The Effect of Doe Harvest on White-tailed Deer Populations

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Over-population is the major factor limiting production of high quality white-tailed deer in Texas. Deer population control is as imperative for the production of high quality deer as the control of stocking rate is for the production of high quality domestic livestock. Texas Parks and Wildlife Department biologists attribute the long-term decline in South Texas antler quality to inadequate doe harvest.

The necessity for extensive doe harvest to control deer population growth is widely accepted among wildlife biologists. Deer populations brought within the carrying capacity of their range generally experience increased body weight, antler measurements and fawn production. However, the effect of doe harvest on subsequent development and survival of orphaned fawns has been debated until recently because of a lack of research evidence.

The goal of this paper is to address two questions of management concern to landowners planning a population reduction program. First, what are the effects of dam removal before the fawn has been weaned? Specific concerns are potentially decreased survival and stunted body and antler development. Secondly, what are the overall, long-term effects of doe harvest on the deer population several years down the road?

Effect on Orphaned Fawns

The major controversy surrounding doe harvest centers on the potential negative impact of disrupting the relationships between the dam, who is the leader of the family group, and the remaining members of the family group. A family group generally consists of the dam, the current year's fawn(s) and the previous year's yearling doe(s). The dam provides milk prior to weaning and leadership in selecting appropriate cover and feeding areas.

The sooner a deer is harvested from the range, the more forage will be left for other deer. However, if the positive effect of more forage is offset by negative effects on the orphaned fawn, then the net effect of doe harvest would not be beneficial.

Addressing this concern has been particularly difficult for research biologists because of many logistical problems. One study of mule deer in Colorado concluded that if fawns were orphaned after 6 weeks of age they were capable of obtaining sufficient nutrition without their dams. A study of white-tailed deer in Virginia showed that fawns orphaned at 4 to 6 months of age survived as well as unorphaned controls. Neither of these studies provided measurements of physical development because of problems associated with working in the field.

Texas Parks and Wildlife Department personnel examined the effects of artificial weaning of fawns prior to their natural weaning date in pens at Kerr Wildlife Management Area. Fawns artificially weaned at 60 and 90 days of age did not differ in physical development at 180 days of age compared to fawns that remained with their dams. A large sample size in the Kerr study allowed for strong conclusions regarding the lack of effects from early weaning. The only limitation to this study was that it was conducted in a pen and could not address many of the "unknowns" that orphaned fawns would face in the field.

Texas Tech University and the Wildlife Division of Harrison Interests Limited cooperated in a field test of the effect of dam removal on physical development, survival and home range of white-tailed deer fawns in South Texas. Dam harvest was set to coincide with the special antlerless-only season beginning in mid-October.

Our study involved the removal of dams from their radio-collared fawns. The radio collars allowed us to monitor survival and movements over the following year and to locate and harvest the experimental animals one year after orphaning. We compared the survival, home range and physical development of orphaned fawns to that of unorphaned fawns.

Of course, Murphy's Law applied during the first year of our study, 1984. It was nearly impossible to study orphaned fawns when literally no fawns were produced that year. Our fortunes faired better in 1985 and we were able to study 14 orphaned fawns and 13 unorphaned fawns.

Rainfall was well above normal during 1985. The study area, located where Dimmitt, Webb and LaSalle counties meet, received more than 40 inches of rainfall. Habitat conditions for deer were excellent during the study.

Our results supported the conclusions from the Kerr study. Removal of the dam during mid-October in South Texas during a good rainfall year did not influence the physical development of fawns to 1 1/2 years of age. The orphaned bucks were almost identical to the unorphaned bucks in regard to antler development and body weight. In fact, the largest 1 1/2 year old buck in our study, a nine-point weighing 88 pounds dressed, was an orphan. The data for the females were not as clear-cut, but we concluded that there also was no negative impact on development of female yearlings. Survival and home range requirements of the two groups also appeared similar (Demarais, unpublished data).

Long-term Effects on Deer Populations

Harvesting a large number of does will definitely have an impact on your wildlife operation. Some of the effects may be considered negative by some ranchers, but the overall impact is highly favorable.

Bill Armstrong, Texas Parks and Wildlife Department biologist, covers a lot of basic deer biology in a simple sentence: "Deer do two things really effectively: 1) they reproduce; and 2) they eat." Under favorable nutritional conditions, fawn production results in rapid population growth until the maximum number of deer the land can support is reached. We call this maximum population the maximum sustainable density.

As the population approaches the maximum sustainable density, Bill's second biological fact comes into play. As more deer eat more forage over a long period, the quality of the available forage declines. The declining diet quality regulates or slows population growth by reducing fawn production. Additionally, the deer that are produced with limited diet quality are not able to fulfill their genetic potential. In other words, the bucks' antler and body sizes won't be as big as they could have been under more optimum conditions.

A deer population will regulate itself if the manager doesn't do the job. It may not be as obvious to the untrained eye as mass-starvation, but it happens. Fewer fawns are produced per doe and survival of those produced is lowered. Does on an inadequate diet during gestation produce fawns which are stunted and may not survive the rigors of life outside the womb. Often the breeding season is delayed or stretched out, producing late fawns which are not physically ready to face stress periods when they arrive. The animals which do survive will stay physically stunted.

A self-regulating deer population results in lowered animal production and quality and decreased range condition. The answer to these problems is simple to say, but much more difficult to apply. The answer lies in a significant, sustained annual harvest of does. But "how much is significant?" you might ask.

Most deer populations can remain at a stable density while sustaining a 15 to 25 percent annual harvest of their doe population. If your census estimated indicates 100 does on your ranch, then in general you can harvest 15 to 25 does every year with no long-term detrimental impact. The exact number to be harvested depends upon year-to-year variations in fawn production. Once your desired density and sex ratio is obtained, you want to harvest only as many animals as are produced each year.

Intensive doe harvest over many years will alter the age distribution of your population. The higher percentage of younger does in your population could eventually limit the annual fawn production because first-time breeders produce fewer fawns than experienced breeders. However, careful examination of annual fawn production estimates and harvest rates can avert any such problem.

One of the most confusing concepts in population management is that "fewer deer can produce more fawns." At maximum sustainable density there are many doe deer but each is producing fawns at a minimal rate because the poor quality habitat is regulating population growth. As relative density is lowered due to adequate doe harvest and habitat quality improves, the previously unproductive does add fawns to the population. For example, 100 does with a 10 percent fawn crop produce 10 fawns. It takes only 50 does with a fawn crop of 20 percent to produce the same number of fawns. We have seen fawn crops rise from 10 to 70 percent in response to a significant annual doe harvest.

One of the least confusing concepts in population management is that "you are what you eat." If only poor quality forage is available because excess deer have stripped away the higher quality forage, then the deer will themselves be of poor quality. We know of one ranch where average dressed weights increased by 20 pounds over 7 years in response to a sustained doe harvest. During this same period, the number of trophy bucks harvested had doubled.

There are some very real problems that must be addressed before and during the application of a doe harvest program. Of concern to many private landowners is the need for access by a relatively large number of doe hunters. Success rates for 2-day, com-

mercial doe hunts range from one to two does per hunter, so about 75 hunters would be needed to harvest 100 does. Hunter access can be controlled through the use of blinds and/or bait stations.

Landowner satisfaction with doe harvest programs must be associated with a change in the aesthetic appreciation of deer. You can expect to see far fewer deer on your property for two reasons. First, does will become more secretive once they learn that people shoot at them and not just at bucks. Second, the improved range condition will reduce the amount of time deer will have to spend feeding to get their required nutrients. If these adjustments in attitude are made, the way will be paved for a successful doe harvest program.

The principles behind sound deer population management are neither new nor unique to the wildlife management field. They apply equally well to any domestic livestock operation. When ranchers manage their wildlife using the same basic principles that they apply to their domestic livestock operation, a productive, high quality deer management program will be the result.

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