

Deer Census Techniques

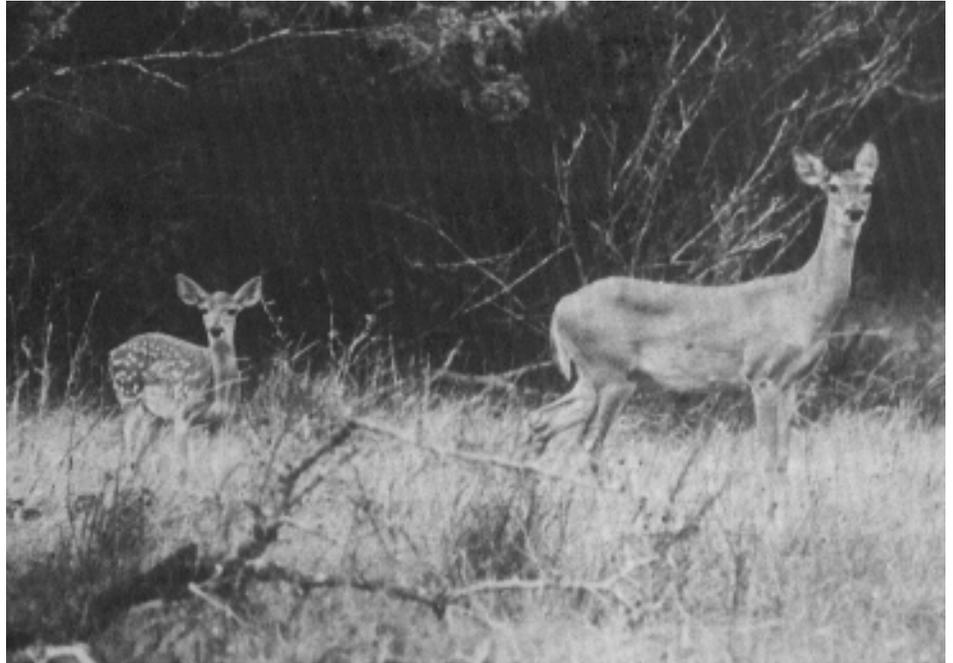
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Why Count Deer?

The white-tailed deer is the No. 1 big game animal in Texas. In fact, Texas has more whitetails than any other state. We harvest more deer annually than most states have in their entire herds. This resource provides tremendous hunting recreation for Texans as well as over 16 million pounds of boneless venison each year.

The great bulk of these animals live on privately owned farms and ranches. Our state is composed of over 95 percent privately owned lands. The harvestable surpluses of deer and other game animals provide landowners with opportunities for increased agricultural income through hunting leases. Continued high quality hunting recreation and increased ranch income are dependent on how well deer herds are managed.

Good deer management doesn't "just happen." It requires a basic understanding of how deer live and how they fit into the range management programs on ranches devoted to livestock-wildlife production. The nutritional requirements must be understood and applied to the vegetative types that exist on the range. For this reason, the number of deer present must be accurately estimated so that populations can



be balanced with food supply and livestock which compete for the food supply.

Certainly the ideal situation would be to have a complete count or census of all deer on a particular ranch or in a particular pasture. Unfortunately, complete counts of deer are nearly impossible to obtain, even where animals are confined under a high fence. Unlike domestic livestock which can be rounded up and counted, deer do not confine their activities to large herd groups and cannot be rounded up successfully. For this reason, sample census methods must be used.

Wildlife biologists have had to rely on various sample census tech-

niques to estimate wild populations. The basic principle involved is that if wildlife numbers can be estimated on a known area which is representative of a larger area, those estimates can be applied to the larger area. The key is to sample the study area as well as possible and make sure it is representative of the habitat type the estimates will be used on. For example, if a sample is taken only in heavy juniper stands, the population estimates could not be well used in an open oak savannah.

It must be recognized that censuses are estimates and, therefore, subject to some error. Wildlife managers have done a good job if their estimate is within plus or minus 10 percent of the actual population.

Since deer are living creatures capable of responding to slightly decreased numbers with increased survival of young, these errors are quite tolerable for management purposes and to dictate harvest levels. In fact, where population estimates are carefully made each year under as nearly the same conditions as possible, the trends are as important, if not more important, than the actual numbers in any one year.

In some parts of the country, "sign" can be used to estimate deer herd densities. For example, where mule deer migrate from summer to winter ranges, track counts can be used along migration routes. Or, where deer are the main large herbivores, the condition of major food plants gives an indicator of use and, therefore, population density. When highly palatable plants are being heavily used as well as some plants of secondary importance, deer numbers should be reduced to prevent range depletion. In our area, however, the most widely used census techniques are "strip census" ones which entail counting deer over a known route and estimating the acreage observed.

Before discussing these techniques in detail, however, it is important to remember that herd composition is as important as total numbers. Buck:doe ratios tell us how much of the harvest should be composed of females and how much of males. Some ranchers, biologists, and hunters believe an ideal situation would be a 1:1 ratio as this reflects the approximate way the animals

are replaced by births; however, to maintain a deer population at this ratio requires intensive management. In practice a ratio of 1 buck to 2 does is not bad. As these ratios get higher, however, the number of harvestable bucks is decreased. In a herd at carrying capacity, a 1:10 buck:doe ratio tells us we have too many females and fewer bucks to harvest. If meat production was the only goal, this would not necessarily be bad. However, the consumer (hunter) is primarily interested in harvesting bucks. Thus, the rule of thumb is to harvest bucks and does based on the ratios that the census indicate.

Another important ratio which we can get from a census is that of fawns per doe. This gives us an indication of herd health since reproduction will be low when females are stressed as by poor nutrition on depleted ranges. In good deer habitat, adult females tend to have twins with triplets not being uncommon. In marginal to poor habitat, singles become the rule and fawn survival is decreased. The number of fawns produced and their survival is important to future hunting seasons.

Deer Census Methods

Three types of census that can be used by private landowners to census deer on their property are the Hahn, Spotlight, and Mobile Line techniques. All are designed to be used just prior to hunting seasons (usually October) and do not require the use of special equipment.

These three methods determine deer populations by observing animals on a calculated number of acres. In other words, a census line is established by determining the number of acres which can be seen along a given route. Dividing the number of acres by the number of deer seen gives an estimate of the population expressed as acres per deer. This number, when based on a representative sample can be expanded to estimate the number of deer on a given ranch.

To determine the number of acres observed along the route the distances which deer can be seen to the right and left of the line are measured at regular intervals. When these distances are totaled and divided by the number of stops, an average width of the census strip is calculated. The average width (usually in yards) is then multiplied by the length of the line (in yards). This will give square yards in the sample and square yards divided by 4,840 (sq. yds. per acre) will give acres seen.

The visibility can also be determined from an aerial photo, although most people prefer ground estimates.

One general rule to follow in measuring acreage is that distances are not measured across an open draw or gully and deer are not counted across the draw or gully. Also, distances are not to exceed 250 yds. to the right or left of the line and deer are not counted past these distances. All lines should be well marked to insure the same route is followed in future years. This is normally not a problem with

Example:

A line two miles long is walked and, based on the visibility to the right and left at 100 yd. intervals, the average width is 150 yds.

$2 \text{ miles} \times 1,760 \text{ yds/mile} = 3,520 \text{ yds. strip length}$

$3,520 \text{ yds. (strip length)} \times 150 \text{ yds. (average width)} = 528,000 \text{ sq. yds. observed}$

$528,000 \text{ sq. yds.} \div 4,840 \text{ sq. yds./acre} = 109 \text{ acres observed}$

If 11 deer were observed, the density would be $109 \text{ acres} \div 11 \text{ deer} = 9.9 \text{ acres per deer}$.

driving lines on roads but walking (Hahn) lines should be clearly marked with fence posts, trees, or piles of rocks spot-painted with brightly colored paint.

Hahn Line

A Hahn line (named for Henry Hahn who devised the technique) is a strip census in which numbers of deer are counted along a 2-mile strip by one man walking. The general directions for establishing and using a Hahn line are as follows:

1. The line should be laid out on an east-west axis and always walked from west to east in the evening (sun at observer's back). It may be 1-3 miles long with 2 miles being optimum.
2. Visibility should be taken at 100 yard intervals along the line. In establishing the line, two men are used. One stays on the line and the other walks out at right angles. When the walker disappears from view in the brush, the line man signals him to stop and the distance walked is the visibility.

3. One line per 1,000 acres should be established if possible.
4. The line should be walked at least twice and the results averaged. The more times it is walked the more precise the count will be.
5. The line should be walked in late September or October. Start the line 30 minutes prior to official sunset for a 2-mile line.
6. All deer observed should be recorded. When possible they should be identified as bucks, does, or fawns.
7. The weather conditions are important. Ideal weather would be a southerly wind less than 15 mph, a cloud of less than 50%, and a relative humidity of less than 70%.
8. The Hahn method is accurate on ranges with high deer densities like the Edwards Plateau. The reliability decreases with low deer populations.

Spotlight Census

The spotlight technique involves counting deer at night using a vehicle (preferably a pickup). One person drives the vehicle and preferably two people count deer and make visibility estimates from the bed of the truck. Aircraft or high intensity spotlights are used. This is considered the most consistent method of deer census. However, while it provides a valuable density data and is easy to do, it does not work as well for composition (buck:doe, doe:fawn) data. For this reason, a daylight mobile line may be run to assist in obtaining this information. The criteria for a spotlight line are as follows:

1. The count should be started 45 minutes to 1 hour after official sunset.
2. The driver should not exceed 10 mph. On ranch roads 5-7 mph is preferable.
3. Texas Parks and Wildlife uses lines at least 15 miles long. Shorter lines may be used on a ranch but should be run frequently.
4. Visibility is taken at 1/10 mile intervals along the route.
5. Winds should be less than 20 mph and cloud cover less than 50%. Relative humidity should be less than 70%.
6. Record all deer observed within the sample area. Identify as to sex and age when possible.
7. The local game warden should always be contacted prior to the

count and advised of spotlighting activities, time of spotlighting, and exact location of the activity. No weapons should be carried in the vehicle.

Mobile Line

This technique involves one person driving a vehicle over a marked route to count deer on a measured acreage. It can also be used to count deer without estimating acreage for buck:doe and doe:fawn ratios. It is the least accurate of the three techniques for density figures. The criteria are as follows:

1. The line should run west to east and be approximately 7 miles long if possible.
2. The census should be started 30 minutes before official sundown for a 7-mile line.
3. Weather conditions should be southerly wind less than 15 mph, cloud cover less than 50% and relative humidity less than 70%.
4. Visibility should be taken to the right and left at 2/10 mile intervals if a density estimate is desired.

Other Information

Certain other observations can be made which will increase the reliability of census methods. Some of these are:

1. **Casual Observations:** Keep records of all deer seen from August until the opening of

hunting season. Use binoculars to class deer as bucks, does, fawns, and undetermined. This will help verify buck:doe and doe:fawn ratios.

2. **Watch Vegetation:** Deer feed primarily on forbs (broad-leafed plants sometimes classed as weeds) and browse. Watch these indicator plants to determine too heavy deer use or heavy competition from livestock.
3. **Harvest Records:** Quality of deer in the harvest can say a lot about what is happening in a deer herd. Recording antler size, body weights, and body condition are all important. However, they must be related to age. Each deer should be aged to see if it is a young deer doing well or an older deer doing poorly. Texas Parks and Wildlife or your County Extension Agent can provide you with materials to learn about how to age deer. These records from harvested animals will be useful in years to come to evaluate the progress of your management program.

Remember, all census information is trend data. Annual records should be retained to compare population trends and to assist in determining the impact of management practices.



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