FEATURE

SUSTAINED YIELD HARVEST: A NEW WAY OF LOOKING AT MANAGING YOUR DEER

Part I—Understanding Sustained Yield Strategies

Dr. James C. Kroll

As one who has been in the "whitetail industry" for 34 years, it is amazing to see the boom in lands being managed for deer. Although there is no way yet to quantify it, I suspect there are millions of acres across the country being devoted specifically to deer management. With all this interest comes a variety of opinions and strategies on how to produce monster bucks; yet, little attention is paid to how many bucks the operator is producing.

Most landowners who manage for trophy whitetails fall into one of two groups: 1) those primarily interested in producing bucks scoring higher than anyone else (ego) and 2) those trying to make a living from deer (profit). Although there absolutely is nothing wrong with the first motivation, the second requires a much higher level of management input.

Some landowners are what I call "one-buck wonders," meaning they produce one or two big bucks per year on very large acreages. As my good friend, David Morris, once put it, "They have to inventory a lot of bucks." When you look at the average for the ranch, however, they pretty well fit into the general pattern, with the average mature buck having eight points and scoring about 130 Boone and Crockett (B&C).

Whether or not you are operating for profit, if you are going to all that effort, why not adopt a management strategy that maximizes mature buck production?

In this article, I will discuss what I have done over the last three decades to bring properties to the point of sustained yield. Please stick with me through this series because I promise you it will change how you think about deer management.

Sustained yield is a term most landowners have not heard about, although it has been around among biologists for years. My colleague, Dr. Billy Higginbotham, once asked my class, "What is the job of the fisheries biologist?" (Billy is not only a great wildlife biologist, but also has years of experience managing lakes and ponds.) After a good deal of discussion, the students gave up. "The answer is, to shorten the time between bites!" he said.

That set me to thinking about deer management. In reality, the job of the biologist or manager is to provide access to more quality or trophy bucks. If killing a monster buck on your land amounts to winning the lottery, you need to examine what you are doing. Let's look at some basics and then proceed to advise about how YOU can increase buck production on your land.

Sustained Yield, Maximum Sustained Yield and Optimum Sustained Yield

About 1975, I began thinking about some concepts that back then were relatively new in regard to game management. At that time, the mentality, essentially, was that you "mined" game from the land, rather than thinking of it as an agricultural crop.

Fisheries biologists were way ahead of us at that time, primarily because they were dealing with closed systems, such as ponds and lakes.

After reading a small paperback book by, of all things, an entomologist (a bug man) on population ecology, I began to wonder if sustained yield could be applied to deer, as well.

Sustained yield can be defined as the harvest of about the same number or weight of animals annually, theoretically forever. If you have a lawn, you can understand what I mean. Each week you go out, mow your lawn and then dutifully water and sometimes fertilize it. You then are "rewarded" by the grass growing to the same height it was the last time you mowed. Seems silly when you look at it that way. Yet, why couldn't deer herds be done the same way?

There are two types of deer management: extensive and intensive. The hoopla over deer management permits in Texas really results from philosophical differences between biologists who think deer should be managed according to the "natural" limits of the land and those who support the idea of intensifying management to produce more animals. Again, there is nothing wrong with either attitude, only those who feel their side is the right side on this issue.

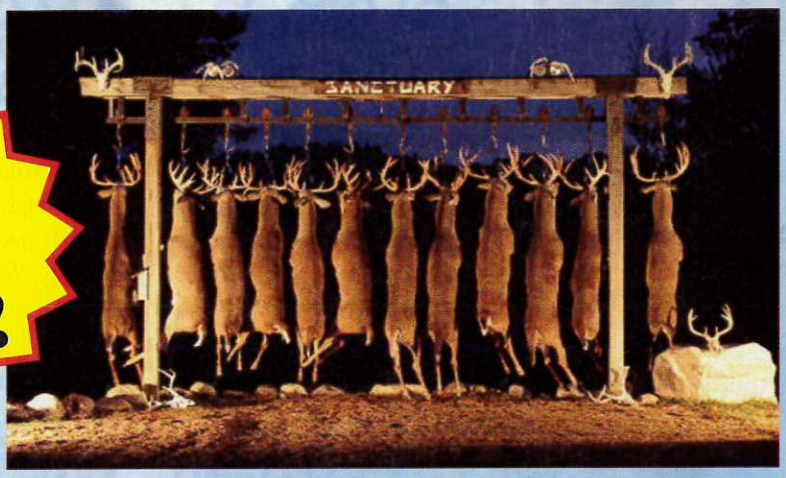
It may seem I am locked into a series of "2s," but there also are two situations in Texas for managing deer: site-limited and habitat-limited.

An example of site-limited management is South and West Texas, and the rest of the state represents the other. Each situation requires different management strategies, but you can have a sustained yield of deer in either setting.

The trick is to determine what your deer are doing, the quality of their nutrition and ultimately the number of deer being recruited into the herd annually. The term recruitment is important to understand. Most biologists talk in terms of fawn crop, which is expressed as a percentage figure. If your biologist or manager says you have a 60 percent fawn crop, he means you have 60 fawns per 100 does in the early fall.

The time interval is very important.

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increase at 20 percent annually, you would expect the more does present, the higher the recruitment.

Examine the two population curves in Figure 1. The straight line upward represents what you might expect if there were no impacts of habitat and nutrition, the other shows expected recruitment, taking into account the limits imposed by habitat/nutrition.

These curves are for a ranch with a maximum carrying capacity of 700 does and 60 percent recruitment. If there were no limits, you would expect 700 does to recruit 420 yearlings. But, the limits imposed by nutrition reduce actual recruitment as the herd gets larger. It is one of the most difficult concepts to get across to landowners that they can recruit more yearlings with less does on the range.

Returning to the graph, note the actual fawn crop curve peaks exactly one-half of carrying capacity, in this case 700 does. That turns out to be the point for MSY. Needless to say, when I came to this conclusion, I was pretty excited.

Immediately, I crafted a manuscript for publication, but when I showed it to my colleagues, they thought it was a dumb idea. "Why would anyone be interested in establishing a MSY harvest strategy for deer?" was their question. So, I put the idea on the shelf for a while.

In 1979, a biologist named Dale McCullough published an entire book on the subject of MSY in deer! The idea turned out not to be so "dumb" after all.

But, MSY only represents a management situation in which the goal is just to kill the most deer. It has little application to trophy deer management. This brings into the picture a middle ground concept, optimum sustained yield (OSY). It is the sustained yield harvest level that permits a maximum harvest of mature bucks.

One of the first questions I ask any landowner is, "What is your mature buck harvest density?" That is, what is the number of acres for each mature buck harvested? For some reason, the current "wisdom" is you can harvest a mature buck to 500-1,000 acres. I do not know where this came from, but it is not the point of OSY. It simply may or may not represent a sustained yield value.

As I said before, many operations are what I call "one-buck wonders." They produce one good buck a year, and hang their reputation on that buck. Both from an economic standpoint and a management standpoint, it makes little sense to have that kind of program. It is the number of trophy bucks being harvested annually that means something.

How do you reach the OSY level? You do so by paying attention to a long-term strategy involving: 1) detailed records from harvested deer; 2) a reliable estimate of recruitment; 3) a sound forage management program; and finally 4) genetics (culling, etc.).

You easily can manage a deer herd without a census, but you never can manage one without harvest records. Good records from each animal removed from the property are critical to your program, yet that is where most landowners fall short.

Age-related antler development, buck and doe age structure and lactation (proportion of does "in milk") data are mandatory. Age-specific antler data allow you to assess progress towards more trophy-class bucks at a younger age. Age structure data, both from harvested and live animals, permit you to assess the age structure of your herd. And, I already have discussed what recruitment estimates can do for you.

Lactation is just a way to estimate the fawn crop, assuming each lactating doe has brought at least one fawn to the fall. In most cases, genetics and culling are the last things you want to worry about.



DR. JAMES C. KROLL PHOTO

An interesting benefit of the sustained yield harvest program at Mustang Creek is the recovery of many browse species. Proper harvest, along with burning and other habitat management practices, have produced a healthy, productive habitat.

Fawns experience two periods (there I go again!) of major mortality, just after birth and just after weaning. Fawn crop is the result of post-natal mortality, while recruitment is the actual number of fawns that live to be one year of age; they are recruited into the population (Fig. 1). I do not care how many fawns you have in the fall, it's the number of deer recruited that matters.

In South Texas, this figure often falls below 15 percent. That is unacceptable, especially when you consider that's only the number that gets into the population as yearlings, not those that live to be mature bucks.

The best way to find out what your recruitment rate is would be to conduct some type of census in the fall, followed by another in the late winter-early spring period. If you are thinking about helicopter counts or spotlight counts, forget it! These have been shown time and again not to give a very accurate estimate of population size or composition. They give you an index, not a true estimate.

The most accurate ways to do this are large numbers of incidental sightings and/or infrared-triggered cameras. I usually require my hunters or landowners to carry a small index card with them every time they come to the property. On these cards they record each deer they see, the sex and relative age of each.

Another method is to use the infrared-triggered cameras at random locations around the property, using corn as bait. Do not use them at feeders because bucks tend to dominate and you will not get a reliable estimate. Just add up all photos of does and fawns and then calculate the doe/fawn ratio.

The best times are the late summer-early fall for fawn crop, and late winter-early spring for recruitment. Actually, I do not always recommend the fall count because what difference does it make how many fawns you have in the fall when it is the number going into the spring that counts? You no doubt will be surprised by the difference.

Once you have a recruitment estimate you need to examine it carefully. If it is very low, say 15-20 percent, you need to ask yourself what can be done to improve it? That may include feeding, food plots or habitat management, such as roller-chopping or timber harvest. Theoretically, you can harvest up to the annual recruitment without decreasing your herd. That would be your first approximation of sustained yield.

The next step is look at the average age of deer being harvested. If your buck age is not below 4-1/2 years, you probably are in good shape. Likewise, if the proportion of does in the 2-1/2 years or younger ages falls between 50-60 percent, you are in good shape. If the proportion falls below that range, you are not harvesting enough; more than 60 percent, you are taking too many does. Over time, you can "fine tune" the harvest.

If you think about it, there can be many solutions to obtaining a sustained yield on your property. Each population size has a point of sustained yield solution. That leads us to the next concept, maximum sustained yield (MSY).

Again, around 1975, I began thinking about sustained yield harvest strategies. If there could be several sustained yield levels for any herd, I thought, why could there not be a point where you could achieve a MSY harvest?

After a great number of mathematical calculations (most of which you do not want to know about), I arrived at a model for MSY.

Since, whitetails are what we call "K-strategists"—those species that live a relatively long time, have a small number of offspring each year and are controlled mostly by their habitat. It seemed logical habitat and nutrition could limit survival at higher population levels.

So, if our deer herd has a tendency to

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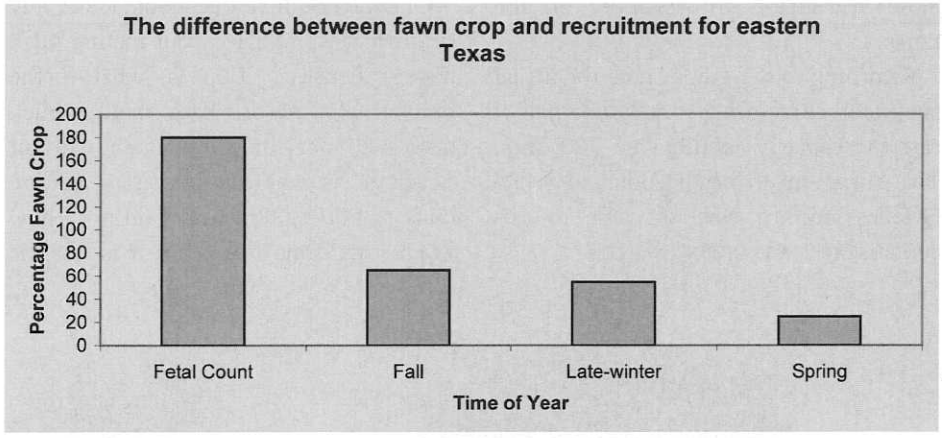


Figure 1. This chart shows you what happens to fawns from early fall to spring.

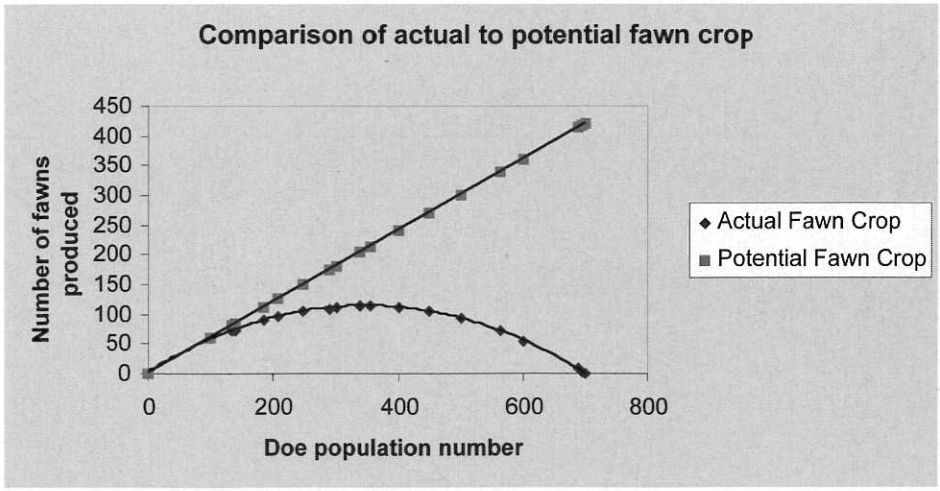


Figure 2. The two curves above illustrate the concept of maximum sustained yield (MSY).

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(I feel you will have to address all aspects of management, including proper harvest, records and attention to the nutrition of your deer.)

The next step is to implement a sound nutrition management program. Drive or walk around your property, stopping periodically to ask yourself, "What is there for deer to eat here on a year-round basis?" If the answer is, "Not much," then you need to determine what you can effectively do there to improve the situation.

Food plots certainly are the easiest way to improve nutrition, but if you do not have adequate rainfall when your deer need it, there is no reason to waste your money.

You may then want to opt for "rainfall in a bag," or feed. Feeding can be quite expensive, especially if you are maintaining far more does than you really need. Remember, you are running a "momma cow" operation. You only need enough does to produce an OSY of mature bucks. The rest are of no use to you.

I can think of no program in which habitat management is not a factor. Even if you plant food plots or feed, you still have to manage your native habitat. In producing large amounts of forage, remember a deer's world is only from the ground up to about four feet. If there is nothing to eat in this deer zone, you are not realizing your true productive capacity.

Practices such as roller-chopping, discing, burning and timber harvest/thinning all increase the quantity and quality of forage. Fertilization often increases nutritional quality of your plants, as well.

Too many landowners treat management as a buffet line. You get your tray, walk down the line and pick out the things you like to eat. Unfortunately, management does not work this way. You cannot choose which practices you like and which you do not. It is a package deal—take it all or none at all.

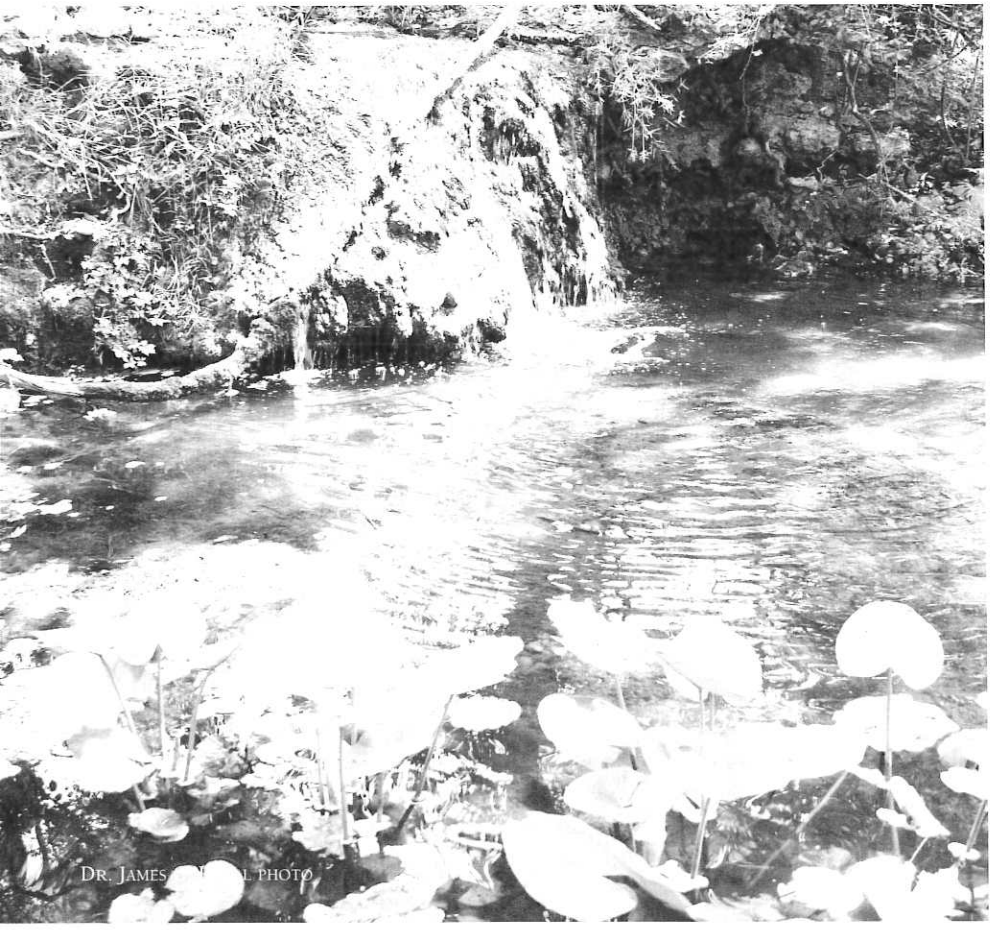
So, to summarize this first segment of the two-part series, deer herds can produce a sustained yield of bucks for harvest. There are several points as the population grows where there can be sustained yield.

The point where you can harvest the most animals is called the point of maximum sustained yield. However, MSY does not allow you to produce large numbers of mature bucks. Optimum sustained yield, then, is the point where you harvest the most mature bucks on a sustained yield basis. In order to find this point, you have to keep sound records on recruitment, age distribution and age-specific antler quality.

Finally, in order to maximize mature buck production, you will have to put a lot of input into your habitat, as well as provide supplemental feed in the form of food plots or pelleted ration.

Now, that was not so painful, was it?

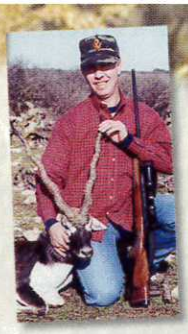
In the next issue I will show you real life examples of this concept, highlighting Mustang Creek Ranch, where we have harvested a mature buck to 50 acres for years. After reading the final installment, I promise you will never look at your deer herd in the same way again.



DR. JAMES [illegible] L PHOTO

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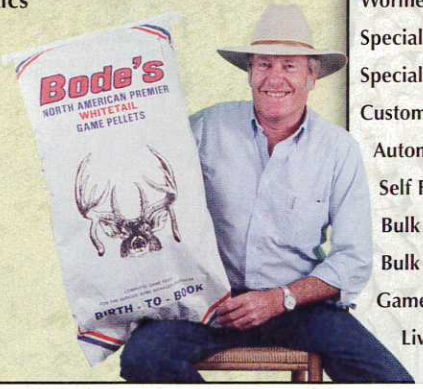
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