



## AERIAL SURVEYS FOR WHITE-TAILED DEER IN TEXAS

by

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This overview of **aerial surveys for white-tailed deer** will answer some of the basic questions about their use in obtaining management information on white-tailed deer populations. Collecting information on deer populations (estimated density, sex and age ratios) is necessary for developing harvest recommendations based on deer management goals. Any deer survey technique is only one part of a comprehensive deer management program that must also include proper habitat and livestock management, deer harvest management and record keeping.

There are some limitations to the use of aircraft in surveying deer populations. These will be discussed later, but include expense, availability of aircraft and experienced observers, terrain, and dominant vegetation.

### Basics of the Aerial Deer Survey

In many areas of the state, aircraft (helicopter and fixed-wing) are effectively utilized to obtain deer density, sex ratios, fawn survival, and deer distribution information. Although more expensive to conduct than the spotlight and mobile deer surveys, the aerial survey does provide necessary population data in a short time frame. This information can be utilized to provide harvest recommendations, for the entire ranch as well as individual pastures.

The **helicopter survey** is considered by some to be the most accurate census for determining populations on a given unit of land. The total number of deer recorded on helicopter surveys should **not** be considered a complete count of all deer. Studies by Texas A&M University, Kingsville indicate that accuracy of helicopter surveys in South Texas is fairly consistent, but they can underestimate deer density by 60-70%. The information gathered from this type of survey should be used as population trend information and for the preparation of annual harvest recommendations with the understanding that the deer density figures are probably conservative.

### Permit Required

Before any aerial survey can be conducted, a **“Landowners Authorization to Manage Wildlife by Aircraft”** permit form must be filled out and mailed to Texas Parks and Wildlife in Austin prior to the day of the

survey. The owner of the helicopter must also be permitted by Texas Parks and Wildlife in order to operate this type of business. Failure to comply can bring stiff penalties to the operator and the observer conducting the survey. Details on permitting can be obtained by contacting the Law Enforcement Division of Texas Parks and Wildlife in Austin.

### Helicopter Surveys

Once all the permits are in order, the actual survey should be started approximately 15 to 30 minutes after sunrise. On ranches with dense vegetation and/or hills, it is recommended to start at least an hour or more after sunrise due to shadows. The drawback to starting later is that deer movement is reduced.

On ranches of no more than 5,000 acres (or larger in relatively open country), the entire ranch can be surveyed rather than sampled. The survey should be flown by pasture. This provides shorter transects (line of travel) and the flight line can be maintained.

Most often aerial surveys are conducted with both a pilot and an observer with each counting the deer observed. The observer records all bucks, does, fawns and any unidentified deer spotted. This data should be recorded on a data sheet rather than a tape recorder as information may be lost due to tape malfunction or garbled due to aircraft noise. Data should be collected by pasture if a complete ranch survey is being conducted. The observer may also record bucks by point-class (1-3, 4-5 points, 6-7 points, 8-9 points, 10+ points) to provide additional information, however a departure from the transect to collect this information is not recommended. If collected in this manner, the data can be used to establish harvest recommendations by pasture. This is an important consideration if the landowner or manager is leasing by pastures to several groups or otherwise needs to manage the harvest by pasture.

Ideally, transects should be flown on north-south bearings. This eliminates the observer and pilot from looking directly into the sun and missing deer. This is not always practical due to terrain or other obstacles that may be in the flight path. Another consideration is wind direction. Helicopter pilots prefer to fly into the wind when possible and the wind does not always blow from the north or south. Survey altitude will normally be from

30-50 feet above ground level. Flight altitude is also dependent upon terrain, vegetation condition, type, composition and any manmade obstacles that occur on the ranch.

Difficulties in locating and counting deer can be expected where heavy, close-growing stands of cedar, oaks and/or a combination of tall over story of trees with brush undergrowth. Aerial surveys may not be suitable on ranches that have near complete canopy closure of evergreen species (such as ashe juniper) that reach heights of 10-15 feet. Shin oak and other shorter brush stands are not as problematic because running deer are still readily visible.

In dense vegetation, deer will not readily move from the sound of the helicopter. For individual pastures it is better to initiate the count in the densest portion of the pasture and work toward the more open areas. Likewise the hillsides should either be worked from top to bottom or bottom to top depending on location of open areas.

Veteran observers develop their own technique for counting deer. But all basically agree that an observer should not only look ahead but also scan to the side and to the rear of the helicopter. Also, in thick vegetation it is advisable to look through the vegetation and not get mesmerized by looking at the top of the vegetation.

Timing of aerial surveys is important. Ideally, deer population information is collected during late summer or early fall to have the most current information when developing harvest recommendations. In areas where deciduous species, such as post, blackjack, Texas oak, and/or mesquites are the dominant species, it is necessary to wait until after leaf drop (late fall/winter). Ranches with sparse vegetation, such as areas of West Central Texas may be surveyed as early as mid-August.

### **Airplane or Fixed-Wing Surveys.**

On large ranches where uniform terrain and vegetation exists, flying the entire ranch by helicopter is not always feasible due to the time involved in conducting the survey. In this case, strip transects should be flown at ¼ to ½ mile intervals. The area counted on each side of the plane or transect will be 100 yards (200 yard total width). Deer spotted outside this strip should not be counted. These transects can be flown with fixed wing aircraft if the vegetation is open enough to allow good-visibility from an airplane.

If you convert the square yards (200 yards wide X 1,760 yards per mile) to acres, you will find that each mile flown equals 72.72 acres surveyed. By multiplying the number of survey miles flown by 72.72 acres, you get the total acres sampled for the ranch. The deer density and herd composition derived from these transects (see equations) can be expanded for the entire ranch to arrive at an estimate of the deer population and herd composition. With this method of surveying deer, the observer will only see a small portion of the deer on the ranch. Therefore, counting points on bucks is not as important because the figures cannot be reliably expanded to the entire ranch. The expanded data obtained from this type of survey is a sample and is **not** intended, nor should it be considered, a total count.

### **BENEFITS and DRAWBACKS**

Helicopter and fixed-wing surveys allow the landowner/manager to determine the following:

1. Buck to Doe Ratio
2. Fawn Production
3. Antler Development of Bucks
4. Distribution of Animals on Ranch
5. Vegetative Condition of Ranch
6. Location of Deer for Harvest.

The biggest drawback to a helicopter census is the cost. Increase costs in fuel, liability insurance and general maintenance, are passed on to the consumer. Costs will also vary between operators. The main benefit of a helicopter survey is that it is a time saving measure for landowners or managers that do not have the time to conduct spotlight surveys and herd composition counts.

### **Equations**

Estimated Deer Density when using strip transects:

(No. Miles Surveyed X 72.72 Acres) ÷ Deer Observed = Acres per Deer

Number of Does per Buck

Does Observed ÷ Bucks Observed = Does per Buck

Fawn Production

Fawns Observed ÷ Does Observed = Fawns per Doe

For more information and assistance in conducting aerial deer surveys, contact: **Private Lands Enhancement**

**Program, Texas Parks & Wildlife, 4200 Smith School  
Road, Austin, TX 78744 or call (1-800-792-1112).**