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# Using Livestock to Manage Wildlife Habitat

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Can livestock be used to manage wildlife habitat? The answer depends on the livestock and wildlife species in question. Many wildlife species can benefit when their habitat is disturbed by livestock (which causes changes in vegetation composition and structure), if properly managed. It is not possible to optimize wildlife and livestock production at the same time. However, managing for both livestock and wildlife is a good way to diversify your ranching enterprise. It requires that managers understand the habitat and food requirements of both the wildlife and the livestock.

## How Grazing Affects Habitat

Uniform grazing as a result of high stock density can certainly reduce the quality of wildlife habitat by decreasing plant diversity and the escape, resting, screening and thermal cover wildlife need to survive. However, properly managed livestock grazing can improve wildlife habitat by increasing plant diversity. For example, light cattle grazing (less than 35 percent use of primary forage species) to moderate grazing (35 to 45 percent use of primary forage species) usually encourages forb production. Many species of birds depend on the large seeds of forbs for food. White-tailed deer also benefit from forb production. Livestock grazing is most likely to have a positive effect in areas with more than 20 inches of annual rainfall. In drier areas properly managed light to moderate grazing usually does not damage wild-life habitat, but it is unlikely to improve it.

Two of the most economically important wildlife species in Texas are white-tailed deer and quail, and both benefit from certain types of habitat disturbance. For example, both of these species suffer if their habitat changes completely to brush or completely to grass, especially midgrass to tallgrass plants which compete with forbs. In other words, some type of management is necessary in order to maintain good quality deer or quail habitat. Both species can benefit from well-managed livestock grazing.

## Livestock-Wildlife Competition

Even if livestock and wildlife species eat similar types of food (grasses, browse and forbs), they compete only if food supplies are limited. They are more likely to compete for food when there is little plant diversity or when there are too many animals, either wildlife or livestock.

## Grazing and White-tailed Deer

While cattle grazing creates open spaces for forb production, cattle may compete with white-tailed deer for these forbs. On an annual basis, cattle consume about 12 percent forbs, compared to 36 percent for white-tailed deer. In spring, cattle forb consumption may increase to 25 percent, compared to 52 percent for white-tailed deer. A 1,150-pound cow eating 2.6 percent of its body weight in forage consumes about 30 pounds of dry forage a day. If 25 percent of that

forage is forbs, it would eat about 7 pounds of forbs. In comparison, a 100-pound deer consuming forage at 3.5 percent of its body weight eats about 3.5 pounds of dry forage, of which about 2 pounds would be forbs. If the cow and deer in this example were competing for the same forbs, the cow would be consuming forbs that would otherwise be available for the deer. This potential competition could be a problem if deer management were the primary objective and if forage were in limited supply (which is often the case on semi-arid rangelands).

A study in South Texas (in a region with 32 to 36 inches of average rainfall) showed that diet overlap (two animal species eating the same plant species) between white-tailed deer and cattle ranged from 2 to 64 percent. This overlap increased with drought and a heavy cattle stocking rate for that area (6 acres/animal unit/year). In this study, cattle grazing increased plant diversity when rainfall was average or above average, but had no benefit during drought.

Competition caused by drought or excessive grazing can be reduced with a grazing system that allows each pasture to rest during the growing season at least once over a period of several years. Still, stocking rate is the most important factor in using livestock to manage wildlife habitat. Where deer are the primary concern, stocking rates should be light to moderate to avoid overgrazing during periods of low forage growth.

## Grazing and Bobwhite Quail

Bobwhite quail need a variety of plant successional stages (the progressive replacement of one vegetation community by another) to meet their needs for food, cover and space. The successional stage of a piece of land is described as its "range condition." Range condition can be rated as poor, fair, good or excellent depending on the status of vegetation relative to its natural potential. The correct range condition for quail depends on location. In areas with deep soils, a long growing season, and high annual rainfall (more than 30 inches), range condition should be fair to good. In areas with poor soils, a short growing season, and low and variable rainfall, range condition should be good to excellent. Grazing can be used to achieve the proper range condition for quail habitat. Where the annual rainfall is less than 20 inches, grazing should be light to benefit quail, especially to preserve adequate nesting habitat (Fig. 1). In areas with more than 40 inches of rainfall and abundant grasses and forbs, continuous grazing can be moderate.

Figure 1. Basketball-sized grass clumps provide excellent quail nesting sites.

A variety of grazing systems have been developed to meet specific objectives of rangeland management. Some of the grazing systems are:

- continuous;
- deferred-rotation;
- rest-rotation;
- short-duration;
- high intensity/low frequency;
- best-pasture;
- seasonal-suitability; and
- the Merrill three-herd/four pasture scheme.

Each grazing system has a different effect on wildlife and habitat, and no single system can meet all ecological and financial objectives on every type of rangeland. Therefore, grazing systems should be selected according to local conditions and landowner objectives. Specialized grazing systems that strategically define recurring periods of grazing and rest can be used to improve range condition for quail and other wildlife (Fig. 2).

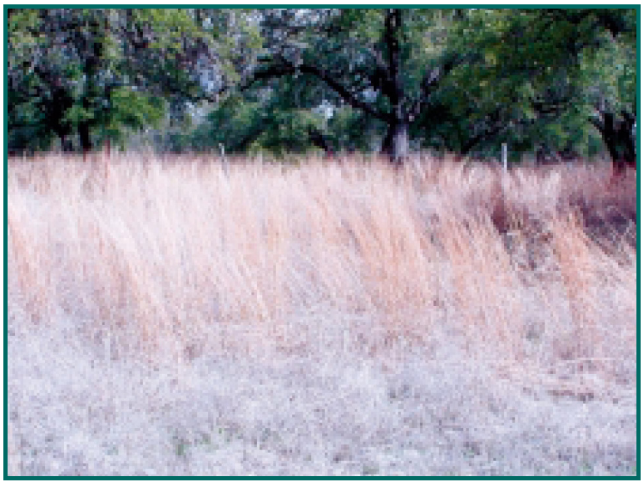

Figure 2. Quail need a minimum of 300 nest clumps per acre.

The combination of rainfall and the amount of brush influences the proper grazing intensity for quail. In areas that get 20 to 30 inches of rainfall, grazing should be light on rangelands with 5 percent or less brush cover. In such areas, herbaceous plants must provide more of the travel and escape cover that would otherwise be provided by brush (Fig. 3). However, if brush species are diverse and of mature height, grazing can be increased to moderate levels. Rangelands that receive 30 inches of rainfall or more can be grazed at moderate levels when there is 5 percent or less brush cover.

Figure 3. Where brush is sparse, quail must rely more on herbaceous plants for travel and escape cover.

A ranch in Brooks County (South Texas) has successfully used cattle grazing as a tool for quail management, the primary management objective of the ranch. The ranch is mostly tallgrass savannah with mesquite and mixed brush. Fire and grazing (with cows) are used to create openings in the dense tallgrass for feeding sites and forb production. Each year within each pasture, a different group of 25- to 30-acre patches are burned in late winter. Cattle graze the pastures the following spring and summer, with grazing concentrated on the burned areas. Cattle are allowed to graze these patches short, which encourages production of forb seeds for the quail and insects

for quail chicks. The ranch has various stages of regrowth mixed with unburned areas, which creates the kind of habitat diversity conducive to quail production. Grazing periods within a pasture are determined by what is best for quail. Stocking rate is decreased during droughts to maintain adequate food sources and nesting cover. The ranch has consistently produced good calf crops with good weaning weights, and rarely needs supplemental feed, even in winter or during drought.

Figure 4. Grass growing among thorny brush or cactus provides good nesting cover for turkeys.

## Grazing and Rio Grande Turkeys

Where turkey habitat is grazed by livestock, problems can include trampling of eggs, increased nest predation, poor choice of nest sites, and limited food.

Trampling is probably not significant unless stock density exceeds 1 animal unit per acre, which is uncommon on most rangelands in Texas.

Excessive grazing can make turkey nests more vulnerable to predators by reducing cover. Even when some areas are protected from excessive grazing predation can be a problem, because often the protected areas are small and few and nest predators are attracted to such isolated patches of habitat.

Grazing pressure or intensity appears to influence the nest sites turkey hens select. Hens usually choose ungrazed or lightly grazed areas for nesting. Low-growing, thorny bushes or cactus interwoven with grasses are especially valuable for nesting (Fig. 4). Herbaceous vegetation can become too dense or tall for nesting in areas with more than 30 inches of annual rainfall, so some grazing would improve nesting conditions in those areas.

Excessive grazing by cattle and goats can affect the food available for turkeys by gradually depleting important browse species, preferred grasses and desirable forbs. Therefore, the amount of herbaceous and woody plants being used by livestock should be carefully monitored when managing for turkey habitat.

## Selecting the Type of Livestock

To select the species and class (stocker, cow-calf, etc.) of livestock best suited for managing wildlife habitat, it is necessary to understand the diets of both livestock and the wildlife species being managed. When livestock have their choice of foods (grass, browse or forbs), cattle will eat mostly grass, sheep mostly grass with more forbs and browse than cattle, and goats about equal amounts of grass and browse (Fig. 5). However, their diets shift somewhat by season, and are very dependent on the plants available. If grass is the vegetation to be managed, cattle would be the preferred species to use because they eat mostly grass. In theory, sheep or goats could also be used to manage grass, but if the wildlife species being managed is white-tailed deer or bobwhite quail there is more apt to be competition for browse and forbs because sheep and goats eat more of these plants than cattle (Table 1).

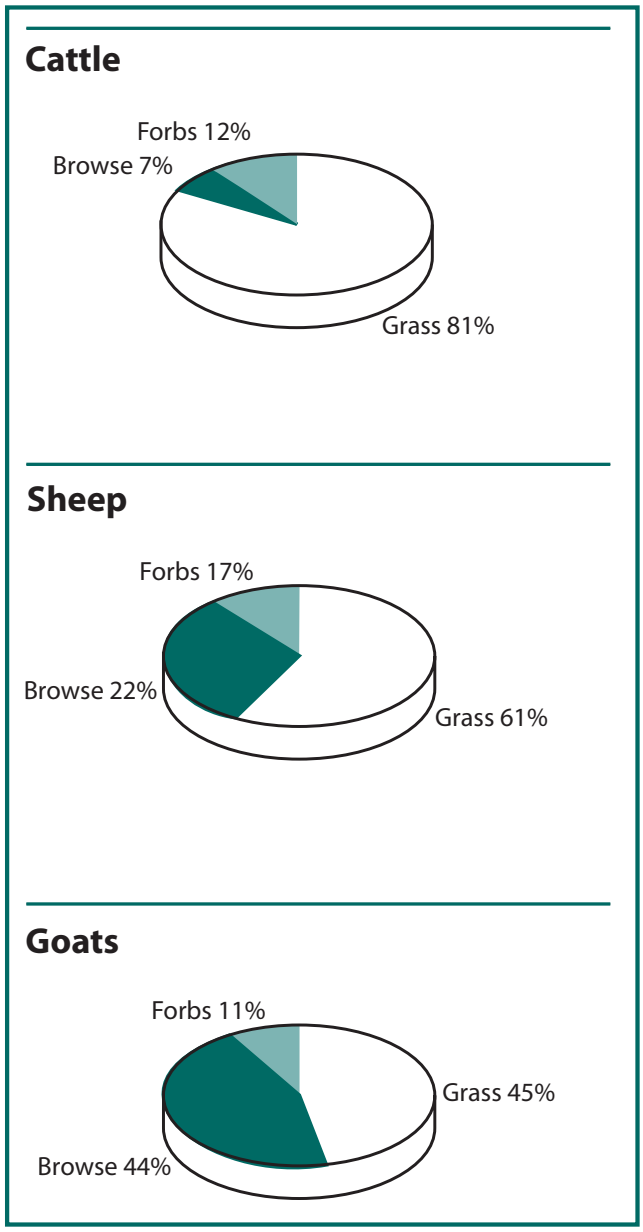


Figure 5. Comparing the average annual diets of cattle, sheep and goats.

Therefore, the effect of grazing on browse and forbs would have to be monitored closely. The example animal weights in Table 1 were selected because they are typical for modern, mature female cattle, sheep and goats.

It could be argued that cattle also eat browse and forbs and could also compete with deer. However, cattle will not consume enough forbs or browse to compete with wildlife unless the habitat lacks grass.

**Table 1. Potential competition between livestock and white-tailed deer for browse and forbs.**

| | |
|---|---|
| 1 cow (weighing 1,150 lbs.) | can consume as much browse and forbs as 1.7 white-tailed deer |
| 9 sheep (total weight 1,150 lbs.) | can consume as much browse and forbs as 3.5 white-tailed deer |
| 10 goats (total weight 1,150 lbs.) | can consume as much browse and forbs as 4.9 white-tailed deer |

Example livestock weights are typical for modern females; average weight of white-tailed deer is 100 pounds.

Rainfall patterns can be highly variable across Texas. For example, West Texas receives less than average rainfall seven out of ten years. Stocker cattle (steers or heifers) may be more appropriate in some situations than cow-calf operations because with stockers it is easier to implement flexible stocking rates to match variations in rainfall and forage production.

A ranch near Brady, Texas provides an example of how goats, despite their dietary similarity with deer, can sometimes be used to manage white-tailed deer habitat. Angora mutton goats are used to browse shinoak-dominated portions of the ranch. This goat browsing stimulates shinoak regrowth, which is more palatable to deer than unbrowsed plants. The rancher believes that the bigger bucks tend to be harvested from parts of the ranch that are browsed by goats for short, intense periods.

## The Effect of Exotic Big Game

The presence of exotic big game must also be considered when determining what species and class of livestock (if any) to use for managing wildlife habitat. There are now many species of exotic big game on Texas rangelands, and they can have the same effect as livestock.

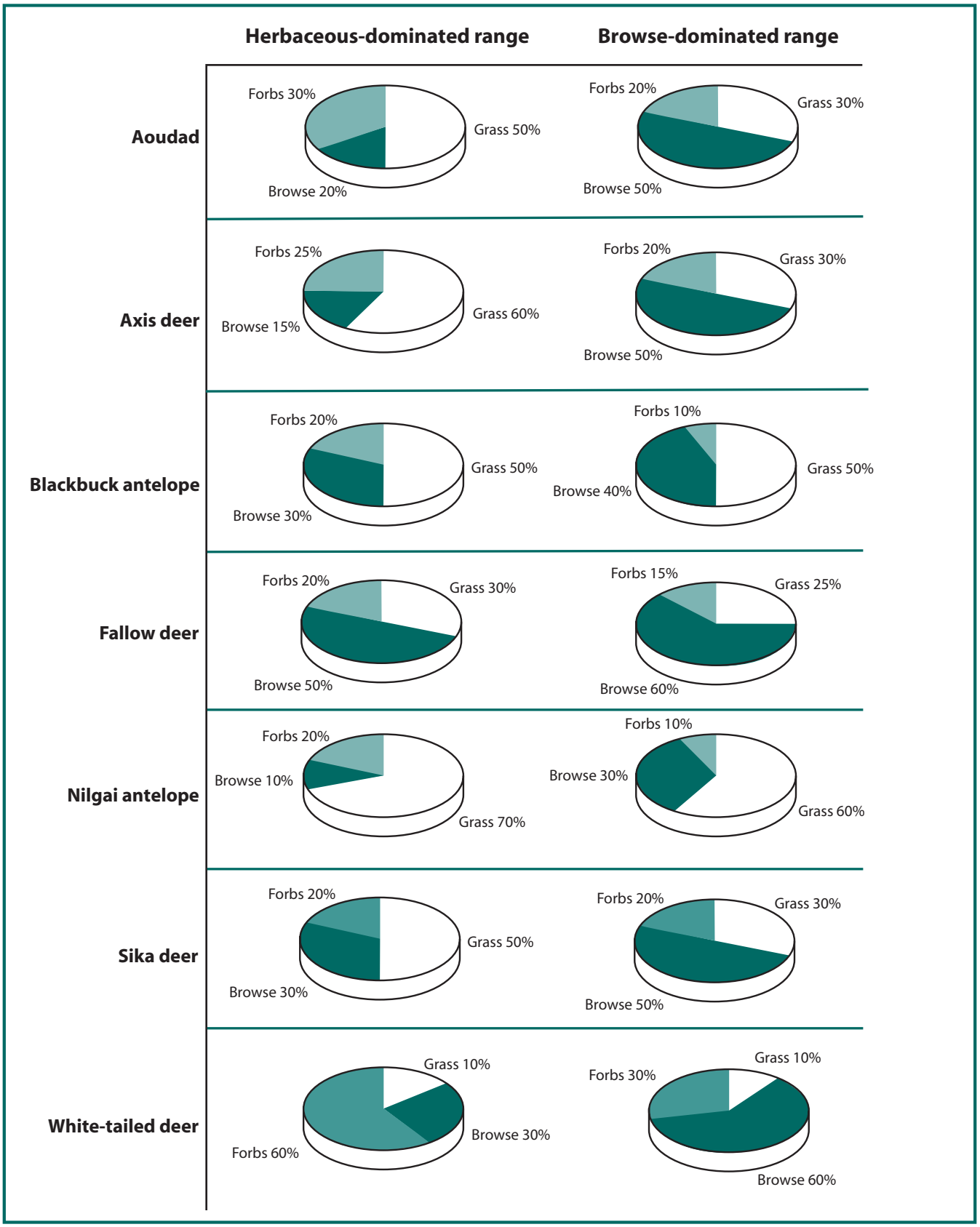


Figure 6. Comparing the diets of big game exotic wildlife species and white-tailed deer on herbaceous- and browse-dominated ranges. Exotics decrease grass and/or forb consumption and increase browse consumption as browse becomes the dominant plant type. White-tailed deer consume the same amounts of grass in either situation.

Like domestic goats, many exotic species are intermediate feeders between cattle (grazers) and white-tailed deer (browsers). They can shift their diets relatively easily from grass to browse or browse to grass (Fig. 6). This flexibility makes them very competitive with white-tailed deer for forbs and browse (Table 2). In addition, exotics may browse 6 feet high or more, which puts remaining browse out of the reach of white-tailed deer because they can browse only to 4 feet. White-tailed deer need grass and forb cover approximately 18 to 24 inches high for fawning areas (Fig.7). If both exotics and livestock are present, too much grass could be removed to maintain healthy habitat for white-tailed deer and other wildlife.

**Table 2. Potential competition between exotic big game and white-tailed deer for browse and forbs.**

| | |
|---|---|
| 1 aoudad (average weight 200 lbs. | can consume as much browse and forbs as 1.3 white-tailed deer* |
| 1 axis deer (average weight 160 lbs.) | can consume as much browse and forbs as 1.0 white-tailed deer |
| 1 blackbuck antelope (average weight 75 lbs.) | can consume as much browse and forbs as 0.5 white-tailed deer |
| 1 fallow deer (average weight 130 lbs.) | can consume as much browse and forbs as 1.0 white-tailed deer |
| 1 nilgai (average weight 450 lbs.) | can consume as much browse and forbs as 1.5 white-tailed deer |
| 1 sika deer (average weight 145 lbs.) | can consume as much browse and forbs as 1.0 white-tailed deer |

* Average weight of white-tailed deer is 100 pounds.

**Calculations do not include the grass component, which is typically less than 15 percent of white-tailed deer diets.

Figure 7. Grass and forb cover 18 to 24 inches tall is needed for excellent white-tailed deer fawning areas.

## Conclusions

Livestock, especially cattle, can be used to manage the habitat of some wildlife species if: 1) the grazing is appropriate for the wildlife species in question; and 2) the grazing is appropriate at a given time. The livestock grazing program should be flexible and it should be coupled with a good range monitoring program so that the effect of livestock on wildlife habitat can be evaluated.

## Management Recommendations

White-tailed deer management

- To protect fawning habitat:
  - Graze no more than 25 percent of the current year's herbaceous growth.
  - For excellent fawning habitat, manage for tall grass (18 to 24 inches) in a large percentage of the management area.
- To provide adequate food sources:
  - Do not allow livestock to use more than 25 percent of the current year's growth.

– Do not allow browsing by livestock and wildlife to result in severe hedging of highly preferred browse species, to exceed 50 percent on moderately preferred species by the end of summer, to exceed 50 percent on low-preference deciduous species by late fall, or to exceed 50 percent on live oaks and evergreens by the end of winter.

***Bobwhite quail management***

- To protect nesting habitat:
  - Graze lightly or not at all where there is 20 inches or less of rainfall annually.
  - Moderate grazing or even heavy grazing may be acceptable in areas with more than 40 inches of rainfall annually, depending upon the brush species available.
  - Manage for a minimum of 300 basketball-sized grass clumps per acre.
  - Manage for a minimum grass stubble height of 8 inches, preferably 12 to 14 inches.
- To ensure adequate food supplies, restrict heavy grazing that would eliminate or greatly reduce forbs or grass seeds.
- Encourage spot grazing on small patches of the habitat.

***Turkey management***

- To protect nesting habitat:
  - Graze lightly or not at all in the drier regions of the state or where range condition is fair to poor.
  - Preserve low, thorny brush interwoven with grass.

    or
  - Create grazing exclosures that are 100 to 500 acres in size for every 3,000 to 5,000 acres of rangeland.

    Graze exclosures every 4 to 5 years in dry climates and every 2 to 3 years in wetter climates to prevent nesting habitat from becoming too dense.

    Graze exclosures only in July and August.

    Leave vegetation 18 to 24 inches tall in exclosures with adequate interspaces for travel of poults.
- Outside of nesting areas, use moderate grazing intensity to promote food production.

## For more information:


B-6130, "White-tailed Deer Browse Preferences for South Texas and the Edwards Plateau," Texas Cooperative Extension.

L-5400, "Stocking Rate: The Key Grazing Management Decision," Texas Cooperative Extension.

L-5196, "Integrating Deer, Quail and Turkey Habitat," Texas Cooperative Extension.

L-5024, "Range Condition: Key to Sustained Ranch Productivity," Texas Cooperative Extension.

B-6114 , "Grazing and Browsing: How Plants are Affected." Texas Cooperative Extension.

"The use and management of browse in the Edwards Plateau of Texas." Natural Resources Conservation Service. Temple, TX. *http://texnat.tamu.edu/cmplants/UseMgmtBrowseEPTX.pdf*

Managing Livestock Stocking Rates on Rangeland. Symposium Proceedings, 1993. Department of Rangeland Ecology and Management, College Station, TX. *http://texnat.tamu.edu/symposia/index.htm*

Preserving Texas's Quail Heritage into the 21st Century. Symposium Proceedings, 1999. Department of Wildlife and Fisheries Sciences, College Station, TX. *http://texnat.tamu.edu/symposia/index.htm*

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