stands commonly resulting from a prior seeding of from the aggressive spreading of forage plants onto formerly cultivated sites or into indigenous stands; medium levels of treatment and grazing management generally projected, but major manipulation of forage stand in the future not excluded; also includes formerly cultivated lands returned from cultivation for conservation reasons through forage stand establishment; replaces ***tame pasture.***

III. ***Short-term grazing lands***—arable land on which grazing is presently being realized but under limited duration; high levels of development, maintenance, and management projected; utilizes mostly introduced forage species, but native species responsive to high management and cultural inputs may be considered; mostly land capability classes I through IV; syn. with ***cropland pasture.***

A. ***Crop-rotation pasture***—grazing maintained for 3 to 10 years in a predesigned crop rotation cycle; cost-benefit results must be competitive with cash crops; intensive cultural treatment provided, including forage stand establishment, fertilization, pest control (weed, insects, rodents, diseases), and irrigation, if necessary; grazing is given top priority but stand may yield harvested forage or seed as a secondary crop; perennial forage species mostly utilized; replaces ***tame pasture.***

B. ***Annual pasture***—plant stand establishment for grazing during a single year, or annual tillage and reestablishment is projected; often used in rotation with cash crops; short-season grazing often provided by emergency or catch-crop plantings or as a double crop when interseeded into or following harvest of the primary crop for fall grazing, winter cover/grazing, or spring grazing; annual forage plant species utilized; intensive cultural treatment provided; grazing is given top priority but may yield harvested forage; syn. ***temporary*** or ***emergency pasture.***

C. ***Crop aftermath pasture***—grazing is a secondary product and carried out after (or sometimes before) the primary crop is produced and harvested; income is supplemental to the main crop, i.e. hay, row crops, small grains, horticultural crops, etc; consists of stubble, crop residues, chaff, lost grain, weed and volunteer herbage, excess foliage yield on small grain crops, and windrowed or baled forages fed/grazed on site where produced.

Literature Cited

Barnes, Robert F. 1982. Grassland Agriculture—Serving Mankind. Rangelands 4(2):61-62.

Dyksterhuis, E.J. 1986. Viewpoint: Crop or Range? Rangelands 8(2):73-75.

Love, R.M., and R.E. Eckert, Jr. 1985. Rangeland Ecosystems and Their Improvement. Chapter 51 *In:* Maurice E. Heath, Robert F. Barnes, and Darrel S. Metcalfe; Forages: The Science of Grasslands Agriculture; Iowa State Univ. Press, Ames, Iowa; Fourth Ed.

Society for Range Management, Board of Directors. 1985. Policy Statements by the Society for Range Management. Rangelands 7(5):229-230.

Society for Range Management, Affiliations Comm. 1986. Organization and Activities of the Affiliations Committee. Rangelands 8(6):297-299.

Society for Range Management, RISC Comm. 1980. Draft Standard Definitions and Terminology. Rangelands 2(4):165-167.

Vallentine, John F. 1978. More Pasture or Just Range for Rangemen? Rangeman's Journal 5(2):37-38.

Vogel, K.P., H.J. Gorz, and F.A. Haskins. 1985. Viewpoint. Forage and Range Research Needs in the Central Great Plains. J. Range Manage. 38(5):477-479.

Wheeler, J.L. 1981. Complementing Grassland with Forage Crops. P. 239-260 *In:* F.H.W. Morley (Ed.); Grazing Animals; Elsevier Sci. Pub. Co., Amsterdam, Neth.

Doe Harvest Effects

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

The necessity for extensive doe harvest to control deer population growth is an accepted management tool among wildlife biologists. Maintaining deer populations within the carrying capacity of their range generally results in 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 due to a lack of research evidence.

This paper addresses two questions of management concern to landowners planning a deer population reduction program. First, we discuss the effects of dam removal before her fawn has been weaned; specifically the impact on physical development.

Secondly, we discuss the over-all, long-term effects of doe harvest on a deer population several years in the future.

Orphaned Fawns

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.

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The major controversy surrounding doe harvest centers on the potential negative impact of disrupting the relationship between the dam, which is the leader of her 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.

One study on mule deer in Colorado concluded that if fawns were orphaned after 6 weeks of age they were capable of obtaining sufficient nutrition without their dam (Swenson 1972). Another study on white-tailed deer in Virginia showed that fawns orphaned at 4 to 6 months of age survived as well as unorphaned controls (Woodson et al. 1980). Neither of these studies provided measurements of animal physical development.

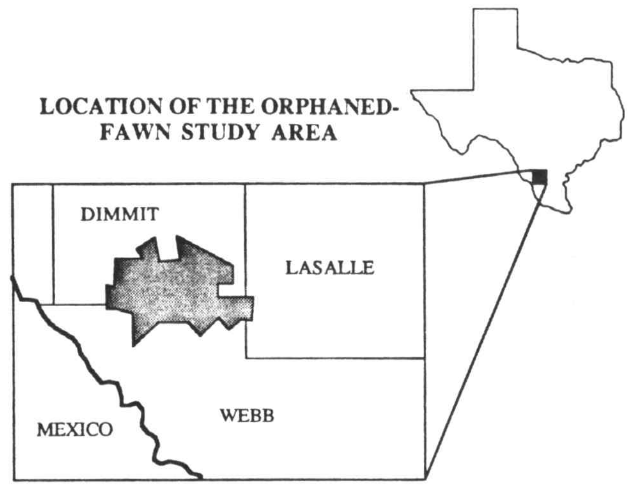
Texas Parks and Wildlife Department personnel examined the effects of artificial weaning of fawns prior to their natural weaning date in pens at Kerr Wildlife Management Area (Williams and Harmel 1987). Fawns artificially weaned at 60 and 90 days of age did not differ in physical development at 180 days of age compared to fawns that remained with their dams. The only limitation to the Kerr 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, Ltd., 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 anterless-only season beginning in mid-October.

Our study involved the removal of dams from their radio-collared fawns. Survival and movements were monitored the following year. We compared the survival, home range, and physical development to 1½ years of age 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 and 13 unorphaned fawns.

Rainfall was well above normal during 1985. The study area, located where Dimmitt, Webb, and LaSalle counties meet, received over 40 inches of rainfall and habitat conditions for deer were very good.



Our results supported the conclusions from the Kerr study. Removal of the dam during 15 October–8 November in South Texas during a good rainfall year did not influence the physical development of fawns to 1½ years of age. The orphaned bucks were almost identical to the unorphaned bucks in regards to antler development and body weight. In fact, the largest 1½ year old buck in our study, a nine-point weighing 88 lbs. 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 of the two groups also appeared similar (Demarais, unpublished data).

Long-term Effects on Deer Populations

Harvesting a large number of doe deer will definitely have an impact on a deer population. Some of the effects may be considered negative by some ranchers, but the over-all 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 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' antlers 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 a mass-starvation, but it happens. Fewer fawns are produced per doe and survival of those produced is less. Doe deer 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 lengthened, producing late fawns which are not physically ready to face stress periods. The animals which do survive may stay physically stunted.

A self-regulating deer population results in lowered animal production and quality as well as a 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 doe deer. But, "How much is significant?"

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

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 the relative density is lowered by doe harvest, and habitat quality improves, the previously unproductive doe deer add fawns to the population. For example, 100 doe with a 10% fawn crop produces 10 fawns. It takes only 50 doe with a fawn crop of 20% to produce the same number of fawns. Some fawn crops have risen from 10% to 70% in response to a significant annual doe harvest.

One of the least confusing concepts in population management is, "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. Average dressed weights increased by 20 lbs. over 7 years in response to a sustained doe harvest on a ranch managed by Bob Cook and Gene Fuchs, of the Shelton Land and Cattle Co. During this same period, the number of trophy bucks harvested 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 commercial doe hunts range from 1 to 2 does per hunter, so about 75 hunters would be needed to harvest 100 does.

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 and quality deer management program will be the result.

Literature Cited

Swenson, L.K. 1972. Mortality in orphaned mule deer fawns. M.S. Thesis. Colorado State Univ., Ft. Collins. 50 pp.

Williams, J.D., and D.E. Harmel. 1987. Effect of early weaning on 180 day body measurements on white-tailed deer. Southwest Deer Study Group Meeting, Gatlinburg, Tenn. (Abstract).

Woodson, D.L., E.T. Reed, R.L. Downing, and B.S. McGinnes. 1980. Effect of fall orphaning on white-tailed deer fawns and yearlings. J. Wildl. Manage. 44:249-252.