



Wildlife Note — 28

# White-Tailed Deer

by Chuck Fergus

The white-tailed deer, *Odocoileus virginianus*, was so named because the underside of its tail is covered with white hair, and when it runs it often holds its tail erect so that the white undersurface is visible. Whitetails belong to the Cervidae family, which in North America includes elk, moose, caribou and mule deer. Cervids are split-hoofed mammals with no incisor teeth in the front of the upper jaw. They are classed as ruminant animals, meaning they have a four-chambered stomach and frequently chew a "cud." Adult male whitetails grow and shed a set of antlers each year. On rare occasions, adult females also grow antlers.

Scientists have identified 30 subspecies of whitetails in Central and North America. Whitetails occur from southern Canada south through the United States and Mexico to Panama, but they are absent from most of Canada, Nevada and Utah. They occur commonly throughout Pennsylvania.

The largest of the subspecies is the northern woodland whitetail, and the smallest is the endangered Florida Key deer. The subspecies throughout most of Pennsylvania is the northern woodland whitetail.

In Pennsylvania the average adult buck weighs about 140 pounds live weight and stands 32 to 34 inches at the shoulder. He is about 70 inches long from the tip of his nose to the base of his tail. His tail vertebrae add only about 11 inches, but the long

hair makes it far more conspicuous. Does tend to average less in weight and body length than males of the same age from the same area.

Deer weights vary considerably, depending upon age, sex, diet and the time of year. For example, breeding-age bucks may weigh 25 to 30 percent more at the



onset of the breeding season than they do at its conclusion. Hence, a 140-pound buck in December might have weighed 180 pounds in September.

Hair color is alike in both sexes. In adults, the belly, throat, areas around the eyes, insides of the ears and the underside of the tail are white all year long. During summer, the upper parts of the body are reddish brown, and in winter they are grayish brown.

Summer hairs are short, thin, straight and wiry. Winter hairs are long, thick, hollow and slightly crinkled. Winter hairs afford the deer excellent protection against the cold. Summer coats are shed in August and September, winter coats in May and June.

Melanistic and albino deer occur but they are rare. Partial albinos, sometimes called "piebalds" or "calico" deer, occur more frequently.

Fawns are born with white spots in the upper coat. When a fawn is lying on the ground or in dry leaves this coat looks like the sun hitting the ground after it passes through the treetops. This provides excellent camouflage for the fawns. Their summer coats are molted about the same time as the fall molt in adults, and fawns take on the same coat colors as adults in the fall.

Whitetails have scent-producing glands: two tarsals, one inside each hind leg at the hock joint; two metatarsals, one on the outside of each hind leg between the hock and the foot; four interdigitals, one between the toes of each foot; and two preorbitals, one below inside corners of each eye. The tarsals and metatarsals release scents conveying excitement or fear, while the interdigitals produce odors which let deer trail each other by smell. The preorbitals are used to personalize the prominent overhanging branch at "scrapes" — thrown-up dirt patterns — used to attract does during the rut.

Deer can run at 40 miles per hour for short bursts and maintain speeds of 25 miles per hour for longer periods.

They are also good jumpers capable of clearing obstacles up to nine feet high or 25 feet wide. The air-filled hairs of their coats enable them to swim easily.

Although whitetails are color-blind and sometimes have a hard time identifying stationary objects, they are easily alerted by movement. Their keen senses of smell and hearing also help them detect danger.

Usually deer are silent, but they can bleat, grunt, whine, and when alarmed or suspicious, make loud "whiew" sounds by forcefully blowing air through their nostrils. Does whine to call their fawns and fawns bleat to call their mothers.

Although antler growth is evident on male fawns, the button-like protrusions are not prominent. A buck's first set of antlers begins to grow when it's about 10 months old. Each year after the buck reaches this age, it will grow and shed a new set of antlers. Typical antlers curve upward and outward to point forward, and consist of two main beams with individual tines growing upward from them.

If the yearling buck comes from an area with poor food conditions, his first set of antlers may be only "spikes" — antlers consisting of single main beams only. Spikes are more common in yearling deer than older ones because antler growth starts at a time when the young buck's body is still growing rapidly. But because antler development is tied in closely with the animal's nutritional status, older bucks might also carry spikes if they come from an area with poor food conditions. More of the nutrients in the young buck's body are going for body growth than in older bucks, hence, less are available for antler development. Fifty percent or more of the yearling bucks from poor deer range in Pennsylvania may produce only spikes, compared to 10 percent or less from good deer range.

Antlers generally begin to grow in March or April. Growing antlers are covered by a skin called "velvet." This velvet is covered with soft hairs and contains blood vessels which supply nutrients to the growing antlers. The solid bone-like substance which makes up the polished antler is secreted by cells on the inside of the velvet. By August or early September antler growth ceases and the velvet is shed or rubbed off by the buck as he rubs saplings, shrubs or rocks with his antlers. Polished antlers are carried throughout most of the breeding season, which can last into late February. The antlers are shed at the end of this period, and a new set begins to grow in March or April.



While antlers grow they're soft and subject to injury. Bent and twisted tines and main beams are a result of injury to the antler while it was growing. Broken antlers occur after the antler has stopped growing and is hard. The small cavities sometimes seen in polished antlers are a result of botfly larvae damage during the growing period.

The antler cycle is influenced by secretions from the pituitary gland. Changes in length of daylight periods and, to a lesser degree, temperature influence the hormone secretions from this gland. Hormones are believed to be a factor in the initiation of new antler growth. Increases in the amount of testosterone in the blood of whitetail bucks in late August and early September cause blood flow to the antlers to stop. The velvet dies and is shed or rubbed off. Throughout the breeding season, testosterone levels continue to increase until they peak in November, usually coinciding with the height of breeding. After that, testosterone abates, apparently triggering antler shedding.

Shedding usually occurs earlier in northern states than southern ones. Spike bucks tend to retain their velvet longer and shed their antlers sooner than bucks with branched antlers. The roles of age and nutrition in the length of antler retention are not fully understood at present.

### Social Organization

The social organization of the whitetail is largely matriarchal. Although large numbers of deer are sometimes seen together in feeding areas or wintering areas, these associations are usually temporary and do not reflect the same strong ties as family associations between related does. The most common social group is an adult doe, her fawns and her yearling female offspring. Sometimes three or four generations of related does are present in a family group. When fawning season rolls around in late May, adult does leave the family group and remain alone to bear and rear their fawns. Once a pregnant doe leaves the family circle to bear her fawns, her yearling offspring are left on their own for the summer.

Siblings tend to remain together throughout most of summer. Sibling groups with yearling bucks separate in September as the rut approaches. Yearling bucks tend to disperse from the mother's home range at this time. Yearling does remain in the mother's home range and generally rejoin their mother and her new fawns between September and October.

During the breeding season adult and yearling bucks tend to stay alone except when in pursuit of a female approaching estrus. After the breeding season, in late January, yearling and adult bucks form loose associations of small groups, usually two to four animals, which remain together throughout most of the winter and summer months. These groups break up around September when the rut starts.

### Reproduction

The mating season of white-tailed deer begins as early as September and can last into late January. Breeding

activity reaches its peak in early November, and most adult females have been bred by the end of December. Some females are capable of reproducing at seven or eight months of age and give birth at 14 or 15 months of age. Most of these animals breed a month or two later than older does, and they usually produce a single fawn.

The age and health of a doe influence her reproductive capacity. Females from the best range produce more fawns than those from poor range. Adult females (2.5 years and older) usually produce twins, and triplets are not uncommon. There is a tendency for young females to produce a larger percentage of male offspring than older does.

### Food Habits

Whitetails eat a wide variety of herbaceous and woody plants. In a Pennsylvania study where biologists examined and measured the food contained in the rumens of vehicle-killed deer, about 100 different plant species were identified. More than half were tree, shrub or vine species, the remainder, herbaceous plants. A good number of ingested plants could not be identified.

Whitetail food preferences are largely dependent on plant species occurring in an area and the time of year. Green leaves, herbaceous plants and new growth on woody plants are eaten in the spring and summer. In late summer, fall and early winter, both hard and soft fruits such as apples, pears and acorns are a major component of their diet. In winter, evergreen leaves, hard browse and dry leaves are eaten. Good supplies of a variety of natural foods at all times of the year are essential if an area is to carry a healthy deer population.

### Habitat

A seedling-sapling forest satisfies two deer needs: (1) concealment, and (2) food in the form of buds, stems and leaves of shrubs and young trees. Seedling-sapling stands are created most frequently by timber harvesting. Clearcutting, or even-aged timber management, means cutting most trees larger than saplings, but leaving an area of land looking "clear." This cutting technique should be restricted to areas where sufficient regeneration is present to guarantee a sustainable forest. In the timber cut, snags, den trees, mast trees and rare tree species should be left behind to assure a good habitat diversity for an abundance of wildlife.

Newly cut treetops provide an immediate source of browse in winter months when snow cover makes other sources of food unavailable. Therefore, when possible, the actual cutting operations should be carried out when the trees are dormant. However, the greatest benefit of clearcutting to deer lies in the often abundant new growth vegetation and succulent sprouts and seedlings that flourish in the sunlight following the cutting. Once established, this new thick growth also provides concealment for deer, not only in the early years following the cutting, but for a longer period, after much of the browse has grown out of their reach.

While most deer habitat management should revolve around a forest cutting program, including the establishment of herbaceous openings, a conifer tree planting pro-

gram to shelter deer in severe winter weather is sometimes necessary where suitable cover of that type is absent. The value of these plantations to deer is low during most of the year but high during winter. As with clearcutting, conifer plantations should be kept small and scattered. Large plantations are unnecessary. Small clumps of only 30 to 60 trees will suffice. Individual trees within the plantation can be spaced as far apart as eight to ten feet. Preferably, these clump plantings should be located in lowlands or on south-facing slopes.

### Management

Deer are a valuable natural resource, but they must be closely managed or they'll quickly overpopulate the range they inhabit. When overpopulation occurs, deer strip their habitat of its life-supporting qualities, not just for deer, but for many woodland wildlife species. Crop and other property damage problems also increase, as well as deer-vehicle collisions.

Pole timber and over-browsed woodland cannot support large densities of deer. Without adequate food sources and cover, deer populations are stressed. Deer must work harder for daily nourishment and often have not built up the energy reserves they need to make it through winter. Young deer, because they require food for both growth and energy reserves, are most susceptible to winter starvation and exposure. They simply don't have the muscle to push away older, more dominant deer at feeding locations.

Under-nourished deer are more prone to succumb to exposure and disease. In addition, unhealthy deer typically have smaller body size, lower reproductive rates and smaller antlers. So the key to managing deer is keeping their populations at healthy levels. This essentially entails ensuring they don't exceed their range's ability to support them. We use hunting to adjust deer populations.

Population control can be accomplished only through a rationed harvest of female deer. The Game Commission issues permits entitling hunters to take antlerless deer in particular management units, areas where the agency continually collects deer population data. Deer populations and density goals based upon habitat, along with hunter success rates, are used to gauge how many hunting permits should be issued.

Public support of our management program is essential to maintaining the deer population as a public asset to be enjoyed by future generations of Pennsylvanians and visitors to Pennsylvania.

