

SETTING UP AND CONDUCTING WHITE-TAILED DEER SPOTLIGHT SURVEYS

This brief overview of the **deer spotlight survey** is designed to answer some of the most commonly asked questions about this method for censusing white-tailed deer and its application. A deer spotlight survey is only one part of a comprehensive deer management program that must also include proper habitat management, harvest management, and record keeping. Why a deer census is needed, what it will and will not tell you, the type of equipment necessary for conducting spotlight surveys, and how to interpret data collected will be discussed.

There are some limitations to using spotlight census for estimating densities of white-tailed deer in Texas. Spotlight surveys have limited application on small tracts of land or where dense vegetation greatly reduces visibility. Spotlight surveys are not designed to observe a total deer population, rather to sample a representative portion of habitat and the number of deer found there. This number can then be extrapolated over the rest of the property.

What is a deer spotlight survey? A deer spotlight survey is a method of sampling a given area of land and the density of deer found there. Area is expressed as the number of **visible acres** which is determined by taking a series of visibility readings along the designated route at 1/10th mile intervals. Data collected on a deer spotlight survey is expressed as the number of **acres per deer**. Multiple counts are required on the repeatable route for reliable information on deer density. For best results survey at least 3 times on **non-consecutive** nights. (more surveys is always better.)

Why do I need to know about estimated deer density and herd composition? Estimates of deer density and habitat surveys can help determine whether your deer herd is at, above or below carrying capacity of the habitat. Deer **carrying capacity** is the density of healthy and productive deer the land can support without causing habitat damage. A knowledge of the deer density and herd composition is necessary to regulate annual deer harvest (how many bucks or does to harvest). Daylight herd composition counts may be used in conjunction with spotlight census data to more accurately estimate percentages of bucks, does, and fawns in the deer herd. The spotlight census also enables landowners to monitor progress of habitat and harvest strategies in reaching specific deer management goals and objectives.

Where do I set up my deer census line? Select all-weather roads that go through a variety of habitat types. Avoid roads that frequently wash out or become impassable following heavy rain. The transect should sample different habitat types in proportion to number of acres they represent on the property. For instance, if 10% of the property being surveyed is in the river bottom, then 10% of the route should be setup to go through the river bottom. Avoid roads by feeders or food plots where deer may be concentrated. Spotlight surveys conducted during August and September are less likely to be influenced by seasonal environmental factors, food distribution, or other biological events affecting deer. On large tracts, more than one route may be required to adequately sample a ranch. **Make a map of the route(s) for future reference.**

How do I set up my line and determine visible acres? Once a route has been selected, an estimate of the number of visible acres along the route must be determined. Sometime before the survey you are going to want to drive the route and calculate your visibility. Drive the route and have the driver stop every **1/10 mile**. The observers estimate how far they can see a deer (or where the brush becomes too thick to see deer) in a straight line **perpendicular** to the truck (**e.g. left 150 yards and right 50 yards, etc.**) up to maximum of 250 yards from the road. A visibility estimate is also needed at the start point of the line, 0.0 miles (+ **1** in the formula for calculating acres of visibility). Visibility readings may be recorded on a form or tape recorded for later tabulation. This process is repeated for the length of the route. On dead-end roads, record visibilities only going down the road and resume taking visibilities when a new portion of the route is begun. When conducting additional counts on the same census route, it is **not** necessary to retake visibilities. Visibility estimates may be used for several years unless significant changes in vegetation has occurred along the route, normally recalculated every 3 years. The following formula is used to convert 1/10 mile visibility estimates into **acres of visibility**:

Total yards of visibilities / number of 1/10mile stops + 1 the start point X Number of miles X 1,760 / 4,840 = Visible Acres

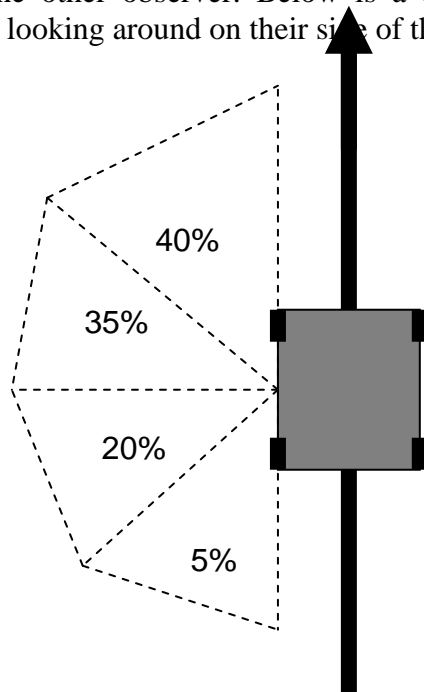
For a 7.7 mile line with 4,744 total yards of visibility the formula would be:

4,744 / 77 + 1 X 7.7 X 1,760 / 4,840 = 170.29 ac.

When do I conduct deer spotlight counts? Spotlight surveys are generally conducted during the months of August 1st to September 10th. Deer are generally well distributed in their home ranges during this period of the year and are more easily identified by sex and age-class (fawns). Each route should be counted 3-4 times to improve reliability of the data. Do not conduct surveys during rain, high wind or following significant disturbance along the route during the day of the count (working cattle, construction, seismograph work, etc.) Begin all counts one hour after official sunset. Contact the local Texas Parks and Wildlife Department game warden prior to conducting spotlight surveys. Also, notify neighbors or adjoining landowners that might see the lights to alert them about your activity.

What equipment do I need to make a deer survey? Pickup trucks (4-wheel drive may be required) are preferred over sport utility vehicles or cars, but UTV's can be used if required. The main point is you want as much visibility as possible for the observers, so the back of a UTV or pickup will work the best. An example of what is commonly used for setting up a spotlight rig: Use a 25 ft. piece of 12 gauge insulated woven wire with two "alligator" clips on one end and a two-plug outdoor type outlet box on the other. Replace the cigarette lighter plug on the spotlight cords with a standard male plug. Attach the alligator clips to the positive and negative poles of the vehicle battery and plug the light into the outlet box. Other wiring systems can also be used. Use spotlights with 100,000 candlepower are recommended (4 inch aircraft landing lights work great). Avoid using lights that are heavy, ones that are flood lights, and the battery operated spotlights. Other necessary equipment includes clipboard, **binoculars**, and a pencil.

How do I conduct the survey? Drive the route 5 to 8 mph. It is imperative to have 3 people to conduct the survey. You will have one driving and serving as a data recorder, and the other 2 will be on the back of the truck with the spotlights making the observations and passing them to the driver/recorder. Stop only to identify deer or determine the number of deer in a group, don't spend to long trying to identify the deer. If a deer cant be identified easily in 10 to 15 seconds record them as "unidentified." Unless all deer observed in a group can be identified by sex and age-class, record ALL these deer as unidentified. Recording only bucks from a group will bias data and reflect a better buck to doe ratio than may be present. Record deer as **bucks, does, fawns, or unidentified.** Deer are usually first spotted by their reflective eyes. Deer eye reflection is greenish-white. Other wildlife, birds, fence posts, and livestock are often mistaken for deer. Deer observed over 250 yards from the vehicle should **not** be recorded. It is **imperative** that binoculars be used to identify **all** deer observed, don't spend to much time trying to identify the deer. Keep the lights moving back and forth as the truck moves, checking both ahead of and behind the vehicle. The observer on each side of the vehicle shines only his/her side to prevent blinding the other observer. Below is a diagram that shows how much time an observer should spend looking around on their side of the vehicle.



How do I interpret the spotlight census data? Divide the **total number of deer** into the **total number of visible acres** observed to determine the number of **acres per deer** on the route. For example: **1,260 acres** (one spotlight survey route counted 3 times with 420 acres of visibility) divided by 90 (total number of deer observed on one spotlight survey route counted 3 times) = **one deer per 14.00 acres.** The estimated deer population for the ranch can then be estimated by dividing the total acres of the ranch by the estimated acres per deer figure. For example, the deer **population estimate** for a **5,000 acres** ranch with a deer density of one deer per **14.00** acres is **357 total deer.** An **estimate** of the number of bucks, does, and fawns in the population may then be determined by multiplying the **total number of deer** by the **percent** of all deer identified that were bucks, does, and fawns. For example:

357 Deer X 0.20 (% identified as bucks) = 71 bucks
357 Deer X 0.50 (% identified as does) = 179 does
357 Deer X 0.30 (% identified as fawns) = 107 fawns
TOTAL = 357 deer

In addition, deer identified as bucks, does, and fawns from spotlight surveys combined with daylight **herd composition counts** will provide important information on the buck to doe and fawn to doe ratios. These ratios are important population parameters of your deer herd that allow you to measure the success of your management program.

For example: 179 does / 71 bucks = 2.52 does per buck

107 fawns / 179 does = 0.59 fawns per doe

How can Texas Parks and Wildlife Department help me? On written request, department wildlife biologists and technicians provide technical assistance to landowners on wildlife and habitat management planning, including establishing deer management programs and deer spotlight surveys. Under the Private Lands Enhancement Program, department personnel are available to assist landowners with setting up and conducting an initial spotlight survey. In addition, assistance is available for interpreting census data collected by landowners and formulating harvest recommendations based on that information. Literature and data forms are available on request. For assistance, contact your local Texas Parks and Wildlife Department wildlife biologist.