



HUNTING WHITE-TAILED DEER

in Missouri



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Acknowledgements

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Published by the Missouri Department of Conservation,
PO Box 180, Jefferson City, Missouri 65102–1080

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White-tailed deer are one of Missouri's most valuable wildlife resources. Deer hunting is tremendously popular, and each year half a million hunters spend 6 million days afield pursuing whitetails. This contributes more than \$1 billion to Missouri's economy and supports more than 12,000 jobs. Deer are also a favorite species of photographers and wildlife viewers, attracting thousands of visitors annually to Missouri's public lands.

The Show-Me State's deer herd is a wildlife success story. It's hard to imagine, but in the early 1900s, habitat destruction, unrestricted hunting, overgrazing, and other careless practices had decimated Missouri's deer population. In 1925, only about 400 deer remained in the state. With better stewardship, regulated harvests, and the cooperation of countless citizens,

deer populations recovered, and deer numbers today exceed those of presettlement times.

Missourians have strong feelings about white-tailed deer, and the Missouri Department of Conservation is sensitive to these attitudes. Although hunters and wildlife viewers like to see lots of whitetails, overly abundant deer can lead to vehicle collisions, crop damage, and destruction of landscape plantings. These issues, along with other considerations such as deer-borne diseases and public perceptions about how deer should be managed, create challenges for resource managers. Department biologists strive to balance citizen perspectives, cooperate with communities and landowners, manage habitats, and set harvest regulations to maintain deer numbers that serve the interests of the greatest number of Missourians.





HISTORY OF DEER IN MISSOURI

During presettlement times, white-tailed deer were abundant in Missouri, especially in the more fertile and diverse habitats of northern Missouri. The influx of European settlers during the last half of the 19th century coincided with a rapid decline in the state's deer population. Year-round market hunting, unregulated timber cutting, and free-ranging livestock caused deer numbers to plummet.

Token laws restricting deer hunting were passed in the late 1800s and early 1900s, but the laws were not enforced. In 1925, biologists estimated that fewer than 400 deer remained in Missouri. In response to dwindling deer numbers, Missouri's legislature closed deer season and made the first substantial effort to enforce hunting regulations. Deer were brought to Missouri from Michigan and were released onto five refuges in the Ozarks. In 1931, deer season was reopened, but a low harvest indicated the population had not recovered.

Only when the Conservation Commission formed in 1937 did significant efforts to restore whitetails begin to succeed. The Commission closed deer season from 1938 to 1943. During the closure, deer from Wisconsin, Michigan, Minnesota, and existing refuges within Missouri were stocked throughout the state. Conservation agents were hired to enforce the *Wildlife Code of Missouri* and deter poaching. By 1944, the deer population had grown to 15,000, and Missouri held its first deer season since the recovery effort had begun.

Deer management has come a long way since 1944. That year, 7,557 hunters harvested 583 deer during a two-day, buck-only season in 20 southern-Missouri counties. Today, nearly 500,000 hunters harvest about 250,000 to 300,000 deer annually. Missourians can take pride in the widespread restoration of whitetails to the Show-Me State.

Deer management requires flexibility to respond to changing conditions. Hunting pressure strongly affects white-tailed deer, and populations can be under-harvested or over-harvested. The penalties for either are great. With under-harvest, crop damage and deer-vehicle accidents may increase. Over-harvest may cause years of slow recovery, especially in the Ozarks where forage quality is lower. Successful management requires maintaining a delicate balance.

Different management approaches are necessary to accomplish this balancing act. In the 1950s and early 1960s, Missouri had short, any-deer seasons. As hunting pressure increased, this approach became outdated because

doe harvest could not be controlled. Today, doe harvest is regulated through the number of antlerless deer-hunting permits individual hunters may fill on a county by county basis. In addition to regulating doe harvest, firearms deer season now is composed of several portions that provide a variety of hunting dates and methods for different user groups to enjoy. This helps satisfy the great demand for deer hunting without harming the resource.

The next era of deer management will depend upon the actions of individuals and groups of landowners. Individual landowners may not be able to implement deer management on large enough acreages to be successful. But groups of neighboring landowners working cooperatively can achieve substantial management goals. By forming wildlife management cooperatives, landowners, hunters, and wildlife enthusiasts can collaborate to achieve habitat improvements and harvest management on their collective properties. Through cooperation among neighbors, large blocks of land can be managed, and each landowner gains the management advantages of the collective group. For help forming a wildlife management cooperative, contact your local Conservation Department office.





BIOLOGY OF WHITE-TAILED DEER

Antlers

White-tailed deer grow and shed their antlers annually. Antlers, which can sprout several inches a day, are among the fastest growing bones in the animal kingdom.

Usually, only male whitetails grow antlers. Females have been known to develop antlers, but this is extremely rare. Biologists theorize that antlers may indicate a buck's fitness to prospective mates, serve as weapons against predators or other males, or act as a display of dominance during breeding season.

Many hunters place great importance on antler size. The next time you lower your sights on a buck, put some thought into his antlers and what it took to grow them.

Annual Growth Cycle

Antlers develop from pedicles, which are two bony areas protruding from a buck's skull. Pedicles begin forming a few weeks before male deer are born. By the time a buck is 4 to 5 months old, his pedicles are visible as "buttons."

Changes in day length trigger hormone cycles that regulate antler formation. In spring and early summer, antlers grow rapidly. Deer feed on mineral- and protein-rich foods, and a network of blood vessels supply antlers with nutrients. While growing, antlers are covered with a hairy membrane called velvet and are sensitive, soft, and prone to injury.

As days grow shorter in late summer and early fall, growth slows and antlers begin to harden. Blood stops flowing to the antlers, causing velvet to dry and slough off. Bucks help the process along by rubbing their antlers on small trees and bushes. Growing antlers contain a high amount of water and a low amount of dry matter. When antlers stop growing, they contain less water and more dry matter, including significant amounts of calcium and phosphorus.

Healthy bucks keep their antlers through the breeding season. Bucks begin shedding antlers in late December in Missouri. Bone between the antler and pedicle weakens, causing the antler to break off. In some cases, antlers break prematurely, which can damage the pedicle and cause future antler deformities. Nearly all bucks shed their antlers by March. Once the antlers are shed, new antlers begin forming immediately.

Antler Injuries

Injuries to a buck's legs, pedicles, or velvet often lead to misshapen antlers. If a deer injures one of its front legs, the antler growing on the same side as the injured leg may become deformed. If one of a buck's rear legs is injured, the antler growing on the opposite side of the injury may



become deformed. Depending on how severely the leg is injured, antlers may be deformed for one or many growth cycles. Velvet injuries can be relatively insignificant, such as a small, abnormal point, or extensive, such as a broken main beam. Velvet injuries typically affect only one year's antler formation. Pedicle injuries usually are caused by fighting, vehicle collisions, or imperfect shedding of antlers. If a pedicle is injured severely, the deer may grow deformed antlers for the rest of its life.

Managing for Large Antlers

In Missouri, age usually is the most significant factor determining a buck's antler size. Deer develop their skeletal and muscle systems before devoting resources to antler growth. Generally, antlers increase in size until a buck is about 6 years old. Most bucks, however, are harvested well before this age.

Nutrition also plays an important role in antler size. Deer in northern Missouri are typically larger and have bigger antlers than those in southern Missouri. This is because northern Missouri soils are more fertile and produce better forage year-round compared to southern Missouri, which has less-productive soils.

Deer enthusiasts debate about how to manage for larger antlers. Some managers suggest supplemental feedings or specific plants for food plots. But these practices have demonstrated few measurable impacts on wild herds.

Other managers believe that certain bucks, because of the shape and size of their antlers, are genetically inferior and must be culled from the herd. Although good genes certainly play a role in antler size, culling has little impact on the genetics of wild deer. In the wild, breeding occurs among many different pairs of bucks and does, and each parent contributes half the genetic material to their offspring. This makes trying to control genetics in a wild population nearly impossible.

Missouri's deer herd is genetically diverse and generally lives in good habitat. For most landowners, the best management strategies are to encourage quality forage plants and to allow more bucks to mature to older age classes so they are able to reach their full potential for antler growth.

The Seasons

Spring

Spring is a time of plenty for deer. Succulent plants send out tender shoots. Food is abundant even in areas where it is normally scarce. In Missouri, deer favor wild lettuce, grape vines, trumpet vines, cinquefoil, sweet clover, violets, and spring beauty. Most plants offer peak nutrition during spring, and deer respond with growth spurts and weight gains. Males channel energy to their antlers and regain weight lost during last year's breeding activities. Females transfer energy to unborn fawns, which undergo rapid growth.

Almost all of Missouri's does 1 ½ years old or older breed and produce fawns each year. The number of fawns that are born and survive annually is dependent upon several factors including the age and nutrition of the mother, deer density in the area, and predators. Birthrates and survival vary from region to region as these factors change.

In Missouri, most adult and yearling does have twins each year. The folk tale that old does are barren is a myth. Fetuses have been found in does older than 15. In fact, some researchers suggest that older does are more successful mothers because they are experienced and have the best territories.



Fawning peaks in late May through June and begins when pregnant does isolate themselves and drive other deer from their fawning areas. Adult does use the same areas each year. The establishment of fawning territories is thought to limit social stress and evenly distribute populations. Territories also may prevent newborn fawns from imprinting on deer that aren't their mothers.

Birth lasts 30 to 150 minutes, with twins born 15 to 30 minutes apart. After giving birth, the doe consumes placental membranes and afterbirth, most likely to reduce scent and recycle nutrients. Mothers also consume their fawns' fecal materials for the first two to three weeks. Newborn fawns, which weigh from 4 to 8 pounds, can stand 30 minutes after birth.

A fawn's first weeks of life are precarious. Young fawns are vulnerable to a variety of predators, diseases, parasites, and human-caused mortality. In Missouri, the major natural predators are coyotes, dogs, and bobcats. To reduce exposure to predators, fawns spend most of their time bedded and hidden in heavy cover, such as hay fields, pastures, and old fields. Studies using radio transmitters suggest fawns are active less than five hours a day.

Does and their offspring spend most of their time in a 10- to 20-acre area for the first few weeks. Does visit their fawns to nurse and groom them two to four times a day. Fawns often move to a new bed site after each feeding session, but siblings generally do not bed together. During this time, does sometimes physically defend their offspring from predators. It is also during this period that people find what they believe are abandoned fawns. In most cases, their mothers are close by. Bedded fawns should always be left alone. Fawns increase nursing and activity after their first month of age. When fawns are 4 to 6 weeks old, does may visit as often as five or six times per day. Although fawns begin eating vegetation when they are 2 weeks old, it takes 10 weeks for fawns to be able to survive without their mother.

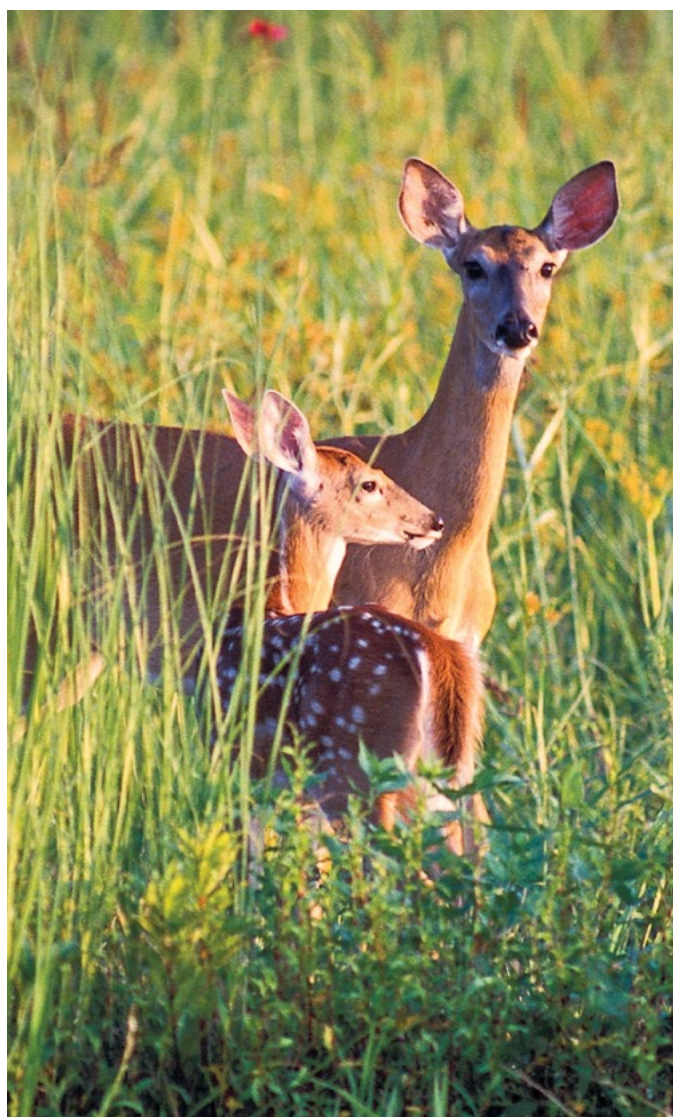
A young doe typically establishes her fawning territory next to her mother's territory, but sometimes does disperse to new areas. Studies in Missouri suggest does travel widely during spring and then, before giving birth, reduce their movements dramatically.

It is much more common for 1-year-old bucks to disperse than their female counterparts. A study in northern Missouri found that 77 percent of buck fawns roamed more than 8 miles. Dispersal by young bucks and does is especially pronounced in areas with high deer densities. Dispersing deer tend to have higher mortality rates, but this phenomenon is part of deer biology. It helps expand populations and limits inbreeding.

Summer

During summer, does and bucks are segregated, sedentary, and spend most of their active time eating. Does and fawns travel and feed together throughout the summer. Sometimes fawns from the previous year travel with this year's doe/fawn groups. Does with fawns may spend 70 percent of their time eating to meet their high nutritional requirements. They often seek shrubby, thick cover because it offers more hiding places and higher quality forage.

Bucks often congregate in bachelor groups composed of other males. Males typically use open habitats, such as mature hardwoods, fields, and woodlands, so they often are found in different habitats than does and fawns. Some researchers suggest males prefer open areas so that they can keep track of their position in the social hierarchy and keep from damaging their antlers while feeding. Others theorize that males' nutritional requirements are lower per pound of body weight or that males' larger stomachs allow them to consume more food and gather sufficient nutrition from poorer ranges.





Fall

Fall is a frenzied time of year for whitetails. Does and fawns continue to travel in groups, but by fall, fawns are weaned, and does feed aggressively to recover from the stresses of raising offspring. During fall, deer eat foods rich in starch and carbohydrates. In oak-hickory forests, this means acorns and soft mast, such as persimmons and plums. Deer also browse cool-season plants, which undergo a resurgence of growth with rain and lower fall temperatures.

Yearling bucks that did not disperse the previous spring do so in fall and winter. This group represents less than 20 percent of yearling bucks in Missouri. Bachelor groups break up, and bucks begin to shed their antler velvet and rub trees. An increasing production of testosterone, triggered by decreasing day length, brings on the changes in buck behavior and the hardening of antlers. Rutting behavior and activity varies with the age and experience of the buck, and the sex and age ratios of the local herd.

Sparring matches are common prior to the breakup of bachelor groups, especially among younger animals. Yearling and 2-year-old bucks spar to size each other up without

injuring themselves. Older bucks with previously established dominance tend not to participate in much pre-rut sparring.

Sparring and visual posturing allow bucks to establish a social hierarchy. This limits energy spent on unnecessary fighting. Bucks establish a dominance ranking that tends to hold year-round, but a dominant animal may temporarily lose rank if it casts its antlers sooner than the others or becomes injured. Occasionally, two evenly matched individuals meet and the resulting battle for dominance is quite serious. Adult bucks can injure or kill one another. Sometimes antlers become locked, and both animals perish.

About the time bucks decrease their sparring activities, they increase their antler rubbing. Bucks rub bark from trees, leaving behind scent from glands on their heads. Most rubs are thought to be signposts made by bucks to advertise their presence. Rubs provide visual cues and scents that inform other deer about the rub maker. Young bucks may groom the foreheads of mature bucks. This grooming is not only a submissive display but also allows a young buck to key in on the scent from a particular mature buck and stay clear of

its territory. The number of rubs a deer makes seems to vary among individuals, but studies of penned deer have shown that adults rub more than yearlings.

Scrapes are probably used to attract or keep track of breeding females and to advertise the presence of the maker. When making a scrape, a deer paws the ground and urinates on the disturbed soil. Most scrapes are made near travel routes under low tree branches that typically are nibbled on and marked with scent from the deer's forehead. Adult bucks make about twice as many scrapes as yearlings. Although not common, buck fawns and does have been observed freshening scrapes.

The pattern and frequency of buck sign in an area often reflects the age structure and sex ratios of the resident deer herd. Areas with mature adult bucks have more buck sign, and these areas show signs of rubbing and scraping activities earlier than areas with predominately yearling bucks.

Testosterone levels increase as the rut progresses, and bucks become driven to find estrous does (those that are ready to breed). The period just prior to peak breeding probably offers bowhunters the best hunting of the season because bucks increase activity to search for does. Rutting bucks spend more time searching for and tending to does than eating during breeding season and sometimes lose considerable weight. Bucks typically visit the various doe family units in their home range to check for estrous does.

Prior to breeding, does also increase activity levels, thus increasing the likelihood of finding a buck and being bred. Does allow a buck to breed only during the 24-hour-period when they are in peak estrus. Does that are not bred cycle again about 28 days later and may be bred in subsequent cycles. In Missouri, most adult does are bred the second and third weeks of November.

During courtship, bucks trail and chase does to determine their receptivity to breeding. When a buck finds a receptive doe, he remains close by, and the two mate several times. In north Missouri, researchers used radio telemetry to learn that mating pairs spend more than 12 hours together in some cases.

As breeding winds down, testosterone production decreases in males, and they eventually shed their antlers. Some studies suggest that antler shedding also is tied to nutrition because deer living on better ranges tend to carry antlers longer than those on poorer ranges. Young deer typically shed antlers earlier than adults. Older deer that are actively breeding shed their antlers after there are no longer does coming into estrus.

During the rut, bucks are struck by vehicles more frequently and are more vulnerable to hunting than at other times of the year. The rut takes a toll on a buck's physical condition. Besides weight losses of up to 40 percent, bucks also may suffer from battle scars and exhaustion. Bucks often enter winter in poorer condition than the rest of the herd.

Winter

Winter can be a difficult time of year for deer, especially in the north. Cold weather and reduced food availability force deer to change their habits to conserve energy and survive. Although Missouri winters are not often severe, our whitetails display some of the same behaviors as their northern counterparts. Northern deer spend winters in sheltered areas, sometimes referred to as deer yards, and then return to their summer ranges the following spring. A number of radio-tagged deer in Missouri made movements of up to 10 miles each winter then moved back to their summer ranges each spring.

Deer often winter in the same areas every year but may concentrate in new areas if food is abundant. Typically, bucks and does remain segregated. Does and their offspring from several generations often form large groups, and males reunite with members of their bachelor groups or travel alone.

Deer reduce activity up to 50 percent during the winter months to conserve energy. One study found deer were active 68 percent of the time in October but only 37 percent of the time in February. A deer's metabolic rate slows down as its activity declines, so it requires less energy to survive.

During winter, deer eat foods that are rich in carbohydrates, such as acorns and waste grain. Deer also browse on young trees and shrubs. The degree to which deer browse certain shrub and tree species sometimes is used as an indicator of deer population levels and winter severity. Some species of sumac and dogwood are readily consumed by deer. Red cedar and hickory are considered starvation foods and are only eaten when populations are high and food is scarce.

Diet

Whitetails are able to eat more than 600 species of plants. Their four-chambered stomachs enable them to break down herbaceous vegetation, but they cannot digest low-quality forage, such as grasses and woody browse as efficiently as cattle and goats. Deer are selective feeders and seek out preferred plant species. Deer seem to possess an ability to select plants that offer the most nutrition during whatever time of year they are foraging.

Differences in plant use and regional food habits are likely a reflection of plant availability. Deer in the Ozarks live in mostly wooded areas and rely on natural forage. Acorns, leaves, and various forbs are important wild foods. Agricultural crops may be preferred when they are available, but deer rely on native plants for most of their diet. For recommendations on how you can improve habitat and plant diversity on your hunting property, contact your local private land conservationist or wildlife biologist at mdc.mo.gov.

Deer Diseases

Like all wildlife species, deer are susceptible to a variety of diseases and parasites. This section covers some of the more common conditions that hunters may observe in deer. Many of these conditions, although unsightly, present little to no risk to humans. However, the Conservation Department recommends that people follow common-sense precautions when encountering or harvesting deer.

When field dressing a deer, normal tissues and structures can appear abnormal even to experienced hunters. Lymph nodes occur throughout the body, but the ones most commonly seen by hunters are located beneath the shoulder blades, and between the large muscle groups behind the knees. Lymph nodes are normally gray to tan in color, oval in shape, and appear slimy. They are commonly found within masses of fat and can be enlarged and darkened during times of infection or illness.

Hemal nodes are pea-sized spherical structures embedded within the fatty tissues of the body. These nodes are numerous in ruminants such as deer and elk, though many hunters may harvest and process several deer before noticing them. Hemal nodes are usually maroon or black in color, and may be either solid or fluid-filled. They resemble a small blood clot and are often misinterpreted as tumors or bird shot.

Lymph and hemal nodes are normal anatomical structures and serve as important filtering organs for animals' circulatory systems. They pose no harm to hunters and are typically trimmed out with excess fat during processing.

Chronic Wasting Disease

Chronic wasting disease (CWD) occurs in North American deer, moose, and elk. It belongs to a group of infectious diseases known as transmissible spongiform encephalopathies (TSEs).

TSEs are believed to be caused by abnormally folded proteins called prions. CWD prions can affect an animal's brain and are always fatal. An animal may be infected for many months before showing signs of the disease. Typical signs of infection include drooping head or ears, poor body condition, muscle tremors, poor coordination, drooling, difficulty swallowing, or excessive thirst or urination. Diagnosis can only be confirmed by laboratory examination of brain or lymph node tissue.

Prions may be excreted from infected animals through feces, urine, or saliva. Direct transmission to other animals can occur from contact with these substances. CWD prions are extremely persistent in the environment, so contaminated soils can be an indirect source of infection. The movement and transportation of deer, both captive and free-ranging, can contribute to the spread of

the disease. Hunter-harvested carcasses can also be a source of disease spread. Hunters need to educate themselves on the most current regulations involving the taking and transport of deer from known CWD-positive areas. This information is available from local Conservation Department offices and conservation agents.

There is currently no evidence CWD can infect people, either through contact with infected animals or by eating meat of infected animals. However, public health officials recommend avoiding consumption of meat from animals that test positive for the disease. Hunters are encouraged to take the following precautions when field dressing deer:

- Wear latex or rubber gloves.
- Bone out the meat from your deer. Do not saw through bone, and avoid cutting through the brain or spinal cord.
- Minimize the handling of brain and spinal tissues.
- Wash hands and instruments thoroughly after field dressing is completed.
- Avoid consuming brains, spinal cords, eyes, spleens, tonsils, and lymph nodes. Normal field dressing coupled with boning out a carcass will remove most, if not all, of these body parts.
- If you have your deer commercially processed, request that your animal is processed individually, without meat from other animals being added to meat from your animal.
- If you observe or harvest a deer that looks sick, please contact your local conservation agent.



MIKE HOPPER, KANSAS DEPT. OF WILDLIFE, PARKS AND TOURISM

Hemorrhagic Disease

Hemorrhagic disease outbreaks occur sporadically in Missouri. Hemorrhagic disease (HD) includes both epizootic hemorrhagic disease (EHD) and bluetongue (BTV) viruses. These diseases are closely related and produce similar symptoms in deer.

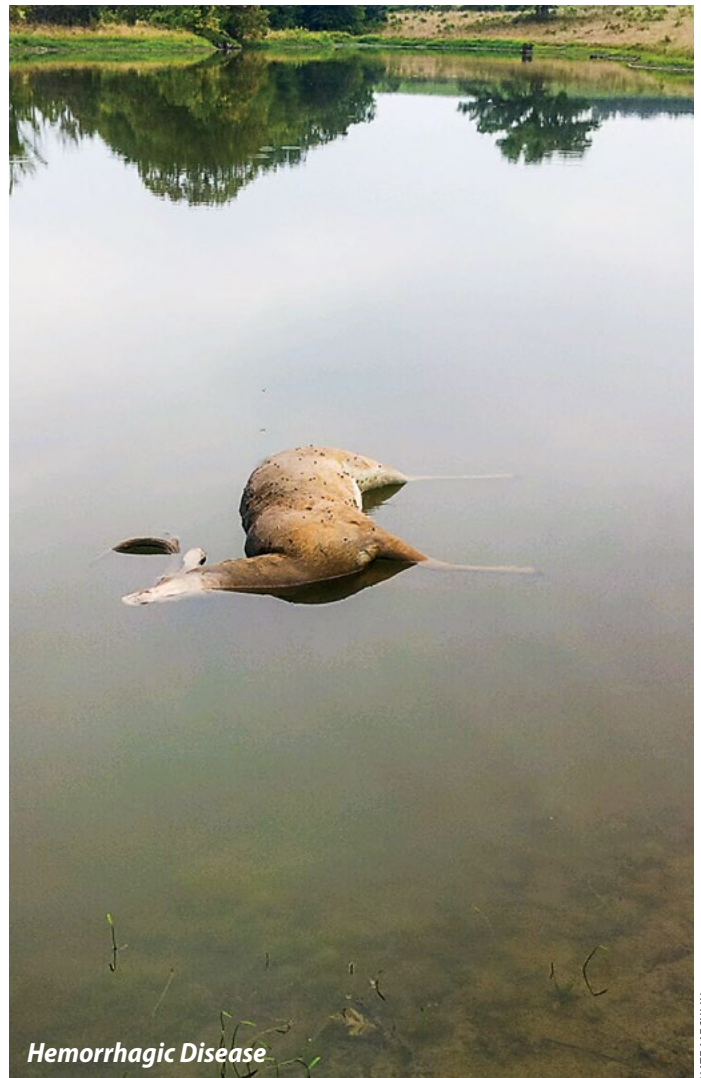
Several species within the deer family are susceptible to the HD viruses, including white-tailed, mule, and black-tailed deer and elk. Domestic ruminants such as cattle and goats typically show mild to no signs when infected. In contrast, sheep may develop severe illness when infected with the bluetongue virus.

HD is transmitted by biting midge flies. Midges are most abundant from August to October, so disease outbreaks are usually seen during this time. The disease may go unnoticed in the wild because deer carcasses quickly decompose and are consumed by scavengers. Some infected deer may not show obvious symptoms; others may die in one to three days. Typical symptoms include drooling, swollen neck, tongue, or eyelids, reduced activity, and significant weight loss. Because sick deer are feverish, they are often found near water. In some cases, deer develop sores on their tongues, dental pads, or insides of their cheeks. In Missouri, most deer that contract HD die quickly within a matter of days.

The severity and distribution of HD is highly variable across the country. High-density deer herds may exhibit higher mortality rates due to increased contact between individuals, which allows infected midges to transfer from one deer to another. Incidence of the disease has ranged from a few scattered mild cases to dramatic outbreaks. Mortality rates during outbreaks are usually less than 20 percent of the local population, but losses of up to 50 percent have been documented.

In some areas of the country, HD has been present long enough for some animals to develop immunity to certain strains of the virus. In these areas, not all infected deer die from HD. The most common evidence that deer have survived the disease is from the sloughing off and regrowth of hooves. These deer generally remain in good condition, and the hoof sloughing is simply a residual effect of the disease.

There are no known health risks from handling or eating venison from deer infected with HD. Deer can, however, develop secondary bacterial infections due to HD and may not be suitable for consumption. If you find a dead deer and the cause of death is not apparent, please report it to your local conservation agent.



Brain Abscesses

Brain abscesses are bacterial infections in the skull and brain. In white-tailed deer, brain abscesses most often occur in bucks (90 percent of cases) and are often seasonal, primarily due to antler development and fighting. During antler drop or severe fighting with other bucks, infections can develop on the skull near the pedicle, resulting in a brain abscess.

In the southeastern United States, brain abscesses are estimated to account for about 10 percent of natural mortality of mature bucks. Infection symptoms may include poor coordination, circling movements, blindness, lethargy (significant lack of energy), and emaciation.

The meat of a deer with a brain abscess may not be suitable for human consumption. The Conservation Department recommends not to consume any animal that appears ill.

Skin Conditions of Deer

Cutaneous Fibromas

Cutaneous fibromas are hairless tumors that are found on the skin of deer. Often resembling warts, fibromas can be found anywhere on the body and range in size from less than 1 inch to more than 8 inches. They are caused by a virus that often infects deer through a wound. Transmission of the virus is thought to occur by biting insects or direct contact with an infected animal. Fibromas are more common in bucks because they are more likely to incur wounds while fighting with other bucks and rubbing antlers.

While they can look grotesque, cutaneous fibromas generally do no harm to deer unless they interfere with sight, respiration, eating, or walking. Human infection has not been reported. Fibromas are confined to the skin, so meat from animals with fibromas is safe to eat. However, large fibromas may be complicated by bacterial infections that can render the animal unfit for consumption. Hunters are encouraged to use their judgment when determining what parts of an animal are safe to eat.

Mange

Mange is caused by a mite that lives on the skin of deer. While many deer can have the mite with no adverse effects, other animals can show extensive areas of hair loss and thickening of the underlying skin. The skin will often appear dark and hardened in the hairless areas, and small pustules resembling pimples may be seen on close examination. The appearance can be quite dramatic, and often causes concern in hunters and wildlife watchers. However, mortality from mange has not been reported in deer, and the mites most commonly responsible for mange in deer are not contagious to other species. Most cases of mange in does occur in late summer, while bucks appear more affected in fall and winter.

Similar to cutaneous fibromas, the mites that cause mange are confined to the skin. They do not affect the quality of the meat and are removed with normal processing.



MILTON FRIEND, USGS

Ticks

Ticks are a common parasite of deer, and many species can transmit diseases to people. It is important for hunters to minimize their exposure to ticks using the following precautions:

- Wear long sleeves and pants in the field. Many repellents are available for both skin and clothing. Exposed skin should be protected with products containing at least 20 percent DEET, and clothing can be treated with permethrin products. Be sure to follow product labels, and avoid the eyes, nose, and mouth when applying repellents.
- Wear latex or rubber gloves while dressing and processing deer.
- Take a shower after being in the woods, and check your entire body closely.

Many people associate deer with an increased risk of Lyme disease. This is most likely because the tick responsible for the spread of Lyme disease, the black-legged tick, is commonly referred to as a "deer tick." Although white-tailed deer are the predominant host for the adult stage of the deer tick, there are no reports of clinical disease in deer or other wildlife species. In addition, the adult ticks that normally feed on deer do not feed on additional hosts and therefore will not transmit the bacteria that cause the disease. There is no evidence to support the possibility of human infection through the handling of deer carcasses or through the consumption of venison.

Internal Parasites of Deer

Nasal Bot Flies

Nasal bots are the larvae of flies that commonly invade the nasal passages of deer. They are most often found by taxidermists preparing heads for mounting but may occasionally be seen by hunters during field dressing. Although they can be quite large (up to 1.5 inches long), nasal bots do little harm to deer and do not pose a known health risk to humans. Meat from deer infected with nasal bot flies is safe to eat.

Arterial Worms

Arterial worms are naturally-occurring parasites of deer, elk, and domestic sheep. The worms live primarily in the arteries of the neck, and high worm infestations can reduce blood flow to the head. The most common sign of an infection is a food impaction in the deer's mouth, leading to a "lumpy jaw" appearance. Infection rates are generally not high enough to impact deer populations, and there are no known human health implications.

Abdominal Worms

Abdominal worms are commonly seen by hunters during field dressing. These slender white parasites may be up to 10 inches long. Adult worms live in the abdominal cavity of deer and produce larvae that circulate in the blood. Younger deer are more likely to harbor this parasite than older deer, apparently due to the development of immunity in older deer. Abdominal worms seldom harm the host and are of no significance to other animals.

There are no known public health risks related to abdominal worms, and meat from infected deer is safe to eat. Dead encapsulated worms on the surface of the liver can be cut away and pose no health risk.

Tapeworms

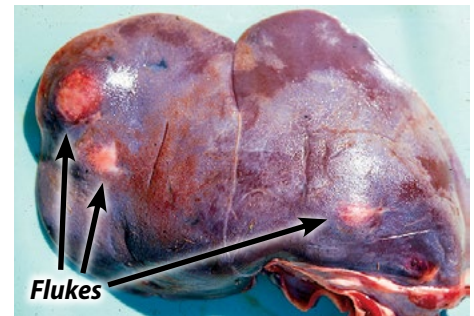
Several tapeworms can infect deer, but one of the most visible appears as a white oval on the liver or on membranes within the deer's abdominal cavity. Commonly referred to as "bladderworm," this oval structure is the larval stage of the tapeworm.

Tapeworms do not cause infections in deer and do not infect humans. Venison from animals infected with tapeworms is safe to eat.



Flukes

Flukes are parasites that commonly infect the livers of white-tailed deer. They are often flat and oval, resembling a leech. Deer



usually tolerate liver flukes with no distinct signs of disease, and most hunters will never encounter the parasites during normal field dressing. Often, the only signs of their presence are white, fibrous scars on the surface of the liver. There may also be a very distinctive black pigment streaking across the liver surface. Flukes are not infective to humans and present no known public health risk.

Trauma

Deer are susceptible to a variety of traumatic injuries, and they have an incredible ability to heal. Injuries may be due to hunter-inflicted wounds, encounters with other aggressive animals, or automobiles. Penetrating injuries from sticks or fences are not uncommon. Although many of these injuries heal without complications, infections can arise. The presence of unusually strong odors, discolored meat, or open, non-healing wounds may lead to bacterial spread throughout the body and render the animal unfit to eat. Always use common sense and good judgment to determine if the animal is suitable for the table.



BEFORE THE HUNT

Private Land Management

Managing private land for better deer hunting has become increasingly popular in recent years. Habitat improvements can increase the number of deer an area can hold, but deer numbers are largely controlled by hunter harvest.

Missouri's deer hunting regulations are set to give hunters and landowners flexibility to keep deer numbers at acceptable levels. As a general rule, if you want the deer population to increase on your property, harvest less than 15 percent of the adult does. For a stable population, harvest 15–20 percent of the does. And to lower the deer population, harvest more than 20 percent of the adult does. To learn how to estimate how many does and how many deer are in your area, check out the white-tailed deer management guides at extension.missouri.edu/deer.

Hunters are commonly interested in antler size. Antler growth is strongly related to the age of the buck. Hunters have a lot of control over what age bucks reach because most buck mortality is due to hunter harvest. Most hunters do not own large areas of land, so a landowner cooperative often is needed to have a significant impact on the ages of bucks in the area. Landowner cooperatives allow hunters to manage a larger geographic area that will encompass many deer home ranges, allowing bucks to live longer and their antlers to grow to their full potential.

For hunters who own or have permission to manage the land they hunt, habitat management is a popular emphasis. While food plots are by far the most popular deer management conducted, they are rarely the most effective. Food plots are a nice addition to — not a substitute for — good habitat management. More effective management practices include timber stand improvement, warm-season grass establishment, prescribed burning, old field management, and glade management.

Every property is unique, and knowing the best course of action for your farm can be daunting. Conservation Department private land conservationists (PLCs), wildlife biologists, foresters, fisheries biologists, and conservation agents can offer management recommendations that will help you reach your wildlife goals. In addition to providing sound habitat management advice, Department staff stay up-to-date on federal, state, and other cost-share programs that may help with the cost of management practices. To find your local Conservation Department contacts, call the nearest regional office listed on Page 37 or visit mdc.mo.gov.

Other Resources

One-on-one contact with a Conservation Department employee is usually the best source of information available to landowners, but other information sources abound.

A series of white-tailed deer management guides covering everything from basic deer biology to how to conduct effective camera surveys is available at extension.missouri.edu/deer.

The Conservation Department offers several habitat management guides, including *Wildlife Management for Missouri Landowners*, *Forest Management for Missouri Landowners*, and *On the Edge*, a guide to bobwhite quail management. These publications are available at Conservation Department offices and online at mdc.mo.gov.

A wealth of deer-management information is available online. You should realize, however, that some of the information you find may not be suited for your situation or location. If you have questions, contact your local Conservation Department employee.

Bowhunter Survey

A vital part of good population management is good record keeping. If you are an archery hunter, a great way to keep observation records and help Department biologists collect data is to participate in the Bowhunter Observation Survey. Information you collect will be used by biologists to gauge the health of wildlife populations and set hunting regulations.

Participation is easy. Just send your name and complete mailing address to: **Bowhunter Observation Survey; Missouri Department of Conservation; 3500 East Gans Rd.; Columbia, MO 65201**. You will receive a diary to record the deer, turkey, and furbearers you observe while bowhunting. At the end of the season, drop the postage-paid diary in the mail. After Department biologists tally the information, they will send you a summary of sightings for the entire state and return your diary if requested. Keep a file of your diaries, and you can go back through to see how things have changed on your hunting land over time.



Finding a Place to Hunt

Deer are available in nearly every habitat type in Missouri from small urban woodlots, to agricultural lands, to vast forests. Because of this, where you hunt largely depends on where you live, how far you wish to travel, and whether there are land-access restrictions.

Public Land

Public land in Missouri is owned and managed by a variety of organizations. However, most of the land open to hunting is managed by the Conservation Department or the U.S. Forest Service.

Public hunting areas have many benefits. Foremost, anyone may hunt on public areas if he or she has the appropriate hunting permits. Optimizing wildlife habitat is one of the main goals of public land management, and the management is performed by professional wildlife managers who continually research and implement the latest techniques to enhance habitat and wildlife populations. Public hunting areas are spread throughout the state and provide relatively easy access to hunting opportunities. Locate a conservation area near you by visiting mdc.mo.gov/atlas.

Become familiar with the area you plan to hunt by scouting in the off season. One of the most enjoyable

methods of scouting is participating in another activity while you scout. Search for shed antlers in late winter, hunt turkeys and mushrooms in spring, or hunt squirrels in summer. Learning the hills and valleys, roads and trails, and habitat features of a public area pays off when formulating a hunting plan and determining hunting sites.

Online pre-season scouting is also important in determining the regulations that pertain to the public area you plan to hunt. Regulations vary from public area to public area, so be sure to learn which methods can be used (muzzleloader, bow, rifle, etc.), which permits can be filled, and which seasons and limits apply, in addition to other special requirements (use of tree stands, hunting hours, etc.). For a list of conservation areas and their regulations see the *Fall Deer & Turkey Hunting Regulations and Information* booklet.

Lastly, public land is just that — *public* — so use common sense and treat others with respect so everyone can have an enjoyable experience.

Managed Hunts

Missouri offers numerous managed deer hunts for archery, crossbow, muzzleloaders, and modern firearms from mid-September through January. A variety of public land agencies

participate in the hunts including national wildlife refuges, state parks, city municipalities, and conservation areas. The hunts help managers achieve site-specific deer management goals and provide additional hunting opportunities to the public. Hunters are drawn from an application pool using a weighted, random drawing system. This system allows hunters who do not get drawn on their first attempt to earn a preference point and have a better chance of being drawn on subsequent attempts. Several managed hunts are available for youth hunters and hunters with disabilities. An added benefit for hunters interested in harvesting multiple deer per year is that managed hunt harvests do not count toward a hunter's regular season bag limit. Managed hunt locations, dates, and details about the application process can be found in the *Fall Deer & Turkey Hunting Regulations and Information* booklet.

Private Land

With more than 93 percent of land in Missouri being privately owned, the bulk of deer hunting opportunity is on private land. Private land is used for a variety of purposes including row crop, pasture, and timber production, urban development, and wildlife habitat management. Although wildlife habitat is not the primary focus of most private land management, deer have adapted well to society's modifications to their environment and, in many cases, have benefited.

Hunting private land offers many benefits. Limiting who may hunt on a specific property is one of the biggest. Fewer hunters reduce disturbances, which makes deer more predictable. Hunters can scatter themselves throughout a property so they do not interfere with each other. Tree stands and blinds are more secure on private property. And, landowners have much greater control over how many deer and which deer are harvested on their property.

Many hunters do not have a friend or family member who has land where they can hunt. This does not mean there is no private land available to hunt, only that it is more challenging to acquire permission. Challenging, fortunately, does not mean impossible. Here are a few things to consider when attempting to acquire permission to hunt on private land.

Visit Face-to-Face

Always take the time to stop by and visit with the landowner instead of only making a phone call. The face-to-face contact is important for landowners to learn more about you and to put a face and vehicle with the person that will be hunting their property.

Because land changes hands on a fairly frequent basis, locating the owner of a particular parcel can be challenging. Information on land ownership can be acquired at the county court house from the assessor's office or a plat book. Plat books can provide the name of the landowner and a phone book or the assessor's office can provide the landowner's address.

Just because you secured access to hunt one year, does not automatically give you permission to hunt the next year. Make sure to contact the landowner each year to ensure you are still allowed to hunt.

Look and Act Presentable

Think about your initial contact with a landowner. It is important to portray professionalism and trust. The landowner may have concerns about livestock or other assets on the property. In that first face-to-face meeting, the landowner has to determine if you will respect his or her property. This determination will be based in part on how you look, act, drive, and present yourself. Make a good first impression.

Be Courteous

Arrange to visit during the time of day when the landowner may be outdoors or easily accessible. Avoid meal times, when other guests are present, and any time after sunset. Enter with a positive demeanor and allow enough time to chat. Often landowners are proud of their property and the work they have put into it. A conversation can help you learn a lot about the surrounding area, deer movements, and the quality of the deer herd. In addition, be courteous even if you have been told "no." Landowners in farming communities often know each other well, and word can spread quickly about a rude encounter.

Make it a Win-Win

A landowner who has allowed you to hunt on his or her property has given you something. It is a good idea to offer something in return. Depending on the situation, stopping by for an occasional chat, providing a portion of your harvest, or pitching in to help around the property often will suffice. You also may ask if you can post the landowner's boundaries as a gesture of good faith.

Most importantly, consider the landowner's property goals and try to help him or her meet them. If the landowner wants a lower deer population to reduce crop damage, be sure to harvest does when the opportunity presents itself. If the landowner wants bucks to reach an older age class, pass up younger bucks. All of these activities help to develop a good, long-standing, hunter-landowner relationship.

Don't Give Up

Finding a landowner who doesn't already have a hunter or several hunters hunting on his or her property can be challenging. Getting told "no" is a part of asking permission and should be expected. With persistence and a positive attitude an opportunity will present itself.

In addition to landowners providing free access to their land, there are other avenues to ensure you have a hunting location each fall. Two of these are leasing land and hiring an outfitter. Although both generally require payment, they are becoming increasingly popular. Leased land has the advantage

of securing a particular property for the long-term and allows the lessees more say in how many people are able to hunt. Outfitters often provide a package arrangement where stands are already set up, lodging is provided, and other amenities, such as skinning sheds, are available. This may be a good option for someone who wants a quality hunt with a high success rate but does not have the time to do the work in the field. Find outfitters and land to lease on the Internet, in newspaper classifieds, through word of mouth, or from realtors.

Scouting

Scouting is one of the most important aspects of deer hunting. White-tailed deer are a challenging quarry that require hunters to study their habits and develop a plan to intersect their movements. Scouting is extremely enjoyable whether or not it leads to a deer being harvested. Here are a few things to consider when scouting.

Acorns

During the fall, deer abandon other food sources to search for highly prized acorns. There are many oak species in Missouri, but they all can be lumped into two categories: white oaks and red oaks. Deer prefer white oak acorns due to a lower tannin content that makes them more palatable. But it is important to have a mix of both white and red oaks to ensure there are adequate acorns each year. Frosts, droughts, floods, and severe storms all influence acorn production. In years when production is high, deer tend to be spread out, able to forage with little movement. When acorn production is low, deer concentrate in areas that produced acorns and travel from tree to tree to find adequate forage. This makes deer more visible to hunters. Look for hoof prints, deer pellets, and broken acorn shells under trees to find active feeding sites. When acorns are on the ground, the area will be used by deer at all times of the day.

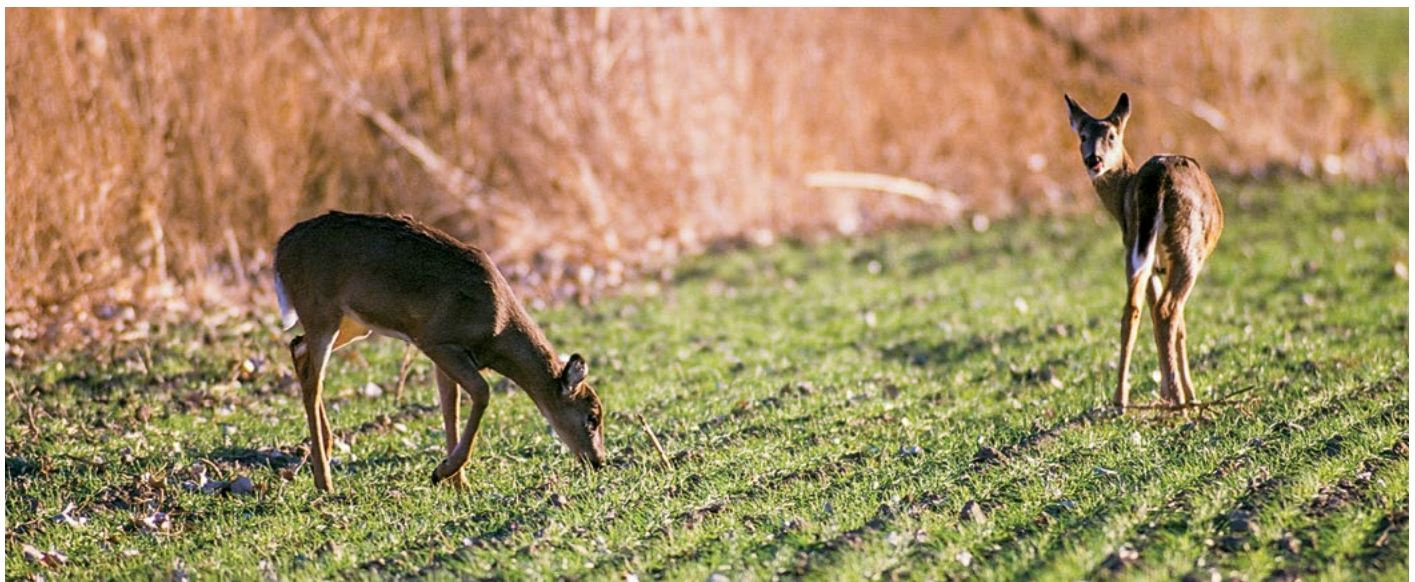
Crop Fields

Hunting the edge of crop fields can be effective. Deer feel more comfortable about feeding in the open when there is cover nearby. Take notice where forested habitats jut out into fields, especially where two points jut out across from each other. If deer are on the move, they will tend to cross a field from point to point. When deer enter a field to feed, they prefer secluded, shadowed coves earlier in the evening. They also will feed in low spots in a field before venturing away from cover. Food near cover will always be visited earlier in the evening than the middle of a big crop field.

It's hard for a hunter to enter a crop field before sunrise without spooking the deer that fed in the field all night, but entering after daybreak can be a good option. Deer feeding in other fields may move through when heading back to their bedding areas for the day.

Soybean fields are great summertime deer viewing areas. Soybean leaves and pods are highly sought after by deer in the summer months while bucks are growing antlers and does are lactating. As the soybean leaves begin to turn yellow, deer will visit the area less. This is the time of year acorns are starting to drop. When you notice that deer have disappeared from soybean fields, shift your focus to finding acorns. If a soybean field is left standing into the winter months, deer will return to the area to feed heavily on any remaining bean pods.

Hunting early in the season next to standing corn can be difficult. Standing corn provides extra cover and travel routes to keep deer concealed. Harvested cornfields, however, can be a great place to find deer as fall progresses and winter sets in. Deer will scavenge waste grain to increase their carbohydrate intakes. These carbohydrates help deer pack on fat to prepare for harsh winter conditions. The more fat deer can accumulate during fall and early winter, the more time they can spend resting in cover during



frigid conditions. Bucks also use their fat reserves during the rut when they spend all of their time in search of estrous does and seldom feed.

Food Plots

Food plots are just one tool in a deer manager's toolbox. The role that food plots play in deer management is to supplement native forages and provide nutrition during stressful periods of the year. Many hunters plant food plots to attract deer for hunting purposes, and food plots do typically increase deer sightings if the right forage is planted in the right location. Monitoring a food plot to see if the location and forage you chose is working is helpful in learning the preferences of your deer herd. Utilization cages can be put in food plots to see how much deer are actually using the plot. These cages are typically small circular fences that exclude deer from foraging inside. They will allow you to view the amount of forage a plot is capable of producing without browsing pressure. Food plot managers are always surprised by how much their plots are being used compared to what they are seeing growing inside of the cage. Be sure to stake your cage securely because deer will remove the cage given the opportunity. Pay close attention to freshly nibbled leaves and stems, and watch for other deer sign such as tracks and scat. This will give you an idea about what types of forage deer are seeking at various times of the year.

One of the most important aspects to consider when making food plots is hunting pressure. The more you hunt over a food plot, the less deer you will see. Scaring deer directly and leaving your scent causes deer to avoid the food plot during daylight hours or stop using it altogether. It is typically better to plant several small food plots to hunt over or a few large food plots that you only hunt from a distance. Hunting from a distance means hunting the transition zones between food and cover and only rarely hunting directly over a food plot. Deer will always go to food plots, but they may take different routes to avoid disturbance. Continually adjust your stand sites based on deer movements to increase your chances of having a deer pass by at close range.

Water

During dry years and in early archery season when temperatures are still high, deer may visit secluded water sources often. Check ponds for deer activity and set up trail cameras to help you identify times when deer are actively using them. Keep in mind that during normal years, deer gain much of their water from the food they eat.

Ponds, rivers, creeks, and lake arms can help hunters by creating pinch points. Deer generally choose the path of least resistance. This path often causes them to cut closely around coves or across pond dikes. These are excellent stand sites because deer trails often converge at these locations, allowing for a larger number of deer sightings, especially during the rut.

Water does not always create pinch points, however. Deer will frequently wade across small creeks and swim across large rivers in search for food, cover, and breeding opportunities. Watch closely along creek edges for crossings. Often these areas are soft, causing worn trails that are easy to spot.

Scrapes and Rubs

Scrapes are signposts made by bucks. When making a scrape, a deer paws the ground and urinates on the disturbed soil. Research has shown that deer visit scrapes mainly at night. Scrapes, however, are highly visible and can give away travel corridors. Don't focus on individual scrapes but on the route being used between scrapes. Scrapes are usually visited by many different deer, and not just bucks. Deer are able to gain a lot of information about other deer in the area from the scent they leave behind. Putting a trail camera on a scrape that is near a food source from mid-September to mid-November can provide a hunter with a good idea of the deer moving through an area.

Bucks use shrubs and saplings to rub the velvet off their antlers. A lot of rubs in an area does not necessarily mean there are many different bucks there, but it is a good sign. Older bucks tend to make more rubs than younger bucks. Although a buck can make rubs of any size, overly large rubs tend to indicate older bucks. When scouting, look for linear rub lines that indicate buck travel routes. Circular rub lines around thickets or small timber blocks may indicate a core bedding area for a particular buck.



Trails

Every time hunters see a well-used deer trail, they should ask themselves two questions: Where is the main food source from here and where is the main bedding area or heavy cover from here? Follow deer trails in the off season, especially right at the close of the archery season, and see where they lead. Make note of these trails for the next year because they will not be as easy to find in the dense cover of summer. If the food source the trail leads to is a crop field or pasture, take note of what is planted there. Changes in available forages will influence deer movement from year to year.

Deer take the path of least resistance and try to stay in cover while doing so. This may cause the path to go through a deep ditch, a low spot in a creek, an open gateway, a path between two fallen trees, a downed fence, or any other route that makes a deer's food-to-bed and bed-to-food movements easier.

Stand Locations

A deer's nose is its greatest defense and needs to be taken into account when deciding where to place your deer stand. Try to set your stand so the prevailing winds blow your scent away from any deer that may pass underneath. The most consistent winds are usually found on ridgetops where there are few large obstructions to cause winds to swirl. Swirling winds can cause your scent to blow toward the trail or food source you are hunting and alert deer to your presence.

Valleys or drainages can cause prevailing winds to swirl and interact with thermals. On wind-protected slopes, the downwind side of slopes, or in valleys, thermals can influence wind direction. Thermals occur from the heating and cooling of air. After the sun goes down in the evening, air begins to cool and starts to sink down valleys and into low areas. This sinking air causes air to flow downhill, which is especially apparent in valleys. When the sun rises, it begins to warm the air, and the air begins to flow back up the valleys. These thermal air currents are particularly pronounced on sunny days and can cause significant air swirl when mixed with prevailing winds. Because topography, cloud cover, and prevailing wind speeds affect thermals, it is important to spend some time on your hunting property in the off season to see how the wind changes throughout the day. When choosing a stand site, think about where you can put the stand to have your scent blow away from the direction that deer are coming and going. In an ideal situation, your scent should blow toward areas where deer don't normally frequent, such as large ponds, roadways, or steep drops.

Keep the wind in mind when planning how to get to your stand. There's no use setting up a great stand if you spook all the deer off the bedding or feeding area on your way to it. Try to set up your stand so that the wind will be in your face as you walk to it. Try not to walk on ridgetops where you will be easily silhouetted against the sky. Is there an old road that you can

exit quietly, a shallow creek or drainage you can walk up? The key to entering and exiting a stand is to do so undetected.

Selecting the proper tree for a tree stand is also an important aspect of scouting and hunting. Most tree stands require a straight or gently leaning tree. Never put a stand on a tree that is leaning in the direction you plan to hang the stand. This may cause you to fall forward from the stand. Do not hang stands on trees that are dead or hollow, and try to select a tree that offers some cover in the form of branches around the stand or some trees in close proximity. This will break up your movements when drawing back a bow or moving a firearm into position. Face the stand in the same direction as where you anticipate deer will be passing. Looking around a tree for several hours to watch the main trail can cause muscle strain, discomfort, eye fatigue, and increased movement. You may need to cut branches out of shooting lanes to ensure they are free of obstructions, but leave enough cover around the stand to ensure your movements remain undetected.



Choosing the Right Firearm

Firearms are the most widely used method for harvesting deer. Unfortunately, this most basic piece of deer hunting equipment is also one of the largest investments. As a deer hunter you have four firearm types to choose from: rifles, shotguns, muzzleloaders, and handguns.

Rifles

Rifles are chosen by the majority of Missouri deer hunters. Hundreds of kinds of rifles are available, and each one is unique. Think of choosing a rifle like choosing a vehicle. You will have to give something up to get something in return. In the end, your choice will come down to personal preferences. Answering these questions and prioritizing your needs will help narrow down your options.

- What do you need the rifle to do?
- How and where do you intend to hunt?
- How far do you intend to shoot?
- What types of shots do you anticipate you will need to take?
- How much can you spend?
- Will you need to purchase additional items such as scopes, scope rings, and bases?
- What is the cost of maintenance?
- How much is ammunition?
- What size rifle fits in your arms best?
- How much does the rifle weigh?
- How much recoil does it have?
- What type of action do you prefer (bolt action, lever action, pump, semi-automatic, or single shot)?
- What do regulations allow?

When you have answered all the questions, you should have a pretty good idea of the rifle that is best for you. It is now time to make your selection and begin practicing. Make



sure to practice until you can consistently hit a 6- to 8-inch target at varying distances from the shooting positions you will use in the field. A good scope can make a big difference on accuracy at longer ranges. Just remember, your scope should never be used as binoculars! Practice firearms safety, and never point a gun at anything you do not want to shoot.

Shotguns

Many hunters choose a shotgun for deer hunting. Some of the same questions you answered in the section on rifles apply to shotgun selection. Shotguns come in a variety of combinations, ranging from those used to hunt upland birds or waterfowl to highly specialized shotguns for deer hunting. In addition to all the different action types and gauges, you will find various barrel lengths, chokes, and options in both smoothbore and rifled barrels. Any of these will take deer if you choose the proper ammunition and know your limits.

When selecting the proper ammunition, you should keep in mind the regulations in the area you are hunting. In Missouri, when deer hunting with a shotgun, you are required to use slugs. Slugs are single projectiles specifically designed for large game such as deer. With the correct combination of hunter and equipment, shotgun slugs can be accurately used for long-range hunting, but an average combination is best suited to shots inside of 100 yards. Be sure to practice so you will know your effective range.

Slugs come in two basic types, rifled slugs and sabot slugs. Rifled slugs are designed to be shot from smoothbore shotguns. They generally have grooves, or rifling, cut into the slug. This causes the slug to spin as air resistance pushes against it, making it more accurate. It is a good idea to shoot rifled slugs from an open choke, such as a cylinder bore or improved cylinder choke.

Sabot slugs are designed to be shot from shotguns with fully rifled barrels or rifled choke tubes. This type of slug has a bullet placed inside a plastic jacket. Sabot slugs require the shotgun barrel to impart the spin on the bullet. The fully rifled slug barrel in combination with a sabot slug is the choice of the majority of shotgun deer hunters. It will generally be more accurate but has a higher cost associated with the barrel and slugs.

Muzzleloaders

Muzzleloaders are firearms capable of being loaded from the muzzle. Instead of having a complete cartridge as with a rifle, when using a muzzleloader you must load each component separately. Today's muzzleloader is not the same as those we think of from history books. Though some hunters still use flintlock and caplock muzzleloaders, many prefer a modern in-line. Modern in-line muzzleloaders are much more reliable, more user friendly, and, in some ways, safer than the traditional versions. Modern bullets and specially designed muzzleloading propellants make them easier and cleaner to shoot. The main benefit to choosing a muzzleloader is that many states, including Missouri, have an additional season for their use. This equates to extended opportunities in the field.

Muzzleloaders have a couple of drawbacks, though. Muzzleloaders are primarily short-range tools, and shots should generally be limited to around 100 yards. Practice will determine your effective range, and many shooters that have spent time finding the perfect load can extend their accurate distance. Another drawback is that muzzleloader hunters are limited to one shot. It takes the average hunter about one minute to reload a muzzleloader. In most field conditions, deer are not going to stand around while you reload. You must make your first shot count.

Handguns

Handguns require more skill to achieve proficiency than any other firearm. Even in the best hands, most handguns are limited to shots inside of 50 yards. Getting this close to deer takes a higher level of skill, but it is that challenge that makes hunting with a handgun fun. Selecting the right handgun follows the same process as that for other firearms. Most dedicated handgun hunters choose firearms in larger calibers with longer, more accurate barrels. A .357 magnum or larger caliber would be a good starting point. The .44 magnum is a popular cartridge that has sufficient knockdown power and recoil and is manageable for most hunters. The ability to put a scope or red-dot sight on your pistol is important. The theme with a handgun should be practice, practice, practice, and then practice some more. As a hunter, it is your obligation to know your limits and the limits of your equipment to harvest game in the most ethical and humane way possible.

Other Essential Equipment

- Proper hunting permits
- Clothing appropriate for weather conditions
- Hunter orange vest and hat as required by law
- Extra ammunition
- Sharp knife for field dressing
- Small saw for cutting rib cage and pelvis during field dressing
- Binoculars for spotting deer
- Small flashlight or headlamp
- Tree stand safety gear (if using tree stand)
 - Haul line to lift gear into tree stand
 - Fall-arrest system that includes a full body harness with tethering system, a lifeline rope or lineman's style climbing belt, and a suspension relief strap

Optional Equipment

- Backpack for carrying gear
- Cellphone and/or portable radio
- Extra flashlight with batteries
- Bottle of water
- Snacks
- Range finder
- GPS device
- Map and compass
- Deer calls
- Shooting rest
- Toilet paper
- Extra clothes in a waterproof bag, especially socks and gloves
- Fire-starting supplies
- Signal device such as a loud whistle
- Gambrel with rope and pulley system for hanging deer
- Small knife sharpener
- Rubber gloves for field dressing
- Rope for dragging deer
- Firearms cleaning kit
- Multi-tool or small tool kit
- Small first-aid kit
- Insect repellent



Choosing the Right Archery Equipment

Selecting archery equipment for deer hunting is not as complicated as some would make it seem. The most important thing is accuracy. If you are not able to shoot a tight group of arrows into a target, you will not be able to harvest a deer.

There are several factors to consider when choosing a bow. What type of bow do you want to use: compound, re-curve, or long bow? Are you right- or left-eye dominant? Shooting with your dominant eye is paramount to archery, and just because you're right-handed doesn't necessarily mean you're right-eye dominant or vice versa if you're left-handed. The easiest way to find out which eye is dominant is with an empty paper towel tube. Look through the tube at an object with both eyes open and then close one eye. If you can still see the object through the tube, the eye that is open is your dominant eye. If you can't see the object, the eye that is closed is your dominant eye.

Bows

Most beginners start with a compound bow. Compounds can be fitted with various accessories to increase accuracy, including sights, stabilizers, and quivers. Many bow manufacturers offer bow packages with all the accessories you need to get started already attached. Traditional bows such as long bows or re-curves can be outfitted with some of the same options, but most people who chose to use these types of bows usually prefer few if any additions. Traditional bows are just as accurate as modern compound bows, but because traditional bows lack sights, becoming proficient with a traditional bow requires much more practice. No matter what type of bow you decide to use, be sure to try as many different kinds as you can. Most archery shops will allow you to test a bow before you buy it.

Regardless of the type of bow you chose, one of the biggest factors to consider is how much draw weight the bow should have. Draw weight is the amount of force (measured



in pounds) it takes to pull the bowstring back to full draw. Although the bow must provide enough force to push an arrow through a deer's hide and muscles to reach the vital organs, the force required is less than most people think. Missouri regulations do not require minimum draw weights, but 40 pounds or greater is recommended. Archery hunting is about getting close to a deer and making a good, ethical shot. Don't feel pressured to shoot the heaviest amount of draw weight. It's more important to hit where you are aiming. Another thing to consider is that in the summer when you are warm and your muscles are loose, pulling back 70 pounds of draw weight might be easy, but in November when you've been sitting motionless in a cold tree stand for hours, the effort you need to draw back the bow will be much greater.

Arrows

Arrows are made of a multitude of materials, such as wood, aluminum, fiberglass, and graphite. Once you have your bow, consult a reputable archery shop to discuss which type of arrows and broadheads you should be shooting. If you choose to go the more traditional route and shoot a re-curve, wooden arrows are a fine choice. If you choose to shoot a compound bow, wooden arrows should never be used. The

force generated by compound bows can cause wooden arrows to shatter. Aluminum arrows are a good choice for just about any archer who is just starting out. In time you might switch to lighter-weight — but pricier — choices such as graphite. The lighter the arrow, the faster it is, but lighter arrows may be less accurate. Try as many types of arrows as you can before deciding. Bows sometimes can be finicky and will shoot one type of arrow better than another. Find which arrow works best for your bow and then practice, practice, practice.

Additional Archery Equipment

A few additional pieces of equipment may increase your accuracy, ease, and efficiency while archery hunting. A shooting release helps ensure that the string is released properly and consistently. A quiver to keep your arrows in is helpful. Be sure to practice shooting your bow with your quiver on if that is the way you plan to hunt. Most archery hunting is done from either a tree stand or a ground blind. Whichever you use, be sure to practice shooting your bow from an elevated platform or a seated position to simulate the type of hunting you will be doing. Also practice estimating distances by picking out an object, guessing its distance, and then checking yourself by stepping off the distance or by using a range finder. Accurately judging distance can mean the difference between a clean harvest and a missed or wounded deer. You also might want to purchase a stabilizer for your bow if you're having problems shooting tight groups of arrows. If your bow isn't equipped with an arrow rest, you'll want to purchase one of those as well. If you have the space to do it safely, you might consider purchasing a 3-D target so you can practice at home. Be sure to read the manufacturer's recommendations to learn what types of arrow tips can be safely shot at the target.

No matter how well your bow fits or how perfectly matched your accessories are, if you cannot consistently hit where you are aiming, your odds of success will be minimal. Hunting with archery equipment requires learning how to get close to your quarry and being able to efficiently harvest the game you are after. Just because you were able to shoot your bow well in December doesn't mean you'll be able to shoot well next September. So, grab your bow and practice!

Urban Archery Hunting

Archery deer hunting in Missouri has grown tremendously in recent years. Hunters enjoy the challenge of using a more primitive weapon to harvest deer, and the longer season allows for more opportunity. Although numbers vary by year, about 350,000 archery deer tags are issued annually, and archery hunters harvest about 50,000 deer each year.

Managing Urban Deer

Urban deer management is much different than managing deer in rural areas. Cities usually have more restrictive hunting regulations and often need larger harvests to bring deer populations down. Deer in urban areas can pose a higher threat to vehicles and cause property damage if their populations are not controlled. In most areas of Missouri, deer populations do not reach their maximum carrying capacity. In urban areas that restrict firearm and archery use, deer populations can skyrocket, reaching carrying capacity and increasing disease risks. Cultural carrying capacity refers to how many deer society will tolerate. Often, cultural carrying capacity is much lower than what the habitat can actually sustain.

For safety reasons, many municipalities do not allow the use of firearms, so controlling deer populations can be difficult.

Archery deer hunters can play a key role in managing urban deer. Establishing city ordinances that allow archery deer hunting has become a major tool in managing urban deer populations. However, once deer populations reach numbers in excess of 100 deer per square mile, archery methods are no longer as effective. Sharpshooting is often needed to supplement archery methods to control deer numbers. This is why it is critical that municipalities remain proactive in managing deer populations.

Along with the use of archery methods to harvest deer, many county and state parks and urban conservation areas offer managed hunts. Although these managed hunts do offer hunting opportunities, they are designed to control deer populations where hunter access is limited. By offering a managed hunt, hunting dates can be planned to reduce conflicts with other area users and increase harvest potential. Managed hunts have been successful in reducing deer densities. Increasing the harvest of does is key to a successful urban deer management program. Typical harvest numbers during statewide archery season reflect a 2-to-1 or less doe-to-buck harvest. Urban deer management should strive for a 3-to-1 or greater doe-to-buck harvest.





DURING THE HUNT

Deer Hunting Regulations

Deer regulations are set the summer before the fall seasons begin. For details, see the *Fall Deer & Turkey Hunting Regulations and Information* booklet, which is available in print form from permit vendors, Conservation Department offices, and online at mdc.mo.gov. If you have questions about how a regulation should be followed, contact a Conservation Department office or your local conservation agent.

It is important to review the deer hunting rules and regulations each year prior to hunting. Missouri's deer populations are ever-changing; you should expect deer regulations to change as well. Ignorance of the law is not a reasonable excuse for breaking it.



Safety

To buy firearms hunting permits, most hunters must pass a hunter-education course. (See the *Fall Deer & Turkey Hunting Regulations and Information* booklet for exceptions.) Missouri Bowhunter Education Courses are optional but beneficial. Bowhunter courses usually take place in the summer and may be required to participate in an urban managed archery hunt.

The most important rule of firearms safety is to keep your muzzle pointed in a safe direction. Many firearms are capable of shooting well over a mile, sometimes ever farther. You are responsible for each projectile you shoot from your firearm or bow until it finally comes to rest. Do not shoot over the horizon at deer, and remember that even after a bullet has gone through a deer, the bullet can still travel long distances.

Safe gun handling is a must for yourself and for your hunting companions. Treat every firearm as if it were loaded. Learn the techniques for carrying your firearm safely. Always maintain a safe zone of fire while hunting with others, and communicate with other hunters as frequently as possible while you are hunting.

Don't endanger yourself or others by hunting under the influence of alcohol or drugs. If you must take prescription medicines, check with your physician to see if they are safe to use while hunting. If a medicine should not be taken while operating heavy machinery, you should not use it while hunting.

Four Common Causes of Hunting Incidents

- **Hunter judgment mistakes**, such as mistaking another person for game or not checking the foreground or background before firing.
- **Violating safety rules**, such as pointing the muzzle in an unsafe direction or ignoring safety procedures when crossing a fence or other obstacle.
- **Lack of familiarity and practice**, which can lead to using improper ammunition, accidental discharges, and stray shots.
- **Mechanical failure**, such as an obstructed barrel.

Tree Stands

Tree stands come in several types. Hang-on stands offer the ability to place stands earlier in the season in multiple locations. You should remove hang-on stands yearly and inspect all straps, cables, welds, and nuts and bolts. Leaving stands on trees for multiple seasons can cause damage to the stand and the straps that hold it onto the tree. Each year, trees grow in size, which puts stress on the stand that could cause failure. Climbing stands have become popular, especially among hunters who use public land where theft can sometimes be a problem. A drawback of climbing stands is that they require straight trees with few lower limbs.

Tree stands offer better visibility to see deer at longer distances, increased scent control due to an elevated position, reduced noise when entering and exiting, and reduced visibility by deer if the stand is properly placed.

Although tree stands have many positives, they also have a few negatives. Many accidents occur each year from the improper use of tree stands and from hunters not wearing a full-body safety harness and fall-arrest system. When using a tree stand, you are limited to hunting areas that have trees in which to hang a stand. Another problem with tree stands is that they can be cold to hunt from when temperatures drop and winds pick up. Staying comfortable often dictates how long you are able to hunt, which impacts your success.

Tree Stand Safety

Safety is key to a successful hunt. Do not take shortcuts when hanging and hunting out of tree stands. Always notify friends and family about your hunting location and what time you plan to return home. Do not use dead limbs as steps when entering or leaving the stand. Wear a safety harness! Climbing into and out of a stand is the most dangerous part of using a tree stand. Try to keep three points of contact with your stand at all times while you are climbing. Never carry your gun or bow with you as you climb. Use a rope to haul up your bow or unloaded gun after you're safely in your stand and hooked into your safety harness.



Ground Blinds

Ground blinds can be purchased or homemade, elevated or set flat on the ground, and built with synthetic or natural materials. Portable ground blinds are more user friendly and durable than they used to be, and many companies manufacture them. Most sporting goods stores have a variety of blinds set up so you can look over their features and check how sturdy each blind is.

Ground blinds can be set up in nearly any location, they conceal movement well (making them perfect for young hunters tagging along with a mentor), they are much warmer than tree stands, they do not require the use of a safety harness, and they take much less physical effort to set up than tree stands.

Ground blinds have a few drawbacks. Deer are skittish about any new object in a field, so you must add brush or grass around your blind so it matches its surroundings. Scent control

plays a big role when hunting from a ground blind. You are not elevated — as you would be from a tree stand — so your scent will stay closer to the ground. This makes hunting the right wind direction especially important. You often can't see as far from a ground blind as you can from a tree stand, so deer can more easily sneak in on you. And, ground blinds can be hot to hunt out of during the early season, though a battery-operated fan can help cool things down.

Ground blinds are great at concealing you from deer, but they also conceal you from other hunters. Wrapping hunter-orange ribbons on each side of the blind or hanging an old hunter-orange jacket or cap on the roof of the blind will increase your visibility to other hunters without spooking deer. If you're firearms hunting, you'll need to wear a hunter-orange hat and vest, shirt, or coat, but your other clothing should be dark in color. Most blinds have a black lining, so wearing dark clothing decreases your visibility to deer.

Make sure that whether you use a tree stand or a ground blind you know all of its features and safety requirements. Safety while hunting should be your No. 1 priority.



State and federal agencies have regulations regarding the use of tree stands and ground blinds. Review the regulations listed in the *Fall Deer & Turkey Hunting Regulations and Information* booklet before using a stand or blind on conservation areas.

Scents and Scent Control

To fool a wary whitetail, you not only need to beat its eyes and ears, but also its keen sense of smell. Knowing how to use and control scent is a good tool to add to your deer-hunting toolbox.

Scents

Cover scents are used to cover up or mask a hunter's scent. Cover scents are often natural scents of things that would be found in a specific hunting area. Popular cover scents include cedar, raccoon or fox urine, skunk, and soil.

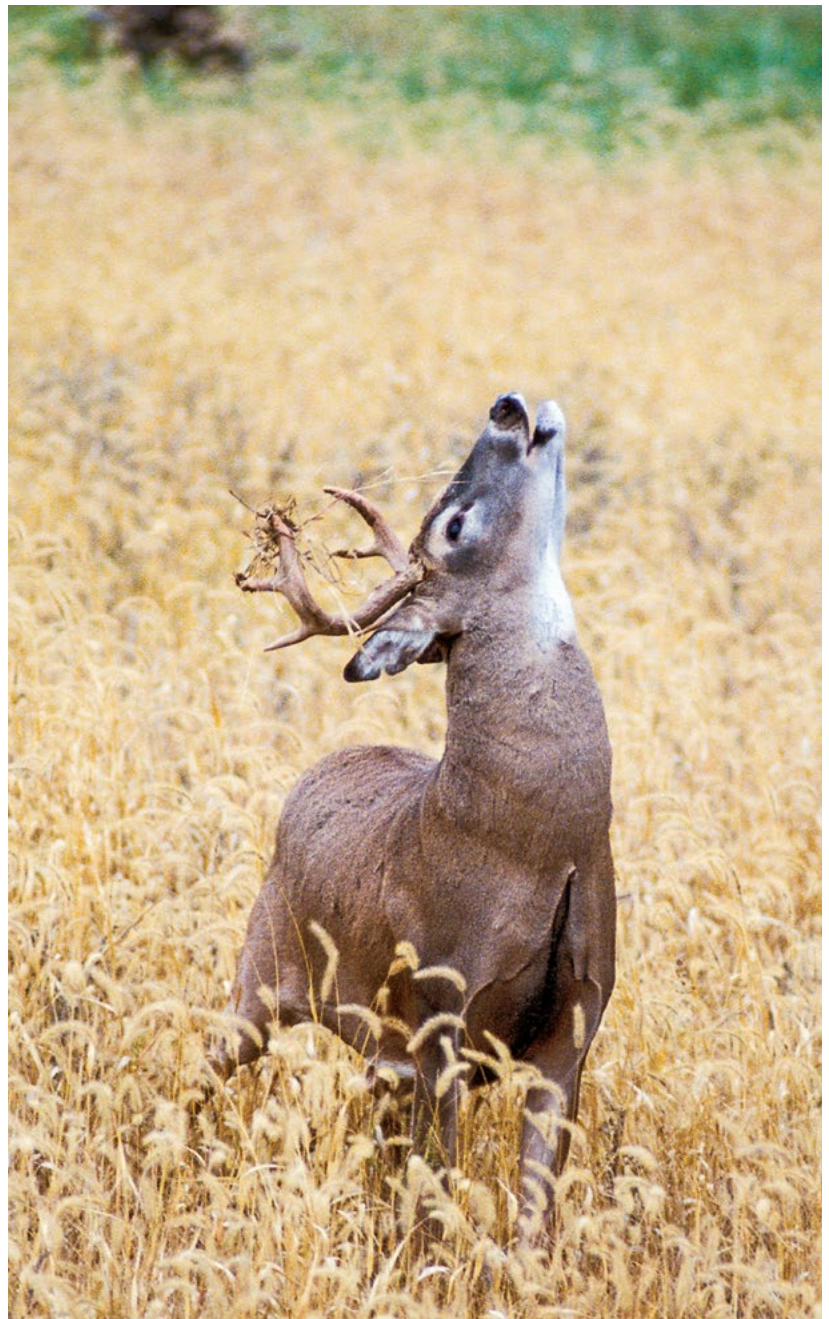
Attractant scents are used to bring deer closer to your hunting location. Common attractants used by hunters include urine and tarsal gland scents that portray does in estrus, mature bucks, or mock scrapes. These scents are made to be placed on the ground, in branches, or next to decoys near your hunting location. Scent drags, which are popular with some hunters, are made of an absorbent material saturated with scent and attached to a string. The drag is pulled behind the hunter, leaving a scent trail for deer to follow. Attractant scents should not be applied to clothing or gear. They can sometimes trigger aggressive responses from bucks. Some deer show a negative response to attractants and flee from the area after catching wind of a particular scent. Using attractants is typically more productive during the pre-rut and rut when bucks are searching for does in estrus.

Scent Control

Scent control is key to getting close enough to a deer to harvest it, especially for bowhunters. But fooling a whitetail's nose at a distance of 20 yards or less is no easy feat. Many hunters go to extremes to eliminate as much of their human scent as possible. Some use products that break down bacteria that cause human odors. Although no product gets rid of odors 100 percent, many can help reduce a hunter's scent to some degree. Scent-eliminating products include sprays, clothing washes, body washes, shampoos, deodorants, and specialized clothing. Although these products can reduce human odors, there is no substitute for using the wind to your advantage. Even if you cannot keep yourself and your clothing scent-free, using the wind to blow your scent away from deer will lessen your chances of being detected.

Many hunters wear rubber boots to their hunting stands. Rubber boots can be cleaned easily, do not absorb foreign odors, and do not distribute odors as you walk to your hunting location.

Keeping your hunting clothing clean and scent-free is important. You should avoid pumping gasoline and engaging in other activities that emit strong odors while you are wearing hunting clothing. Store hunting clothes in air-tight containers such as plastic totes, large zip-top bags, or scent-proof clothing bags made for hunters. If you want to add a little cover scent, you can place cedar shavings or leaves inside the container to give your clothing an outdoors smell. Baking soda also can be added to help reduce odors. When storing clothing in air-tight containers, make sure the clothes are dry to prevent mildew. Air drying your hunting clothes outdoors is recommended.



Using a Deer Decoy

Hunters have been using decoys to harvest game for centuries. Most Missouri hunters are familiar with using decoys for ducks and turkeys, but decoys can also be used for deer.

Safety

The No. 1 thing to consider when using a deer decoy is your safety. If a decoy looks real to a deer, it also will look real to another hunter. Unless you are the only hunter in the area, avoid using a deer decoy during firearms season. It is best to hunt over a decoy from an elevated stand. This will reduce the possibility of being in the line of fire if someone shoots at the decoy from the ground. Take precautions when carrying your decoy to and from your hunting location. If you have a decoy that is collapsible or dismantles into a carrying case, this is the best method of transport. However, if your decoy is not collapsible, be sure to remove the antlers, wear hunter orange, put hunter orange over the decoy, and carry the decoy upside down.

The Decoy

Deer decoys range from high-quality, photographic two-dimensional decoys to three-dimensional decoys with moving parts. Each decoy has pros and cons in terms of portability, durability, and visual quality. Deer are curious animals, and a mediocre decoy may illicit investigation in some deer and flight in others. The more realistic-looking the decoy is, the more likely it is that you will fool wary deer. It's critically important to make sure the decoy is free of any human scent. Various buck or doe scents can be used with the decoy to help bring deer in close for a good shot.

Hunting for Does or Bucks

Whether you set up your decoy as a buck or a doe can often determine what deer you will be attracting. Curious does will investigate a doe decoy, and bucks will be lured in hoping to breed with the decoy. Often, mature does are weary of bucks during the rut and will avoid a buck decoy. Subordinate bucks often approach a buck decoy simply to investigate it, and they will not show signs of aggression. More aggressive bucks will often knock over the decoy as they try to spar or fight the decoy.

Timing

In September and early October, bucks usually are still tolerant of other bucks, and they are still in small groups focused on feeding. Using a buck or doe decoy in this early part of the season attracts deer that are curious. Late October and November — during the rut — are the best times to use a buck decoy. It will often bring in aggressive bucks that are defending the does within their home ranges.

Setup

Because a decoy is a visual attractant, it is best to set it up in habitats where it can be seen from a reasonably long distance. Edges of crop fields near timber or in larger woodland openings usually work best. The location of the decoy in relation to your stand is important, especially for archery hunters. Getting a deer into close range and positioned at the right angle are important. If your decoy has antlers and you are decoying to illicit an aggressive response from dominant bucks, keep in mind that the bucks coming to your setup are likely wanting to fight your decoy. Dominant bucks will usually circle around an antlered decoy until they are downwind. Using buck scent near your decoy will help fool a buck into thinking the decoy is real. Once a buck is fooled, he will usually approach the decoy head on. Oftentimes, the buck will turn broadside to the decoy approximately 5–10 yards from the head of the decoy. Placing your decoy approximately 25 yards upwind of your tree stand and facing the decoy in your direction would be an ideal setup. This way, when a buck approaches your decoy, the buck will likely turn broadside 15–20 yards in front of your tree stand.

Using Trail Cameras

Seeing is believing. Trail cameras can help you learn when, where, and how deer use your hunting location, help you share pictures with friends, and help generate excitement for upcoming hunting seasons.

Fortunately, trail camera technology continues to improve, and prices for basic models have decreased. Before making a purchase, do a little research. Many websites offer unbiased trail camera reviews and information. Trail cameras use different types of flashes, batteries, and data cards. You'll need to decide which combination best fits your needs and budget.

Trail cameras are equipped with either a white, black, or infrared flash. White flashes capture images in full color similar to personal digital cameras, but the flash is visible to deer. Black and infrared flashes take nighttime black-and-white pictures, but they are harder to detect. If the area where you're setting up your camera is frequented by others, a black flash camera is a good option. As its name suggests, black flash cameras do not utilize visible light source to capture photos, thus making them a good choice for security. A metal box placed over the camera and some type of locking device will help reduce the chance of theft. Cameras also can be hung above eye level to make them harder to spot.

Battery life is a concern because trail cameras experience all types of weather. Lithium batteries perform better in cold temperatures but cost more than alkaline batteries. Rechargeable batteries save money over the long term but have a higher initial cost.

Be sure to check what size data card your trail camera requires. With cameras being able to take increasingly better quality pictures, the memory each picture requires has also increased. Couple this with fast trigger speeds, the option to shoot video, and potentially long periods between checking the camera, and it makes sense to use a data card with as much memory as possible. It's also a good idea to carry an extra data card and fresh batteries with you when checking your camera. This allows you to swap out cards and batteries to keep the camera up and running continuously.

Choose a camera location that deer frequent. Setting a trail camera on a scrape near a food source or a set of rubs can yield impressive photos of many deer making their way through the area. Keep in mind that many cameras have sensors that reach out to only 50 feet. Pick a location where your cameras can be pointed north or south. An east- or west-facing camera will have problems with the sun triggering the camera's sensor. Bright sunlight also will wash out the images, making wildlife in the photos hard to see. Remove vegetation and limbs from in front of the camera's sensor, as they will wave in the wind and trigger the camera to take a photo when no animal is present.

Trail cameras are not permitted on many local, state, and federal public areas. Check regulations before you hang a trail camera.

Use Trail Cameras to Estimate Deer Populations

Camera surveys can be used to estimate deer populations on your property to help with harvest goals for the following fall. The Missouri Department of Conservation in cooperation with the University of Missouri Extension has a document aimed at helping hunters collect this survey information. It can be found at: extension.missouri.edu/publications/g9481



Tracking a Wounded Deer

If the deer you shot does not fall on the spot, you will have to track it by following its blood trail. According to the *Wildlife Code of Missouri* — and out of respect for the animal — hunters “who kill or injure any wildlife shall make a reasonable search to retrieve the wildlife.” Following a wounded deer immediately may cause it to run farther away, so wait a minimum of 30 minutes before trailing. In cases of a liver or gut shot, you may need to wait four hours to avoid pushing a wounded deer. Note which direction the deer ran, or which direction it was headed, before you shot. Mark the spot from which you took a shot, then look carefully on the ground for blood where the deer stood. Remember to walk alongside a blood trail so that you do not disturb the sign — you may have to return to this area if you lose the trail. Look for other signs that indicate where the deer may have been, including disturbed vegetation or leaves. Have your firearm or bow with you while tracking during legal shooting hours — never assume the deer is dead. If you lose the trail, search from the last blood spot you found in ever-increasing circles. If you still cannot locate the animal, get someone to help you. If the blood trail happens to lead you to private property, you must obtain permission from the landowner to enter their property. Remember that you must make every effort to retrieve the animal before giving up or going back to the hunt.



AFTER THE HUNT

Field Dressing Deer

A deer down is not necessarily a deer dead. A wounded deer can hurt you, so reload and watch the deer from a short distance. If you do not detect movement for a few minutes, approach cautiously from behind the deer's head. Set your firearm or bow aside only after you are certain the deer is dead. If the deer's eye does not blink when touched with a stick, it's dead. Now it's time to field dress the deer to ensure a rapid loss of body heat and to make the drag out of the woods a bit easier on your back. Hang the animal head-up or lay it on a slope with its rump lower than its shoulders. The process for field dressing is shown below.

1 Insert your knife point under the hide only and make one long, straight incision from between the hind legs up to the belly. The natural tautness of the hide will cause the skin and hair to pull away, giving you unobstructed access to the abdominal muscle tissues.



2 Using short, shallow, slicing strokes, open the body cavity by cutting the skin, fat, and abdominal muscle tissue. As the tissue separates, use your fingers to enlarge the abdominal opening until you can fit your hands into the body cavity.



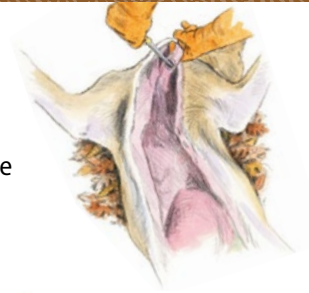
3 If you wish to have your deer head mounted, stop the incision at the bottom of the rib cage. Otherwise, continue the opening all the way to the fleshy, hollow junction of the neck and chest. Some hunters like to use a saw or clippers to cut through the sternum and the pelvis, but a sharp knife can work as well, especially on a young deer.



4 If using a saw, large knife, or small ax and sledgehammer, open the chest cavity by separating the rib cage. This will allow easier removal of the heart and lungs. Be careful when using a knife to always make sure the blade is pointing away from your body.



5 Severing the windpipe will make it easier to remove the stomach and lungs.



6 Carefully sever the connective tissue holding the interior organs to the diaphragm, and pull the entire mass of organs back toward the pelvic opening.



7 Using a saw, large knife, or small ax and sledgehammer, open the pelvis to ease removing the organs. Lay the bulk of the organs outside the carcass. Guide the lower intestine through the pelvic opening, and then sever the anus and sphincter muscle from the carcass. Some hunters elect to sever the area around the anus in a circular manner and pull the anus and intestines back through the pelvic bone if a saw, large knife, or small ax is not available. It is a good idea to tie the anus off with a string if utilizing this method of removal to ensure the carcass remains as clean as possible.



Note: Strong juices from digestive organs will taint the meat and should be removed quickly if the animal was gut shot or if you accidentally cut the organs while field dressing the deer. A rag or bunches of leaves may be used to wipe out the juices, or they may be washed out with water. Some people believe the carcass should not be washed with water because of the potential to promote bacterial growth. However, thorough cleaning when the digestive organs have been punctured makes washing and then patting the cavity dry an appropriate procedure.

8 Prop the body cavity open with sticks and cool quickly by hanging the carcass head-up in a shady, airy place. Let the deer hang this way for about an hour before moving it to camp or your vehicle if practical. A piece of cloth wrapped around the carcass will keep out flies and dirt as you drag it out of the woods or transport it to your destination.



Don't Carry the Carcass on Your Shoulders!

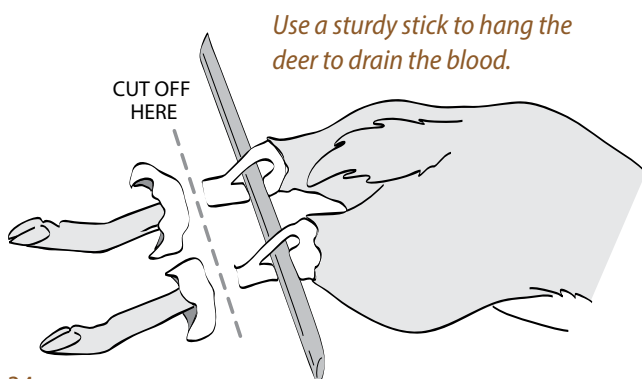
The carcass should be dragged or carted out of the woods and not carried on your shoulders. A deer on the shoulders could invite a shot by another hunter. The antlers of a buck make a good handle for dragging. Some hunters tie the front feet behind the head of the carcass to keep them from catching on brush. A strong stick between the hind hocks will provide a good handle for dragging does or fawns. There also are many commercially produced deer carts, which are used by an increasing number of hunters.

Keep the Carcass Cool

The deer should be kept as clean and as cool as possible during transport. A plastic bag full of ice placed inside the carcass will keep it cool if you have a long trip home.

Processing

For better venison, hang the deer before processing. Leave the skin on to prevent dehydration and keep the meat clean. A handy way to hang the carcass is illustrated below. Hang the deer to drain blood and cool to 50 F within six hours of harvest. Freezing the venison more quickly will result in tougher meat.



Aging venison any longer is not necessary. However, when stored at 34–40 F for up to eight days, the taste and tenderness of venison cuts can be improved.

The following tools are needed for home processing: hand saw, cutting board or solid table, a flexible knife for boning, a stout knife for trimming fat and making larger cuts, a knife sharpener, freezer paper, plastic wrap, masking or freezer tape, and a marker. To help sort meats for stewing and grinding, large plastic or metal tubs or bowls are handy.

There are many ways to process a deer, and those experienced at processing often have their own special way of doing it. What we present are some general guidelines for the beginner. Remove the skin and take care to keep the hair side away from the carcass. Be sure to remove as much fat as possible (deer fat has a strong flavor). Trim any bruises or gunshot damage and wash the outside. After dripping dry, the carcass is ready to be cut.

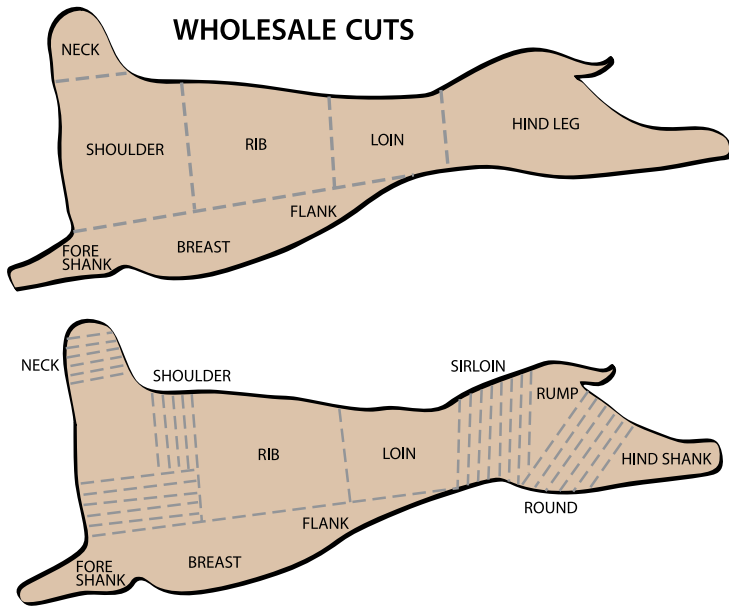
The most widely used method of processing venison is the boneless method. This method removes meat from the bone and is quite simple. Muscle groups are identified and separated using a sharp boning knife. Tendons, fat, and fascia (light colored membranes covering muscles) can cause meat to be tough and taste unpleasant, so a good rule of thumb is to remove everything that is not red meat. Larger and more tender sections of muscle can be used for roasts, steaks, and stew meat. Smaller, less tender muscle groups can be ground into burger. Many good videos on how to process venison can be found on the Internet. Conservation Department offices also offer deer processing classes. Find details at mdc.mo.gov/events.

Wholesale Cuts

Place the carcass on a cutting table and remove the flank, breast, and shank. Remove the shoulder by cutting between ribs 5 and 6 perpendicular to the backbone. Separate the rib from the loin behind the last rib and cut the loin from the sirloin in the middle of the last lumbar vertebra. The wholesale cuts of deer are neck, shoulder, rib or rack, loin, hind leg, fore shank, breast, and flank.

Labeling

Label each package clearly with a permanent marker. Make the letters large enough for easy reading. Labels should include the hunter's name, address, Telecheck confirmation number, and date taken; the name of the cut; the quantity; and the packaging date. Venison can be stored in the home freezer at 6 F or lower for about one year.



a full head-neck-and-shoulder mount. After skinning, sever the head from the neck and take head, antlers, and hide to your taxidermist. If you anticipate any trouble, you might let your taxidermist tackle the caping chore.

European mounts are very popular as well. With European mounts you remove all the skin and as much meat from the skull as possible, then boil the skull for about an hour. You can then power wash the skull to remove any cartilage and remaining flesh. Some people will mix Borax or dish detergent into the boiling water to whiten the skull. Peroxide is also used to bleach the skull white or you can purchase a number of commercial products to aid in the bleaching process. Another method of displaying antlers that is inexpensive, yet attractive, is to attach them directly to a backboard or wall. Simply saw off a good, solid section of skull with the antlers and fasten through a hole drilled in the middle. Deer hide or felt can be used to cover the skull-plate, if desired.

If you plan to have the hide processed, remove all the flesh and fat from the skin with a dull knife while the skin is fresh. If you cannot work on the skin when it is fresh, freeze it until you are ready and then allow it to thaw. Then rub salt onto the flesh side and roll it up, flesh side in, and send it off to the processor.

Preparing and Cooking Venison

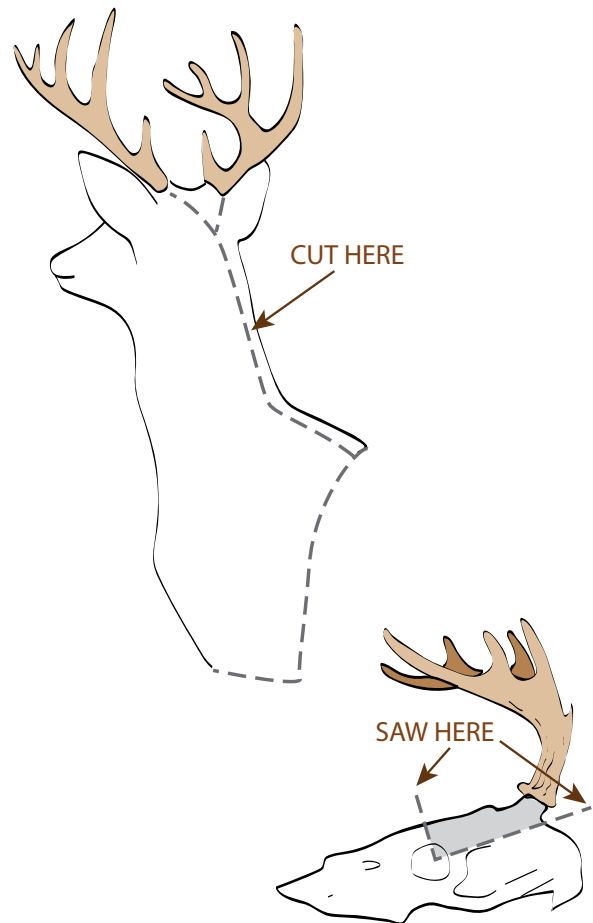
Venison is a healthy and delicious meat choice, but the road to a tasty meal requires care in processing and preparation. If you've eaten gamey tasting venison, chances are the offensive taste was obtained through processing or cooking. The meat's quality is a result of the deer's age, sex, and diet. Older deer have tougher meat, while the meat of bucks in rut is stronger-tasting from the stress of breeding season.

Venison is low in fat and calories and rich in protein. Use low-fat cooking techniques, such as broiling, grilling, baking, or stewing instead of frying to keep the venison healthy. Keep in mind what you are cooking and match it with the right cooking technique — roasting and stewing for tougher cuts and frying, broiling, and grilling for more tender cuts.

Trophy Preparation

Deer hunting is indeed an exciting sport, and trophies are popular reminders of successful days afield. Head mounts, racks, and hides are the most common deer-hunting trophies. However, deer legs are often used as gun racks, lamp bases, and bookends. Hides also can be used to make items of clothing, wallets, and purses. Whether you decide to make your own trophy or leave the job to a professional, the way you handle your deer from the moment it is downed will affect the quality of the product.

For instance, if you plan to mount your deer head, do not cut the animal's throat. In fact, make no cuts in the head and neck region other than those indicated in the diagram to the right. This method of skinning will allow plenty of hide for



Disposal of Carcasses

Proper disposal of deer carcasses helps prevent the spread of infectious diseases, such as chronic wasting disease (CWD). Deer can become infected with CWD if they come into contact with other infected deer or with surfaces containing carcass parts from diseased deer.

The Conservation Department has established a CWD Containment Zone in Adair, Chariton, Linn, Macon, Randolph, and Sullivan counties. Hunters who harvest deer in these counties should not take whole deer carcasses out of the containment zone or carcass parts that contain brain, spinal cord, eyes, spleen, or lymph nodes.

Safe Parts to Transport

- Meat that is cut and wrapped, or has been boned out,
- Quarters or other portions of meat with no part of the spine or head attached,
- Hides or capes from which all excess tissue has been removed,
- Antlers, including antlers attached to skull plates or skulls cleaned of all muscle and brain tissue, and
- Finished taxidermy products.

Hunters throughout Missouri should follow these best practices to safely dispose of carcasses:

- Avoid cutting through the spine, brain, or bones when processing deer.
- Remove meat in the field and leave the carcass behind. Bury it if possible.
- If processing harvested deer in camp or at home, place carcass parts in trash bags and properly dispose of them through a trash service or landfill.
- Take harvested deer to a licensed commercial processor to assure proper carcass disposal.
- For taxidermy work, use a licensed taxidermist to assure proper carcass disposal.

Recognizing Record Antler Points

Think you have a record set of antlers? Visit these websites to see how your deer measures up.

- Boone and Crockett Club: www.boone-crockett.org
- Pope and Young Club: www.pope-young.org/default.asp
- Missouri Show-Me Big Bucks Club: showmebigbucks.org
- Archery Big Bucks of Missouri: archerybigbucks.com



Deer Certificates

Is this deer your first deer? Then check out the Department's "First Deer Certificates" for first-time successful hunters and kids at short.mdc.mo.gov/4GG.

Missouri Department of Conservation

Central Region

3500 East Gans Road
Columbia, MO 65201
573-815-7900

Kansas City Region

12405 SE Ranson Road
Lee's Summit, MO 64082
816-622-0900

Northeast Region

3500 S. Baltimore
Kirksville, MO 63501
660-785-2424

Northwest Region

701 James McCarthy Drive
St. Joseph, MO 64507
816-271-3100

Ozark Region

551 Joe Jones Blvd.
West Plains, MO 65775
417-256-7161

Southeast Region

2302 County Park Drive
Cape Girardeau, MO 63701
573-290-5730

Southwest Region

2630 N. Mayfair
Springfield, MO 65803
417-895-6880

St. Louis Region

2360 Highway D
St. Charles, MO 63304
636-441-4554

The Conservation Department works with you and for you to sustain healthy forests, fish, and wildlife. If you have a conservation question, need help managing your property for wildlife, or would like to speak with your local conservation agent, call the nearest Department office listed in the sidebar to the left. For phone numbers and email addresses of Department staff in your county, use the "Local Contact" feature at mdc.mo.gov.



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9/2024
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