

Population Management: Population Regulation

If certain qualities of a deer herd are to be maintained, humans must help control deer populations. When nutrient limitations alone control deer populations, most herd health qualities suffer. Historically, predation was probably the primary influence when Cross Timbers deer populations were maintained within the limits of food, cover, water, and space. Historical deer predators in the Cross Timbers were the mountain lion, gray wolf, coyote, and native American. The gray wolf has been extirpated from the Cross Timbers, and the mountain lion nearly so. Thus the importance of man's role as a deer predator has increased.

The only relatively efficient means to manage deer herd numbers other than habitat modification is through managing hunter harvest (i.e., contemporary predation). Management of deer numbers is necessary to regulate or control deer herd health.

In rare instances, trapping and relocating deer may be an option for managers with relatively abundant funds, labor, and equipment. However, relocation programs have problems finding places to take deer unless they release them into hunted areas because almost all deer habitats already support deer. Releasing trapped deer into unhunted established deer populations simply transfers the problems to the recipient place.

For regulating deer herds, managing deer quality, and managing herd health, the most important aspect of harvest is doe harvest. Doe harvest is one of the most misunderstood yet most important aspects of deer management. When a white-tailed deer population is near or above carrying capacity, its numbers and quality can not be managed effectively through hunting without harvesting does.

The reasons for harvesting does are the same as the reasons for controlling cattle numbers in livestock management. If a livestock manager removed no cattle or removed only male cattle from a cow-calf herd and left all female cattle, eventually he would have too many cattle. Through time their numbers would increase to the point where neither the land nor the manger could provide enough food for them. From that point on, their health, weights, reproductive rates, and overall quality would continue to decline until the cattle actually started starving. Many deer herds exhibit this trend where the proper number of does is not harvested.

The important concept here is "proper" doe harvest. The proper doe harvest for a particular tract of land depends on deer management goals, deer density relative to carrying capacity, fawn crop, and sex ratio. Proper doe harvest changes from place to place and it changes through the years on the same place. For some situations, proper doe harvest may be no doe harvest. If a deer herd is well below carrying capacity and more deer is a goal, a manager would probably want to harvest few or no deer. For other situations, proper doe harvest may be as many as 1 doe per 25 acres. If a deer herd has many more does than bucks and the herd is at or above carrying capacity of the land, a manager would generally want to harvest a relatively large number of does.

Deer harvests on an area are generally managed through harvest quotas. Deer harvest quotas are the numbers of male and female deer that can or should be removed from an area during a certain time frame. When establishing harvest quotas, managers should consider goals, habitat limits, deer density, sex ratio, fawn crop, and recent trends in deer population parameters. Even if all deer population parameters are the same on different management areas, deer harvest quotas generally vary when the goals vary.

Potential Management Goals

There is more than one way to manage deer. The appropriate deer management depends upon a person's goals. This section provides examples of deer management strategies for alternative deer management goals listed at the beginning of the section "Population Management."

Eliminating deer or minimizing deer number.

Most managers with this goal basically do not want any deer on their property. Examples of situations with this goal include airports (deer crossing runways create a safety hazard) or farms with crops susceptible to deer depredation managed by people who do not want deer. Three management options can help accomplish this goal: (1) exclude deer from the area with a deer fence, (2) remove deer cover and/or food so an area provides poor or no deer habitat, and (3) intensively harvest deer annually from the area to maintain a very low or nonexistent population level. Exclusion and habitat destruction accomplish this goal more effectively than intensive sport hunting or trapping. On areas with good deer habitat and well established deer populations, it can be very difficult to safely harvest enough deer within current game laws to satisfactorily accomplish this goal. Deer herd health qualities and deer population parameters other than density are irrelevant to a manager with this goal.

Sustaining a viable deer population at relatively low densities

Managers with this goal want deer, but they want to maintain a deer population at some point below carrying capacity. Examples of situations with this goal include land managed by people who want deer but want to minimize competition with crops or livestock, minimize being bothered by deer hunters, or conserve a wildlife species or native plant community especially sensitive to deer interactions.

Minimizing cover available for deer may help maintain low deer populations for some farmers and ranchers, especially those who want to minimize being bothered by hunters, but it is probably not an option for timber managers. In areas with adequate deer cover and some deer food, intensive deer harvest is the most practical solution to maintain low deer densities.

Deer density should be maintained below the level where significant problems occur. This requires enough deer harvest, especially doe harvest, to suppress population level. When an acceptable deer population level is achieved, deer harvest should be heavy enough to compensate for annual recruitment. Hunting pressure needs to be maintained every year because reproductive rates generally are high under these conditions and deer probably will move into the area from surrounding sites. In this management scenario, deer fawn crops, body weights, and antler characteristics generally will be near maximum for the region. Deer habitat should indicate relatively little deer impact because there should be habitat for more deer than occur on the area.

Seeing lots of deer

Managers with this goal want as many deer visible as possible. Examples of situations with this goal include some zoos and parks. To see lots of deer, it is appropriate for deer to reach a relatively high density. Deer habitat should be improved to the fullest extent possible. Realistically though, increasing natural food production is very difficult while a deer population is very abundant. Dense deer populations eat almost every new food plant as it emerges. Due to increased competition for food, deer will be more visible to observers because a dense population forages more during the day and/or they may create a browse line (open up the brush or timber understory by consuming most of the buds, leaves, and small twigs deer can reach). To maintain deer visibility, hunting should be minimized or possibly excluded, so deer will not perceive humans as a threat and hide. However, hunting or trapping/relocation eventually may be necessary because overabundant deer may deteriorate habitat to the point where a substantial decline in deer numbers occurs.

At a high density level relative to carrying capacity, a deer population will tend to have low fawn crops, low body weights, small antlers, high incidences of disease and parasites, high levels of stress (due to poor nutrition and competition for space), depleted food supplies, and significant die-offs during harsh winters. Thus herd health will be relatively poor. These qualities may be acceptable for this goal if the population level can remain relatively consistent.

Maintaining a natural balance between deer and their habitat

Many people believe this is the most desirable goal for parks, refuges, and other areas. While natural has different meanings to different people, it is usually interpreted as deer ecology prior to the introduction of European man. If so, this goal is not truly attainable because it is impractical to remove modern man and develop adequate predator populations of gray wolves and mountain lions. Nevertheless, some progress toward the goal is possible.

To move toward this goal, habitat management probably should consist of reintroducing native plant species, reducing introduced plant species, and managing natural plant communities with grazing ungulates and prescribed burning. Historically, other native ungulates such as bison, elk, and pronghorn influenced Cross Timbers deer habitat. Where bison, elk, or pronghorn grazing is not practical, properly managed cattle grazing can be an appropriate tool for managing the landscape.

Without gray wolf and mountain lion predation, hunting and coyote predation are the primary remaining natural methods for direct population management. Hunting is natural because native Americans hunted deer before European man arrived. Coyotes help regulate deer populations, but alone they frequently can not prevent excessive deer population levels. Bowhunting simulates early hunting techniques more than other current legal methods, but even with coyote predation, it is seldom efficient enough to effectively control deer populations. Therefore, if a healthy deer herd is desirable, other types of deer hunting generally should be part of the management scheme as well.

Optimizing deer herd health and numbers

Managers with this goal want to maintain deer numbers at maximum levels that provide excellent deer herd health qualities. Examples of situations with this goal include the NFWU and some state wildlife management areas. This goal is necessary to accomplish the goals of sustaining maximum harvest of deer, bucks, or trophy bucks. However, it is different in that it requires no specific parameters for sex ratio, fawn harvest, buck harvest, buck age structure, or antler characteristics.

Fall pre-season population level should be maintained slightly below carrying capacity. The deer population should be as abundant as possible without stressing herd health qualities. Habitat should be managed to the fullest extent possible to achieve or maintain excellent condition habitat. Habitat should provide abundant and diverse foods. Fawn crops generally should be over 0.75 fawns per doe. Average body weights and antler dimensions per age-class should be close to maximum for the region. Incidence of diseases and parasites should be relatively low. The population should not experience die-offs even during extended periods of severe weather. The 1990 NFWU deer population parameters in Table 5 demonstrate a deer herd balanced well within its habitat.

Doe harvest is an essential aspect of regulating deer herd health. Enough hunting pressure should be exerted on does to maintain good fawn crops and keep deer from becoming too abundant relative to habitat. When the deer population level is near carrying capacity, female deer harvest may need to be equivalent to 30-45% of the fawn crop depending on natural mortality rates. When the deer population level exceeds carrying capacity, the female deer harvest may need to be even greater. Female deer harvest should equal or exceed male deer harvest.

Sustaining maximum harvest of deer (or bucks)

Managers with this goal want to obtain the maximum sustainable harvest of deer (or bucks) annually. Many managers specifically want to obtain the maximum sustainable harvest of bucks. Examples of situations with this goal include some state deer management programs and some hunting leases. The goal of optimizing deer herd health and numbers is part of this goal.

Bucks would receive heavy hunting pressure. Up to 85% of the bucks could be harvested each year. The average age of harvested bucks would be close to 2 years old, possibly less, because most would be yearlings. A considerable number of antlerless deer should be harvested. Yearling buck antler dimensions should be good while average buck antler dimensions would not be very outstanding because the average age of harvested bucks would be too young to allow for substantial development. Sex ratio should indicate significantly more does than bucks.

For sustaining maximum harvest of deer, not particularly bucks, the sex ratio should be at least 2.5 does per buck. A lot of fawns should be included in the antlerless deer harvest for this goal. About 25-35% (varies according to fawn crop and natural mortality rate) of a deer population could be harvested each year. During years with low fawn crops, fewer deer should be harvested.

For sustaining maximum harvest of bucks, the population should contain about twice as many fawns as bucks while minimizing the number of does in the population necessary to produce such fawn crops. Usually a manager would want to maintain a sex ratio in the range of 1.5 to 2.5 does per buck and a fawn crop in the range of 0.75 to 1.25 fawns per doe. Maximum buck harvest would be attained when the sex ratio is at the low end of the range (i.e., 1.5 does per buck) and the fawn crop is at the high end of the range (i.e., 1.25 fawns per doe). However, fawn crops of 1.25 fawns per doe would be difficult if not impossible to maintain every year. To maintain maximum buck harvest in actual situations, sex ratio should move toward 2.5 does per buck when fawn crops are closer to 0.75 fawn per doe. If the population level is near carrying capacity, the number of female deer harvested should be approximately equivalent to the number of male deer harvested. Male fawn harvest should be minimized because it decreases the number of bucks available for harvest in succeeding years. Although some female fawn harvest would be desirable, fawns usually should not be harvested because a fawn's sex is difficult to identify in hunting situations.

Sustaining maximum harvest and quality of trophy bucks

Managers with this goal want to annually harvest the greatest number and quality of trophy bucks possible. Examples of some situations with this goal include some private ranches or hunting clubs emphasizing trophy bucks. The goal of optimizing deer herd health and numbers is part of this goal.

Three things are necessary to produce a trophy buck: sufficient age, proper nutrition, and proper genetics. A buck generally grows larger antlers and body size each year until it matures physically at 4 to 6 years of age. Buck harvest in a trophy management program should be tightly regulated to allow bucks with desirable antler characteristics to reach at least 4 years of age. In such a program, usually less than 25% of the bucks are harvested each year. Enough does should be harvested each year to try to maintain the adult sex ratio close to 1.0 (hopefully not exceeding 1.5) does per buck. Male fawns should not be harvested.

Nutrition is managed through habitat management and population management. If the goal of optimizing deer herd health is satisfied, nutrition is adequate for trophy deer production.

Genetics is the most difficult aspect of trophy buck management to effectively manipulate because the genetic potential of deer is very difficult to identify. Each deer has a different genetic potential for antler

growth. If bucks with inferior antlers can be identified, they should be culled in some situations so they do not compete for food and breeding with more desirable bucks. The total number of harvested bucks, including cull bucks, should not exceed the male deer harvest quota. Few or no cull bucks should be harvested if the sex ratio is not ideal due to excess does. A manager needs to closely study a deer herd for several years to learn to differentiate bucks of different ages. Genetic manipulation is the lowest priority in trophy buck management.

Some managers believe spikes (bucks with 1 point on each antler) are the easiest category of potentially inferior bucks to recognize. In some cases this may be true, but poor nutrition can mask an animal's antler potential. For example, yearlings that would normally have multi-pointed antlers can have spike antlers when subjected to nutritional stress caused by drought, deer overpopulation, or heavy livestock competition. Additionally, yearlings that are spikes because of late birth, such as the offspring of does bred as fawns, may have more growth potential than other yearling bucks. Intensively harvesting spikes should be evaluated carefully. Although spike bucks could be considered genetically inferior to similarly aged multi-pointed bucks on the same area (theoretically both groups had access to the same food), extensive spike harvest could result in overharvest of an age-class. Thus intensively harvesting spikes is often not warranted.

Trophy buck management is relatively inefficient because some bucks die before and as they mature into trophies due to natural causes, harvest practices on neighboring lands, and early harvest on the management area from mistaken age identification. Very large acreages or a deer fence around a tract of land are usually necessary for optimum results in a trophy management program. Nevertheless, some improvement in trophy quality can be attained on tracts of land larger than 2,000 acres without a deer fence.

Trophy buck management can be costly because of the deer fence, inefficient because of significant buck mortality, and very restrictive because hunters should harvest only specific types of bucks.