



GUIDELINES FOR WHITE-TAILED DEER MANAGEMENT IN THE CROSS-TIMBERS AND PRAIRIES REGION OF NORTH TEXAS

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INTRODUCTION

As with other forms of agriculture enterprises, there are many problems and variables to consider and address to successfully manage white-tailed deer. It's fundamentally a matter of understanding white-tailed deer biology, their habitat and nutritional requirements, and setting clearly defined goals and objectives.

There are three broad areas that need to be addressed when developing and implementing a successful white-tailed deer management plan. They are: **habitat management**, **population management**, and **harvest management**. The following information will discuss and outline steps for management of free-ranging white-tailed deer herds in the Cross-Timbers and Prairies Region of north Texas.

THE CROSS-TIMBERS AND PRAIRIES ECOLOGICAL REGION

The Cross-Timbers and Prairies Ecological Region of north central Texas cover approximately **17.9 million acres**. Within this vast region there are five sub-regions or major land resource areas consisting of the **Eastern Cross-Timbers** (1 million acres), **Grand Prairie** (6.3 million acres), **West Cross-Timbers** (2.6 million acres), **North Central Prairies** (7 million acres), and **Central Rolling Red Prairies** (1 million acres). Populations of white-tailed deer are found throughout the region at varying densities dependent on the quantity and diversity of habitat, land use, livestock numbers and grazing intensity, seasonal rainfall patterns, deer harvest rates, and the degree of **active** management on the part of individual landowners.

Much of the **East** and **West Cross-Timbers** are post oak and blackjack oak woodlands. Historically, the **Grand Prairie** and **North Central Prairies** were predominately open grasslands with only scattered liveoak, but today juniper, mesquite, oak, and other native woody species have invaded much of that region. The **Central Rolling Red Prairies** are mostly open grasslands today with some invasion by mesquite. Habitat for white-tailed deer is not homogeneous throughout the region due to different soil types and geologic features on the landscape. Major soil

associations of either sandy or clayey soils determine dominant woody vegetation. On the sandy, slightly acidic soils of the East and West Cross-Timbers, species such as post oak and blackjack oak are most common. On clayey soils of the Grand Prairie and North-Central Prairies, liveoak, Texas oak, mesquite, cedar elm and Ashe juniper are more dominant.

Major **woody plant species** that constitute the basic framework of white-tailed deer habitat are post oak, blackjack oak, liveoak, shinoak, Texas (Spanish) oak, bur oak, cedar elm, Ashe juniper, mesquite, bumelia, Texas ash, Mexican plum, blackhaw viburnum, possumhaw, roughleaf dogwood, Bois d'arc, Texas sophora, western soapberry, redbud, pecan, black willow, and cottonwood. Major **brush and understory woody species** include elbowbush, lotebush, prickly ash, flameleaf sumac, skunkbush sumac, greenbriar, grape, poison ivy, catclaw, agarita, pricklypear, tasajillo, coralberry, white honeysuckle and others. Many of these species provide components of the requirement for food and cover for white-tailed deer. Associated with these plant associations are a variety of annual and perennial grasses and forbs (weeds) that make up the overall habitat for white-tailed deer.

WHITE-TAILED DEER MANAGEMENT PROBLEMS IN THE CROSS-TIMBERS

Habitat for white-tailed deer in the Cross-Timbers and Prairies is not uniform in plant species composition or distribution. The quality of habitat varies considerable, often within short distances due to changes in soil type, terrains, and the degree or type of land use. Not all land within the Cross-Timbers and Prairies can carry high populations of deer, regardless of the quality of vegetation that may appear during different seasons of the year. Lush growth of woody browse species that are abundant during the spring and summer are starkly absent during the winter months. Dense post oak woodlands become deciduous deserts during winter when only forbs and winter grasses are available for deer forage. Droughts during this period of the year

can result in short supplies of these preferred foods for deer.

Except during the breeding season, white-tailed deer generally live within a home range of approximately one square mile. Their daily movements within that home range throughout the year often results in movements into habitat found on more than one adjoining landowner. Consequently, landowners often “share” individual animals, particularly bucks during the rut. For this reason, the potential for successful white-tailed deer harvest management diminishes as landownership size decreases. As the size of individual ranches continues to decrease throughout the region, effective and meaningful management can be a challenge. **Fragmentation** of habitat often results when changing land uses occur on adjoining tracts of land that were once uniform rangelands or woodlands. Food and cover that are required to support a desired density of deer might no longer be present. Quality of habitat may also vary considerable on large ranches where overgrazing of rangelands by livestock occurs or white-tailed deer habitat is modified or lost to development of improved grass pastures or other land uses.

As landownership size decreases, the potential for over-harvest of white-tailed deer populations increases. Bucks that leave their home range during the rut will likely be exposed to added hunting pressure on adjoining ranches that may not have the same goals and objectives for harvest management that you have. Many ranches in the Cross-Timbers and Prairies do not set harvest recommendations for their hunters based on population management criteria or restrict the number of hunter on lands they lease out for hunting. Texas Parks and Wildlife encourages landowners to form cooperatives or local associations to develop common goals and objectives for white-tailed deer management.

There is no set acreage on which effective white-tailed deer management can be achieved in the Cross-Timbers and Prairies, although it goes without saying - the larger the better! Positive **habitat management** practices can be implemented on just about any size acreage. Effective **population** and **harvest management** will require *a minimum of 2,000 to 2,500 acres*. Management strategies applied to any less acreage will be affected by the biological limiting factors of white-tailed deer for food, cover, space and the accumulative influences of actions taken by adjoining landowners.

WILDLIFE MANAGEMENT PLAN

Fundamental to managing white-tailed deer in the Cross-Timbers or anywhere else in the state, for that matter, is the development of a **wildlife management plan** written specifically for your ranch. It should clearly state your goals and objectives. In other words, where do you want to go with your white-tailed deer population and how are you going to get there. You can write your own wildlife management plan or call on the expertise of a professional resource specialist or wildlife biologist. Wildlife biologists with Texas Parks and Wildlife Department, working under the **Private Lands Enhancement Program**, are also available to assist you with preparing a wildlife management plan. A wildlife management plan should document all aspects of your land and wildlife management program. It should include a description of the habitat, past history of wildlife and land use, current land management and livestock operations, information about current wildlife populations and harvest rates, and wildlife and habitat management practices to be conducted. The key point is to write down your plan and refer to it often. Successful white-tailed deer management is a long-term endeavor, often requiring several years before noticeable changes take place. Because of the biology of white-tailed deer and their habits, their mobility, home range requirements, and other habitat needs, successful management is more practical on larger tracts of land. Cooperative agreements or associations between adjoining landowners is often the only way to successfully address white-tailed deer management on a scale necessary to implement habitat, population, and harvest management strategies.

FOOD - COVER - WATER - SPACE

Good habitat for white-tailed deer must meet their requirements for **food - cover - water - and space**. The diet of white-tailed deer consist primarily of **forbs** (broadleaf herbaceous plants), **browse** (leaves and stems of woody plants), **mast** (acorns, nuts, fruits), and **grass** (primarily cool season or winter grass species). In addition, deer use cultivated crops that occur within their home ranges when available and may cause depredation problems to landowners. **Forbs** are high in protein and are sought after by deer throughout the year when they are available. **Browse** is important during the spring and summer months, particularly during late summer when dry conditions reduce availability of forbs. In the Cross-Timbers, winter browse is lacking and in many areas totally absent. **Mast** is readily eaten when available but generally

is an unreliable or short-term food source. **Grasses** normally make up less than 5% of the diet of white-tailed deer. In addition, deer use cultivated crops that occur within their home ranges when they are available and may cause depredation problems to landowners. Winter crops of wheat and oats are important components of white-tailed deer habitat in many areas of the Cross-Timbers and Prairies and serve to improve the habitability of marginal habitats for white-tailed deer. Deer also use spring and summer crops such as peanuts, milo and other sorghum varieties, and fruit and vegetable crops such as watermelons, cantaloupes, beans, peaches, grapes, and ornamental plants.

Quality and quantity of **browse** on the landscape in the Cross-Timbers and Prairies is probably the most reliable indicator of good deer habitat conditions throughout the year. In the Cross-Timbers and Prairies Region, important woody browse plants are **skunkbush sumac, hackberry, cedar elm, shinoak, post oak, blackjack oak, flameleaf sumac, Texas redbud, greenbriar, and bumelia**. Lands supporting growth of a variety of these species will have a higher carrying capacity for white-tailed deer than those with only a few.

Cover provides security from predators and exposure to disturbances from other environmental factors and weather. The best cover for white-tailed deer is a pattern or mosaic of woody trees and brush interspersed with openings at an approximate **2 to 1 ratio of open area to woody cover**. Clumps or strips of brush should be wide and dense enough during the winter dormant period so that deer can't see through them. White-tailed deer also require space and secure areas for escape from predators and fawning. Habitat management practices that increase the amount of "edge" within a deer's home range are also beneficial.

The presence of adequate surface **water** is an important component of white-tailed deer habitat in the Cross-Timbers. Deer will consume 3-6 quarts of water per day if available and depending on air temperature. Deer also absorb water contained in plants and can produce metabolic water, which is produced in their cells as part of metabolism. Development of additional surface water sources will also improve habitat for white-tailed deer.

HABITAT MANAGEMENT

Properly managing habitat for white-tailed deer includes a series of planned actions and strategies designed to provide for the biological and environmental needs of a healthy white-tailed deer

herd. There is a number of "tools" available to land managers to help manage the habitat required by deer. Aldo Leopold, known as the "father of wildlife management", promoted the use of "the cow, the ax, the plow, fire and the gun" as tools available to the wildlife manager. Without going into great detail, I will mention some of the management practices most important for white-tailed deer habitat management.

Proper **livestock management** is the most important aspect of land management to be addressed on most ranches in the Cross-Timbers. Significant improvement in available forage used by deer and other wildlife species can be achieved with proper stocking rates, use of rotational grazing systems and pasture deferments, use of compatible classes of livestock, and short duration grazing. If **brush management** is necessary, a concerted effort should be made to consider food and cover requirements of wildlife prior to conducting brush control. Individual plant treatment systems such as grubbing or spot treatment with herbicides is better than broadcasting herbicides for total coverage. In the Cross-Timbers, most brush management efforts are directed toward Ashe juniper, mesquite, pricklypear, and eastern red cedar. **Range management** practices that promote growth of native grasses and seasonally important annual and perennial forbs will benefit white-tailed deer. **Fire** is another tool that, when properly applied to the land, can result in greater plant diversity, reduce invasion by undesirable woody plants such as juniper, mesquite, and pricklypear, and improve soil fertility.

Food plots may be used to seasonally supplement the diets of white-tailed deer within their habitat. They are expensive to develop and maintain and should not be used as a substitute for other neglected land management practices. Generally speaking, "when you need them you can't grow them, when you don't, you can." Food plots can be divided into two categories - **warm season** and **cool season** and either annual or perennial plants. **Warm season** planting of crops such as annual legumes (peas), milo and other sorghum varieties, soybeans, and recently lablab are commonly planted in the Cross-Timbers. **Cool season** crops of wheat, oats, clovers and vetch varieties, and Austrian winterpeas can be planted in food plots. Literature is available on planting food plots in the Cross-Timbers from Texas Parks and Wildlife.

The use of **supplemental feeding** is increasing in popularity by landowners in the Cross-Timbers. Like food plots, supplemental feeding should not be used as a substitute for deficiencies in the habitat. Use of supplemental feeding should only be used to supplement the natural forage and diet of deer, not replace it. Deer are selective feeders and will normally only use supplemental food sources during periods of stress or when natural forage is in short supply. Deer may completely stop using supplemental feeders during acorn drop or spring green up.

Supplemental feed should be a complete ration developed specifically for white-tailed deer containing a minimum of **16% protein**. A number of commercial feeds have been developed and are available. Feed should be fed from feeder systems designed specifically for feeding deer. Bulk feeders with timed-release mechanisms are the best. Free-choice feeders should be covered to prevent water damage and contamination. Corn is commonly fed to deer by many landowners and hunters. It is low in protein but high in carbohydrates. Be sure any corn you feed deer has been tested for **aflatoxin**, a fungi producing toxin, and contains no more than **20 parts per billion**.

POPULATION MANAGEMENT

Once your goals and objectives for habitat management have been developed and initiated, consideration must be given to strategies for **population management**. Basically, you must determine the quantity and quality of white-tailed deer you want to support on your ranch. How many deer can your habitat support and what do you want them to look like? The physical appearance of a white-tailed deer is the result of three things - **its nutrition, its age, and its genetics**. You will have limited effect on the genetics aspect of a free-ranging deer herd. Management efforts should be directed toward habitat, nutrition, and age-class improvement of the deer herd.

Total counts of free-ranging white-tailed deer herds are not possible using any type of deer census technique. Deer survey techniques provide estimates of population density expressed as **acres per deer**. They also provide information on the sex and age ratio of the population and trends in population fluctuation from year to year. The number of healthy deer that habitat can support on a year around basis is referred to as **carrying capacity**. Carrying capacity varies throughout the Cross-Timbers and no set figure can be applied to all deer habitats. Carrying capacity estimates ranges from **one deer to 10-12 acres** on good habitat in the Cross-Timbers to as little as **one deer per**

25-30 acres or greater on poorer habitats. The **sex ratio** of free ranging deer herds in the Cross-Timbers should be somewhere around **2.00 to 2.50 does per buck**. With more intensive management, that ratio can be reduced. A ratio of around **0.75 fawns per doe** observed during late summer and early fall is an indication of healthy reproductive deer herd.

White-tailed deer density, sex-ratio, and herd composition can be determined by using a combination of **deer spotlight surveys** and **daylight herd composition counts** conducted during the **August-September-October** period annually. A minimum of **three spotlight surveys** should be conducted annually during this period to determine average number of acres per deer. Spotlight surveys are an "area transect" of a determined acreage on which the total number of deer are counted. **Herd composition** is determined by identifying as many bucks - does - fawns in the population during this same time period from daylight counts to determine the ratio of the sex and age-classes in the population. Without an estimate of the total deer density in acres per deer and information on the ratio of bucks to does and fawn per doe, no definitive harvest recommendations can be made. Texas Parks and Wildlife has literature available on how to conduct these two types of surveys. Landowners under a TPWD wildlife management plan receive assistance on how to conduct these surveys and how to use the data collected for determining harvest rates and achieving of your goals and objectives.

Aerial helicopter deer surveys may also be used to survey deer populations. Researchers in South Texas have found such surveys unreliable for determining actual deer density, sex ratios, and fawn production estimates. If aerial helicopter surveys are used in the Cross-Timbers and Prairies, they must be made during late winter after leaves on deciduous trees have fallen and visibility conditions improve. Fawns and spike bucks are difficult to identify by late winter and some bucks may have shed antlers. Also, post-season counts do not provide the timely population data necessary to formulate harvest recommendations.

HARVEST MANAGEMENT

Once you have an estimate of the density and herd composition of your deer population, decisions must be made about how many, if any, deer should be harvested to meet your goals and objectives. How many and which bucks - how many does - and

how many hunters should you have? This is the point where you make the connection with hunters. Hunters serve a very important role in white-tailed deer management programs. They can help you achieve your goals and objectives by harvesting the recommended number of bucks and does from the population. If you do not have “good” hunters that will cooperate with you on your management program, your chances of success will be diminished. When possible, involve your hunters in your overall management program and keep them informed about your goals and objectives. Not all hunters are able to identify mature age-class bucks and others may be reluctant to kill antlerless deer.

Achieving your goals and objectives may be impossible without clear communication between you and your hunters. The number of hunters you have on your ranch should be based on the number of deer you want harvested. Determine how many bucks and does you want removed from your land based on annual deer surveys and herd composition counts **before** you lease out hunting rights or renew lease agreements with existing hunters. That information can also be incorporated into the lease agreement so hunters will know what is expected.

HARVEST MANAGEMENT STRATEGIES

Your **harvest management** should include several basic strategies to harvesting deer. It should specify what type of bucks you want to produce and harvest. If producing mature age-class bucks is your goal then only mature age-class bucks should be killed. Deer densities must be maintained below or near estimated carrying capacity or other aspects of your management program such as body weights, reproduction, or habitat will be affected. You must also harvest the proper number of bucks or does to achieve your desired buck to doe ratio goal.

HARVEST RATES FOR BUCKS

If your management **strategy** and **goal** is to produce **mature age-class bucks** for harvest, you must educate your hunters about selectively hunting that type of animal and passing up young bucks. Bucks do not mature until they are over 4 years of age. Killing them prior to that point will defeat your goal. To produce **mature age bucks**, total buck harvest should not exceed **20% of the estimated buck population**, including spikes. If your goal is to produce **some mature age class bucks** in the population, harvest approximately **30% of the estimated buck population**, here again hunters selecting only mature

age-class animals. For **maximum harvest** of bucks, **40-50% of the estimated buck population** can be harvested. Under this harvest strategy, few mature age-class animals will be available for harvest. Deer populations that are **at carrying capacity** should be harvested at the rate of approximately **30% of the total estimated population** to allow for annual reproduction that will be added to the population.

Spike-antlered bucks are the result of the influence of age, nutrition, genetics, or combination of these factors. Studies on the Kerr Wildlife Management Area showed that “most deer which are spike-antlered as yearlings will not be spike-antlered in later years, but will continue to be inferior to their fork-antlered cohorts”. Of 144 white-tailed deer bucks from the Kerr Wildlife Management Area, 62% of the fork-antlered bucks as yearlings scored in excess of 120 B&C at 4 ½ years of age whereas only 2.3% of spike-antlered yearlings had similar scores at that age. The majority of spikes in the Cross-Timbers and Prairies Region are restricted to the 1 ½ year age-class. **Texas Parks and Wildlife Department recommends that spikes not be protected from harvest and be included in any buck harvest recommendation as part of the total recommended buck harvest.** If you have a choice between killing a young fork-antlered buck and a spike - take the spike or another antlerless deer.

The introduction of deer on ranches in the Cross-Timbers and Prairies from other parts of Texas or other states is **not** recommended as a means to improve the genetic make up of free ranging deer herds. Most native white-tailed deer found in the Cross-Timbers and Prairies that are provided good habit and nutrition and are allowed to reach mature age-classes exhibit antler and body characteristics acceptable to most landowners and hunters. The Cross-Timbers and Prairies Region ranks second only to South Texas in the number of entries in the annual Texas Big Game Awards Program that recognize quality native deer produced on private ranches in Texas. Deer moved from other area may not have natural immunity to diseases that resident animals have. The probability that the genes of a few imported bucks will change the genetic make up of a free ranging deer herd is not likely. Fifty percent of the genetic make up for antlers characteristics are contributed by the female.

WHITE-TAILED DEER BREEDING CHRONOLOGY

Texas Parks and Wildlife conducted research between 1991-1993 to determine the chronology of breeding activity by white-tailed deer throughout the state. In the **Cross-Timbers**, fetus measurement taken from 296 does over the three-year period indicated that the **peak conception date for white-tailed deer was November 16th**. Conception ranged from as early as **October 13** to as late as **December 17th**.

INTERPRETING HARVEST RECORDS

Plan in advance and work with your hunters to **require** that certain biological data be collected for deer they kill on your ranch. If you are not actively involved in this process it is unlikely to get done. Basic biological data that should be collected from **each** deer harvested under a management plan is **date of kill**, **location** (pasture), **age** (1 ½, 2 ½ ,etc.), **field dressed weight** (in pounds), **antler measurement** from bucks including **number of points** (one inch or longer), **inside spread**, length of each **main beam**, **circumference of each base**, **general physical condition** (good, fair or poor) and **does lactating** (yes or no).. Provide scales, forms for recording data, jaw extractors for removing and saving jawbones for later aging, freezers for storing jawbones or other specimens. At the end of the season, all data should be **averaged by age-class**. Physical characteristics such as body weights and antler size are age-related. Analysis of

long-term data collected and averaged by age-class will allow you to measure the success of your management efforts and detect annual trends in those white-tailed deer biological features you want to improve or increase. Without a system for evaluating your harvested animals it will be difficult to measure your success.

CONCLUSION

In summary, before you embark on a deer management program, develop a **written wildlife management plan** and outline what you want to do, how you plan to get there, and what results you expect to achieve. All successful management programs for white-tailed deer must address **habitat management, population management, and harvest management**. Texas Parks and Wildlife Department supports land and wildlife management on an ecosystem approach, where the long-term management efforts will benefit not only white-tailed deer, but also a variety of other wildlife species on your land. We recognize that without the conservation and management efforts of private landowners in this state that own 97% of the land, the futures of Texas wildlife are in jeopardy.