



White-tailed Deer: Adapted for Survival

Deer are successful herbivorous mammals that have adapted to environments across all continents in the world, except Australia and Antarctica. There are many different species of deer that cannot inter-breed, each with their own specialized adaptations. Deer are adapted for survival and adaptations for predator evasion tend to be divergent depending on the species of deer.

Define the term adaptation and review the adaptations of white-tailed deer described below. For each characteristic, briefly describe how it may contribute to increased survival of white-tailed deer in Pennsylvania.

- Hair

The upper body of a white-tailed deer is reddish brown during the summer and grayish brown in the winter. Their coloring camouflages them with their environment so that it is harder for predators to see them. When alerted, some deer might freeze and use their camouflage to evade detection. Hairs covering the body are short, thin and wiry in summer and become long, thick and hollow in the winter. Air filled hairs in winter provide insulation against the cold.

White-tailed deer fawns are reddish-brown and have light-colored spots on their body which serve as excellent camouflage. The spots imitate the dappling of sunlight on the forest floor after passing through the treetops. They are born relatively scentless and often drop to the ground and remain motionless to avoid predators. Fawns take on the same coat color as adult deer in the fall.

- Smell, Vision, and Hearing

Like many prey species, deer have eyes located on the side of their heads allowing them to scan nearly 270 degrees – everywhere but behind them. This allows them to have a large field of vision so that approaching predators can be more easily spotted. They are able to see in low light or darkness because their eyes: (1) contain many light receptor cells making the eye 1000 times more sensitive to light; (2) contain a reflective pigment called the tapetum which reflects light back to the retina; and (3) have pupils that open much wider than a humans allowing them to gather 9 times more light. Whitetails are color blind and although they easily detect motion they have difficulty detecting stationary objects.

White-tailed deer have large, cupped, maneuverable ears that gather and amplify sound. Their ears are able to rotate up to 180 degrees in different directions helping them to pinpoint the location of sounds and allowing them to focus in on quiet noises in one direction, helping them to evade predators. When fleeing, they can hear if they are being chased as well as listening for what may be in front of them.

Few animals have a better sense of smell than white-tailed deer and a large portion of the deer's brain is devoted to odor reception and interpretation. On days with only a slight breeze, whitetails can pick up the scent of a predator or hunter from 150-200 yards away.

- Communication

The white-tailed deer receives its name from the white hair located on the underside of the tail. When startled by danger and fleeing an area, whitetails often hold their tails erect so that the white undersurface is visible. It serves as a warning signal for other deer. Deer may also communicate by stomping their feet on the ground and grunting or snorting when alarmed. This serves a dual purpose of alerting other deer to danger and warning a predator or human to back away. When a deer stomps its feet, glands located between the hooves also secrete a scent that warns other deer that pass the location later that there was danger here.

- Hooves

The white-tailed deer has sharp hooves which are used as defensive weapons for fighting predators, which include humans. The hooves at the front are longer than the rear hooves and the deer is likely to use the front hooves more than the rear ones. It can easily kill a wolf or coyote with a blow from the front hooves. The deer also utilizes the sharp hooves to make scrapes in trees to mark their scent during the mating seasons and to dig for food.

- Long Legs

The legs of a white-tailed deer are adapted to enhance running and leaping. They can run at about 30-40 miles per hour for short bursts and at 25 miles per hour for longer periods. They are able to jump obstacles that are up to 9 feet tall and 25 feet wide. Their legs have powerful muscles and ligaments which provide extra spring and increase the speed and thrust in a deer's stride. The outer layer of the hoof is strong and this helps absorb the shock as the deer lands on the ground. The hoof's inner surface is softer and tougher to provide cushion and traction on harder surfaces. These deer seldom fall except when the terrain is covered by ice.

- Antlers

Male deer of all species (except the Chinese water deer) have antlers. They begin growing in the spring (March/April) and are initially covered in a soft, hair-covered membrane called “velvet” – a highly vascular tissue that provides oxygen and nutrients during antler growth. The solid bone-like substance which makes up the polished antler is secreted by cells on the inside of the velvet. Growth occurs at the tip and is initially cartilage, which then mineralizes to become bone. In August/September, the velvet dies and is shed or rubbed off to expose the mature, hardened antler. From October to January/February, antlers are used for defense, competition with other bucks for mating privileges, and to occasionally uncover food. Bucks shed the entire antler in January or February and re-growth begins again in the spring.

Adapted from information found at: http://bioweb.uwlax.edu/bio203/s2007/parr_jaco/facts.htm and http://www.ehow.com/info_8746035_whitetailed-deer-feet-adaptations.html#ixzz1nhM5mObT and <http://sfr.psu.edu/youth/sftrc/deer/wtd-lesson1>

Can you tell from looking at the teeth of a deer whether it is an herbivore or carnivore? If so, how?

