

Principles of Habitat Management for Deer

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Home Sweet Home: Deer Can't Live Without It

Habitat is where deer live – their home – and it must include all essential ingredients for survival. Food, shelter and water are the most important building blocks to make the home livable. Solutions about deer numbers and health can ultimately be found by improving one of the three components.

Food, shelter and water must be available to deer. Food may be out of reach vertically resulting in browse lines from over use or because forested areas grew taller and less appropriate for deer due to natural processes called ecological succession. Food is not available horizontally if brush control or timber harvest operations create openings so large that deer will not leave shelter long enough to obtain food in the center of openings. Likewise, shelter and water are not valuable when food is not available nearby. Arrangement of habitat components should provide all necessary ingredients within appropriate distances for deer to travel.

The area deer travel within to secure their needs is called home range. Animals have a preferred amount of space to use and overcrowding leads to social strife and, ultimately, internal mechanisms for population control. During breeding season, rubs and scrapes – well known to hunters – are ways for bucks to post their territory against intruders and serve as welcome mats for does. Beating antlers together is an effective tool for hunting because of social urges of males to defend their territory.

In any habitat, deer should not be overcrowded for two important reasons. First, health and reproductive success of deer are determined by quantity and quality of habitat components: food, shelter and water. Second, the social system of deer can be affected. Considered together, habitat and social requirements of deer must be met within some level of tolerance within an environment: a carrying capacity.

A ranch can hold a certain number of deer at any given time at a desired level of quality. If habitat needs of cattle, goats, sheep, other wildlife, rodents and insects are also considered, a complex set of considerations develops. Carrying capacity changes constantly due to weather, human-caused alterations in vegetation, natural changes through ecological succession, and from grazing and browsing by domestic and wild animals.

From the deer's perspective there are basically two kinds of problems with habitat. First, the habitat may be good, but the deer are too plentiful. Competition is great and most deer can't find sufficient food or unoccupied shelter; thus, predation, diseases and poor nutrition begin to take a toll. Fawn crops go down and recruitment of new members to the fall population is affected. Even worse, overutilization of forage could decrease the productivity of plants and the carrying capacity for the following year could be lowered. The second kind of problem is when the habitat is poor regardless of the number of deer. Deer are in poor condition and below trophy making potential even when populations are low. They still compete for forage and space and can destroy habitat even further. In both cases, herd size must be reduced to the level of carrying capacity. The poor habitats will need treatments for improvement.

There Could Be Too Many Deer on Good and Bad Range

Every year there is a biological surplus of deer to be harvested. On excellent range with low numbers of deer, the surplus may be small, but undoubtedly there are old, injured, diseased or deformed animals that should be culled. Since most of Texas is well stocked with deer, I won't dwell upon restocking a ranch. Suffice it to say that superior deer with good racks and healthy bodies should be spared while spikes and animals with obvious abnormalities should be removed. The biggest worry may be that as the population expands you will not be prepared for heavier harvest of bucks and does when the time comes. The important thing to remember is that any reproduction that occurs when a deer population has reached carrying capacity is surplus, and wasted if not used. From a seasonal perspective, summer and early fall capacities may be high, but winter and spring habitats (very critical periods for deer) could be low. Consequently, it is important to reduce numbers prior to the critical period when the capacity is limited.

Ingredients of habitat that are deficient and prevent populations from growth are called limiting factors. The requirement that is present in minimum amounts below the tolerance level of deer is the limiting factor. Thus, if water and food are plentiful and escape cover is minimal, shelter is the limiting factor. More subtle factors could include lack of minerals in the soil or low levels of protein in plants. This relationship is called

the law of the minimum. Many factors can be at work simultaneously upon a herd, making it difficult to identify specific problems and solutions. For example, coyotes may eat a large number of fawns, lowering recruitment to the fall population. Predation could be the limiting factor. However, predators work best when shelter of prey is poor or if limited food supplies weaken fawns. If shelter and/or food are the real problems—two of three key habitat ingredients—then reducing predators would not affect the real limiting factors. On another habitat, escape cover may seem to be limited. Hunting is stopped. Now cover is not limited (but your business would be!) since animals don't need to escape hunters. If more food were supplied near the cover, higher populations could be supported. Thus, any of the factors—hunting, cover and food—could be considered limiting. The factors of most concern and relevance in the carrying capacity of an area are food, shelter and water arranged spatially to meet the habitat and social needs of deer.

Carrying Capacity of Land is Limited

Think of the carrying capacity on a ranch as if it were a bath tub. The tub is the habitat. The size of the tub is the carrying capacity. Water running in is births and migrations. Water going out is death (from all causes). Balancing the amount of inputs to habitats with the amount of deaths from the population is the goal. Managers can stop migration with high, expensive fences, but can't regulate fawn production as easily. Deaths can be modified by stopping or increasing hunting, controlling predators, etc. Often, however, when one death factor is changed, another takes its place. For example, a disease may kill deer if predators don't. Regardless, it would be difficult and expensive to catch enough predators (they have a biological surplus, too) or to give shots to all deer like we do with cattle. Hunting can be controlled and is a valuable tool. The other factor under our control is the tub. We can improve habitat and make it bigger, or reduce habitat and watch deer spill out over the sides.

With the bathtub, births, deaths and carrying capacity in mind, let's stock the tub under a few different circumstances. The scenarios are adapted from a presentation by Dr. Richard Teague at a deer seminar in California.

- The carrying capacity on one ranch is 100 deer, half of which are females (50). One fawn per each doe makes it to the fall for a total of 150 deer. Fifty deer are surplus and if humans don't remove them, mother nature eventually will. Harvesting the 50 deer isn't reducing the herd, it is using the surplus.
- The carrying capacity on another ranch of similar size is ten deer (five does) due to poor food supplies. If one fawn per doe reaches the fall population then 15 deer are present. Five deer

are still surplus and should be harvested. You can't stockpile deer on poor range. There is no value in putting more water into a small bathtub. When the tub is full, the tub is full.

- The final ranch has 1,000 deer (500 are does) and the habitat is extremely poor. Reproduction and survival of young is limited. Even though a doe is capable of having twins or triplets on good range, deer on this ranch will average one fawn per two does or 250 fawns per 500 does. The total population by fall is 1,250. If 1,000 deer are the desired number, we can harvest 250 and still maintain the desired levels. Reproduction is low due to the harvest. Harvest is low due to poor reproduction. But total deer numbers remain constant. The ranch is in a steady state of poor quality.
- Finally, the last herd could have been managed another way. We could cut the herd to 250 does, one-half of the original number. Bucks and does together would now total 750 rather than 1,000. If food was the true limiting factor, then nutrition of the females should increase and reproductive input to the population will follow. Understanding again that deer with good nutrition will produce two or three fawns per doe, let's conservatively assume that only one fawn per doe is recruited into the fall population. Total deer on the ranch would now include 250 fawns, 250 does and 500 bucks, or 1,000 deer. The surplus of 250 can still be harvested as before. Now, however, pressure on the range may be low enough to allow the habitat to recover, the health of the herd to improve and the carrying capacity to eventually increase. **The object is not to have a maximum, it is to harvest the maximum.**

Ranch Objectives and a Plan

If you have a ranch with deer on it, some quality of habitat exists. Now all you have to do is decide the objectives for the environment, herd and clients. With step one being an understanding of how wildlife and their habitats interact from preceding information, step two is to fit wildlife and recreational clients into overall ranch management objectives. There is no time here to review economic, philosophical and marketing strategies. Let's assume that you want to manage deer in some relationship with livestock and that hunters desire access to shoot deer. Should you manage for quantity harvest (most meat per amount of forage consumed) or quality harvest (trophy bucks)? Perhaps a combination of both is needed. That is, females and inferior males may have to be marketed to provide forage of necessary quality to grow impressive antlers on superior males. A final question: How many hunters can the herd (and your facilities) accommodate?

Plans begin by learning what supply is available and what demands exist. Wildlife cannot be tallied like cattle. Estimates of populations and indexes of abundance are calculated from observing or finding sign from samples of the total population. Ramsey (1981, 1983), D. E. Guynn (1982) and Weishuhn (1982) provided guidelines for estimation methods in earlier Rancher's Roundups. The quality of a range to support deer should also be looked at. Abundance, composition and availability of desired plant species are important to monitor. Blankenship (1981) graphed some important species to deer in South Texas. The quality of deer harvested is a valuable indication of habitat carrying capacity and overall health of the herd. When only prime males are harvested, one can only learn about that segment of the population. Records should be kept on all harvested animals including information about age, weight, body condition (body, tail and kidney fat), antler measurements, sex and more (Cook 1981, Guynn 1983).

Basic data gathered and understood about animals and their habitat can be compared to determine carrying capacity goals. Robinson and Bolen (1984), Halls (1978), Varner and Hughes (1981) and Hailey (1983) discussed nutritional considerations for deer herds. Relationships of domestic livestock must also be understood (Harmel 1981, Blankenship 1981). Competition between deer and domestic livestock and exotic wildlife varies within the year and among species (Halls 1978, Armstrong 1981). Signs of too many deer and other competitors include the following (Halls 1978):

1. most palatable plants are heavily grazed and may disappear;
2. the use of "stuffer" foods increases;
3. browse lines appear;
4. deer reproductive rates decline, and there are fewer twins;
5. fawn losses are high;
6. mature animals show a decline in size and weight;
7. antler size declines and there is a high percentage of spike bucks;
8. deer are in poor physical condition and more susceptible to disease and insects; and
9. the sex ratio at birth may favor bucks.

Desires of clients for deer harvest also are part of habitat and deer population management objectives. Ranches can be hunted as is, managed for maximum meat production per forage consumed, regulated to produce trophy males or a combination of these. Articles that will help to better understand the options have been presented in proceedings of International Rancher's Roundup (Cook 1981, Welge 1981, Finegan 1981, Maltsberger 1981, D. E. Guynn 1982, Wolf 1983, Harley 1983).

Hunting managers have more immediate control through providing hunter satisfaction than in other aspects of the operation. Treatment of hunters and marketing of their experiences (Menziez 1983) relates to habitat and overall ranch plans. The number of hunters (Deckert al. 1980), chances of success (Stankey et al. 1973) and perception of population size (McCullough and Carmen 1982) have immediate effects on hunter satisfaction and are within control of the manager (D. E. Guynn 1982).

Words To Remember

- W WEATHER AND WATER:** mother nature is the ultimate manager.
- I INTERESTS** of clients and yourself: the reason for management.
- L LONG RANGE OBJECTIVES** of the property must be decided: livestock, wildlife and recreational opportunities.
- D DIVERSITY:** diverse habitats are good for wildlife; diverse enterprises are good for business.
- L LIMITING FACTORS:** needs of animals and clients must be met within levels of tolerance or populations and profits will not be optimized.
- I IMPROVEMENTS** in herd structure, habitats and services are balanced with objectives and costs.
- F FOOD** in appropriate quantity and quality must be available to ensure healthy, productive herds.
- E ENERGY FLOW** from plants to animals is limited, much like the carrying capacity of a gasoline can. For more fuel to be supplied, a larger can is required. Habitats can carry a limited amount of animals until the carrying capacity is improved.

- H HABITAT COMPONENTS: food, shelter and water are usually the source of problems and solutions.
- A ARRANGEMENT: habitat components must be located within the spatial needs of wildlife.
- B BASELINE INFORMATION should be known about plants, animal populations and the biological potential for improvements on the property.
- I INTERSPERSION of habitat components – food, shelter and water – throughout property improves availability to wildlife and accessibility to clients without causing social conflicts among either group.
- T TIME: habitats change naturally over time through a process of ecological succession; it takes time for habitats and wildlife populations to recover.
- A ANIMALS change in number and health as habitats improve or decline over time.
- T TOO MANY DEER affect quality of habitat, quality of trophies and overall herd productivity.
- S SUCCESS is the goal – clients want it, animals need it, you will deserve it – based upon an understanding of wildlife, their habitats, carrying capacity and appropriate harvest.

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