



## White-tailed Deer

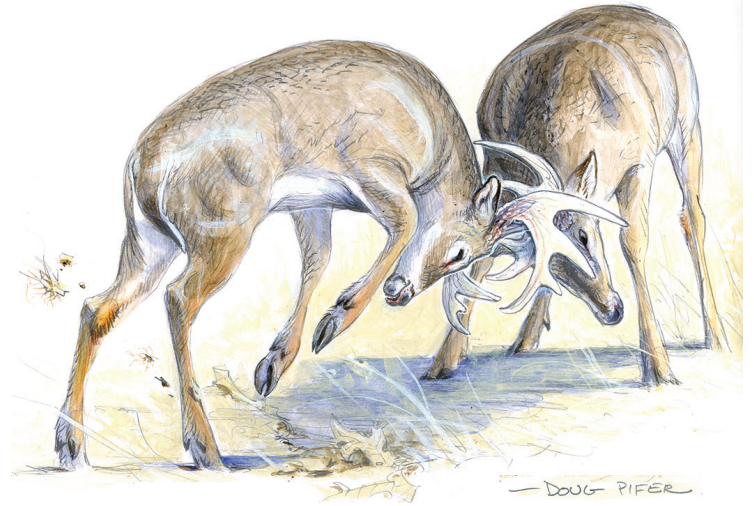
The white-tailed deer, *Odocoileus virginianus*, was so named because the underside of its tail is covered with white hair, and when it runs it often holds its tail erect so that the white undersurface is visible. Whitetails belong to the Cervidae family, which in North America includes the elk, moose, 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, females also grow antlers.

Whitetails are the most widely distributed large animal in North America. They are found throughout most of the continental United States, southern Canada, Mexico, Central America and northern portions of South America as far south as Peru. White-tailed deer are common throughout Pennsylvania. The species is absent from much of the western United States, including Nevada, Utah and California (though its close relatives, the mule deer and black-tailed deer, can be found there).

A male deer is referred to as a buck, and a female a doe. In Pennsylvania, the average adult buck weighs about 140 pounds 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 be smaller compared to bucks of the same age.

Deer weights vary considerably, depending upon age, gender, diet and the time of year the weight is checked. For example, breeding-age bucks might 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 approximately 180 pounds in September.

Adult deer share the same coat color and markings. 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 coats are composed of short, thin, wiry guard hairs with no underfur. Winter coats have long, thick guard hairs that are hollow with soft, wooly, densely packed underfur. The winter coat provides excellent protection against the elements. Summer coats are shed in August and September, winter coats in April and May.

Melanistic (dark-colored) and albino (abnormally white) deer occur, but they are exceptionally rare. Partial white deer, called “piebalds” or “calico” deer, occur more frequently but are still reported to make up less than 1 percent of the population.

Fawns are born with reddish-brown coats dappled with white spots. This simple pattern is excellent camouflage. 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. Fawns lose their spots by taking on the same coat colors as adults in the fall.

Whitetails have many scent-producing glands: two tarsal, one inside each hind leg at the hock joint; two metatarsal, one on the outside of each hind leg between the hock and the foot; four interdigital, one between the toes of each foot; and two preorbital, one below the inside corners of each eye. The tarsal and metatarsal glands release scents conveying excitement or fear; while the interdigital glands produce odors that let deer trail each other by smell. The

preorbital glands are used to personalize the prominent overhanging branch at “scrapes” – dirt areas where leaves and grass are scraped away – that are used to communicate with other deer during the breeding season, also known as the rut.

Deer can run at 40 mph for short bursts and maintain speeds of 25 mph for longer periods. They are also good jumpers, capable of clearing obstacles up to 9 feet high or 25 feet wide. The air-filled guard hairs enable them to swim easily.

Day or night, a deer’s visual acuity is excellent. Deer can distinguish among different colors, but their eyes are particularly adapted as motion detectors. Their keen senses of smell and hearing help them to 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. From this point forward, a buck will grow and shed a new set of antlers each year. 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 common in yearlings because antler growth starts at a time when the young buck’s body still is growing. But because antler development is tied in closely with the animal’s nutritional status, older bucks may also produce spikes if they come from an area with poor food conditions.

Antler growth is a complex process driven by hormones and photoperiod (day length). Antler tissue is the fastest growing tissue known to man, having the capacity to grow an inch or more per day. Annually, antler growth begins when the days are lengthening – between the spring equinox and the summer solstice (mid-March through mid-April). Antlers grow from the tip and are full of thousands of blood vessels and are covered in velvet.

As the summer progresses and day length begins to decrease, testosterone production increases. This triggers mineralization or hardening of the antlers. The soft tissue is transformed directly into bone by the depositing of minerals within the cartilage matrix through the extensive capillary network – hardening the antlers from the base to the tip. Antler-hardening takes about a month starting in mid-July and ending in mid-August, after which time, the velvet dries up and is rubbed off.

After the breeding season, testosterone levels drop off and antlers are shed in late winter or early spring. The process then starts all over again.

While antlers are growing, they’re soft and subject to injury. Bent and twisted tines and main beams often indicate the antler was injured while it was growing. Broken antlers occur after the antler has stopped growing and has hardened.

Antler shedding usually occurs earlier in northern states than southern ones. Natural variation and general health (which relates to nutrition) factor into when a buck will shed his antlers. It is typical for most bucks in an area to shed their antlers within a month or so of one another. But each buck has an individual antler cycle, and this also plays a role in when antlers are shed. This antler cycle is independent of all other bucks and is thought to be related to the animal’s birth date.

## Social Organization

The social organization of the whitetail is largely matriarchal. Although large numbers of deer are sometimes seen together in feeding or wintering areas, these associations are usually temporary and do not reflect the same strong ties as family associations. 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 approaches in late May, adult does become aggressive toward their yearling offspring; temporarily severing ties with the family group. Does remain alone to bear and rear their fawns. A doe's yearling offspring are left on their own for the summer.

For both male and female yearlings, this breakdown in family bond could result in movement away from their mother's home range. This movement is called "dispersal." If siblings do not disperse, they tend to remain together throughout most of summer. Sibling groups with yearling bucks break up in September as the rut approaches. Yearling bucks tend to disperse from the mother's home range at this time. In Pennsylvania, yearling bucks travel 3 to 5 miles on average, although dispersal movements of more than 40 miles have been observed. Yearling does that do not disperse remain in the mother's home range and rejoin her, 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, bucks form loose associations of usually two to four animals. These bachelor groups remain together throughout most of the winter and summer months. These associations dissolve in September when the rut starts again.

## Reproduction

The breeding season of white-tailed deer begins as early as September and can last into late January. Breeding activity reaches its peak in mid-November, and most adult females have been bred by the end of December. Some female fawns are capable of reproducing at 7 or 8 months of age and give birth at 14 or 15 months of age. Most of these animals breed a few weeks later than older does, and they usually produce a single fawn.

The age and health of a doe influence her reproductive capacity. Females from high-quality habitat produce more fawns than those from poor-quality habitat. Adult females (2½ years and older) usually produce twins, with 5 percent or less producing triplets. There is a tendency for younger females, females in poor condition, and females in poor-quality habitat to produce more male offspring.

## 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 large 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 incorporated into their diet. In winter, evergreen leaves, hard browse and dry leaves are eaten. A variety of natural foods at all times of the year are essential if an area is to carry a healthy deer population.



## Habitat

The age of a forest determines the number of deer it can support. Studies in Pennsylvania's northern hardwood and mixed-oak forests show that seedling/sapling stands can support the greatest number of deer, pole-timber stands support few or no deer, and saw-timber stands can support a moderate number of deer.

Vegetation that affords protection to an animal is commonly referred to as cover. Dense thickets, especially evergreens, usually jump to mind as being best for deer. This type of cover is perfect for winter. The key word is "protection" – protection from all enemies, be they man, beast, insects or weather. Some kind of protection is needed during all seasons of the year, not just winter.

In Pennsylvania, the most essential cover component is probably winter protection within extensive hardwood stands. This kind of cover is best provided in areas protected from cold winds with southern exposures. Heavy snows can cause deer to move from high elevations to lower, protected valleys particularly into areas with conifer cover. A source of natural foods in the vicinity of good winter cover is the ideal location for deer to survive this critical time of year.

## 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.

To balance these costs, the Game Commission engages the public to identify deer-management goals. These goals then direct the deer-management program. Goals include managing for healthy and sustainable deer populations and habitat, maintaining deer-human conflicts at acceptable levels; and providing deer-related recreational opportunities such as hunting and wildlife viewing.

Population control can only be facilitated through regulated harvest of female deer. The Game Commission uses hunting to adjust deer populations. By issuing permits entitling hunters to take antlerless deer in particular management units, population trends can be affected to meet management goals. Deer population, habitat and deer-human conflict measures are used to determine how many hunting permits should be issued.

A sound management program is essential in maintaining the deer population as a public asset to be enjoyed by future generations of Pennsylvanians and visitors to the Commonwealth.

