

Thought to be extinct until the mid-Thirties and scarce until the early Sixties, deer in Kansas have made an amazing recovery in the last two decades. It was no accident—

The Comeback

Whitetail and mule deer in Kansas

Bill Peabody

Courtesy of Terry Sieve and Wild Wings, Inc., Lake City, MI.





Bruce Kintner

Deer are more abundant in Kansas now than ever before in the state's history. They are highly adaptable, secretive animals that take advantage of every opportunity to increase their numbers and extend their range. Encouraging as this may sound, the reality of land use changes which are detrimental to continued herd growth, particularly the loss of quality woody habitat, coupled with growing intolerance of landowners and motorists to "too many" deer, will limit the opportunity for increasing our herds much beyond populations levels expected in the early 1980's.

Fourteen seasons and 51,595 legal deer later, the 1965 skeptics who predicted that hunting would wipe out the Kansas deer herd and cause all sorts of havoc in the first season, have been sheepishly quiet. Kansas has yet to record its first firearm fatality as a result of deer hunting, and a productive and healthy deer herd is a tribute not only to the Commission's successful management program, but to the state's landowners who raise and support the bulk of the deer produced in the state. The sportsmen of Kansas also deserve considerable credit and this article is dedicated to them. Without their support and cooperation, much of what you are about to read would not have been possible. They pay at least as much or more for a resident deer hunting permit as hunters in any other state in the country. They have driven miles to mandatory check stations, contributed biological samples from their deer, and most have religiously returned questionnaires providing information about their hunt.

If there is an Achilles' heel associated with the deer

management program, it is the inability to satisfy demand for firearms permits in most management units. The potential danger here is apparent. The Commission's primary responsibility related to deer is to maintain and/or increase the resource and the habitat base upon which it is inseparably tied. Yet, the agency must be responsive to the needs and desires of Kansas deer hunters who support its programs. The two responsibilities should be and generally are compatible. What is good for the long-term benefit of the resource should also satisfy the needs of the deer hunter—at least we would like to think that it is the case, but this requires a certain degree of understanding on the part of the hunter. The Commission is dedicated to optimum, sustained yield deer herd management that attempts to satisfy both harvest and non-harvest demands. If harvest demand cannot be met, it is not because the Commission would not like to do so but because current deer populations cannot tolerate additional hunting pressure without adjustments in management strategies that will most certainly reduce the quality of the hunt.

The outlook for deer in Kansas can perhaps best be described as one of cautious optimism—cautious because of the realities of intensified land use that eats away at the key to a deer's very existence—its habitat, yet optimistic that a "cure" can and will be found. Finding that "cure" is important because having wildlife around, whether it is a deer or an obscure little critter we seldom see, enhances the quality of life for all Kansans.

Beginnings

With few exceptions good deer cover was never abundant on the pristine prairie. Frequent uncontrolled fires burned large areas of prairie and were only stopped by streams and other natural barriers. These fires maintained the prairies but eliminated or retarded the growth of many woody plants. After the white man moved into the territory, the frequency of uncontrolled fires decreased and burning was confined to smaller areas of prairie, but it still helped to control woody plant development. In addition, periodic flooding and the scouring effect of moving water on many streams slowed and in some cases precluded the establishment of brush and trees. With habitat thus limited, deer were uncommon on most of the prairie.

Early Kansas history contains numerous accounts of bison, deer, wapiti, and antelope. While deer did play a significant role in the settlement of this state, particularly in the eastern one-third, they were secondary in importance to the thundering herds of bison that once roamed the Kansas plains and provided most of the meat, hides, and bones used by Indians, explorers, trappers, and settlers.

Whitetails (*Odocoileus virginianus*) and the less common mule deer (*O. hemionus*) were 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, Kansas in 1804 and Zebulon Pike found deer in 1806 in an area of eastcentral Kansas comprising what is now Chase, Coffey, Lyon, Morris, and Woodson counties.

In 1857, a surveying party led by Col. Joseph E. Johnston surveyed the southern boundary of the Kansas Territory. The party crossed the Chautauqua Hills (Cross Timbers) along the southern line of present Chautauqua and Montgomery counties. Notes taken by the group indicated that slightly west of Elgin, game including deer, antelope, and wild turkeys was very numerous. This area continues to support good wild-life populations today and was thought to provide the last remaining stronghold for deer before they were reportedly extirpated in the early 1900's.

During the winter of 1859, good numbers of mule deer were found in the hills between the Saline and Solomon rivers, and other small herds of mulies were reported along the upper reaches of the Smoky, Saline, and Solomon rivers as late as 1866.

Newspaper accounts attest to the fact that deer were still relatively abundant in Kansas in the 1870's. The

Junction City Union of December 24, 1870 stated "there have been thirteen deer killed in the bottom about a mile from town during the past two weeks." And the Hutchinson News, July 4, 1872 reported "a drive sixty miles southwest brings us to the best hunting ground in Kansas, in the valley and among the hills of Medicine Lodge Creek, Barbour (now Barber) County. In addition to other game, here are deer and wild turkey in the greatest abundance."

Judging from these and other reports, deer were more or less common along the wooded portions of streams and in large timbered areas as late as 1875. Several authors reported deer as common until about 1884, but considered them extinct in Kansas by 1904. By 1890, deer had disappeared from most of western and northern Missouri, but 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. Seton estimated the entire population in 1908 to be 500,000 deer. Current estimates place the nationwide population at about seventeen million animals.

In his discussion of the history and population growth of the white-tailed deer in the Great Plains Region, Cook noted that the whitetail was fairly common in riparian woodlands but was never as abundant on other portions of its range and became greatly restricted by advancing settlement. Use of the land for agriculture combined with brush and timber clearing destroyed much of the habitat on which deer were dependent. The effect of land settlement and of uncontrolled hunting was to reduce herds to small and widely scattered groups that maintained themselves with difficulty. Winter habitat became greatly restricted, forcing deer to concentrate in the limited tree and brush growth along streams.

Deer were not abundant anywhere in the Plains following the drought of the 1930's and were still considered absent from Kansas in 1933. The prolonged drought permitted new woody plant seedlings to become established along streams in the absence of destructive floods, and woody plantings such as shelterbelts and timber claims were encouraged to control wind and water erosion. Natural establishment of woody plants occurred on many drainages following the construction of flood control structures, and with complete protection and public cooperation combined with habitat changes beneficial to deer, populations began to increase. This scenario was repeated in all of the Plains states with Kansas the last state to develop a huntable population.

Deer herds in the Midwest increased rapidly during the 1930's and 1940's. This was due to improved habitat conditions, closure to hunting, more effective law enforcement, restocking, establishment of refuges, emigration from surrounding states, and support from sportsmen.

The Fish and Game Commission and a few 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 management, trapping and transplanting programs being carried out by states surrounding Kansas. During this period, deer were increasing in Missouri, Nebraska, and Colorado, and it is likely that natural dispersal was responsible for providing most of Kansas' initial breeding population. This may account, at least in part, for the slow growth rate of our deer herd initially. By the early 1950's signs of deer were being seen frequently in many areas of the state, and it was apparent that deer were making a slow comeback in Kansas. Hunting in adjacent states and eventually in Kansas helped to distribute deer better and alleviated a growing number of crop damage complaints.

Life Styles

The breeding season for whitetails and mule deer takes place in the fall with the peak of breeding occurring in the last two weeks of November. Since spotted fawns have been seen as early as April and whitetail does killed on the road in August have been found carrying unborn fawns, biologists have estimated that

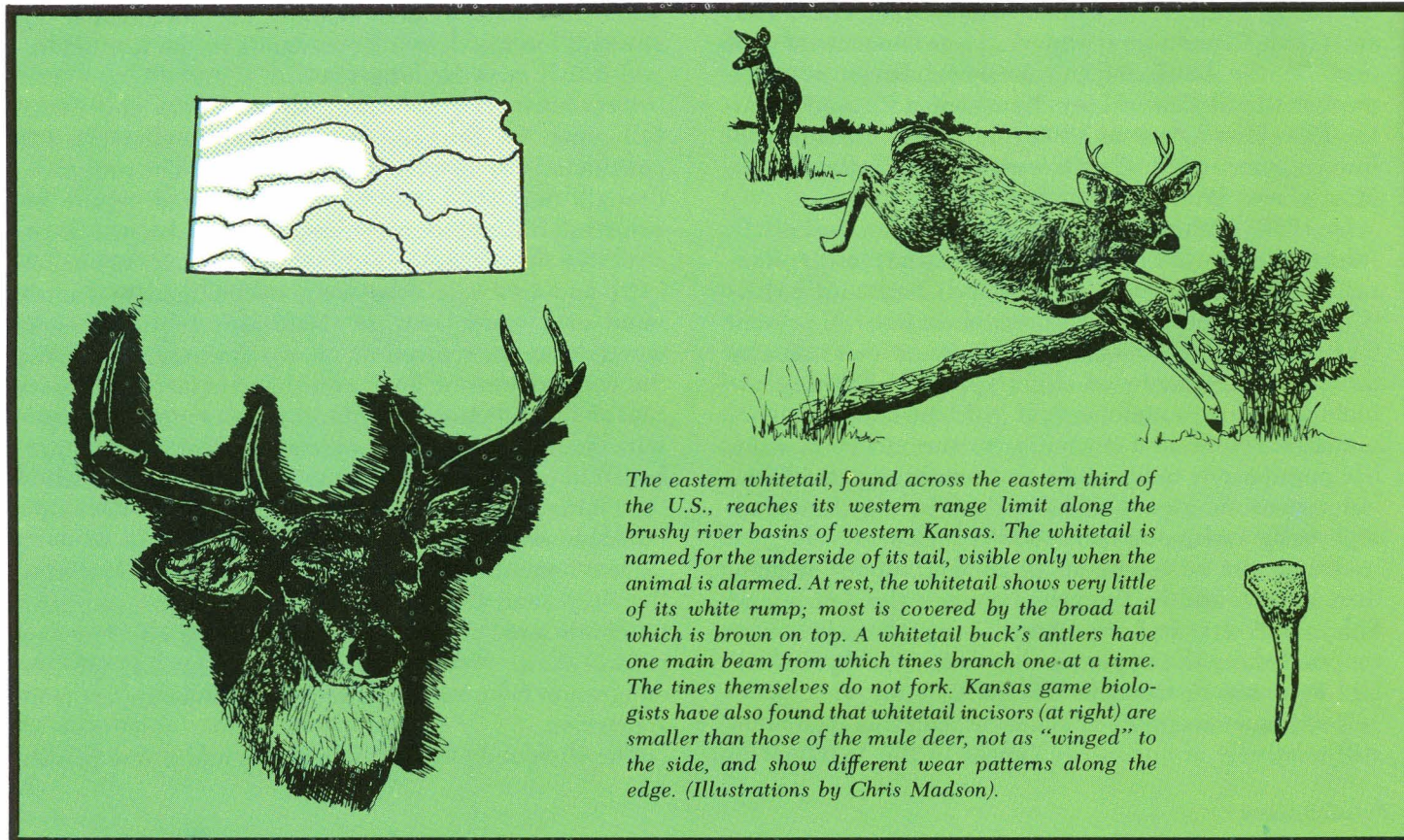
actual breeding extends from October into February.

Reproductive rates for deer vary among species and age classes and are strongly influenced by the doe's "plane of nutrition." In Kansas, most deer have access to waste grain, winter wheat, and alfalfa through the winter which, combined with spring foods like coral-berry (buckbrush), grape, gray dogwood, elm, ash, hackberry, mulberry, and sweet clover, bring pregnant does through the winter in excellent physical condition, ready to bear many healthy fawns.

In Kansas, from fifty to seventy percent of all white-tail doe fawns breed before they're a year old. Mule deer are less productive than whitetails because fewer mule deer fawns and yearlings breed. Adult does of both species have about the same rate of productivity. The average for all age classes of both species is about 1.2 fawns per doe.

Summer is an easy time for Kansas deer. Many move out into seasonal cover provided by crops and thrive on a mixed diet of wild fruits, forbs, alfalfa, and acorns and crop residues as they become available.

Through the fall, does go through a series of estrus cycles, usually twenty-eight days in length for white-tails and twenty-four to twenty-eight days for mule deer. If a doe doesn't breed in her first "heat" period, three, even four estrus cycles will occur before her breeding potential for the year ends. Most does capable of conceiving each year are bred. The "dry does" many hunters pursue are generally yearlings or fawns that



The eastern whitetail, found across the eastern third of the U.S., reaches its western range limit along the brushy river basins of western Kansas. The whitetail is named for the underside of its tail, visible only when the animal is alarmed. At rest, the whitetail shows very little of its white rump; most is covered by the broad tail which is brown on top. A whitetail buck's antlers have one main beam from which tines branch one-at-a time. The tines themselves do not fork. Kansas game biologists have also found that whitetail incisors (at right) are smaller than those of the mule deer, not as "winged" to the side, and show different wear patterns along the edge. (Illustrations by Chris Madson).

have not yet been bred. This is particularly true of yearling mule deer does which usually breed for the first time at about sixteen to eighteen months of age.

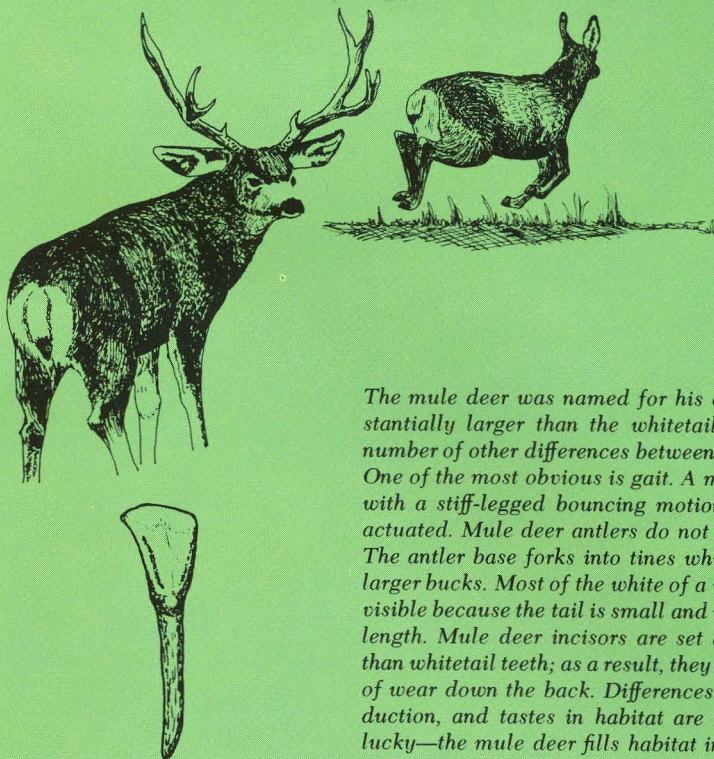
Shortening day length and reduced light intensity in the fall triggers sexual activity in bucks as well as in does.

Bucks become sexually mature when they are one and a half years of age, although wildlife researchers in New Hampshire have demonstrated that some precocious fawn bucks on urea diets can fertilize does. Under ideal conditions with penned deer, a buck can service twenty does. This is probably seldom, if ever, achieved in the wild. A whitetail buck will mate with six to ten does during a rutting season, but will stay with a single doe for several days prior to and following her short heat period. Thus, he is probably "out of action" for four or five days per each doe serviced.

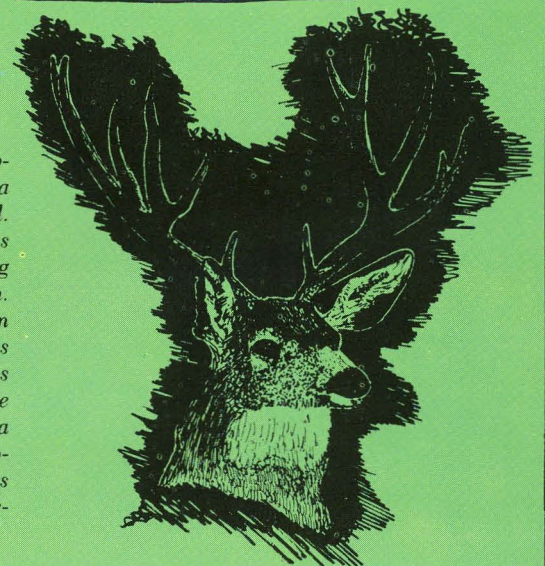
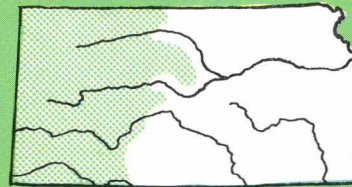
Whitetail bucks do not form strong family ties with does and fawns, nor do they collect a harem as elk do. Mule deer bucks also will mate with several does during the breeding season, but have a slightly greater tendency than whitetail bucks to collect a small harem. In most areas of Kansas there does not appear to be a shortage of bucks to breed all of the does. Much of the breeding occurs before the firearms season and enough bucks survive the seasons to insure that most does capable of conceiving are bred.

A buck's antlers are solid, bony growths protruding from the skull. They are not horns. Horns are hollow or

nearly so and once grown are not shed. Sheep, goats and cattle have horns, while deer, elk and moose have antlers. Antlers are shed every winter and begin new growth in the spring. In Kansas, new antlers begin to form in April and early May. They are covered with skin and short hair known as "velvet." This velvety skin, filled with blood vessels, nourishes and builds the growing bone-like material of the antlers. In August and early September the blood supply to the antlers is cut off; they harden, and the velvet dries and starts to peel off. Bucks hasten the removal of velvet from their antlers while testing their strength on limber saplings with the approach of the rutting season. There is much "shadow boxing" and an occasional encounter between bucks, but fights to the death are uncommon. Bucks expend large amounts of energy during the rut, actively pursuing does and taking little time to feed or rest. Body weight may decrease by five to ten percent, and by the end of the breeding season, bucks may appear to be completely devoid of fat. This constant activity also increases their vulnerability to hunters. While tree rubs signal the presence of a buck, the presence of active "scrapes" indicate that the buck has established a breeding territory. Scrapes are made when a buck paws the ground with his hooves and then urinates on his metatarsal glands to impart scent to the scrape. Active scrapes are pawed clear of leaf litter periodically by the buck and have strong, musky odor. They alert does of his presence and deter other



The mule deer was named for his ears which are substantially larger than the whitetail's, but there are a number of other differences between the species as well. One of the most obvious is gait. A mule deer often runs with a stiff-legged bouncing motion that looks spring actuated. Mule deer antlers do not have a main beam. The antler base forks into tines which branch again in larger bucks. Most of the white of a mule deer's rump is visible because the tail is small and white for most of its length. Mule deer incisors are set at a different angle than whitetail teeth; as a result, they have a broader area of wear down the back. Differences in behavior, reproduction, and tastes in habitat are numerous which is lucky—the mule deer fills habitat in Kansas the whitetail can't handle.



bucks who might be inclined to move into his territory.

Bucks begin to lose their antlers in January and most have been dropped by the end of March. In Kansas, however, there are two records of firearms hunters thinking that they were shooting does during the December season only to have the antlerless deer turn out to be bucks that had already dropped their antlers. At least two cases of antlered does have been reported in Kansas also. Abnormal hormone secretions are apparently responsible for this antler development in females, as this condition can be induced experimen-

tally by injecting does with certain male hormones.

Antlers are among the fastest growing animal tissues known to man. It takes a high level of nutrition and good quality food to produce racks. Once antlers are shed, mice and other rodents usually consume them within a year or two. Occasionally a farmer will "find one" when he runs it through a tractor tire!

Fawn bucks do not develop antlers their first fall—only small one to two inch bumps. The following year, if they live that long, a young buck will develop antlers. If the one-and-a-half year old gets plenty of



quality food to eat and the proper supply of minerals (primarily calcium), he'll be a nice forkhorn or even a four- or six-point buck. Five to seven percent of Kansas bucks, especially those shot in the Chautauqua Hills (Cross Timbers) region, grow only spikes as yearlings. Contrary to popular belief, the number of points on a set of antlers has nothing to do with the age of a deer. Mature bucks merely have larger, more massive sets of antlers. Bucks from three and a half to seven and a half years of age develop the largest racks. Biologists determine a deer's age by examining the degree of tooth

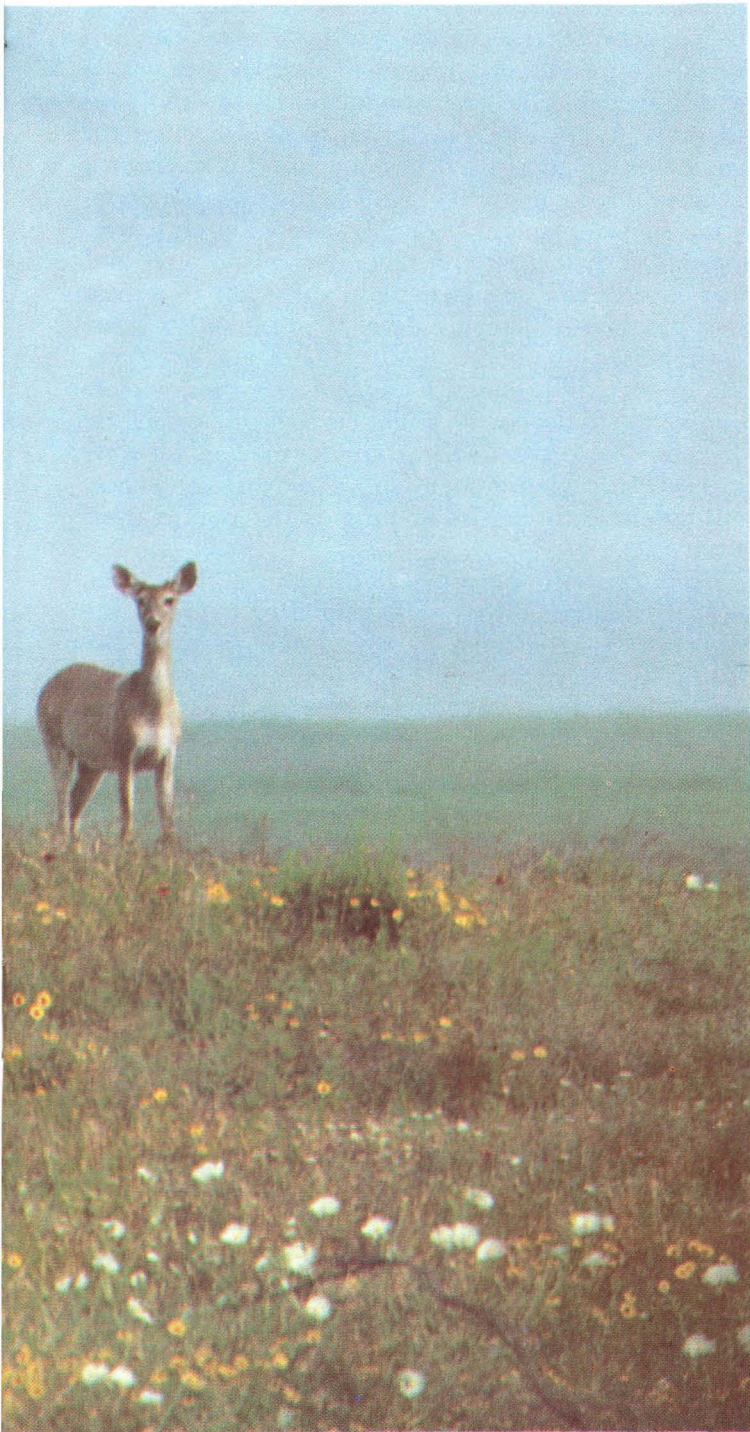
replacement and wear on the premolars and molars, or by counting annual rings in the cementum of a deer's first incisor. Kansas wildlife biologists have also developed a method of determining species and three age classes of deer (fawns, yearlings and adults) by simply looking at the deer's incisors.

Following the rut and particularly after the hunting seasons have ended, deer activity lessens and both species tend to form groups. Herds begin forming when leaf fall occurs and crops are harvested. Harvest reduces deer range to a fraction of its summer abundance. 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 this "fall shuffle" period, hunting influences deer movements and distribution more than any other factor. After that, food availability and secure winter cover are important. "Yarding," the concentration of large numbers of whitetails in small wintering areas in northern deer range, does not occur in Kansas.

Once winter is past, the process of replenishing the deer population begins. Most fawns are born during late May and throughout June. Some females that have bred later in the winter (particularly fawns) may drop their fawns in July and August. The does of both species usually produce a single fawn from their first mating, but whitetail does just one year old have been known to bear twins. Twin fawns from healthy adults are the rule; and a small percentage (eight to fifteen percent) of adult does have triplets. Fawns retain their spotted coats for three to four months and can become nutritionally self-sufficient at about two to three months of age if something happens to the doe. When deer populations are maintained within the limits of the biological carrying capacity of the range, good productivity, excellent physical development, and impressive racks on bucks result. Fawn production and survival are very important factors in determining the growth rate of our deer herds.

Deer movements through the year in Kansas are profoundly 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 are 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 long movements will occur. Deer movements peak once in spring (21.2 percent of all roadkills occur during April and May) and again in October, November, and December (40.4 percent of all roadkills). The spring flurry of activity is related to winter herd break-up and pre-fawning activity while the fall shuffle is in response to the rut, changing habitat conditions that force deer to move to secure wintering areas, and hunting pressure. The relative severity of any given winter appears to



Kent Monte

have a strong influence on the size of winter herds and the distance traveled to habitats that meet their needs. In mild winter, deer are more widely distributed and do not form large herds until stressed.

Kansas mule deer are non-migratory, but relatively long movements are not uncommon, particularly among yearlings. This was demonstrated during a 1966 to 1972 study conducted in a twelve county area of northwest Kansas. Wildlife biologists and conservation officers caught, tagged, and released sixty-seven mule deer fawns and seven whitetails.

Nineteen of the mule deer (thirteen bucks and six does) were recovered. Four were recovered as fawns, thirteen as yearlings, and eleven as adults.

Deer recovered as fawns remained in the vicinity of their capture site with no straight line movements over one mile recorded. Those recovered as yearlings moved an average of forty-six miles while adults traveled eighty-four miles from their tagging location. Movement of yearling males and females was nearly equal. A Utah study showed that fawn dispersal was infrequent but relatively long movements for yearlings was common.

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 sixty-eight-mile movement. Nebraska's firearms hunters recovered three of our marked bucks after movements of thirty-seven, sixty-five, and seventy-five miles north of their capture site. Another set of twin bucks were recovered as yearlings during the same year but over sixty miles apart.

The longest known straight line movement for mule deer was ninety-seven miles. However, a yearling whitetail doe holds the Kansas record for the longest journey. Tagged as a fawn in Sheridan County, she moved 170 miles to her recovery site on the Chikaskia River in Kingman County crossing at least seven drainages in the process.

Such long-distance deer movements seem to be common on the Plains. Reports from the northern lake states and other whitetail country to the east indicate that deer in other habitat types may be much more sedentary. It may be that eastern deer habitat provides year-round food and cover in a much smaller area.

Even in the best habitat, deer suffer year-round losses that reduce the growth rate of the population. Deer-vehicle accidents removed a minimum of 1,456 deer from our herds in 1978. We estimate that three to five percent of our deer population is lost on the highway each year. The magnitude of loss to poachers is difficult to determine but may approach the legal harvest in some areas of the state. Similar losses are reported in other Midwestern states.

Other accidents (*e.g.*, fawns killed in hay meadows by mowing machines), crippling loss, predation, dis-

ease, and parasites further reduce the deer population. Disease and parasitism are a minor problem for deer in Kansas. The coyote and, to a lesser degree, the bobcat are the most important wild predators on deer in the state. Domestic and/or feral, free-ranging dogs on occasion kill or cripple deer and, perhaps more importantly, harass them so that they are predisposed to other forms of mortality (highways, falls, etc.).

Since the winter of 1973-74, high fur prices have stimulated hunting and trapping of coyotes and bobcats. One might speculate that the number of predators that survive the winter and are capable of killing fawns during early summer has been reduced. Additionally, the increase in other prey species like rabbits and rodents in recent years provides mama coyote with a readily available and easily obtainable food supply for her pups. At any rate, the impact of predation on our deer herds is difficult to determine, but if it has been a significant fawn mortality factor in the past, the population should respond favorably. Most Kansans, irrespective of their desire for more deer, want to see and hear coyotes and would deplore any effort to reduce their number to "benefit" deer. Most biologists agree that relationships between all predator and prey species are incredibly complex and that even the complete elimination of the coyote might have surprisingly little effect on deer survival. These species evolved together in the prairie environment and given half a chance, will continue to coexist as long as the prairie itself survives.

While epizootic hemorrhagic disease (EHD) is the most devastating disease affecting deer 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 early October. Perhaps as deer congregate around water during dry years, they run a greater risk of exposure. This particular disease appears to be specific for whitetails, but has been found infrequently in mule deer and antelope.

The state's veterinarians and farmers are more concerned about leptospirosis, anaplasmosis, and brucellosis or "bangs" disease as it affects their dairy and cattle herds. "Bangs" is practically nonexistent in deer while blood serum analysis from almost 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 may be advisable to test a sample of deer again, if for no other reason than to demonstrate good faith on the part of the Fish and Game Commission to monitor for wildlife diseases. It is highly 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 some point compatible with agricultural interest.

Home Country

If deer managers agree on nothing else, they all share a common concern for the maintenance of deer habitat in sufficient quality and quantity to provide abundant populations of America's top big game animal. "A difficult task," you say, in light of increasing demands on the resource, and you're absolutely right, but it can be done by providing rural landowners with economic incentives, by continuing to base management decisions on sound biological information, and by letting Kansans know what they can do to maintain and improve cover.

For example, it would help deer, the gas shortage, *and* the low price of grain to avoid planting that last two, five, or ten acres of marginal farmland. It would help deer, save on winter propane bills, and reduce wind erosion to develop windbreaks and shelterbelts around farmsteads and fields. Such breaks catch snow for early spring moisture, provide shade, furnish habitat for wildlife, and make a pleasing break in the monotony of an otherwise nondescript landscape. Many highly effective wildlife management techniques are no more complex than these. The key to their success is involving Kansans in *action* programs they can identify with. We all have different pet causes.

What affects one person may not arouse another. The secret is letting people know how many interests are served by abundant wildlife populations.

The agriculturally-oriented Midwest produces the healthiest, most productive, and many of the largest deer in the United States. In the North American Big Game Awards competition (formerly the Boone and Crockett Club), Kansas has ten typical whitetail racks listed; two in the top twenty. Bowhunting's counterpart, the Pope and Young Club, shows listings of forty-six typical whitetail racks from the Sunflower State of which an amazing five are in the top twenty. And, we all know of one or two "rocking chair" racks that have never been measured.

The habitat that raises these Kansas trophies is a constantly changing array of woods, grassland, and agricultural ground whose ability to support deer fluctuates with season, climatic conditions, intensity of land use, cropping patterns, and degree of human disturbance (mostly hunting pressure).

Most deer populations are associated with permanent woody vegetation. This habitat exists in Kansas primarily as small woodlots, the loess drift hills along

In the depths of winter, even the most modest tracts of riverside timber support a few deer. Woody cover moderates the weather, provides staple midwinter browse, and is often close to high-energy sources of food like corn, milo, and alfalfa. This herd was photographed along the Smoky Hill River near Ellis. (Photo by Kent Monte).



the Kansas and Missouri rivers, the blackjack-post-oak forest known as the Cross Timbers area in southeast Kansas, the oak-hickory woods on the eastern uplands, and as stream-associated vegetation.

It is estimated that five percent (2.6 million acres) of Kansas provides the base habitat that supports our deer herds for most of the year. Eighty percent of this habitat is land with ten percent or more tree cover.

Whitetails are most numerous along streams where elm, ash, cottonwood, hackberry, willows, oak, and boxelder are common along with brushy species like sumac, coralberry or buckbrush, dogwood, plum, chokecherry, and gooseberry. Adjacent croplands provide cover during the growing season, but the focal point of deer activity is almost always secure woody cover. This may take the form of small, ungrazed pockets of brush interspersed with native grasses and forbs, particularly in mule deer range. Kansans are lucky to have the mule deer as a second species because the muley uses sparser western habitat that whitetails ignore. A mule deer may range many miles from bottomland timber through most of the year, but in the depths of winter, the mule deer is just like the whitetail in its preference for woody cover.

Because deer use a wide variety of cover types, including crop fields during the growing season, it is difficult to determine just what constitutes good deer habitat in an agricultural environment. Therefore, it is often meaningless to discuss deer densities in Kansas.

It is ironic, but the large flood control and irrigation reservoirs which have stabilized stream flow and helped protect woody cover on floodplains have also allowed landowners to clear timber and intensify farming along major rivers to the detriment of deer. Most eastern Kansas impoundments have inundated thousands of acres of prime deer habitat, but management in the upper reaches of most western Kansas reservoirs has provided excellent deer cover, increasing the carrying capacity of the drainage before the dam was built. With ninety eight percent of all land in Kansas under private ownership, the value of this publicly owned deer habitat, usually managed by the Fish and Game Commission under an interim lease, is readily apparent. This reservoir-associated cover in the west is like an oasis in the midst of an agricultural "desert." Corn, sorghum, soybean, wheat, and alfalfa residues on private ground provide deer with a highly nutritious food source, but it is the cover, not food, that is the vital link in deer management on western farmland.

Highly mechanized, large-scale monoculture farming is having adverse effects on all wildlife, including deer. We can be thankful that the Department of Agriculture's "maximum production" philosophy during the Butz years has been tempered with a more reasonable farm program that has not only put more dollars in the farmer's pocket but has benefited wildlife through a reduction in acres planted.

The grazing of woodlots and floodplain timber by livestock is common in Kansas. Probably seventy percent of all woodland is grazed or used as livestock wintering areas. Livestock trample understory vegetation and tend to discourage deer from using the area. By excluding grazing from small ten- to twenty-acre patches, landowners can attract deer.

It is unlikely that Kansas' climate imposes any direct limitations on the distribution and population growth of deer. Weather's greatest influence is related to precipitation and the availability of moisture to woody plants. Availability of drinking water may occasionally present a problem.

Severe winter storms are generally short-lived and although deer may move to areas that afford better protection from the elements, concentrations of deer do not occur for any length of time. Little, if any, direct mortality is thought to occur over the winter in Kansas. The winter of 1978-79 was as severe as any in recent years, and no mortality directly attributable to bad weather was reported even though large herds of deer formed and stayed together for a long period. During periods of heavy snow, free ranging dogs constitute a greater threat to deer than severe weather.

Management

The current deer management goal of the Fish and Game Commission is to increase the deer population to the optimum carrying capacity of the existing habitat and provide for recreational use. The use of the word 'existing' may seem to imply passive management but is probably realistic when the potential for increasing deer habitat in the state is considered. However, to meet increasing resident demand for firearms deer hunting permits, Fish and Game will have to take a more active role in maintaining and hopefully improving the quality of Kansas deer habitat. In addition, efforts will be made to reduce the number of deer lost to nonhunting mortality.

Our deer population is currently below the biological carrying capacity of the habitat, but it is fast approaching the economic carrying capacity of the range. Defined in terms of big game management, biological carrying capacity is the number of deer a unit of range can support in good physical condition while not reducing the vigor of the habitat. Landowners, motorists, and others with deer problems will eventually establish another, artificial, but economically realistic upper population limit.

Kansans have become increasingly tolerant of deer as the herd has grown. In the farming community, this



acceptance is perhaps closely related to increasing yields and the diminishing economic impact of occasional deer browsing, but sooner or later, deer will reach a population level that will balance demand for more deer and complaints from agricultural interests.

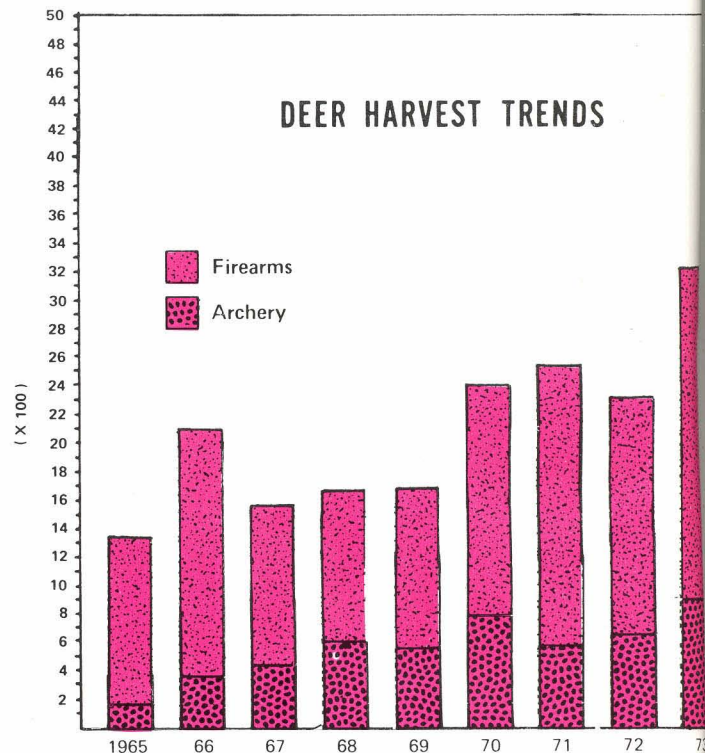
Because most land in Kansas is privately owned and the Fish and Game Commission has had relatively little influence on private land management, the agency's deer management is primarily harvest management. During and after each year's seasons, the wildlife biologist responsible for the deer program gathers biological data and hunter performance information. Analysis of these parameters is compared with base information from previous years to find out whether goals for the population's growth rate and physical condition are being met.

When preparing hunting season recommendations for the next year, the manager reviews all these data, obtains additional input from field personnel, considers the number and location of crop damage complaints and deer-vehicle accidents, and with other staff members recommends harvest quotas for each management unit. On occasion, public meetings are held to find out how sportsmen feel about Kansas deer management and season recommendations.

The Commission director is involved in the staff review of the season; the recommendations themselves are presented to Fish and Game Commissioners at their April meeting. The public is always invited to attend and comment during this final review before the Commission takes action. Usually, the Commissioners have already reviewed the proposals at their leisure, but they now consider public comment, carefully reflect on constituent suggestions, the future of deer resource, and operational objectives before they vote on the recommendations. In the fourteen years that this author has been involved in the process, I believe the Commissioners have approved biologically sound and justifiable recommendations that have met with the approval of most Kansans.

By law, half of all firearms deer hunting permits (including muzzleloaders) are reserved for landowners who have eighty or more acres of farm land used for commercial agricultural purposes. However, all are required to pay the \$15 permit fee (if they are successful), and in 1980 the fee will be \$20.

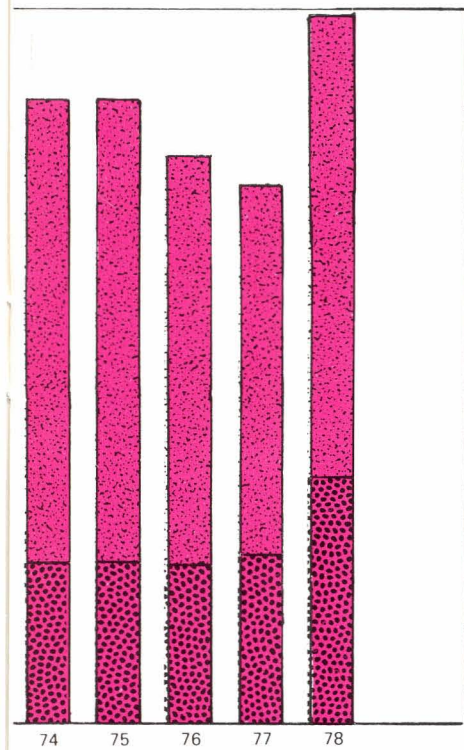
Is this adequate compensation for the people who own enough land to manage for deer? Many say no, but of the 78,000 or so farm units in Kansas, only a small percentage actually support the state's deer herds. Should all landowners, regardless of whether they have deer on their farms, receive the same special consideration? This question is open to debate. If the Commission were somehow able to identify only those farms that produce and feed deer and provide some kind of preferential treatment or monetary incentive, it might increase landowner tolerance of deer *and* deer hunters. This latter factor is especially important as we



attempt to satisfy sportsmen's demand for firearms permits by increasing hunting pressure. The majority of permit holders hunt deer on private land. Further, not all landowners with deer on their property are interested in hunting them, but if they are and fail to draw a permit, are they likely to grant hunting permission to the general public? Not likely! And if so, perhaps only very reluctantly.

If you were to ask ten deer hunters for their definition of a quality hunt, there would probably be ten different answers. It is likely that bowhunters will see things a little differently than firearms hunters. To some, a quality hunt depends on the environment in which the hunt takes place. Others consider relative hunter densities important, while some feel that seeing deer, especially antlered bucks, is crucial to a quality hunting experience. The Fish and Game Commission has responsibility for controlling the sport and must maintain some standards of quality for the deer hunter. Our laws and regulations attempt to do this. They will not satisfy everyone and are not really expected to. Without some controls, the deer resource and the rural landowner who has deer on his land would "take it in the head."

Because Kansas has a relatively small deer population and a limited amount of habitat, the Commission has limited annual deer kill and tried to focus hunting pressure on large, productive populations. Before the 1965 season, the state was divided into management units. Twelve of these units were opened in the first



The effect of progressively more liberal seasons can be seen in this graph of deer kill. From 1965 until 1969, firearms deer season was five days long in selected areas of the state. From 1970 through 1972, hunters in western Kansas had a nine-day season, and in 1973, the nine-day season was expanded to all hunting management units. At the same time, archery season was expanded from forty-six to seventy-seven days. Even with this increasing harvest, the Kansas deer population continues to grow.

season; by 1968, the entire state was opened. The number of firearms permits issued in each unit is set according to the results of local population surveys so that the deer herd can continue to expand while it supports hunting. By allowing annual but limited harvests of deer on a sustained yield basis, total herd size and its growth rate can be controlled. While “bucks only” hunting continues to be the mainstay of our harvest program, some antlerless deer (does and young-of-the-year) are taken annually.

In fourteen bow and firearms seasons, 51,595 deer have been harvested. Of this number, seventy-three percent were antlered bucks and twenty-seven percent does and fawns. Total annual harvest (bow and gun) has increased 344 percent since 1965 although the increase hasn't been continuous since harvest rate is influenced by permit quotas, number of antlerless deer taken annually, length of season, and prevailing weather conditions.

Bowhunters across the state await the arrival of October 1 with the excitement of an Indian brave about to begin his first hunt. The anticipation begins with the last day of the previous season. Except for 1971 when the archery deer season began on October 16, all others have opened on the first. Season length has varied from forty-six to seventy-seven days and in recent years is averaging about seventy-five days. Approximately eighty-five to ninety percent of the permittees are active and in 1978 they averaged 16.7 days afield. Even though a record 1,738 deer were harvested by 7,395

bowhunters in 1978, and resulted in an excellent twenty-four percent success rate, more than seventy hunter-days were spent in the woods per deer legally taken. Average hunter success is about nineteen percent.

In the past fourteen years, bowhunters have reported harvesting 11,371 deer of which forty-nine percent have been antlered bucks. The seasons have provided countless days of wholesome, outdoor recreation, almost 124,000 hunter-days in 1978, with relatively little drain on the resource. Archers have been some of the nation's strongest supporters of sport hunting and have recognized the need to “clean up” their own ranks and adopt the highest ethical standards and most humane hunting equipment and methods possible for harvesting deer.

It is not surprising in light of increasing deer herds, more liberal permit quotas and regulations, that the largest antlered buck harvest on record was reported in all management units in 1978. In fourteen years, prior to 1979, 40,224 deer have been harvested by rifle, shotgun, and muzzleloader hunters. Of that number, almost eighty percent (32,098) were antlered deer. The legal harvest has increased 269 percent during this period while there has been a 224 percent increase in hunting pressure. Average hunter success is almost thirty-five percent with a management unit range of seventy to eighty-five percent in the west and twenty eight to sixty percent in the central and eastern units. To illustrate the effect of “any deer” permits, 1,551 were issued in 1978 and thirty-seven percent (575) of the permittees harvested antlerless deer.

Approximately ninety percent of all firearms permittees are active annually. In achieving the record harvest they spent almost 49,000 hunter-days in the field and averaged about ten days per deer taken.

Almost 19,000 Kansans participated in the 1978 deer seasons and accumulated 172,744 hunter-days of recreation. Based on \$7.39 per day of recreation, last year's deer seasons were worth \$1,276,578 to Kansas sportsmen. In addition to the recreation provided, the harvest of 6,680 deer produced about 367,400 pounds of boneless venison valued at approximately \$657,646. Admittedly, this may be “small potatoes” in states with larger deer herds and many more hunters, but it represents a sizable cash credit for Sunflower Sportsmen.

At present, harvest management strategy is aimed at maintaining reasonably good statewide hunter success (thirty-five to forty percent), moderate hunter densities and a harvest age structure that maintains a productive, healthy herd within the tolerance limits of landowners, yet provides an abundance of yearling three and four point (western count) bucks and a liberal sprinkling of two-and-a-half to five-and-a-half year old trophies. Legal deer harvests and associated hunting mortality remove twenty to twenty-five percent of our fall population compared to fifteen to eighteen percent just a few years ago.

This type of management strategy requires the annual harvest of some antlerless deer along with antlered bucks. The deer population's growth rate cannot be controlled with "bucks only" hunting and, fortunately, Kansas has never fallen into that unwise and restrictive management trap. The producing segment of the population (females) must be controlled if a herd's growth rate is to be contained. About twenty-seven percent of all deer legally taken in the state have been does and fawns. Don't misunderstand; antlered-only hunting has its place in our flexible management program, but it is just one of several options used to provide hunting opportunity and herd control.

In past years, several different types of antlerless deer harvest regulations were used. In some management units, hunters have been allowed to take deer of any sex or age on all days, the first two days, or the last day of the firearms season. These regulations did not provide the means to control the number of antlerless deer taken, and overharvests occurred in several areas. Now, in units where antlerless deer hunting is authorized, ten to fifty percent of the permittees receive "any-deer" licenses. This enables the Commission to predict the number of does and fawns that will be taken with a reasonable degree of accuracy.

The number of active hunters, percent of "any deer" permits, length of the season, weather conditions during the hunting period, number, species and vulnerability of deer, all combine in ways that determine annual harvest and hunter success. Fourteen years of experience and data enable the Commission to achieve predictable results with its harvest management. We can increase or decrease the take of deer, particularly of does and fawns, merely by changing those things over which we have control. The degree of control exerted depends not only upon statewide management objectives but on conditions within each management unit.

Any reasonable person should be able to understand that the Commission's primary concern as it relates to deer is the maintenance of the resource for this and future generations, to keep problems associated with deer at a tolerable level, and provide as much recreational opportunity as possible within the limits imposed by the natural reproductive ability of our herds and the habitat they occupy.

Now, let's get down to specifics about our deer population and relate some of the things we've learned about them during the past seventeen years. Although frequently asked to do so, resource managers across the nation are reluctant to provide deer population estimates. In most instances, statistically reliable data are just not available. Excessive costs, difficulty with survey design, manpower requirements, and the plain fact that deer are secretive creatures and not easy to physically count precludes a complete statewide census.

Post-season hunter questionnaires, determination of ages of harvested deer from deer teeth submitted by successful hunters, occasional mandatory check sta-

tions, January deer counts, records of nonhunting deer mortality, and periodic use of a landowner opinion survey are all used in place of a complete statewide deer census. These surveys allow Commission biologists to assess population and harvest trends, assess the impact of deer on farming, and find out about public attitudes toward deer and deer management in the state.

Kansas' deer population has been increasing every year since the deer project began in 1962; slowly in some areas, more rapidly in others. The number of deer-vehicle accidents provided a fairly reliable population trend indicator until gasoline shortages, less evening travel, a reduced speed limit, and less traffic volume necessitated the development of a new data base. From 1965 to 1974, the average annual rate of increase in road-killed deer was 9.6 percent. The deer roadkill index, which takes traffic volume into account, increased an average of 7.4 percent during the same period. Deer-vehicle accidents increased from 563 to 1,423 in nine years before decreasing to 1,211 in 1974. A total of 1,456 road-killed deer was reported last year.

The statewide deer density is approximately 0.6 deer per square mile. When only "deer range" is considered, densities approach eight to twelve deer per square mile. Until farmers voice opposition to too many deer, we can assume that they find the population tolerable, and we can allow it to increase in an effort to provide more deer to satisfy recreational demands. All our deer population, harvest, and age structure data suggest that we had about 15,000 deer in the state when we began to hunt them in 1965. Today, we estimate a herd of 45-50,000.

It is vitally important to determine the age structure of a deer herd in assessing mortality and survival rates. In the past, deer age was determined at mandatory check stations by biologists who examined tooth replacement and wear in the lower deer jaw. This method was subject to error due to variations in deer tooth wear and aging mistakes, but it remains the most reliable field age determination technique available. When compulsory check stations were discontinued in 1969, successful hunters were asked to remove the two front incisors from their deer and mail them in for examination. Biologists determine species and age of these deer from various tooth characteristics.

In 1978, this sample of harvested whitetail and mule deer contained 4.7 percent fawns, 63.7 percent yearlings, 17.3 percent two-and-a-half year olds, and 14.3 percent older deer. Numbers of fawns and yearlings in the harvest showed important differences between the two deer species and between the hunters of each species. Whitetail hunters took more fawns than mule deer hunters harvested, indicating that they had more trouble identifying fawns and that they were probably less finicky about the age of the deer they took. Mule deer hunters in western Kansas took very few fawns. This may be partly because mule deer are often in

groups during the hunting season so that the hunter can compare sizes more easily, but it probably also shows that the western Kansas deer hunter is more selective.

The relatively low number of fawns and yearlings harvested from the mule deer population is another sign that mule deer are less productive than whitetails. Using the average age composition for the two species, we have calculated that 100 whitetail does of all ages produce 130 to 140 fawns per year while an equal number of mule deer does have eighty to eighty-five fawns. This rate of pregnancy is reduced by ten to twelve percent because of fawn mortality before birth. An unknown amount of fawn mortality after birth also reduces the number of deer added to the population before hunting starts.

On the buck's side of the ledger, yearling whitetails comprised 68.4 percent of the antlered harvest in 1978 and 67.3 percent the previous year. Mule deer one-and-a-half year olds accounted for 71.9 percent of the 1978 kill and 68 percent of the '77 harvest.

Now, just what does all this statistical gobbledegook mean? First, it strongly indicates that, under the modified bucks-only hunting regulations at current levels of hunting pressure, our deer herd is in excellent shape and is still increasing in most areas. Older trophy bucks are still common enough to tempt the most discriminating hunter, and the relative abundance of yearlings and two-and-a-half year olds should make the hunt interesting, if not successful, for almost half of the permittees. Generally, the slight excess of males born into the population every year is quickly eliminated as hunters select for antlered deer. A buck's ability to fertilize several does means that the productivity of a deer population won't usually decline because of the hunter's preference for bucks. By the same token, the growth of a problem deer population can't be controlled by a bucks-only season.

The statistics also show that mule deer are not as productive as whitetails. Since mulies are also more vulnerable to hunting, Fish and Game has tailored regulations to reduce mule deer harvest and insure sustained yield year after year.

Kansas deer are in excellent physical condition as demonstrated by their productivity, impressive antler development, and weight gains. Field dressed buck fawns average about seventy-six pounds for whitetails and seventy-five pounds for mule deer. Yearling whitetail bucks weigh approximately 123 pounds field dressed whereas their western Kansas cousins tip the scales at 116 pounds. In short, the fertility of the Kansas prairie is reflected in its ability to raise healthy, fast-growing deer as well as in its agricultural potential.

However, the Commission recognizes that, while the deer herd itself is a vital element in the state's deer management, it isn't the only element. While we have developed confidence in our ability to assess deer

populations, landowner tolerance, and the results of annual hunting seasons, we have also begun to recognize that every interested person sees deer management problems a little differently and that his solutions will probably be in terms of his personal experiences and may not agree with the Commission's program. In this regard, we will continue our efforts to improve deer management in Kansas and incorporate sportsman input into our season and permitting recommendations.

The key to more successful management is the financing of more habitat. By far the most promising solution to the problem is to offer landowners a tax reduction for land retained in woodlands, and perhaps additional monetary incentives to plant more trees.

In some states, hunters and others interested in wildlife contribute substantial sums of money to their respective conservation agencies by purchasing habitat stamps or by donating part of their state income tax refund. These funds are used in a variety of ways to maintain, improve and develop additional habitat for wildlife. In Missouri, a 1977 constitutional amendment to divert an eighth of one percent of annual sales tax revenues into conservation programs is having a very positive impact on maintaining wildlife habitat in that state. Obviously, these measures require overwhelming legislative and public support to be implemented, but they fairly place the responsibility for maintaining wildlife populations on the shoulders of all Kansans.

Kent Stucky





A look ahead

For all practical purposes, the scientific management of Kansas wildlife resources didn't get off the ground until 1962. Since that time, we've come a long way. The road has been paved with some notable successes and several minor setbacks. Through the years, however, one encouraging situation has developed. Kansans who have been in the state long enough to see the return of deer to the prairie almost unanimously agree that it's good to have them back. We have had a rare opportunity to find out how much a wildlife species can mean by losing it, then gaining it back again. Let's hope the lesson sinks in; we may not be able to heal similar mistakes as easily in the future.

Fortunately, when we manage deer, we are dealing with a renewable resource in a prairie environment that maximizes reproductive rates. If deer poaching can be controlled and nonhunting mortality reduced to

the lowest possible level, more deer will be available for recreational use, both harvest and nonharvest. It is totally unrealistic to expect to meet all sportsmen's demands for hunting uses, but careful consideration of all management options and imaginative thinking will enable the wildlife manager to provide optimum recreation benefits within the limits imposed by finite habitat.

We must maintain our credibility with the public by resisting the temptation to fulfill all demand with "pie-in-the-sky" proposals. Kansans are traditionally a solid, conservative, hard-working people. As long as we give them straight, factual answers and sound biological management, we're confident that they will provide the long-term support needed to maintain our deer.