BUILDING YOUR OWN
'DEER FACTORY'

How Do Deer Utilize *Your* Hunting Area?

Providing whitetails with all of the right habitat elements is one of the keys to holding them on a piece of land. Our research shows how it can be done.

by Dr. James C. Kroll

Last March, following my presentation at the Quality Deer Management Association's annual convention in Athens, Georgia, I fielded questions from the audience. Predictably, one of the first concerned the minimum acreage required for effective whitetail management.

After three decades of dealing with the public on management issues, I was hardly surprised by this question. That's because it reflects one of the most common concerns of landowners and hunters everywhere. There is a general feeling that unless a person controls a vast amount of land, it is pointless to try to manage the deer herd – particularly for mature bucks.

Yes, total acreage can be an important variable in the management equation. However, if acreage were all that mattered, there would be poor herds and poor hunting on every tract of limited size, and that certainly is not the case. In real-world whitetail management, the key question is not how much land you have under your control; rather, it is how you can maximize the deer potential of the habitat you have to work with.

"LANDSCAPING" FOR DEER

When I introduced the concept of "landscaping" for deer (see the August 1998 issue), my concern was that there would be relatively little interest in the topic. However, since then it seems the concept has caught the imagination of landowners and hunters alike. Perhaps this is because proper "landscaping" makes a property not only more attractive to deer but also easier to hunt effectively.

The term "landscaping" might not seem applicable to wildlife management, but it is a concept long studied by wildlife ecologists; only recently has it been brought to public attention. Consider the yard around your house. Over the years, you no doubt have laid out (either by design or by accident) various elements that provide the comforts of an outdoor setting. You might have planted conifers along the edge of your yard to screen you from the view of passersby; perhaps you put in a flowerbed to enjoy from your bedroom window.

Interestingly, studies on human behavior have revealed that we tend to establish landscapes similar to our ancestral habitat, the savanna (prairie interspersed with trees). Likewise,



Whitetails need enough screening cover to let them feel secure. If a lot of that vegetation consists of nutritious browse in various stages of growth, you're providing the herd with "one-stop shopping." Photo by Mike Biggs.



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wildlife species unknowingly select various habitat components that fit their concept of "good" habitat. The whitetail is no exception.

Since 1975, I have devoted much of my research to trying to dissect the mind of the whitetail. In fact, that is exactly what brought me to this species as my life's research work. I wanted to discover how the whitetail perceives its environment and how it selects places as "good" habitat and avoids others as "bad" habitat.

My early telemetry (radio-tracking) research focused on this goal, and my early ***North American WHITETAIL*** writings on mature buck behavior came from this work. And more recently, with the advent of geo-positioning technology (GPS), I have been able to fine-tune a lot of those earlier findings.

My own deer-research property is in East Texas, among the pines and hardwoods characteristic of that region. I purchased the initial property in 1978 and steadily added to it as a college professor's pay would allow. I wanted this to be not only an experimental area but also a place that would help me demonstrate how someone with limited acreage could improve both the deer and the hunting on his/her land.

Interestingly, the second year I owned the property, I harvested a buck that scored in the high 160s Boone and Crockett. I thought, "Boy, have I found myself a great piece of deer woods!" But as it turned out, that was the last great whitetail I would harvest or even see there for many years.

In the early days, my experiences on our farm seemed to support this idea that it took at least a square mile (640 acres) to manage deer effectively. I would let a young buck walk, only to see him shot by someone else. To make matters worse, a county road bisected my land, giving the "night crowd" ample opportunity to poach. What could I do?

As I learned more about deer, the more convinced I became I could indeed change my fate for the better. I'm happy to say you can too!

HOW DO DEER USE THEIR HABITAT?

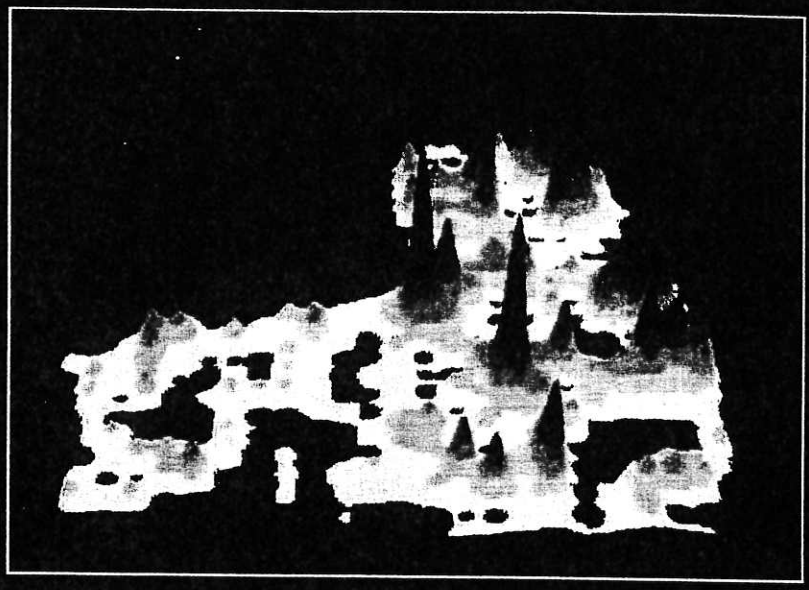
It is interesting to hear people talk about how whitetails use a piece of land. Too many people think the deer roam randomly over the landscape

and that every part of every property is useful to the deer. The best hunters understand that whitetails select specific habitat components and use them in a logical manner.

Anyone who has spent much time seriously observing whitetails understands that they spend more time in some areas than in others. However, *proving* that certain habitat types are favored takes more than just personal observation and anecdotal evidence. Much of my 20 years of telemetry work went into showing conclusively that not all habitats are equal in attractiveness to deer. And in the process, I learned something just as helpful, from a management perspective: Even when a piece of land has all of the right components, deer still might not use the area, due to improper *placement* of those elements.

Realizing this was what gave me my original idea of "landscaping" for deer. The next step was to determine how deer used my land and what the best combinations of habitat elements for maximum utilization were.

SPATIAL ANALYSIS OF BUCK MOVEMENT



This 3-D graph shows buck activity on the author's research area. The higher the peaks, the more use was noted. Although great effort has been made to create great habitat, some areas (green) remain unused. Graph by Dr. James C. Kroll.

THE WHITETAIL'S MINIMUM HOME RANGE

One of the most interesting studies we conducted involved seeing if we could change the size of the home ranges of specific deer. To find out, we radio-collared wild deer (by permit) and then rearranged their landscape. In some cases, this might have involved adding a clearing, planting a food plot or planting a stand of pines.

At the time, we had few ideas as to what the "ideal" arrangement should be; all we had to go on was an age-old wildlife-management concept that the more dispersed a habitat, the better it is for game animals. Concepts such as "edge" and "interspersion" (mixing) of habitat types had not been fully tested, however.

What we discovered was that a whitetail's home-range size is not necessarily a static entity; it can be changed. The reason is that whitetails are no different from people, in that they try to optimize their lives so they can obtain everything they

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need without spending too much time searching.

There are two basic types of habitat: fine-grained and coarse-grained. (This sounds like "eco-babble," but bear with me.) A fine-grained habitat is one for which you really cannot discern the various components, because the changes are extremely subtle. An expansive mature forest would be a good example of such a habitat. A coarse-grained habitat, on the other hand, is one broken into distinct patches of various ages and conditions. Most Midwest areas of wood lots and fields typify this kind of habitat.

We knew from our early research that deer by nature prefer neither fine-grained nor coarse-grained habitats. Rather, they tend to occupy some intermediate condition. The two big questions we had to answer were these: How fine-grained can we make a habitat before deer stop using it? Can a habitat become too coarse-grained? Answering these questions was the emphasis of the next decade of research.

I ultimately discovered that there is an innate minimum home range nestled inside the genes of whitetails. By taking an extremely fine-grained habitat and breaking it up slowly, we found home range size decreased significantly. (When I talk about home range in this context, I am referring to the area in which the deer spends the majority of its time outside the breeding season.) However, once the home range decreased to about 80 acres, we could not make it any smaller, no matter what we did. Hence, I proposed the minimum management unit size for deer be the 80-acre unit.

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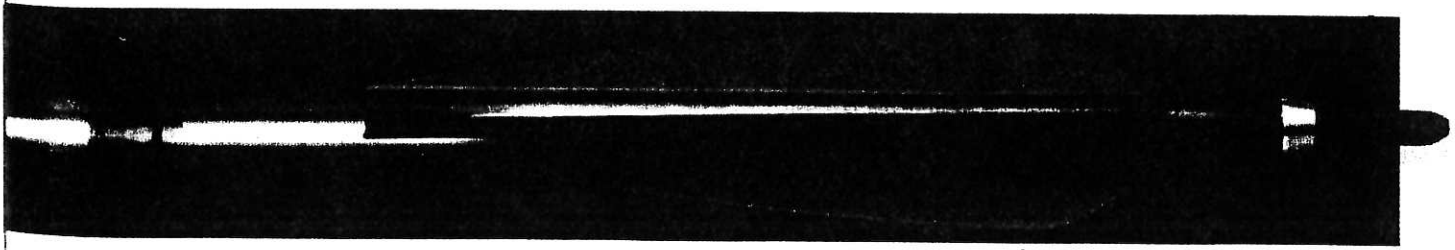
The next step was to examine how exactly deer were using their landscape and which elements had high utility and which did not. That is where our recent work with GPS technology has proved enlightening. Last year, my colleagues Jason Grogan, Ben Koerth and I undertook a study with the ambitious goal of obtaining a GPS location of every rub and scrape on the research area. (Fortunately, I have a number of graduate students who are young enough and enthusiastic enough to help with this work.) We are expanding this study during the 2002 research season to additional areas, as well as measuring forage utilization across the landscape. The map shown here presents the locations of all rubs and scrapes on the property.

Note that the pattern of rubs conforms to my earlier writings about travel corridors and sanctuaries. You literally can "connect the dots" to identify the travel corridors. Bed locations also are noted on the map, and these are also connected to the travel corridors. Certainly useful information for hunting, but on further examination, the study reveals a great deal more.

As the director of a high-tech research facility, I have the advantage of having access to some of the most sophisticated computer systems in the United States. We employ geographic information systems (GIS) in our day-to-day work on forest management. GIS allows us to produce layers of information, each representing a different analysis of the land. For example, one layer might represent soil types, another layer the type of forest cover. Using such systems, we can conduct very detailed analyses of the land. One such analysis is called "Krieging," which permits us to statistically analyze the spatial use of land by animals.

Applying this new technology to our dataset from the research center, we were able to produce a map that assigned probabilities to the use of our property by bucks (see map). You can clearly see how this type of analysis adds a great deal to the simple rub location map presented earlier. On this map, deer-use intensity is indicated by the intensity of color. The darker the color, the more intense the use. Just to show you how accurate such a methodology is, note the high-use locations indicated by the arrows. These areas turned out to be beds and sanctuaries, as identified by the GPS

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One of the goals of any management plan should be to improve the habitat. An abundance of good forage (such as American beautyberry, shown here) is a positive sign. Photo by Gordon Whittington.

locations of these features.

Even more interesting is the fact that we thought we had done a pretty good job of making the property "perfect" for deer. Yet notice the distinct areas that are *not* being used by bucks! It turns out that these are either mature hardwood stands or dense mixed-pine or pure-pine stands. In essence, they have less "utility" to our deer. Of course, this analysis of rubs and scrapes just looks at how bucks use their space from late summer into early winter, but it does show how deer view their world.

In upcoming issues, we will be presenting and analyzing properties from folks like you from around North America. In doing so, we will be applying the concept of landscape analysis to real-world situations, as well as showing you how to analyze your own hunting area.

(**Editor's note:** If you would like for Dr. Kroll to assess the management options for your hunting land in a future installment of this series, send a full description of the property and a rundown of its management history to: ***North American WHITETAIL***, P.O. Box 741, Dept. DF, Marietta, GA 30061. Due to Dr. Kroll's busy schedule, he can offer advice only for those properties selected for publication.)