



HABITAT 101: *Habitat Concepts and Management Tools for South Texas*

Definitions:

Diversity: Preferred wildlife habitat is made up of a wide *variety* of plants that provide food and/or cover.

Limiting Factor: Any '*weak link*' that is critical to the survival of an animal or a species. Ex. severe drought or habitat destruction.

Interspersion: A variety or *patchwork pattern of habitats* in close proximity to each other; these areas are connected by travel lanes or *wildlife corridors*.

Edge ~~zone~~: The *transition zone* between two different vegetative types, or where two or more plant communities join. Ex. where a cleared field and brush pasture meet. Deer are *edge* feeders.

Home Range: The area where an animal spends the majority of its time. For deer, we generally consider the average home range to be about 200 acres.

Selective Foragers: Animals which prefer a wide variety of plant species in their diet but select for tender succulent shoots—primarily the current years growth.

Plant Succession: The orderly process (natural or man-influenced) of one group of plants replacing another over time.

Basic Needs of Wildlife

Just like humans, wildlife need food to eat, water to drink, cover to protect them from predators and weather extremes, and space to live and raise their young. The living space that provides all of the basic needs of wildlife is called *habitat*. Combinations of the following 4 basic *habitat components* are unique for each species.

Food

Food supplies energy and other nutrients that all animals need to survive. Without proper nutrition, white-tailed deer cannot grow to their genetic potential.

Four broad classifications of plants which deer utilize:

- **Forbs**—broad-leaved herbaceous annual & perennial plants commonly called *weeds* or wildflowers.
- **Woody Browse**—leaves and twigs from trees or shrubs.
- **Grasses**—narrow-leaved herbaceous plants with parallel veins.
- **Mast**—fruits and nuts of trees and shrubs-ex. oak acorns, prickly pear tunas, persimmon fruit

Deer are *herbivores*—plant eaters, preferring a diversity of forbs and woody browse. They do a poor job of digesting most grasses. However, not all forbs or browse plants are necessarily deer foods. Like humans, deer eat what they like best, leaving less favored plants behind! For this reason, deer are known as *selective foragers*—preferring to feed on a wide variety of plants rather than a few specific ones. Most preferred plants have higher nutritional values which vary according to the season of the year. Therefore, both the *quantity* and the *quality* of available plant species are important.

Water

Of all the nutrients important to wildlife, water is the most critical. Some animals must drink water from a spring, pond or creek nearly every day, while others extract moisture from the foods they eat. For most wildlife species, water is obtained from three major sources:

- surface water or *free-standing water*
- extraction of moisture from plant material
- *metabolism*—chemical breakdown of carbohydrates, fats, and proteins inside the animal.

Deer can rarely meet their water requirements from metabolism and the succulent plant material they consume. They also require accessible, well-distributed sources of free-standing water. Water is often the most critical *limiting factor* (weak link) in arid South Texas. Water would not be a limiting factor in habitats receiving 40 inches of average annual rainfall as in East Texas, however the average annual rainfall in much of South Texas is 18.325 inches per year. Would water then become a limiting factor?

Shelter

Most wildlife species require specific types of cover or shelter. Most often shelter is utilized:

- as living space to feed and rest
- as escape or protection from predators and/or inclement weather
- as places to rear their young

Shelter can take many forms including vegetation, underground burrows, rockpiles, or other natural features. Shelter can also take the form of man-made features such as bridges, buildings, power poles, etc. Utilization of these non-traditional forms of shelter highlights the *adaptability* of many wildlife species.

For deer, the same woody browse species that provide a stable food supply also serve as escape and thermal cover. Escape cover is particularly important to reproductive success when does leave young, defenseless fawns hidden while they leave to forage for food. Grasses are important in providing fawning cover.

Many wildlife species prefer a diversity of plant cover types in their home area ranging from thick brush to open spaces to meet their varying cover needs. Most often these cover types are connected by *wildlife corridors* where they can travel, unseen by possible predators. Drainages and creek bottoms are examples of these travel corridors. Deer, like most wildlife species, are

edge feeders—preferring to venture only a safe distance into openings to feed. When disturbed most deer run for cover, preferring to move ¼ mile or less.

Space

Different animals have different space requirements. Like people, most wildlife species do not like to be too crowded. Some animals like mountain lions are not tolerant of each other and require thousands of acres to roam, while others, such as the bobwhite quail may never travel more than a few hundred yards from their birth place. Space also refers to the arrangement of food, water, and shelter. These components must be found within close proximity to one another and within easy traveling distance for a given species. Biologists call these space requirements *home ranges*—the distance an animal will travel in its lifetime to meet its habitat needs. Although home ranges often overlap, each animal occupies its own unique space.

Theory and Tools of Management

Natural habitats can support a limited number of animals based on the distribution and amount of the four basic habitat components. The number of animals that can be supported by a particular habitat is called *carrying capacity*. Changes in the habitat, whether natural like the maturing of a forest—*plant succession*, or human-related like the wholesale removal of woody cover for improved pasture for livestock production, lead to changes in a habitat's carrying capacity.

Wildlife biologists use habitat management techniques or *tools* to mimic some of the forb, grass, and browse-producing processes that occurred prior to European settlement in Texas.

Using these tools in proper combinations results in improved nutrition for deer, livestock, and other species.

Aldo Leopold, the father of wildlife management published Sand County Almanac in 1949. In it he quotes "...game (wildlife) can be restored by the creative use of the same tools which have heretofore destroyed it—axe, cow, plow, fire, and gun. The favorable alignment of these forces sometimes came about in pioneer days by accident. "...Management is their purposeful and continuing alignment." Look for some of the following management tools espoused by Leopold at work on Chaparrrosa Ranch today.



AXE



COW



PLOW



FIRE



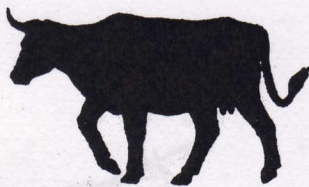
GUN



Mechanical brush management allows desirable forb and browse production. Properly utilized brush clearing practices can improve the 'menu' of escape cover and food plants for both wildlife and livestock. Wildfires accomplished this in the *old days*. Today's wildlife managers use a combination of mechanical methods and prescribed fire with the ultimate goal of *soil disturbance* and setting back *plant succession*. All resulting new growth is highly preferred by wildlife and is significantly higher in nutritional value. Some of the mechanical brush manipulation tools available include:

- Root plowing—a "total" plant removal method, which cuts the woody plants' roots off below the soil's surface. Root plowing usually stimulates the growth of herbaceous vegetation (grasses and forbs). A drawback of root plowing is that once woody plants re-establish on root plowed sites, the diversity of woody plants, which deer and other wildlife depend on as a food and cover source, is dramatically reduced. The treatment life of root plowing is longer than "top removal" methods. However, maintenance treatments such as prescribed fire must be used to maintain the desired herbaceous vegetation stands which result from root plowing.
- Rollerchopping, aeration, or chaining—creates soil disturbance and reduces competition from undesirable woody vegetation by returning a plant community to early successional growth stages. These are considered "top removal" methods for woody plants and treatment life is relatively short. Woody plants will regrow quickly and maintenance treatments will need to be applied within 2-4 years to maintain the benefit of the original treatment. Prescribed fire or additional mechanical treatments are recommended as maintenance treatments.

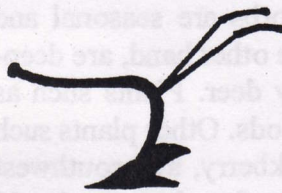
When brush management techniques are used, wildlife managers must remember to allow for a deer's cover requirements. A good technique is to mix cleared and brushy areas producing cover, and a mosaic of food plants. Brush removal should never exceed 25-30% at any given time and should take place in strip or block patterns. Leaving strips of native habitat intact provides this cover requirement, however strips should be wide enough to provide adequate protection. A good rule of thumb is to stand in the center of an opening and look into the brush strip. The brush remaining should not allow visually seeing through it when plants are dormant (mid-winter). All brush control practices should follow land contour lines to minimize erosion and should always avoid sensitive habitats such as creek drainages and waterways. These areas are far more valuable as travel corridors, and roosting sites for species such as Rio Grande Turkey.



If you had to pick the single most important deer management *tool*, it would be **livestock grazing management** followed closely by fire. By learning to control these two high-impact processes, a wildlife manager can impact a wide range of vegetation for a wide range of animals. Grazing management consists of:

- Proper domestic stocking rates—balancing livestock numbers with available forage.
- Stocking with proper kinds of animals—Cattle are primarily grass eaters but will consume forbs/browse as grass disappears. Deer are also forb/browse eaters. Deer management consists of grazing cattle and deer simultaneously, remembering to balance deer numbers to forbs/browse and cattle numbers to grass. Other livestock like sheep/goats, and exotic wildlife species definitely compete with native deer species by removing preferred forb and woody browse plants.

- Rotational grazing systems—Prior to European settlement, buffalo (bison) ranged over most of the Great Plains, including Texas. These great herds—up to 30 miles long—were constantly on the move to allow grazed areas to recover. Their hooves churned the soil much like tilling a garden, leaving bare areas for weeds and browse to grow. Forb-eating animals like deer and antelope and weed/seed-eaters like dove and quail were attracted to these areas. Buffals had *weeded* the range and the area would then grow back to grass to await their next visit. Biologists use fencing and rotational grazing of domestic livestock to mimic the buffalo herds. Rotational grazing systems are preferred over continual grazing systems which do not allow plants to rest or recover.



Plowing And Seeding - Have you ever noticed that the first plants to come back in a plowed, scraped, or otherwise disturbed area are forbs (weeds). Exposed to air, light, and water, seeds that were lying dormant in the soil begin to germinate. The young plants are high in nutrient value and attract forb and weed/seed-eaters such as deer, turkey, quail, and dove. The technique is called fallow discing because it uses a conventional farm disc to disturb the soil to a depth of 4-6 inches. No reseeding occurs as the native seed bank usually provides an ample source to revegetate disturbed areas (much like plowing a field following the harvest). These areas can serve as "native" food plots. These "native" food plots can be supplemented with either native plants (sunflower or croton) or nutritious small grains such as peas and beans (also known as legumes), sorghum, oats, or rye. Seeded areas can also serve as a *seed bank* allowing native plants to spread to other areas.



Fires are not all alike. **Prescribed fires** are also called *controlled burns* because they are conducted under specific climatic conditions to produce a desired effect on vegetation and are able to be "controlled" or contained within a specific area. Historically, natural and man-caused fires occurred frequently. Prescribed fires used today are not as intense. Biologists now use fire to manipulate vegetation for the benefit of wildlife. Fires can be

used to:

- control invasive vegetation like cedar in the Hill Country or remove rank, old growth grasses or woody vegetation and allows new, more nutritious growth to sprout.
- open vegetative overstory to allow light penetration to the soil surface for forb and browse production
- speed up nutrient and mineral cycles by fixing nitrogen in the soil from burn debris, thereby having a fertilization effect on the range
- increase moisture infiltration into the soil

Grasses provide the primary fuel to carry fires across rangelands. Proper grazing management is crucial in allowing the use of prescribed fire as a management tool. There is an art and a science to using this powerful tool. Fires can be *cool* or *hot*. Depending upon weather conditions and management practices before and after the burn, various plants can be selected for or against. Cool fires seldom harm mature trees while hot fires can top-kill trees. Managers are encouraged to learn how to use prescribed fire before attempting one on their own. They should contact professionals with Texas Parks & Wildlife, Natural Resource Conservation Service, or Texas Cooperative Extension. Of all habitat management tools available to the land manager prescribed fire is the most effective and least expensive to implement.



Mother Nature provides a surplus of animals to compensate for death losses in a species. In populations where management does not occur, animal numbers will soon build to levels exceeding range carrying capacity resulting in habitat abuse, starvation, and death. A **regulated harvest** helps assure that there is plenty of food for the number of animals present on the range. Balancing deer numbers to the amount of forage available insures maximum body and antler growth in order for more deer to reach their genetic potential.

Since we know deer prefer forbs and woody browse, biologists use these plants to judge the quality of habitats and to assess range abuse should it be occurring. Forbs are seasonal and fluctuate with rainfall patterns and timing of grazing. Browse plants, on the other hand, are deep-rooted and more stable. However, not all browse plants are preferred by deer. Plants such as whitebrush, twisted acacia, coyotillo, and goatbush are poor quality deer foods. Other plants such as kidneywood, granjeno, guayacan, coma, prickly pear cactus, sugar hackberry, and southwest bernardia are considered *preferred* deer foods. In assessing habitats, these preferred plants should not display removal of over 50% of their current year's growth. If this is the case or if poor quality plants show heavy use by deer, chances are you have too many deer on the range! When using hunting as a management tool, biologists also consider the sex ratio of bucks to does, the age of the deer, and the genetics of the herd.

