The information that you can glean from trail cameras is invaluable. You must know what you are dealing with. Otherwise, how do you know what type of management strategy to implement?

There’s a saying in business that goes something like “If you can’t measure it, you can’t manage it”. The same is true for deer management. We spend a significant amount of time and money planting high quality, year round food plots and managing our deer herds and habitats. You may feel like you’ve seen incremental increases in the quality of your deer and deer hunting; however, without solid baseline data followed up with accurate record keeping and trends you just don’t have an accurate method for measuring what you’re managing. Are you shooting too many does? Perhaps you need to ramp up your doe harvest quota or remove a few mature bucks that just don’t match your expectations for antler quality.

Think back to the first time you were introduced to trail cameras. Perhaps you received one as a gift or you picked one up at an outdoor show or retail outlet. It’s likely that all of us experienced the same level of excitement the first time.
we retrieved the memory card or developed the pictures (yes, we used film cameras for many years prior to the introduction and domination of digital camera technology). My first major introduction to trail cameras and their operation was slightly different that most. I had just left my home state of Pennsylvania to acquire a degree in wildlife science at Mississippi State University in Starkville, MS. At the time there were only two major trail camera manufacturers, only one of which was utilized by the hunting community. Very few, if any, hunters were using them as a scouting tool. Furthermore, those early units were typically very crude compared to what we’re used to today, oftentimes consisting of multiple pieces of equipment systematically installed on a tree or post. It’s actually comical to think back to the tricks and innovation we employed to mount a camera unit with up to five separate components: a transmitter, a receiver, a tripod, a camera, and a camera cover.

That summer leading up to my freshman year in college I was hired by a graduate student who was working with trail cameras and studying their effectiveness as tools for observational research and population censusing techniques. Another graduate student at MSU, William McKinley, followed up that research with his own detailed analysis of the accuracy of the camera technique for surveying and estimating deer densities and population characteristics. Of course, I was eager to work on William’s project as well.

Thirteen years later with 8 years under our belts commercially conducting trail camera surveys for clients across the whitetails’ range and we have come to rely on quality trail cameras for surveying current herd conditions and for tracking progress in our management programs. In fact, camera surveys are typically a baseline starting point when we begin working with new clients as the reality is valuable harvest and observational data are rarely available (though we wish it were)! Camera surveys provide a photographic documentation of exactly what we’re working with. From the time we begin viewing client’s photos they read like a history book and they certainly don’t lie! How have you been managing your deer herd?

Successive camera surveys in years to follow allow us to track deer herd characteristics and isolate any concerning trends. Furthermore, multiple years worth of data allow us to evaluate the level of success our management efforts (i.e. food plots) have had on the herd. Ultimately, management decisions are refined or adapted to drive these trends in a desirable direction. Are you harvesting too many does or not enough? Perhaps you’re harvesting the wrong bucks or your antler restriction criteria have resulted in mature bucks that don’t necessarily carry the type of headgear you’re shooting for. Maybe you’re experiencing frighteningly low fawn recruitment rates due to unnaturally high predator densities, poor fawning habitat, or both.

This article will give you a snapshot view of how trail cameras have helped us produce consistent, positive and desired results for clients. Just like high quality food plots, habitat improvement projects, timber stand improvement, thermal cover establishment, refuge, tree plantings and water developments, properly conducted and well thought out trail camera surveys are valuable tools that allow us to tweak our overall deer management programs to ultimately produce healthy deer herds and quality hunting experiences.

For decades now deer biologists and managers have been studying key population characteristics that offer accurate insight into the current condition of not only the deer herd being surveyed but also on the current habitat and hunting conditions. The key population characteristics that I want you to start tracking on your deer herd include: estimated density (population), adult sex ratio (buck:doe), buck age structure, antler quality, and the fawn recruitment rate (fawn:doe ratio).

### Density Estimate

When I talk to hunters about camera surveys, they are generally most concerned with the total number of deer that utilize their property during the hunting season. They typically want to prove that they have been right all along, deer numbers are declining. While it is an interesting piece of the
puzzle to estimate and track, it is important to realize that your density estimate is only one small piece of the survey puzzle. Furthermore, identifiable trends (i.e. consistent decline) from multiple years worth of density estimates is far more valuable than any particular year singled out.

Density estimates derived from camera surveys define a “population” contained within the study area whether it is 100 acres or 100,000 acres. However, free-ranging deer are more than likely crossing property boundaries throughout the year. Reported home-range sizes of white-tailed deer vary across their range as well as during the rut, fawning, winter and other times of year. One thing is for sure, if we capture a buck on film we know we have the opportunity to impress him with what we’re growing and managing for his benefit.

Other factors that can affect home-range size include sex, age and the quality and diversity of the habitat. Most landowners and hunting clubs do not control enough acreage to keep deer from wandering off their properties at some point. Also, some animals that are on the property never show up on film. Therefore, it is important to keep in mind that your density results reflect a “snapshot” taken during your survey period.

When making management decisions from deer density estimates, always compare trends in your data over time. Never make crucial decisions from one survey. To truly gain insight into your deer herd you need to repeat your camera survey annually and repeat your methods and timing exactly. The key to estimating deer density with infrared-triggered cameras is to keep your methods consistent from year to year and "capture" as many photographs of deer as possible. Record camera station locations with a hand-held GPS unit, and operate your camera surveys for 10-14 days to pick up as many animals as possible. Research shows that camera surveys lasting longer than 14 days are not cost effective and do not significantly increase accuracy.

We maintain simple bar graphs of the “total estimated population” (and all other population characteristics) from all of our annual camera surveys. Since methods remain consistent, we can isolate trends in response to the management program. Even when you maintain consistent survey methods from year to year, many variables may affect your results. For example, when acorns or other mast is abundant, your bait piles face some stiff competition. Perhaps the opposite is true and a poor mast crop year has led to increased activity at your bait sites. Always remain aware of this possibility and seek assistance while interpreting your data if something seems out of whack. Oftentimes there may be something minor impacting your results; however, sometimes there are multiple red flags just under your radar that are creeping up and will ultimately negatively impact your hunting success.

Even though the value in your data lies in trends, most managers still want to hear a number — a target density. Unfortunately, I can’t give you a rule of thumb that covers...
the entire range of the whitetail. Contact your state or regional wildlife biologist, communicate your goals for your property, and ask them to help you develop a target deer density for your region, goals and habitat type.

Adult Sex Ratio

Whether obtained from field observation data, camera surveys, or preferably, a combination of the two, the adult sex ratio can tell you a lot about a deer population. Much has been written about sex ratios in white-tailed deer and for good reason – it is a very important indicator of deer herd condition. Fortunately, this ratio is relatively easy to manage through regulation of the trigger finger. As long as your antlerless harvest program is improving the adult sex ratio, you are headed in the right direction.

Most adult sex ratios across the white-tailed deer’s range are skewed toward females. Research identifies several negative factors that skewed sex ratios have on deer populations, including prolonged breeding and fawning periods, increased post-rut mortality on bucks, decreased competition for does during the rut, and increased rut-related stress on young bucks, just to name a few.

Adult sex ratio is managed with the landowner’s desired population composition goals in mind. Although these goals are often extremely diverse, most management programs aim for one adult male for every one to two adult females. We have found that most of our clients are very satisfied when our estimates reach an adult buck:doe ratio of 1:2. This target ratio is only obtained through a restraint in harvesting young bucks and moderate to aggressive doe harvesting. After a few years of data collection and harvest adjustments, you will begin to notice trends. I suggest maintaining simple bar graphs with a “quality zone” at 1:1.5 or a number that you feel comfortable with. These simple graphs provide visual illustrations of your programs progress.

Adult Buck Age Structure

Graphing the number of individual bucks photographed (with age estimates assigned) in your annual camera surveys is not only fun; but, it also serves as an excellent gauge when assessing your ability to protect immature bucks from harvest. Providing secure cover and refuge for young and middle-aged bucks on your property during the hunting season is crucial to maximizing the number of bucks that will reach the older age classes.

As previously mentioned, you are bound to lose bucks to neighbors during the hunting season. The extent to which this affects your management program can be minimized with a detailed management plan that focuses on property layout or “deer landscaping.” Ultimately, the success of your deer management program is largely dependent upon your ability to protect immature bucks from premature harvest. Furthermore, surveying the buck age structure allows you to set expectations for what you can harvest during the upcoming hunting season.

Fawn Recruitment Rate

One of the best indicators of deer herd condition in relationship to habitat quality is fawn recruitment. The recruitment rate refers to the number of fawns that survive and are introduced into the fall deer herd (their first hunting season). This is quite different than the fawn crop estimate, or number of fawns actually born. Research has identified a strong correlation between habitat quality and fawn recruitment rates. In general, as a deer population increases beyond the carrying capacity of the habitat, the number of fawns recruited annually decrease. Biologists refer to this as an inverse relationship. In low-density populations where high-quality food is plentiful, twin fawns are the norm and triplets are seen quite often. Under these circumstances many female yearling does, and even some fawn does, will breed and produce fawns. On the other hand, as the population density increases, competition for food also increases, and fewer adult does give birth to twins while many yearling does fail to produce fawns.

Again, it is helpful to graph fawn recruitment rates using a quality zone that represents a goal for your specific management plan. Like density and sex ratio, this number varies dramatically across the whitetail’s range.

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While a general rule of thumb is difficult, most managers shoot for a fawn recruitment rate of at least 0.75 fawns that survive to the opening day of the hunting season for each adult doe in the population. If your results yield 35 fawns and 59 adult does, your fawn recruitment is 35 divided by 59, or 0.59 fawns/adult doe. Note that in extremely productive areas, fawn recruitment can exceed 1.0, whereas in extremely poor areas fawn crops of less than 0.20 are possible.

**Estimated Antler B&C Scores (antler quality)**

Finally, photos of the bucks that utilize your property provide an opportunity for you to assess antler quality and estimate B&C scores of any bucks that you deem “shooters”. We take this a step further and attach an estimated age to each buck. We then create “shoot/don’t shoot” photo albums for our client’s detailing which bucks are available for harvest and which bucks we want them to pass, all based on their specific goals and objectives.

Hopefully, I’ve done my job here and you understand how surveying your deer herd can lead to healthier deer herds and quality hunting experiences. With the incredible food plot products on the market today I suspect you will see an improvement in buck quality and herd conditions just by incorporating them into your program.

Stay tuned for a just in time article in the summer issue of Farming for Wildlife on how you can unlock the key characteristics of your deer herd using your trail cameras as I explain how we conduct trail camera surveys for our clients.