



Estimating Wildlife Numbers

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Fact Sheet 12

Forestry and Natural Resources

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The landscape of diverse habitats across South Carolina provides many of the survival needs of wildlife. The diversity of vegetation provides excellent cover for wildlife; however, it greatly eliminates the ability to directly count all wildlife in a given area. In addition, most wildlife species are secretive by their very nature, and usually will not hold still long enough to be counted. Therefore, the task of determining how many wildlife are on a particular tract of land is difficult. Yet landowners most frequently ask the question: "How many deer, quail, turkey, or other wildlife do I have on my land?" This is also probably the least answered question. The best response is that it is not necessary to know the numbers of a wildlife population to properly manage it. What is important is that you understand the basics of how and why population numbers fluctuate. Are there more animals than a year ago? Are there fewer animals than a year ago? Are there the same number of animals as last year? The population trend is the most important factor. A reliable trend tells us if a population is increasing, decreasing, or remaining stable.

Trends and fluctuations in wildlife populations from year to year can be estimated using an index of population growth or decline. By collecting data using the same techniques under the same conditions year after year, you can get a good idea of what is happening to wildlife numbers. Always keep in mind that it is easier to manage for wildlife that are already present than trying to attract wildlife that are not present. Absence of a wildlife species generally means that long-term habitat modifications would be necessary to attract that particular animal. By using various wildlife population index techniques you can get an idea of what species of wildlife are present on a particular tract of land and whether those populations are increasing, decreasing, or staying stable. Remember, these techniques are indexes and will not give you a population density estimate or total population size. Keep in mind that each technique has inherent biases. For example, track counts for white-tailed deer underestimate the number of fawns; whereas, spotlight counts at night underestimate the number of bucks.

Night Spotlight Counts

SPECIES: White-tailed deer, rabbits, furbearers

METHOD: Establish a route that you can safely drive at night which covers all the major habitats on a farm or forested tract. There are strict laws against spotlighting (or "shining") in South Carolina, so be sure

to contact your local South Carolina Department of Natural Resources (SCDNR) conservation officer before heading out to spotlight. Explain to the officer what you are doing. **Do not, under any circumstance have a firearm or any other device capable of killing wildlife present in the vehicle while conducting spotlight censuses.**

Begin the route shortly after dark. Drive no faster than 8 miles per hour and record the number of deer, rabbits, or other animals of interest that you see. When you spot a deer during a survey, try to record the age (fawn, yearling, adult) and sex of the animal. Be aware that you will probably see fewer bucks and fawns than are actually present. Conduct the survey in October for deer, raccoons, foxes, and coyotes and during the summer months for rabbits. Be sure to run the route at least 3 to 4 times to get an average number. Calculate an index of animals observed by dividing the number of animals seen by the acreage or mileage covered. For example, you observed an average of 24 deer on the established route which covered four miles. Your index of the deer population would be 1 deer/6 miles driven.

Fecal Pellet Counts

SPECIES: White-tailed deer, rabbits

METHOD: Establish several permanent transects (imaginary lines) that bisect a farm or forested tracts. Along each of these lines, establish 10 to 40 permanent sample plots (12' by 50' for deer, 1-yard square for rabbits). Mark these plots so they can be visited year after year. Within each plot, remove all the rabbit or deer fecal pellets. Recheck the plots after two weeks and count the number of pellet groups. Your index of the deer population would be the number of pellet groups per transect. For example, you establish 3 transects on the tract with 10 stations per transect. You observe 5 pellet groups on transect 1, 3 on transect 2, and 10 on transect 3. Your index to the population would be an average value of 6 pellet groups per transect (18 divided by 3). Deer pellet counts should be conducted in late February to obtain the pre-fawning population.

For rabbits, count all the pellets in the plots. The number of pellets within the plots is multiplied by the total acreage of the plots and divided by a standard defecation rate of 350 pellets per rabbit per day. For example, you establish 5 plots (each plot was 0.1 acre) on a farm or forested tract and find the following number of pellets in each plot: 700 in plot 1, 1400 in plot 2, 350 in plot 3, 2100 in plot 4, and 700 in plot 5.

To calculate the index, multiply 700 x .1, 1400 x .1, etc. Then add the 5 plot totals together and divide by 350 (70 + 140 + 35 + 210 + 70 = 525 divided by 350 = an index value of 1.5). Rabbit counts should be conducted in the summer.

Call Counts

SPECIES: Bobwhite quail, mourning doves, wild turkey

METHOD: Call counts rely on listening for the calls of birds and recording the number of individuals heard per mile of route traveled, or per stop along the route. Establish walking or driving routes with permanent listening posts throughout the property. The listening posts should be far enough apart so the same birds cannot be heard from any two stops. The routes should be designed so they can be completed in less than 3 to 4 hours. The number of listening posts or length of driving routes will vary according to the size or total acreage of the property. Keep the posts far enough apart to avoid duplication and sample the same posts and routes at the same time every year.

Surveys should begin 30 minutes before sunrise for wild turkey. Surveys for bobwhite quail and mourning dove should begin at sunrise. If you are conducting a driving route survey, do not slam your vehicle door when leaving the vehicle to begin the count because the noise may cause animals to leave the area. Do not conduct calling count surveys when it is raining, snowing, or windy (wind greater than 7 to 8 mph). The survey is conducted by stopping at each listening post and recording the number of birds calling for a specified period of time (3 minutes for doves and turkeys, and 5 minutes for bobwhite quail). Census routes should be run on two successive days. The routes should be run from one direction the first morning and the opposite direction the next morning.

Calling census routes should be conducted at the following times:

- for bobwhite quail during late May and early June (peak of quail mating season),
- for wild turkey during April, and
- for mourning doves at various times throughout the breeding season.

Calculate the index by adding the number of birds heard and dividing by the mileage covered. For example, on a driving count for wild turkey with 10 stops, you hear 7 turkeys. Your index would be 0.7 turkeys per mile (7 birds heard divided by 10 miles driven).

Flush Counts

SPECIES: Bobwhite quail, mourning doves, white-tailed deer, grassland and brushy songbirds

METHOD: Establish permanent transect lines that cross the property. Establish these transects so they are evenly spaced apart and each individual walking the line will not disturb or affect the wildlife on another line (quarter-mile or more apart). The length of the transect

line should cover the entire area to be sampled, but it should not take longer than 2 hours to complete.

The surveys can be conducted at sunrise or 2 hours before sunset. They should be conducted several times each year (October or February for white-tailed deer, summer or fall for quail and doves). The surveys should be run during the same general time period each year to allow for comparisons. Individuals conducting the surveys should walk at a normal pace and record the wildlife species seen, the number of each individual species, and the approximate distance from the line each species was observed. A simple index to the population can be calculated using the following formula:

$$P = \frac{A \times F}{2 \times D \times L} \text{ where}$$

P = the population
A = total area of the study
F = number of animals flushed (or seen)
D = average flushing distance
L = length of the strip walked

For example, A = 50-acre farm

F = 19 quail flushed

D = 5-foot flushing distance

L = 600 feet walked

The index value would be 0.16 (50 x 19 = 950 divided by 2 x 3000)

Singing Ground Surveys

SPECIES: Woodcock

METHOD: During the first 2 weeks of March, observe suitable woodcock breeding habitat to determine if the area is occupied by displaying male woodcock. Visit each site during the last 2 hours of daylight when courtship displays are most frequently observed. Increases or decreases in the numbers of calling males are used to index general population trends for the area.

Track Counts

SPECIES: White-tailed deer, furbearers

METHOD: Disk a long, narrow strip of ground 4 to 9 feet wide along the length of property boundaries during August. The next morning count the number of deer that walked through the strip. It is important to follow the tracks of each animal as it entered and left the strip to ensure that each animal is counted only once. Repeat the procedure at least 3 times to ensure that you did not do a count on a day when the deer were more or less active than normal. Try to separate the number of fawn tracks from adult tracks (using a size difference) to get a percentage of fawns produced. The index is calculated by counting the number of deer

crossing each linear mile. This is equal to the number of deer per square mile.

A variation of this method can be used to census furbearers. Establish several transects crossing the property as you would for a flush count. Establish permanent scent post stations where a small patch of soil is hoed or disked and smoothed over so you can observe furbearer tracks in the dirt. Lime evenly sifted and smoothed out also works well for counting tracks at scent post stations. Place a stick in the ground at the center of each station so that 2" of the stick is exposed. Smear some furbearer bait (depends on the furbearer you are sampling for) on the stick or pour a teaspoon of fox urine over it. Furbearer baits and fox urine are available from sporting good stores or trapping/outdoor mail-order catalogs. The following morning check each scent station and identify the tracks at each scent post. Count the number of scent stations visited to determine an index for the population.

Other Methods

Biologists use a variety of other methods to determine population levels for various wildlife species. The techniques to sample wildlife populations vary considerably, so an exhaustive treatment is not possible here. Some of these techniques include mark-recapture, aerial reconnaissance for white-tailed deer and waterfowl, mail carrier and roadside wildlife counts, roadkill counts and night cameras. These counts often require surveying large amounts of territory, the use of specialized equipment or techniques that are not appropriate or too expensive for landowner use.

Biological Monitoring of the Harvest

The following techniques are not used to gain an index of population levels, but are useful in monitoring the health of a particular wildlife population. One method used for small game is to look at the age composition of animals harvested during the hunting season. The following three examples show how this works for different wildlife species.

Quail - A general composition of 70 to 80% juvenile quail in a harvest would indicate a healthy quail population and a good reproductive year.

Woodcock - A population composition having about 2 juvenile woodcock harvested per adult hen would be considered a healthy reproducing population.

Deer - Biological monitoring of deer harvests provides information on the health of your deer herd. The two most commonly used measurements are yearling (1½ year age class) buck main antler beam diameter and yearling buck and doe field-dressed body weight. The average weight of the yearling age class along with main antler beam diameter is the best index to the condition of a deer herd. Slight shifts from year to year can indicate subtle changes, but you should not be concerned with this. If you have steadily declining average weights and average beam diameters over a period of years, this would indicate too many deer and a decline in habitat quality and/or abundance. An

increasing deer population will reach a point at which the food supply and quality is inadequate to support healthy animals. Average or normal yearling field-dressed body weights (with all internal organs removed) and buck beam diameters for deer in each region of South Carolina can be obtained from the District Wildlife Biologist with the SCDNR.