BUILDING YOUR OWN
'DEER FACTORY'

# Herd Modeling For Bigger Bucks

*Once you've censused your property's deer herd, in just minutes you can determine how the annual harvest will affect your management program for years to come. Here's what you need to know.*

*by Gordon Whittington*

Gathering good data is one of the first and most important challenges you face in your efforts to develop a healthier, more balanced deer herd on your land. There's simply no substitute for such information, for it will drive every key decision you make as a whitetail manager.

As David Morris explained in the last two issues, you need to gather the following data: (1) total resident deer population; (2) buck:doe ratio; (3) age structure; (4) recruitment rate; and (5) mortality rate. Only by estimating these numbers, through censusing, can you make informed decisions about how to get the herd into balance and keep it that way.

Hopefully, by now you've started to come up with such estimates. Perhaps you've even begun trying to figure out what those numbers say about your herd. If so, you're on your way to becoming an effective manager, which ultimately should make you a more successful hunter as well. But just having information isn't the total answer. What you *do* with it is what really matters.

**YOUR HERD MODEL**

Reasonably accurate data will help you develop a good herd model. What's that? Simply a numerical representation of a deer population, indicating how it can be altered by changing one or more variables. (See Page 43.) In short, the model shows how various management decisions — especially harvest decisions — can change your herd over time.

Modeling lets you test the results of one management strategy vs. another without implementing either of them. This has two advantages over the trial-and-error "strategy" many landowners and hunters use. First, playing out a scenario on paper is quick. In just a few minutes, you can see an outcome that would take *years* to create in the field. And if one scenario doesn't pan out on paper, just pencil in new numbers and see where they lead. This greatly reduces your risk of making big mistakes in your management program — mistakes that would cost you time, money and frustration.

With modeling, when you finally conclude that a given plan of action is right for your herd, you can implement it with confidence. Of course, how successful you are in meeting your goals then will depend on how well the plan is executed.

**Modeling In Action**

The example on the facing page shows how a model can be used to predict the future of a herd. Your model might include other numbers in every one of the spaces, but the principles still will apply.

Going into the 1998 season, we estimate that this herd consists of 64 adult deer, with a buck:doe ratio of 1:3 (16 bucks and 48 does, with no fawns included in either group). Of the 16 antlered bucks, 12 are yearlings (age 1 1/2 years), while the other four are 2 1/2 years old.

Our responsibility as managers of the resource is to return the herd to a healthy state and keep it there. There should be three broad goals: (1) a total deer number that's within the limitations of the habitat; (2) a well-balanced buck:doe ratio; and (3) a well-balanced age structure. Does this herd meet these criteria? If not, what can we do about it?

First, by examining the habitat, we know the property is pretty well "maxed out" on deer. In other words, there's just enough good year-round food to keep the herd healthy at its present size. Although increasing the quality and quantity of forage (what we at ***WHITETAIL*** call "food-source" management) would raise the habitat's productive capacity, for now let's assume we're going to live within the current limitations of the land. In short, we'll consider 64 adult deer and their annual fawn crop to be all the whitetails we can handle.

What about that 1:3 buck:doe ratio? Although it might seem to be well-balanced, it's actually far from ideal. Remember, bucks and does are born in essentially equal numbers, so a "natural" sex ratio is closer to 1:1 than 1:3. Yes, we need enough does to produce enough buck fawns every year; however, the more food, cover

# HOW A HERD MODEL CAN HELP YOU

Once you've censused your hunting land to find out as much as possible about the deer population there, you can construct a herd model. Of course, the model won't be perfectly accurate, because you won't have perfect data; even so, the exercise will show you quite clearly what the trends are and how you can improve the herd's health. Below is an example of this concept in action.

The property in question is one that will be coming under "management" for the first time this year. Based on census results, the tract holds an estimated 64 resident adult deer. (An examination of the habitat suggests that this is the maximum number of deer it will hold without the animals being nutritionally stressed.)

The adult deer population is made up of an estimated 16 antlered bucks and 48 does (fawns not included), meaning it has a beginning buck:doe ratio of 1:3. In a "natural" herd, there should be fewer than two does for every buck. What has caused this wide gap? More hunting pressure on the bucks than on the does.

Censusing shows that most of the antlered bucks on the property are yearlings (age 1 1/2). This also is the result of too much hunting pressure on the bucks. The herd would be much healthier if a minimum of 30 percent of the adult males were at least 3 1/2 years of age. In short, we're looking at a herd composition that's out of balance, and the total herd size is threatening to expand beyond the capacity of the habitat. This is true even though in our example the recruitment rate (fawn crop) is only 50 percent annually, and the natural mortality rate (including all deer deaths other than those resulting from legal hunting) is 10 percent annually.

To bring the model to life, let's turn two hypothetical groups of hunters loose on this property and have them hunt there for three years. The first group (top chart) consists of persons who don't shoot many does and don't pass up any antlered bucks. The second group (bottom chart) is made up of hunters who understand that the herd's composition is out of whack, and they know that manipulating the harvest is the way to get it back in balance. Refer to the main text for an analysis of the results.

| | Bucks By Age-Class | | | | Total Bucks | Total Does | Total Deer | Buck:Doe Ratio |
|---|---|---|---|---|---|---|---|---|
| | Fawns | 1 1/2 | 2 1/2 | 3 1/2+ | | | | |
| **Fall 1998 adult deer** | | **12** | **4** | | **16** | **48** | **64** | **1:3** |
| Fawns added | 12 | | | | 12 | 12 | 24 | |
| Natural mortality | -1 | -1 | -1 | | -3 | -6 | -9 | |
| 1998 hunter harvest | -1 | -6 | -2 | | -9 | -4 | -13 | |
| **Fall 1999 adult deer** | | **10** | **5** | **1** | **16** | **50** | **66** | **1:3.1** |
| Fawns added | 12 | | | | 12 | 12 | 24 | |
| Natural mortality | -1 | -1 | | | -2 | -6 | -8 | |
| 1999 hunter harvest | -2 | -7 | -2 | | -11 | -3 | -14 | |
| **Fall 2000 adult deer** | | **9** | **2** | **4** | **15** | **53** | **68** | **1:3.5** |
| Fawns added | 13 | | | | 13 | 13 | 26 | |
| Natural mortality | -1 | -1 | | -1 | -3 | -7 | -10 | |
| 2000 hunter harvest | -1 | -5 | -1 | -1 | -8 | -4 | -12 | |
| **Fall 2001 adult deer** | | **11** | **3** | **3** | **17** | **55** | **72** | **1:3.2** |

| | Bucks By Age-Class | | | | Total Bucks | Total Does | Total Deer | Buck:Doe Ratio |
|---|---|---|---|---|---|---|---|---|
| | Fawns | 1 1/2 | 2 1/2 | 3 1/2+ | | | | |
| **Fall 1998 adult deer** | | **12** | **4** | | **16** | **48** | **64** | **1:3** |
| Fawns added | 12 | | | | 12 | 12 | 24 | |
| Natural mortality | -1 | -1 | -1 | | -3 | -6 | -9 | |
| 1998 hunter harvest | | | -2 | | -2 | -13 | -15 | |
| **Fall 1999 adult deer** | | **11** | **11** | **1** | **23** | **41** | **64** | **1:1.8** |
| Fawns added | 10 | | | | 10 | 10 | 20 | |
| Natural mortality | -1 | -1 | -1 | | -3 | -5 | -8 | |
| 1999 hunter harvest | | | -3 | | -3 | -9 | -12 | |
| **Fall 2000 adult deer** | | **9** | **10** | **8** | **27** | **37** | **64** | **1:1.4** |
| Fawns added | 9 | | | | 9 | 9 | 18 | |
| Natural mortality | -1 | -1 | -1 | -1 | -4 | -4 | -8 | |
| 2000 hunter harvest | | | -2 | -3 | -5 | -5 | -10 | |
| **Fall 2001 adult deer** | | **8** | **8** | **11** | **27** | **37** | **64** | **1:1.4** |

and water we use on does, the less there is for the bucks. Plus, the less balanced the buck:doe ratio is, the harder it is to control deer numbers.

Finally, we can see that the age structure of the bucks is far from what nature intends it to be. By our estimates, no buck in the herd is older than age 2 1/2. In a "natural" herd, we'd find a fair number of the bucks to be *at least* 3 1/2 years old.

Let's say our goal is threefold: (1) to keep the population in line with the current capacity of 64 adult deer; (2) to balance the sex ratio so that there are no more than three does for every two bucks (a 1:1.5 buck:doe ratio); and (3) to have at least 30 percent of the antlered bucks be at least 3 1/2 years old.

Can we do it? Let's find out.

**INDISCRIMINATE HARVEST**

Look at the top set of numbers in the model. They show what might happen if the land is hunted with no real regard for this herd's health.

What happens when these guys hit the woods in the fall of '98? Right off, they remove eight of the 16 antlered bucks. The hunters shoot just five antlerless deer, and one of these turns out to be a buck fawn ("button" buck), not a doe. In short, of the 13 hunter kills, nine are male. As a result, by the start of the '99 season, the buck:doe ratio has gone from 1:3 to 1:3.1, and because not enough does were taken, the total adult deer population has increased to 66.

This disturbing trend continues in the fall of '99. The hunters again hammer the young bucks, taking seven yearlings and two of the six bucks that are at least 2 1/2 years old. Throw in two more buck fawns, and a full 11 of the 14 deer taken are male. By the next season, the sex ratio has widened to 1:3.5, and the total number of adult deer on the property has climbed to 68.

During the third hunting season, eight of the 12 deer taken are bucks. By the next fall, the herd stands at 72 total adult deer — 12.5 percent more than we believe the habitat will carry in good health — and the buck:doe ratio has widened to 1:3.2. Bucks of at least age 3 1/2 make up only 19 percent of the adult males present. What's more, because the herd now is nutritionally stressed, none of the bucks is able to reach his genetic potential. In short, this model shows a herd that's *still* out of whack.

**A BALANCED STRATEGY**

Now, let's try a different approach. To illustrate, we'll bring in a group of hunters who recognize this herd's problems and are willing to do what's needed to bring it back into balance. (Their results are shown on in the bottom model on Page 43).

When these hunters realize that the herd contains too many does and too few bucks — mature bucks in particular — they adjust the harvest accordingly. They quickly begin shooting does, bagging 13 the first year. (But by exercising care in picking targets, they avoid shooting any buck fawns in the process.) The hunters also shoot no yearling bucks and end up with a total of two male deer taken, each 2 1/2 years old.

What are the results of this effort and restraint? By opening day of the '99 season, the estimated buck:doe ratio will stand at a relatively tight 1:1.8, and the total number of adult deer still will be a workable 64.

And it only gets better. With doe numbers now reduced, each year the harvest includes just enough females to keep total deer numbers from rising and to keep the buck:doe ratio in balance. Plus, with more bucks beyond age 1 1/2 available each year, the harvest of male deer can be bumped up. Still, all of the bucks taken are at least 2 1/2 years old.

The buck:doe ratio continues to tighten, leveling off at 1:1.4 even though the buck kill is rising. What's more, the average age of bucks in the harvest is rising rapidly. In the third year, there are three bucks of at least age 3 1/2 in the harvest, and by opening day of the fourth season, 37 percent of the antlered bucks in the herd are 3 1/2 or older! And remember, this is being done without exceeding the habitat's current limit of 64 adult deer.

**CONCLUSION**

As you start to work on your own model, don't be overly concerned about the accuracy of your data. For instance, if you think the recruitment rate is 60 percent but it's really 80 percent, you'll realize that over time and will be able to adjust your herd model accordingly. Just monitor any herd changes the best that you can, by close observation and good record keeping, and the model will become progressively more accurate.

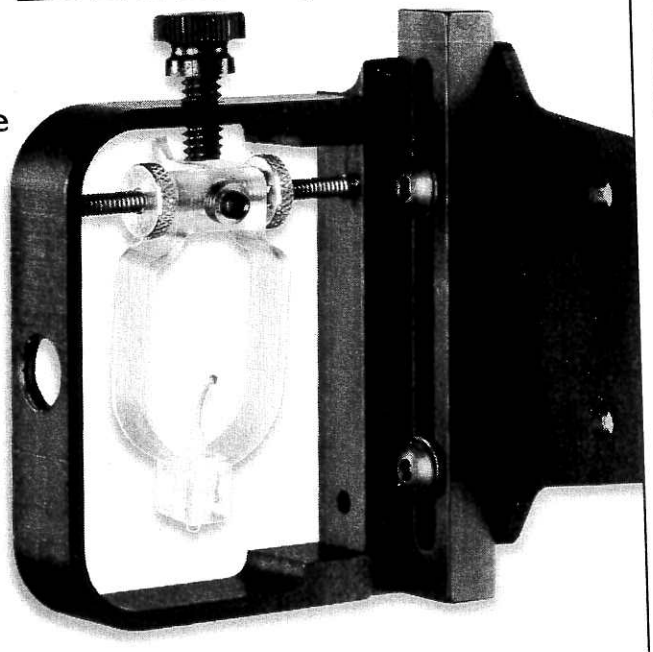
Next month, David Morris will tell how to develop the right harvest plan for your land. His advice will help you decide which deer you should harvest — and which deer you shouldn't — to reach your goals.


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