TOOLS *of the* TRADE

The same technology that fuels our fast-paced lives also can serve to make hunting whitetails more productive and enjoyable.

BY ■ DR. JAMES C. KROLL

In these early years of the 21st century, it seems we're awash with technology. For some of us, at least, Blackberries, iPhones, laptop computers and a host of other electronic personal-management devices now dictate how we spend the better part of each day.

The advance of technology leaves me with no wonder why deer hunting holds such appeal in these modern times. Striking afield in pursuit of a whitetail buck allows us to personally retreat to a simpler era.

Even so, the same technology that fuels our fast-paced lives also can serve us to make our outdoor experience even more enjoyable — provided the devices become our servants, rather than our masters.

During the last 3 1/2 decades, I've lived with, studied and hunted whitetails as a career. In fact, some of the research tools we've developed at the Institute for White-tailed Deer Management & Research (located at Stephen F. Austin State University in Nacogdoches, Texas) often are credited with improving deer hunters' success in the pursuit of their favorite big-game species.

TOOL OR GADGET?

Pick up any outdoor magazine and you'll find a cornucopia of deer-hunting products — "gadgets," some might claim — each touted to help you put a trophy buck on your wall this season. Aldo Leopold, the father of American wildlife management, once defined a "gadget" as something that takes the place of skill. In the time of Leopold

(the 1930s), plenty of folks still practiced deer hunting with the keen outdoorsman skills we often only read about today.

Sadly, few hunters here in the 21st century have the same opportunities or free time to develop those highly evolved hunting skills of yesteryear. Further, every demographic study on deer hunters comes up with the same conclusion: Their median age is increasing.

So, what was considered a hunting "gadget" by Leopold might better be characterized as a hunting "tool" today. I've modified my own definition a bit, and have come to the conclusion a "gadget" is something that doesn't enhance the hunting experience.

On the other hand, true advances in technology, as applied to deer hunting today, can indeed enhance the hunter's individual experience as he pursues his quarry. Frankly, a number of these new resources keep us in the woods longer and help us understand whitetails better than a lifetime of stomping around in the bushes ever could! Let's take a look at some of these intriguing developments.

INFRARED-TRIGGERED SCOUTING CAMERAS

Here at the institute, we've come up with a number of good ideas over our 35-year existence. Perhaps the best of these was the infrared-triggered scouting camera.

Today, we not only have digital scouting cameras capable of taking high-quality still photos, some even can shoot impressive video clips. We've come a long way, haven't we? The progress has been astounding to those of us who remember when we first erected two small plastic boxes, connected to an expensive motor-drive Nikon camera overlooking a scrape, in order to get candid photos of deer behavior in the wild.

Despite the years that have gone by since those early attempts to capture shots of deer on the hoof, most hunters and landowners still don't understand the power of this technology to improve both hunting and management.

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In our 1994 book *The Art & Science of Patterning Whitetails*, Gordon Whittington (editor in chief for ***North American Whitetail***) and I discussed the concept of "patterning." Although the term had been in use for some time already, it was largely misunderstood. To most hunters, "patterning" meant figuring out which buck would walk by which tree at a given time. Our book took a broader view; to us, "patterning" was (and still is) more about understanding the overall habitat and how the deer population as a whole use it throughout the year. For instance:

(1) Where are the food sources, and how do they change with the seasons?

(2) Where are the travel corridors, sanctuaries and staging areas?

(3) When do these deer breed?

The answers to these and similar questions all form the foundation of patterning deer. And a scouting cameras can be one of the most useful tools for getting those answers.

The average deer hunter who has a scouting camera uses it mainly to find a buck big enough to target and to learn at what time that deer is moving through the area. But some of the latest cameras provide a wealth of additional information to those who can interpret it. They record not only a photo's time and date but also temperature, moon phase and even relative humidity.

Many years ago, research partner Ben Koerth and I conducted simultaneous scientific experiments on activity patterns of whitetails in Michigan and Texas. Surprisingly, though the herds were 1,500 miles apart, we found their activity patterns were identical.

We then carried this study farther by statistically analyzing actual feeding times of these deer against the various predictive models on the market and in literature. We quickly saw there was no relationship. (One well-known model even predicted the *opposite* of what the deer really were doing.) We concluded the daily activity pattern of whitetails doesn't change, only the magnitude of the peaks in activity.

Back in the 1970s, I'd already learned when deer tend to move, through my radio-telemetry studies in Southern forests. So, why did we repeat this work? The cost to confirm the results had dropped dramatically. The early telemetry studies cost more than $500,000 — the camera study cost less than $10,000!

Because of the great size of the areas in which Ben and I were interested, we used 40 cameras in our second study. Depending on the size of your hunting plot, you possibly could conduct a similar study on your own property with just two or three cameras.

What else can you learn from the photos taken by scouting cameras? Careful study of the photos can tell you everything from when a buck strips his velvet to the timing of the rut.

Ben and I like to employ scouting cameras from late summer into early fall, then again in late winter. This helps us learn to age live bucks (see my book *Aging and Judging Trophy Whitetails*), which allows us to determine the age structure of our buck population. Further, by carefully examining the various signs of the rut — swelling of the neck, tarsal gland stains, battle scars and more — revealed by photos, we can pinpoint when we need to be using a certain

tactic in the deer woods.

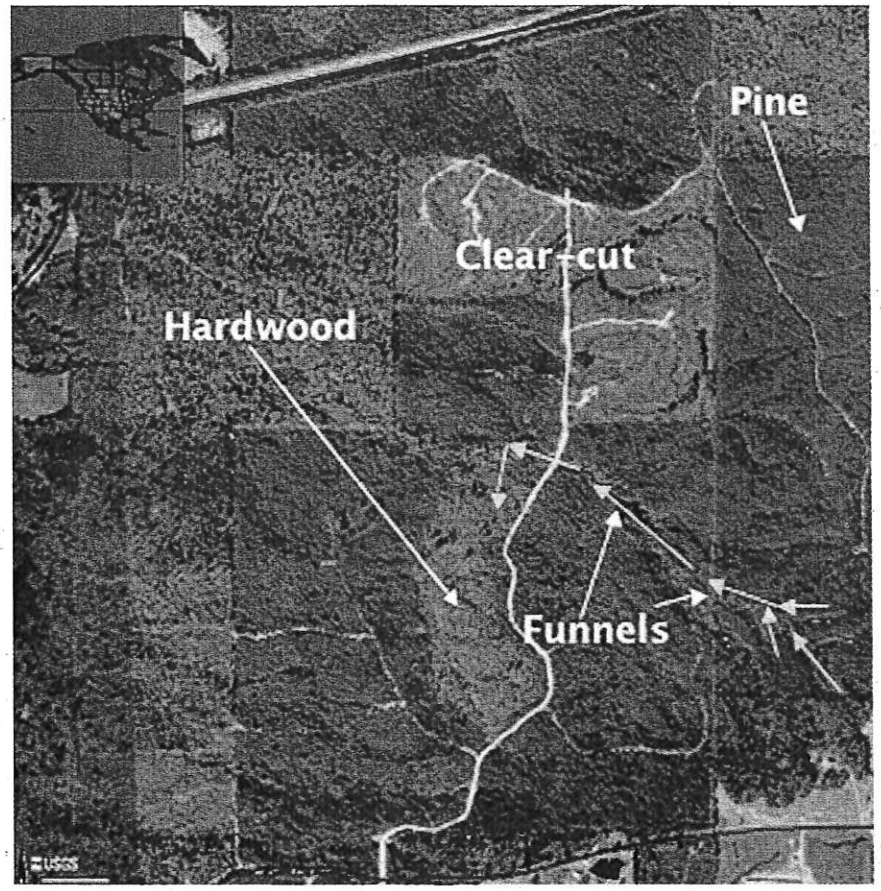
During the winter, photos downloaded from your camera tell you when antler casting occurs (a sign of body condition), and the number of bucks that have overwintered. You'll also discover the number of buck fawns that have survived and have been "recruited" into the deer herd. Sometimes, you even can find a buck that has just cast his antlers, giving you a better idea of not just when to search for his sheds, but also where.

These are just a few of the potential uses of scouting cameras, but I think you get the idea; they really can improve the quality of your hunting and management experience. Today's cameras are much more than "gadgets."

AERIAL PHOTOGRAPHY & SATELLITE IMAGERY

I've often said, "Give me a recent aerial photo and topographic map of an area, and I'll show you where the bucks are and how they travel."

This isn't just some wild claim. Nor is it magic. Through our research we've confirmed that bucks use specific habitats in predictable ways, and those patterns can be identified from the air. Mapping technologies — those associated with aerial photography and satellite imagery — have greatly improved both deer management and deer hunting. As with scouting cameras, we're talking about technology that gives you a unique perspective on the whitetail's world, thus increasing the quality of your overall hunting and management experience.



Merely by studying this false-infrared aerial photo of a Mississippi hunting club, the author was able to locate two funnels (places where cover and/or terrain concentrate deer travel). In this image, pine plantations show up as bright red; hardwoods (oaks and hickories) appear pinkish-gray in color. The yellow arrows depict the movement of deer from their beds into a hardwood stand to feed. *Photo by USGS.*

Remote-sensing technologies can be intimidating and time-consuming for the deer hunter. As important, until recently, aerial photos and maps were difficult and expensive to acquire. In the "old days," I had to rent a plane and take aerial photos myself to get recent imagery. Today, the advent of Internet services such as Google Earth makes aerial images available with a click of the mouse. However, the quality of these images and the time at which they were taken might not lend much support to patterning deer on your land. Let's look at some hints and sources for good aerial imagery and maps.

Basically, aerial images are available from private photographers or state/federal agencies. Foreign government agencies might also provide aerial imagery, but by the time most countries release their "spy" images, they can be old and obsolete.

Almost every state in the nation now provides imagery services to the general public. As you might imagine, this has created some concern; while a hunter can acquire an image of his favorite hunting territory from an on-line source, a terrorist can use the same type of imagery to plot mayhem. As a result, the quality and even availability of some images is restricted.

Those state agencies that manage our natural resources and provide on-line or off-line access to aerial imagery distribute photos that typically aren't very old. The U.S. government, through the U.S. Geological Survey (the federal source for science and physical information about the Earth, its natural and living resources, natural hazards and the environment) also serves up satellite imagery.

Unfortunately, the resolution of these photos often won't support deer-hunting applications. So, you might instead try Kent State University's Web site, www.library.kent.edu/page/11084, which hosts both state and federal resources — as well as those from private companies, such as Microsoft — of aerial imagery useful to deer hunters.

To make the most of these handy resources, you need to understand the basics of remote-sensing imagery. The first requirement is a solid understanding of resolution: the size of the individual elements in the image.

To put resolution into perspective, imagery from U.S. LandSat 7 (managed by NASA and with its data distributed by USGS, LandSat 7 refreshes the global archive of satellite photos, providing up-to-date and cloud-free images) is recorded in small squares,

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called "pixels," each measuring 900 square meters (9,704 square feet). Anything on the ground that is smaller than 900 square meters can't be recognized easily.

There are more recent satellites collecting data in the 1-meter range, but most aren't readily available to the general public. These images are collected with a scanner/sensor, while until recently aerial images have been collected with a camera.

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Most states now offer aerial photography that is high resolution (1 meter or less), and very importantly, corrected for distortion and curvature of the earth (orthoimages). Typically, deer hunters obtain a Digital Ortho Photoquad or DOQ. Most are sized as 7.5-minute images, but size varies with the portion of the Earth you're viewing. The average deer-hunting property fits easily in a single DOQ. (Somehow, though, it seems I'm never that lucky; my hunting spots always are split between at least two photos!)

"But," you say, "what's wrong with going to Google Earth, getting a photo there and not worrying about all this technical stuff?"

If you want a reasonably useful image of your property and aren't concerned that it might be of questionable accuracy and unknown age, check out the resources available through Google Earth. It's an interesting site, insomuch that imagery can be pasted into the photo from multiple sources. But if you maneuver around the site, in no time you'll discover abrupt changes in resolution. That's because higher-resolution imagery hasn't made it into the site yet, or because they simply aren't available.

Another problem with Google Earth images is they aren't "spatial" — that is, a photo can't be used for exact locations of features. (The importance of this will become obvious later in our discussion.) If you want imagery that's much more useful than what you can get from Google Earth, read on.

It's interesting to note many hunters still use black-and-white aerial photos. Unless such images are all you have, you'll probably find them to be of relatively little use. Contrast (the definition associated with black, gray and white colors) is the issue.

Meanwhile, color images — especially those referred to as "infrared" images — offer much better opportunities for patterning your deer or herd. Although technically "false infrared," these images usually are collected in winter or early spring, when leaf canopy is at a minimum. This gives you a great deal of analytical power for patterning your deer. Green vegetation appears red in these photos, while dormant vegetation is gray to bluish. Conifers such as pines and spruce are bright red. Because there are winter weeds present, wet areas in fields and meadows also appear reddish. You should know that deer focus their feeding on wetter areas, where vegetation is more succulent and nutritious.



Careful study of photos taken with scouting cameras can reveal a lot about hunting and managing the deer in your area. *Photo by Dr. James C. Kroll.*

In the accompanying aerial photo of a Mississippi hunting club (obtained from the USGS Web site: http://nationalmap.gov), pine plantations show up as bright red; hardwoods (oaks and hickories) appear pinkish-gray in color. As a normal part of forestry operations on this property, streamside management zones (SMZs) were left among the planted pines. The yellow arrows depict the movement of deer from their beds, down the SMZ and into the hardwood stand to feed. Using this technology, I was able to find two excellent funnels (narrow points through which deer are forced to travel) where I might ambush a buck.

The nice thing about the USGS National Map Web site is it allows you to turn off and on the aerial imagery, which is laid down over the topographic map of the same area. This feature enables you to use some basic logic in determining what your deer are doing. Note the movement patterns depicted in the aerial photo also are related to the topographic relief. That's why I pointed out how you can pattern deer without setting foot on the property.

Make a note, too, to determine the age of the imagery you've collected. The hardwood stand in the image you are using could well be a clearcut today! Most state and federal agencies distribute imagery taken in the last two or three years, though some produce photography more often than that. Always check the age of the image you've obtained.

GPS TECHNOLOGIES

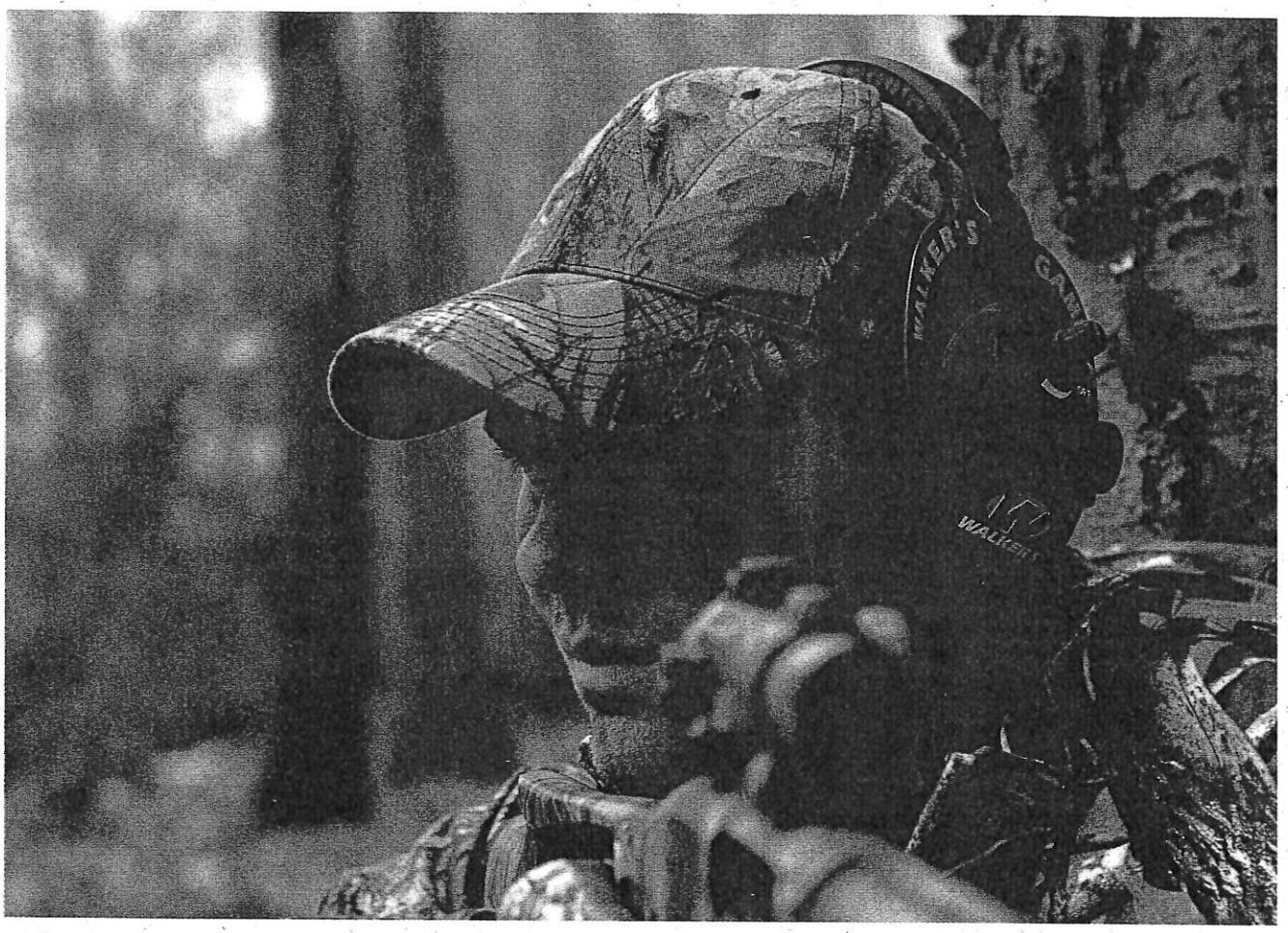
Ask the average hunter what GPS units are good for, and the answer will be: "They get you to your deer stand without getting lost!" Sadly, that's the general use for Global Positioning System receivers in hunting. But let's take it to a higher level.

The American public first became aware of GPS technology in the early 1990s, when they saw the U.S. military remotely guide bombs through the windows of the bad guys during the Gulf War. Later, when services such as OnStar came into general use — followed by TomTom, NUVI and other dashboard navigation devices — the general population began to see GPS as useful in everyday life.

Although it's not important to understand all of the technology behind

GPS, the college professor in me doesn't like a "black box" mentality. So, I'll offer a general rundown of the system's basics.

Currently, 24 GPS satellites orbit Earth for use by the average citizen in locating where he/she is on the planet.



High-tech aids aren't limited to scouting cameras or GPS units. For instance, the hunter seeking to both enhance and protect his sense of hearing now can do just that.

Two additional satellites are being held as "backup" for the basic constellation. Here's how they work.

Each of the satellites has an onboard atomic clock that's very accurate. Each satellite also sends out a unique signal. By timing how long it takes to receive each signal, your GPS unit calculates its precise location.

In comparison to military defense GPS units, those available to consumers aren't all that precise; however, most locate the user in the range of +/-15 meters (46. 2 feet). That's good enough for many uses. These locations later can be "differentially corrected" to give a more precise location if needed. The important thing is that your GPS unit displays your location, which can be used for a host of deer-hunting and management applications.

Almost anyone who has used a GPS knows about "waypoints," the saved location data for points of interest. But did you know waypoints and paths can be recorded, then overlaid on a map or aerial photo? Most manufacturers of GPS/navigation units now offer some sort of base image, either downloaded from an Internet site or on a memory card. Armed with this information, you're empowered to do some advanced patterning of your deer herd.

I've long urged hunters to mark the locations of rubs and scrapes on a topographic map or aerial photo. A rub or scrape represents a "door" to figuring out a buck's travel corridors. Later, you can "connect the dots" to display the paths bucks walk during the rut. Our research shows that once these routes are established, generations of bucks will use the same rub lines and scrape locations from then on, provided the habitat isn't altered dramatically.

By mapping rubs, even if you just start randomly, eventually you will see the deer "highways." Then, using the same aerial photos and topographic maps discussed above, you can more easily pattern deer and identify the best stand locations. Combine all of this with the images downloaded from your scouting cameras and you'll have a potent set of high-tech tools to increase your chances of harvesting a mature buck.

CONCLUSION

Were Leopold still alive, I don't think he'd consider any of these technologies true "gadgets." What these advances have provided us hunters is the chance to increase our understanding and appreciation of whitetails. Absorbing that information and determining what to do with it still takes a full dose of woodsmanship and all of the other elements of sound hunting. In the end, even the best technology is only as good as the hunter using it.