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## Trail Camera Census

**By Charles A. DeYoung**

Use of remotely triggered “trail cameras” has exploded among hunters in recent years. For confirmation of this phenomena, one has only to review catalogs of the large array of outdoor gear companies offering these devices. Trail cameras have also been used by deer biologists and managers to gain scientific and management information on deer herds. Harry Jacobson, James Kroll, and associates first published on using trail cameras to census deer in 1997.

CKWRI graduate students Aaron Foley and Matt Moore have been studying facets of trail camera census as part of our large Comanche-Faith project in Dimmit County. Aaron and Matt used known numbers of tagged deer in 12, 200-acre enclosures to test assumptions about trail camera census. This eNews details some of their findings.

The basic approach to calculating a population estimate from trail camera photos is to first tally the number of individual bucks seen in photos on a property. Identification is based mainly on antler characteristics, but sometimes other factors. Then, it is assumed that does and fawns are seen at the same rate as bucks, and a population estimate is calculated as follows:

1. Determine number of individual bucks in photos.
2. Calculate the ratio of does:bucks in photos by dividing number of does in photos by number of bucks in photos
3. For estimated number of does, multiply #1 times #2.
4. Calculate the ratio of fawns:does in photos by dividing the number of fawns in photos by number of does in photos
5. For estimated number of fawns, multiply #3 times #4
6. For population estimate, add #1 plus #3 plus #5

Camera density (acres per individual camera) is important and of course the more cameras, the better. Aaron and Matt used 1 camera per 50 acres. The standard length of a camera census is 14 days and they are usually done over corn bait, although feeder sites and water troughs can be used. There are many considerations in deciding when to conduct a camera survey. First, bucks must have full grown antlers, limiting surveys to September through February. Second, early surveys allow collection of data useful for the upcoming hunting season, but are more likely to underestimate fawns.

Third, deer may be more likely to come to bait later in the season, increasing the chances of getting a photo of each deer. Finally, the ability to distinguish fawns and does declines over time and may be difficult in February.

Results of the research showed the camera population estimate underestimated the actual marked deer population by 7-53%, averaging about 30%. This resulted primarily from bucks showing up more often in photos versus does. Fawns were badly underestimated in the fall, with better fawn estimates obtained during winter surveys.

Matt Moore did research outside the 200 acre enclosures by comparing a camera census estimate of population size with a helicopter survey on the same pasture. The helicopter coverage was 67% of the 5,654 acre pasture or 3,788 acres. The camera survey covered 1,500 acres of the pasture. Despite the difference in acreage covered, the camera survey resulted in 75 individual bucks identified versus 33 seen by helicopter. Thus, if similar sampling intensities are used, camera survey will result in sighting more bucks on a property with the added advantage of a photo record for each animal.

So, what is the bottom line on trail camera censuses of deer? Although the trail camera method underestimated populations, it did so less than has been reported for helicopter surveys (about 70% of the population estimated by camera versus 33-40% by helicopter). Trail cameras over bait probably do not produce good sex ratio estimates whereas sex ratios obtained by helicopter surveys are unbiased (although variable from count-to-count). Both camera and helicopter surveys tend to underestimate fawns. Cameras surveys can be conducted in heavy woody cover whereas helicopter surveys are best done in semi-open country.

***Manager's Tip***

If you want to do a deer population estimate that is the best today's technology affords, conduct BOTH a helicopter survey and a camera survey. Using the six steps listed for calculating a camera population estimate, substitute the helicopter survey data for #2 (sex ratio) and #4 (fawns per doe). Matt Moore found that he was able to count 90% of the known bucks in the Comanche-Faith project using cameras, so for this area of Texas, the buck census from cameras is very accurate. Moreover, previous CKWRI research has shown that sex ratios and fawns/doe obtained by helicopter are less biased than those obtained by camera. With these substitutions, calculate the population estimate using the mix of camera and helicopter data.

Camera surveys are usually employed on smaller properties because they work best if a high camera density is used (i.e. one camera to 50-100 acres). Using this camera density on a property of several thousand acres would require lots of cameras and labor. Cameras can be rotated around a property every two weeks to reduce the total number needed. On the other hand, quality cameras can last for years if properly cared for, and used repeatedly. Thus, managers may want to pencil out the costs of the two techniques over several years.

There is no doubt that trail camera census should be considered along with helicopter surveys and spotlight surveys for gaining management information on deer herds. All methods have disadvantages and managers should pick one based on the unique mix of factors on each property.

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