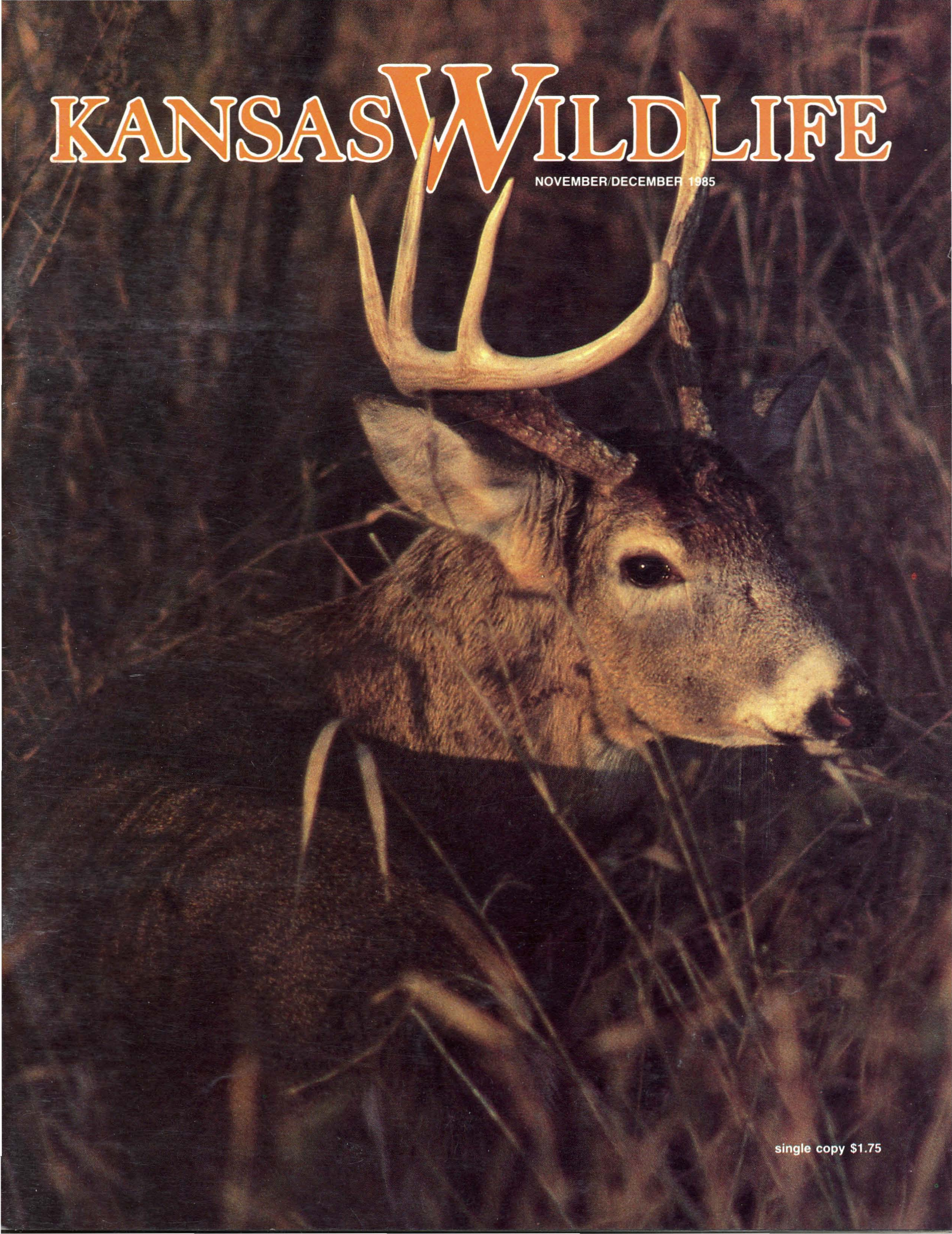
KANSAS WILDLIFE

NOVEMBER/DECEMBER 1985



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Editorial

Deer

He told you about them first a long time ago. It may have been in a northwoods camp, maybe on some wind-pummeled Colorado peak. It might have even been over a piece of apple pie in a big farmhouse kitchen while the coffee gurgled and a soft autumn rain splashed gently on the sill outside the window and your aunt was doing the dishes and three new kittens were jousting for position against the belly of their mother in the corner by the old hot water heater.

First you learned about bucks, because that's what all the men talked about. Bucks hung, motheaten and cross-eyed, in the bars. Bucks were smart. Bucks were old. Bucks had identity. You remember Splayfoot and Hangtine and Whiteface. They each had a personality, and nobody ever got them. Sometimes you wondered if they really existed, because you never saw them. But about the time you were going to say so, somebody would come back, breathless, with a story about how he'd seen one of those ghosts, how it had looked, all haughty and wise and with those heavy gnarled antlers that rocked back and forth when it ran and tore branches out a foot on either side of the trail, they were so wide. And nobody ever got them.

"Bucks are grand animals," he'd say. "Hell, all deer are. But especially bucks. Kill a buck, sure. But don't take its dignity, and don't lose yours. They're a grand animal." Then he would stop talking and all you'd hear would be the popping of pine in the fire, the brush of the wind, the splatter of raindrops on the sill.

Later he told you to pay attention in biology class. You said that cells and amoebas and DNA were not as interesting as deer. He said if you really wanted to know about deer you learned about the other things first. And then he told you more about deer, as if to admit that you were right after all and that deer really were the only creatures worth talking about. He told you about the rut, about how deer acted in the crazy season. He told you how the bucks, thick-necked, chased the does then jumped them, and how the does nurtured their fawns in their bellies all through winter's storms, often without adequate food, while you ate apple pie in the farm kitchen by the hot water heater. He told you about fawning, the first of June, after spring rains had made everything green again and the sun was getting hot and the woods were steaming and the mosquitoes were out. The fawns were so well camouflaged, he said, that you could almost step on one before you saw it. You didn't believe that because you thought yourself a pretty good woodsman with pretty good eyes. And then one day you did step on a fawn. Not almost. And you were sheepish. But most of all you were glad because it didn't seem hurt by your clumsiness.

During the wheat harvest when the machines were shut down and you slumped in the shade and gulped lemonade, he told you the antlers should be just about formed. He wiped his face and said that in the Rockies the mule deer were lying in snow patches above timber letting the wind blow the flies away, that here in Kansas deer didn't like flies but got used to them and the bucks had to lie in fencerows instead of alpine meadows. You wondered, sitting there, why all bucks didn't live in the mountains.

As you got older you saw lots of deer. Not just the motheaten deer in bars, but real deer that burst out of the weeds in front of you when you walked down a fenceline, deer that clattered, with eyes like neon, across the hot tar on summer nights, deer that stretched daintily for the apples in the tree behind the house, and deer that you never saw but knew had to be out there because other people saw them, the deer nobody ever got.

When fall came and leaves lost their green and mornings got cold and the geese flew, you saw more deer. These were not the long-haired deer of winter, the patchy deer of spring, the round red deer of summer. These deer were nut-brown and gray, hard and fast and alert. They blew steam from their nostrils on frosty dawns. They made you excited.

When you asked him about it, about what it meant, he said he couldn't tell you, but that he had felt that way for a lot of falls. Just something you either had or didn't have, he said.

You didn't see many bucks in the fall, but you saw where they'd scrubbed saplings white and sticky, ridding their antlers of velvet and polishing them to the color of an old oak rocking chair. "Rut's comin'," he said one day, and the next morning, early, he was out in the back pasture with the Winchester. You met him down there. The gun hurt your ears when it went off, but the empty cases smelled wonderful. He let you try it once and you got your eye too close to the scope. It was only an '06, but it bled a lot. You wiped it with his handkerchief and asked to try it again.

One year you went hunting with him. It may have been in the northwoods or in Colorado or maybe in the brushlot behind the south pasture. He said he would hunt with you, then left you by a tree because he said you could hunt together without being together and that it was better that way. You didn't understand but you did as you were told.

You saw lots of does: beautiful, graceful, stupid does. But you didn't see a buck. He shot one. You remember how it steamed when he gutted it and how the eyes glazed and how you were both very quiet as you dragged it over the snow.

You had liver that night. He told you more about deer. You ate apple pie for dessert and it started to snow again. "Good for trackin' in the morning," he said. Then he looked at you; straight in the eye he looked at you and said, real direct-like, "Bucks are grand animals. You won't want to kill all the bucks you can. But you'll want to kill some. It's only natural. It's not bad. Someday you'll want to go after a really big buck and you'll pass up all the other deer for a crack at the one you've marked."

You'd heard of those bucks. And you knew right then you would hunt them: the deer nobody ever got.

CACHING IN

Joe Schaefer
and
Doug McWhirter

Illustrations by Ken Raney

Starvation is something most of us never have to worry about. As long as we have enough cash, food is readily available in restaurants, convenience stores, supermarkets, our refrigerators and pantries. We are literally surrounded by food.

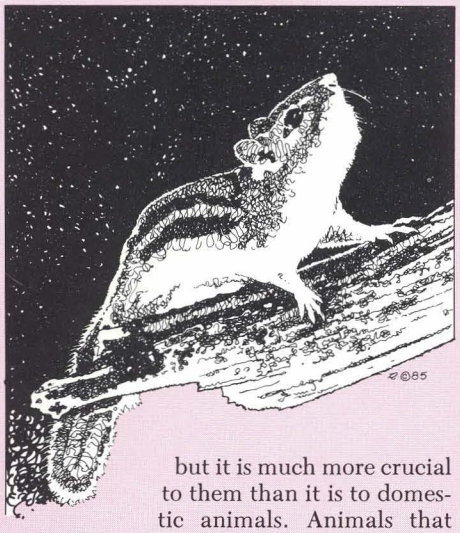
But meals don't come so easily for wild creatures. How do animals cope when food is not readily available or abundant only on a seasonal basis? One solution to diminished food supplies is a change in eating habits. Cardinals consume insects and berries in the summer, but must switch to seeds in the winter. Other species move to places where there is sufficient food. Canada geese fly south each year before winter locks in all available forage. Come spring they return to areas that have generated new plant growth. Some animals sleep or hibernate during times when food is relatively scarce. These activities don't require much energy, and the animals can survive for many days in a slumbering state. During severe cold spells creatures that are normally active in winter — opossums and racoons, for example — just doze off until the weather improves.

True hibernation is a complex physiological process. During hibernation a ground squirrel's body temperature will drop from 106°F to 37°F, its heart beat will slow from 350 beats/minute to 5 beats/minute, and its respiration will go from 50 breaths/minute to only 4 breaths/minute. Although hibernation requires a relatively small amount of energy, ground squirrels will lose ⅓ to ½ of their body weight in winter quarters.

Fat storage is another survival technique when food is scarce. If ground squirrels don't have enough fat built up by the time they go into hibernation, they run a high risk of not making it through their winter sleep. One example of an animal that does not hibernate but stores fat is the gecko lizard; it can store enough fat in its tail to remain alive for six to nine months. For the gecko, this strategy ensures survival in times of short food supply.

Storing fat is storing processed food. Storing unprocessed food items for future use is another survival technique. We do this at home each time we put groceries in the pantry or refrigerator. Dogs bury bones for the same reason.

Wild animals also store (cache) food,



but it is much more crucial to them than it is to domestic animals. Animals that cache food reduce their exposure to predators and adverse weather and spend less energy searching for a meal in times of short food supply.

There are also benefits to the environment. For example, some of the acorns that are not recovered by squirrels will produce new oak trees, which will provide cover and food for more wildlife. The European nutcracker stashes many seeds in one spot, causing competition among the young seedlings. Natural selection takes over then; only the strongest and healthiest tree survives to produce seed.

The size of a cache depends on the size and habits of the individual animal. A nutcracker will put up to 11 pounds of seeds into each cache; a fox may bury a whole rabbit; and a grizzly bear will partially cover an elk carcass. Wolverine caches of over 100 birds have been recorded. Moles may cache up to 1,000 live earthworms that have been paralyzed by a bite to the head. Caching helps moles to satisfy a voracious appetite: they eat their own body weight in worms each day!

The seasons in which caching takes place also vary. Some animals store food only for the winter. Pikas, for example, cut their own hay during the summer when mountain grasses are long. Foxes will cache food at any time of the year if hunting has been successful. In winter they cover the stored food with snow, but in summer a thin layer of soil is used.

Caches are used for different lengths of time. Pikas and squirrels store food for several months. Grizzly bears only use their caches for a few days at the most. They will eat until full, return a couple of times to pick at the carcass, then leave the remains for scavengers.

How animals find their caches is not clearly understood. Nutcrackers recover anywhere from 6 to 65 percent of their caches. In one experimental study that allowed nutcrackers to cache seeds in a room with 180 sand-filled holes, some found all of their stores without a single miss! This provides a good case for the use of memory in cache retrieval. Nutcrackers have also been known to dig out caches in 24 inches of snow!

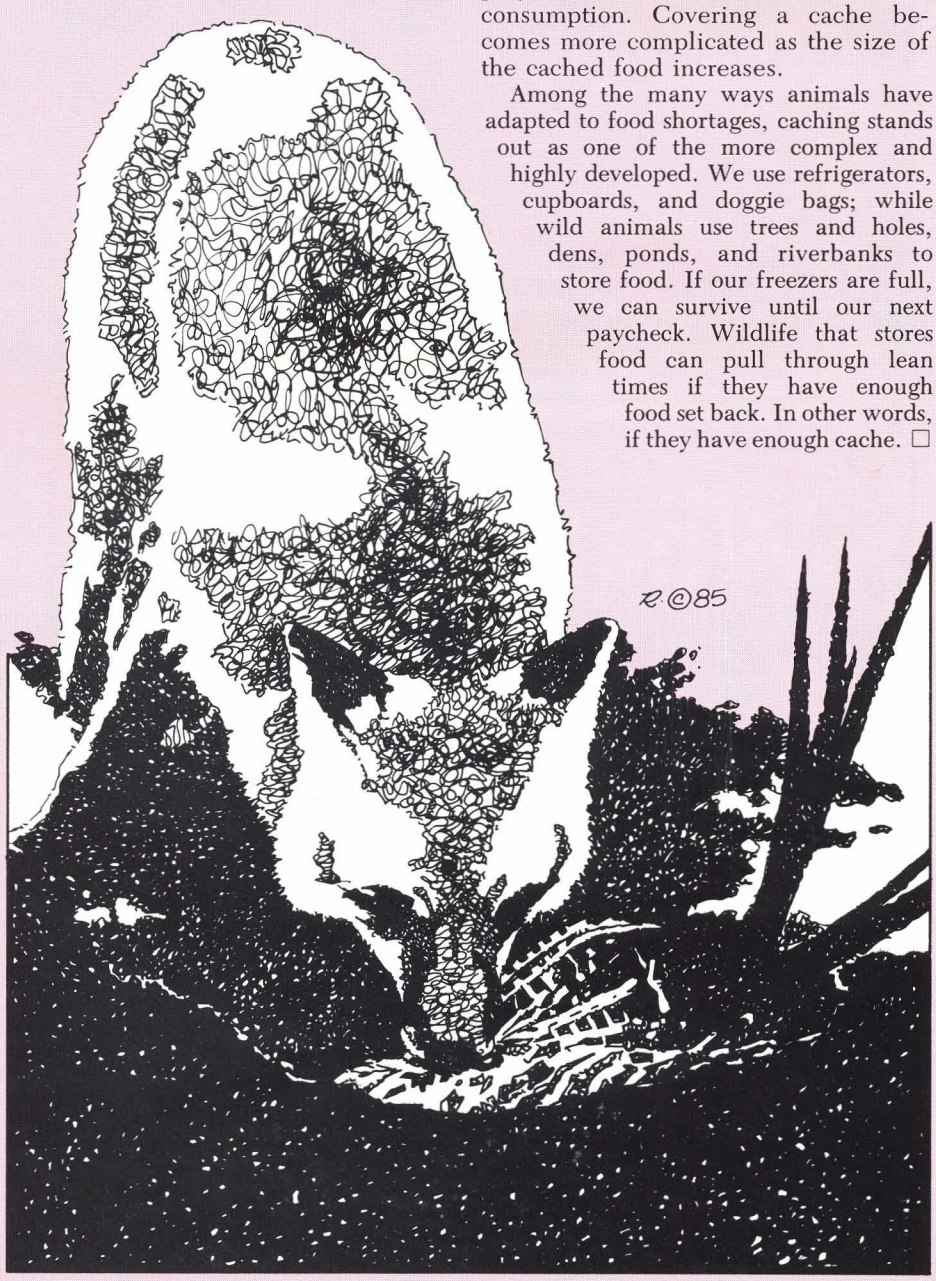
Not all animals remember where they stashed their food. Squirrels, for example are believed to smell their caches instead of memorizing them. The evidence? Tree squirrels often dig up the caches of other squirrels and not their own; and if a nut is removed from a cache the squirrel that put it there will not even look for it.

Cache-robbing is a common practice in the wild. Wolves rob bear caches, foxes rob wolf caches, and crows rob fox caches. Black-billed magpies use memory to locate their own caches and smell to locate the caches of other magpies. Nutcrackers lose anywhere from 20 to 80 percent of their caches to other animals.

To combat this pilfering problem, animals have adopted various strategies. After they have eaten their fill, grizzly bears will bed down within charging distance of their caches. Wolverines mark their cache with musk scent to let other scavengers know that it belongs to them.

Another ploy that helps reduce cache robbing is concealment or the use of physical barriers. Chipmunks stash seeds and nuts in underground storerooms, squirrels bury nuts in the forest floor, beavers place sticks underwater or in their dens, crocodiles shove their prey in holes in the river bank for later consumption. Covering a cache becomes more complicated as the size of the cached food increases.

Among the many ways animals have adapted to food shortages, caching stands out as one of the more complex and highly developed. We use refrigerators, cupboards, and doggie bags; while wild animals use trees and holes, dens, ponds, and riverbanks to store food. If our freezers are full, we can survive until our next paycheck. Wildlife that stores food can pull through lean times if they have enough food set back. In other words, if they have enough cache. □



Wayne van Zwoll photo; inset by Gene Brehm

What's Wrong at Roadside

Highways eliminate habitat. But we can still salvage right-of-ways for wildlife.

Mary Winder

Wildlife habitat is disappearing in our country at an alarming rate. The construction of new houses, factories, shopping centers, and roads, and intensive farming practices all take their toll. With each passing year, there are fewer and fewer places left for wildlife. Some states are starting programs to create habitat in areas often overlooked as places where wildlife could live.

Indiana, for example, is developing habitat next to highways. From 1976 to 1983, this state planted nearly 950,000 bareroot shrub and tree seedlings on highway right-of-way land. This planting program was financed by IDNR in cooperation with the Indiana Department of Highways.

The authors of a report on the program came to several interesting conclusions. For instance, they learned that "IDNR plantings do provide a habitat which attracts a greater number and greater diversity of wildlife." Also, they found no increase in roadkill when they compared the areas where wildlife plantings were made (experimental plots) with grassed areas (control plots). "More than twice as many animals were seen in the experimental plots, yet the incidence of roadkill was the same as along control

plots. These results indicate that right-of-way habitat can be developed with woody vegetation to attract wildlife without an attendant rise in roadkill."

In concluding, the researchers recommended that the IDNR planting program be continued. They suggested that a study be initiated to investigate roadsides that have not been sprayed or mowed and have grown up with native woody vegetation, as an economical alternative to planting shrubs and trees.

Iowa has been trying a similar program. Since 1960 this state has been planting a variety of shrubs along highways for the purpose of controlling snow and erosion by wind and water. These plantings are financed by the Federal Highway Administration and the state of Iowa. In 1982, the Iowa legislature authorized the Department of Transportation to do $100,000 worth of plantings, some using native grasses like switchgrass. Such cover greatly benefits wildlife.

Nebraska has taken a different, but also effective approach in trying to solve the difficult problem of making a place for wildlife in a world that seems to be running out of room. Their goal is education. The Nebraska Wildlife Federation recognizes that 97 percent of Nebraska land is privately owned, and it plans to show the state's private landowners how to create good wildlife habitat in their backyards, on their agricultural lands, and along roadsides. The Federation has leased seven highway wayside areas across the state, ranging in size from four to 75 acres, from the Department of Roads. Its plan is to develop each wayside area into a place with quality habitat where people from the nearby communities can come to learn how to attract and feed wildlife on their own land. The Nebraska Wildlife Federation is footing the bill for this project, with a first-year budget of $44,115. They have established a Wildlife Heritage Fund and receive donations from corporations, as well.

But what about Kansas? Is anything being done here to develop wildlife habitat in roadside environs? Well, no. Not yet. But the need for such work is becoming clearer. Currently the Kansas Department of Transportation (KDOT) is planning to build a new U.S. Highway 36 in Doniphan County in the extreme northeast corner of the state. As is the case in many other areas, wildlife habitat in Doniphan County is shrinking. Farmers have been clearing wooded land and plowing up pasture to plant more crops.

George Jorgensen of Troy, District Conservationist in Doniphan County from 1968 to 1984, opines that landowners in the county cleared 10,000 acres of timber in the 10 years between 1967 to 1977. All of this clearing, and other factors as well, have contributed to the decrease in both quantity and quality of wildlife habitat in Doniphan County. The construction of a new U.S. Highway 36 will adversely affect additional wildlife habitat, much of which is of very high quality. Appendix E of the Environmental Impact Statement for this highway project states: "Many of the habitat types that are affected areas can be considered nothing short of top quality."

Several concerned individuals and organizations in Kansas have contacted KDOT and urged them to replace at least part of the habitat they will destroy in Doniphan County by placing shrubs and trees on the right-of-way of this new highway. In the Environmental Impact Statement, both the Kansas Fish and Game Commission (KF&G) and the U.S. Fish and Wildlife Service have recommended to KDOT that they establish shrubs and trees on the right-of-way to lessen negative impacts of this highway on wildlife.

Though KDOT has not agreed to plant shrubs and trees, it does plan to seed some native grasses, which will provide better habitat for wildlife than cool-season grasses like brome. W. H. Wright, State Transportation Engineer, described their position: "We are not inconsiderate of the environment. We must limit our activities to those appropriate for the expenditure of highway funds and those for which we are responsible under the law. Should others wish to take the lead in providing resources and money to implement your proposal, we would certainly cooperate to the extent possible."

KDOT has made a preliminary estimate that the construction costs alone for the 15-mile stretch of U.S. Highway 36 in Doniphan County will be approximately $31 million. As mentioned earlier, the Iowa legislature recently authorized $100,000 to be used for wind erosion plantings near highways. That amount is certainly small compared to $31 million, and even half the Iowa sum would buy a lot of shrubs and tree seedlings and pay for the labor of planting and maintenance.

Gene Brehm photo

Grassy ditches like this hold pheasants, quail, small rodents. Mowing — especially during nesting season — destroys this valuable cover.

If KDOT is convinced that it does not have adequate funds to finance a wildlife planting program along highways, there is still something they, and other agencies and individuals involved in managing roadsides in Kansas, can do to greatly improve habitat on right-of-way land without additional expense: They can simply reduce mowing operations.

Less disturbance along the roadside means more habitat for wildlife. Mowing is certainly necessary for safety reasons near signs, intersections, and so on. But mowing the entire right-of-way just to maintain a neat appearance not only destroys habitat but is of questionable economic value. Setting up a rotation system where roadsides are mowed only once every few years would be of great benefit to wildlife. Mowing a strip or two next to the highway and letting the rest grow back to stands of native woody vegetation would increase the quality of habitat even more.

Timing is also important. Some state and county roadsides containing prime upland game habitat are mowed during nesting season, destroying many animals. Waiting to mow until after July 15 greatly reduces this problem with quail and pheasants. Also, when roadsides are mowed shortly before winter, essential thermal cover is eliminated. Even if there is plenty of food available, wildlife will die in the winter if there is not sufficient thermal cover. The use of herbicides next to roads and the practice of burning roadsides also have detrimental effects on habitat. Reducing or eliminating these practices would help improve roadside habitat.

In some cases, people may have to change their attitudes about how a roadside should look. They must realize that roadsides that appear to be "untidy" provide good habitat for wildlife. And after all, who wouldn't rather see a cock pheasant or a scissortail flycatcher while driving along a Kansas highway, than a monotonous stretch of closely-mowed grass!

The economic benefits wildlife brings to Kansas should not be overlooked. Hunters spend a tremendous amount of money in the state. Dick Ranney, Director of the Dodge City Convention

and Visitors Bureau, described the economic impact of pheasant season on Dodge City: "Opening weekend alone generates approximately $2,956,430.40 (here) . . . and that is a major economic impact." Fishermen, hikers, campers, photographers, birdwatchers, and others are drawn to areas where they can view wildlife; these people all spend money. Because wildlife is so important to the Kansas economy it is obviously in the best economic interests of the state to create and improve wildlife habitat.

KDOT has made some effort to address the issue of the impacts their projects have on fish and wildlife. In January, 1984, a Memorandum of Understanding between KDOT & KF&G went into effect. This agreement allows KF&G to review KDOT projects and suggest ways to lessen the negative impacts these projects have on fish and wildlife. So there *is* communication between the two agencies, and wildlife in Kansas benefits because of it. In this respect, KDOT may be more progressive than the transportation departments of other states.

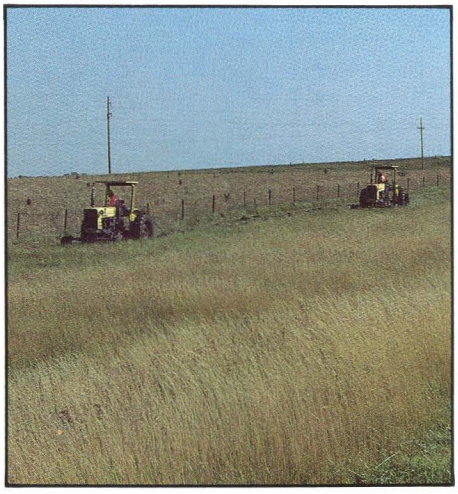
In April of 1985 KF&G offered to provide technical assistance with the planting of shrubs and trees on the new U.S. Highway 36 right-of-way to establish wildlife habitat — though the agency waives responsibility to finance a planting project like this. Bob Wood, wildlife ecologist with KF&G said, "It is our view that if a development like a highway causes a habitat loss, then it must be a project cost to replace it."

Although KF&G does not presently have a program geared specifically to creating habitat along roads, it does have several programs involved with habitat development across the state. The goal of its Wildlife Habitat Improvement Program (WHIP) is to help landowners in Kansas create or improve wildlife habitat on their land. And the program is designed to do this "with little or no cost or sacrifice of agricultural production."

All Kansas landowners are eligible to take part in WHIP. In the past 10 years, approximately 1,800 landowners in Kansas have participated in this program. To become involved in WHIP, an interested landowner fills out an application form and sends it to the regional KF&G office, along with two copies of ASCS aerial photographs of his land. The nearest district game biologist will then study the photos, arrange to meet the landowner, and offer suggestions about how to improve or develop habitat on the land for the types of wildlife the landowner desires.

The biologist may inform the landowner about methods to better manage a pond for wildlife, or he may describe a way to provide cover for wildlife in the corners of center-pivot irrigation systems. He may suggest that shrubs and trees be planted or brushpiles be constructed. Depending on the situation, he may even be able to assist the landowner with the planting, brushpile construction, or whatever else is needed. In some cases, cost-sharing funds are available.

Another KF&G program that is concerned with habitat is the Chickadee Check-off. Tax payers contribute money to this program by marking a line on their Kansas Income Tax form. This fund is used exclusively to help non-game animals such as songbirds, butterflies, and chipmunks. Contributions to Chickadee Check-off have supported



Wayne van Zwoll photo

Much of the mowing on superhighways extends far beyond the shoulder, destroying acres of prime wildlife cover. Must grass be short to be attractive?

many different projects across the state, including these concerned with habitat improvement. For instance, the program has provided birdfeeders to nursing homes, defrayed the cost of non-game plant bundles sold by the State Extension Service, and set up bluebird nest-box trails in several counties.

A third habitat program at KF&G is WILDTRUST. Through this program, which was initiated in 1979, Kansans can contribute land or personal property, or set up memorial funds or project funds to be used to benefit new or existing projects. Many of these WILDTRUST donations have had a positive influence on the quality and quantity of wildlife habitat in Kansas.

There are probably several reasons why KF&G does not have a program developed specifically for managing land next to roads for wildlife. One reason is that Kansas is perhaps in better shape, in terms of the amount of remaining habitat, than other states. Intensive farming, urbanization, and industrialization are certainly problems adversely affecting habitat in Kansas, but these factors are not as serious or widespread here as they are in other areas of the country. In short, although habitat is disappearing in Kansas, there are still a lot of places left where wildlife can live.

This is not to say that creating habitat along roadsides in Kansas is unnecessary now. It is shortsighted indeed to wait until roadsides are the only places left where there is room for wildlife habitat. Funding has been the main obstacle to roadside plantings here. Many interested organizations, agencies, and individuals have agreed that initiating a wildlife planting program for Kansas roadsides is an excellent idea. But none of these has sufficient funds to support such a program.

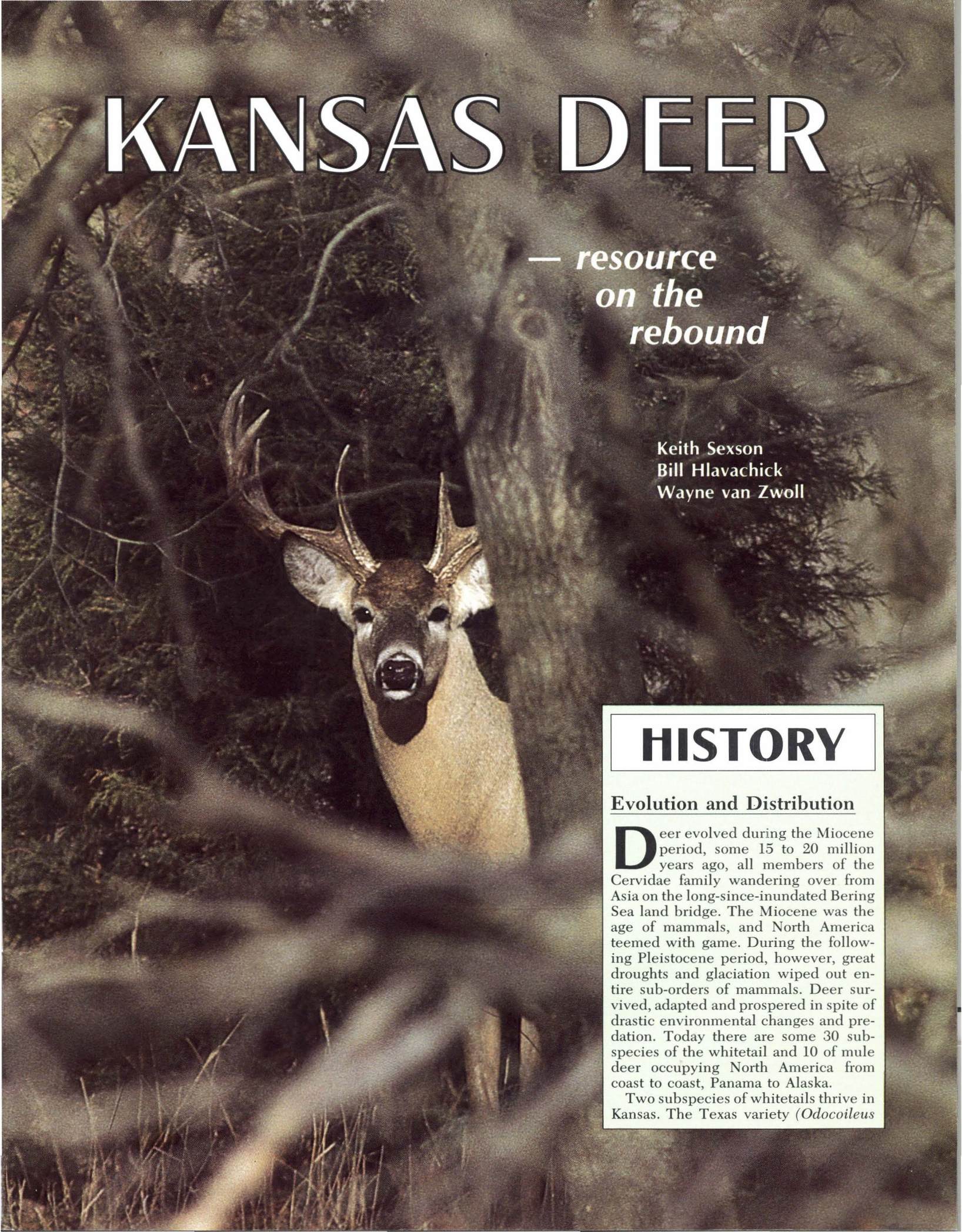
Perhaps someday funds will become available for a statewide planting program. Then wildlife plantings could be made across Kansas wherever new highways are being constructed, and even next to existing highways and county roads. Perhaps someday it will be the rule rather than the exception for those agencies and individuals involved with roadside management in Kansas to follow procedures such as mowing a smaller portion of the roadside, mowing less often, mowing at the correct times of the year, and reducing herbicide use and burning of roadsides. If these things come to pass, thousands of acres of Kansas roadsides could become ribbons of prime wildlife habitat bordering the cropfields, pastures, and woodlands of the state.

Planting shrubs and trees next to roads and changing roadside management policies are just examples of ways to create quality wildlife habitat in an unlikely place. School yards, church grounds, industrial property, vacant lots, and land adjacent to shopping centers and businesses are other areas with potential for wildlife habitat development. Many wild animals are adaptable, and if a place provides them with what they need to live, they will live there regardless of whether it is a location traditionally thought of as a site for wildlife. Kansans who care about wildlife must learn to use their imaginations and create wildlife habitat wherever they can find places to put it! □

KANSAS DEER

— *resource on the rebound*

Keith Sexson
Bill Hlavachick
Wayne van Zwoll



HISTORY

Evolution and Distribution

Deer evolved during the Miocene period, some 15 to 20 million years ago, all members of the Cervidae family wandering over from Asia on the long-since-inundated Bering Sea land bridge. The Miocene was the age of mammals, and North America teemed with game. During the following Pleistocene period, however, great droughts and glaciation wiped out entire sub-orders of mammals. Deer survived, adapted and prospered in spite of drastic environmental changes and predation. Today there are some 30 subspecies of the whitetail and 10 of mule deer occupying North America from coast to coast, Panama to Alaska.

Two subspecies of whitetails thrive in Kansas. The Texas variety *(Odocoileus*

virginianus texanus) inhabits the western two-thirds of the state and the Kansas whitetail deer *(O. v. macrourus)* the remainder. In the western third of Kansas, whitetails share the range with Rocky Mountain mule deer (*Odocoileus hemionus*), largest of the mule deer.

Kansas: The Early Days

The pre-settlement prairies of Kansas swarmed with buffalo and antelope, even elk; but deer were not common beyond the state's eastern woodlands. Fires maintained the prairie ecosystem and reduced or eradicated woody growth. Frequent flooding and the scouring action of water restricted woody plant invasion along streamsides. While deer did play a significant role in the settlement of this state, particularly in the eastern third, they were of secondary importance. Bison provided most of the meat, hides, and bones used by Indians, explorers, trappers, and settlers.

Whitetails were originally found just about anywhere there was woody cover. The Lewis and Clark Expedition reported a large concentration of deer on the banks of the Missouri River near the present site of Kansas City in 1804, and Zebulon Pike found deer in eastcentral Kansas in 1806. Herds of mule deer were reported along the upper reaches of the Smoky, Saline, and Solomon as late as 1866. The Junction City Union of December 24, 1970 stated that "there have been thirteen deer killed in the bottom about a mile from town during the past two weeks."

Judging from these and other reports, deer were more or less common along the wooded portions of streams and in large timbered areas until about 1884. By 1890, deer had disappeared from most of western and northern Missouri and maintained a precarious existence in the southern Ozark areas. In general, deer numbers in the United States hit a low between the years 1875 and 1915. Deer were declared extirpated in Kansas in 1904.

Deer were not abundant anywhere on the Plains following the drought of the 1930s and were still considered absent from Kansas in 1933. The prolonged drought, however, allowed woody plants to become established along streams. Shelterbelts were planted and flood control structures were built. As woody vegetation thrived, so did deer.

The Kansas Fish and Game Commission and several private individuals stocked deer in various parts of the state in the late thirties and early forties. This was a minor effort compared to the extensive trapping and transplanting programs being carried out by states surrounding Kansas. During this period, deer were increasing in Missouri, Nebraska, and Colorado. By the early 1950s deer were being seen frequently in Kansas. Since then their population has not stopped growing. Estimated in 1908 to number only 500,000, deer in the U.S. now total over 19 million!

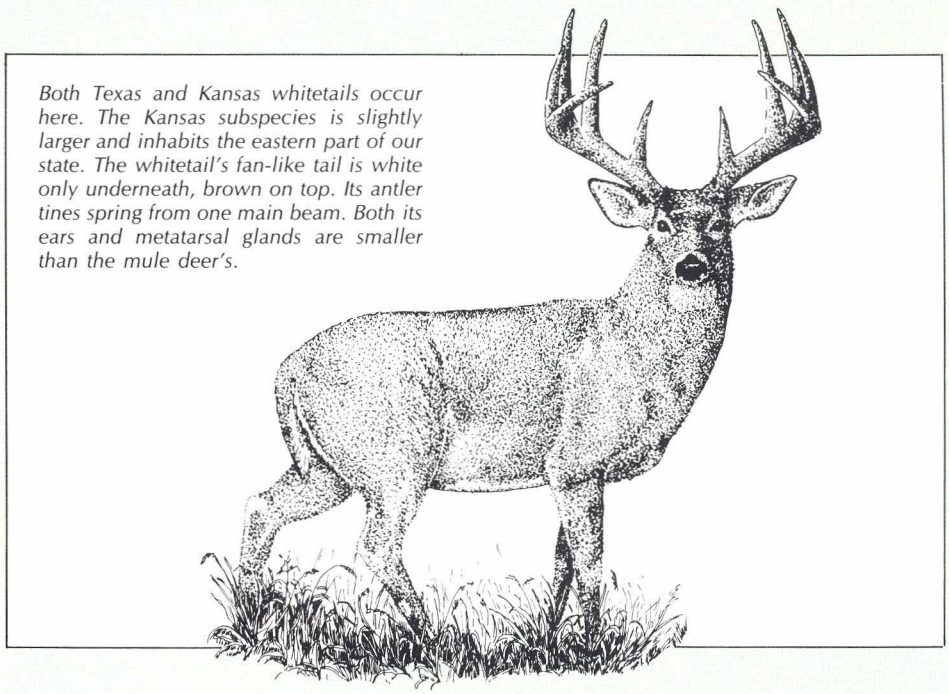
BIOLOGY

The Animal

Most hunters, as well as knowledgeable non-hunters, look on deer as being much larger than they really are. An adult whitetail buck will rarely stand over waist-high to the average man; the chest may be just 18-20 inches deep with the belly only 23 inches from the ground. The little Florida Key version of the whitetail is in the size range of the average collie. On the Island of Coiba off Panama, a big adult buck may weigh no more than 50 pounds!

Northern representatives of a race tend to be larger than their southern counterparts, and this holds true for both mule and whitetail deer. Whitetails from the northern U.S. and southern Canada are typically the largest, though deer from our corn belt can grow to prodigious weights. A hunter in Iowa downed a monster whitetail in 1962 that scaled 440 pounds. In 1941 a Wisconsin hunter brought in a whitetail that weighed, field dressed, 378 pounds. And in 1955 a Maine hunter downed a buck that scaled 355 pounds after having been dressed and hung for three days! Mule deer can be even bigger, live weights of up to 475 pounds being recorded. These monsters are rare, though, and a Kansas buck — whitetail or mule deer — that dresses over 250 pounds is *big*!

One of the most interesting physiological characteristics of a deer is its antlers. There is a significant difference between antlers and horns. Antlers are shed annually, to grow anew every summer and harden in the fall. Horns are never shed and continue to grow throughout the animal's life. If a horn is broken off it will not grow back. Cattle, bison, sheep, goats, and antelope have horns. (The pronghorn antelope, incidentally, is not a true antelope; it is the one horned animal that sheds a part of its horn annually. Only the outside layer is lost, after which a new layer is formed around the remaining core.)



Both Texas and Kansas whitetails occur here. The Kansas subspecies is slightly larger and inhabits the eastern part of our state. The whitetail's fan-like tail is white only underneath, brown on top. Its antler tines spring from one main beam. Both its ears and metatarsal glands are smaller than the mule deer's.

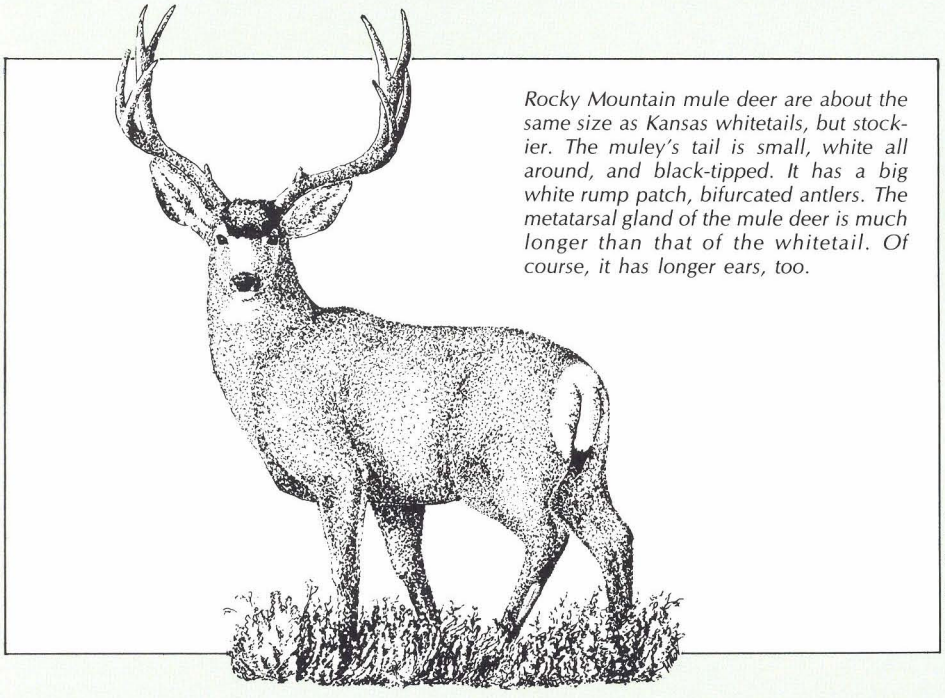
Mike Miller illustration

Antlers are found on all members of the deer family, including elk, caribou, and moose. Whitetail antlers have one main beam from which the tines branch one at a time. The tines are not normally branched. Mule deer antlers do not have a main beam. The antler base forks into tines, which on large bucks may branch again. As a rule, both species have brow tines, though these are frequently absent on mule deer.

Both antlers and horns are extended growths of the frontal skull plate. The pedicel, the base from which the antler grows, is a part of this plate. Antlers are true bone, but are solid and have no

preceding page photo by Gene Brehm

marrow. The base of the antler is called the "burr", and when shed the antler separates from the skull at the junction between the burr and pedicel. New antlers begin growth from the pedicel in April or May. At first they are tender and covered with skin and short hair known as "velvet." This velvety skin, filled with tiny blood vessels, nourishes and builds the growing bone-like material of the antler. Injury to the antler during this stage can cause deformed antlers. Initially, antler growth is slow, but by summer it is extremely rapid and may exceed one-half inch per day. In August and early September the blood supply to the antlers is cut off. They harden, and the velvet dries and sloughs or is rubbed off. Trees that have been savaged by bucks ridding their antlers of velvet are called rubs. Rubs appear as early as August and are not associated with the scrapes that appear later during the rut and delineate a breeding territory. Antlers are normally shed in January, though they may be lost as early as November and as late as March. It isn't hard to find discarded antlers in the woods, though rodents quickly chew them up, presumably for their calcium content.



Rocky Mountain mule deer are about the same size as Kansas whitetails, but stockier. The muley's tail is small, white all around, and black-tipped. It has a big white rump patch, bifurcated antlers. The metatarsal gland of the mule deer is much longer than that of the whitetail. Of course, it has longer ears, too.

Mike Miller illustration

The cycle of antler growth and development is controlled by hormonal secretions caused by changes in the photoperiod. Hormonal imbalances result in deviations from normal antler development. Occasionally does grow antlers. These antlers are usually short, unbranched, covered with velvet, and remain for the life of the animal. This condition is caused by abnormally high levels of testosterone.

Fawn bucks do not develop antlers their first fall. The "button buck" will only have bumps, the pedicels, from which antlers will develop the following spring.

The size and shape of antlers depend on nutrition, age and heredity. Large antlers are a product of a diet containing high protein, proper amounts of fats and carbohydrates, and adequate minerals like calcium and phosphorous. Body growth of a deer is rapid from birth to two years of age, slows during the second and third years, and plateaus in the fourth year. The first 18 months of life, most of the nutritional intake is used for body growth, leaving only minimum amounts for antler development. After the deer has reached maximum body size, a greater amount of the nutritional intake can be used for antler development. For the most part, heredity determines antler shape and number of points, while nutritional levels control the size of antlers. You cannot tell the age of a deer by the number of antler points or size of its rack. Very old deer normally have more massive antlers than they did when at their breeding prime, and occasionally they develop non-typical racks, with heavy burrs, drop tines, and many points in unusual locations.

The occurrence of "spike" bucks in a deer herd concerns deer hunters and managers. Spikes are those bucks that are one and a half years old or older, but with only two hardened points protruding through the skin. Spikes do occur in Kansas, but in relatively small numbers. Where extensive studies have been done, it appears that poor nutrition contributes greatly to the occurrence of spike bucks.

In addition to the tail and antlers, one other physical characteristic can be used to differentiate between the mule deer and whitetails: their glands. All deer have four major external glands that secrete a different scent. These scents are part of the communication system that identifies individual animals.

The preorbitals are tear glands and serve primarily to lubricate and cleanse the eyes. The interdigital gland, located between the hoof lobes, secretes a yellow, waxy, and strong-odored substance. The scent is left on the ground or vegetation each time the deer puts its foot down. The scent helps deer track one another. The tarsal gland is a tufted, discolored patch on the inside of the hind legs. It secretes an oily substance with a strong odor of ammonia. Part of the ammonia smell comes from the habit of the deer deliberately urinating on the gland. Deer check each other by smelling and/or licking the other's hock. The metatarsal glands on the lower outside of the hind legs secrete an oily substance with a strong, musky scent. There is some question as to the role of the metatarsal.

Gland measurements for the whitetail are: preorbital 7/8 inches long; tarsal, 3 to 4 inches wide; and metatarsal, 1 inch long. A mule deer's preorbital is about 1 9/16 inches long, its tarsal 2 to 2¼ inches wide, and its metatarsal 5 inches long.

Reproduction

The mating season for whitetails and mule deer begins in October, with the peak of breeding occurring in mid to late November and extending as late as February. Shortening day length and reduced light intensity in the fall trigger sexual activity in bucks as well as does. The breeding season is known as the rut.

In Kansas, 50 percent of all whitetail doe fawns breed before they're a year old. Less than 10 percent of the mule deer doe fawns breed. About 95 percent of the whitetail does breed as yearlings, but only 60 to 70 percent of the mule deer yearlings breed. Adult does of both species have about the same productivity rates. The average for mature does of both species is 1.25 to 1.50 fawns per doe. Healthy females frequently have twins, and triplets are not uncommon. Does in poor health may never ovulate.

Estrus for the whitetail occurs every 28 days in the fall. Mule deer "cycle" between 22 and 28 days. The estrus period lasts about 24 hours. If the doe is not bred in her first estrus, "heat" will

recur three to four times before her breeding potential ends for the year. So most does capable of conceiving each year are bred. "Dry does" are generally yearlings or fawns that have not yet been bred. This is particularly true of yearling mule deer does, which usually breed for the first time at 16 to 18 months of age.

Mule deer and whitetails are polygamous, the males wandering extensively in pursuit of does in heat. It is during the rut that bucks become aggressive and are antagonistic toward other bucks.

Gene Brehm photo

This whitetail buck's thick neck is brought on by hormonal changes during the rut. By mid November, Kansas bucks are too busy breeding to eat.

Rutting behavior in whitetails includes urine marking of territories, rubbing and thrashing of antlers in shrubs and trees, antler fighting with other bucks, and herding of individual does. Mule deer bucks may collect small harems. Bucks of both species become sexually mature at 18 months of age. While yearling males are capable of breeding, the presence of mature bucks may limit their participation in the breeding of does.

Bucks expend large amounts of energy during the rut, actively pursuing does and taking little time to feed or rest. Body weight may decrease as much as 10 percent. The presence of active scrapes indicates that the buck has established a breeding territory. Scrapes are made when a buck paws the ground with his hooves and then urinates to impart scent to the scrape. Active scrapes are cleared of leaf litter periodically by the buck and they have a strong musky odor. Does are also more active during the rut and may urinate to signal their location and the start of estrus to the male.

Both whitetail and mule deer bucks will tend a single doe two to three days before the estrus and then accompany her for three to four days after breeding. So a buck is "out of action" for five to seven days per doe bred and is not likely to breed more than four does during a 28-day period, servicing twelve or so each season. Bucks in captivity have bred as many as 20 does during a single rut. In Kansas, there is no shortage of bucks to breed receptive does. Most of the breeding is finished before the firearms season begins, and the harvest formula ensures that enough bucks survive the season to continue breeding in following fall.

Fawns are born in late May and June, following a gestation period of about 202 days. This period can vary from 180 to 220 days. Does that were bred later in the winter (primarily fawns) may have their young in July and August. The sex ratio of fawns at the time of birth is about 106 males for each 100 females. Fawn mortality is high. As many as half of the fawns born could be lost before the fall hunting season. Causes for these losses include predation, farm machinery accidents, starvation, fence entanglements, and roadkills.

As fawning time approaches, each pregnant doe seeks solitude. If her fawns of the previous season are still with her she will try to elude them, even striking at them with her front feet in an attempt to drive them away. The fawning site must provide privacy and sheltering cover. No special nest or bed is prepared by the doe before giving birth.

At birth, the fawn weighs six to nine pounds. Both mule deer and whitetail fawns are spotted with white, though mule deer young lack the reddish cast of the whitetail's coat. Fawns retain their mottled pelage for three to four months. During their first month, they remain hidden, the spotted coat providing excellent camouflage. They are essentially scentless for several days — an adaptation to foil predators.

Fawns are left by the doe while she forages, but she is seldom out of touch and returns to feed them. She spends her time some distance from the fawn in order to avoid attracting attention to its hiding place. Because of this separation of doe and fawn, people sometimes find the young deer and assume it has been abandoned. Rarely will a doe abandon her young. If fawns are found they should be left in their bed because the doe is probably hiding only a short distance away.

Fawns depend on their mother's milk until five weeks of age. At two to three weeks they begin to forage, and by the time they're four months old the young are weaned.

As the fawns grow older they begin to accompany the doe for longer distances and periods of time. By fall the doe and fawns are nearly always seen together, and most of the family groups remain together until the following fawning season.

Food Habits and Nutrition

Except during the summer months, agricultural crops make up 50 to 60 percent of the whitetail deer diet in Kansas. Woody plants provide 30 to 40 percent of the forage during all seasons of the year. Summer diets are composed of nearly 50 percent forbs, 30 percent woody material, and 10 to 15 percent farm crops. Grasses comprise the smallest portion of the diet.

Kansas mule deer have food habits similar to the whitetail, though grasses make up a greater proportion of the mule deer diet. This may reflect the fact that mule deer inhabit the more open grassland areas as opposed to the woody drainages frequented by whitetails. Agricultural crops comprise 40 to 50 percent of the mule deer diet.

The daily forage intake for a deer is about three percent of its live weight. This intake varies with the season of the year. Food intake for mature bucks is greatest during the spring, decreases in summer, and increases again in early fall. Intake for does is greatest in the fall, prior to breeding.

Starvation of deer is not a major concern in Kansas. Starvation is rarely caused by a lack of food; rather it is the result of the available food not providing adequate nutrition and energy to sustain the deer in a healthy condition. In order to maintain good health, a deer's diet must contain the correct balance of proteins, carbohydrates, fats, minerals, and vitamins. The nutrient requirements vary with sex, age, season of the year, and environmental conditions.

The use of agricultural crops by Kansas deer can and does lead to crop damage problems. An increasing deer population generally results in more damage reports. Reducing crop damage is a primary consideration in the management of the Kansas deer herd.

Water is an essential item in the daily diet of deer. The amount needed depends on air temperature, evaporation rates, water content of the food eaten, and the physical activities of the animal. Deer have a daily water requirement of about 1½ quarts per 100 pounds body weight in summer. Deer will eat snow or lick ice if all the free water is frozen. Availability of free water can dictate whether or not favorable cover sites will be used by deer. The absence of drinking water may prevent deer from using what is otherwise prime habitat. Adequate water supplies are available in eastern Kansas in the form of rivers, ponds, lakes, and reservoirs. Water in western Kansas is more limited due to fewer water sources and lower rainfall. The increase in irrigation has provided a water source (flood and sprinkler irriga-

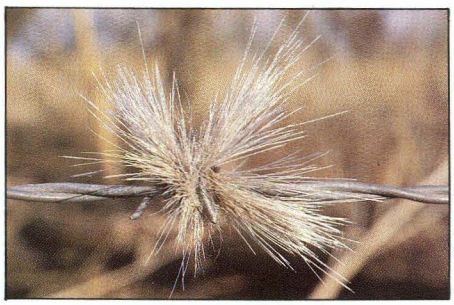
Both whitetail and mule deer fawns have spots, but the big ears on this youngster make it a muley. As a buck, it will develop only "buttons" its first fall, small forks the next. During its third summer it may grow antlers like those in the left inset — they're about half formed. Each fall the antlers will harden, and the mature buck will carry a handsome rack of four points to a side.

Gene Brehm photos

tion and tailwater pits) in areas where free water was once scarce.

Mortality

Captive female deer may live to be 23 years old, and males 16 years. The life span of a deer in the wild is about half that of a captive animal. Rarely do wild deer reach 12 years of age — whether they are hunted or not. In a hunted population, very few bucks exceed 5½ years, though a good number of does may be 8½ years old.



Gene Brehm photo

Large predators like wolves, cougars, and grizzlies once preyed on Kansas deer. Those predators are now gone, but automobiles, feral dogs, and fences kill in their stead.

The primary causes of deer mortality include legal hunter harvest, poaching, deer-vehicle accidents, predation, diseases, parasites, hunter crippling losses, and fence and farm accidents. In 1984, legal harvest removed nearly 24,000 deer and reported deer-vehicle accidents claimed 3,000 more. The actual number of deer lost to vehicle collisions could be as high as 5,000 annually. The magnitude of loss to poaching is difficult to determine but may approach the legal harvest in some areas of the state.

Deer-vehicle collisions occur most frequently where highways follow or cross woody drainages. "Deer Crossing" signs are placed at locations where there have been five or more deer-vehicle collisions in a one year period.

Predation by coyotes and free-ranging dogs is a primary cause of fawn losses. Predators do serve a useful purpose by removing sick or wounded animals.

Diseases and parasites are minor problems for deer in Kansas. While epizootic hemorrhagic disease (EHD) is the most serious disease affecting whitetail herds in the Midwest, its significance in several minor Kansas die-offs has not been fully documented. The disease can and occasionally does decimate deer herds with amazing swiftness. The EHD virus is spread by a mosquito and has its most pronounced effects during hot, dry years from late July through October. As deer congregate around water during dry years, they run a greater risk of exposure. EHD has been found infrequently in mule deer and antelope.

The state's veterinarians and farmers are more concerned about deer carrying leptospirosis, anaplasmosis, and brucellosis or "bangs" disease, as these affect cattle herds. Brucellosis testing proved negative on 2,000 blood samples collected during the 1981 firearms deer season. Blood serum analysis from 2,000 deer showed a very low 2.9 percent incidence of leptospirosis and a 1.4 percent occurrence of anaplasmosis. As the deer population increases, it is a good practice to test deer again, periodically. It is unlikely that deer populations in Kansas will ever pose a disease threat to the state's livestock and dairy industry. Population levels will be maintained at a point compatible with agricultural interests.

Habitat

Kansas deer habitat is a constantly changing array of woody, grassland and agricultural vegetative communities whose ability to support deer fluctuates with season, climatic conditions, intensity of land use, cropping patterns and degree of human disturbance. Most whitetail populations are associated with permanent woody vegetation of some sort, what we generally think of as cover.

Gene Brehm photo

Though both mule deer and whitetails are considered as browsing animals, they graze effectively, too, and relish succulent plants like alfalfa.

Cover provides shelter from the elements and escape from predators — a sense of security. The degree of security provided affects the health of deer, and security requirements vary with the pressures placed on individual animals. Cover must moderate temperature and precipitation, provide physical barriers to predators, and reduce vulnerability to hunters. As such hazards intensify, the quality and/or quantity of cover must increase or the deer will leave.

Cover can be provided by topographical features such as rock outcrops, gullies and draws, ridges, "go-back" areas grown to forbs and grasses, and even agricultural crops and their residue. Cover becomes less critical as one moves from northern climates into more temperate areas.

Whitetails prefer different cover types than muleys. In the east, whitetails are most abundant along the creeks and rivers where elm, ash, cottonwood, hackberry, willow, oak, and boxelder are common overstory vegetation. Understory vegetation is typically mulberry, sumac, coralberry or buckbrush, dogwood, plum, chokecherry, gooseberry, greenbrier, poison ivy. Grasses and forbs add to the understory diversity necessary to attract deer.

Whitetail fawning sites in alfalfa and clover fields become hazards if the young are trapped there during the mowing operation, so most east-side deer activity during all seasons is in close proximity to secure woody cover. Areas of old field succession provide bedding and fawning sites as well as a diversity of native foods. Field borders of osage orange interspersed with grasses and forbs act as travel lanes. Diversity in plant species and density, as well as canopy coverage, is the key to prime whitetail cover.

Suitable whitetail habitat in western Kansas is limited to creek borders, river bottoms and brushy draws. During the growing season, whitetails here find shelter in corn and milo fields. Even grass fencerows serve as bedding areas for the adaptable whitetails, which are more and more taking up residence in traditional mule deer habitat.

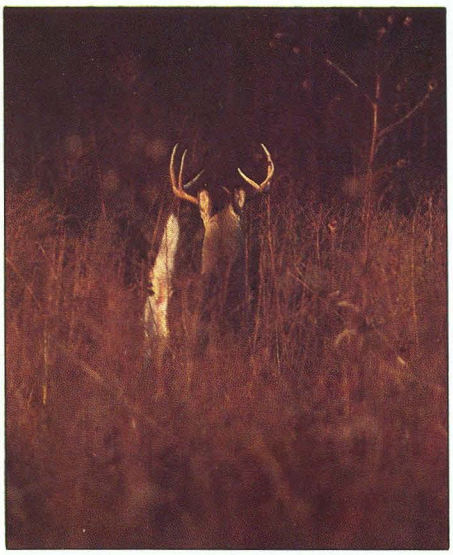
Kansas mule deer frequent the open grasslands and associated croplands of western Kansas. These animals like to be able to see, and they prefer sparse vegetation. Brushy, weedy draws that traverse pastures and croplands are favorite travel lanes and bedding sites. Cottonwood, willow, salt cedar, American elm, hackberry, and green ash are the major tree species associated with mule deer cover. Primary shrub species include rose, plum, golden currant, chokecherry, sumac, snowberry, and sagebrush. Water basins left unfarmed and allowed to grow smartweed, fireweed, ragweed, and sunflowers become islands of cover amidst a sea of agricultural crops. Untilled, ungrazed, brushy draws provide preferred mule deer fawning sites as well as escape cover. Thickets of plum, chokecherry, and sumac are among the most attractive bedding spots for mule deer.

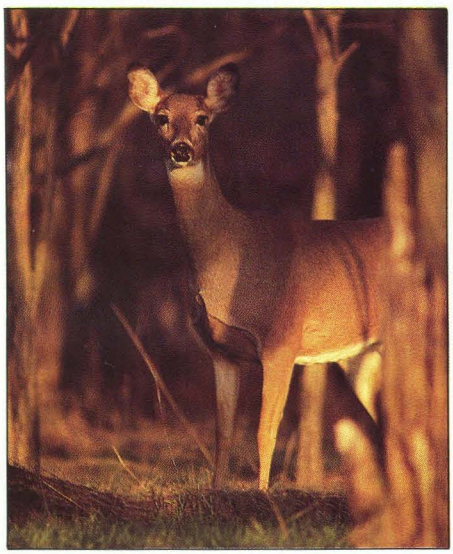
Movement and Home Range

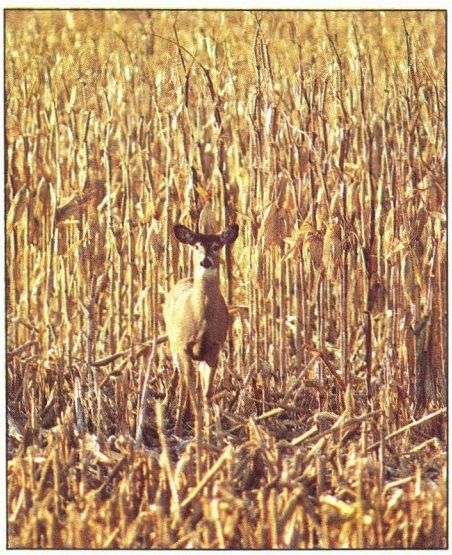
Deer movement in Kansas is influenced by the limited amount of deer habitat in the state and the fact that most of this habitat is thinly spread along watercourses and drainages. Movements are seasonal and dictated partly by the physiological needs of deer and changing habitat conditions. The more a given deer range provides year-round requirements, the less likely it is that migrations will occur. Deer movements peak in April and May and again in October, November, and December. Over 20 percent of the state's roadkills occur in April and May, 40 percent during the second peak in deer activity. Spring movements are related to winter herd break-up and prefawning activity, while the fall shuffle is in response to the rut, hunting pressure, and changing habitat conditions that force deer to move to secure wintering areas.

Following the rut — and particularly after the hunting seasons have ended — deer activity decreases and the animals tend to congregate. Herds begin forming during leaf fall and as crops are harvested. Harvest reduces deer range to a fraction of its summer expanse, as many deer live in standing corn, milo, and wheat. Herding is frequently an environmental requirement because of severe weather and reduced food supplies during the winter. Relatively long movements to wintering areas are not uncommon, particularly among mule deer. During deer season hunting influences deer movements and distribution more than any other factor. After that, food availability and secure winter cover are most important. The relative severity of any given winter strongly influences the size of winter herds and the distance traveled to habitat that meets their needs. In mild winters deer are more widely distributed and do not form large herds until stressed. "Yarding", the concentration of large numbers of whitetails in small wintering areas in northern deer range, does not occur in Kansas.

Migrations of up to 100 miles are not uncommon for mule deer in mountainous habitat. Mule deer found on the prairie don't migrate, but they do travel extensively — particularly the yearlings. This was demonstrated during a recent study conducted in a 12-county area of northwest Kansas. Game biologists and conservation officers caught, tagged, and released 67 mule deer fawns and seven whitetails. Nineteen of the mule deer were later recovered. Deer recovered as fawns remained in the vicinity of their capture site with no straight-line movements over one mile recorded.







Gene Brehm photos

Kansas whitetails thrive in a variety of cover types. The buck at top is headed for second-growth timber, having been jumped from a patch of weeds. Tree belts are favorite travel lanes for deer, and many, like the doe at bottom, spend their summers in cornfields!

Those recovered as yearlings moved an average of 46 miles, while adults traveled 84 miles from their tagging location.

Most of the wandering deer struck out across country rather than following a single drainage. In the study, mule deer over one year old crossed an average of 2.8 drainages. A pair of yearling females marked as fawns were recovered at the same time and location after a 68-mile movement. Another set of twin bucks were recovered as yearlings the same year but over 60 miles apart. Nebraska's firearms hunters recovered three of our marked bucks after movements of 37, 65, and 75 miles. The longest straight-line movement for mule deer was 97 miles — though a yearling whitetail doe holds the Kansas record for the longest journey. Tagged as a fawn in Sheridan County, she wandered 170 miles to the Chikaskia River in Kingman County! No significant difference has been found between the wandering tendencies of bucks and does or the distances each will travel.

A deer's home range is defined as the area traveled on an annual basis by a deer in its normal activities of food gathering, mating and fawn-rearing. The size of a home range is determined by the availability of food, water, cover. Home ranges are generally smallest in the summer and largest in the winter. Kansas deer range more widely in the western part of the state than in the east. The average home range is 320 acres but can vary from 100 acres to over 1,000, depending on the proximity of food, water and cover. In western Kansas there may be a seasonal change in home range locations from summer to winter as a result of inadequate food and cover within the summer range to sustain a wintering population. This is particularly true where deer inhabit corn fields throughout the summer and early fall.

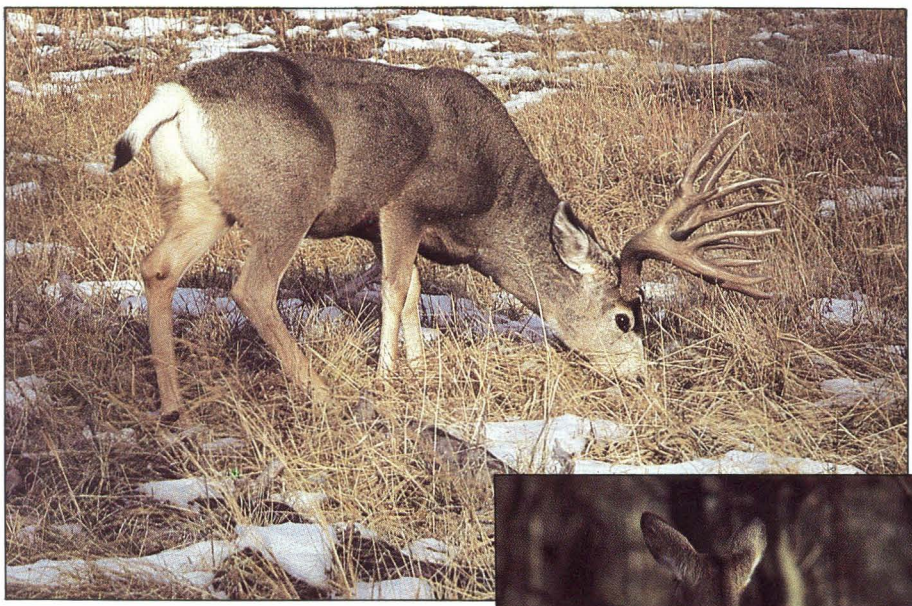
MANAGEMENT

Deer management, in its broadest sense, includes five essential components: (1) research programs to provide knowledge and understanding of deer biology, behavior, and ecology; (2) surveys to monitor population and habitat characteristics and trends; (3) information and education to enhance public understanding and support of deer management programs; (4) enforcement of laws and regulations designed to manage deer populations; and (5) management of deer habitat. In

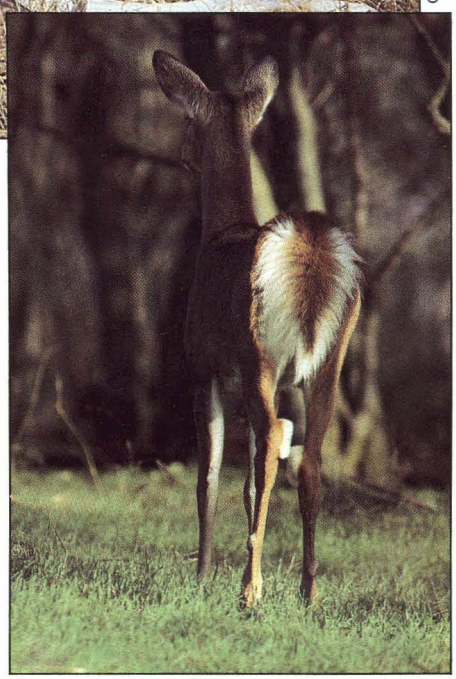
Kansas, harvest manipulations and habitat improvement are the most important deer activities.

Harvest Manipulation

With an increasing whitetail population and stabilized mule deer numbers, population control through hunter harvest is a prime concern of managers, administrators, landowners, and sportsmen. Several factors are considered when establishing deer harvest goals.



Gene Brehm photos



Mule deer in western Kansas may find winter pickings a bit lean, but most, like this buck, come through the snow in fine shape. Starvation is never an issue for Kansas whitetails. The doe here is a typical member of the Kansas herd — sleek, alert, and healthy.

They include: (1) landowner tolerance levels for deer and hunters; (2) deer population size; (3) deer species; (4) numbers of trophy bucks; and (5) hunter densities.

Since Kansas is an agricultural state and most of the land is in private ownership, landowner tolerance for deer and crop damage by deer are important considerations in setting harvest and population goals. Field personnel from the Kansas Fish and Game Commission (KF&G) contact farmers and ranchers to determine numbers and severity of deer damage complaints; farm organizations are involved as well, and periodic landowner deer surveys are taken.

The landowner survey is a measure of change in landowner impressions and attitudes toward the deer resource. The survey was first conducted in 1964 and has been duplicated six times in a 20-year period. Questionnaires are sent to 3,500 landowners randomly selected from ASCS county mailing lists. The most recent survey was done in the winter of 1984-85 and indicated that, from a landowner's perspective, deer numbers were increasing and that landowners would prefer to see a stabilization in population levels.

The number of deer in Kansas at any one time is impossible to know. Since we cannot monitor actual population *size*, it becomes necessary to obtain information that will show its *trend*. A trend survey measures whether the population is increasing, decreasing, or not changing. The landowner deer survey gives us a measure of population change based on landowner opinion and deer damage complaints. Changes in the number of reported deer-vehicle accidents are also used as a population trend indicator. In 1965 there were 107 deer-vehicle accidents reported per one billion miles of vehicle travel; in 1984 there were 424 roadkilled deer per billion vehicle miles. This higher accident rate can be attributed to a productive and adaptable whitetail population that is not only increasing in size, but extending its range.

Because of the diverse nature of Kansas' deer habitat and the spotty distribution of its deer, management units were established to better formulate harvest goals for localized populations. There are now 18 management units plus three military installations. Harvest goals are set for each of these units and permit quotas are recommended that will achieve the desired harvest. Recommendations for season dates and permit quotas are based on population data, landowner and sportsman concerns, and the professional opinions of KF&G personnel. They are presented to the Fish and Game Commissioners for approval at a public meeting. Public comments are there solicited and considered by the Commission.

The issuance of deer hunting permits is currently to Kansas residents only. There is no quota on the number of archery permits that can be issued, but firearms permits are limited. The hunter is entitled to only one deer hunting permit. It can be archery or firearms but not both. Firearms hunters must apply for a permit and must select the management unit in which they wish to hunt. By state law, one-half of all authorized firearms permits must be made available to landowners or tenants who own or rent 80 acres of farm land. All applications are entered on computer and a drawing is held to select those persons who are to receive a firearms permit. Applicants who did not have a firearms permit the previous season are given first consideration in the drawing.

The types of permits issued (i.e. bucks only, any deer, antlerless only) are determined by the population goal. If population stabilization or decrease is desired, it is necessary to harvest does. This requires the issuance of "any deer" and "antlerless only" permits. If a population increase is the goal, then the does need to be protected and "bucks only" permits will comprise the bulk of the permits issued.

Maintenance of the herd at a given level requires that surplus animals be harvested, including females. If an increase is desired, then some surplus should be left for breeding stock. If herd reduction is the goal, then all of the surplus and some of the breeding stock will need to be harvested.

In 1977, the percentage of does in the

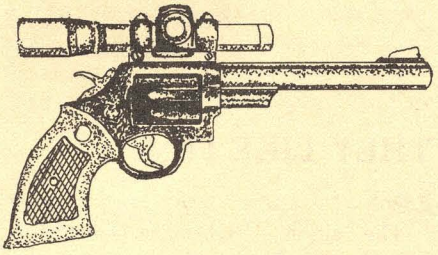
Continued on page 17

the center section

Edited by Rob Manes

LETTERS

Q & A



Editor:

In the July/August issue of KANSAS WILDLIFE, an article by Wayne van Zwoll titled "History of the Hunting Handgun" stated that handguns are legal for Kansas big game, with some restrictions. What conventional pistol cartridges are legal for this purpose?

William O. Brown
Wichita, KS

Dear Mr. Brown:

Handguns legal for big game in Kansas include those "that fire a center-fire bullet greater than .23 inch in diameter and that have a cartridge case length of 1.280 inches or greater." Commercial cartridges that qualify include the .256 Winchester, .32-20, .38-40, .357 Magnum, .357 AutoMag, .41 Magnum, .44-40, .44 Remington Magnum, .44 AutoMag, .45 Long Colt, and .45 Winchester Magnum. Some of these are obsolete as hunting rounds; the .32-20 is a poor choice for any big game. I have omitted foreign cartridges and proprietary loadings. The .30 carbine is specifically outlawed for hunting big game in Kansas.

The best handguns for deer and pronghorns are single-shots chambered for wildcat rounds with rifle-like ballistics. Revolvers in the .41 and .44 Magnum are also first rate, as are autoloaders shooting the .357 and .44 AutoMag and .45 Winchester Magnum cartridges. *Wayne van Zwoll*

Editor:

As a concerned Kansas sportsman, I do enjoy KANSAS WILDLIFE. But I would like to read more about wildlife issues in my Kansas Fish and Game magazine — not from my newspaper, which hardly cares about the outdoor sports.

R. S. Evans
Wichita, KS

Dear Mr. Evans:

It is an objective of this publication to inform readers about important wildlife and environmental issues. This should also be a function of your local newspaper. The editor of that publication would likely be receptive to your comments regarding this matter.

Each week, all newspapers and other media sources in Kansas receive a package of articles from the Fish and Game Commission regarding wildlife issues in the state. These are published at the discretion of the editorial staff of each publication. Your request might get these issues covered by your local media. Also, you may find the Issues portion of this publication helpful. *Manes*

Editor:

I think the Kansas Fish and Game Commission is doing a great job in general and that your are producing an excellent magazine in particular. In the July/August issue of KANSAS WILDLIFE you gave some of the rules pertaining to bowfishing for carp.

I would like to know if crossbows are legal.

Patrick Dreese
Manhattan, KS

Dear Mr. Dreese:

No, the use of crossbows for taking fish in Kansas is not legal. It is outlawed by the definition of a bow in the State Fishing Regulations. *Manes*

Editor:

I would like to compliment the Kansas Fish & Game Commission on the outstanding job done on the bimonthly publication, KANSAS WILDLIFE. The stories are great, the pictures are outstanding — everything is just super.

My friend and I like to fish, but it seems that when we are ready to go fishing, the best bait — crawdads are gone. So, we were wondering if you have any information on how to raise crawdads in a pond.

Frank Williams
Lyons, KS

Dear Mr. Williams:

You need a pond with a hole deep enough to allow the crawdads to survive through periods of extreme heat and cold. The pond should have no predators, such as bass or catfish, in it. Once you have a suitable location, find a source of the kind of crawdads you want to use for bait, capture some with a net or seine, and release them during the warm months. They will reproduce in winter. Controlling the vegetation in your pond will guard against winter and summer die-offs. *Manes*

OBSERVATIONS

Editor:

I would like to recount an unusual experience to you:

My father, a farmer, was baling hay in large, round bales recently, when he discovered a pair of paws sticking out from the center of one of the bales. Upon closer inspection, he saw the paws twitch, so he began carefully pulling hay from the center of the bale. Before long, he had dug enough hay out to realize the creature was a coyote that had been seeking shade

underneath the raked hay. Carefully, Dad pulled hay out of the bale until the coyote was able to wriggle out. After standing and staring at my father for a few minutes, the coyote slowly trotted to the top of a nearby hill and watched as Dad resumed his baling, before finally disappearing.

Debbie Schmidt
Pratt, KS

Editor:

I watched a commercial with a well-known actor trying to explain how important it is to protect wildlife. It was another of those anti-hunting messages.

The way they express their misguided ideals, one would be lead to believe sportsmen are murderers. These organizations say their main purpose is to protect and preserve wildlife. All they really care about is recruiting the unaware, uneducated populace to donate money. If these same folks who are suckered into donating to these organizations were to simply send their money to state fish and game departments, wildlife would certainly have the best protection possible.

Jack R. Copeland
Salina, KS

Editor:

We agree that one of the ugliest cratures in Kansas is the Dobson fly (May/June KANSAS WILDLIFE). We live in central Kansas, a mile or better from a creek. Last year, I saw a mature Dobson fly for the first time — on my white laundry on the clothes line. I was terrified, and upon trying to remove it, found it emitted a most horrible odor.

Unfortunately, we found a number of others on the laundry and side of the house during the next few weeks. We hope they do not return this year.

Martha Dittmon
Woodbine, KS

Editor:

As president of the Kansas Herpetological Society, I have long been aware of the tremendous numbers of reptiles and amphibians, as well as other wildlife species, that perish on roads and in agricultural areas each year. However, during a stint driving an alfalfa cutter this summer, I was amazed by the number of animals killed by the swathers (the machines used to mow the alfalfa and lay it into rows).

From the first of May through mid-July I kept a running count of the animals I personally discovered dead in the wake of the fast moving swathing machines. It runs as follows: 53 black rat snakes, 38 bull snakes, 33 red-sided garter snakes, 27 yellow-bellied racers, and 22 box turtles.

The biggest shock came when I realized the numbers of quail and pheasant eggs and hens that were killed. I discovered nests that were destroyed, accounting for over 1400 quail and pheasant eggs and over 200 hen quail and pheasant. Also, I found a single fawn whitetail deer that had been killed by the swathers.

The statistics amazed and saddened me, being both a staunch conservationist and an avid hunter.

Keep up the good work on your fine publication!

Martin Capron
Oxford, KS

Editor:

This is in reference to a letter written by Mr. K. Wood of Haviland.

I am one of those "city people." In 10 years, I have never drawn a rifle permit in Kansas, although I have applied 8 of those 10 years. The other two years I hunted with a bow.

I am in full agreement with Mr. Wood about those who come out to hunt and do what they please, but I take offense to the reference to "city people" as being the only ones who violate the rights of the landowner and don't pay their way. There are guilty parties from both walks of life.

Those of us who are law-abiding sportsmen and respect the landowner's rights pay the price for those hunters who don't. I am a Kansas Hunter Safety instructor and deeply believe in the respect for the laws that we try to instill in young people.

Roy W. Connelly
Larned, KS

SANDHILL STUFF

Editor:

You've dug it up again! Just three short years ago, Kansans decided that killing the sandhill crane wasn't suitable. Now your article in the "Center Section" of the September/October issue says that "Fish and Game Commissioners want to wait until 1986 to begin the season."

I have taken no poll, but I feel sure that the commissioners have had few real sportsmen demanding this open season on the sandhill crane. Many of us feel there should be a reduction in the number of species hunted. Why don't we continue to work together for positive wildlife goals ?

Ralph H. Wiley
Wichita, KS

Editor:

I just read in my September/October issue of KANSAS WILDLIFE, that a sandhill crane season is being considered in 1986. I'm all in favor of it. I've read and heard from several sources that they are a difficult bird to bag and not bad eating either.

Kenneth E. Whitson II
Independence, KS

THEY LIKE IT

Editor:

The article, "Changing Channels," (May/June, 1985) impressed me so much, I think it should be required reading for every landowner with river or creek property. It should be passed along with other important papers when the land changes hands.

Thank you for an outstanding publication. If I had to choose only one magazine to subscribe to, KANSAS WILDLIFE would be my choice. Your subjects affect us all.

S.A. Kopplin
Mulvane, KS

Editor:

We would like you to know that all of us enjoy your publication very much and consider it a class act. I particularly enjoyed the article and recipes on carp in the July/August issue. I have always considered carp meat in the same category as skunk or rat, but easier to clean.

Joseph A. Barnett
Topeka, KS

Editor:

I just wanted to tell you what a fine-looking issue of KANSAS WILDLIFE you put out for July/August. It really seemed to have something for everyone, but I especially liked the stories about carp and their edibility.

Terry Rudnick
Washington Dept. of Game

THE LAW

BOWHUNTERS HELP

Last year, a 19-year-old man cut a hole in a farmyard fence and arrowed a privately owned whitetail buck in the rear quarters. The deer later died.

The Wisconsin Bowhunters Association and other archery clubs and shops in the West Bend area, where the crime occurred, raised funds to purchase another deer for the farmer and his wife.

The Wisconsin Bowhunters and the farmer offered a $500 reward for information about the killing. As a result, the culprit was identified and convicted. *Bowhunters Who Care*

FOLLOWING THE CLUES

Area Law Enforcement Supervisor Doug Sonntag's years of experience have sharpened his skills for following the trail of clues left by poachers. One day last fall, while visiting with some local Anderson County residents, Sonntag learned of a deer shot by a man who lived just east of Kincaid, Kansas. The report was that the deer was killed on a Thursday night. Sonntag checked computer records and found that the man did have a permit. Later he heard of the same man shooting a deer on the following Friday morning, so he went to talk with the suspect.

The man showed his unattached deer tag to Sonntag, saying he had not yet killed a deer to fill the permit; but Sonntag noticed faint stains on the front of the tag that looked like rust and others on the back appeared to be blood. Sonntag left without further question, but his trip was a fast one to get a search warrant from the county courthouse.

When he returned to search the place, Sonntag found a deer hanging in the garage. The tag attached to it was assigned to the suspect's son. Sonntag knew the man's 17-year-old boy had been in school and at basketball practice during the entire day and evening the deer was killed. When the son arrived, he admitted that he did not kill the deer.

Sonntag had an idea about how he might locate the deer killed on Thursday. A woman the suspect had associated with had received a landowner permit in 1983, and Sonntag's investigation determined that she did not own land. So he enlisted the help of Wildlife Conservation Officer Johnny Ray, who persuaded the woman to admit that the suspect shot the deer, and it was hanging in an abandon house near her home at Mildred, Kansas.

Accompanied by Ray and W.C.O.s Don Clarke and Doug Whiteaker, Sonntag went to arrest the suspect. Intoxicated, the man threatened the officers with a knife and was particularly abusive of Officer Clarke, who had arrested him a few years earlier on multiple deer violations.

Unable to come up with the $2,500 bail, the Kincaid man spent the night in the Anderson County jail. In court, charges for resisting arrest and taking deer without a permit were dropped, but the culprit pleaded guilty to possession of an illegal deer and failure to affix his tag to the deer. Judge Phillip Fromme fined him $1,500 and sentenced him to two six-month terms in jail. The jail time was suspended, with the stipulation that the man would receive treatment for alcohol abuse rehabilitation. *Manes*

NO SCAPE GOAT

Acting on a tip from a concerned citizen, southeast Kansas Wildlife Conservation Officer Harley McDaniel went to the house of a Mulberry man who reportedly had an illegally killed deer. The man consented to a search, and McDaniel found a butchered steer hanging in the garage. Behind it was a deer carcass.

When questioned about the deer, the Mulberry man retorted, "That's not mine, and anyway it's a goat."

McDaniel cast a knowing half smile at the man and said, "I've been doing this job for a long time, Mister, and that animal hanging there is a deer."

The animal was untagged, and Officer McDaniel issued him a citation for illegal possession of a deer. He pleaded guilty in Crawford County District Court and paid $275 for the offense . . . but McDaniel wasn't through with him.

Noting that the man didn't raise cattle, Officer McDaniel informed the sheriff about the suspicious beef. As a result, the Mulberry man and two partners, also from Mulberry, were charged with felony cattle theft in Barton County, Missouri. All three were convicted, and the two partners, already on probation from previous convictions, were sent to the Missouri State Penitentiary for two years. *Manes*

RATES AND TRENDS

Field surveys conducted by Kansas Fish and Game law men show that for every twenty license or permit checks, one person will have violated a fish and game law or regulation. Figures taken from the 1984 Wildlife Conservation Officer Annual Report, show 68,460 license and permit inspections, with 3,448 citations and 354 warnings issued. An overall statewide violation rate of .056 is derived by dividing the total number of citations and warnings by 68,460 license and permit inspections. This means almost six out of 100 people checked in the field by Wildlife Conservation Officers will be in violation of Kansas Fish and Game Commission laws or regulations.

The 1984 violation rate of .056 is consistent with those of previous years. The 1982 figure was .062 and the 1983 figure was .058.

Even though the overall rate shows a downward trend, wildlife-related violations are still costing the Kansas Fish and Game Commission considerable dollars annually in lost revenues. Sportsmen purchased 444,284 licenses and registered 27,306 boats in 1984. The combined total of 471,590 licenses, permits, and boat registrations can be multiplied by a violation rate to determine the number of people not buying required licenses, permits, or boat registrations. This violation rate is determined by taking the total number of hunting license, fishing license, trapping license, and boating registration violations and dividing it by the total number of license and permit inspections. In this case, we have 1,405 violations divided by 68,460 license and permit inspections. These figures are taken from the 1984 violations summary. The violation rate is .02. The total number of people not buying required licenses, permits, or boat registrations is (471,590 x .02) or 9,431.

The potential dollar amount lost is more than $138,000. That is calculated by taking the total number of license, permit, and boat registration sales in each category and multiplying it by .02. The number of lost sales in each category is multiplied by the value of each authorization. These values are then summed to give a figure concerning the total lost revenues.

This does not include revenue losses due to fraud (i.e. nonresidents purchasing resident licenses), controlled shooting area permit sales, field trial permit sales, or big game permit sales. *Omar Stavlo*

TRESPASS LAWS

Three Kansas laws address trespassing. Only one of those, the "hunting by written permission only" law, is a Fish and Game statute. Under that law, a sportsman must have in his possession a note signed by the landowner or tenant, saying he may hunt on posted lands. Only the immediate family members of the landowner or his tenants may hunt without the note on land posted "hunting by written permission only." Others, even relatives and friends, hunting on such lands without the written permission are in violation of a Class C misdemeanor, which carries a maximum fine of $500 and revocation of hunting rights for one year. A law enforcement official may ticket trespassers under this law, without a complaint from the landowner.

The written permission law allows hunters to enter posted land in pursuit of wounded game, regardless of whether they have written permission to do so. A confusing conflict in the law arises at this point, however. The "criminal trespass" law does not allow pursuit of wounded game without permission.

Criminal trespass occurs when a person enters lands which are posted to restrict entrance or are fenced, or when a landowner's verbal request to leave unposted or unfenced property is not obeyed. Violation of the criminal trespass law is a class B misdemeanor, which carries a maximum penalty of $1,000 and six months imprisonment.

A third form of illegal trespass, referred to as "unlawful hunting," is a Class C misdemeanor, carrying the same penalties as the written permission law. Violation of this law occurs when someone shoots or attempts to take game on private property, without the landowner's or tenant's permission. The unlawful hunting law also makes it illegal to shoot or attempt to take game from a public road or railroad right-of-way, without permission from the person or persons who control access to the adjoining land.

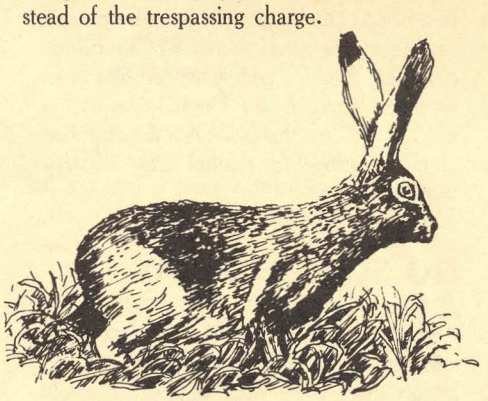
It is the hunter's responsibility to know who owns any land he enters, and to have proper permission to do so. By creating feelings of animosity among landowners, sportsmen who enter private property illegally diminish opportunities for others to hunt, trap, and fish. *Manes*

RABBITS IN THE NIGHT

It was an Operation Game Thief call that sent Wildlife Conservation Officer Bruce Peters into the night to search for a man who allegedly was trapping rabbits for illegal sale, shooting rabbits with illegal weapons, and using a spotlight to shoot coyotes at night. W.C.O. Claude Blair had taken the call, and his investigation provided information that the man had gone to the Johnson, Kansas area for the evening to get more rabbits.

Peters met with local officers in Johnson, and they devised a plan to search the area around town. It was almost 11:00 p.m. when they spotted the lights of a small pickup bouncing across the terrain. The driver of the truck was a Johnson man. Two California men were crammed into the cab with him, and the trio had five live rabbits, two .22 rifles, and more than four hundred rounds of ammunition.

The Californians were charged with failure to produce valid hunting licenses, trapping rabbits without proper permits, illegal use of artificial lights, and trespassing without written permission. The Johnson man was similarly charged, with an illegal ammunition count instead of the trespassing charge.



A Jeep, occupied by the brother of the Johnson man and another man from Ulysses, pulled up to the spot where the first vehicle was stopped. They also had live rabbits and several guns with them, and each received a ticket for using illegal ammunition. The driver was additionally charged with illegal use of an artificial light and trapping rabbits without a valid permit.

The four men put up bond money totalling $2,000 and they appeared before a Grant County Judge. The two California men pleaded guilty to all but the trespassing charges, which were dropped. One of them paid $95 dollars, and the other paid $145. The three Kansans pleaded not guilty to all charges, and Stanton County Judge Herbert Noyes was brought in to hear the case.

The hearing was lengthy, with the men acting as their own attorneys. Judge Noyes took a few days to consider the case and finally found the men guilty on all counts except the trespassing charges. They paid a total of $350. *Manes*

OGT IN COLORADO

Like the Kansas Fish and Game Commission and many other state wildlife agencies, the Colorado Division of Wildlife has established a system to receive anonymous reports of wildlife violations. A recent report through that state's Operation Game Thief Hotline has led to the arrest of two Pueblo, Colorado anglers for taking more than the legal limit of crappie — 235 more.

According to Colorado Wildlife Manager Albert Trujillo, the anglers attracted attention from others at Holbrook Reservoir, prompting the OGT call. With a search warrant in hand, wildlife officers and sheriff's deputies knocked on the door of the suspects' motor home.

At first, no evidence of illegal fish was visible, but a strong fish odor in the bathroom prompted a closer inspection. A fish scale found in the bathroom, led to examinations of the water holding tanks of the motor home. A crappie was found as the first holding tank began to drain. Back at the sheriff's office, the remainder of the fish were recovered from the two tanks.

Colorado has a system to assess points against sportsmen's hunting and fishing licenses for wildlife violations. Licenses can be revoked after 18 points are accumulated. Each of the anglers involved in this case could receive more than 240 points and fines of nearly $5,000. *Colorado Division of Wildlife*

STEEL SHOT

Steel shot (in all gauges) must be used for waterfowl hunting on the following public wildlife areas in Kansas: Elk City Reservoir and Wildlife Area in Montgomery County; Cheney Reservoir and Wildlife Area in Reno County; Quivira National Wildlife Refuge in Reno, Rice, and Stafford counties; as well as all of Stafford County not in the Quivira Refuge.

Steel shot must be used in *all* shotgun hunting (this includes upland birds and any other game taken by the use of shotshells) on the following areas: Jamestown Wildlife Area; Texas Lake Wildlife Area; Neosho Wildlife Area; Marais des Cygnes Wildlife Area; and Cheyenne Bottoms Wildlife Area, except lead shot may be used in the area west of U.S. 281 commonly known as the Inlet Canal Area.

It is illegal to have lead-containing shotshells in possession in any of the above situations. Copper-plated lead shot is not a legal substitute for steel shot. Muzzleloaders are exempt from steel shot regulations. *Manes*

ISSUES

LOOPHOLES

Current tax loopholes and incentives don't just benefit the rich — they encourage the destruction of natural resources as well. Oil drilling ventures are attractive tax shelters because the tax code allows deductions for exploration costs, employees' wages, and some capital costs. One tax provision stimulating mining permits coal producers to exclude a percentage of their annual gross income as a mineral depletion allowance. Such tax breaks encourage unwise exploitation of natural resources and pose an unnecessary drain on federal coffers. *National Wildlife Federation*

1080 BAN LIFTED

The Environmental Protection Agency has approved the use of Compound 1080 to control coyote predation on domestic sheep and goats, overturning a 13-year-old ban on the poison.

The EPA limited the use of 1080 to collars that will be worn around the domestic animals' necks. Coyotes, which usually bite into the neck of their larger prey, would get a lethal dose of the poison contained in small reservoirs around the plastic collar. This method is said to be selective because it reportedly affects only those animals that prey on sheep and goats.

The EPA rules require that users of the collars be trained and certified, and that the collars be used only in fenced areas and not on the open range. They also require that records be maintained of collars purchased, used, and lost; and that any deaths of non-target animals be reported. Conservationists will be monitoring use of the collars closely to determine if non-target species of wildlife are affected. *Wildlife Management Institute*

RIGHTFULLY YOURS

The new Dingell-Johnson (D-J) federal aid monies for expansion of fisheries programs are scheduled to be distributed to Kansas and other states in early 1986. Fisheries programs in the state will receive an estimated one million dollars annually from the expansion funds.

Past efforts of the U.S. Office of Management and Budget, as well as others in Washington, D.C., to divert the funds elsewhere could resurface; but for now, the money will be going to its intended purpose — improving fishing. Diversion of the funds was defeated by anglers who sent a strong message to Congress and the Reagan Administration, but sportsmen must continue to be aware of the handling of D-J monies at the federal level.

At least 10 percent of the new money will be spent on boating access to public fishing areas, and up to 10 percent may be spent on education projects dealing with fishing and aquatic resources. The Kansas Fish and Game Commission has outlined expenditures of these funds, following guidelines from the U.S. Fish and Wildlife Service. The majority of the projects are aimed at improving overall fishing conditions in state waters, rather than improving fishing for any one species.

Following is a list of proposed projects to receive funding through the new D-J monies over the first two years: State fishing lake facility development (boat ramps, etc.); fish hatchery staff expansions; statewide stream access development; studies of white crappie populations in Kansas reservoirs; Pratt fish hatchery renovation; Farlington fish hatchery renovation; fish habitat improvements; develop Site 50 on the Upper Black Vermillion Watershed; Rocky Ford repair engineering; repair Ottawa State Fishing Lake; seasonal stream water quality studies; aquatic resource education; Miami State Fishing Lake spillway improvements; broodfish and egg collection enhancements; Saline State Fishing Lake drainage diversion; university contracted walleye and hybrid studies; standard fish weight formulae development; Clark State Fishing Lake road and crossing repairs; community lake development.

Most of these projects originated from Fisheries field staff, and were based on the needs of individual waters, as well as the people who use them. These monies, allocated to the Kansas Fish and Game Commission for fisheries improvement, came from anglers. When fishermen buy tackle or boat fuel, a small percent of the price they pay is a federal excise tax (D-J Tax) that goes to state wildlife agencies. *Mike Theurer*

KILLER IS LOOSE

The chemical that killed more than 2,000 people near a Union Carbide plant in Bhopal, India — methylisocyanate — is not regulated as a hazardous air pollutant in the United States, even though it is manufactured here. *International Wildlife*

MORE THAN SOIL

United States House and Senate committees have approved conservation components of the new Farm Bill, opening the door for 20 million acres across the nation to be taken out of crop production and placed in a reserve system. The move would help to ensure the country's economic base, as well as providing significant increases in wildlife habitat.

The legislation would include "sodbuster," "swampbuster," and conservation reserve programs. It could take almost three million Kansas acres out of crop production.

The reserve program is aimed at retiring highly erodible lands already planted to row crops. It would allow the U.S. Department of Agriculture to pay landowners up to $50,000 a year for taking fragile land out of production. The USDA reports that the payments could amount to $11 billion over the 10-year phase-in of the program, but those costs would be offset to a large degree by reductions in existing price support payments.

The sodbuster program would deny price supports to farmers who plow highly erodible lands which have not been tilled since 1980. Some crops, such as perennial fruit and nut trees, would be exempted. Farmers who plant crops on highly erodible land in violation of the provisions would lose federal price supports for all their crops.

The swampbuster program would deny federal benefits to farmers who drain and till natural wetlands. Similar to the sodbuster program, it would deny subsidies to farmers who grow crops on such lands. *Manes*

HUNTING

THE RELEASE

Imagine yourself in a tree stand during the archery deer season. You have selected a choice site for your sturdy stand, and you feel confident that this is an excellent spot to take a deer.

On a cool autumn morning, a deer walks into your shooting lane at 15 yards. You know you can place your arrow well at this range. You draw, not even realizing the strain of the pull. Your hand comes back to its anchor point, you pick a spot, and relax your fingers. The arrow leaves the bow, swaying from side to side and strikes the ground between the animal's legs.

You know you can hit a quarter at that range, but you just missed completely!

What went wrong?

You were probably a victim of a poor release. As basic as it may seem, one of the most overlooked and important aspects of shooting a hunting bow is the release — turning loose the string from the fingers and setting the arrow to flight.

To achieve a smooth release, the fingers must let go of the bow string with little resistance. They should quickly snap from the string, but the hand should not leave the anchor point on your face. Some say it helps to imagine gently flicking water from your finger tips.

There are several tools which help archers to release the string smoothly and protect the shooting fingers. Finger-release shooting aids include gloves, tabs, and string covers. Mechanical release aids hold the bow drawn, with the string locked in a trigger mechanism.

The shooting glove protects the first three fingers of the drawing hand, as does the tab, which is a single leather piece that slides over the middle finger of the drawing hand. A shooting glove should be flexible enough to allow the shooter to feel the string, yet thick enough to protect the fingers. A glove should be discarded if it develops a crease where the string is gripped. A crease may snag during release. Gloves and tabs must fit properly.

Some archers prefer to use no finger protection. Instead, the string is covered with a protective sleeve of rubber where the fingers grip during drawing.

Mechanical releases are becoming more popular with archers because they consistently give clean releases. Still, the key to using a mechanical release effectively is developing a consistent aiming point and not jerking when the trigger is pulled or pushed.

Another factor which contributes to a smooth release is the manner in which the archer holds the bow. The bow hand should be relaxed, not squeezing. Sometimes a sling is used to catch the bow after releasing the string, allowing the bow hand to remain open, with the fingers pointing in the direction of the target. Many archers simply wrap the thumb and index finger of the bow hand around the handle.

Another consideration is the locking of the bow arm at the elbow. Many archers find it desireable to leave the elbow slightly bent outward and not locked. This allows the recoil upon release to be absorbed in the spring action of the flexed elbow.

Follow-through is the most important point for a smooth release. This occurs during and after the release. During the draw, the eyes are focused on a target. They should remain fixed there until the arrow strikes.

To correct release problems, it helps to shoot from a point close to a practice target, concentrating on the release and follow-through with each shot. Another way to correct release problems is to have a buddy observe your shooting technique through several arrows. Many times, the observer may be able to spot a problem you can't identify.

The most important aspect of developing a smooth release is repetition. Only through faithful practice can an archer shoot a bow well with little thought. It must become a natural motion. *Jerry Burkhart*

PHEASANT COMEBACK

After sharp declines during 1983 and 1984, the Kansas pheasant population has rebounded strongly. Biologists with the Kansas Fish and Game Commission believe that hunters will notice a substantial increase in ringnecks this season, but they say it won't be "easy pickin's."

The 1984 season produced a harvest of just 616,000 cocks. Though that figure may dwarf the harvests of most states, it represents the poorest season Kansas has experienced since 1976. Even with this year's improvement, only fair to locally good numbers of birds are expected.

Weather and cover conditions were nearly ideal for pheasant production in Kansas this past spring and summer. Adequate soil moisture and an early spring resulted in excellent nesting conditions. A mild summer with timely rainfall filled out the production equation with good brood-rearing cover. The only factor which prevents fall pheasant populations from reaching excellent levels is relatively low numbers of adults available to breed.

Low breeding populations in 1985 were the result of the worst series of weather events imaginable for pheasant production. An unusually late spring in 1983 delayed nesting and was immediately followed by what proved to be the worst drought since the "dirty thirties." This situation exposed vulnerable young birds to adverse conditions and resulted in heavy chick losses. The drought also left poor cover conditions, which added to pheasant losses when December hit with record-breaking cold and snowfall. Another late spring and midsummer drought severely limited pheasant production again in 1984.

The effects of such devastating weather are not easily overcome, but the 1985 production season has gone far towards recovery of Kansas' pheasant population — far enough that there should be enough cocks to keep most hunters interested this fall. *Randy Rodgers*

100-POINT HENS

Most of the ducks hunted in Kansas and its neighboring states have been assigned higher point values in the bag limit system. The U.S. Fish and Wildlife Service adopted waterfowl season and limit frameworks designed to reduce the harvest of ducks nationwide.

In Kansas, most of those ducks which were worth 10 points last year are now worth 20. This includes teal, scaup, wigeon, gadwall, shoveler, and mergansers (other than the hooded). A new category of 35-point ducks includes drake mallard, pintail, ringneck, ruddy duck, and all other species not listed elsewhere. The 70-point ducks are redheads, hooded mergansers, and wood ducks.

Most noteworthy is the 100-point category, which now includes the hen mallard, in addition to the canvasback. The hen mallard was the topic of intense discussion at flyway council meetings this year. Its early nesting habits and great dependence on grassland nesting sites have led to acute losses of the birds during the hatching season. The ongoing destruction of northern prairies has forced hen mallards to nest in areas where they are especially vulnerable to predators, and the resulting losses have been devastating. Studies of the situation have suggested that hunting pressure on hens, combined with nesting ground losses, has had

a unique adverse affect on mallard populations in recent years.

Because of this situation, the Central Flyway Technical Committee considered outlawing the shooting of hen mallards, but ruled that too many of the ducks would be taken mistakenly and that it was impractical to expect hunters to avoid doing so consistently. Instead, the hen mallard was given 100-point status, and state and federal wildlife managers are encouraging hunters to impose a voluntary halt to taking them. Going a step further, the Central Flyway Council adopted a resolution calling for concerted education efforts aimed at pursuading hunters to end shooting of hen mallards. The point value increase is expected to reduce the harvest of mallard hens by 10 to 15 percent. *Manes*

BARREL LENGTH

Shooters have many misconceptions about shotgun barrel lengths. What effect does the length of a shotgun barrel have on shotshell load velocity, choke options, sighting accuracy, and maneuverability?

For the answers, keep reading.

It's true that for every inch of shotgun barrel beyond 20 inches and out to a maximum of 40 inches, about four feet per second (fps) is gained at the muzzle for any given load. Thus, a load developing a muzzle velocity of 1,200 fps in a 20-inch barrel would probably develop 1,280 fps in a 40-inch barrel.

Those concerned about achieving maximum velocity from their shotshell loads are often worried that a 26-inch barrel is not long enough, and that they ought to have a 30-inch or 32-inch barrel. Actually the difference in muzzle velocity between a 26-inch and 32-inch barrel would be, at most, about 25 fps. This difference is insignificant. In fact, there must be a difference of at least 100 fps in muzzle velocity before per-pellet retained energy and lead distance is significantly affected downrange.

So the hunter who totes one of those 40-inch, bolt-action guns is probably gaining only 40 or 50 fps in velocity over the 28-inch or 30-inch barrels used by most waterfowl hunters.

Another concern stems from the mistaken notion that slower-burning powders require more barrel length to ignite completely than do faster-burning powders.

Complete combustion with fast- or slow-burning modern smokeless powders takes place well within the first 18 inches of the barrel, and usually before the shot charge and wad column travel six inches. So whether you have a 26-inch, or 31-inch barrel, it doesn't affect the completeness of combustion — regardless of the burning speed of the smokeless powder in your chosen load.

Most open choke options are offered in shorter barrels. Improved cylinder chokes, for example, are usually found only in 26-inch or shorter barrels. Manufacturers assume that open chokes will be used for close-range shooting, where faster swinging is important. But there is no reason not to have a 28-inch or 30-inch barrel bored improved cylinder, as many waterfowlers using steel shot are discovering.

Perhaps the chief advantage of a long barrel is the longer sighting plane. A 30-inch or 32-inch barrel serves the pass shooter better than a 26-inch or 28-inch barrel. Also, the heavier muzzle of a long barrel aids the long-range shooter. Once you get a muzzle-heavy gun moving, it's harder to slow down and stop the swing. This, of course, is vital to successful shotgunning.

At long range, barrels over 30 inches aid in accurate pointing, and the muzzle heaviness will keep the gun swinging. At close range, however, getting the gun up and moving quickly is important, while accurate pointing is less so. Here, the 28-inch or shorter barrels reduce the overall weight of the gun, place the balance point closer to the butt, and allow quick gun mounting and fast swinging. *Tom Roster*

GOOSE PROGRESS

With assistance from the Fish and Game Commission, giant Canada geese are making a faster-than-expected comeback in Kansas.

"The project is going better than expected, in terms of in-state production and getting geese from other states," says program coordinator Gerry Horak.

Canadas that were introduced to Flint Hills ponds four years ago are now raising young there, according to Horak. In addition to those birds, more than 1,300 came to Kansas from neighboring states and from hatching operations run by the Fish and Game Commission.

A total of 478 adult geese came to Kansas this year from Colorado and Wisconsin. Most of them were rendered temporarily flightless and taken to restoration areas at El Dorado, Fall River, and Cheney reservoirs, and to the Mined Land Wildlife Area, where a production flock has been started.

In addition to the adult geese, 309 goslings were obtained from Wisconsin and Colorado. Some of these were released at ponds in Chase and Lyon counties, and others were distributed in Butler County.

More than 500 geese were produced from flocks in Kansas. The Cedar Bluff flock hatched 150, which were released in Lyon and Butler counties. About 85 from the Pratt Fish Hatchery went to Woodson County, and 30 from the Sedgwick County Zoo were released in Greenwood and Lyon counties.

About 290 geese produced at the Marais des Cygnes Wildlife Area were released into free flight, and goslings were hatched from free-flying geese released in the area in previous years. The Marais des Cygnes flock was Kansas' first production project. Now in its fourth year, it represents the success which is being realized in the program. Hatching is also occurring among wild, free-flying geese in the Flint Hills and in southcentral Kansas. *Manes*

FISHING

BEST KANSAS STREAMS

People have emotional, (if a bit naive) opinions about what Kansas stream is the best. Everyone seems convinced that the little creek near their childhood home is the finest in the state.

Some of us remain convinced that there is no place to better enjoy life than our favorite creek or river. To judge which Kansas streams truly are the best, however, data from systematic surveys and studies allows a more objective evaluation than sincere but biased opinions.

One stream that continually ranks at the top is Shoal Creek in extreme southeast Kansas. Blessed with a great variety of fish and wildlife, it is Kansas' only Ozarkian-type stream. While most other streams in Kansas support 30 to 40 different species of fish, twice this number may be found in Shoal Creek. It sports a fairly fast current and gravel bottom, with crystal clear water most of the time, and its few miles in Kansas cut through some of the most beautiful scenery in the state.

Once Shoal Creek is listed,it is impossible to rank the next dozen or so streams without crossing a multitude of individual preferences. Still, based on an extensive survey of professional biologists' analyses of fisheries information, and confirmation with stream experts, a loose ranking can be developed. The list is the result of a statewide evaluation conducted in 1981 that looked at such qualities as fish populations, angling use, water quality, stream uniqueness, and bankside habitat for terrestrial wildlife. After Shoal Creek, the next eleven streams in order of their ranking in the survey were: Grouse Creek in Cowley County; Cedar Creek in Chase County; Lyon Creek in Geary and Dickinson counties; Mill Creek and three of its tributaries — Illinois Creek, East Branch, and West Branch of Mill Creek, all in Wabaunsee County; Otter Creek in Cowley and Greenwood counties; Chikaskia River in Sumner County; Caney River in Chautauqua and Elk counties; and the South Fork of the Cottonwood River in Chase County.

Other top-notch streams include Deep Creek in Riley County; the Walnut River in Cowley County; the Marais des Cygnes River in Linn and Miami counties; the Saline River in Russell County; and the lower portion of the Neosho River.

The Neosho River deserves special recognition because of its excellent catfish production and the presence of so many unique species. The state record flathead catfish was caught in 1966 from the Neosho near St. Paul, and it still stands at 86 pounds 3 ounces. There are more threatened and endangered aquatic animals surviving in this river than in any other stream system in the state, and the lower segment hosts spawning migrations of paddlefish in early spring. Most of the Neosho River did not rank extremely high on this evaluation because of water quality aspects, but to many experienced river anglers, the Neosho is *the* place to go for catfish.

Of the top twelve streams, eight are in the Flint Hills Region of Kansas. This probably surprises few people, since the Flint Hills grasslands yield little silt, which degrades so many other potentially fine streams in the state. Flint Hills streams offer spectacular surroundings and clear-water fisheries, including some excellent spotted bass fishing.

Two streams in this prestigious listing originate in the scenic Chautauqua Hills of southern Kansas — the Caney River and Grouse Creek.

As a sandy bottom stream, the Chikaskia River is truly different from the rest. This relatively shallow river doesn't boast the large catfish that can be found in the deeper streams of eastern Kansas, but it does offer some excellent fishing for good skillet-size channels, along with spotted bass in its lower segment. The best bragging point on the Chikaskia is its associated riparian wildlife habitat. Its mix of rolling sand dune grasslands and mature tree stands provides a home to large turkey and deer populations, along with hundreds of other species of game and non-game animals. It is truly a wildlife oasis in an area of the state that is marred by grain crop monotony.

These are the streams the experts feel are the best in the state. What's your opinion? Which creek or river holds your fondest memories and what has it meant to the quality of your life in the Sunflower State? *Ken Brunson*

FALL FISHING

Fall, according to many expert anglers, is the very best time of the year to fish. As the water temperature starts to drop, and especially when it gets into the 60s, that's the time to be on the water. In the fall, most sportsmen are in the field hunting, and the lakes are largely vacant.

White bass and crappie many times inhabit the same areas during fall, using the same habitat and structure. They will remain in the same location longer than in any other time of the year.

Look for fall fish in deep water, probably in the 20-foot range. Creek and river channels where you have 15 to 20 feet of water just before it drops off are ideal areas. Fish also seem to prefer rocks over other types of structure in the fall.

When on the water, anglers should pay attention to what is happening around them. Birds, for example, work schools of fish in the fall. Seagulls may indicate the presence of fish, even though they are not diving at shad on the surface. Gulls may sit on the surface over fish schools on the bottom. Anglers shouldn't pass up a gull that is reluctant to leave its spot. *Paul Miller*

PADS FOR BASS

Glen Elder Reservoir, in northcentral Kansas, has maintained a fishable population of largemouth bass for fifteen years. Until recently, the diverse habitats offered by seven feeder creeks and the North and South Forks of the Solomon River have provided the necessary conditions for adequate reproduction and survival of this species. Currently, production of young-of-the-year fish appears adequate to maintain the population, and the last two years' fall seinings have revealed numerous two- to three-inch largemouth bass. Fisheries research indicates, however, that largemouth must obtain a minimum length of about four inches during their first year to survive to adulthood. If a largemouth bass does not obtain this first-year length, it will probably not survive through its first winter.

Evidently, deterioration of creek and river timber and siltation in the streams above Glen Elder has severely reduced the habitat needed to provide proper cover and forage to ensure adequate first-year growth in largemouth bass.

In order to re-establish habitat for the production of needed bass forage species (minnows, aquatic insects, etc.), an effort is underway to establish water lilies in quiet-water areas of Glen Elder Reservoir. These perennial plants spread by thick creeping rhizomes and by seeds, forming dense vegetative stands with three- to four-foot-long stems and floating leaves. Biologists hope these areas will allow adequate forage production and provide cover for young and adult largemouth bass. *Ken McCloskey*

NATURE

BADGER FACTS

With its powerfully muscled body, long claws, and webbed front toes, the badger is a digging machine. Its stubby legs and flattened body make it a tough opponent for other animals.

Badgers are found throughout Kansas, except in the southeast corner of the state. They are especially common in the sandy grasslands of central Kansas.

Badgers mate in late summer or early fall, but the young are not born for about eight months. In April or May, female badgers give birth to about four scantily furred young. Their eyes remain closed for about four weeks, and they nurse the female's milk until they are weaned to solid food at eight weeks. From late August to early October, the young badgers learn to hunt. Soon after that, they leave the mother's home range in search of their own territories.

Badgers are mostly nocturnal, foraging in the dark for small mammals. They do at times venture out during daylight hours, but avoid extreme heat. Their most common foods include pocket gophers, ground squirrels, mice, rabbits, and occasionally insects.

In winter, badgers stay closer to their den entrances, often straying less than 200 yards. Summer outings may cover two miles or more and include overnight stays in numerous dens.

Badgers may modify the burrows of prairie dogs or other animals, but they are well equipped to dig their own tunnels and often do. A badger den may have more than one entrance and several smaller tunnels branching from the main one. They usually construct a central room in the den measuring eighteen to twenty inches across.

In the wild, most badgers live no longer than four or five years. In captivity, they may live up to fifteen years, but they are powerful wild animals which should not be kept as pets. *Manes*

CHIPMUNK AID

The Kansas Fish and Game Commission's eastern chipmunk reintroduction project is receiving a boost from an urban Kansas City woman. Becky Hossfield has been assisting the program in an unusual way — by getting right into the act.

Chipmunks, once abundant in extreme eastern Kansas, are now uncommon. Their decline was likely due to urbanization and other habitat alterations.

Reintroduction efforts began in 1983 with chipmunks that were purchased from Jefferson City, Missouri and released on the zoo grounds at Emporia and in surrounding parks. Efforts were made in 1984 to find a local population of trappable chipmunks near Kansas City. After scouting suitable areas, live trapping was attempted at Swope Park in Kansas City, Missouri. Two days of intensive trapping proved unsuccessful and the reintroduction project was temporarily halted.

It wasn't until the spring of 1985 that things were unexpectedly unshelved. Mrs. Hossfield, a Johnson County, Kansas resident, contacted the Kansas Fish and Game office in Kansas City regarding an "overabundance" of what she suspected to be eastern chipmunks. The report was investigated by Terri Shuman, urban wildlife biologist with Kansas Fish and Game. Ten family groups were found to inhabit the half-acre urban yard. It was then just a matter of live trapping the chipmunks so they could be relocated.

Mrs. Hossfield enthusiastically undertook the trapping herself. She baited the live traps with peanut butter and waited patiently for a chipmunk to become hungry and curious enough to investigate. In just a few days, the first one ventured into a trap. Shuman collected the trapped chipmunks and transported them to the Kansas University Museum of Natural History Reservation in Lawrence.

Eric Cleveland, a graduate student at the University of Kansas, held them a few days for observation and individual indentification, and then released them. He is studying chipmunk social structure and general ecology.

By early September, a total of ten chipmunks from Kansas City had new residences in Lawrence. These join 17 others that were purchased from Missouri and released. Future plans for the project include continued trapping and releasing and population monitoring studies.

The chipmunk is returning to many areas in eastern Kansas, thanks to private contributions to the Chickadee Checkoff Program, also called the Nongame Wildlife Improvement Program, and enthusiastic individuals like Becky Hossfield. Mrs. Hossfield will continue to live trap until late fall. She says the chipmunk trapping experience is "kind of like Christmas. I'm having a ball." *Mary Kay Spanbauer*

RATS!

Rats are tough. How tough?

Rats can: Plummet five stories to the ground and scurry off unharmed; swim half a mile and tread water for three days; wiggle through a hole no larger than a quarter; and even survive being flushed down a toilet, as well as enter buildings by the same route. *International Wildlife*

REHABILITATION

Across Kansas, dozens of concerned individuals donate their time, energy, and money to rehabilitate injured and orphaned wild animals. Hawks, deer, raccoons, and other wildlife are found at these specially permitted rehabilitation centers, which must be equipped with proper holding facilities and operated with the expertise to ensure the health of the animals.

Though rehabilitation programs offer little direct benefit to most wildlife populations (the well-being of a species seldom hinges on an individual animal), they do provide people with unique, up-close learning experiences with the animals. Kansas' licensed rehabilitators are generally careful not to promote close kinship and feelings of personification toward the animals with which they work.

One such rehabilitator is Lucile Robinson of Burns, Kansas. She is a registered nurse who donates her free time to working with children involved in 4-H wildlife projects, and she uses animals in her rehabilitation program to teach the youngsters about nature. Last year, Lucile received special recognition from the U.S. Fish and Wildlife Service for her work.

"I take the animals off the hands of people who don't know what else to do with them," Lucile says. "I let the children touch and see the very young animals, but my goal is to return them to the wild, so I don't want them to be imprinted."

Lucile buys expensive doe replacement milk to nurse fawns which frequently come under her care. Other animals also require special expensive treatment, which she provides from her own resources. *Manes*

NOTES

WILDTRUST UPDATE

The Kansas Fish and Game Commission's Wildtrust Program allows people to donate property, money, or even their time to wildlife management in the state. To date, the program has allowed more than 10,000 acres of land to be opened for public hunting, fishing, and other outdoor recreation. The $1.8 million value of that property is augmented by $329,000 in cash, $123,000 in other properties, $18,000 in services, and other valuable contributions to the management of Kansas' wild resources.

Many of the contributions to the Fish and Game Commission are received through the provisions of wills and estate settlements. Others are given while the donors are still living. Tax benefits are available for most donations made through Wildtrust.

Some of the major land donations include portions of the Mined Land Wildlife Area in southeast Kansas. This gift from the Gulf Oil Company and the Pittsburg-Midway Coal Company covered more than 8,000 acres. Other land donations include 800 acres in Phillips and Smith counties in memory of Francis Wachs; a 31-acre river access site in Kansas City from Sam Schultz; and the 83-acre Green Wildlife Area, donated by Mrs. Virgil Arnold. Several direct land donations are currently being processed

Other contributions include $12,000 from the Safari Club International for the reintroduction of roughed grouse; a $5,000 boat, motor, and trailer from a fishing enthusiast; engineering services that would amount to several thousand dollars from the Coleman Company; $5,000 in confiscated guns from the Wichita Police Department to be used in hunter safety training; $3,000 to establish a hardwood grove at Webster Reservoir in memory of Alan Collins; $4,000 to use at the Milford Fish Hatchery from the Frank Kluckner family; a $3,000 shooting range at Cheney Wildlife Area in memory of Mark Fornshell; $800 in memory of Herbert Reay for use in the Milford Conservation Education Center; $1,000 from the Clem Gillespie family to commission a painting from which Fish and Game may distribute prints; and $500 each to commission paintings for prints in memory of Judge Don Musser and Trent Princ.

Items donated through the Wildtrust Program may carry special stipulations for such considerations as land management, use of funds, and memorial recognition. More information is available from the Wildtrust coordinator at the Kansas Fish and Game headquarters in Pratt. *Manes*

UPS & DOWNS

American hunters and anglers spent over half a billion dollars in license and permit fees — a new record — to pursue their sports in 1984. According to information from state wildlife agencies, $552 million was spent in 1984 for the purchase of hunting and fishing licenses, tags, permits, and stamps. The total number of license holders, however, dropped slightly from 45,503,447 in 1983 to 45,034,168 in 1984. In Kansas, 248,880 sportsmen spent $4,548,882 on licenses and permits. Interestingly, the amount spent on these items comprises less than seven percent of the total spent by hunters and anglers on their pastimes. Most of the money they spend goes into the general economy. *USFWS*

PLANNED SAFETY

Since its origin in 1973, the Kansas Hunter Safety Education Program has grown to include the efforts of 2,850 volunteer instructors. They certify 14,000 students annually and have certified 200,000 since the beginning.

For the program to continue to grow, new ideas and teaching techniques must be introduced. This was done at a series of Hunter Responsibility/Ethics workshops held this year to introduce instructors to new teaching techniques.

A Strategic Planning Committee made up of instructors and Fish and Game personnel was formed and met several times to complete long-range plans for the Hunter Safety Program. Revision of the instructor and student manual was discussed, and a deadline for completion was set for early in 1986. The revisions will include, information on the use of drugs and alcohol in hunting, the use of steel shot, and the use of sidearms and muzzleloaders in hunting big game.

New shoulder patches and flourescent orange certificates made of a water-resistant material will be available this year. A new entry plan for students and instructors into Fish and Game computer system has been completed and will make retrieval of required information readily available. *George Schlecty*

WHIP HONOR

Bud Crumrine has been with the Kansas Fish and Game Commission for nearly 30 years. Like other wildlife conservation officers, Crumrine has spent a great deal of his time at non-law enforcement duties. In particular, he has been instrumental in the success of the state's Wildlife Habitat Improvement Program (WHIP), which is designed to develop quality wildlife habitat on private lands.

WHIP requires good relationships between Fish and Game representatives and landowners, and Crumrine has been tireless in his efforts to work with farmers and ranchers. According to a report from WHIP Coordinator Don Dick, Crumrine's work has resulted in the enrollment of more than 40 northwest Kansas landowners and 19,100 acres in the program. The enrollments have led to the planting of more than 31 acres of native grass, 26,000 trees, and many food plots in the area.

Fish and Game Director Bill Hanzlick told Crumrine, "This award, in a small way, shows our appreciation of your contribution and long-term commitment to the future of our Kansas wildlife resource."

Crumrine gave credit to the landowners in the area for their concern for wildlife, and he noted that other Fish and Game employees had contributed to the successes. He pointed out that 85 percent of the hunting in Kansas occurs on private land, emphasizing the importance of farmers and ranchers in wildlife management.

"Without the help of these private citizens," concluded Crumrine, "the WHIP program could never accomplish what it has been established to do." *Manes*

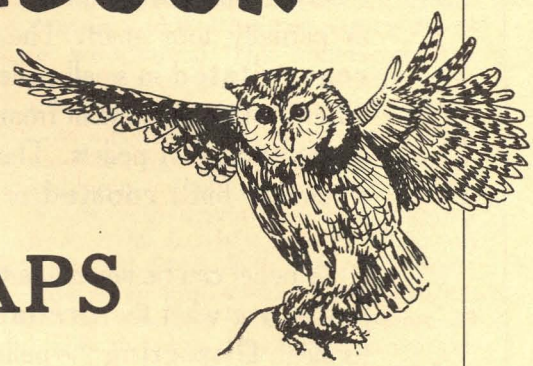
WISDOM

"Nature is full genius, full of the divinity; so that not a snowflake escapes its fashioning hand."

Henry David Thoreau

NATURE'S NOTEBOOK

by Joyce Harmon Depenbusch
Wildlife Education Coordinator
Kansas Fish and Game Commission



FLYING MOUSETRAPS

They don't call owls "Mother Nature's mouse traps" for nothing — their massive beaks and powerful talons allow them to catch their **prey** with ease. Special wing feathers with soft-fringed edges make their flight silent. This helps owls to sneak up on their meals without being heard. They have specially shaped flat faces that funnel sound to their ears. Some species have one ear opening lower than the other for better direction sensing.

Owls are able to turn, or **rotate**, their heads about 270 degrees. This lets them see a wide **spectrum** from their **perches**. How far can you turn your head without moving the rest of your body? About how many **degrees** is that?

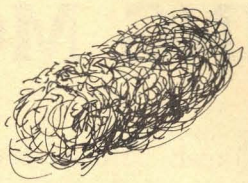
Many owl species are **nocturnal**, or active at night, and so are most of their prey **species**. Owls have large eyes that allow them to use all available light, even at night when very little is present. Burrowing owls, on the other hand, are **diurnal**, or active during the day. They make their homes in old prairie dog or badger burrows, and eat mostly insects and other small animals.

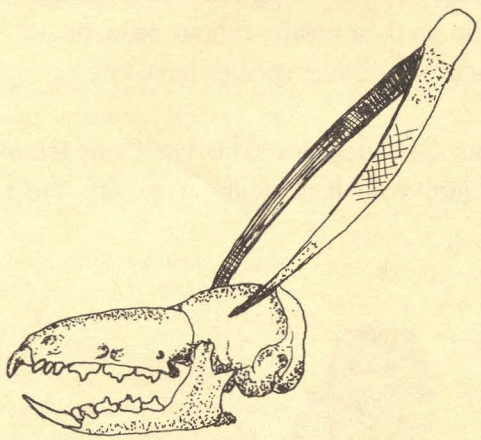
Kansas has about ten species of owls. The great horned owl is the largest and most common. They nest earlier in the year than most other birds in Kansas. The great horned owl doesn't really have horns, but tufts of feathers on its head. Screech owls and saw whet owls are the smallest Kansas owls. The barn owl is nicknamed "monkey face", because it has a heart-shaped, white face. They help people by reducing rat and mouse **populations.**

BUNDLE OF BONES

Owls and hawks eat voles, mice, shrews, and other small animals. They eat their food whole or partially torn apart. The portion of the food that is **indigestible,** or can't be eaten, is **regurgitated** in small pellets. A **pellet** is a gray mass of fur, bones, and feathers. Pellets may differ in size and content from one species of owl to another. Hawk pellets tend to be more loosely packed than owl pellets. These bundles of "leftovers" can be found under nest sites or in areas where the birds **roosted,** or rested, during the day.

A pellet can be taken apart with tweezers to discover what the **predator** caught for its meal. **Dissecting** the pellet can be made easier if it is soaked in warm, soapy water for an hour.

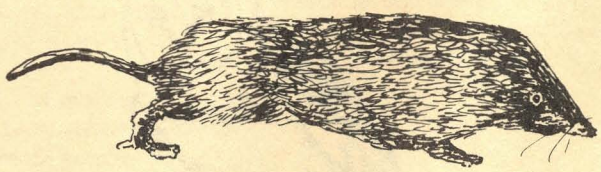




To do this, carefully sort the contents of a pellet into groups. The groups may include: **skulls, vertebrae, pelvis,** miscellaneous bones, feathers, hair, etc. Bird bones are different from those of mammals because they are hollow (that makes the bird lightweight for flight). Skulls will be the easiest of the pellet contents to identify. Further sort the skulls by the kind of animals they belong to. A field guide to Kansas mammals will help you identify, or **key,** these species.

The remains of white-footed mice, deer mice, voles, and shrews are frequently found in pellets. The skull sizes vary from about 28 millimeters long and 14 millimeters wide for the mice, to 28 millimeters long and 16 millimeters wide in voles, and 16 millimeters long and 7.5 millimeters wide in shrews. Mice are **herbivores,** or plant eaters. Voles and shrews are **omnivores,** meaning they eat both plants and animals.

Voles are generally larger than mice. They are stocky, with small eyes and large heads. Kansas has prairie, meadow, and woodland voles. The least shrew is the smallest mammal in Kansas, with a total body length of about 78 millimeters.



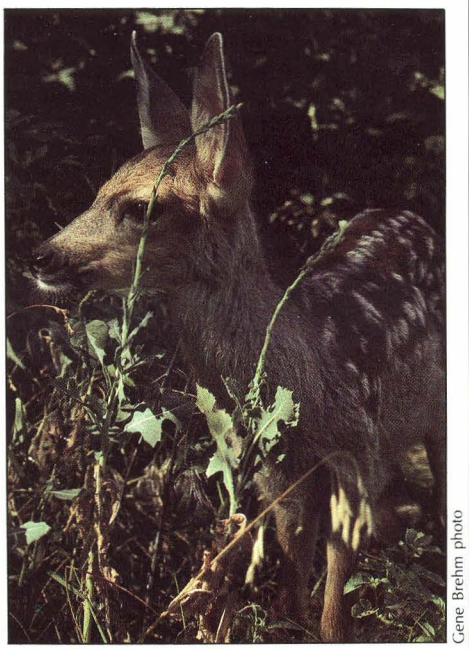
whitetail harvest was six, the lowest in 20 years of hunting. In 1984, 37 percent of the whitetail harvest was does, indicative of an attempt to stabilize the whitetail population. On the other hand, an attempt is being made now to increase mule deer numbers by protecting the does. The proportion of does in the 1981-1984 mule deer harvest was only eight percent.

In Kansas, the mule deer presents a harvest management challenge because its behavior makes it more vulnerable to hunters. The mule deer inhabits open grasslands in western Kansas and is a more trusting animal than the whitetail. Until 1979 there was no differentiation in species for harvest goals in the western Kansas deer range. Since the reopening of deer hunting in 1965, the mule deer was the primary species in the western units and there was no reason to consider harvest goals for individual species. Whitetails comprised less than five percent of the total deer harvest in the western units in those early years.

But by the mid seventies, whitetails made up about 25 percent of the western harvest. The whitetail was expanding its range into traditional mule deer country and increasing resident deer numbers. Permit quotas and harvest goals were subsequently increased, but without species differentiation. The result was that hunting pressure increased on the mule deer rather than being apportioned to both species. In 1979, "whitetail only" permits along with "either species" permits were issued. In an attempt to increase the mule deer population in eight western management units, the mule deer doe is protected by issuing "bucks only, either species" permits; and, in an attempt to stabilize the whitetail population a combination of "any whitetail" and "antlerless only whitetail" permits are being issued. This system has resulted in whitetails comprising 60 to 90 percent of the deer harvest in the traditional mule deer units.

When most Kansas deer hunters go afield, they have a vision of harvesting a "trophy" deer. To most hunters that means an antlered deer having 10 points or more. The present deer management program in Kansas is designed to provide the opportunity for a hunter to harvest a trophy buck if he directs his hunt at achieving that goal. The herd cannot be managed in a way that will place a trophy buck in the sights of every hunter, (at least not without drastically reducing the harvest *and* the number of hunters). Still the chances for a trophy buck in Kansas are better than in most states and, in fact, may be the best in the nation for big whitetails!

Management of trophy bucks in Kansas means allowing animals to reach 2½ years of age or older. Kansas bucks are not lacking nutritious food, so time is all they need in order to grow sizable antlers. Bucks from 3½ to 7½ years old develop the largest racks. Age data are necessary for monitoring the effects of harvest on a population's age structure. To do this, tooth envelopes are provided each firearms deer hunter and he is requested to submit to KF&G the two primary incisors from the harvested deer. By visual inspection the fawns and 1½ year old deer are sorted from the adults. A sample of the adult incisors are sectioned and microscopically "read" for age. The age is determined by counting the number of growth rings or dental cementum annuli, much like counting the annual growth rings for the age of a tree.



Gene Brehm photo

This fawn is only a few weeks old. If it is a buck, it may live to be four or five, perhaps older if it is very lucky. In a hunted population, does live longer, but rarely exceed nine years of age in the wild.

The mule deer buck age structure for the last 13 years has averaged 70 percent yearlings, 20 percent 2½ year-old deer, and 10 percent mature (3½ years or older) animals. Whitetail bucks for the same time period averaged 60 percent yearlings, 20 percent 2½ years, and 20 percent 3½ years and older. This type of age structure provides a good balance between young deer and trophy-age bucks.

Hunters and non-hunters alike benefit from a healthy deer herd. Last year deer provided nearly 344,000 man-days of hunting recreation for 42,000 deer hunters and untold days of enjoyment by the non-deer-hunting public. One third of those questioned in a telephone survey of 500 randomly-selected Kansas citizens said that deer were their favorite wild animal. This underscores the need for total public input when considering deer management programs.

As a consequence of increasing deer numbers, harvest goals, hunter success and hunter numbers have all increased. Numbers of bowhunters have jumped from 1,100 in 1965 to over 15,000 in 1984, and the ranks of firearms hunters have grown from 4,600 in 1965 to 30,600 in 1984. Hunters have also experienced higher and higher success rates over the last 20 years of deer hunting: Archers had 14 percent success in 1965 compared to 31 percent in 1984, while firearms success was 38 percent in 1965, 68 percent in 1984. Harvest and hunter success information is obtained from questionnaires provided each deer hunter.

As the number of permit holders increases, we are satisfying a greater proportion of the Kansas hunters who want to pursue deer. But concurrently there is the potential for a reduction in the quality of each hunting experience. The density of archery hunters has increased from three hunters per 100 square miles in 1966 to 16 in 1984; firearms hunters have increased from 8 per 100 square miles in 1968 to 41 in 1984. These figures are expected to continue upward in coming years. With increasing densities of hunters, the number of potential hunter conflicts also rises.

The definition of a "quality" hunting experience is different for each hunter. For some, a quality hunt depends solely on the environment in which the hunt takes place. For others the kill is of paramount importance. Still others feel quality is related to observing deer, especially antlered bucks. And many hunters just want solitude in the woods. KF&G has a responsibility for controlling the sport of deer hunting and must maintain some standards of "quality" for the deer hunter. Our laws and regulations are not only a tool for managing hunter harvest, but they also establish some baseline for hunter ethics and hunting quality. As hunter numbers and hunting conditions change, laws, regulations, and policies will also change in order to maintain some degree of quality and ethical behavior in the sport of deer hunting. For some, the words quality and ethics are foreign, but if deer hunting as we know it today is to survive into the 21st century, all hunters will need to examine old habits and ideas and be prepared to change them.

Gene Brehm photo

A lot of hunters don't like to shoot does, but careful cropping of females is necessary to maintain proper age and sex ratios in our deer herd. Antlerless quotas are determined for every deer management unit after biologists have assessed the need for doe harvest.

Habitat Improvement

Habitat is defined as those environmental factors a species needs to survive and reproduce in a given area. These factors include food, cover, and water. The numbers and distribution of any animal are limited by the quantity of suitable habitat. Habitat management in Kansas has two basic objectives: (1) to maintain quality habitat in its present state, and (2) to improve habitat where it has deteriorated.

Though Kansas has a great variety of deer habitats, management is directed at two main types — woodland and rangeland. Here are some of the strategies we use in each: Dense stands of mature timber where understory cover is sparse are treated by selective timber harvest or thinning. This removal of trees will open the overstory canopy, allowing sunlight to penetrate and stimulate the growth of understory vegetation (shrubs, forbs, grasses). These clearings will provide the successional stages of vegetation growth so important for deer. A number of well-scattered openings is more desirable than one large opening. The size and distribution of openings is determined by the size and shape of the timber stand to be treated.

Woodland edges are planted to a variety of plant species to maintan diversity and natural succession. Cropfield borders, when planted to woody cover or given over to advanced succession, offer good travel lanes for deer. Non-tillable draws and ravines can also be planted to shrubs, forbs, and grasses. In western Kansas, these areas provide needed mule deer fawning sites.

Grazing of woodlands by livestock is discouraged. Livestock compact the soil and trample, eat, or otherwise destroy important understory vegetation. Fencing of woodland areas is encouraged. Brushy, ungrazed draws in western Kansas are premium mule deer cover and need to be protected from use by livestock.

Rangeland management for deer includes the establishment of grazing programs that maintain grassland vigor and quality. This benefits livestock and deer. When burning is used, selected areas of brush are protected. Maintenance of brushy draws and ravines as well as grasslands is particularly important for mule deer in western Kansas. Field corners and other waste pockets should be allowed to grow into weedy, brushy sites to create mule deer cover. Such areas include abandoned farmsteads, rainwater basins, and pivot irrigation corners. All can provide fawning sites and winter cover.

In both woodland and rangeland settings, burning is an important tool in maintaining successional stages. Controlled burns are beneficial for all wildlife if done at the right time and in the proper way. Mowing and disking can also be used to establish early successional stages and maintain desired species compositions and densities.

Besides enhancing the stands of natural foods (browse, forbs, and grasses) through woodland and rangeland management, we can plant agricultural crops near deer cover. One- to three-acre food plot plantings of corn or sorghum in an area of winter deer cover will supplement natural foods and draw the animals from great distances. Even crop residues next to wintering areas provide a good source of winter food, if those residues are not fall-plowed.

Though winter blizzards in western Kansas can cause hardship for deer, supplemental feeding under these conditions is generally not advisable. The practice of supplementally feeding deer can be expensive and most often is not done until after the deer begin to show signs of malnutrition. If the artificial food differs greatly from that which the deer has been using, the microflora of the stomach are unable to process it. The deer is then likely to die. Winter food sources are beneficial when established before winter weather can create hardship for the deer population.

The key to successful deer management is to create proper habitat — as much edge and interspersion of cover types as possible.

HUNTING

Deer in Kansas are managed for a number of reasons. They're pretty animals, and photogenic. People like to see deer, so we all want a few around. On the other hand, not all farmers want to feed deer, and nobody wants to hit deer with their automobile. That means we don't want too many deer. Biologists are also concerned with things like deer distribution, health, and genetics. They want a good deer herd, not just a big one or a little one.

What is a good deer herd? It's many things, but one of its characteristics is that it needs periodic cropping. That means hunting. Letting deer die of old age not only wastes these animals, but their habitat takes a beating in the process, and the herd members suffer genetically if the practice continues. In modern Kansas, there are more things that keep deer alive than there are things that kill deer. So, if the herd is to remain healthy, of good genetic character, and the size we want it to be, it must be trimmed. Management is, after all, wise manipulation of populations. It is not merely protection; nor is it only a reduction of surplus. That we have one of the healthiest herds in the nation says a lot for our management and managers.

It may seem a bit out of character for people who like to see deer and who give a lot of money each year to Kansas' deer management program to get any pleasure from shooting them, but that's what happens each fall. Sportsmen from all over the state save up vacation time

and dollars to chase the elusive big-racked buck through timber and over prairie. They do it because they like to hunt and because man evolved a hunting animal. Happily, their sport is in concert with what is best for the deer. And they willingly lay down their weapons when the season is over, knowing that controlled harvest is good, but that overkill is, like full protection, not in the best interests of the herd.

Hunting Methods

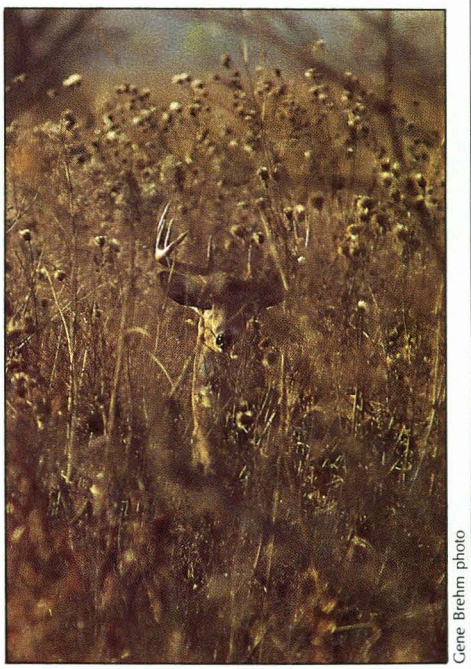
Whether you're a beginning Kansas deer hunter or a seasoned woodsman — or perhaps someone who'd just like to know a little more about deer hunting — a review of tools and techniques is in order. Let's start with techniques.

Many Kansas hunters prefer to hunt out of a tree stand, and of the methods legal, this is no doubt the most effective for whitetails. These deer travel established routes at loosely established times. Except for escape trails, such routes are visible even to a casual observer. Waiting alongside one of these trails long enough is sure to reward you with the sight of a deer. Waiting in a tree stand is better than waiting on the ground not because you have a wider field of view but because you are above the wind currents that telegraph your presence to deer.

A tree has to be special to make a good or even serviceable blind. Not only must the tree be within shot range of the trail, but it must afford you some flexibility should the deer appear from right or left, walking or moving fast. You must have clear shot lanes in both directions at several different points and distances. You can't shoot well if you're looking into the sun, so the tree must be to the sun side of the trail at the time you expect the deer to come along. Whether you opt for a platform or simply stake out in a large crotch, the blind must be easily accessible. You don't want to make a lot of commotion when you climb up or down, and since your most productive hunting hours are early and late, you'll be going up or down in the dark. Safety is important, and your blind must be stable. A safety belt is a good idea, too. Another thing you should think about is how high to go. If your feet are ten feet off the ground, you're not only above the deer's normal line of vision, but are high enough that the animal is unlikely to smell you. Thermal winds may drag your scent down, and if you don't take normal precautions to minimize your odor your scent pool may still be detectable; but remember, the less severe the shot angle, the less likely you are to miss — especially with a bow!

Deer like cover. Whitetails will travel through heavy brush or timber before they'll venture into the open, especially during the daytime. They may feed in crop fields at night, but you won't see them there during hunting hours. You can tell the purpose of deer trails by studying them. If you find a path that's heavily used, with all tracks going from heavy cover to more open areas, it is likely to be a feeding trail, used at dusk by deer moving from their beds to forage. If the tracks lead from the fields to cover, your best bet on that trail would be in the morning as the deer move to bed. Escape trails are not so plainly marked, but they play an important role. Rarely is a deer far from security cover, and it knows instantly how to get there. Escape trails aren't good ones to watch unless you're hunting a very crowded area where other hunters may push deer to you along such routes.

You hear a lot about scrapes nowadays, though deer have been making scrapes for years. A scrape is a dished area in the earth where a rutting buck has marked his territory. One buck may make several scrapes in an area. Commonly they are around the perimeter of and just inside a woodlot or shelterbelt. Most of the time they are on trails or near trails. Scrapes are made just prior to and during the rut, though they may remain visible long after. A rutting buck will visit his scrape periodically and work it. Usually this involves urinating in it, pawing it up, and perhaps raking overhead branches with his antlers. Almost all scrapes are located under low branches, and the buck will hook his antlers in these twigs, twisting them this way and that. He'll get up on his hind legs to reach them, if need be. Often he'll rub the tip of a branch with the front of his eye, where his preorbital gland is located. This is thought to be an act of territoriality. Most scrapes also show one clear hoofprint of the buck that visited them. This hoofprint can be a great help to you, as it gives you an idea of the body size of the local buck. If you're hunting for a big set of antlers, it pays to look for big tracks — albeit there is not always a direct correlation.



Gene Brehm photo

Deer are not as tall as most people think, the average height being only about three feet at the shoulder. You'll see more deer if you look low.

The last half of November is the normal rutting season for both mule deer and whitetails in Kansas, though the peak varies with locality. While mule deer are not territorial and do not make scrapes, they go through the same physiological and psychological changes whitetails do. That is, their necks get big and they become more active, eating less and traveling more — especially during the day. They're not as cautious in the rut, either, and because Kansas' firearms deer season falls at the end of this period, a lot of big bucks are taken that would escape hunters during other times of the year. Hunting the rut is exciting because you see a lot of deer. More specifically, you see many more bucks than at other times. Whether you are after antlers or not, watching those heavy-racked males chase the does or work their scrapes or just trot down the trail a few feet from your blind is great fun.

Whether you hunt scrapes or trails, scouting is an important part of your efforts afield. If you want to see deer, you must know enough about their habits to predict where they'll be and station yourself there. It does no good to walk through the woods on opening day, hoping to find a well-used trail or fresh scrape. You won't know anything about the deer using the area or when they are likely to pass by your stand. The most successful hunters spend many days afield before they pick up their weapons. It makes them more familiar with their hunting territory as well as with the local animals. They get to know the deer individually and can tell if there's a big buck in the area. Scouting helps them make the most of their time during the hunting season, when time is at a premium.

Stand hunting is not the only way to hunt deer. In fact, it may not be the best way to hunt mule deer in Kansas. Stand hunting is effective on whitetails because they are habitual in their travels and generally frequent small areas. One or two sections of good cover is plenty of

territory for whitetails. Mule deer, on the other hand, range more widely and are less apt to stick to well-defined trails. They prefer more open country than whitetails, too, though in heavily-hunted areas they are learning the value of dense cover.

One of the most rewarding ways to hunt mule deer, and a challenging approach to whitetails, is still hunting. Still hunting is *not* remaining still. That's stand hunting. Still hunting is moving very slowly and quietly through cover, hoping to spot a deer browsing or even bedded. Because these animals are so well camouflaged themselves, and because their senses are so keen, the odds are stacked against you when you still hunt. Many times you'll pass by deer that elect to stay hidden rather than bolt into the open, or you'll spook your quarry so far ahead that all you'll see is a white tail or rump patch. Still hunting is sneaking, and you must be very good at it if you expect to get close to a deer without giving yourself away.

Hunting season is a hazardous time for bucks like this, though more often than not they're able to elude the red-clad rifleman. Deer hunting can be a challenging sport and is a necessary part of Kansas deer management.

Another deer hunting method Kansans use is driving. Driving is best done with a sizable but not unwieldy group of sportsmen who agree to hunt cooperatively in an area. Half a dozen hunters can effectively drive a small woodlot or shelterbelt. It's best if all have at least a

rudimentary knowledge of the area and essential that one be given the job of organizing the drive. Most drives are made by half the hunters involved, while the other half act as standers, posted on the edges and far end of the cover to be driven. The best drivers hunt as if they were still hunting: slowly and quietly. Noisy drives not only ruin the atmosphere of the hunt but alert deer far in advance of the drivers that something is amiss. These deer will likely hold tight, pinpointing the exact location of each driver as he moves. Many deer slip between drivers and end up behind the line without anyone knowing about it. They can do this more easily if the drivers are making noise. A quiet drive is much more effective, as each driver is actually hunting, not just bulling through cover. Not only do the drivers have a better chance of seeing deer, but the standers are rewarded with deer that can't tolerate the suspense in the thick stuff and try to leave. All drives should be conducted in a crosswind if possible, for the benefit of both groups of hunters. If the country dictates that a drive be made parallel with prevailing breezes, the standers should always be placed downwind. Driving is an excellent way to get at deer in their bedding sites, where still hunting is often futile and stand hunting impractical.

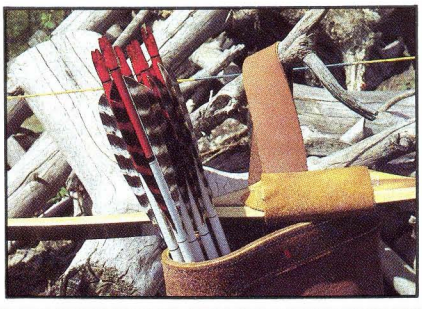
Spotting a deer is only part of the hunt. To kill your quarry quickly and humanely you must make a good shot. That means placing your first arrow, ball, slug, or bullet in the proper place — right behind the shoulder and about a third of the way up from the lower chest line. A hit here will destroy little meat, as your projectile penetrates the rib cage to the center of the lungs. The lungs, besides being vital organs, are large ones, and much easier to locate than heart or brain. A head shot will spoil a trophy, and bullets directed to spine or shoulder will ruin much meat. Always shoot for the lungs, and try very hard to make the first shot good. Wait, if you must, for the animal to come closer or present a better target angle. Don't shoot at running deer until you've practiced considerably on moving targets. Adhere to reasonable range limitations. By making every shot a lethal one you'll not only improve your success in the woods, but you'll help reduce crippling losses that rob everyone.

After you shoot, watch that deer and prepare to shoot again. If the animal is far away, you may not see a reaction; if close the recoil may hide it. Running deer often show no response to a bullet strike. Hits can be audible but are not always, and seldom will you see hair fly. Don't *expect* the deer to go down at the shot unless you destroy brain, spine, or major bones. A good hit, a one-shot kill, is not necessarily an instantaneous knockout. There is no way to predict exactly what effect your shot will have, so it's best to call your shot as well as you can, shoot again if the deer gives you another chance, and check the target site for hair, even if you think you missed. Many fine animals are left in the woods by careless and ignorant shooters who failed to check after they pulled the trigger. *Always* check.

A footnote on hunting methods: It's good to think, once in a while, about why you want to hunt deer. If it's just to gather meat or to tag a big local buck before someone else does, you may try the most effective legal means you can. But you're missing something if you do. There's a lot of sport and adventure in deer hunting if you do it right. Voluntarily making things tough on yourself can put spice into what some still consider just an exercise in killing. Regardless of hunting motive, the deer benefit from controlled harvest, and biologically it matters not to the herd that you shoot your deer in an alfalfa field from the seat of a pickup. Nor do the deer care if you pull all stops to take the biggest local rack so you can brag to the unenlightened that you are the best hunter in the county. But the institution of sport hunting is imperiled today, and it isn't because we've lost biological justification for harvest. It may simply be that too many hunters have lost the mystique of the chase.

Hunting Weapons

The centerfire rifle is the tool most of us think of when we think of deer hunting. But in Kansas it's also legal to use a bow and arrow, muzzleloading rifle, shotgun, and handgun. Here are some of the requisites of each.



Wayne van Zwoll photo

bow and arrow: Archery equipment has undergone great change in recent years, and the most sophisticated bow today is hardly what you would call a primitive weapon. Nonetheless, all bows still depend on flexible limbs for storing energy and a simple string to impart that energy to the arrow. An arrow still kills the way it did hundreds of yeas ago — by hemorrhage — and it is still a short-range missile.

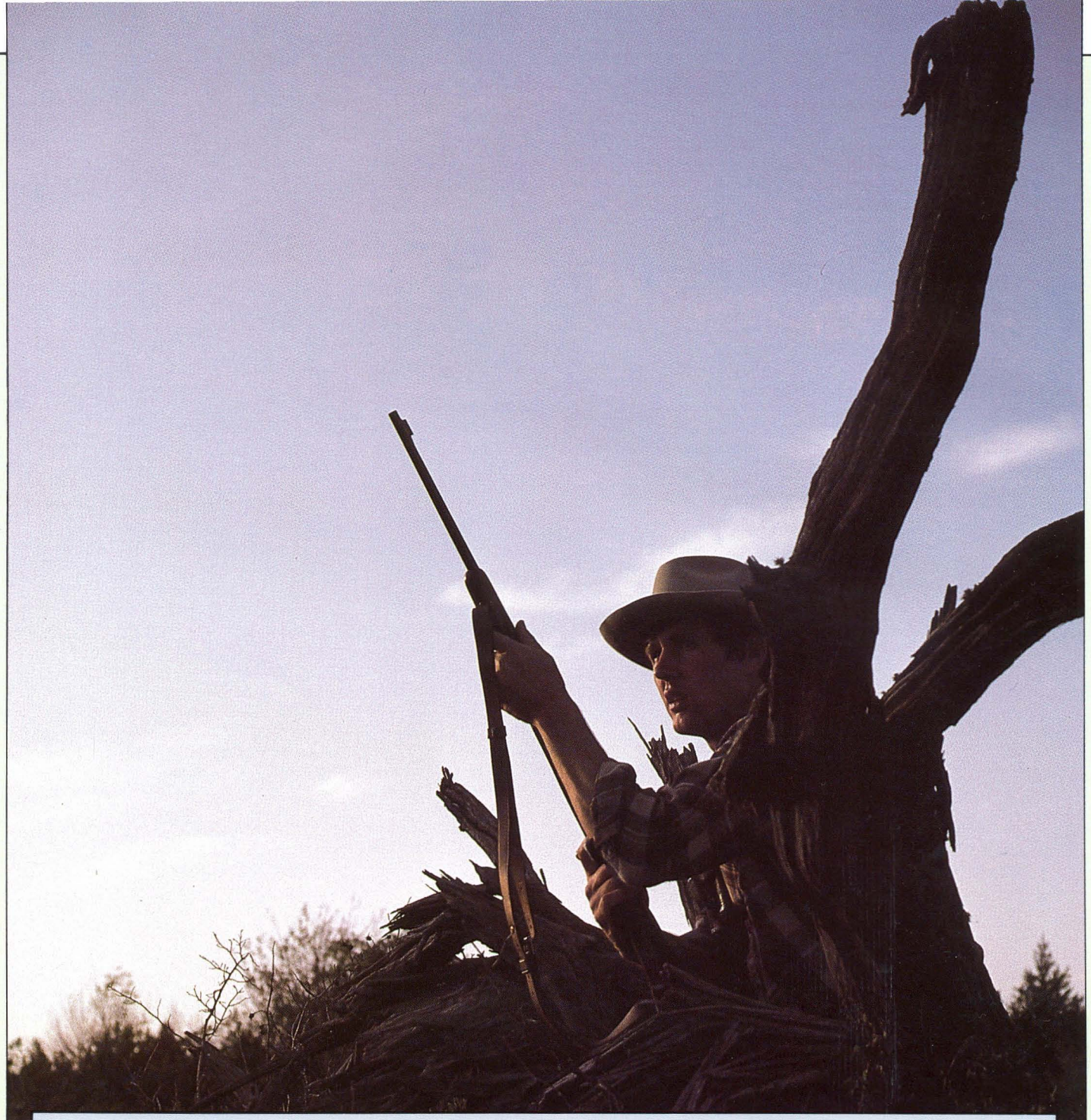
Kansas law requires that all bows used for big game hunting draw at least 45 pounds. Whether you prefer a longbow, recurve, or compound, this weight is ample for deer hunting. What's most important is that you shoot your bow well and keep keen edges on your broadheads. To shoot well you needn't be able to skewer airborne oranges at 90 paces; just make sure you can keep all your arrows in a pie-size target at any range you'd consider shooting a deer. Many archers can shoot that well at very long range — 60 yards or even more. For most of us, though, the effective range of our arrows is closer to 30 steps. And even bowmen who can group arrows tightly at extended yardage would do well to take their shots as close as possible. The rainbow trajectory of an arrow makes accurate range estimation a must beyond 30 yards (a deer standing at 50 will be missed completely if an archer holds for 40), and the long flight time of an arrow allows the deer to move partly or completely out of the way after a shot. At close range the arrow remains an effective weapon. As long as you can estimate range well and do not shoot farther than you can be sure of a lethal hit, you will kill deer humanely.

It's important that you practice shooting a lot before the season. Use animal-face targets at unmarked distances so you'll be able to judge range and pick an aiming point automatically in the woods. Shoot uphill and down. Shoot from a tree if you'll be hunting from one. Shoot from *that* tree several times so you have a feel for the stand and know how far it is to points around it. Make sure, when you do this, that your shot lanes are clear, not only at sight-line, but along the path of your arrow's trajectory.

Keen broadheads are killing instruments. An arrow delivers very little impact shock and destroys no tissue around the wound channel of the head. The broadhead kills by cutting blood vessels and vital organs, quickly draining the deer of life. The edges — especially the rear edges — of the broadhead must be as sharp as razors to prevent elastic tissues and vessels from sliding over them. Sharp, a broadhead is a lethal, humane hunting weapon. There is no place for a dull head afield.

Because an arrow delivers no knockout blow on impact, a deer won't always react to a hit. If it does, it may bolt, then stop and look back. Or it may simply walk away. There is no characteristic reaction to an arrow hit. When you release an arrow, assume you hit your deer

Gene Brehm photo; inset by Wayne van Zwoll



. . . how Kansas deer stack up:

Not only is Kansas hunter success among the highest in the nation, our management programs produce some truly outstanding bucks. Here are the top three deer in four categories recognized by the Boone and Crockett Club, and the number one B&C listing for each.

whitetail deer, typical

world record shot by
James Jordan, Burnett County
Wisconsin in 1914,
score — 206⅛

top three Kansas deer:
Dennis Finger's 1974 buck,
Nemaha County — 200 7/8

Michael Young's 1973 buck,
Chautauqua County — 194

Milton Wellbrock's 1968 buck,
Russell County — 189

mule deer, typical

world record shot by
Doug Burris, Dolores
County Colorado, in 1972,
score — 225 6/8

top three Kansas deer:
Fred Gilbert's 1966 buck,
Rawlins County — 184 2/8

Glenn Meyers' 1984 buck,
Kearny County — 182 7/8

Stan Smith's 1981 buck,
Finney County — 181 3/8

whitetail deer, nontypical

world record found dead
in St. Louis County
Missouri in 1981,
score — 333 7/8

top three Kansas deer:
John Band's 1965 buck,
Republic County — 258 6/8

Theron Wilson's 1974 buck,
Mitchell County — 251⅛

Clifford Pickell's 1968 buck,
Greenwood County — 249 6/8

mule deer, nontypical

world record shot by
Ed Broder, Chip Lake
Alberta, in 1926,
score — 355 2/8

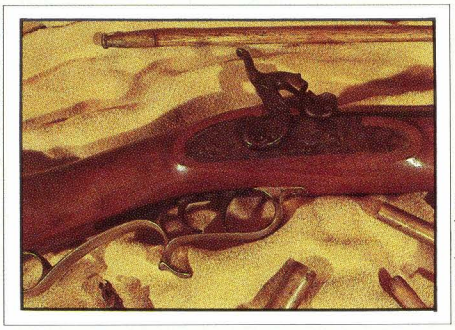
top three Kansas deer:
Lee Ordle's 1966 buck,
Rooks County — 260 6/8

Thad Douthit's 1965 buck,
Cheyenne County — 239 7/8

Herman Lang's 1969 buck,
Finney County — 229 7/8

Wayne van Zwoll photo

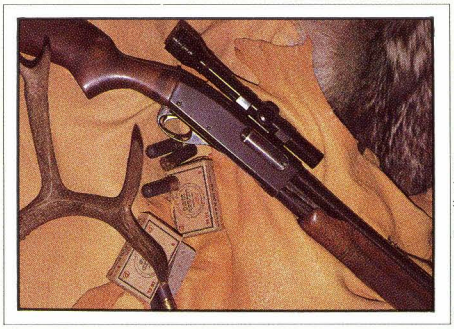
unless you are sure the shaft went wild. Don't move. The deer probably won't know where the shot came from and will not know what is wrong. Even a fatal arrow wound is not initially painful, and if your shot was in the lungs, where it should have been, the deer will not go far. If you approach, though, your quarry may forget about the arrow entirely and flee from you, covering a lot of ground in short order and making your tracking job that much more difficult. As a rule, it's best to wait an hour before trailing an arrow-hit deer, unless you've seen it go down.



Gene Brehm photo

muzzleloading rifles: Black powder shooters are allotted a certain number of rifle deer tags in Kansas and need not compete with centerfire riflemen in the drawing. That's been a good arrangement for the front-stuffers, and taking big game with primitive rifles is growing in popularity. The minimum legal caliber for black powder deer hunters in Kansas is 40. Probably the most popular bore size is .50. These and larger muzzleloaders are capable of taking deer cleanly with either patched round ball or conical bullet. Both flint and percussion guns may be used in Kansas, and the lock need not be exposed. Optical sights are permitted; so is Pyrodex as a propellant. Though Kansas muzzleloading regulations are quite liberal, many black powder shooters shun Pyrodex and conical bullets. Hardly anyone uses a scope. Shooting a muzzleloader, after all, is reliving the experience of early hunters. Authenticity adds to the fun.

A muzzleloader *is* fun to hunt with. It makes you concentrate on that first shot, because it is the only shot you'll have. Though front-loading rifles are quite capable of killing deer at ranges over 100 yards, accuracy and sight limitations restrict effective range to under that. The sluggish flight of the ball or bullet makes proper lead extremely critical on running deer, and the slow lock time of black powder arms mandates a smooth, uninterrupted swing. It's always best to rest a muzzleloader because the tremors in your arm have plenty of time to destroy the shot *after* you pull the trigger.



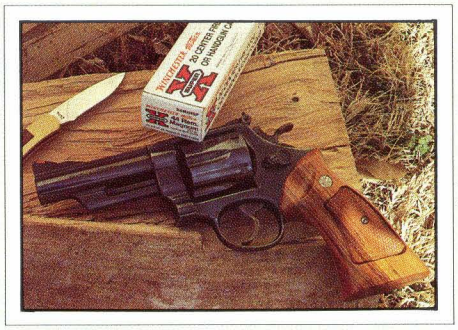
Wayne van Zwoll photo

shotguns: Slugs 20 gauge and larger are the only smoothbore projectiles legal for Kansas deer; buckshot is not allowed. Because shotguns are short-range weapons and slugs don't travel nearly so far as rifle bullets, they are favored for deer hunting in heavily populated areas.

A lot of people look down their noses at shotguns, but they shouldn't. Shotguns have a lot going for them at close range. The slug is a big, heavy thing that doesn't need to expand to get the job done. Pump and autoloading shotguns are not only fast to operate but are also among the most used sporting arms in the state. The fellow who hunts deer with a shotgun probably also uses the same thing to kill pheasants and harass the local quail population. He may hunt rabbits and squirrels with it, or prairie chickens and waterfowl. He probably shoots it at a few clay birds each year, too. In short, he is familiar with it. A lot of deer rifles in Kansas don't get any use outside the first week in December.

If you own a shotgun and want to hunt deer with it, there are a few things you should keep in mind. First, a double — whether over-under or side-by-side — will probably not shoot well for you. It will likely throw slugs from each tube to different points of impact. Much better is a pump or autoloader, preferably with an open choke. A tight choke will not be harmed by the passage of slugs, as the soft lead will swage down easily. But the swaging stresses the slug and may deform it unevenly, resulting in wider groups. Almost all shotgun bores are larger than the diameter of the slug. A tighter fit would help accuracy, but thin shotgun barrels couldn't stand the pressure generated by swaging immediately in front of the chamber. Incidentally, the accuracy of rifled slugs is due to their nose-heavy design. Some spinning of the slug does occur as air is forced through the grooves in its sides, but this is not enough to cause a great deal of rotation with most slugs and is not thought to contribute significantly to accuracy. Slugs out of a pump or autoloading shotgun should group in six inches at 75 yards, and a few will do that at 100. Changing barrels will often improve accuracy, and if you're serious about hunting deer with a smoothbore, you would do well to invest in a short, cylinder-bored barrel.

Sighting a shotgun is different than sighting a rifle. Your eye must act as the rear sight on the shotgun, and most shotguns will shoot high with slugs if you hold them the way you do when shooting at birds. It's often necessary to almost bury the bead in the receiver top to get the slug to print to point of aim. Shotguns for deer hunting are best equipped either with open sights on a slug barrel or with a ramp front and rifle receiver sight combination. Either will markedly boost your effectiveness in the woods. A low-power scope is best of all, and mounts are available to fit most repeating shotguns.



Wayne van Zwoll photo

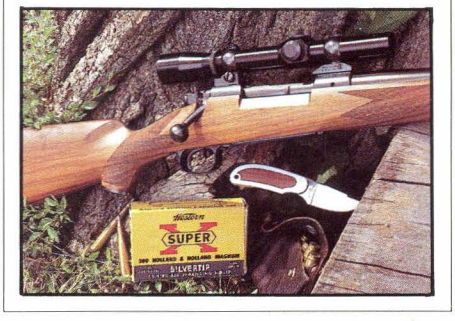
handguns: Pistols and revolvers are the most recent legal deer weapons in Kansas. There are no barrel length or ballistic stipulations, but the cartridge case must be at least 1.28 inches long and the bullet greater than .23 inches in diameter. The .30 carbine round is *not* permitted. As with rifles, only expanding bullets may be used.

Until the sport of metallic silhouette shooting entered the U.S., handguns were considered defensive weapons by most folks. The .357 Magnum had come along in 1935 and the .44 Magnum eleven years later and both had been used to take big game. Still, the development of really potent guns and loads didn't start until silhouette enthusiasts went to work. Now special break-action and bolt-action single-shot pistols are chambered for rounds as powerful as the .308 Winchester. Revolvers like the .454 Casull deliver more muzzle energy than was once thought possible out of a wheel gun. Many handgun cartridges are effective well beyond the yardages at which even practiced handgunners can hit.

Because traditional handgun cartridges like the .357, .41, and .44 Magnums are low-velocity rounds, bullet expansion is not as violent or reliable as with the faster-stepping rifle cartridges.

Some expansion of pistol bullets is desirable, of course, even if those slugs are nearly half an inch in diameter to begin with. Hollow-points with large nose cavities generally give the best upset, albeit ballistic coefficient suffers in bullets of this design. If you're using one of the traditional handgun rounds, you won't go wrong to choose jacketed hollow-point bullets of medium weight. By far the best choice is a rifle cartridge or rifle cartridge derivative in a single-shot pistol. Soft-point bullet performance at handgun ranges will be adequate, and the flatter trajectory will make long-range hits easier.

At one time, adjustable sights were a luxury feature on a handgun. Now not only are all the better open sights adjustable, but receiver sights are available and scopes are becoming more popular. Whatever sights you choose, you'll find it easier to steady them with a firm two-hand hold, preferably over a rest. You might even buy a sling and loop it over your head or forearm — anything to deaden those wobbles! Modern handguns are very accurate, and the cartridges more than a match for deer, but you must be able to bridle that accuracy and direct that power to a vital spot on your target.



Wayne van Zwoll photo

rifles: Kansas law requires that rifles used for big game be a minimum 23 caliber; that's all. So you have a lot of rifles to choose from. The best rifles, though, have some pretty specific things in common. First, they are accurate. No matter what the chambering, your rifle should be able to shoot tight groups — a minute and a half is fine. If your gun won't shoot that well, you're compromising your ability to make long shots. Even if you don't *plan* on taking long shots, you may be tempted when a buck with caribou antlers steps out of a distant shelterbelt. Better to be prepared.

The second requirement of any deer rifle is that it be sighted in — by you. You must know where the point of impact is in relation to point of aim for any distance you'd consider shooting at a deer. If you don't, rifle accuracy is of no consequence and ballistic performance is wasted. Thirdly, the rifle must have a crisp, predictable trigger, one that will let you squeeze off carefully aimed shots without disturbing sight alignment. It needn't be particularly light, just crisp and consistent. Fourth, the rifle must have a good set of iron sights or a high-quality scope. A receiver sight is much better than an open rear blade because of the greater sight radius it affords and because more precise aim can be taken when your eye doesn't have to focus on front and rear sight both. A low-power scope is best of all.

Good deer cartridges are so plentiful now that there are almost too many of them. The .30-30, once the standard for these animals, is no longer high on the list. Many other rounds are more effective — especially in Kansas, where a long open shot is certainly a possibility. Actually, all the cartridges developed before the turn of the century have been eclipsed by racier numbers. Not that newer is always better. The .30-06 is still one of the best deer rounds ever developed, and the .300 Savage remains a fine cartridge for fans of that company's 99 rifle. The 7×57 Mauser and .257 Roberts have made recent comebacks as light-recoiling but accurate and adequate deer calibers.

Among the best cartridges for Kansas hunting, where long and short shots both may be taken, are the .243 Win., 6mm Rem., .250 Sav., .257 Roberts, .25-06 Rem., 6.5 Rem. Magnum, .270 Win., 7×57 Mauser, .280 Rem., .284 Win., .300 Sav., .308 Win., and .30-06 Springfield. Most belted magnums are unnecessarily powerful, though the 7mm Rem., and .300 Win. Magnums have reputations as all-around big-game cartridges. The Weatherby .240, .257, .270, 7mm, and .300 rounds are also superb long-range performers, as is the .300 H&H. Winchesters' old .348 is a fine cartridge for the woods but lacking at long range. The same goes for the similar .358 Win. and .350 Rem. Magnum rounds. New offerings, like the .307 and .356 Win. are springing up everywhere. But with current powders and bullets, any newcomer is bound to nearly duplicate an excellent deer cartridge already on the market. Most remain only because their case design adapts them to a specific rifle. Anyway, the most important thing about a deer cartridge is not its headstamp, but its bullet.

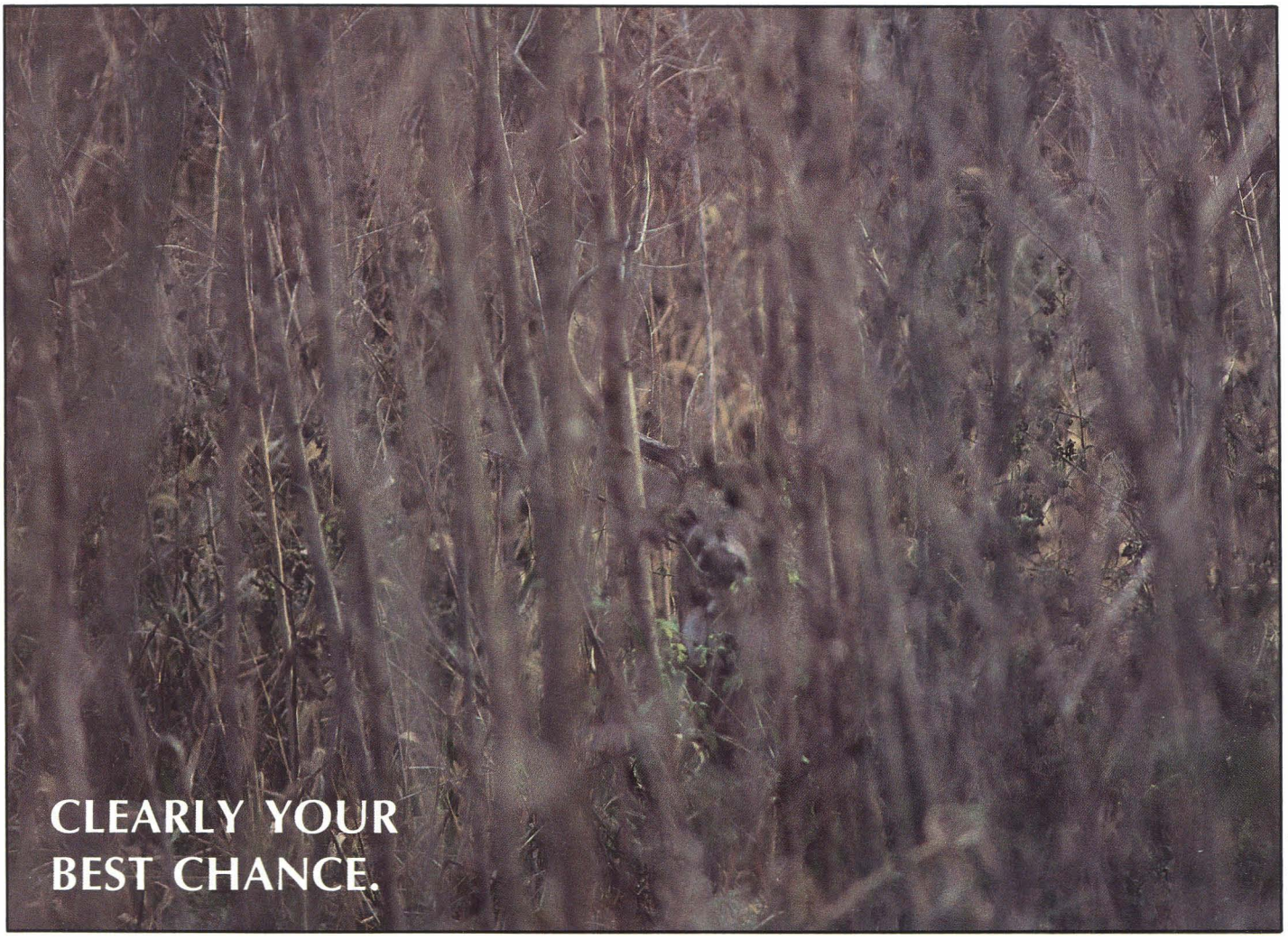
Good deer bullets are ballistically efficient; that is, they have a good form factor, a sleek, streamlined appearance. Round-nose bullets give somewhat more reliable expansion and deeper penetration at close range, but those qualities aren't needed on light animals like deer — at least not in the group of cartridges just listed. More important is the ability of that slug to shoot flat over long distances and accurately at any distance, so you can thread it through brush or between trees. No bullet, no matter how masculine it looks, is made to shoot *through* brush.

After you've decided on a slippery spitzer shape for your bullet, try several weights in your rifle, and several makes. Perhaps one will shoot much better than the others, and that's the one you should choose. If you stay in the middle of the weight range for the caliber, you won't go far wrong. The 150- and 165-grain bullets in 30 caliber, for example, are both fine choices, as is the 130-grain in the .270, the 140 in the 7mm. Because 24- and 25-caliber rifles are intended for varmints as well as big game, it's best to lean to the heavy end in bullet weight: 117 for the .25, say, and 100 for the .24 — depending on how fast you can or want to push your bullets.

Just about any reputable jacketed soft-point on the market will make a good deer bullet. Those that open fast will be too fragile if you hit your deer close with a lot of speed, and those that are more strongly constructed may hold together a little too well at long range if they aren't pushed fast. Your expected shot circumstances will determine what bullet is best for you. Accuracy remains a critical element.

Deer hunting is among the most fascinating of outdoor pursuits. It is a demanding sport, one that tests both your mental and physical preparedness. It is good for the Kansas deer herd, too, and is an integral part of modern deer management. If you haven't yet taken the dawn trail of a big Kansas buck, perhaps it's time you did. If you're an old hand, you're probably already scouting and practicing on the target range. Whether this will be your first season or your twentieth, good luck, friend. May your shot be true and your steaks tender. □

Gene Brehm photo



Gene Brehm photo

Some things only happen once a year. You have to be ready. Right now is the time to update that Christmas list—and fill out those gift subscriptions to KANSAS WILDLIFE.

KANSAS WILDLIFE is the only magazine dedicated exclusively to the great wildlife resources of our state. More than a hunting and fishing publication, it keeps you informed on the tough environmental issues that determine Kansas' outdoor future. And it gives you close encounters with the creatures that most folks only see at a distance — if at all.

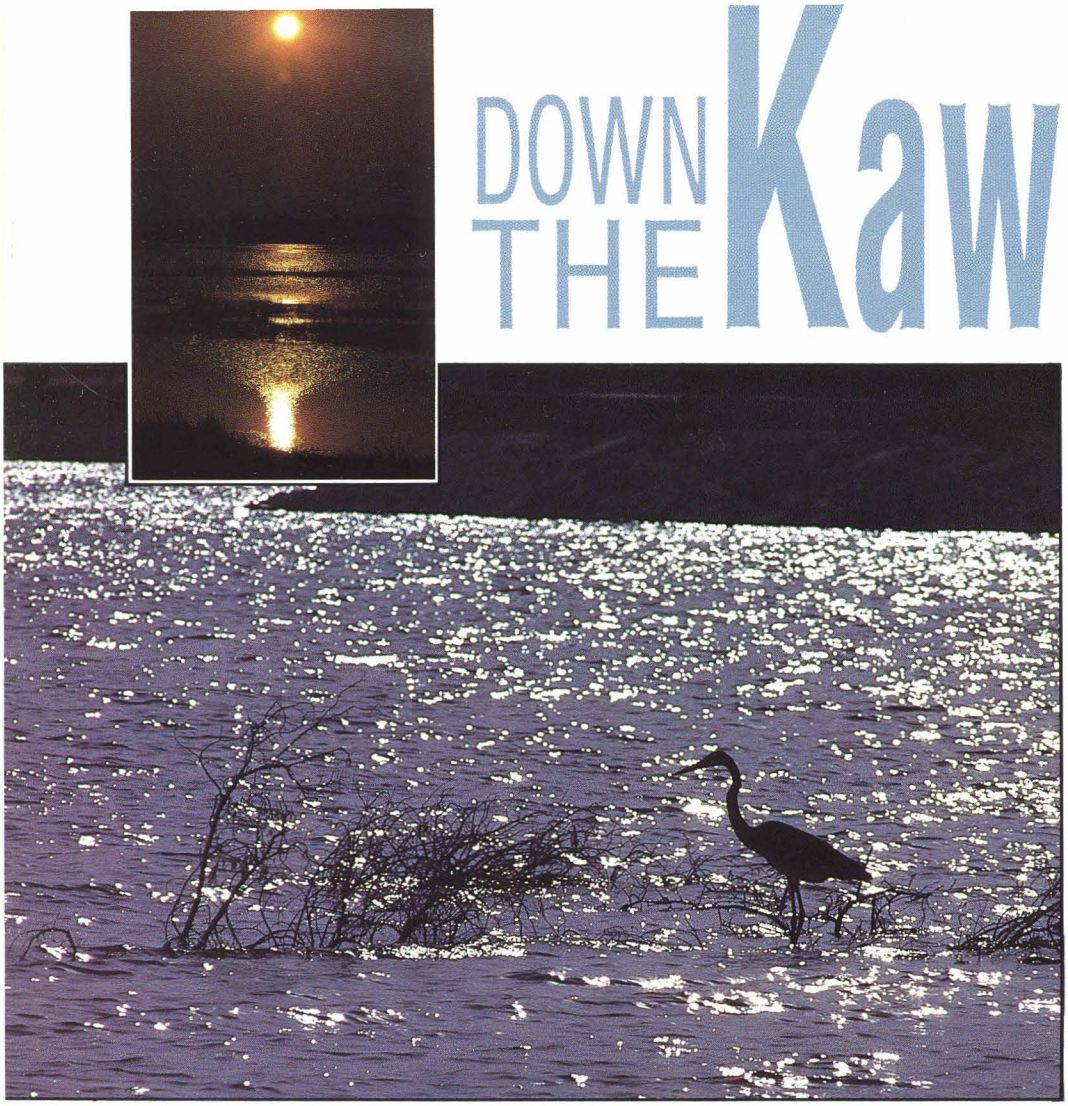
Articles in KANSAS WILDLIFE are not written by journalists, but by professional biologists, administrators, and researchers in the wildlife field. They're solid, and you can tell it. KANSAS WILDLIFE brings it to you straight, right from the hub of the Fish and Game Commission. We don't accept outside advertising, either; each issue is distilled, sifted, packed with the information you want and need as an outdoor enthusiast.

KANSAS WILDLIFE has consistently ranked in the top ten of state wildlife publications in national competition. We have one of the best outdoor photographers in the business, and our editorial staff works hard to see that you get as much clear, concise information as possible in each issue.

You know someone who is concerned about the natural resources of this state. Like you, they want to keep abreast of outdoor happenings, learn more about native wildlife, sharpen their outdoor skills. You speak their language; how about introducing them to KANSAS WILDLIFE? For Christmas. It's an inexpensive gift they can enjoy right now and look forward to the whole year. We honestly believe that nowhere can a student of the Kansas outdoors find more value for his money than in the pages of KANSAS WILDLIFE — a year's worth of information and entertainment for only six dollars.

KANSAS WILDLIFE.
FOR CHRISTMAS.

DOWN THE Kaw



Gene Brehm photos

Glen Hurst

Come along. Let's explore a river. It's a big one, but many Kansans know little about it. Fewer still take advantage of its recreational opportunities. It is the Kansas River. Most folks call it the Kaw. . . .

It starts at Junction City where the Smoky Hill and Republican Rivers come together. From there it flows through the Kaw Valley to Kansas City where it empties into the Missouri River. The Kansas is one of three rivers in the state that are classified as navigable. That is, you don't have to worry about trespass as long as you gain river access without crossing private property. The Fish and Game Commission, with cooperation from several cities, has established access points from Manhattan to Kansas City. These are as follows:

1. East of Manhattan on Highway 24 at the Blue River Bridge.

2. In Topeka off I-70's MacVicar Street Exit.

3,4,5. At Lawrence, one above the dam in Riverside Park north of the river bridge, another on the north side of the river and east of the bridge, and one at the mouth of Mud Creek.

6. In Eudora, west of the Wakarusa River Bridge.

7. In Edwardsville south of Highway 32 at the east edge of town.

8. Under the 7th Street Bridge in Kansas City.

These boat ramps were installed for public use. If you're looking for a place to get close to nature and enjoy peace and quiet, the Kansas River is hard to beat. It's great for boating, fishing, hunting, camping or the study of wildlife.

Canoeing is gaining popularity on the river, with a lot of people spending three or four days on a float trip. If you plan on joining them, remember that water can rise rapidly during the night if heavy rains have occurred upstream. Check weather conditions before you go, and don't camp on low sand bars.

Duck hunting on the Kansas River revolves around Jeffrey Energy Center's two big lakes. Since these lakes are not hunted, they hold large numbers of ducks that fly back and forth to the river and feed in nearby fields. Many hunters build duck blinds on the sand bars. A dog or small boat is a big help in retrieving downed ducks, as the current will quickly sweep them away.

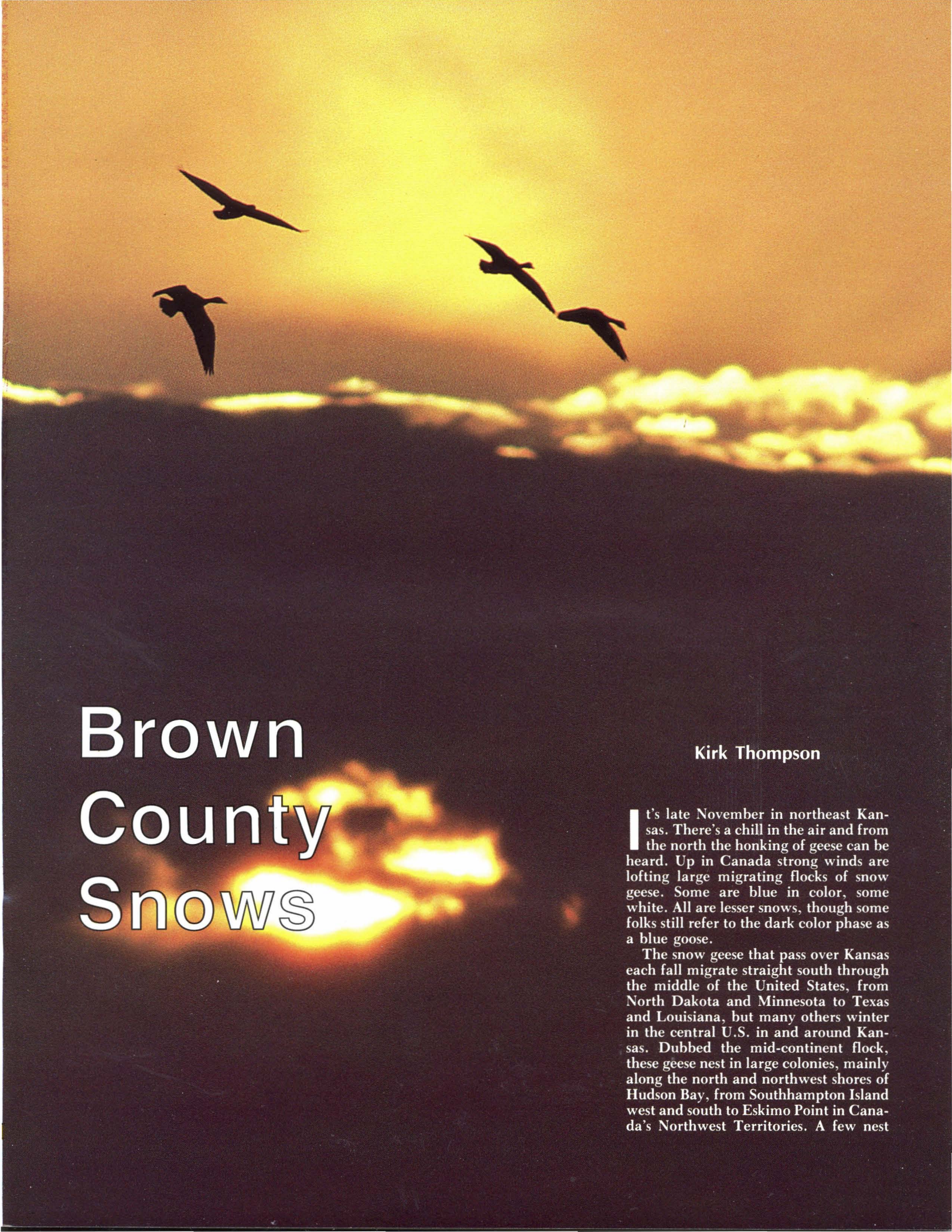
Most of the fishing done on the Kaw is with trot and bank lines, and catfish are the primary quarry. Old newspapers are filled with stories about big catfish. One of the articles describes how two such fish were taken from the Kansas River near Topeka in the summer of 1859. The largest weighed 160 pounds, the smallest 110. A few days later a 106-pound fish was caught near the same spot. It was one of many catfish weighing more than 100 pounds caught in the river. In fact, fishing was so good in the early days that the King brothers opened a fish market in Manhattan in 1869. It was called the Manhattan Fishing Company. It remained in business for several years, with the largest catch scaling 131 pounds!

Most of the big blue cats caught in the state have come from the Kansas River near Lawrence. Bowerstock Dam there remains a favorite spot for many anglers. The first really big blue cat to come from this drainage was taken on a limb line in 1974 and weighed in at 33 pounds. The new record now stands at 56 pounds.

When going up and down the river by boat, there are several obstacles of which you should be aware. Jeffrey's Energy Center has a water intake south of Belvue, and the city of Topeka has another just east of the Westgate Bridge. The Bowersock Dam in Lawrence can be very dangerous, while the last hazard is a rock dam about half a mile east of Edwardsville's boat ramp.

The Kansas River is cleaner today than it has been for many years. Cities have installed sewage systems, and the river is no longer used for city dumps. Much of the litter you see along the river banks will be with us for quite awhile. It was years being put there and will be years being picked up. The river is continually shifting its sand; part of the channel is in a totally different place than where it was earlier in the century. Part of this was caused by the 1951 flood, the last big flood on the river.

What does the future hold for the Kaw? That depends on our performance as stewards of Kansas' rivers. The once-sparkling Smoky Hill is now a dry wash. Other streams are being polluted or sucked dry from underneath. Water is life itself to our environment; it not only gives us pleasure but sustenance. The health of our rivers will continue to be a measure of our wisdom. □



Brown County Snows

Kirk Thompson

It's late November in northeast Kansas. There's a chill in the air and from the north the honking of geese can be heard. Up in Canada strong winds are lofting large migrating flocks of snow geese. Some are blue in color, some white. All are lesser snows, though some folks still refer to the dark color phase as a blue goose.

The snow geese that pass over Kansas each fall migrate straight south through the middle of the United States, from North Dakota and Minnesota to Texas and Louisiana, but many others winter in the central U.S. in and around Kansas. Dubbed the mid-continent flock, these geese nest in large colonies, mainly along the north and northwest shores of Hudson Bay, from Southhampton Island west and south to Eskimo Point in Canada's Northwest Territories. A few nest

farther up on the south shore of Queen Maud Gulf, and some along the northwest shore of James Bay.

Snow geese arrive on their breeding grounds in late May or around the first of June, just as the tundra is thawing. If spring is late, many of the paired geese must wait to nest till the snow melts. As a result, many late-nesting pairs will have a reduced brood size, mainly attributable to losses from predation. If the snow remains too long, some pairs will not nest at all.

Under normal weather conditions, the geese begin to nest two weeks after they arrive on their breeding grounds. Each female lays an average of five to seven eggs, taking approximately 11 days to complete the clutch. Eggs are white, though some have a slightly bluish cast. Incubation lasts 23 to 24 days. The young range in color from a smoky blue-black for the blue phase, to yellow for the white phase. Young snow geese are voracious feeders and will increase their weight 20 times during their six- to seven-week fledgling period. In August, approximately 42 days after they hatch, they make their first flight. In the first part of September, after many of the non-breeding birds have left, the adults with young start their long journey south.

Fall migrations vary in length, some geese flying almost non-stop from James Bay directly to the Gulf coast. But many snows do not migrate as far south as the Gulf, alighting in Kansas and Missouri where corn fields draw the birds out of the air.

Beginning in the late 1950s, snow goose numbers have increased in the central flyway. Kansas populations continued to rise dramatically in the late 1960s and early 1970s. Most snow geese in Kansas were associated with Kansas wildlife management areas, and specifically with Brown State Fishing Lake near Hiawatha. In 1974 a peak population of 300,000 snows remained at Brown for several days, and 200,000 overwintered.

During the early and mid 1970s, Brown County snows would generally fly out north and east of the lake to feed in corn fields, gleaning after the combines. As hunting pressure in their feeding areas increased, the geese were forced to range farther away from the lake and eat other crops — green wheat and milo especially.

Gene Brehm photo

Wall-to-wall geese — that's what you can still find if you visit ice-free impoundments like Missouri's Squaw Creek site in winter. Though geese have been discouraged from using Brown State Fishing Lake in large numbers, they still forage in Brown and Doniphan Counties.

Larger snow goose populations at Brown eventually brought problems. Unethical hunters were one. Some gunners were waking landowners at all hours of the night for permission to hunt; others would just trespass. This handful of so-called sportsmen were the ones everybody remembered. Landowners began to dislike both geese and hunters. They became very selective in granting hunting rights, many allowing only close friends and relatives on their property.

Other problems were even more noticeable. With the lake a refuge, hunters lined up along roads and fences, shooting at geese as they flew into or out of the lake. Many of these geese were not retrievable; quite a few were crippled and later died. Bag limit enforcement was difficult, and gun safety in the crowds of hunters became a concern.

Fowl cholera, a disease affecting geese and other waterfowl, was also a potential problem. The fowl cholera agent is present in both nasal excretions and feces of infected birds. In small water impoundments, water can become contaminated with the bacteria quickly. At Brown State Fishing Lake the potential was high, though not any greater than in other small impoundments where the geese congregated.

Increasing goose populations did *not* interfere with the fishing at Brown State Fishing Lake. A creel census taken while goose numbers were at their peak indicated the lake was number one in the state in 1) fish per surface acre, 2) fish per fisherman, and 3) fish caught per hour. Most fish caught were crappie, but good angling was also available for channel catfish, largemouth bass, and carp.

Gene Brehm photos

Though most people looked on snow geese as an asset to Brown County, problems outside the refuge and an increasing disease potential finally became unacceptable. In the fall of 1975 a rallying project was implemented to prevent snow geese from using the refuge at Brown. The rallying crew was on hand 24 hours a day from October 14, 1975 through January 17, 1976. Noise-making devices, stationary "scarecrows", and lots of manpower were used to drive the geese away. The rallying project was successful but expensive. A different approach seemed in order. In the fall of 1976, the lake was opened to public hunting. When the snow goose season commenced, hunters were allowed to shoot geese in what was formerly the refuge. This ploy was very effective in dispersing the geese, and for the most part, the geese stopped using Brown State Fishing Lake.

The year after the geese left Brown, the numbers of snow geese visiting northeast Kansas dropped. Because of Missouri's nearby Squaw Creek National Wildlife Refuge, many of the geese still frequented northeast Kansas to feed, but not with the regularity they did in the past. Squaw Creek has hosted larger snow goose populations in recent years.

Snow geese generally start arriving in northwest Missouri in late October and reach their peak in early December, with as many as 400,000 using the Squaw Creek area. In November the snow geese begin to fly into Kansas because they become wary of the many

Left: Both blue and white color phases of the snow goose winter in northeast Kansas. These birds have their wings set and are looking for a place to land — maybe they're giving a critical eye to a sloppy decoy spread! Below: When all the geese get up at once the sky disappears.

hunting leases around Squaw Creek. They need more grain as fields in Missouri become depleted and goose populations increase in the area. Almost all snow geese using northeast Kansas corn fields in late November and December now come from Squaw Creek.

Even though the snows start using grain fields in Brown and Doniphan Counties in late November, large numbers do not show up without help from the weather. With a strong north wind, geese are blown south from Squaw Creek and cross over into northeast Kansas around White Cloud. From here the geese fly south and west, many using traditional feeding grounds around and north of Highway 36 on the Brown and Doniphan County line.

Excellent snow goose hunting still exists throughout the season in northeast Kansas, due to Squaw Creek and another small lake sanctuary in Missouri. The Iatan Power Plant, just south of Atchison, Kansas on the Missouri side of the river, created a new winter goose refuge when it began operation in 1980. At Iatan a small lake was constructed in which to dump waste coal ash. The lake is protected from the northwest wind and is also deep enough to allow the geese to maintain open water. It made an ideal refuge and, because of its location, enabled a few geese to feed in their traditional areas in Brown and Doniphan Counties. When Squaw Creek freezes over, many of the geese move to the Iatan Power Plant ash pond. From Iatan they continue to feed in Brown and Doniphan Counties as well as in areas in Missouri; but when the food supplies dwindle, they expand their feeding into Atchison, Leavenworth, and Jefferson Counties in Kansas, especially in January and February. Iatan does not hold as many snow geese as Brown State Fishing Lake did, but it is still refuge for up to 50,000 during an average winter.

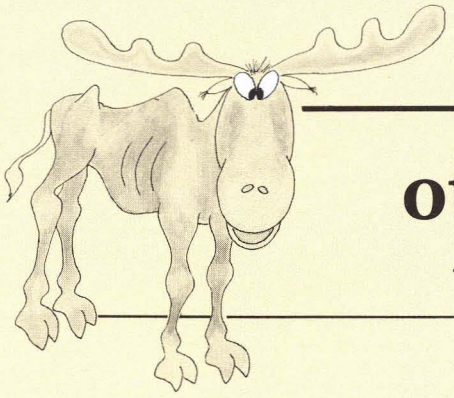
As the weather warms in late February or March, snow geese from the Gulf return to northeast Kansas. Some join geese that wintered here; others pass over Kansas as they migrate north. The number of geese using northeast Kansas in the spring is inversely related to the goose concentrations there in the fall. That is, if there are large flocks of geese in fall and early winter, food supplies become depleted and in the spring many migrating geese pass over, nonstop, to look for better feeding areas. On the other hand, if for some reason snow goose numbers are low in fall and winter, more geese stop in the spring.

Northeast Kansas has all the ingredients necessary to maintain an excellent population of snow geese. The enormous amount of waste grain left in the fields can provide food for them for several months, and water in this part of the state is not a limiting factor. If you wish to see or hunt snow geese in northeast Kansas, your chances are generally best in the second week of December. Almost all land in northeast Kansas is private, and except for Kansas Fish and Game management areas, no other public hunting is available. Farmers, though, are wising up to the fact that geese can be an asset, pulling up volunteer grain and drawing hunters willing to pay for good shooting. Snow geese from the Squaw Creek and Iatan wintering areas still provide plenty of action for hunters with leases on Kansas feeding fields.

Whether you hunt geese or just like to watch those flickering, undulating lines of white against a wintry sky, you won't go wrong if you head for northeast Kansas. Brown County's tremendous congregations of snow geese may now be scattered over more territory, but the birds are there. As long as corn spills from the combine and water laps the shores of local lakes, the snow geese will return. □

Here they come! And suddenly hours of shivering in a cramped blind are forgotten. Whether you hunt geese or not, the soft honking of incomers, the sight of set wings and feet coming down, the smell of winter cattails are guaranteed to raise your pulse!

Gene Brehm photo



off trail

. . . with Stub Snagbark©

It'll be Christmas soon, and you'll want to shop for something nice for someone you know. If you know lots of people you may have to look for lots of nice things. Because some people are nicer than others, though, not all your gifts have to be real winners. In fact, you may even want to buy something cheap for someone who doesn't mean much to you.

Buying cheap doesn't prevent you from spending a lot of money. Shoddy merchandise can be very expensive. But if you're really out for junk, you'll save quite a bit of money by being right up front with the store clerk:

"May I help you sir?"

"I certainly hope so. I need a gift for someone who doesn't mean much to me at all and would think I was up to something if I gave him (her) anything of value. What do you have in the way of merchandise that doesn't cost much and isn't worth much but is advertised on TV and bulks up well under wrapping paper?"

"Just follow the blue floor line to those bins in back. You can't miss our Value Department. We call it the Bottom Line. I see there's a crowd forming there already; please don't fight over the merchandise."

Shopping for junk is exasperating because there's such a quick turnover of the popular items, and several weeks before Christmas there's a nationwide shortage of things that look expensive but aren't. Cheap things that look cheap will always be in good supply for last-minute shoppers, however. If the person whose name you drew out of a hat at the party this year is the neighbor whose dog kills your petunias each spring, the best time to shop is Christmas Eve, when everything is marked down and nothing of what's left fits anyone or does anything useful.

Lots of people think that you *can't* buy quality anymore, and that finding a gift for someone nice is getting harder all the time. That's simply not true. You can find quality all over. Sometimes it turns up unexpectedly. Just the other day I picked up a broom to sweep the firing line on an indoor rifle range. The broom felt good in my hand, and I examined it more closely. The handle was thick, probably an inch and a quarter in diameter. It was solid wood, with a heavy coat of varnish and even a pleasing grain. The business end of this broom was tightly bound, the bristles a great yellow mass that was really much heavier than I needed to sweep a few spent cases off a concrete floor. I felt, as I took the first tentative strokes with this jewel, that I was overbroomed.

It's a shame that more merchandise can't be made the way that broom was made. There's a lot of pleasure in using something that was artfully designed and stoutly built, and I suspect a lot of us would pay a premium for such tools.

It would be nice to get as a gift a broom that really was a state-of-the-art broom. Brooms, after all, have been around a long time and we ought to know how to build a good one. Any broom would be hard to hide under a Christmas tree, and you might draw some laughs from people who saw your name on the tag. But I for one would be proud to get a good broom:

"I see you're getting a new tool for Christmas."

"I wouldn't know."

"Come on. Anybody can see that's a broom. Over there in the back — leaning against the outboard motor with my name on it."

"How do you know that's an outboard motor?"

"I had to order it; the wife doesn't know much about such things. I'll bet you didn't order that broom."

"No. If that's what it is, I certainly didn't."

"Kind of a letdown, huh. Getting a broom, I mean."

"That all depends."

"Depends? On What?"

"On what kind of a broom it is. It may very well be a good one."

"A broom's a broom."

"Hardly. Is your outboard motor the same as any other? If it were, why didn't you trust your wife to order it? In fact, there are probably a lot of outboards that are better and more expensive than the one in that package."

"Yes, but . . . ."

"My broom, on the other hand, may be a top-of-the-line model, with hardwood handle and a hand-sewn, genuine straw sweep. It likely will require no service, and I'm not paying for extended warranties, fuel, ignition parts, or shear pins. Too, the broom is complete as a unit. There's nothing else to buy, nothing to add to make it functional. It's ready to go right out of the wrapper. In fact, if you're correct and that *is* a broom, I can hardly wait to try it out."

By now the crowd that has gathered around the broom-looking package is so thick neither my companion nor I can see more than the tip of the tree. He is silent, thoroughly beaten, his confidence shaken and arrogance demolished. I have beaten him with a broom. Not just any broom, but a premium quality broom, one that has been made for long hard service and one that was built for pride of ownership as much as for utility.

You don't want a broom this Christmas? Try giving one. Or maybe your taste runs to hammers. I got a good hammer once and loved it. If your budget is tight, you might opt for a dust pan or go halvsies on the broom with someone of like mind.

Insisting on quality for yourself has its drawbacks, of course; the reason I have no double shotgun is because I once shouldered a Boss. The trick on the high-dollar items is to make enough friends during the year that at Christmas they all get together and scrape up the $20,000 for that prize scattergun and present you with it as a token of solidarity for that which is well made.

You can't afford to have as friends donors who shop at the Bottom Line.

cover photo: whitetail deer by Gene Brehm

"I shot my first mule deer in 1914 when I was twelve years old, and at that time deer were scarce all over the West. Old timers like my grandfather took it for granted that the decrease in deer was natural and that eventually they would be exterminated . . . The notion that there could be too many deer was to most people at that time as absurd as a statement that a woman could be too beautiful or too virtuous, that air could be too pure, or that an automobile could be too safe."

—Jack O'Connor

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