Key Fundamentals Of Managing Your Deer

If you're trying to improve the whitetail population on your land, it's critical that you understand the factors that will determine your results. Here's an overview of what every private-land hunter needs to know.

by Dr. James C. Kroll

Interest in deer management is now spreading like a tidal wave across North America. However, among hunters and landowners, there is still much confusion over what can and cannot be done to improve a herd.

WHITETAIL's new emphasis on management is aimed at providing this information, to empower *you* to be in control of *your* deer hunting. Unfortunately, in many cases we biologists have been of little help in this regard. Almost every time we have discussed deer management over the years, we have ended with "Be sure to consult a professional biologist." In other words, "Don't try this at home . . . leave it to the pros."

As director of the Institute for White-tailed Deer Management and Research, I know many of you have both the interest and field experience to become effective managers of private lands, if you are not already. You really can build a "deer factory" on your property, no matter what its size or other limitations — if you have the right knowledge.

WHY YOU NEED TO KNOW HOW POPULATIONS WORK

In building your own "deer factory," the first step is to recognize the factors that influence a herd's size and composition. In my travels

A badly skewed buck:doe ratio is undesirable for several reasons. For starters, it's unnatural, disrupting the social structure of the herd. And, it makes harvesting trophy bucks even more difficult than it otherwise would be. Photo by Bill Lea.



across North America, I hear many questions directly related to this topic, among them the following:

"How many deer are on my land?"

"How many deer can my land carry?"

"How many deer can I harvest from my land?"

Not knowing the answers to these questions leaves you powerless to control the quality of your deer hunting. (Never look to your wildlife agency to solve problems on your land; it has far less control than you do over what happens there.) Indeed, most private-land hunters are missing out on the opportunity to greatly increase their harvest, for the simple reason that no one ever has taught them how to manage their herd.

WILDLIFE IS A CROP

The late Aldo Leopold, considered the father of wildlife management, understood that wildlife is simply an agricultural crop. As such, it is controlled by many of the same factors that determine land's ability to grow corn, wheat or cotton.

"How many deer will my land carry?" is the wrong question. The correct one is "How many deer will my land *produce*?" There is a real difference; after all, the productivity of agricultural land is measured in bushels per acre, not in the number of plants the land will hold!

It is safe to say a deer population grows only if fawns are born. But not all does bring fawns into the herd. Recent studies have shown that in many areas, only a small portion of the does actually have fawns that survive through their first year. In fact, in some places it now takes three does to get one fawn to its first birthday. Why? A lack of food results in undernourished does, which then cannot produce enough milk for rearing young. Many fawns — bucks and does alike — die in their first few weeks or months of life, never making a positive contribution to your hunting. Who cares how many wheat plants sprout in your field if they all wither and die before bearing a crop?

GETTING STARTED

As a manager, you ideally need to know: (1) the current herd size; (2) the number of deer being added each year; (3) the number of deer being removed each year; (4) the age structure; (5) the buck:doe ratio; and, most important, (6) your management goals. Let's examine these one by one, starting with the last.

Your Goals

The first question I ask any prospective deer manager is "What are your goals?" This is not always easy to answer.

I define "success" as achieving a goal; if the goal is not well-stated, success seldom follows. "Why, we want to shoot a whole lot of big bucks" is the most common answer to my question. However, that is not a goal; it is an *expectation*. A more correct statement of the goal would be something such as "We want to harvest eight mature bucks per year off this particular piece of land."

Now, that might be achievable under the circumstances, or it might not. Suppose you have only 10 acres. Is the goal realistic? Because deer are a crop, we must determine the ability of the land to produce them, with or without your help. It would be like "wanting" to produce 1,000 bushels of wheat from those 10 acres — not a reasonable expectation.

As David Morris noted last month, the production capacity of any land can be increased, and this clearly affects how attainable your goals are. But whether you improve your habitat or not, the fundamentals of how a deer herd works are the same.

We will be talking in much more detail about management goals as we get deeper into our coverage. For now, just be thinking about what you want out of your deer land and what you are willing to do to achieve that level of success. *(Continued)*

A BASIC MODEL FOR YOUR HERD

In order to get a handle on your land's deer population, you ideally need to know the following: (1) the current herd size; (2) how many fawns are being added each year; (3) how many deer are dying each year; (4) the herd's age structure; and (5) the buck:doe ratio. If you have at least fair estimates of these, it's simple to make projections of the herd's growth rate and harvest potential.

In the example below, we will begin with a herd of 80 adult deer in the fall of 1998 and show what that population would become by fall 2001, assuming a 50 percent fawn crop, 10 percent annual natural mortality for both sexes and all age-classes, and no harvest by hunters. The beginning buck:doe ratio will be 1:3 (20 bucks, 60 does).

	BUCKS	DOES	TOTAL
Fall 1998 adult deer	**20**	**60**	**80**
Fawns added	+15	+15	+30
Natural mortality	-4	-7	-11
Hunter harvest	-0	-0	-0
Fall 1999 adult deer	**31**	**68**	**99**
Fawns added	+17	+17	+34
Natural mortality	-5	-8	-13
Hunter harvest	-0	-0	-0
Fall 2000 adult deer	**43**	**77**	**120**
Fawns added	+20	+19	+39
Natural mortality	-6	-10	-16
Hunter harvest	-0	-0	-0
Fall 2001 adult deer	**57**	**86**	**143**

This shows that if no deer are taken by hunters, in just three years the adult population will almost double (from 80 deer to 143). Also, with half of the fawns being male, the buck:doe ratio will improve from 1:3 to 1:1.5. (The 20 antlered bucks we started with made up 25 percent of the original adult population, while the 57 antlered bucks we will end up with in fall 2001 will be 40 percent of our 143 adult deer at that time.)

Now, try coming up with a basic population model for your own land, estimating your starting numbers and then factoring in various levels of hunter harvest of both bucks and does.

How Many Deer Do You Have?

Counting deer has long been a perplexing problem for managers; indeed, few other "facts" have generated more distrust of biologists than have census results. The truth is, we seldom have a really accurate count of the deer on any piece of land. On a state/provincial level, the population sizes we see displayed so prominently in many magazines are merely the result of someone's "best guess." Only quite recently have we developed reliable techniques for counting deer, including using infrared-triggered monitors. (See the August, September and October issues for more on this new technology.)

But there is plenty of information to help you come up with a fair estimate of your herd's size, which can then be fine-tuned. For example, almost every wildlife agency has done studies on the ability of various types of land and habitat conditions to support deer. These estimates are often expressed by agency biologists as "deer per square mile," but from the perspective of the private-land manager, "acres per deer" is more relevant. While a biologist might say there are 20 deer per square mile, it makes more sense for a landowner to view that as 1 deer per 32 acres. (There are 640 acres in a square mile; dividing 640 by 20 gives us 32 acres per deer.)

When do we begin to count a deer as part of our herd: as soon as it is born, during its first fall, after it has survived its first hunting season or when it reaches its first birthday? Virtually all wildlife agencies refer to "fall" populations, which reflect estimated deer numbers just before hunting season opens. These figures include fawns (which are then only a few months old) as part of the herd. Because this method is so widely used, we at ***WHITETAIL*** also will refer to "fall" populations in our coverage of management topics.

Let's look at average densities for various habitat types and regions of North America, so you can start to get a feel for the number of deer on your land. Here are some ranges:

South and Southeast: 1 deer per 10 to 30 acres (21.3 to 64 acres per deer).

Woodland habitats without extremely harsh winter conditions or agriculture, such as Eastern U.S. woodlands: 1 deer per 10 to 20 acres (32 to 64 deer per square mile).

Semi-arid habitats without agriculture, such as South Texas: 1 deer per 20 to 30 acres (20 to 32 deer per square mile).

Extremely harsh habitats on the fringe of whitetail range, such as parts of Mexico or Canada: 1 deer per 50 to 100 acres (6.4 to 12.8 deer per square mile).

Fertile delta or intensively farmed habitats, such as many parts of the Midwest: 1 deer per 2 to 10 acres (64 to 320 deer per square mile). Note that this includes only true deer habitat, not open fields.

Because these are broad numbers, the deer population on your land might be quite different from what I have suggested for your region as a whole. Perhaps most of your acreage is made up of cattle pastures, while your neighbor's land is virtually all productive deer habitat. That clearly makes a difference. But these ranges at least give you a starting point for developing a management strategy.



When a buck enters his second year of life, he grows his first rack and gets figured into the herd's buck:doe ratio. Photo by Dick Mermon.

How Many Are Being Added?

There are several ways to estimate the number of deer being added to your herd each year. One of the best is through direct observation; keeping a written record of how many does and fawns are seen has been shown to give a good estimate of the fawn crop.

Estimates of the reproduction rate most often are expressed on a percentage basis; for example, if during late summer and fall you see only 2 fawns for every 5 adult does, you'd call it a 40 percent fawn crop. This "recruitment," as it's often called, can vary widely; it ranges from 10 percent to something over 100 percent (more fawns than does).

Any fawn that has survived until fall has effectively been recruited into the herd. This is far more relevant than trying to figure out how many fawns are being born; all that matters is how many actually survive to reach the cut-off date selected for determining the fall population.

How Many Are Being Removed?

Deer die in a variety of ways, and assessing annual non-hunting mortality is a rather inexact process. Even so, for the purpose of modeling, we can come up with average mortality rates that paint a reasonably accurate picture of what is going on with the herd.

In our sample population model on page 35, we have assumed an average annual natural mortality rate of 10 percent across the board. For getting started in managing your herd, this figure is accurate enough, even though actual mortality varies by sex and by age-class. (Fawns, both male and female, suffer from higher natural mortality rates than do adult deer, and bucks are more vulnerable to natural mortality than are does.) We will get into the specifics of these differences later.

What Is The Age Structure?

Every big buck obviously was once a yearling. Sadly, in most herds, the majority of these 1 1/2-year-olds are shot, while the does are allowed to live; the result is a population of old females and young males. If your desire is a well-balanced herd with good hunting for mature bucks, you need just the opposite.

Regardless of what else you do to manage your deer, a balanced age structure is paramount to producing more and better bucks, and letting young bucks walk is the only way to achieve this goal. The odds of a buck on your land living to at least age 3 1/2 must be considered as you develop a set of realistic goals for your management program.

Sex Ratios

The sex ratio of a herd, commonly expressed as the "buck:doe ratio," is another big piece of the population puzzle. This compares the number of antlered males to the number of adult females; that is, neither buck fawns nor doe fawns are included in

it. A buck:doe ratio of 1:4 thus indicates that the adult population is around 20 percent male, 80 percent female.

Across North America, the sex ratio ranges from around 1:1 (seen only in intensively managed herds) to around 1:8. The majority of herds have ratios somewhere in the middle of this range, as you might expect.

The same hunting pressure that eliminates many bucks as yearlings tends to skew the buck:doe ratio heavily toward the female side. But while herds often are said to have 15 or 20 does per buck, in truth such unbalanced numbers are impossible to create — even with very heavy pressure on bucks. Remember, roughly half of the fawns born each year are male, so there are almost always enough yearling bucks in a herd to keep the buck:doe ratio tighter than 1:8 (89 percent female).

Good observation records can give you a feel for the buck:doe ratio on your land. But remember that due to the nocturnal nature of bucks, there generally are more of them than daytime observation alone would indicate. Infrared-triggered cameras can help you literally get a clearer picture of the true ratio. In addition, your wildlife agency might have county-wide or regional estimates that would serve as a starting point.

The sex ratio obviously is critical in figuring out how many bucks are potentially available for harvest. And it greatly affects the intensity of observed rutting activity.

A REAL-WORLD EXAMPLE

Let's examine an actual situation to see how a population model can help us assess a herd. The tract is one I recently visited, a 1,280-acre Arkansas deer-hunting club that is managed by its members.

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The two square miles ("sections") of land have been managed for about 10 years now and have produced some fine bucks. But members never had really analyzed their land to see if they were doing a good job of managing the herd. My job was to help them arrive at an answer.

From the state agency, we learned that this type of habitat (mixed pine-hardwood) could support as many as 70 deer (adults and fawns combined) per square mile. That means the club *could* have 140 deer on their 1,280 acres (a deer per 9.1 acres). Of course, the animals can come and go at will, and they spend some time on neighbors' land. But this club has done an excellent job of protecting deer, so there is no reason for them to want to be on neighbors' land any more than on the club's land.

This club also keeps excellent records, including incidental deer sightings made by members as they travel about the acreage during the year. Amazingly, the 10 members (one per 128 acres) had accumulated some 1,000 observations of deer from August through October. From these sightings, we calculated the buck:doe ratio at 1:3 and a doe:fawn ratio of 2:1 (a 50 percent fawn crop).

Having this information allowed us to estimate that the club's land held an opening-day population of roughly 140 deer, approximately 100 of which were adults (non-fawns). Sightings suggested a buck:doe ratio of 1:3, so we broke these 100 adults into an estimated 25 bucks (100 divided by 4) and 75 does (100 minus 25) present. And finally, because bucks and does are born in almost equal numbers, on average, of the 40 fawns that had made it to Oct. 1, we assumed 20 were bucks and 20 were does.

You no doubt can see from this that compiling good records of deer sightings is a valuable way to learn a lot about your herd. Your original assumptions and estimates will not always prove correct, but as you observe and work with the herd, you can fine-tune the accuracy of your model, resulting in increasingly effective management. And the sooner you start, the sooner you will have the deer herd you want.

RAISING THE BAR

A biologist's traditional advice to a hunting club or private individual wanting to increase the number of mature bucks on a given piece of land has always been to reduce the buck harvest and learn to live within the limitations of the herd. That will work — but is it the best solution?

While reducing buck harvest is definitely one way to have more big bucks, we must recognize that it can have a downside. In the case of the club I visited, the total annual lease price is $4,500, so the 10 members each pay $450 per year for hunting privileges. For that, each expects to be able to shoot a mature buck every season. If they simply reduce the membership in order to produce more mature bucks, every remaining member will have to pay proportionately more to stay in the club. And dumping some members likely would cause hard feelings.

Good observation records can give you a feel for the buck:doe ratio on your land.

Conventional wisdom is that the club must take this route or simply live with things the way they now are. But as David Morris noted in our last issue, we have found that there is a better way. Through many years of research at Fort Perry Plantation, *WHITETAIL*'s deer-management research facility in Georgia, we now know it is possible to grow not only bigger deer, but also more of them. The secret is to combine the right harvest strategy with elevated nutrition.

Depending on the situation, this strategy, which we call "food-source management," can involve planting agricultural crops, managing native habitat and/or providing direct supplemental feed for deer. When these efforts are combined with a harvest strategy that removes the right number of the right deer at the right time, the result is more *and* bigger whitetails. In the case of the Arkansas club, that could well make the difference between successful long-term management and years of frustration.

Most deer hunters and landowners have not tapped the full potential of their acreage, simply because of a lack of knowledge about what can be done to improve their herds. Now, we at *WHITETAIL* are determined to change that, by giving you the know-how to control your hunting destiny. So join us next month as we get into the process of figuring out just how many of which deer you should be harvesting off your land.