bucks he does *not* want harvested.

From the hunter's perspective, there are several potential ways to use this information. First, infrared technology could allow you to determine the quality of bucks in your area. It might even help you decide on the proper strategy for hunting those deer. However, you should be prepared for the frustration of learning that the majority of your photos of mature bucks will be taken at night. It's fairly uncommon to find a consistent pattern of buck movement down a specific trail during legal shooting hours; thus, you can't expect to get a photo of a mature buck at a certain place at a certain time of day, then simply hunt at the camera site with expectations of the deer showing up again "on schedule."

For the hunter who wants to *know* he's hunting a big-racked deer, basing a hunting strategy purely on tracks, rubs, scrapes and/or droppings without having seen the buck is a bit of a guessing game. We know a buck can leave huge sign but not necessarily have a rack to match. A photo removes all doubt, particularly if it's from the current year.

Lastly, these devices allow you to greatly enhance the enjoyment you get from interacting with deer. I actually know landowners who, after starting to use infrared-triggered cameras on their properties, seldom even hunt their deer anymore. They claim to derive more enjoyment from trying to get photos of big bucks and then showing them to their buddies!

What you do with the photos you get of deer in your area is up to you, of course. All I can say is that for the first time ever, these monitors have allowed us to get reliable data on how many deer are out there, and I cannot help but think that will prove to be a plus for future management.

In the October issue, Ben Koerth and I will discuss unique research we recently conducted using these cameras. Interestingly, one of these studies caused us both to "eat crow" regarding something we had laughed at for years. Join us next month to find out what that surprise was!



