



White-tailed Deer

Biology & Management

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Historical

The flashing of a white, flag-like tail along the edge of a field and into the woods signals the presence of the most popular game animal in the South. Hunting the white-tailed deer (*Odocoileus virginiana*) is a form of recreation that is steeped in tradition and tremendously popular. There is also considerable interest in the aesthetic, economic and educational values of deer as well as the recreational opportunities they provide. Our deer herds are certainly a valuable resource and, with proper management, they will continue to thrive.

In pre-colonial times, the extensive mature forests of the South did not provide optimum habitat diversity necessary to maintain high density deer populations. Deer were locally abundant, in areas where lightning fires and other factors had opened up the dense forest canopy. Natural enemies of deer, such as the cougar and timber wolf, also played a significant part in regulating deer numbers and in keeping them in relative balance with their habitat. As colonial settlement, extensive agricultural production (cotton), and market hunting grew, these factors severely limited deer populations and herds began to decline drastically.

By the early 1900s, deer numbers had reached a low point and the public finally became more concerned about conservation. Game laws were enacted and law enforcement efforts were strengthened. After World War II, a deer restocking program was initiated. Deer were trapped from areas in the lowcountry where adequate populations were present and relocated in suitable areas throughout the state. The screwworm epidemic later placed a major limiting factor upon the growth of deer populations across the Southeast. In 1958, however, the screwworm problem was eliminated, and once again deer herds began the natural expansion of their range. The restoration efforts by state wildlife agencies, solid support of private landowners and the general public, and elimination of the dreaded screwworm enabled the spectacular comeback of the white-tailed deer.

Since vast stands of virgin forest and large predators are gone, few natural factors, except deer themselves, now act to limit deer populations. If factors are not present to limit a population's growth, deer herds become their own worst enemy. The most valuable and preferred food plants are browsed out or eliminated. Deer are then forced to utilize lower preference foods with lower nutritive quality. The problem becomes more complicated with each successive fawn crop. Natural mortality may increase significantly and the population often



experiences a reduction in overall health. Unfortunately, when die-offs occur, the habitat has usually been severely damaged and may require many years to recover. This sequence of events occurs as a cycle where factors are not present to regulate a deer population's growth.

Man, however, has assumed the role of many predators. Through regulated hunting, adequate numbers of animals are removed from growing populations each year, keeping deer herds in balance with their habitat. Also, by balancing the deer harvest with the annual fawn crop, relatively stable and healthy populations can be maintained.

Life History

In the South, the whitetail is our only native species of deer; however, there are four distinct subspecies. Throughout the southern region there is a noticeable seasonal variation in the coloration of the whitetail. The short, reddish summer coats are shed over a period of several weeks in the early fall, and the heavier, gray or gray-brown winter coat is acquired at this time. The winter coat is replaced through a similar shedding process during the following spring. Fawns normally lose their spotted coloration after 3 or 4 months, or at the time their winter coat replaces their first summer coat.



White-tailed deer are polygamous breeders: one male mates with several females during a breeding season. Breeding occurs during the fall and winter, but may extend from late August through January. Peak breeding usually occurs in November. The gestation period for white-tailed deer is slightly less than 7 months or between 190 and 210 days. Fawning normally extends from March through July with peak fawn-drop occurring in late May.

Does bearing young for the first time often have a single fawn. Thereafter, they may have up to 4 but rarely more than 2 and sometimes only one. A single litter per year is produced. Both sexes are capable of breeding at 1½ years of age, but doe fawns receiving adequate nutrition often breed during their first year.

Typically, males slightly outnumber females at birth. They usually weigh 5 to 7 pounds, with males being larger than females. Fawns are able to stand on spindly legs during their first day of life, but do not ordinarily begin following their mother until they are about one month old. During this early period, they are visited frequently by the doe for feeding. Fawns usually are not abandoned, as many people believe when they happen to find them unattended between feeding periods. The doe is almost always browsing or resting nearby. Fawns that are found in the woods should be left alone. Moreover, male deer, in particular, do not make safe pets. Many people have been seriously injured by “domesticated” bucks that had lost their fear of man.

Male fawns have a type of antler growth usually referred to as buttons. Bucks get their first noticeable antlers as yearlings or at the age of 1 to 1½ years. Yearling bucks may have up to 10 or more antler points, depending upon nutrition. Generally, older animals have heavier, better developed antlers than animals of a younger age, if nutrition is comparable.

Bucks normally shed their antlers each year. The time of antler-drop may vary somewhat, but in an average season, some shedding is noticeable in late December, most of it has occurred by the middle of February, and by early March it is unusual to see an antlered buck. People are often bewildered by their inability to locate shed antlers in the woods. This is because antlers have a high amount of calcium phosphate, which is preferred by rodents and quickly eaten.

Once a deer sheds his antlers, new growth starts immediately, though visible antler growth is sometimes not apparent for several weeks. Growth is rapid, and the antlers mature in 3 to 4 months. Throughout the summer, the antlers are equipped with a very rich blood supply and are covered with a hair-like membrane commonly known as velvet. While “in velvet,” a deer’s antlers are particularly vulnerable to injury, and cuts or bruises suffered at this time often result in freakish or deformed antlers. By late summer or early fall, antler growth is completed and they become solid and hard. The velvet dries and sloughs off or is rubbed off. Healthy bucks maintain polished antlers throughout the breeding season.

Habitat Needs of Deer

White-tailed deer are extremely adaptable animals. Their essential requirements include food, cover and water. Abundant forest land provides suitable cover, except where large acreages are in agricultural production and cover for deer may be limiting. An interspersed of brushland, woodland and non-forested land creates more diversity in the types and amounts of food and cover present. The transition zone between two cover types is often referred to as an “edge.” Deer, as well as other wildlife species, utilize such areas heavily. Many timber harvest operations today create an “edge effect” and add diversity to a habitat. Free water is readily available in the South and is rarely a limiting factor to deer populations. The quality and quantity of the natural foods present in an area usually determine, to a large extent, that population’s size and health.

Deer have a large and varied diet and eat practically all plant species at one time or another. They were once thought to be exclusively browsers, selecting twigs primarily. However, leaves, bark and herbaceous material such as grasses, weeds and soft-stemmed plants have been found to be important in their diets. Acorns, other nuts, fruits, mushrooms, algae and mosses are also heavily utilized when available.

Deer seem to be able to determine which foods or plants are most nourishing. Foods eaten readily in one area may not be taken in another due to differences in soil types, succulence, deer numbers and other factors. Utilization of specific food items is heavier on burned than on nonburned areas, and also heavier on fertilized than on non-fertilized areas. Well-fertilized agricultural crops or nursery stock are often browsed severely in high deer density areas. Preferences of individual food items are basically a reflection of food availability at a particular time.

Deer prefer a variety of agricultural crops including both grains and vegetables. Damage to commercial agricultural crops, nurseries and orchards is often extensive and severe. Orchard losses are usually greatest to small trees, and they often have to be replaced several times because of severe browsing. Another type of damage often overlooked is the damage to natural or planted trees on forest land. The various forms of deer damage are usually most severe where deer population densities are high and in areas where small agricultural fields, orchard units or regeneration sites are interspersed with forested deer habitat.

The relationship between food supply and population density, and their effects on antler development and reproduction, are often misunderstood. Many people fail to realize that overpopulation can occur when deer numbers are not extremely high. If there are more deer than available food, the herd is overpopulated and the habitat and individuals within the population suffer. Deer on an inadequate plane of nutrition experience a buildup of certain parasite levels, show obvious signs of poor antler development and lowered reproductive rates. Declining body weights of both bucks and does are also a direct result of inadequate nutrition.

As a population continues to increase beyond its food supply, animal quality declines even further and natural mortality becomes more significant. There are usually rising complaints of deer damage to agricultural crops and forest reproduction and increased risks of deer-vehicle accidents. Additionally, the ever present threat of a mass die-off from malnutrition, parasitism or disease becomes imminent.

Habitat Improvements for Deer

Land management practices exert a direct influence upon the value of an area for deer habitat. Habitat manipulation through timber harvest, controlled burning and agricultural or wildlife plantings have been shown to be important in providing a proper combination of food and cover necessary to maintain healthy deer populations. Food plots can be important in providing a proper combination of food necessary to maintain healthy deer populations. Deer habitat is nearly always a by-product of forest management or some other land use.

Forest Management

Pure stands of unmanaged pine timber generally provide poor deer habitat because of the low quality forage and the scarcity of mast-producing hardwoods (e.g. oaks and other fruit-producing trees). Dense stands and closed canopies reduce browse and fruit yields. Management efforts in this forest type should be directed toward increasing browse production. Intermediate thinning of pine stands is recommended to open the overstory and encourage desirable understory vegetation. Thinning should be sufficient to achieve a basal area of 50 to 60 square feet per acre prior to stand regeneration.

Mixed pine-hardwood types generally provide good deer habitat and are important for mast, fruit and browse production. These stands should be thinned frequently to renew understory forage and hasten early mast yields. Where possible, retain valuable hardwood trees for mast production. A minimum stocking equivalent of 20 square feet basal area per acre of mast species is suggested. A good balance between the white and red oak groups is desired to provide consistent mast production.

Bottomland hardwood forests containing a mixture of oaks and other fruit-producing trees and shrubs provides good deer habitat. These areas normally have fertile soils and provide high quality browse; however, they are often subject to flooding which may reduce available food

supplies. Mast production in this habitat is generally good but as in the mixed pine-hardwood type, both white and red oak groups should be retained.

Stand sizes of 40 to 100 acres in pine, and between 10 and 40 acres in mixed pine-hardwood and bottomland hardwoods are recommended. Intermitte forest types and age classes where possible to provide maximum diversity and edge. Regeneration areas should be well distributed and spaced at ¼ to 1½ mile intervals. Methods of tree harvest cutting (seed tree, clearcut or shelterwood) is not an important factor in deer management. Where clearcutting is practiced, cuts should be as small as economically feasible. Distributing small 5 to 10 acre clearcuts throughout an area improves habitat for deer. Regenerating stands in linear, irregular shapes benefits deer by maximizing edge.

Short rotations for pulpwood provide browse for deer more frequently than do long rotations. Hard mast, however, is practically eliminated under short rotations since mast production does not begin until about age 25. Yields increase annually until peak production occurs at about age 50-60 years. The decision to regenerate or leave individual stands should be based on the greatest need for forage or mast.

A regeneration or intermediate cut is needed at least every 6 to 10 years. On better sites, forage production peaks about 2 to 3 years after regeneration and then declines steadily for the next 5 or 6 years. At about 8 to 10 years the canopy closes and forage production declines even further. Until thinning at 15-25 years, forage production is at its lowest. Any subsequent intermediate cutting temporarily boosts forage production.

Conversion of extensive mixed-hardwood or pine-hardwood stands to pine is detrimental to deer. Discourage conversion of bottomland oak types to non-mast producing species. Encourage intermingling of mast-rich forest types of bottomland hardwoods along creeks and rivers. Prior to regeneration, areas providing critical habitat, such as grape or honeysuckle thickets, soft or hard mast, live oak clumps or stringers of bottomland hardwoods should be identified and protected during timber harvest. Also, natural openings, savannahs, fields and old house sites should be excluded from planting to provide natural foods and cover.

Favor site preparation methods which concentrate or limit the amount of debris on the ground. If possible, protect root crowns of valuable wildlife understory plants such as dogwood, viburnum, crabapple, plums, grape and chinkapin. Wide seedling spacing delays canopy closure. Spacing of 300 to 450 pine seedlings per acre allows a greater variety and quantity of understory food supplies to exist over a long period of time. Where practical, planting of desirable mast-producing hardwood seedlings on suitable sites is certainly a valuable practice.

Prescribed Burning

Prescribed fire is a practical and economical tool in deer management. Prescribed burning in pine stands benefits deer by increasing browse yields and improving the palatability and nutrition of understory plants. Care should be used with fire in hardwoods because trees will

eventually be killed or their fruit production severely damaged. Exclude stream bottoms, transition and critical areas supporting mast-producing hardwoods and associated species.

Initial burns in pine stands should be made as early in the rotation as possible. Burning rotations of 2 to 3 years, depending on the site, provide maximum benefit to deer. During the first few years the entire area should be burned annually; thereafter, burning of small blocks in alternate years provides a continuous supply of lush, succulent growth. Burning should be conducted during late winter in February or early March.

Wildlife Plantings

Deer readily utilize plants growing in natural or developed forest openings. These openings can compensate for yearly and seasonal fluctuations in food supplies, especially mast. They are less important, however, if the habitat is enhanced through coordinated and sustained timber cutting for deer. Openings are also an aid to hunting and can be beneficial in obtaining adequate deer harvests.

Retain natural openings in timber stands. Forest openings of 1 to 3 acres should be developed in pine or mixed pine-hardwood types. These openings should be irregularly shaped, preferably linear, and strategically located throughout an area to provide maximum diversity and edge. Openings should not be developed adjacent to major roads or other access routes that are easily viewed to discourage poaching. Unused logging roads, skid roads and trails can be "opened up" and seeded to provide additional supplemental food.

A diversity in the management of wildlife openings is desirable. Rotation of the following alternatives should be considered.

1. Allow some openings to grow up in native vegetation and maintain these in an early stage of plant succession by annual mowing.
2. Plant some openings in annual crops such as corn, soybeans, cowpeas or one of the grain sorghums.
3. Plant some openings in wheat, oats or rye for winter grazing.
4. Plant some openings in perennials such as white clover and maintain these by annual late summer mowing and periodic fertilization.

Deer Herd Management

Harvest regulation is an essential part of sound management for white-tailed deer. Regulating the harvest is necessary to keep deer populations in relative balance with their food supply. Where food is abundant and deer are healthy, a sustained but regulated harvest maintains healthy conditions and prevents overpopulation. In areas where deer are approaching overpopulation and food supplies are becoming critical, herd reduction is necessary. Heavy deer harvests become important to prevent further damage to the habitat and a decline in deer quality.

Regulated either-sex harvests are necessary for proper herd management. Hunting bucks alone cannot control a growing population. Hunting deer of both sexes will not exterminate them any

more than it will quail, squirrels or other game species, provided the harvest is regulated. When few deer are lost to causes other than legal hunting, a reasonable harvest of both bucks and does assures a healthy population for the future.

Many people believe that deer populations contain a high proportion of old barren does and that this fact can be used as a justification for harvesting antlerless deer. Antlerless deer harvests can be justified for a number of reasons, but this is not one of them. Does that have never produced fawns or have stopped producing entirely are almost nonexistent. Furthermore, when barren does are found, it is almost always a result of some physiological malfunction rather than age. Obviously, there is a limit to the age at which does remain productive, but very few individuals reach such an advanced age. The effect of these few individuals is essentially insignificant to the productivity of the population.

Inbreeding is another factor which concerns people involved in deer management. Inbreeding does occur in wild deer populations, but is not a problem as it is in domestic livestock. Inbreeding in most wild deer populations is probably of little consequence, since the number of animals in a herd is usually sufficiently large to avoid close inbreeding.

Proper management of deer herds is accomplished by regulating harvests to keep deer populations in balance with their food supplies and manipulating habitats through various land management practices to make an area more favorable to deer. Another factor which must be considered, however, is the compatibility of deer populations with commercial agriculture, forestry and other interests. Problems often arise when adjoining landowners have different interests and objectives. It should be an objective of deer management to annually produce, harvest and utilize an optimum crop of healthy animals consistent with other uses of the land.

Record Keeping

A detailed and accurate record-keeping effort is necessary for a successful deer management program. Records should be kept of the date and sex of each deer harvested and biological data on age, weight, antler development and productivity. Data from the yearling (1½ year) age class provides the most reliable indicator of a deer herd's health. Accurate determination of age is essential to obtaining good records. A mandible (lower jawbone) should be removed and properly labeled from each animal harvested. Labeled jawbones and the records of biological data kept throughout the season should be given to a wildlife biologist for aging and date analysis. South Carolina Department of Natural Resources provides assistance for landowners who are interested in developing a record-keeping program for harvested deer.

Knowledge of trends in annual harvests and biological condition, along with data from parasite burdens, spotlight counts and browse utilization surveys provide biologists and land managers with a sound basis for future harvest recommendations. This approach will assure maintenance of quality habitats and a healthy well-managed deer herd.