KANSAS Wildlife & Parks

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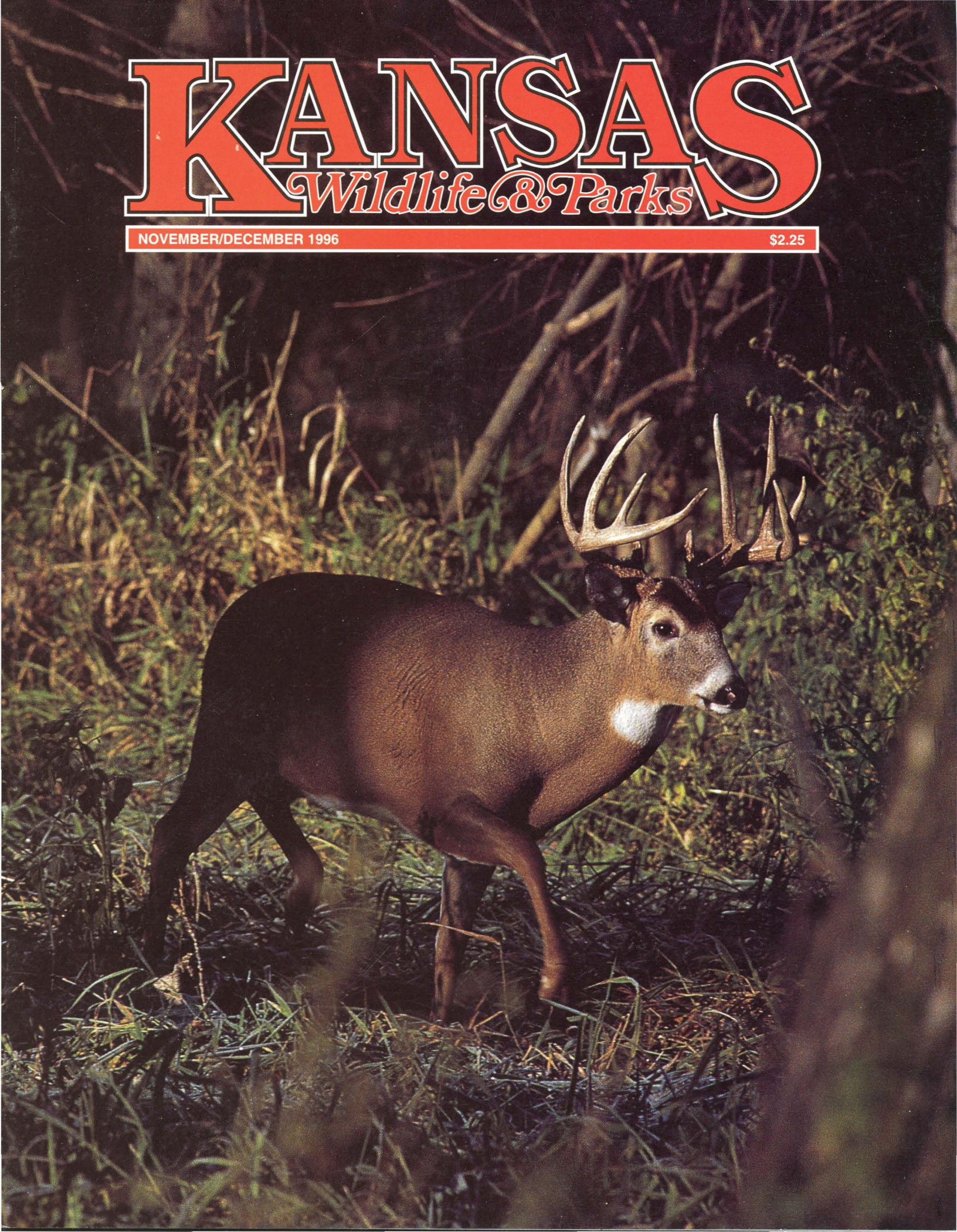

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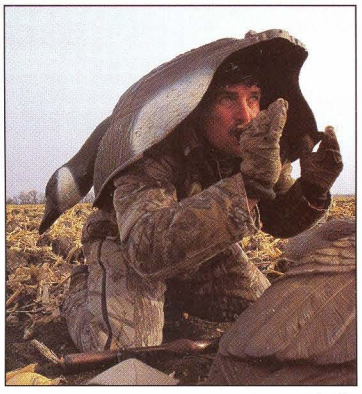

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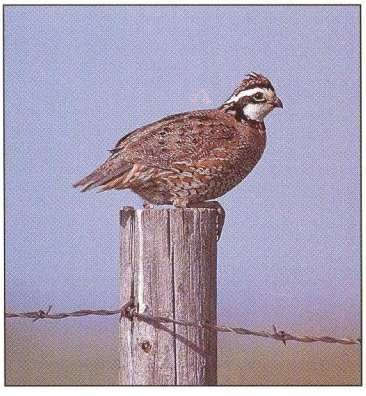

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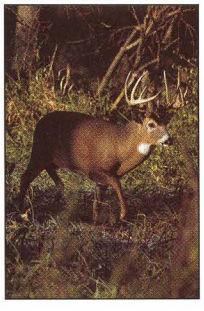

About the covers
Front: A white-tailed buck searches the woods during the rut. Mike Blair photographed the scene with a 400mm lens, @ f/8, 1/125 sec. **Back:** Fall duck numbers are the highest since records have been kept. This mallard was photographed by Blair with a 600mm lens, @ f/5.6, 1/500 sec.

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Editorial Creed: To promote the conservation and wise use of our natural resources, to instill an understanding of our responsibilities to the land.

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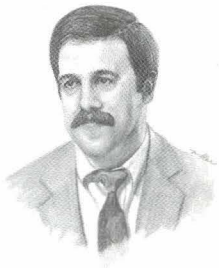
The View From Here

Steve Williams



A Place To Hunt

It's a fact; pheasant and quail hunting in Kansas can be as good as it gets. Harvests for both species usually rank among the top three states in the nation. However, the amount of land open to public hunting in Kansas ranks near the bottom. While Kansas landowners are known for their generosity and willingness to let those who ask hunt, many would-be hunters report that not having a place to hunt is the biggest obstacle keeping them from the field. The Walk-In Hunter Access (WIHA) program should begin to remedy that problem.

What began as a pilot effort in 1995, involving seven counties and 10,000 acres has grown to 84 counties and more than 180,000 acres in 1996. The department leased land from landowners or tenants with contracts that start in either September or November and end Jan. 31. The land had to be at least 80 contiguous acres and have suitable wildlife habitat. Lease payments varied with the amount of opportunities available and the length of the lease.

Response to WIHA has been overwhelmingly positive. Ninety-six percent of the hunters who hunted WIHA areas last year recommended continuing the program. Nearly all of the landowners who participated in 1995 renewed this year. And when the notice went out this summer that the program was expanding statewide, wildlife biologists were swamped with contract requests.

Each inquiry required a biologist to visit the site and determine if suitable hunting opportunities were available. If upland bird hunting was the primary attraction, then a November-January lease was pursued. However if dove, deer or waterfowl hunting was available, the preferred lease was Sept. 1-Jan. 31. Much of the land enrolled initially was Conservation Reserve Program grass, which is ideal for upland bird hunting. However, all land was considered, and a wide variety of habitat types are included. The deadline for signing up land for 1996-1997 was Aug. 15. Landowners wanting information for enrolling land next year should contact either the Pratt Operations office or the nearest regional department office.

As news of the success of WIHA spread, hunters have kept department staff busy with requests for the WIHA land atlas. But the benefits of WIHA go beyond landowners and hunters. Counties with numerous WIHA tracts may see more hunters travel to the area this fall, providing an important boost to local economies. Annually hunters in Kansas spend more than $130 million on food, lodging, gasoline and other related purchases. And hunting-related businesses support 4,260 jobs in Kansas.

From the department's standpoint, WIHA is an economic program. Because the program is funded by revenues derived from hunting license sales, the department is eligible to receive federal reimbursement. The average contract this year paid $1.49 per acre. The department is reimbursed $.75 for every dollar spent. WIHA has allowed the department to dramatically increase hunting opportunities in a day and age when state land acquisition is hindered by negative attitudes and limited budgets.

The momentum WIHA gained in 1996 appears to give the program bright future. Much of the program's continued success, however, will rest with hunters. If the rules of each WIHA lease are followed, it is likely that landowners will remain in the program. But if hunters ignore signs, drive off maintained roads, or trespass on neighboring lands, the program could lose its momentum. It is imperative that hunters accept this responsibility. Department staff have posted all leased tracts and will be patrolling the areas throughout the season. If you don't see the WIHA signs, don't hunt, even if the map shows the area to be leased. Like the title implies, it is a walk-in program. Vehicles are restricted to designated parking areas and maintained roads.

We are on the verge of an exciting era for Kansas hunting. I hope everyone has a chance to enjoy these new opportunities. And I hope to see some of you who haven't hunted in several years. WIHA should make it easier for all of us to find quality hunting and rediscover the joys of the Kansas autumn, opening day traditions and the camaraderie of family and friends. Hunt safely and ethically and take a youngster with you whenever you can.

Steve Williams

Mike Blair photo

Legacy Lost

Randy Rodgers
wildlife research biologist, Hays

While Kansas still ranks near the top of states in pheasant harvest, more than 30 years of surveys show drastic declines in pheasant populations in western Kansas. Biologists have been searching for reasons why.

As I turned south toward Dighton, I spotted a lump on the shoulder of the highway. It was a hen pheasant, and she was alive — barely. She had collided with a force far more powerful than herself and now, as I backed up the pickup, death seemed to be tightening its grip.

Eyes closed, her head was swaying in an eerie side-to-side motion that did not change as I approached. I gently picked her up, and for a moment her eyes opened, and the convulsions in her neck seemed to ease. She was pheasant number 15.

For 18 springs, I've traveled to southwest Kansas for an annual wildlife survey. By counting the number of pheasants along the same highways, at the same time of evening, and during similar weather each year, I've turned the drive into an informal measure of a thin slice of western Kansas' pheasant population. By the time I reached Garden City this spring, the total was 18, including the hen — number 15.

Sadly, this little driving survey only confirmed what I already knew: that pheasants, and the traditions associated with them, were in trouble in western Kansas. In the early 1980s, I typically would see 80-90 pheasants on the same trip.

The fact that pheasants have drastically declined in western Kansas is no revelation to any careful observer. But for most people, gradual change can be deceptive. Changes that occur over long periods of time may be perceived as almost no change at all. Without objective measures of long-term trends, there's danger that a degraded condition could be perceived as normal.

In 1981, I used information from just such a measure to look at where pheasant populations might be changing in Kansas. Even then, evidence pointed toward substantial pheasant declines in much of western Kansas. Perhaps those early warnings were taken too lightly.

After all, pheasant numbers at the time were still good, and the traditions of family reunions and city-country friendships that revolved around pheasant hunting were still going strong on the High Plains. They are not anymore.

Over the last decade, western Kansas pheasant populations have hovered around an average level that makes the previous low point look good. That earlier low was directly tied to "fencerow-to-fencerow" crop production promoted in the early 1970s. The subsequent dramatic recovery of pheasants in the late 1970s came only after those policies ended, and high fuel prices curtailed tillage. But the pheasant crash of the middle 1980s and the subsequent failure of the population to recover have resulted from different causes.

Perhaps the best, long-term measure of pheasant populations in Kansas has been provided by our rural mail carriers. About 350 carriers working within Kansas' pheasant range have voluntarily counted wildlife during four weeks every year for more than 30 years. That's more than 200,000 observation-days accumulated over that period.

When that imposing amount of information is summarized, a depressing picture emerges. Nearly all of the counties on the High Plains of Kansas have lost at least half of their pheasant populations since the first decade of the rural mail carriers survey. That, however, seems mild once you realize that, over vast parts of the High Plains, the situation is much worse. Pheasant populations in many counties have plummeted more than 75 percent. Even major portions of central Kansas have experienced substantial drops in pheasant numbers.

Over the last decade, pheasant populations have hovered around a level that makes the previous low point look good.

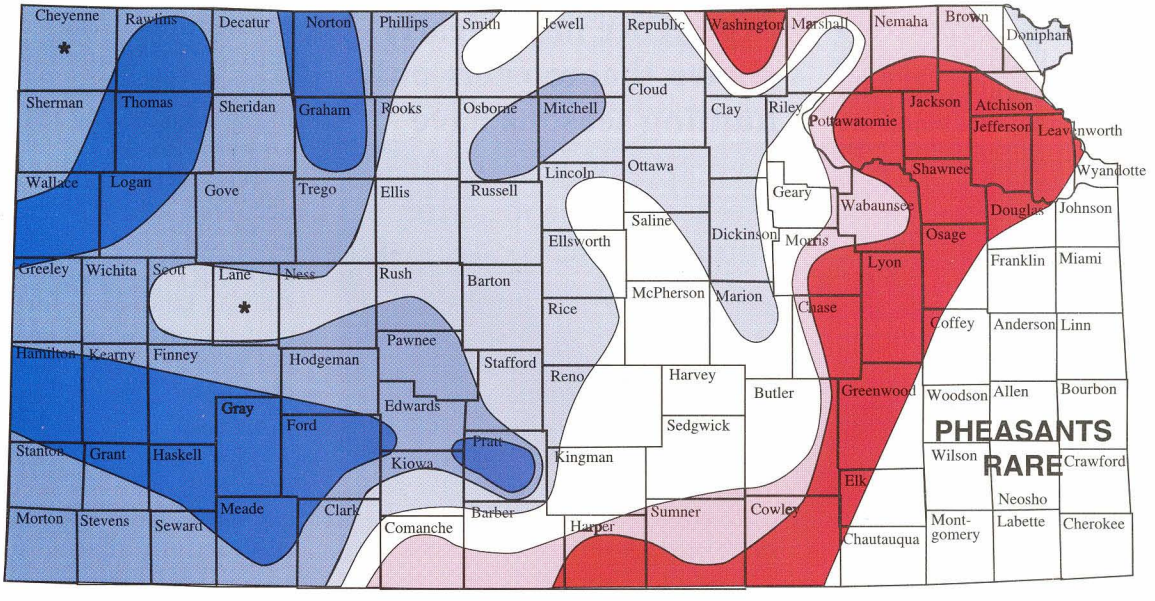
It's true that ringnecks have increased in some counties along the eastern margin of Kansas' pheasant range. While this may seem impressive when viewed as percentage change, these eastern Kansas increases are minuscule compared to the massive losses in the west.

So, what's going on in western Kansas? How can it be that pheasant populations have reached such low levels at the same time the Conservation Reserve Program (CRP) has added so much permanent cover to the western Kansas landscape?

There is no single answer. However, there are a couple of major trends in western Kansas farming that have rendered much of the High Plains inhospitable to pheasants. First let's clarify what's *not* causing the decline.

Many genuinely concerned folks feel compelled to speculate about what has happened to the birds. Such erroneous ideas, unfortunately, usually divert attention from the real problem and create conve-

20 YEAR CHANGE IN KANSAS PHEASANT POPULATION
Average of 1966-75 Compared to the Average of 1986-95



nient scapegoats.

Without doubt, the most common of these misguided ideas contends that pheasants are overhunted, and their numbers would quickly rebuild if the hunting season was shortened or temporarily closed. This idea is often accompanied by speculation that the season is maintained at its existing length only because the wildlife agency wants to sell more hunting licenses. Neither statement is true.

Research and decades of experience have clearly shown that roosters-only hunting seasons have virtually no effect on pheasant reproduction and the subsequent fall population. The best of many examples of this occurred during the 1970s in Iowa and Minnesota. Following the 1969 crash of pheasant populations in both states, Minnesota wildlife officials bowed to public pressure and closed their pheasant season. In contrast, Iowa maintained its normal season length. Even though Minnesota pheasants were not hunted in 1969 and subsequent seasons were much shorter than in Iowa, Minnesota pheasants recovered no faster than the hunted population just across the state line in Iowa.

The ring-necked pheasant is a polygamous bird. Since a single rooster can successfully mate with many hens, relatively few males are needed for normal spring reproduction. Kansas hunters could safely harvest four out of five roosters in the fall with no negative effect. In reality, winter sex ratios in Kansas indicate that we never harvest even half of the roosters present in fall, leaving more than enough for normal spring mating.

As for the question of selling hunting licenses, consider this fact: the number of hunters in the field is directly affected by the level of the pheasant population. Put simply, if there are more pheasants, then more hunters will pursue them. The double insinuation that modern hunting seasons hurt pheasant populations but result in more license sales makes no sense. Pheasant seasons are set to optimize recreational opportunity while staying well within the limits that the pheasant resource can sustain, not to increase license sales.

Mike Blair photo

More than 150,000 hunters pursue upland birds in Kansas each year, including 30,000 nonresidents. Money spent by hunters is critical to many western Kansas communities.

What about hawks? Some people have noticed that hawks and owls appear more abundant than they were 20 years ago and have decided that this must be the reason pheasants have dwindled. Once again, scapegoats have been created.

Research and decades of experience have clearly shown that roosters-only hunting seasons have virtually no effect on pheasant reproduction and the subsequent fall population.

Given the opportunity, red-tailed hawks and great horned owls will take pheasants, and it is true that their numbers have increased since they were federally protected in 1972. But it is wrong to assume that this increase in raptors has precipitated the drastic decline in pheasants.

Given good habitat, pheasants can be relatively safe from predation. Deprive a pheasant of adequate cover, however, and a raptor may well make a meal of it. Raptors are often the mechanism of death for individual pheasants, but the underlying cause for long-term population decline is rooted in a change of habitat quality.

In recent years, I've heard many other false explanations. They have run the gamut from "a disease killed them all," to "they're all out in the CRP, but we just can't find them." These statements mask the true basis for pheasant decline and contribute further to their dim future. Unfortunately, there is no denying that habitat loss is the primary reason for this decline in western Kansas.

What kind of habitat loss has occurred and why has it particularly affected the High Plains? Farming has dominated the western Kansas landscape for most of this century, and wheat has always been the primary crop. Inevitably, then, the answers must lie in agricultural practices.

The semi-arid table lands of western Kansas accommodate extensive, large-scale farming. With productivity limited by moisture, successful farming on the High Plains has always meant farming more acres than might be needed farther east. Development of massive farm machinery not only permitted individual farms to increase

the acres cropped, but it also fostered a situation in which bigger fields became convenient. The relatively flat land on the High Plains enhanced this tendency. Since the 1960s, this trend toward huge, single-crop fields has manifested itself in the destruction of fencerows, odd areas, roadsides, and large chunks of native prairie. One need only drive the backroads to see how little untilled land remains. What's more, the overall pattern on the landscape produced by these huge fields is one of reduced habitat diversity and a lack of mixed habitats adjacent to one another, both important to pheasants and other wildlife.

Still, the huge fields and general scarcity of permanent vegetation is a situation that's been around for three decades on the High Plains. While hurt by the massive scale of such farming, pheasant numbers generally remained good through the early 1980s because pheasants took advantage of *how* the land was farmed. Pheasants' ability to obtain their needs largely from within the predominant High Plains cropping systems made them less dependent on permanent habitats than was the case farther east.

Because of the relative aridity, the most dominant wheat-growing system in western Kansas has been "wheat-fallow." In this system, wheat is planted only once every two years with the field lying idle, or fallow, in the interim. It's during the fallow phase that moisture is accumulated in the soil profile, helping ensure the viability of the next crop.

The start of the cycle comes with the planting of winter wheat in September or October. The seeds germinate and grow for a period in the fall before becoming dormant over winter. Come spring, dormancy is broken, and the wheat typically undergoes rapid growth.

Kansas pheasants have always taken advantage of this green, growing wheat as a major nesting habitat. Although inferior in some ways to more permanent vegetation, green wheat provides the advantage of being generally undisturbed by farm machinery during the nesting season. By virtue of wheat's sheer abundance and uniform appearance, it's also difficult for potential nest predators to search. Pheasant studies on the central Great Plains have consistently shown that a majority of successful clutches were hatched in green wheat.

Pheasant studies in the central Great Plains have consistently shown that a majority of successful clutches were hatched in green wheat.

While wheat harvest has always been a chaotic, sometimes deadly, time for pheasant broods, the removal of the heads allowed more light to reach small weeds that had already germinated under the wheat's canopy. These weeds, particularly the broadleaf plants such as sunflower and kochia, were a life-giving link for surviving chicks.

Traditionally, many western Kansas farmers simply allowed the weeds to grow the remainder of the summer. Agronomic studies in wheat-fallow had confirmed the wisdom of this temporary abandonment. The resultant green growth provided the broods shade from the scorching summer sun, protection during storms, and a canopy between them and the searching eyes of airborne predators. Most critically, the broadleaf weeds provided ideal habitat where chicks could move freely to feed on abundant soft-bodied insects.

By fall and the first killing frost, the broadleaf weeds had transformed the stubble fields into winter cover. Their nutritious seeds would supplement the waste grain already present. The dead skeletons of sunflower and kochia would stand strong against the bitter-cold winds and would shield the ringnecks from the talons of redtails and horned owls until spring. Once spring tillage destroyed these winter covers, the explosive growth of a new crop of green wheat was creating fresh cover in the adjacent field, where the rituals of mating could begin anew.

In these ways, as a friend so aptly put it, fallowed wheat fields were the pheasant factories of western Kansas. But things have changed. Traditional wheat-cropping systems had provided a buffer for pheasants against the sweeping loss of permanent habitats on the High Plains, but these birds were left vulnerable to the next escalation of habitat loss

Randy Rodgers photo

Broadleaf weeds such as sunflowers growing in fallow wheat stubble are critical to pheasants, both as summer brood cover and as winter cover and food source.

— changes within the cropping systems themselves.

It had become apparent by the late 1980s that pheasant populations in western Kansas were not recovering, even with decent weather patterns and the addition of CRP grasslands. Recognizing the intimate dependence High Plains ringnecks have on wheat-cropping systems, two emerging changes were suspected. But suspicions are not enough. Before root causes could be identified, it would take proof.

In 1990, a five-year research project was begun to determine the effects of certain wheat management practices on wildlife populations. Of particular interest were practices affecting the quality of the stubble left after harvest.

For many years, wheat breeders labored to develop shorter varieties that could resist lodging, the tendency for ripening wheat to lay over under the strain of windy, wet conditions. Excessive lodging resulted in decreased yields because the heads became inaccessible to the combine. The new shorter varieties have become popular on the High Plains. Of course, one inevitable result of these shorter varieties is that stubble left after harvest is considerably shorter than that of standard-height wheat.

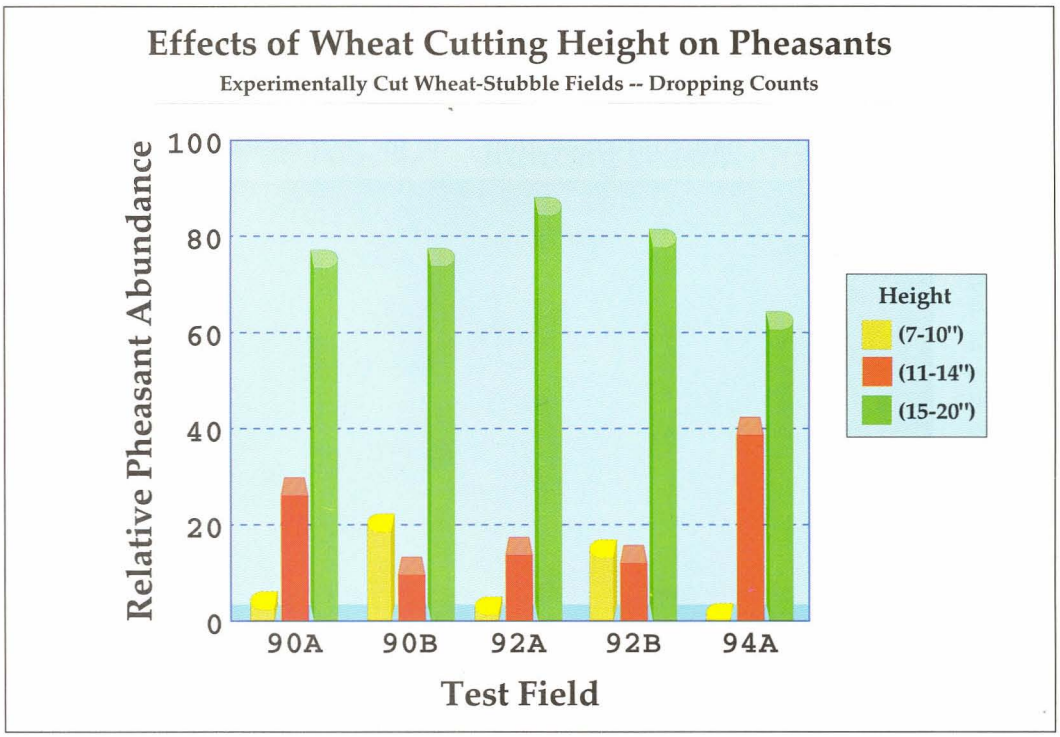
The problem of short stubble has been exacerbated by modern combines that are more powerful and efficient at threshing grain from greater quantities of straw. These improvements, considered by themselves, may seem unrelated to wildlife. But where older combines would choke on excessive straw if the header was set too low, the new machines allow the operator to lower the header and cut even the shortest sucker head in the stand.

In 1990, a five-year research project was begun to determine the effects of certain wheat management practices on wildlife populations.

Some combine operators may be so focused on cutting all the heads that they fail to consider the negatives. Processing excess straw is expensive since it consumes more fuel, speeds up parts wear, and increases the chance of breakdown. It also slows down harvest and can decrease threshing efficiency, all in pursuit of a small amount of low-quality grain found in the sucker heads.

The end result is much shorter stubble than was common 20 years ago. Today, you seldom see wheat stubble as tall as 10 inches. If you get out and walk in it, you realize that much isn't even ankle high.

As part of the wheat/wildlife research, five fields were experimentally harvested by cutting three comparable 10-acre sections of each at different heights. Weeds were allowed to grow the remainder of the summer, and overwinter pheasant use was measured. The results were startling. On average, wheat cut at heights of between 7 and 10 inches harbored only one-tenth the pheasants as adjacent areas cut between 15 and 20 inches tall. Intermediate heights produced intermediate pheasant use. Put another way, every 5 inches of additional stubble height resulted in a tripling of pheasant use.



Five wheat fields that were cut experimentally illustrate the effect of stubble height on pheasant use. A reduction in cutting height of 10 inches can reduce pheasant use by 80 percent.

Something unexpected happened in those trials. Cutting height not only altered the stubble itself, it affected the type and vigor of weeds that grew within the stubble. Weeds in short stubble tended to include more grasses, while broadleaf weeds generally dominated in the tall stubble. What's more, broadleaf plants of the same species grew more vigorously in tall stubble than they did in short stubble. These relationships were observed every year tests were run but were more evident in some years than in others.

Actual cutting of plant stems during harvest sometimes played a role in these

effects. More often, though, the weeds were too small at harvest to be affected by the sickle bar. Nevertheless, plant growth remained more vigorous within the taller stubble.

So what's happening here? Probably, it has to do with the wind. Because taller stubble shields young broadleaf plants from hot summer wind, less moisture is lost from the plants' leaves, and evaporation from the soil surface is reduced as well. This means that more moisture is available for plants in tall stubble to channel into growth. By the time the plants emerge above the tall stubble, they have well-established root systems that can maintain the plants even when their leaves are exposed to the desiccating wind.

In short stubble, small plants almost immediately begin losing moisture to the wind. Their shallower root systems can be strained to extract enough water from a surrounding soil that is already drier due to increased surface evaporation. The end result is that plants in short stubble grow less.

All this has major implications for pheasants. The quality of their stubble-field habitat not only relies on the height of the stubble, but also on the height, vigor and type of weeds that grow there. From the perspective of a pheasant, tall stubble is better than short, and rigid broadleaf plants are better than flimsy grasses.

There may be an agronomic irony here. Sometimes a solution focused too narrowly on a single problem can lead to new problems. This is particularly true in natural resource systems. In solving the problem of lodging by breeding shorter wheat, some results may not have been considered. Short stubble is less effective at controlling erosion. Short stubble produces less organic matter; organic matter that is critical to the soil's long-term tilth, fertility, and moisture-storing capacity. And short stubble traps less snow in winter and permits more evaporation in summer, both of which lead to poorer moisture storage in a region where moisture is limiting. Of course hindsight is usually clearer. Maybe it's time to reconsider these things.

Randy Rodgers photo

Test plots with 7-inch stubble fostered grassy weeds in 1990 (left). Sunflowers dominated in 18-inch tall stubble (right), providing much better wildlife habitat..

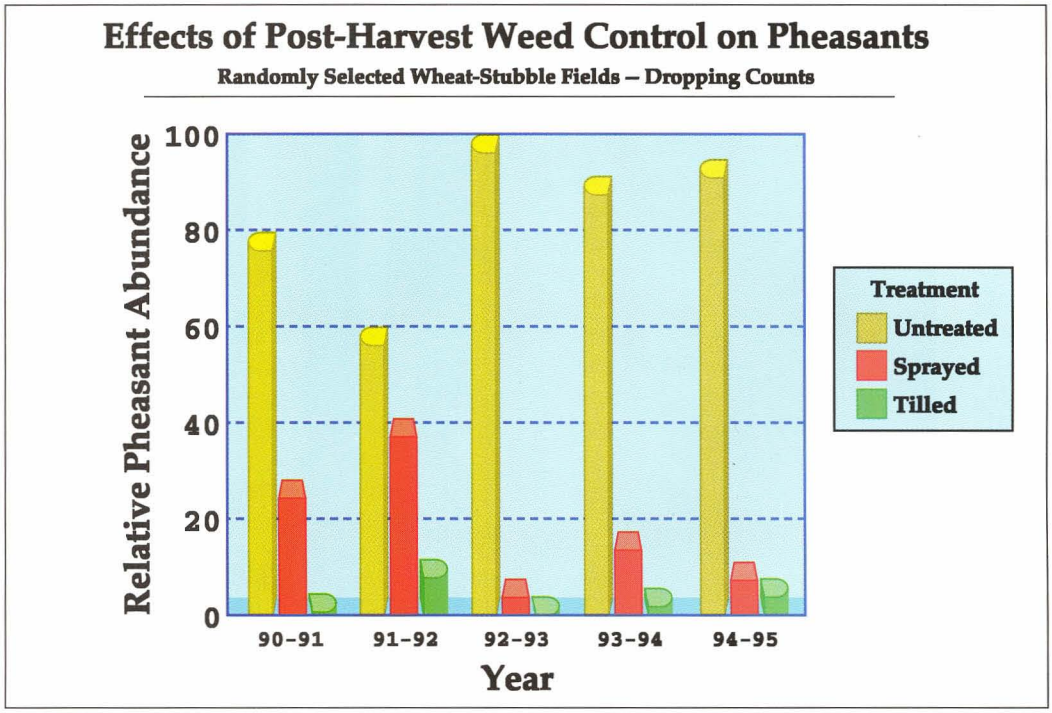
Something else in wheat farming has changed. Wild sunflower, kochia, and pigweed that once dominated the stubble fields after a western Kansas wheat harvest are less common on the landscape. Now, most stubble fields stand lifeless after harvest. They offer no place where pheasant chicks can safely forage for bugs. If green plants are present, they are likely to be annual grasses or volunteer wheat, species that do little to stop the wind once winter arrives.

Wild sunflower, kochia, and pigweed that once dominated the stubble fields after wheat harvest are less common on the landscape.

Herbicide use has increased many times over on the High Plains in the last two decades. Once the potential for chemical weed control was mixed with intensified cropping systems as well as the socially- and economically-driven desire to eradicate weeds, the capability of vast cropland landscapes to support pheasants was diminished. We just didn't know how much.

Between 1990 and 1995, we studied the effects of post-harvest weed control on wildlife in 135 wheat stubble fields in northwest Kansas. Each year, one-third of the randomly selected fields had been tilled (disced or undercut) during the post-harvest period, one-third had been sprayed with herbicides, and the remainder had been left untreated and allowed to grow weeds. As in the stubble height tests, the results were dramatic. It wasn't surprising that post-harvest tillage resulted in little pheasant use of a field. What we didn't anticipate was the magnitude of the negative effect herbicides would have. The effect of spraying stubble reduced overwinter pheasant use by an average of 80 percent, regardless of stubble height.

Averages, however, don't tell the whole story. These results also varied from year to year. Weed growth during the droughty summer of 1991 was minimal and as a result, untreated stubble did



The study compared winter pheasant use of herbicide-sprayed, tilled, and untreated weedy wheat stubble in 145 western Kansas fields. Spraying reduced pheasant use an average of 80 percent.

not appear substantially different from herbicide-sprayed stubble. What's more, the subsequent winter was the mildest in memory. Still, pheasant use in untreated fields exceeded that in sprayed fields by about 60 percent.

The third year of the study proved more telling. The winter of 1992-1993 brought extensive snow cover and persistently cold temperatures. In that winter, sprayed stubble wasn't good enough. Untreated fields harbored 28 times more pheasant use than herbicide-sprayed fields. This is especially significant because it is severe conditions, not mild, that most influence wildlife populations.

There will be those who suggest that spraying is at least better for pheasants than tillage, based on this study. They are, however, failing to consider the landscape as a whole, especially in those years when only the best cover will do. If all the fields in the study areas had been sprayed or tilled in 1992, few pheasants would have survived the winter. From the perspective of pheasants trying to survive a severe winter, it is far better to have a quarter of the fields in good weedy stubble, even if all others are tilled, than it is to have all the fields sprayed.

Chemical companies have gone to great lengths to develop herbicides that are not directly poisonous to animals. But toxicity is not the issue here. Lacking habitat that provides food and protection, pheasants starve and freeze to death just as surely as if they were poisoned.

Even as we examined the effect of post-harvest herbicide use on wildlife, a new class of herbicides emerged, marketed for use on green wheat itself. Green, growing wheat shades the soil surface quickly enough in spring to generally suppress weed competition, so herbicides were infrequently applied. These new herbicides are specifically aimed at cool-season weeds that could compete with green wheat. The control of these cool-season weeds presents little direct threat to pheasants, but these new chemicals also feature residual (long-lasting) activity, and they affect warm-season, broadleaf weeds. These two factors combine to change the species of weeds that can grow in post-harvest stubble. When green wheat is treated with such herbicides, grassy weeds tend to dominate post-harvest growth, and the broadleaf weeds that are so beneficial to pheasants are absent or suppressed. Such fields produce cover only marginally valuable to pheasants, even if no post-harvest weed control occurs.

So, a picture has emerged that closely links the demise of western Kansas pheasants to a decrease in wheat-stubble height and an increase in weed control intensity, particularly through the application of herbicides. There are other factors, but these two appear to be at the heart of the decline.

These changes have so degraded the landscape for pheasants on the central High Plains that even millions of acres of CRP grassland have failed to reverse the trend. CRP in Kansas has fallen short of providing the hoped-for benefits for pheasants. Fears that weeds would dominate CRP prevented incorporation of native broadleaf forbs into CRP seed mixtures. As a result, the native grass habitat of western Kansas CRP has mostly added nesting habitat to an area where nesting cover was generally not the limiting factor for pheasants. Lacking broadleaf forbs, most CRP has not filled the enormous void in brood habitat left by intensive weed control in wheat. Some heavier CRP stands provide winter cover but without forbs, they contain no internal food sources.

For three years, district wildlife biologists and I evaluated overwinter pheasant use of CRP by comparing 14 pairs of CRP and weedy wheat stubble fields. It came as no surprise that the stubble fields were almost three times more useful to pheasants than the CRP fields.

This must not be taken to suggest that CRP has been useless for pheasants. A high portion of pheasants remaining in western Kansas are in or near CRP. But the positive influ-

ence of CRP has not countered changes that occurred in the wheat fields. CRP has, in effect, become a buffer, without which the pheasant situation would be much worse.

Is there hope? Can the decline in pheasants in western Kansas be turned around?

One positive sign is the development of a new stripper header, designed in England, that can be attached to almost any combine. Unlike the conventional sickle-bar headers that cut the wheat, the stripper header literally strips the grain off the wheat stem. This permits the combine to operate more efficiently, at higher speeds, and under conditions where sickle-bar headers cannot. More importantly to wildlife, the "stubble" is just as tall after harvest as before, leaving potentially better habitat than conventional harvesting.

Still, it is clear that taller stubble alone is not enough. Without at least some broadleaf weeds, even tall stubble is of limited value to pheasants — they need both. Perhaps not every field needs to be filled with wild sunflowers, and maybe even weeds in just parts of fields would help. But there will have to be broadleaf weeds to provide chicks a place to grow. There will have to be weeds that can stand strong in the winter; enough that they won't drift full of snow; enough to conceal pheasants from predators; and enough to thwart the attack when concealment fails. And there, it seems, lies the catch.

Is there hope? Can the decline in pheasants in western Kansas be turned around?

The questions surrounding chemical weed control are complicated and anything but one-sided. There can be no doubt that herbicides have changed the face of farming. Their value as tools in agriculture is well accepted. But herbicides are not silver bullets, and their use is not without consequences. Plants most resistant to herbicides often survive to spread their resistance to new generations. This has spawned an escalation in weed warfare which, it appears, will continue into the future. The concern goes beyond weeds and pheasants, to the health of an ecosystem, upon which many species — including humans — depend.

For pheasants to recover in western Kansas, there must be a willingness to think differently. There must be a willingness to consider the possibility that efficient farming need not be synonymous with a sterile land devoid of weeds. There must be a willingness to put aside the destructive notion that weeds are bad in every situation.

There are possibilities for new cropping systems on the High Plains that are not only harmless to wildlife habitat, but could help it thrive. At least one such system is already being tested. But it will take more than one study in one place. It will take a broadened perspective from everyone involved with the land and a willingness to try. Before all that, it will take a recognition that the land is not merely a means for survival — it is a place to live.

Such were my thoughts as I held pheasant 15. She laid tranquil as I admired the subtle hues of her plumage. The warm pinks on her neck matched those of the fading light of the western horizon. As her own life faded, I found myself wondering if her dying might somehow mirror the plight of her species in western Kansas — and hoping it didn't.

Regrettably, pheasants are but one conspicuous loss among many less obvious. Who will notice how few tree sparrows can be found on the High Plains? Who will miss the wispy flight of the short-eared owls that once floated from the stubble fields? I fear that continuing down our present path will surely end with our legacy lost.

Mike Blair photo

A hen pheasant searches for a safe nest site. She will need undisturbed cover to hide her nest in and then cover that includes broadleaf weeds to raise her brood in.

Goose Music

by J. Mark Shoup
associate editor, Pratt
photos by Mike Blair

A growing population of Canada geese, both locally and continentally is attracting more hunters each year. The big geese are unpredictable and wary, providing a challenging quarry.

What is a wild goose worth? Supposing there were no longer any painting, or poetry, or goose music? It is a black thought to dwell upon, but it must be answered. In dire necessity somebody might write another Iliad, or paint an "Angelus," but fashion a goose?

—Aldo Leopold, from "Goose Music," in *A Sand County Almanac*

Growing up in western Kansas, ducks were my first and always my favorite game, but I never hunted geese. After I left home, my father held a goose lease near Quivira National Wildlife Refuge, but those were in the days of my exile to the city, and I seldom had the opportunity to join him in the blind. On those occasions when I did, however, I was always moved by the echo of goose music.

Leopold's words strike a metaphorical chord for the symphony of wildlife sounds we enjoy, but his focus on geese was not accidental. In the 1940s, when "Goose Music" was written, North America's Canada goose population had dropped to about 1 million. Habitat destruction and late-19th century market hunting had taken their toll on these magnificent birds. Their recovery stalled through the 1950s and 60s, explaining in part why I didn't hunt them growing up. But Leopold would be pleased to see how his favorite musician is doing today.

Through the aggressive reintroduction and habitat development efforts of federal and state wildlife agencies, including the Kansas Department of Wildlife and Parks, this giant of the air is making an unparalleled comeback. Today, the Canada goose population is nearing 4 million and growing. In some areas — particularly urban parks, golf courses, and high-profile housing developments with lakes — they are becoming a nuisance.

For the hunter and wildlife lover, however, the comeback has been a welcome blessing. Declining duck numbers through the 1980s left waterfowlers pining for the outdoors. No more. While duck numbers are just beginning to rebound, Canadas are thriving throughout much of Kansas.

Last winter I took advantage of this boom in different parts of the state, one being urban. Yes, urban, or close to it anyway.

As I mentioned earlier, geese have become numerous, even problematic, in some urban areas where they roost and loaf around any place with a pond or river. But when it comes time to feed, they head for crop fields in the nearby countryside. Last season, about 12,000 Canada geese spent their winter loafing time in the City of Wichita. For avid goose hunters in the surrounding areas, this made for excellent early morning and late afternoon hunts.

The key to hunting semi-urban farmland is no different from that used in the country — finding where they feed. This usually means corn stubble or green winter wheat in Kansas, and there is plenty to be had wherever urban development gives way to farmland. This scouting is the most critical step to successful goose hunting. Simply drive roads in mid-morning or late afternoon and watch for flying geese. When you spot them, watch to see where they are feeding. Spend several days doing this until you've discovered a pattern, then ask permission from landowners on or near the property where the geese land. (Once you've gained permission, be sure to show appreciation throughout the year. A smoked goose, fresh garden vegetables, or homemade bread are nice personal gifts.)

Rich Sanders is an avid goose hunter from Pratt who not only hunts in Kansas but travels to Canada each year to pursue his passion. He knows the ins and outs of goose hunting like some men know the dynamics of a golf swing, but when it comes to scouting, his advice is simple: "Spend more time scouting than you do hunting." Larry Buchholz, another avid goose hunter who hunts the semi-urban farm fields around Wichita, agrees.

"You have to be flexible," says Buchholz. "Remember that the birds pick the fields. You should have at least three or four fields to choose from."

Prior to scouting, however, you need a gun and some decoys.

Whether pump, semi-auto, or double-barrel, the shotgun of choice is a twelve-gauge, preferably with a three-inch chamber. Some hunters use 10-gauge guns with 3 1/2-inch shells, but I can't see ruining a fun day by beating myself to death with a cannon. Patience and good shot selection are better than more firepower any day. Either 28- or 30-inch barrel will work although a 30-inch may help with swing through on longer shots. Choke should be modified, which is full with steel shot. (Non-toxic shot is required of all waterfowl hunters.) Steel No. 1 or BB shot works best. If you're in a goose and duck hunting situation, No. 1s are perfect.

Decoys are the most important tool the hunter has for pulling geese within shooting range. Buchholz believes that the number of decoys in a spread depends on the time of year:

"Three dozen should be enough early, but I increase the number later in the season. In January, as the birds get more wary, we may vary the number or scatter several small groups throughout a large field just to give them a different look."

Many hunters believe that to really be effective in late season, you should have at least four or five dozen, twice that many if possible. The bigger the spread, the better. This can be an expensive proposition, but the pocketbook damage can be deflected by buying a few at a time, checking want-ads for used decoys, and borrowing from friends.

Decoys vary widely in price from the simple windsock and silhouette to the full-bodied decoy. New on the market are plastic silhouettes with screen-printed photographs of geese. They're expensive, but in a dozen decoys, no two will be alike. All types work well, but a nice compromise is the shell decoy, which has no legs and is hollow underneath and inside, making them easy to stack and carry. Another innovation in decoys is the flag, which is simply a piece of dark cloth cut to the shape of a pair of wings and mounted on a stick. When shaken

One popular hunting technique is to scout geese flight patterns to feed fields, usually corn or green wheat. The trick is finding a field geese are using that particular week.

up and down, it resembles a flapping goose. Both Sanders and Buchholz swear by the flag as a means of convincing reluctant geese to fly into a spread. "Just give 'em a few waves," says Buchholz, and most groups will at least give you a second look.

Shell decoys come in a variety of sizes up to magnum, which is big enough to put over your back and hide under. In fact, some hunters use Canada decoys big enough for two hunters to use as a blind. You may ask, What bird would come to a decoy six times its size? Plenty. Geese aren't concerned with proportion. In fact, Sanders has found that decoys of different sizes make no difference in the spread's ability to pull in geese.

Geese have acute vision and decoy spreads and blinds need to be chosen carefully. A good set-up that fools the birds into setting their wings for landing will provide good, close shots.

Once you've gathered enough decoys, or while you're in the process of gathering, buy a call and start practicing. The best all-round call is probably a flute, which looks much like a duck call only about twice as long. The flute is a resonant, melodious call capable of imitating all the sounds a goose makes, from the murmurs of common flight to loud, deep "honks" and high-pitched, pleading comeback calls. Basically, all calls are patterned off two basic sounds blown through the flute — haw-it and haw-oot, with a break between notes.

However, the written word fails when it comes to imitating bird calls. There are a number of good tapes on the market to help you master calling technique, and if you've never called before, it's a good idea to get one.

Sanders has what may be an even better idea. "Go listen to tame or semi-tame geese. Go to the park in Wichita and listen and then try to imitate what you hear." When you're out in the field, Sanders believes that distance is the key to calling. "At a long distance, concentrate on a long greeting call," he explains. "And as they get closer, speed it up to a shorter, sharper, more excited call."

"Calling geese isn't really that hard," adds Buchholz, "and a flute is by far the best to reach out a good distance. Be sure to talk to them a little all the way down. If everything stops suddenly, they might get spooked."

Okay, you've scouted your territory, gathered your decoys, and mastered the call. There's only one more detail before you hit the field — clothing. Kansas winter weather shifts can be rapid and radical. Always watch weather reports and dress in layers. Insulated coveralls and warm gloves, socks, boots, and headgear are musts. Outer clothing should always be camouflage.

Bring drinking water, too. Your body needs liquid in winter as well as summer. Try to avoid coffee, colas, or other drinks with caffeine, which restricts blood vessels and makes it harder for your body to stay warm.

Once all planning and preparation is complete, it's time to think about setting up decoys. Decoy placement is a strategy in itself. First, remember that waterfowl, like airplanes, must land flying into the wind. Accordingly, place most of your decoys facing into the wind, as if they were ready for a quick takeoff. Some hunters recommend separating decoys into two large groups about 40 yards apart and perpendicular to the wind. The space between the two large groups of decoys creates a "safe zone" in the middle where real geese can land without having to commingle immediately with either group. It

also creates a good place for your blind.

Sanders takes a different approach. "It varies as to field situation," he says," but I generally try to use a triangular setup with three groups of decoys. It's a tall triangle with the group at the tallest point the farthest upwind. Then we have at least one hunter in each group of decoys. That way, even if the birds flare off, at least one of us might get a shot."

Whichever set you choose, divide your large groups of decoys into smaller family groups of six to eight birds and place a few at angles to the wind to make the spread more realistic.

Blinds can take several different forms. For those with strong backs and good knees, a magnum decoy works well. Using this method, the hunter kneels, places the decoy over his back, and crouches over his thighs to stay hidden. Seeing can be difficult in this position, and it's hard to stay put for long periods. A more comfortable method is to dig an 8- or 10-inch depression the length of your body, throw in a piece of 1-inch foam, and cover yourself with a shell decoy or camouflage netting that matches your surroundings.

Of course, the most functional hiding place is a pit blind. This requires that you go out days or weeks before your first trip and dig a chest-deep hole big enough to accommodate two or three hunters and buckets to sit on. Camouflage netting or corn stalks can be used to fashion a cover. The drawback to this kind of blind is that it is not mobile and, unless it's in some area the landowner is unconcerned about, it must be filled in and packed after each season. Never dig in a landowner's ground without permission.

Modern technology being what it is, another new innovation in blinds has hit the market recently. "It's just a magnum decoy attached to a modified lawn chair," says Sanders. "The decoy is attached to the back of the chair, and you just sit in the chair and flip the decoy over your head. It's very comfortable. The birds don't flare from it — you can put it right in front of your lead decoy. It's the best answer I've seen." However, Sanders notes that, as with all blinds, you have to eliminate as much shadow as possible if you are hunting on a sunny day. Be sure to position the blind to allow minimum shadow, or cover the shadow with decoys.

Shell decoys are handy because large numbers can be carried easily.

Buchholz emphasizes that mobility is the most important blind feature, and hunting groups should be limited to three or four people. "You need to be able to move around," he says. "The birds won't come in if you set up in the same place every day. And I like a fairly windy day best. When they're fighting the wind, they fly lower and are generally more anxious to land."

With all these considerations in mind, I took to the field one bitter-cold January morning, gingerly steering my pickup across icy roads and snow to a pre-dawn rendezvous point, some 5 miles outside Wichita, with Region 4 public information officer Marc Murrell. We met near a corn stubble field where several days of observation had told us the birds were flying. (In fact, Murrell had actually taken geese in this field a few days earlier.) We drove our pickups into the middle of the field and unloaded and placed our decoys.

It was well past dawn by the time we got set up, moved the pickups, and made the half-mile trek back to the decoy spread. The wind chill was still well below zero. By 8:30 or 9:00, we began to see groups of geese rise into the sky above the

Geese have a poor sense of proportion, and the large, magnum-size decoys not only attract attention from long range, they also provide a convenient and effective blind.

The long, cold wait is worth it when the weight of a limit of geese is in hand. Few experiences can match the thrill of a flock of Canadas approaching with wings set.

trees that blocked our view of town. At first, the groups were small — 25 or 30 birds — but they soon grew larger. The first group to give us a look was about one-half mile away when we began calling. At one-quarter mile, the din of their voices began to mingle with ours, and at 200 yards all I could hear was sound from the sky. When it became clear that the geese were in range but not going to land, Murrell yelled "Take 'em!" and the three of us threw the decoys from our backs and rose to our knees.

Now, a goose in flight is one of nature's great deceptions. They are so big, they can seem impossibly close. "Impossible" as in "can't miss," right? And they appear to slow time with their methodical wingbeats. Until you shoot, that is.

As I popped from under my shell, pointed skyward, and shot, I realized that my 20-yard, 10-mph target was about 50 yards away and moving at least 100. I blew a hole in the sky about 10 yards behind the bird. Luckily, I had a second chance and swung through the next bird harder than seemed logical. Eerily, it dropped like a sack of potatoes. (Rich Sanders thinks that a going away shot on geese is the best shot. If you don't react quickly with these birds, that may be the only shot you get.)

The three of us would limit that morning, burying all thoughts of bitter wind or aching joints. I had caught goose fever.

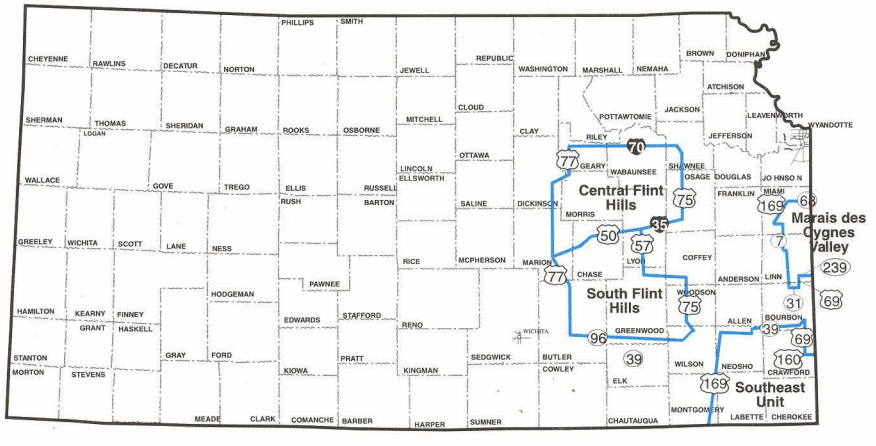
The next day, we hunted again, in a different but nearby field. It was afternoon this time, not quite as cold — just right for the slightly-touched folks called goose hunters. The late-afternoon sun turned a patchwork of high cirrus clouds bright red as geese began to rise in the distance, again in small groups but soon growing larger and larger. Soon, group after group of 200 or 300 birds stretched across the horizon. There must have been two or three thousand geese, and their downwind chorus grew louder as each flight neared.

Then it dawned on me what had so inspired Aldo Leopold. The air was filled not only with the beating of giant wings, but a symphony that elevates the experience of goose hunting beyond what the hunter sees or the flyers do. Geese do not honk; they purl, syncopate, harmonize, chant — they resound. For me, goose hunting would be many times diminished if I were deaf, and when the voices of my hunting companions are muffled under the crescendo of goose music, I rejoice that I have good ears.

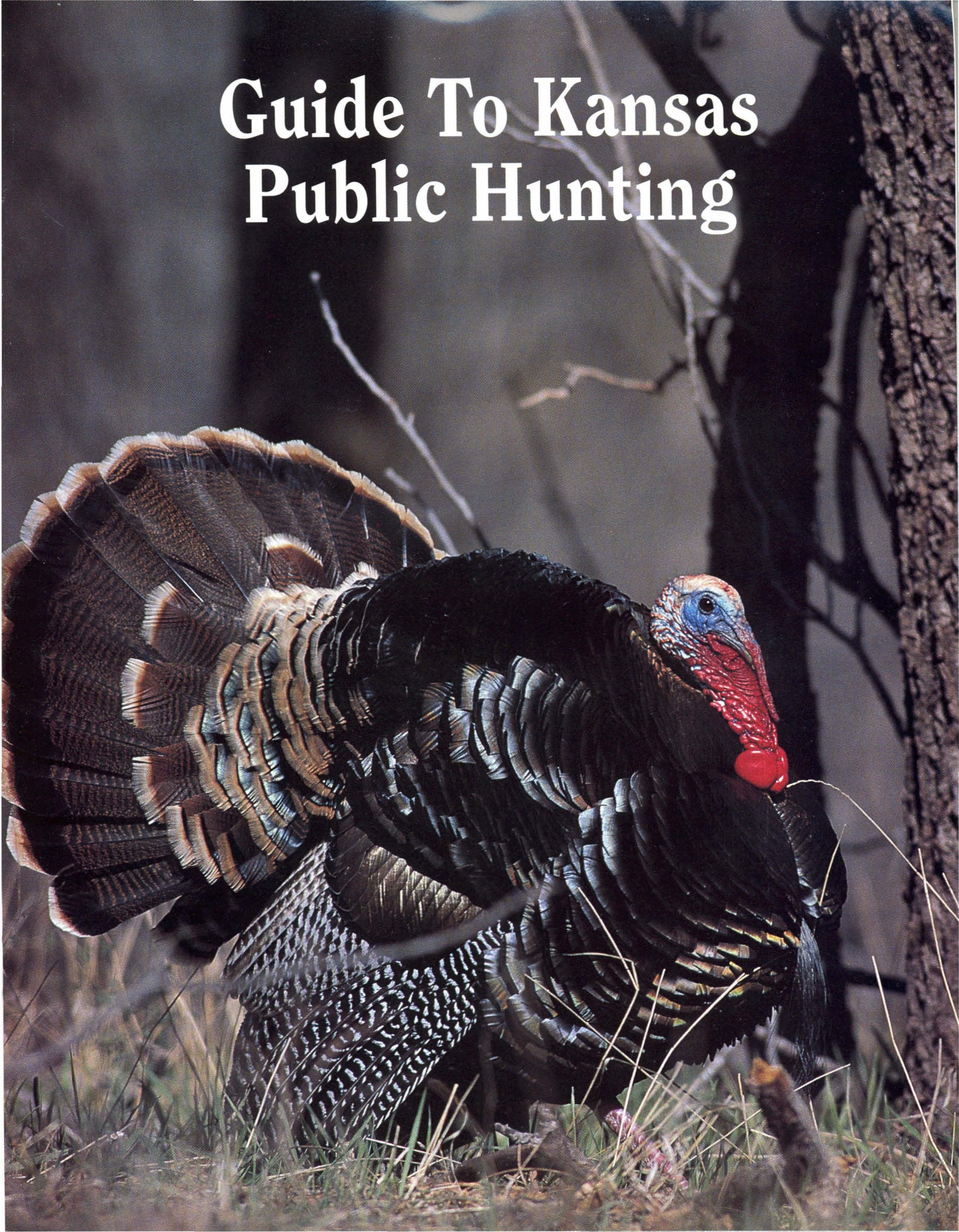
That afternoon, the air was filled with goose music for at least two hours. As luck would have it, the musical avians had different feeding spots in mind this time. No matter. I would have other opportunities, both urban and rural, and the blessing of goose meat would grace my table, as fine a fare as anyone could ask for, a more temporal reminder of the satisfaction hunters take in the recovery of the Canada goose.

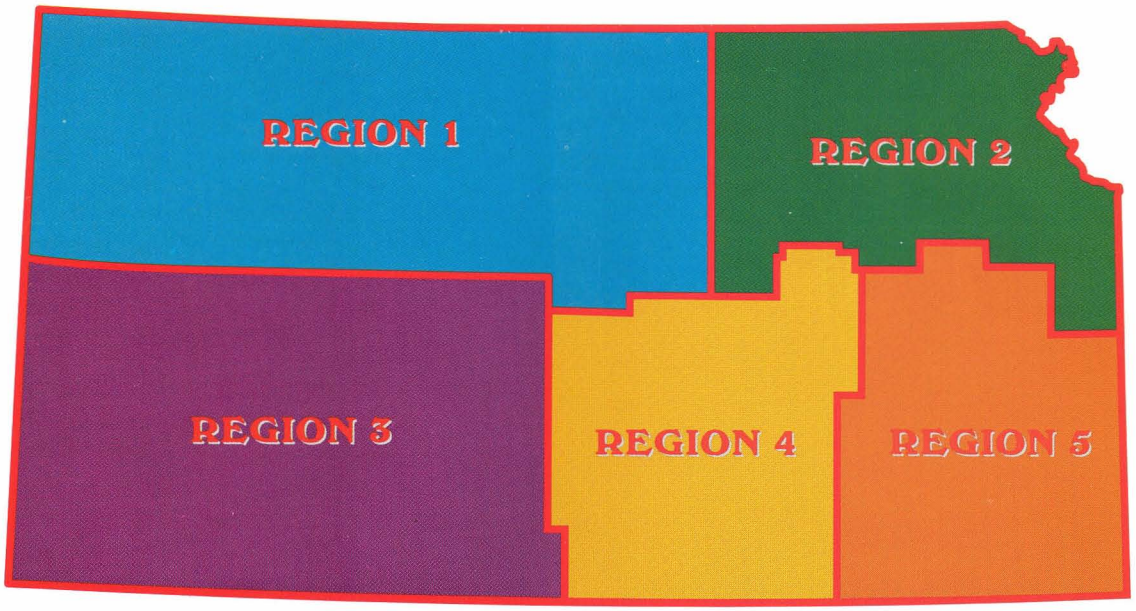
Note: The dark goose season runs Nov. 2 through Jan. 26, except for four special permit units in eastern Kansas. The daily bag limit is two Canadas or one Canada and one whitefront. Check the 1996-97 Kansas Hunting and Furharvesting Regulations Summary for details.

Special Dark Goose Units



Guide To Kansas Public Hunting





Hunting In Kansas

A common question posed by first-time Kansas bird hunters is "What kind of hunt will it be?" Hunters want to be prepared, and they need to know what the weather will be like, what kind of terrain they'll be hunting and what species of bird they'll most likely encounter. That question can be answered simply: "Your Kansas hunt can be whatever you want it to be."

A bird hunt in Kansas might take place in a wide-open stubblefield, or it might be in rolling midgrass prairie dotted with tangled sandhill plum thickets. Your Kansas hunt can take you to rough, broken country with cactus and yucca, or to tallgrass prairie dissected by steep, cedar-choked draws. A western pheasant hunt might start at the edge of a huge field enrolled in Conservation Reserve; endless grass, over your head in some places, but ideal cover for the ringneck. A Flint Hills quail hunt might cover miles in the gently rolling hills, through tall grass and along short hedge rows and small crop fields. Farther east, the land is wetter, with lush grasslands and small bean or corn fields bordered by thick hardwood timber stands; ideally suited to bobwhites.

So you see, it's difficult to tell someone what to expect in Kansas . . . except that bird hunting opportunities can be unsurpassed. Of course, Kansas is no different than any other region. Bird populations fluctuate, depending upon a variety of factors. What sets Kansas bird hunting apart is the variety of hunting situations and bird species

available. You can enjoy some of the best quail hunting found anywhere in the U.S. in the eastern part of the state. If you're after pheasants, go northwest. If you want variety, hunt in the northcentral portion of the state, and if you're lucky, you might see three species of birds in a day: pheasants, bobwhite quail and greater prairie chicken. And for the real adventurer, the southwest corner of the state offers a rare quadruple treat: pheasants, bobwhites, lesser prairie chickens and scaled quail.

This guide is designed to help you discover the public lands open to hunting as well as let you in on the opportunities found here. Kansas doesn't boast a great deal of state-owned land open to hunting, but the wildlife areas listed in this booklet are managed for optimum wildlife benefits as well as recreation. Wildlife areas provide not only prime hunting grounds but also critical habitat for many nongame species.

It's fashionable for locals to turn their noses up to hunting on public land. After all, they usually have contact with a local landowner who will let them hunt. And perhaps this landowner generosity is what keeps our public lands from being overcrowded. Some public areas located near large cities are crowded on the pheasant opener, but go back a month later and the area seems deserted. Or drive a backroad to a small parcel of public land in central or western Kansas. There are many of these public land oases listed in this guide, and you'll be surprised how good the hunting is.

Since much of Kansas is privately owned, most of the hunting takes place on private land. It's a good idea to locate a good public hunting area with the hunting opportunities you desire and plan to hunt there. While you're in the area, scout for good private land and contact local landowners. You'll be surprised at how easy it can be to get permission to hunt if you make the effort to get to know landowners.

The department is also providing more public hunting opportunities through the Walk-In Hunting Area program. This program leases land from landowners across the state, then posts and opens that land to public hunting. Leases run from September through January or November through January. Contact the Pratt office or any regional department office (listed on the back of this brochure) for a Walk-In Hunting Area atlas.

Remember to treat all public and private land with respect and promote a positive hunter image. Small acts of responsibility and consideration will go a long way in ensuring that hunting opportunities remain available in the future. Hunt safe and ethically and enjoy your hunt!

Ring-necked pheasant

Usually considered a symbol of the Kansas farm country, the ring-necked pheasant is actually an exotic introduction. Native to Asia, the pheasant adapted well to Kansas' mix of agriculture and grassland since the first birds were released in 1906. The quality of bird hunting in Kansas is dependent upon a variety of factors, including changes in land use, winter severity, spring weather conditions, early summer heat, cover conditions and more. But usually, Kansas ranks in the top three states in the nation in birds harvested. The best hunting is generally in the northwest and northcentral regions. The southwest and south-central regions' harvests are usually lower. Pheasant hunting can be excellent locally in the northeast. The southeast region offers no pheasant hunting.

Waterfowl

Kansas lies in the middle of the central flyway and can provide excellent duck and goose hunting. In the western half of the state, hunters enjoy good early-season duck hunting and great Canada and white-fronted goose hunting. In the eastern half, great late-season duck hunting is complemented by some fantastic snow goose hunting along the eastern border. Several areas in the east have recently reopened to dark goose hunting after reintroduction programs reestablished local flocks of Canada geese. Some geographical units offer fantastic special-permit goose hunts. Most species of puddle ducks are popular with Kansas duck hunters including blue-winged and green-winged teal, wood ducks, mallard, pintail, widgeon and gadwall.

Bobwhite quail

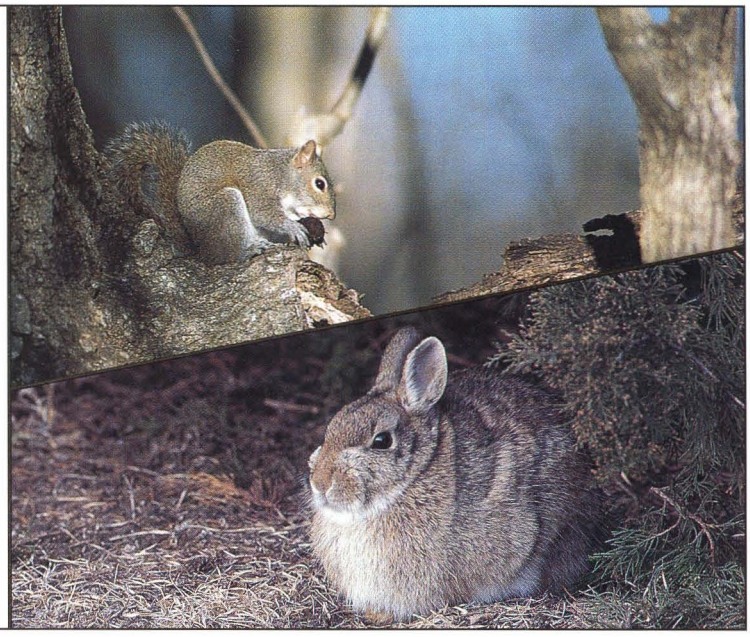
Kansas quail hunting has received deserved notoriety. Because quail inhabit more permanent cover, such as woodlands and grasslands, than the pheasant, their numbers fluctuate less. Barring long periods of snow cover and cold weather, bobwhite quail populations are remarkably resilient. Kansas quail hunting ranks right up there with the best in the nation. The very best quail hunting is found in the southeast and east-central regions of Kansas. But the northeast region also affords excellent quail hunting. The northcentral offers good quail hunting and excellent pheasant/quail combination hunts. Some of the grassland/farmland edge country in the southcentral and southwest can also offer excellent quail hunting. Kansas quail hunting can take a variety of faces, from wide-open shooting in the plum-thicket pastures of the west to the small crop field/timber borders in the southeast.

Turkey

According to early pioneer records, turkeys were numerous in certain parts of Kansas. However, they were quickly wiped out as settler numbers increased. Thanks to reintroductions of wild birds and a solid management program, turkeys inhabit nearly every county today, and the population is still growing. The Rio Grande subspecies inhabits the west, and the eastern subspecies is common in the eastern one-fourth of Kansas. Proving extremely adaptable, turkeys are found in shelterbelts, old farmsteads and timbered areas in addition to the more common stream and river corridors. The first spring season was held in 1974, with several hundred lucky hunters drawing permits. Today, more than 15,000 hunters pursue turkeys each spring.

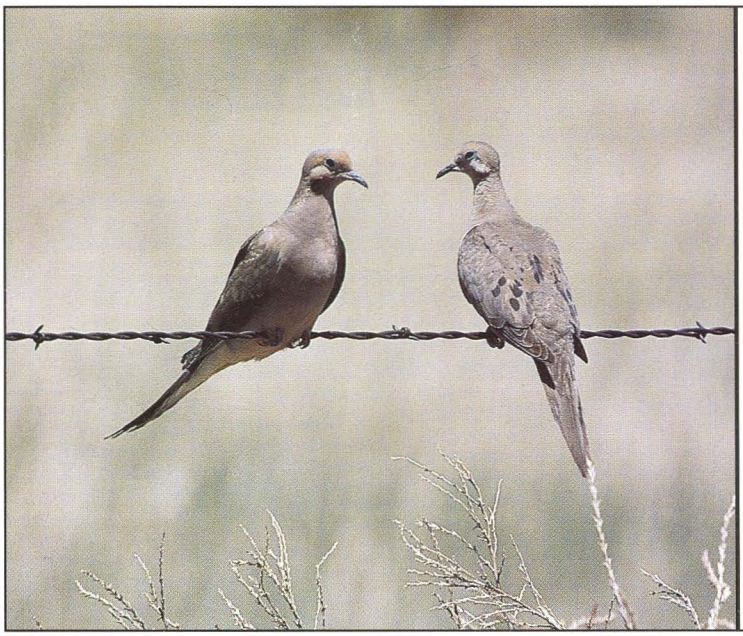
Rabbit and squirrel

Because so much emphasis is placed on Kansas bird hunting, rabbit hunting is overlooked. In fact, most local hunters rarely hunt rabbits, even though they see plenty while pursuing birds. Nonresidents, though, marvel at the rabbit hunting opportunity in Kansas, along with the long season (year-round) and liberal bag limit (10 per day). Cottontail rabbits are common in every county in the state, but highest populations are in the eastern half of the state. Since so few actually hunt them, great late-season hunts can be had on public land. Squirrel hunting may be even more overshadowed, but the heavily timbered eastern edge of Kansas has both gray and fox squirrels. Fox squirrels have migrated west along timber corridors and are now common to the Colorado border where suitable timber exists. Squirrel hunting is not a traditional pastime, so opportunities are easy to find and never crowded.



Deer

Deer are another Kansas wildlife management success story. Nearly extirpated from the state at the turn of the century, deer have slowly made their way back through protection, habitat improvement and regulation. The first modern season was held in 1965, and today more than 50,000 firearms hunters and 15,000 bowhunters enjoy great hunting. Gun hunters enjoy a success rate of 60 percent, while 35 percent of bowhunters are typically successful. But the real story behind Kansas deer management is the big bucks it produces. The limited permit program addresses regional population fluctuations and requires harvest of does, allowing bucks to mature. Kansas whitetails grace both Boone and Crockett and Pope and Young record books in surprising numbers. While whitetails are the most numerous, the western part of the state also supports a healthy population of mule deer.

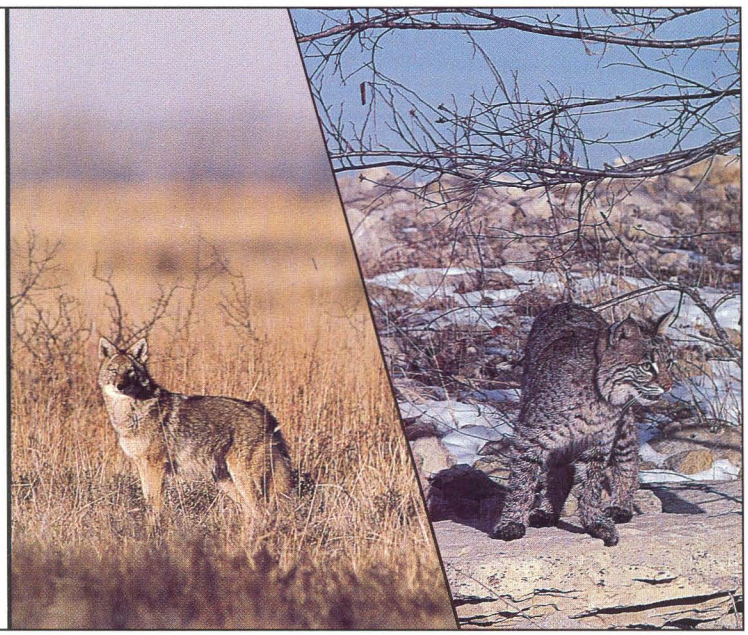


Mourning dove

The mourning dove is the most numerous game bird in the nation, and in Kansas it's easy to see why. Summer surveys indicate Kansas is one of the top nesting sites for doves. Some pairs may nest as many as three times through the summer, and their first brood may mature and raise a brood of their own before the summer is through. Kansas can literally be teeming with doves in September before fall's first cold snap. The season opens Sept. 1, and if it's hot and dry, stock ponds and windmill runovers are the best places to hunt the speedsters. Waterholes and roosts should be hunted in the evening, but feed fields, especially those with little vegetation such as burned or worked wheat stubble, can be great in the mornings.

Coyotes and furbearers

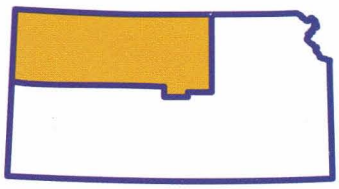
The coyote has adapted admirably to the changing Kansas landscape and has prospered in spite of efforts to eradicate it. Coyotes are common throughout the state and since high populations can be a problem to Kansas stockmen, permission to hunt or trap them is seldom refused. Predator callers have excellent success in late winter. Another large predator common in Kansas is the bobcat. Though seldom seen because of its secretive nature, the bobcat is most numerous in the southeast. Other furbearers common in the state include red and gray fox, swift fox, raccoon, beaver, mink, opossum, badger and muskrat.

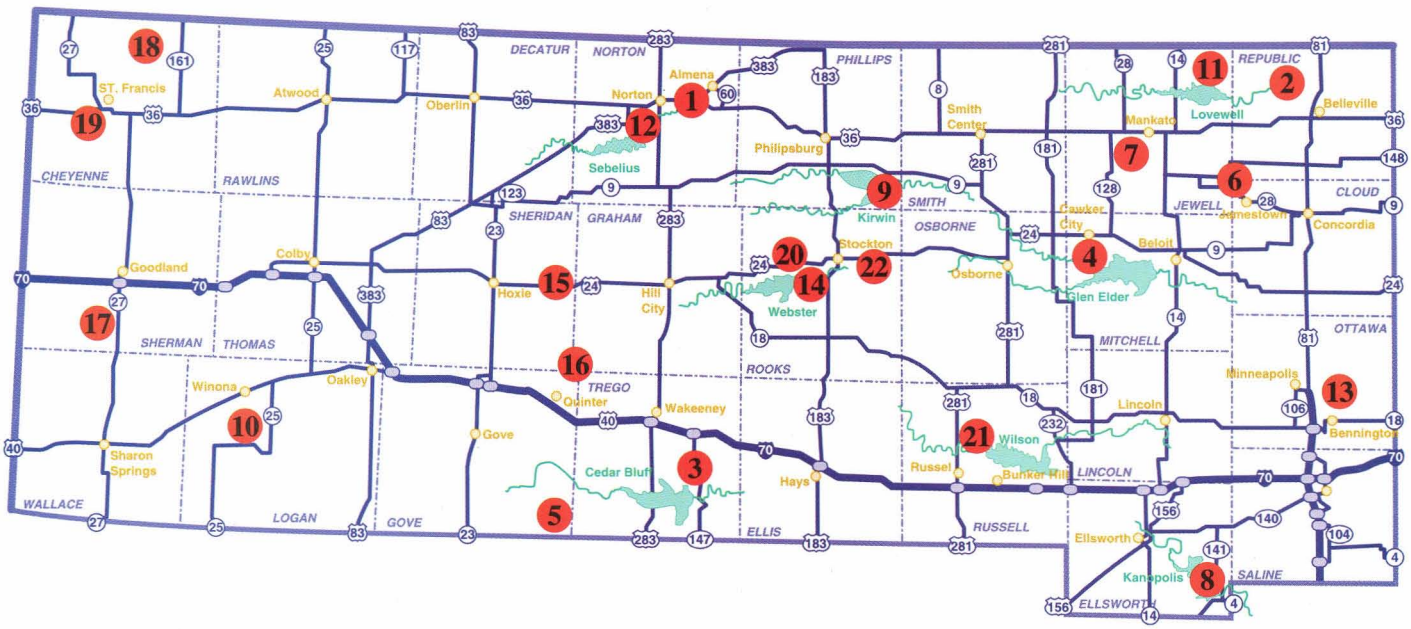


Prairie chicken

A true symbol of the Kansas prairie, the prairie chicken is a unique bird that depends on vast areas of native grass for its survival. Thanks to the Flint Hills, a large region of grassland protected from development by a shallow layer of rock, the prairie chicken maintains a stronghold in Kansas. The more common greater prairie chicken inhabits the eastern half of the state and the lesser prairie chicken inhabits the sandhill and sandsage prairie of the southwest. Both species are traditionally hunted in late fall when the flocks fly from grassland to cropfields just after dawn. Deceptively fast, prairie chickens are difficult targets. In the spring, prairie chickens awe viewers with a spectacular courtship dance that includes loud, resonant "booming" sounds.

Region 1

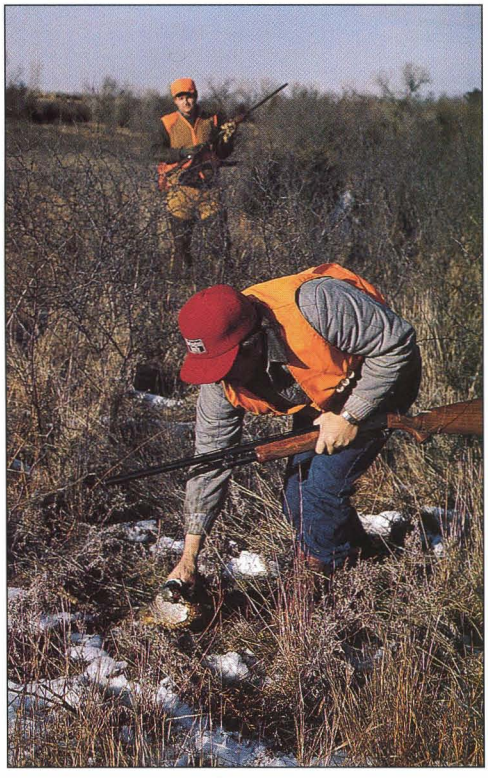




1	**Almena Diversion Wildlife Area**	**111 acres**	Deer, quail, pheasant, dove, squirrel, turkey and rabbit.
	2 miles south and 1 1/2 miles west of Almena		
2	**Brzon Wildlife Area**	**320 acres**	Quail, pheasant, rabbit, dove, turkey, deer and coyote. *(Special hunts available by permit; contact Lovewell State Park Office -- (913) 753-4971.)*
	6 miles north and 4 miles west of Belleville		
3	**Cedar Bluff Wildlife Area**	**9,542 acres**	Pheasant, quail, deer, dove, turkey, squirrel, rabbit, waterfowl, coyote, bobcat and raccoon. *(Refuge Sept.10 - March1)*
	13 miles south of I-70 on Highway K-147		
4	**Glen Elder Wildlife Area**	**12,514 acres**	Pheasant, quail, deer, turkey, waterfowl, squirrel, rabbit, dove, turkey, coyote, bobcat and raccoon. *(Special hunts may be available Contact Glen Elder State Park Office -- (913)545-3345.)*
	Tracts surrounding Cawker City		
5	**Gove Public Domain**	**160 acres**	Deer and coyote.
	22 1/2 miles south of Quinter, 1 mile east		
6	**Jamestown Wildlife Area**	**3,438 acres**	Waterfowl, pheasant, quail, rabbit, deer and muskrat. *(Steel shot required for all shotgun hunting. For information on special hunts, contact Lovewell State Park Office -- (913)753-4971.)*
	3 1/2 miles north and 2 miles west of Jamestown		
7	**Jewell State Fishing Lake and WA**	**165 acres**	Pheasants, quail and rabbits.
	6 miles south and 3 miles west of Mankato		
8	**Kanopolis Wildlife Area**	**12,500 acres**	Waterfowl, turkey, pheasant, quail, deer, dove, rabbit, squirrel, prairie chicken, coyote and furbearers.
	12 miles southeast of Ellsworth		

Reg 1 Cont'

9	**Kirwin National Wildlife Refuge** **15 miles southeast of Phillipsburg**	**3,700 acres**	Waterfowl, dove, pheasant, quail, turkey, snipe, rabbit, squirrel and deer. *(Steel shot is required for all shotgun hunting. Deer hunting is restricted to archery only. Call (913) 543-6673 for more information.)*
10	**Logan State Fishing Lake and WA** **9 miles south of Winona**	**271 acres**	Deer, pheasant, dove and waterfowl when lake has water.
11	**Lovewell Wildlife Area** **12 miles northeast of Mankato**	**2,229 acres**	Waterfowl, pheasant, quail, deer, rabbits, squirrel and dove.
12	**Norton Wildlife Area** **6 miles west and 2 miles south of Norton**	**6,421 acres**	Pheasant, quail, deer, turkey, waterfowl, coyotes, rabbit and dove.
13	**Ottawa State Fishing Lake and WA** **5 miles north and 1 mile east of Bennington**	**611 acres**	Pheasant, quail, rabbitt, squirrel, deer and dove.
14	**Rooks State Fishing Lake and WA** **1 1/2 miles south and 2 miles west of Stockton**	**243 acres**	Pheasant, quail, deer, squirrel, rabbit, dove and waterfowl when area has water.
15	**Sheridan State Fishing Lake and WA** **11 miles east of Hoxie**	**48 acres**	Deer, turkey, pheasant and waterfowl.
16	**Sheridan Wildlife Area** **5 miles north and 3 miles east of Quinter**	**458 acres**	Deer, turkey, squirrel, waterfowl, pheasant and quail.
17	**Sherman Wildlife Area** **10 miles south and 3 miles west of Goodland**	**1,547 acres**	Deer, pheasant and dove.
18	**South Fork Wildlife Area** **11 miles north and 7 miles east of St. Francis**	**1,100 acres**	Deer, turkey, pheasant, waterfowl and quail.
19	**St. Francis Wildlife Area** **1 mile W of St. Francis, then 3 miles SW on River Road**	**480 acres**	Deer, turkey, quail, pheasant and waterfowl.
20	**Webster Wildlife Area** **8 miles west of Stockton**	**8,018 acres**	Deer, pheasant, turkey, waterfowl, coyote and dove.
21	**Wilson Wildlife Area** **7 miles northwest of Bunker Hill**	**8,039 acres**	Pheasant, quail, deer, dove, waterfowl, turkey, rabbits, coyotes and furbearers.
22	**Woodston Diversion** **8 miles east of Stockton**	**210 acres**	Pheasant, quail, deer, turkey, squirrel, rabbit, coyote and dove.



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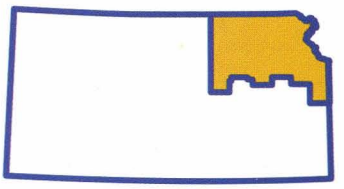
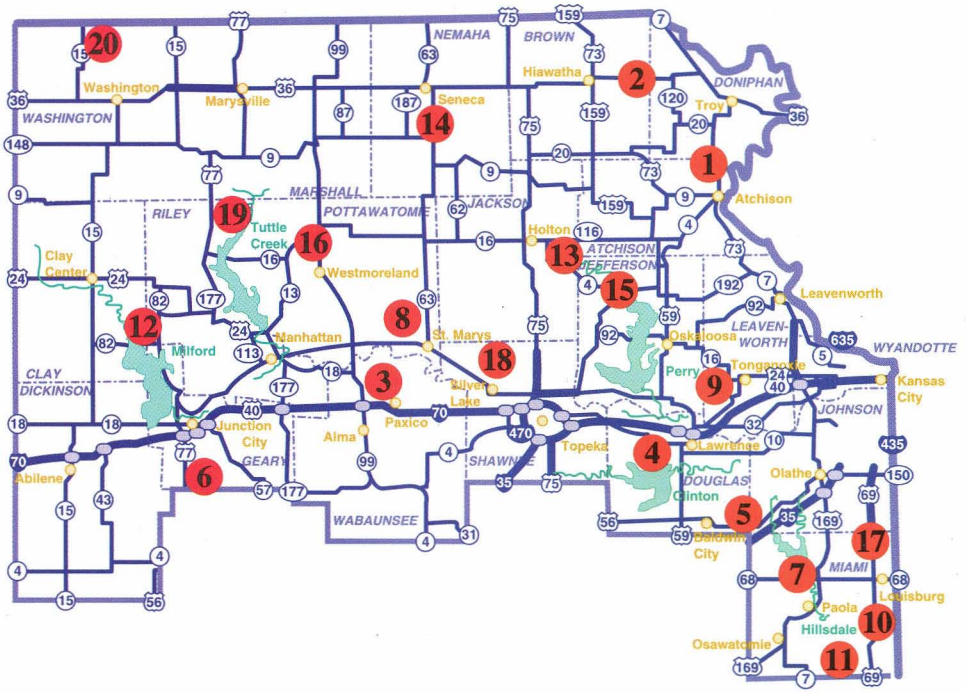
Region 2



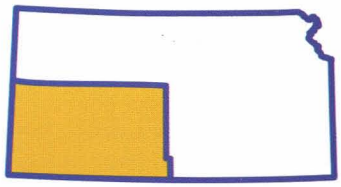


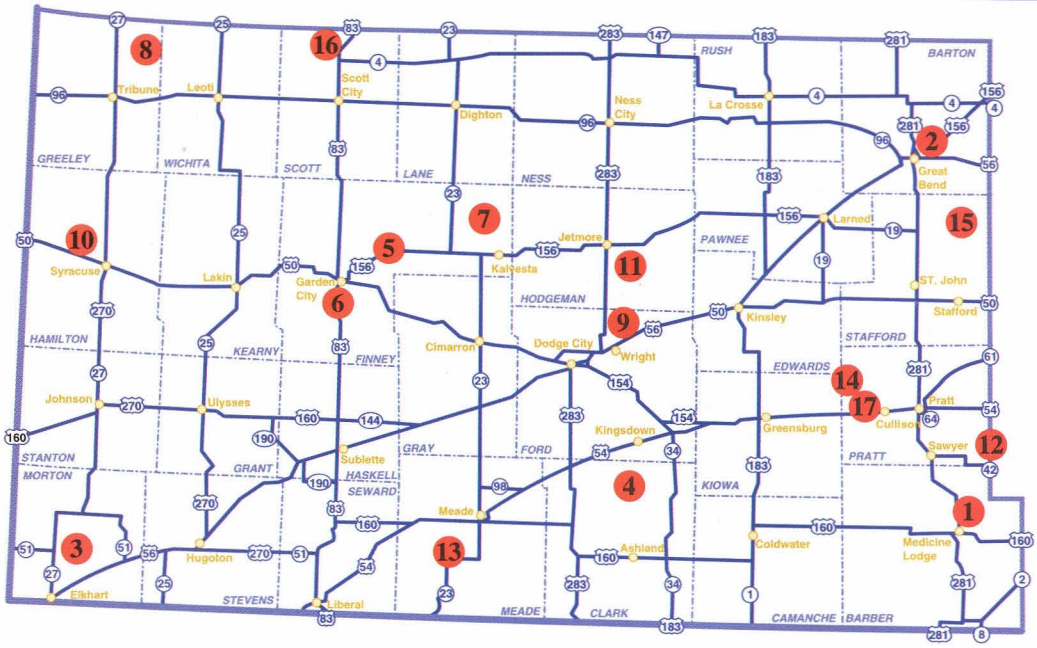
1	**Atchison State Fishing Lake and WA**	**248 acres**	Pheasant, quail, turkey, deer, rabbit, waterfowl, squirrel and furbearers. *(East edge of lake to east property line is closed to hunting.)*
	3 miles north, 2 miles west and 1/2 mile north of Atchison		
2	**Brown State Fishing Lake and WA**	**189 acres**	Pheasant, quail, rabbit, waterfowl, dove and furbearers. *(Hunting is allowed from September 1-March 10 on Thursday, Saturday and Sunday only.)*
	8 miles east of Hiawatha		
3	**Bolton Wildlife Area**	**640 acres**	Deer, turkey, dove, rabbit, quail, coyote, bobcat, and raccoon
	2 1/2 miles north and 1 1/2 miles west of Paxico		
4	**Clinton Wildlife Area**	**9,190 acres**	Deer, turkey, rabbit, quail, dove, squirrel, waterfowl, raccoon, coyote and bobcat. *(500 acre refuge area on upper arm of Wakarusa River.)*
	8 miles west of Lawrence		
5	**Douglas State Fishing Lake**	**719 acres**	Squirrel, rabbit, deer, turkey, coyote, bobcat, quail and waterfowl.
	1 mile north and three miles east of Baldwin City		
6	**Geary State Fishing Lake and WA**	**282 acres**	Quail, pheasant, dove, rabbit, waterfowl and deer. *(No hunting is permitted on the dam, on the lake nor on any of the developed or undeveloped areas north and northeast of the lake.)*
	10 miles south of Junction City off Highway 77		
7	**Hillsdale Wildlife Area**	**7,600 acres**	Deer, rabbit, quail, dove, waterfowl, coyote, bobcat, squirrel and raccoon.
	15 miles S of Olathe on Highway 169, 3 miles W on 255 St		

Reg 2 Cont'

8a	**Jeffery Energy Center Unit 1** **5 miles N of St. Marys on Highway K-63 and 3 miles W**	**1,250 acres**	Quail, pheasant, prairie chicken, rabbit, dove, deer, turkey and waterfowl. *(Unit 1 is open to the public, Shotguns, muzzleloaders and archery hunting only. Trapping and hunting of coyotes and furbearers is prohibited. Waterfowl hunters will be assigned specific blinds.)*
8b	**Jeffery Energy Center Unit 2** **5 miles N of St. Marys on Highway K-63 and 3 miles W**	**5,000 acres**	Quail, pheasant, prairie chicken, rabbit, dove, deer, turkey and waterfowl. *(Unit 2 access is limited and requires a special permit available at front gate to the center. Shotguns, muzzleloaders and archery hunting only. Trapping / hunting of coyotes and furbearers is prohibited. Waterfowlers will be assigned specific blinds.)*
9	**Leavenworth State Fishing Lake** **3 miles N and 2 miles W of Tonganoxie on Highway 90**	**507 acres**	Squirrel, rabbit, deer, turkey, coyote, bobcat, quail and waterfowl. *(Waterfowl hunting is allowed on two arms of the lake, refuge areas closed year-round.)*
10	**Louisburg-Middle Creek St. Fishing Lake** **7 miles south of Louisburg**	**518 acres**	Deer, rabbit, quail, dove, waterfowl, coyote, bobcat, squirrel and raccoon. *(Shotgun and archery hunting only.)*
11	**Miami State Fishing Lake** **8 miles east and 5 miles south of Osawatomie**	**267 acres**	Deer, rabbit, quail, dove, waterfowl, coyote, bobcat, squirrel and raccoon.
12	**Milford Wildlife Area** **5 miles NW of Junction City**	**18,873 acres**	Quail, pheasant, dove, rabbit, prairie chicken, deer, squirrels, coyotes, bobcat, raccoon and waterfowl. *(1,100-acre refuge N and E of Wakefield is closed to any activity. Signs mark the refuge boundary. Most of the wildlife area is on the W shoreline of the reservoir, and it runs to the N end 8 miles N of Wakefield*
13	**Nebo State Fishing Lake** **8 miles east of Holton, 1 mile south and 1/2 mile west**	**75 acres**	Pheasant, quail, deer, waterfowl and furbearers.
14	**Nemaha Wildlife Area** **4 1/2 miles south of Seneca on Highway 63**	**705 acres**	Quail, pheasant, rabbit, dove, beaver, raccoon, deer and turkey.
15	**Perry Wildlife Area** **25 miles northeast of Topeka**	**10,984 acres**	Deer, turkey, rabbit, pheasant, quail, dove, waterfowl, squirrel, coyote, bobcat and other furbearers. *(Two refuge areas closed from Oct. 1-Jan. 15.)*
16	**Pottawatomie No. 1 Wildlife Area** **5 miles north of Westmoreland**	**190 acres**	Quail, rabbit, deer, squirrel and raccoon.
17	**Rutlader Wildlife Area** **1/2 M. N of Louisburg-Middle Creek SFL, 355 st. and Metcalf**	**108 acres**	Deer, rabbit, quail, dove and bobcat. *(Shotgun and archery hunting only.)*
18	**Shawnee State Fishing Lake** **7 1/2 miles north of Silver Lake**	**608 acres**	Prairie chicken, pheasant, quail, dove, beaver, muskrat and deer. *(Open to shotgun and archery hunting only Dec. 1 through Jan. 31. Closed to any hunting the remainder of the year.)*
19	**Tuttle Creek Wildlife Area** **22 miles north of Manhattan on Highway 77**	**12,200 acres**	Quail, pheasant, prairie chicken, rabbit, dove, coyote, raccoon, bobcat muskrat, beaver, mink, deer, turkey and waterfowl.
20	**Washington State Fishing Lake and WA** **7 miles north and 3 miles west of Washington**	**457 acres**	Turkey, quail, pheasant, dove, rabbit, waterfowl and deer. *(Developed areas east of the lake are closed to hunting.)*

Region 3





1	**Barber Wildlife Area**	**179 acres**	Quail, dove, squirrel, rabbits and deer. *(Deer hunting with archery equipment only. Shotguns are the only firearms allowed.)*
	Upper end of Barber SFL, northern edge of Medicine Lodge		
2	**Cheyenne Bottoms Wildlife Area**	**19,857 acres**	Waterfowl, pheasant, rabbit, bobcat, coyote, raccoon and deer. *(On weekends and holidays, permits are required to hunt in the blind areas. Steel shot is required for all shotgun hunting. Rules for certain areas change seasonally, so check with the area office before hunting.)*
	5 miles north and 2 miles east of Great Bend		
3	**Cimarron National Grasslands**	**108,000 acres**	Bobwhite and scaled quail, pheasant, lesser prairie chicken, doves, deer, raccoon, bobcat, coyote and prairie dog. *(In portions of the Cimarron River corridor, travel is restricted to roads marked for driving. In the recreation area, camping is allowed only on designated sites.)*
	Morton County near Elkhart		
4	**Clark Wildlife Area**	**700 acres**	Deer, turkey, quail, dove, rabbit, bobcat, coyote and raccoon.
	9 miles south and 1 mile west of Kingsdown		
5	**Concannon Wildlife Area**	**800 acres**	Waterfowl, pheasant, dove, rabbit, coyote and deer. *(Walk-in traffic only.)*
	18 miles east of Garden City on Highway 156		
6	**Finney County Game Refuge**	**670 acres**	Pheasant, dove, rabbit, coyote and deer. *(Because the buffalo herd is rotated from pasture to pasture, certain portions of the area are closed to hunting at various times. Contact the area office, (316) 276 8886, or the regional office, (316) 227-8609, for more information. Walk-in traffic only.)*
	1/2 mile south of Garden City		
7	**Finney State Lake and Wildlife Area**	**863 acres**	Pheasant, waterfowl, dove, rabbit, coyote and deer.
	8 miles north and 3 miles west of Kalvesta		
8	**Greeley County Wildlife Area**	**900 acres**	Pheasant, rabbit, dove, coyote and deer. *(No shooting within a 10-acre area around the house. Fences and boundary signs may not yet be established. Before hunting, contact the Finney County Game Refuge -- (316) 276-8886, or the regional office -- (316) 227-8609.)*
	8 miles N, 5 miles E, 2 miles N and 1/2 mile E of Tribune		

Reg 3 Cont'

9	**Hain Wildlife Area** **5 miles N and 2 1/4 miles E of Wright off Highway 283**	**53 acres**	Waterfowl and dove.
10	**Hamilton Wildlife Area** **3 miles west and 4 miles north of Syracuse**	**432 acres**	Pheasant, dove, waterfowl, rabbit, deer, quail and turkey.
11	**Hodgeman Wildlife Area** **3 miles east and 2 miles south of Jetmore**	**254 acres**	Pheasant, quail, deer, dove and rabbit. *(Walk-in traffic only.)*
12	**Isabel Wildlife Area** **8 miles east of Sawyer**	**200 acres**	Waterfowl, pheasants, quail, dove, rabbit, squirrel, deer, raccoon and coyote. *(Steel shot for all shotgun hunting.)*
13	**Meade State Fishing Lake and WA** **8 miles south and 5 miles west of Meade**	**420 acres**	Pheasant, quail, dove, deer, turkey, rabbit and some waterfowl.
14	**Pratt Sandhills Wildlife Area** **5 miles west and 7 miles north of Cullison**	**4,757 acres**	Quail, pheasant, lesser prairie chicken, dove, turkey, deer, coyote, squirrel, rabbit, bobcat and raccoon.
15	**Quivira National Wildlife Refuge** **13 miles north Stafford**	**8,000 acres**	Waterfowl, pheasant, quail. *(Call refuge office for more information -- (316) 486-2393.)*
16	**Scott Wildlife Area** **14 miles north, 1 mile west of Scott City**	**160 acres**	Deer, squirrel and quail. *(No hunting allowed immediately adjacent to the state fishing lake. Area open to hunting marked with public hunting signs.)*
17	**Texas Lake Wildlife Area** **4 miles west and 1 mile north of Cullison**	**880 acres**	Waterfowl, pheasant, quail, deer, rabbit, squirrel and dove. *(Steel shot required for all shotgun hunting, except slugs allowed for deer hunting.)*

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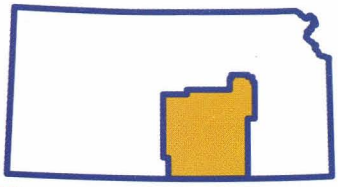
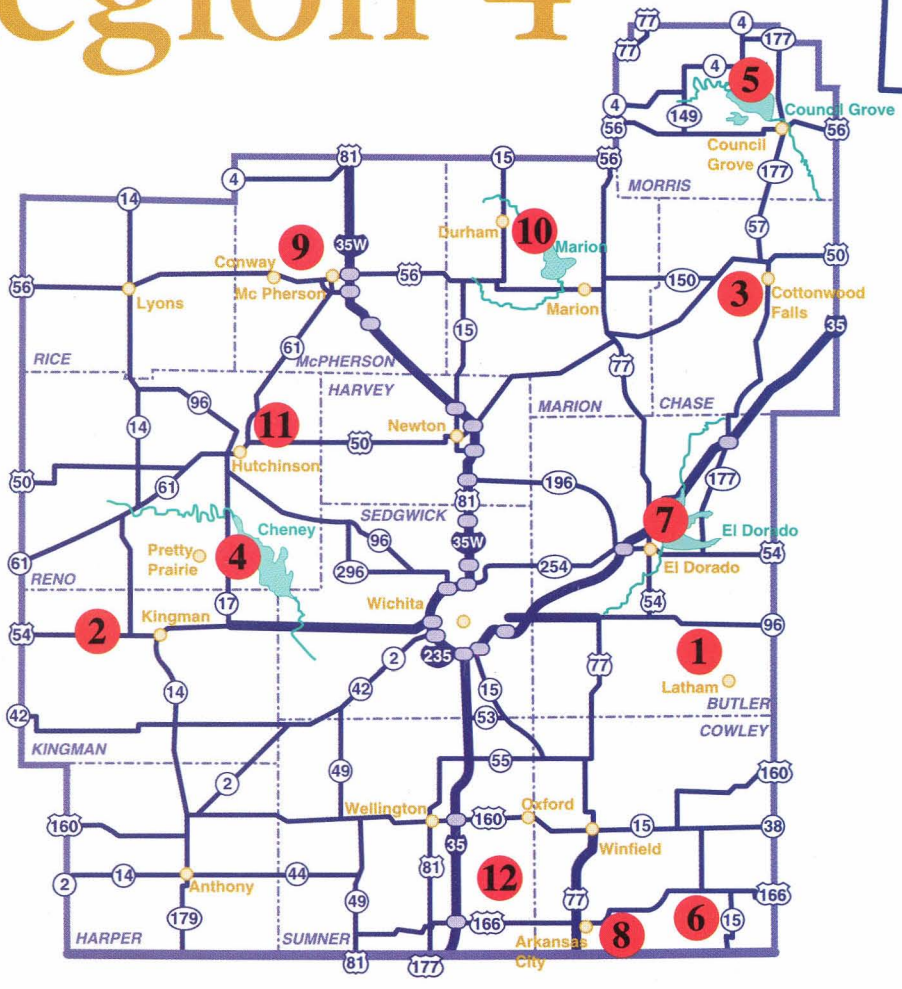
Region 4





1	**Butler State Fishing Lake And WA**	**196 acres**	Quail, waterfowl, rabbit, dove, prairie chicken, deer, turkey, squirrel and raccoon.
	3 miles west and 1 mile north of Latham		
2	**Byron Walker Wildlife Area**	**4,462 acres**	Pheasant, quail, deer, dove, turkey, woodcock, waterfowl, rabbits and squirrel. *(No shooting zones around headquarters, bison pen, and eastern two-thirds of the state fishing lake. Contact area office for more information -- (316) 532-3242.)*
	7 miles west of Kingman		
3	**Chase State Fishing Lake And WA**	**452 acres**	Quail, deer, waterfowl and prairie chicken. *(South Flint Hills Unit permit required for dark goose hunting.)*
	1 1/2 miles west of Cottonwood Falls		
4	**Cheney Wildlife Area and State Park**	**9,887 acres**	Pheasant, rabbit, dove, waterfowl, quail, deer, turkey, squirrel, coyote, bobcat, raccoon and red fox. *(Goose refuge marked, closed to all activities throughout fall and winter. Small area in the state park posted open to hunting with shotgun and archery only.)*
	7 miles east of Pretty Prairie		
5	**Council Grove Wildlife Area**	**2,638 acres**	Quail, pheasant, waterfowl, deer, turkey, rabbit, squirrel, dove, prairie chicken, raccoon, bobcat and coyote. *(Central Flint Hills Unit permit required to hunt dark geese.)*
	5 miles northwest of Council Grove		
6	**Cowley State Fishing Lake and WA**	**200 acres**	Quail, deer, rabbit, squirrel and waterfowl.
	16 miles east of Arkansas City on Highway 166		

Reg 4 Cont'

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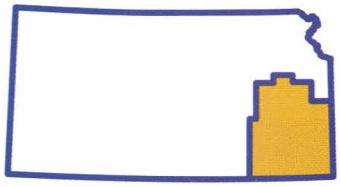
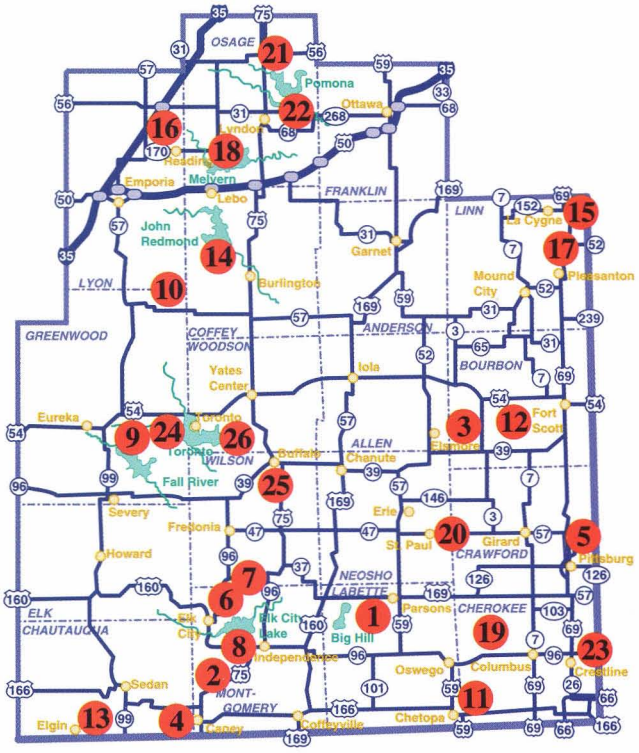
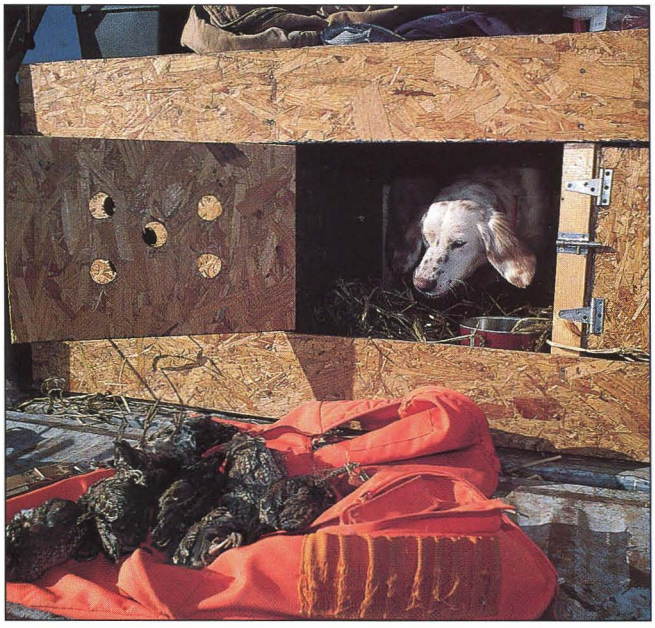
7	**El Dorado Wildlife Area and State Park** **2 miles east and 1 mile north of El Dorado**	**4,632 acres**	Turkey, quail, pheasant, prairie chicken, deer, waterfowl, dove, squirrel, rabbit, bobcat, raccoon and woodcock. *(Handicapped accessible waterfowl blind. Portion of state park posted open to hunting, vehicle permit required. South Flint Hills Unit permit needed for dark goose hunting. (316)321-7180.)*
8	**Kaw Wildlife Area** **1 mile southeast of Arkansas City**	**4,341 acres**	Quail, dove, waterfowl, deer, turkey, rabbit, squirrel, woodcock and bobcat.
9	**McPherson Valley Wetlands Wildlife Area** **2 miles north and 1 mile east of Conway**	**1,628 acres**	Waterfowl, pheasant, snipe, and rail. *(Steel shot only for all species. Contact the McPherson Valley Wetlands 24-hour Hotline (316) 241-7669.)*
10	**Marion Wildlife Area** **2 miles south and 2 miles east of Durham**	**3,522 acres**	Pheasant, geese, deer, quail, turkey, dove, rabbits, squirrel, raccoon and coyote.
11	**Sandhills State Park** **3 miles northeast of Hutchinson**	**800 acres**	Quail, pheasant, archery deer and fall archery turkey. *(Hunting by permit only. Application deadline for permit drawing is September 1. Contact Cheney State Park for more information -- (316) 542-3664.)*
12	**Slate Creek Wildlife Area** **6 miles south and 1 1/2 miles west of Oxford**	**827 acres**	Waterfowl, pheasant, quail, deer, rabbits, dove, squirrel, turkey, woodcock, snipe and rail. *(Hunting by permit only from early muzzleloader deer season through the upland bird season. Application deadline for drawing is September 1. No permit is required for waterfowl hunting, and hunting without a permit is allowed for legal species after upland bird seasons until the early muzzleloader deer season. Steel shot required for all shotgun hunting.*

Region 5







Mike Blair Photo

1	**Big Hill Wildlife Area** **8 miles west and 4 miles south of Parsons**	**1,320 acres**	Quail, deer, turkey, rabbit, squirrel and waterfowl hunting on area ponds. *(Southeast Unit Permit required to hunt dark geese.)*
2	**Berentz/Dick WA (Buffalo Ranch)** **2 miles W, 2 miles S and 10 1/2 miles W of Independence**	**1,360 acres**	Quail, rabbit, deer, turkey, coyote and bobcat. *(3 day per week hunting on Tuesday, Thursday, and Saturday; shotgun and archery only.)*
3	**Bourbon State Fishing Lake and WA** **4 1/2 miles east of Elsmore**	**277 acres**	Quail, deer, turkey, squirrel and waterfowl.
4	**Copan Wildlife Area** **1/2 mile west of Caney**	**2,360 acres**	Deer, turkey, squirrel, waterfowl, quail, rabbit, bobcat and raccoon.
5	**Crawford Wildlife Area** **4 miles north, 1 mile east of Pittsburg**	**510 acres**	Quail, turkey, deer, rabbits, squirrels, dove, geese and furbearers. *(Southeast Unit Permit required to hunt dark geese. call (316) 231-3173 for more information)*
6	**Dove Flats Wildlife Area** **2 1/2 miles east, 1 mile north of Elk City**	**206 acres**	Quail, rabbits, dove and waterfowl.
7	**Duck Creek Wildlife Area** **1 1/2 miles east, 3 1/3 miles north of Elk City**	**246 acres**	Quail, rabbits, dove, waterfowl and deer.

Reg 5 Cont'

8	**Elk City Wildlife Area** **3 miles west of Independence.**	**11,880 acres**	Waterfowl, deer, quail, turkey, squirrel, rabbit, dove, bobcat and raccoon.
9	**Fall River Wildlife Area** **6 miles north and 1 mile east of Severy**	**8,392 acres**	Quail, turkey, deer, dove, squirrel, rabbits, prairie chicken, raccoon, bobcat and waterfowl. *(South Flint Hills Unit permit needed for dark goose hunting. Refuges closed all year.)*
10	**Flint Hills National Wildlife Refuge** **15 miles southeast of Emporia**	**7,500 acres**	Waterfowl, quail, deer, turkey, rabbits and squirrel. *(Steel shot only for all species, no centerfire rifles or pistols. Refuge rules vary by location; contact the Flint Hills National Wildlife Refuge -- (316) 392-5553.)*
11	**Harmon Wildlife Area** **2 miles north, 1 1/4 miles east and 1 mile south of Chetopa**	**102 acres**	Deer, quail, turkey, rabbits, squirrel and waterfowl. *(Southeast Unit Permit required to hunt dark geese.)*
12	**Hollister Wildlife Area** **6 miles west and 2 miles south of Fort Scott**	**2,432 acres**	Quail, deer, prairie chicken, turkey, dove, coyote and bobcat.
13	**Hulah Wildlife Area** **Scattered tracts east and west of Elgin**	**844 acres**	Deer, turkey, squirrel, quail, bobcats and raccoon.
14	**John Redmond WA(Otter Creek Arm)** **4 miles west and 2 miles north of Burlington**	**1,472 acres**	Quail, waterfowl, deer, dove, turkey, squirrel and rabbit. *(Steel shot only area for all shotgun hunting.)*
15	**La Cygne Lake and Wildlife Area** **5 miles east of La Cygne**	**4,080 acres**	Quail, rabbit, squirrel, turkey, deer and late season waterfowl. *(Marais des Cygnes Valley Unit Permit required for dark goose hunting. No centerfire rifles or pistols allowed.)*
16	**Lyon State Fishing Lake and WA** **5 miles west and 1 mile north of Reading**	**562 acres**	Quail, deer, rabbit, squirrel and waterfowl. *(Central Flint Hills Unit permit required to hunt dark geese.)*
17	**Marais des Cygnes Wildlife Area** **5 miles north of Pleasanton**	**7,235 acres**	Waterfowl, squirrel, turkey, deer, rabbits and quail. *(Steel shot only for all species. Marais des Cygnes Valley Unit permit required for dark goose hunting. Waterfowl hunters must obtain permit at the area headquarters or check station before hunting.)*
18	**Melvern Wildlife Area** **4 miles north of Lebo**	**10,407 acres**	Quail, deer, waterfowl, squirrel, rabbit, dove and turkey. *(Central Flint Hills Unit Permit required to hunt dark geese. Refuge closed to all activities from October 21-January 15 each year.)*
19	**Mined Land Wildlife Area** **Crawford and Cherokee Counties**	**14,500 acres**	Deer, quail, turkey, dove, waterfowl, rabbits, squirrels and coyotes. *(Southeast Unit Permit required to hunt dark geese. Contact Mined Land Wildlife Area for other restrictions-- (316) 231-3173.)*
20	**Neosho Wildlife Area** **1 mile east of St. Paul**	**3,975 acres**	Waterfowl, deer, quail, squirrel, turkey, rail and snipe. *(Southeast Unit Permit required to hunt dark geese. Steel shot only for all shotgun hunting. Waterfowl hunters must obtain permit from area headquarters or check station before hunting. Contact area office for more information -- (316) 449-2539.)*
21	**Osage State Fishing Lake and WA** **10 miles south of Topeka**	**480 acres**	Quail, rabbit, deer, dove, squirrel and waterfowl. *(Open to hunting November 1-March 1 Shotgun and archery only.)*

Reg 5 Cont'

22	**Pomona Wildlife Area** **17 miles west of Ottawa**	**3,600 acres**	Deer, squirrel, rabbit, dove, quail, waterfowl, coyotes and bobcats.
23	**Spring River Wildlife Area** **3 miles east, 1 1/4 miles north of Crestline**	**424 acres**	Quail, deer, turkey, dove, rabbits, squirrels and furbearers. *(Southeast Unit Permit required to hunt dark geese. Call (3167) 231-3173 for more information.)*
24	**Toronto Wildlife Area** **1 mile west of Toronto**	**3,981 acres**	Quail, deer, turkey, waterfowl, prairie chicken, rabbit, dove and raccoon. *(South Flint Hills Unit permit required for dark goose hunting.)*
25	**Wilson State Fishing Lake and WA** **1 mile south of Buffalo**	**90 acres**	Quail and rabbit.
26	**Woodson State Fishing Lake and WA** **5 miles east of Toronto**	**2,400 acres**	Quail, deer, turkey, prairie chicken, rabbit, waterfowl, squirrel, dove and raccoon. *(South Flint Hills Unit permit required for dark goose hunting.)*

Department Offices

OFFICE OF THE SECRETARY
900 SW Jackson, Suite 502
Topeka, KS 66612-1233
(913) 296-2281

REGION 2
3300 SW 29th
Topeka, KS 66614-2053
(913) 273-6740

REGION 5
1500 W. 7th
P.O. Box 777
Chanute, KS 66720-0777
(316) 431-0380

OPERATIONS OFFICE
512 SE 25th Avenue
Pratt, KS 67124-8174
(316) 672-5911

REGION 3
808 McArtor Rd,
Dodge City, KS 67801-6024
(316) 227-8609

KANSAS CITY OFFICE
14639 W. 95th
Lenexa, KS 66215-1164
(913) 894-9113

REGION 1
P.O. Box 338
U.S. 183 Bypass
Hays, KS 67601-0338
(913) 628-8614

REGION 4
6232 E. 29th. N.
Wichita, KS 67202
(316) 683-8069

EMPORIA INVESTIGATIONS OFFICE
1830 Merchant
Emporia, KS 66801-1525
(316) 342-0658

Wildlife Area Offices

Cedar Bluff State Park	(913)726-3212
Cheney State Park	(316)542-3664
Cheyenne Bottoms	(316)793-7730
Clinton State Park	(913)842-8562
Council Grove WA	(316)767-5900
Crawford State Park	(316)362-3671
Eisenhower State Park	(913)528-4102
El Dorado State Park	(316)321-7180
Elk City State Park	(316)331-6295
Glen Elder State Park	(913)545-3345
Hillsdale State Park	(913)783-4507
Kanopolis State Park	(913)546-2565
Lovewell State Park	(913)753-4971
Marais des Cygnes WA	(913)352-8941
Meade State Park	(316)873-2572
Milford State Park	(913)238-3014
Mined Land WA	(316)231-3173
Perry State Park	(913)246-3449
Scott State Park	(316)872-2061
Toronto/Fall River SP	(316)637-2213
Tuttle Creek State Park	(913)539-7941
Pomona State Park	(913)828-4933
Prairie Dog State Park	(913)877-2953
Webster State Park	(913)425-6775
Wilson State Park	(913)658-2465

FEDERAL OFFICES

Cimarron National Grasslands	(316)697-4621
Flint Hills National Wildlife Refuge	(316)392-5553
Kirwin National Wildlife Refuge	(913)543-6673
Quivira National Wildlife Refuge	(316)486-2393

Wetlands

Wetlands can be magical places, overflowing with life in the fall. When migration is in full swing, literally hundreds of species of wildlife can be seen in a wetland, and Kansas is blessed with many of these watery wonderlands on its public areas.

Many public wildlife areas across the state include wetlands with excellent waterfowl hunting, bird watching and other outdoor opportunities. These special lands range from large areas that are primarily managed for wetland habitat and waterfowl to smaller, less intensively managed wetlands. Many of these areas have been developed and improved through the efforts of the department, local conservation groups, individual sportsmen and women, and major conservation organizations such as Ducks Unlimited (DU), The Nature Conservancy, the Audubon Society and others.

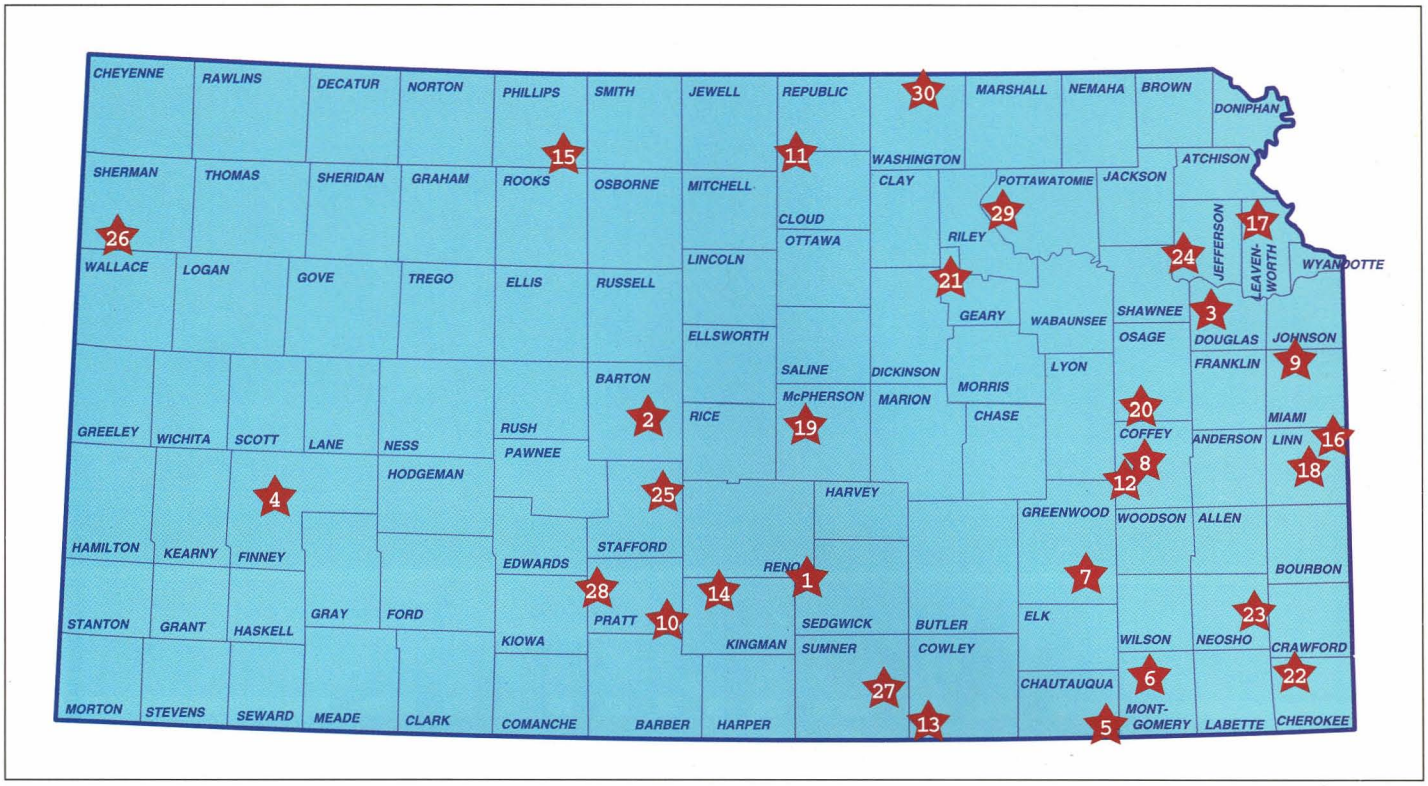
Perhaps the most effective of all wetland restoration programs in Kansas is DU's Matching Aid to Restore States Habitat, better known as MARSH. From the time DU was formed in the 1930s, the organization has focused most of its efforts in Canada, where the majority of America's waterfowl are produced. However, in recent years, DU's mission has broadened to involve other regions of the continent.

In 1984, DU took its efforts to individual states, including Kansas, through the MARSH program. As with its other ventures, MARSH is supported by the fund-raising efforts of local DU chapters. With the MARSH program, 7 1/2 percent of the funds raised by Kansas chapters goes to waterfowl habitat development, improvement, and acquisition within the state.

Just after MARSH started, another revenue-producing tool was introduced in 1987: the state duck stamp. Duck stamp revenue, primarily from waterfowl hunters, totals about $100,000 annually in Kansas. Proceeds fund a variety of wetland projects and, combined with MARSH revenues, broaden the financial base that underwrites habitat improvements.

All proceeds from sales of Kansas duck stamps, available wherever hunting licenses are sold, go to wetland projects in Kansas. Through 1996, MARSH has contributed more than $800,000 to 36 projects in 20 counties. All totalled, more than $2 million has been spent improving or restoring about 5,700 acres.

While sportsmen are the main benefactors through duck stamp purchases, DU auctions and hunting license purchases, anyone who cares about wetlands and the hundreds of wildlife species they support can contribute through the annual purchase of a Kansas duck stamp. This small investment of $3.25 will go a long way in benefitting Kansas wildlife populations. The map on the following page will help you locate many of our public wetlands. More detailed maps of these important habitat and recreation areas are available at the department's major offices. Refuge access restrictions and other special regulations are in effect on many of these areas. It is important to consult local regulations before hunting these areas.



Kansas Public Wetlands

1. Cheney Wildlife Area — 100-acre wetland.

2. * Cheyenne Bottoms Wildlife Area — 13,461 acres of wetlands.

3. * Clinton Wildlife Area — four wetlands, 80 acres.

4. * Concannon Wildlife Area — 30-acre wetland.

5. * Copan Wildlife Area — 6-acre wetland.

6. * Elk City Wildlife Area — 160-acre wetland.

7. * Fall River Wildlife Area — 32-acre wetland.

8. Flint Hills National Wildlife Refuge -- 6,500 acres of wetlands.

9. * Hillsdale Wildlife Area — 50-acre wetland.

10. * Isabel Wetlands Wildlife Area — 26-acres of wetlands.

11. * Jamestown Wildlife Area — 1,300 acres of wetlands.

12. * John Redmond, Otter Creek Wildlife Area — 15-acre wetland.

13. Kaw Wildlife Area — 30-acre wetland.

14. Kingman State Fishing Lake — 279-acre wetland.

15. Kirwin National Wildlife Refuge — 450-500 acres of wetlands.

16. * La Cygne Wildlife Area — 20-acre wetland.

17. Leavenworth State Fishing Lake — 5-acre wetland.

18. * Marais des Cygnes Wildlife Area — 2,817 acres of wetlands.

19. * McPherson Valley Wetlands — 267 acres of wetlands.

20. Melvern Wildlife Area — three wetlands, 60 acres

21. * Milford Wildlife Area — five wetlands, 860 acres

22. Mined Land Wildlife Area — 25-acre wetland

23. Neosho Wildlife Area — 1,733 acres of wetlands.

24. Perry Wildlife Area — 14 wetlands, 956 acres

25. Quivira National Wildlife Refuge -- 6,000 acres of wetlands.

26. Sherman State Fishing Lake — 2-acre wetland

27. * Slate Creek Wildlife Area — 50-acre wetland

28. * Texas Lake Wildlife Area — 116 acres of wetlands.

29. Tuttle Creek Wildlife Area — two wetlands, 178 acres

30. Washington State Fishing Lake — 24-acre wetland

* Areas with MARSH projects

Wild Currents

letters

Edited by Mark Shoup

THANKS TO COMMISSION

Editor:

I wish to congratulate the entire staff of ***Kansas Wildlife and Park***s for putting together the fine magazine. It is worth more than you ask. Best wishes to all of you.

I also wish to thank the Kansas Wildlife and Parks Commission for their decision to accept the five-year zoning plan for waterfowl seasons and backing waterfowl coordinator Marvin Kraft's recommendations.

Hugh Dennis
Eureka

PEACE CORPS FAN

Editor:

It's time for a fan letter. Our family has enjoyed ***Kansas Wildlife and Parks*** for many years, both the articles and the magnificent photography. My son David especially enjoyed the magazine. His Eagle Scout project in 1987 was building wood duck roosts, which the scouts put in trees at a local lake and wildlife area.

He is now serving in the Peace Corps in Nicaragua. Each month, I mail him the magazine so that he can still feel close to Kansas. He put the Jan./Feb. issue in the Peace Corps Headquarters in Managua so that all the volunteers could see the beauty of Kansas.

JoeAnn Kuhlmann
Overland Park

DOGS CAN TOO SPIT

Editor:

To a degree, I must disagree with Mike Miller on his article, "Dogs Can't Spit" on Page 45 of the Sept./Oct. 1996 issue of ***Kansas Wildlife and Parks***. Maybe the dogs he has do not or cannot spit up anything, but I have a beagle that can sure hock up a pill if you don't get it stuffed all the way into his throat past his tongue.

He will work his tongue until he works it up to his teeth, then turn his head so you can't see him gunk it out. We tried hiding the pill in a ball of hamburger, but it took only one time and he would proceed to tear the meat apart, discarding the pill before he would spit it out.

To fully answer the dog spitting question may take a major research project.

Ivan L. Pfalser
Caney

FIRST BIOLOGIST

Editor:

My subscription to ***Kansas Wildlife and Parks*** magazine is paid up to March 1, 1999. I will be 88 years old this coming April 14. When I was discharged from the U.S. Coast Guard in 1944, I weighed 128 pounds. I was not to do any work for one year, so I went to Fort Hays State University and received my master's degree.

I feel that I should get your magazine for the few years that I have left to live. I enjoyed working for the Fish and Game those few years. [See "Note" below.]

Leo Brown
Eureka

Note: In 1934, Leo Brown became the first wildlife biologist for the Kansas Fish and Game Commission. He held this position until entering World War II in 1942. After the war, he became the first veteran to earn a master's degree from Ft. Hays with the GI bill.

--Shoup

AGREE ON CATS

Editor:

I read the article about house cats in ***Kansas Wildlife and Parks*** ("Cat Defense," Sept./Oct. 1996, Page 33). I am in total agreement with you. I have a bird feeder and love to watch the birds as they come and go through our great Central Flyway. They are like friends that come and go every year. I have to continually watch out for the cats in the neighborhood. Like you say, people keep their dogs in control in my neighborhood, but they for some reason let the cats out to roam at will.

I don't blame the cats, but their owners are a pain. Anyway, after reading that the writer is not renewing his subscription to the magazine, I decided to make up his loss.

Therefore, I'm buying my good friend and brother in law, Mr. Perry, a subscription. He is a trapping buddy from back in 1952, our high school days. It just so happened that he married my sister, his loss, my gain.

Keep up the good work on the publication. I really look forward to receiving it.

Ed Fischer
Topeka

PASS IT AROUND

Editor:

Last year, I bought my first ***Kansas Wildlife and Parks*** magazine. I liked it so well that I ordered one for my cousin for his birthday. When I told him, he said his dad got it but that he was glad to get his own.

We all love to hunt. This year, I sent in my money for two year's worth of subscriptions. I have told almost all my friends at school about your magazine, and I think they're getting ready to order, too.

Jacody Helton
Altoona

Dear Mr. Helton:

Thanks for your recommendations. Your timing is perfect, as well. With Christmas just around the corner, *Kansas Wildlife and Parks* makes a perfect gift.

--Shoup

POISON SNAKES

Editor:

My brother Harold Simons of Stockton sends me your magazine. It's a good one. On page 26 [of the Sept./Oct issue], answers of true and false said there are five poisonous snakes found in

Kansas. Can you tell me the names of those five?

I think that usually if you read something about poison snakes in the U.S., they lump all the different rattlesnakes together, and they become "the rattlesnake" as one poison snake.

By the way, I was told by a fellow in Great Bend that Carrie Nation smashed the liquor bottles in a Pratt saloon. She was sure ornery.

Edgar Simons
Fresno, California

Dear Mr. Simons:

Of the five poisonous snakes in Kansas, three are rattlesnakes: the massasauga, timber, and western (or prairie). The other two are the copperhead and the cottonmouth (often called a water moccasin). Only two confirmed sightings of the cottonmouth have been made, and the timber rattlesnake is very rare.

I'm not sure about Carrie Nation in Pratt, but she did have a thing against "snake bite medicine."

--Shoup

CENTS, NOT "SENSE"

Editor:

After reading the letter from Bud Jones in the Sept./Oct. issue of ***Kansas Wildlife and Parks*** ("Dollars and Sense," Page 33), I feel the need to respond.

First, Bud complains about farmers posting their ground. I post every acre on my farms but have yet to deny someone who asks permission to hunt. I post my property because I love to hunt and trap, and also because I need to know who is on my property. I am sure Bud wouldn't like people running all over his backyard. If Bud couldn't get permission, I'm sure there was a good reason.

Second, Bud makes sure we all know about how much money they have spent in Kansas. Everyone is listed except for the farmer whose ground you hunted on. This is the real reason you were here. Perhaps it is time, and I am seriously thinking about this, for farmers and ranchers to charge you to trespass on our property for your entertainment. After all, I pay to attend concerts, movies, etc. for my entertainment.

I am tired of everyone making money on hunters except those of us on whose ground you hunt. Think about it, Bud. The fact that you are not coming back to hunt doesn't bother me at all. However, I wonder how many more of those who feel like you are out there.

If you stop and ask to hunt this fall, and I deny you permission, thank Bud and his ungrateful attitude.

Randy Funk
Otis

Dear Mr. Funk:

Your point about posted ground not necessarily being off limits is well taken. If I had land, I would post it, too – and let other people hunt.

I can see Bud's point of view, also. He obviously loves Kansas and loves to hunt here but misses what he sees as a lost privilege. His point about money, I believe, is that the dollars of visiting hunters benefit everyone in the area indirectly, including farmers.

-Shoup

COUGAR STOCKING?

Editor:

For years, several of us in this area [eastern Kansas] have either heard stories or have ourselves seen what we believe to be cougars. To the best of your knowledge, has there been any confirmation of cougars, other than pets, in our area? If not, then why does Kansas have a law against killing them?

Local scuttle has it that the Wildlife and Parks has turned a few pair of these cats loose in the Burlington area in order to help control the deer population. Any truth to the rumor?

What I'm most curious about is how these cats got here. Are they pets that have been turned loose or escaped? Have they migrated here from some other area? Have they been introduced by some government agency without the knowledge of the general public? Or maybe they've always been here in extremely rare numbers and because of the ever-increasing deer population, have finally reproduced to the extent that there are more sightings.

One more thing. I have family and friends who do predator calling. I'm apprehensive that one of them will eventually call in one of these cats. For obvious reasons, this could be a dangerous situation. What if they were forced to kill one of these animals? Not only do I think it would be a shame, but what kind of trouble would they get in?

Thanks for a fine magazine.

Donna Hess
Waverly

Dear Ms. Hess:

The Department of Wildlife and Parks has never stocked cougars, or mountain lions. First, the public safety issue makes the concept out of the question. In addition, the sale of deer permits provides income for the department's numerous wildlife conservation programs. Why would we undercut these programs by introducing a species that preys primarily on deer?

If you really think about it, no entity is worse at keeping a secret than government, especially in a country with a lively free press. How could lion stockings be kept secret?

Are there lions in Kansas? I have never seen one, but my personal answer is, "Probably." A mountain lion's home range can be greater than 200 square miles. Neighboring states of Arkansas and Colorado both have lions, so it is logical to assume that lions occasionally make their way into Kansas in search of deer. I know of a number of people with trusted good judgement who claim to have seen mountain lions. Who am I to say they haven't?

Pet lions occasionally escape, as well. These animals might well be more dangerous than wild ones because they are used to humans.

The odds of calling in a lion would have to be much rarer than a sighting. That, I don't believe, has ever happened in Kansas.

Any animal can be killed in self defense. There is no specific law against hunting mountain lions -- or giraffes, for that matter. The way Kansas wildlife law works is that a species is huntable if there are laws or regulations that allow such hunting. Otherwise, they cannot be hunted.

--Shoup

JUSTICE FROM THE DEEP

Kansas Department of Wildlife and Parks conservation officers Dave Adams, Reading, and Richard Duling, Quenemo, teamed up last summer for selective enforcement on Melvern Reservoir and received some "assistance" from an unexpected source. Complaints had been received concerning personal watercraft operating dangerously close to boats entering and leaving the marina area. After several hours of patrolling and issuing citations, the officers decided to stop at the marina for a cool drink and a short break.

Noticing two people fishing from the docks, the officers stopped to chat and check fishing licenses. The man produced a fishing license, but when the officers asked the woman angler for her license, she said that she didn't have one. As she reeled in her line, her male companion grabbed the pole from her. Laying it on the dock behind him, the man then tried to fast-talk the officers out of a ticket.

The officers explained to the couple that all anglers 16 to 65 years old are required to have a valid fishing license to fish in Kansas. The officers told the pair that the woman would be cited and the pole would have to be seized until the court decided final disposition of the case.

No sooner had these words been spoken than a dark streak appeared from deep below the dock, headed for the surface where the man had laid the pole with the bait still dangling in the water. The dark streak flashed and in a moment disappeared in a swirl, taking the fishing pole with it. All eyes stared in disbelief at the spot where the pole had just been.

The woman was cited for fishing without a license. The pole and fish were last seen headed for the depths of Melvern Reservoir. The officers felt that, in this instance, the natural resources of Kansas truly got the last word.

--Dave Adams

LEGAL DEER PERMITS

It's that time of year when hunters should be aware of deer permit regulations, in particular, the types of permits that one may **not** possess.

Individuals who apply for "Hunt-Own-Land" permits may not apply for or purchase a statewide archery or regular firearms deer permit. No one may purchase both a statewide archery and a regular firearms or muzzleloader permit.

"Hunt-Own-Land" permits are guaranteed but allow the holder to hunt only on land he or she owns, operates, or manages. Landowner/tenant permits from the regular deer firearms drawing are not guaranteed, but allow the holder to hunt anywhere in the management unit where the applicant qualifies as a landowner or tenant.

--Shoup

OFFICERS FLEX MUSSEL

Last summer, law enforcement officials in southeast Kansas received a number of reports from landowners about mussel harvesters trespassing and stealing farm equipment. In response, Kansas Department of Wildlife and Parks conservation officers rode a Kansas Highway Patrol helicopter along the Neosho River from John Redmond Reservoir to Chanute on July 18.

During the four-hour flight, 15 mussel harvesters were located and ultimately inspected. Cases were made on under-sized shells, no life jackets, and no boat registration. In addition, mussel harvesters were found behind locked gates on private property. Other benefits were gained from the operation, according to Wildlife and Parks Conservation Officer Keith Rather, Chanute.

"One landowner called to thank us for our efforts," says Rather. "Then he called back later to say he had been telling his neighbors about our actions. During his conversations, he had located a landowner who was charging $150 a day per harvester to use his boat ramp to gain easy access to the river. We also gained information on marijuana-growing operations in the area."

About 42 native mussel species originally inhabited Kansas waters. Today, only about 38 remain, and most are in low numbers. Of these, six are endangered, four are threatened, and eleven are listed as Species In Need of Conservation. As more information is gathered on these elusive creatures, more may be listed.

Only four native species – the threeridge, monkeyface, mapleleaf, and bleufer – can be harvested. Threeridge, mapleleaf, and bleufer must have a shell at least 3 inches in diameter before harvesting. Monkeyface must be at least 2 3/4 inches in diameter. Commercial harvesting is only allowed in federal reservoirs and certain portions of rivers in southeast Kansas, including the Elk, Fall, Neosho, and Verdigris rivers. A resident commercial mussel fishing license costs $75. A non-resident license is $1,000. Each must be applied for through Wildlife and Parks' Pratt Operations Office.

--Shoup

OFFICER OF THE YEAR

Mark Gauntt, conservation officer from Silver Lake, has been awarded the 1996 Conservation Officer of the Year Award, sponsored by the Shikar-Safari International. Officers are nominated and chosen for the award by their peers.

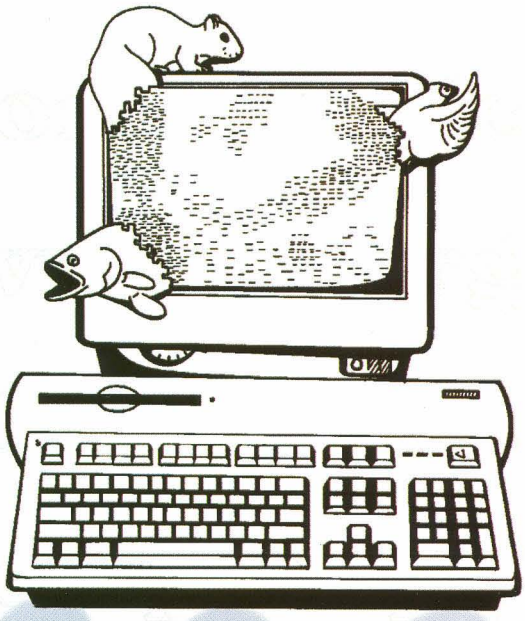
Aside from his normal enforcement duties covering Topeka and Shawnee counties, Gauntt was recognized for his role in coordinating the development and completion of the Region 2 law enforcement firearms training facility.

He was also selected for his active role in the hunter education program, his efforts working to improve the Shawnee County Hunter Education facility, his superior working relationships with other local law enforcement agencies, and for instructing the Topeka Police Department's recruit class in wildlife law.

Congratulations, Mark.

--Mathews

WILDLIFE AND PARKS ON Internet



Internet users who also happen to be outdoor enthusiasts need wait no longer to find the latest online information about Kansas outdoor resources. The Kansas Department of Wildlife and Parks (KDWP) has announced that, as of Sept. 26, the agency is hosting a World-Wide Web site at http://www.ink.org/public/kdwp.

The KDWP Web site is designed to be the most informative one-stop location for agency information, short of a visit to the Pratt Operations Office, the Office of the Secretary, or one of the state's five regional offices. At the KDWP Home Page, Web page links quickly take the "surfer" to one of the following areas of interest.

- **Office Locations** - Find addresses and telephone numbers of all agency offices, including state parks, regional offices, the Pratt Operations Office, and the Office of the Secretary.
- **Fishing** - Includes a map and listing of all state fishing lakes and reservoirs in Kansas.
- **Hunting** - Includes a map and listing of agency-operated public hunting areas throughout the state.
- **Brochures** - Lists all brochures produced by the agency - covering hunting and fishing regulations, parks, wildlife areas, and many other topics - and includes a handy form for ordering these publications.
- **Organizational Structure** - Handy for researchers and those curious about government, this flow chart outlines the management structure of the Department of Wildlife and Parks.
- **Outdoor Store** - This is the place for outdoor gifts. From belt buckles and T-shirts to wildlife ID books and videos, the Outdoor Store page has it all, including color photos of the merchandise and a downloadable form for ordering. Just in time for Christmas!
- **State Parks** - Includes a map and listing for all 24 Kansas State Parks.
- ***Kansas Wildlife and Parks* magazine** - This page includes a color cover photo of the latest issue of this award-winning outdoor magazine along with tables-of-contents for the last two issues. Subscription information is also included.
- **Nongame, Chickadee Checkoff** - Get the latest information on issues dealing with nongame, including updates on Outdoor Wildlife Learning Sites (OWLS), the Chickadee Checkoff program, and threatened and endangered species.
- **News** - This page includes the latest issue of Wildlife and Parks' weekly news release package, which includes timely articles on a variety of outdoor topics. The release is sent to all newspapers, radio and television stations, and outdoor writers in the state. The page is ready for downloading or printing and includes tables of contents for the last four issues of the news release package. An E-mail button allows readers easy communication with agency news contacts.
- **Licenses and Permits** - Want to know the price of a Duck Stamp? A non-resident fishing license? A deer permit? This is the place to go for this information and more. Order applications for anything from a turkey permit or hunting license to a boat registration.
- **Education** - This page contains overviews of the agency's education programs. Hunter education classes and duplicate cards, boating education, Project Wild for schools, and the school publication On TRACKS are covered. Tables of contents for the latest On TRACKS issues are also included.
- **Links** - This page includes links to other conservation organizations, both private and public, in Kansas and throughout the country. E-mail allows interested organizations to request links to their pages.
- **A Message From Secretary Williams** - What's on Wildlife and Parks Secretary Steve Williams' mind? Find out here as he discusses the latest issues of importance to the department and its constituents.

For the aesthetically-minded, each page on the Wildlife and Parks Web site is enhanced with colorful graphics. However, net surfers who don't want to get bogged down with graphics download time need not worry. With browser graphics turned off, each graphic is replaced by an image box with an explanation of what the graphic is.

Future enhancements to the Kansas Department of Wildlife and Parks home page are also in the works. Among these will be the ability to download more complicated publications - such as the hunting and fishing regulation brochures and maps of individual areas - using file transfer protocol (FTP).

For more information on Wildlife and Parks' Web site, steer your browser to http://www.ink.org/public/kdwp, or phone (316) 672-5911.

--Shoup

AMERICORPS AIDS PARKS

Several Kansas state parks are scheduled for United States Department of Agriculture (USDA) AmeriCorps teams this fall. Cheney and El Dorado will have teams of their own. Kanopolis will share a team with Wilson; Tuttle Creek will share with Milford; and Clinton will share with Perry.

Teams will conduct service projects on these and other public areas. Most projects will be flood-related. These teams offer these areas the opportunity to complete projects that could not be attempted with decreasing budget and staffing levels.

AmeriCorps team members receive a monthly living stipend and an educational award after completing 1,700 hours of service. This program provides tremendous benefits to our parks' natural resources and facilities, as well as to the patrons who use these areas. In addition, team members receive valuable work experience in a field that many have expressed interest in pursuing as a career.

For more information about the AmeriCorps program, contact any of these state park offices or call the USDA/AmeriCorps Coordinator, (913) 823-4500.

-Alan Stark, Region 4 parks supervisor, Wichita

USFWS CHIEF DIES

The popular director of the U.S. Fish and Wildlife Service, Mollie Beattie, died of brain cancer June 27 in Vermont. She was 49 years old. Beattie had been treated for the disease since last year and resigned her office in early June.

Beattie ran the USFWS during particularly difficult times that included budget cuts, public discontent with the Endangered Species Act, and argument over uses of the National Wildlife Refuge System. Her administration sputtered early on, but she was a quick learner and a crowd pleaser who soon set a proper course and won universal respect. She was laudably successful at adjusting the agency's handling of endangered species matters to reduce public fears that private property rights would be disregarded in order to protect listed animals.

Beattie was instrumental in the final stages of a program to reintroduce wolves into the northern Rockies in early 1995 and in opening appropriate refuge lands to fishing and hunting.

Raised in Connecticut, Beattie received a master's degree in forestry from the University of Vermont and a master's degree in public administration from Harvard.

-Wildlife Management Institute

DUCK STAMP HISTORY

Although much of the credit for promoting the Federal Duck Stamp [deservedly] goes to J.N. Ding Darling - the award-winning editorial cartoonist who penned the illustration for the first Duck Stamp in 1934 while he was director of the Bureau of Biological Survey (now the U.S. Fish and Wildlife Service) - the idea of a revenue stamp purchased by waterfowl hunters for wetland acquisition was underway before 1920. In 1919, the chief U.S. game warden, George A. Lawyer, was the first to advance the idea of a federal waterfowl stamp for hunting to help acquire wetlands and assure waterfowl habitat and public hunting areas.

Today, scientists generally acknowledge that wetlands constitute the most valuable and productive wildlife habitat in North America and provide, through migratory birds, ecological links to the rest of the world. Conservation advocates in the early part of the century, however, did not enjoy such a degree of scientific certainty. Much of their work relied on a faith that future studies would support their intuitions and the hope that the public at large would eventually appreciate and support the fruits of their efforts.

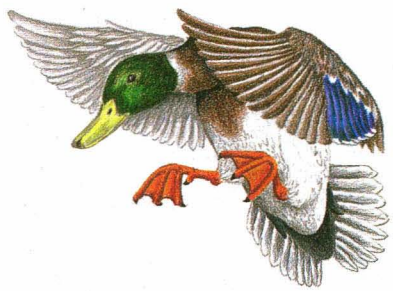
That faith proved well-founded. Since 1934, revenues from the sales of Duck Stamps have totaled more than $500 million and have helped acquire 4.4 million acres of wetlands.

- U.S. Fish and Wildlife Service

Hillsdale WETLAND

Area waterfowl hunters should have a new 60-acre wetland at Hillsdale Reservoir next fall. A 4,750-foot-long dike will provide shallow water habitat. Inside the marsh are 10-12 islands for hunting blinds and possible nesting sites for ducks and geese. Tim Schaid, who is in charge of public lands at Hillsdale State Park for KDWP, said the seeding already has been done on the area and that the valve has been closed to impound water.

-Miami County Republic



THE LIGHTER SIDE

Now look what we've done: we've shortened the day by 8 millionths of a second since 1950 because of the huge dams we've built. Stay with us here.

Benjamin Fong Chao, a geophysicist at the Goddard Space Flight Center, has calculated that construction of 88 huge water reservoirs over the past 40 years has concentrated so much water in the Northern Hemisphere, and closer to the earth's axis, that the earth is spinning faster.

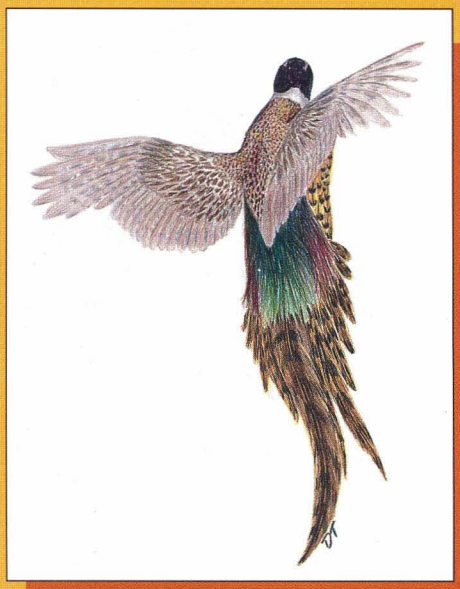
That's not all. The dams are holding so much water that they've caused sea level to drop more than an inch. And they've caused the earth's axis to tip two feet more toward Canada. While lots of natural phenomena, like earthquakes and the moon's pull on the ocean, affect these things even more, dam-building is the only human activity that has such impact. Chao's findings, which appeared in the Dec. 15, 1995, Geophysical Research Letters, are available by calling (301) 286-6120.

-Common Ground

1996 UPLAND BIRD HUNTING OUTLOOK

To help hunters prepare for the coming upland bird seasons, the Kansas Department of Wildlife and Parks prepares an outlook of bird populations for the year. Based on surveys of birds seen by rural mail carriers and department biologists' brood count surveys, the outlook provides a fair measure of what hunters might encounter once bird season opens.

Of course, no survey of wildlife populations can be completely accurate. Habitat conditions and weather patterns may skew results one way or another. And severe weather between survey time and the season opener may also affect what hunters encounter. Still, the following information should provide hunters a good basis for planning fall hunts.



Statewide Summary, General Information

Severe drought conditions that persisted well into spring in Kansas had a strong impact on gamebird production this year. Pheasants were primarily affected indirectly through the drought's impact on the growth of the Kansas wheat crop. Bobwhites were less affected due to their greater reliance on permanent habitats and their somewhat later nesting cycle. Rains have been abundant across the state this summer and have generally been favorable to upland gamebirds. These rains have produced much heavier than normal cover in Kansas, particularly in the west.

Pheasant: Due to their heavy reliance on green wheat as secure nesting cover, pheasants were especially hard hit by the drought conditions this spring. Wherever wheat growth was delayed or stunted by drought this spring, pheasants were forced to seek other nesting cover. Other covers sometimes are mechanically disturbed resulting in poor nest success. Abnormal concentration of nests caused by the unavailability of quality wheat probably increased their vulnerability to predation, even in habitat not disturbed by machinery. Except for northeast Kansas, the entire Kansas pheasant range was affected. Most of Kansas will see pheasant numbers no better than the relatively low numbers of 1995, and the southwest and northcentral regions will be noticeably lower. Southcentral Kansas pheasants remain at or below 1995 levels.

Quail: Bobwhites appear to have had relatively good production in most of the state and should show at least some improvement over 1995. Data available at this time suggest that quail numbers might be substantially higher in some areas, but survey reports were widely mixed, leaving some uncertainty. Northcentral Kansas will continue to hold better than average quail numbers for that area. Recovery of populations in the remainder of the range will provide good hunting opportunities, though still below potential.

Prairie Chicken: Kansas greater prairie chicken populations were very low this spring. It is difficult to monitor prairie chicken production during summer, but even if reproduction proved to be good, it is likely that prairie chicken numbers will continue well below average. The Flint Hills constitute the core of Kansas' greater prairie chicken range. Lesser prairie chickens are found mainly on sand prairies in southwestern Kansas, and their numbers were very low this spring. Drought conditions that persisted through spring in southwestern Kansas may have further impacted lessers. Season lengths and bag limits for lessers are more restrictive than for greater prairie chickens.

Regional Summaries

Northwest

Prospects for pheasant hunting in this region are generally no better than in 1995. Spotty distribution has produced a few reports of improved prospects, but these have generally been outnumbered by reports on the down side. Quail are not abundant in most of the northwest, but fair to locally-good numbers occur in Phillips, Rooks, Norton, and Graham counties. Quail numbers appear to be improved over 1995 and remain above average for this region. Exceptional summer rains have produced rapid vegetative growth and cover is heavy, where not tilled or sprayed.

Northcentral

Pheasant numbers are down from 1995 in all but the extreme eastern portion of this region where numbers appear to have generally increased. For most of the region, hunters will find noticeably fewer pheasants, and hunting will be below average with a few exceptions. Quail numbers will be similar to last year, remaining above average for this region. Quail numbers generally increase from west to east. Cover conditions are heavy throughout the northcentral region.

Northeast

Pheasant populations appear to be significantly improved over 1995, and hunting prospects are probably above average for this region. This region's overall pheasant density, however, is typically lower than that which occurs further west. The northernmost counties provide the best pheasant opportunities in this region. Quail numbers appear to be modestly improved over last year and should provide fair to good hunting this season. Cover conditions range from good in the east to heavy in the western counties.

Southwest

Extended drought this spring pushed southwestern Kansas pheasant numbers to levels even lower than in 1995. Most reports coming from this area estimate pheasant populations to be the lowest in memory. Significant quail populations are found mainly in the southern and eastern tiers of counties in this region, especially in the Red Hills. Quail numbers appear to have increased over last year and should provide relatively good hunting in the areas noted above. Cover conditions in cropland areas are unusually heavy, where not tilled or sprayed. Rangeland cover is also heavy.

Southcentral

Pheasant populations remain at low levels in this region, similar to or slightly lower than those of 1995. This will be the least productive region within the Kansas pheasant range this year. Quail numbers appear to be substantially improved over 1995 and should be back to about average levels. A few areas in the region may not have shared in this overall quail increase. Cover conditions range from good to heavy.

Southeast

Quail populations appear to be at least modestly improved in the southeast region. Reports on quail, however, have varied widely from "little change" over 1995 to "substantial improvement." There is some indication in the information available that quail production may have been better than what, at this point, can be confirmed. Hunters should continue to monitor the situation in the southeast as the season draws nearer. Cover looks good, but is not exceptional.

-Randy Rodgers, research biologist, Hays

Respect For Life

by Mike Blair

The hare's white belly sharply contrasted with the autumn grass. Its amber eye stared widely in death, vacant of the gleam it once held. Maybe coyotes would find the animal tonight - it and all the rest. Along my path, 10 jackrabbits lay dead among the Christmas trees.

Visitors had come to the pines today, men with guns looking for "sport." Twelve-gauge casings strewn along the rows told the story of what had taken place. Quail and pheasants were doubtless sought among the trees, but rabbits had offered targets of opportunity. Caught by loads of fours in mid-stride, they lay where they had fallen.

I studied the carcass, rigid except for the subtle ripplings of windblown fur. Like the others, it greatly polluted the scene, warning all of life to be on guard. In nature, an intact dead body found in the open nearly always points to man. Sick or injured wildlife seeks heavy cover in which to die.

It was a trail of waste that I followed. I looked at the gun in my own hands, a single-shot .22, and pondered my own motives for stalking the pines. I had come for cottontails, hunting food, but I too relished the game of hide-and-seek that is part of hunting. To me, a freshly killed rabbit placed in a game bag is natural and justified. But an animal felled in boredom and allowed to rot in the field is grossly different.

Why were these jackrabbits shot and abandoned? Maybe they were supposed a threat to young trees, though they lived among the pines mostly for shelter. Adjacent wheat and alfalfa offered plentiful food. Even if killed for damage control, there was a cold indignity about the spectacle. If nothing more than providing dog food, the kills should have been retrieved and used, or at least removed from the sight of Holiday buyers who would shortly visit the Christmas tree farm. It was the respectful thing to do.

I wondered if young hunters had been involved, brought to the pines for a shooting exercise. Then, a disgrace would become a tragedy as another generation of hunters learned to express a casual indifference toward life. To shoot and let lay is a wanton mistake. It's also against the law.

When God breathed life into this planet, He gave to man the honor of stewardship. "Have dominion over the fowl of the air, and every living thing that moves upon the Earth," He said. That extends, I think, even to the harvest of the hunt. But there is a weight of responsibility in this far deeper than pulling a trigger. Good stewardship is the reverence for life embodied by Native Americans who breathed apologies to their prey even as they released their arrows. It's the conscience that silently promises that life will not be taken in vain.

I can't say why there was a killing in the pines. Perhaps the shooters believed themselves justified in some way. But what I saw there left me colder than the wind would demand, and I took a lesson from it. If I would hunt, I must never forget the responsibilities that go with the power of inflicting death. And neither must anyone who would be a hunter.

WINTER BASS

Winter black bass fishing can be described only by one word – slow. But don't misunderstand, it can be quite exciting. If you have located early spring or late fall bass, winter bass should be in the same general locations.

The most successful winter fishing is through the ice. Black bass are fairly easy to catch this way, once you find the fish. If you catch a warm sunny day, grab your ice auger and head out on the ice to that spot where you feel the deep bass are concentrated. You might want to take along a depth finder so that you can quickly locate the deep area or dropoff. A few drops of water on the ice will allow a depth finder to read directly through and give accurate bottom readings.

Some ice fishermen feel that the bass will be in the deepest water at the fishing location. But bass also move to feed, so fish dropoffs or ridges next to the deepest water. Remember, try to find areas mentioned above that also have some type of structure.

Winter bass fishing requires some totally different equipment. A light or ultralight spinning outfit works best, filled with 2- or 4-pound test line. Very small jigs are the best artificial bait; try yellow, white, or chartreuse colors in 1/64- to 1/16-ounce sizes. Minnows will work well if they are fished close to the bottom.

Whatever the bait, drop it to the bottom, then work it up and down very slowly. Keep up a slow jigging motion with the jigs, making them look like swimming minnows. If you have no success on the bottom, raise the bait a foot or two and continue. You may have to try a number of holes and a number of depths to find the fish, but when you do catch a bass, you should be close to a good concentration of fish.

--Tommie Berger, fisheries biologist, Sylvan Grove

WOLF CREEK OPENED

Although the deadline for permits to fish Wolf Creek Lake in the fourth-quarter of 1996 ended Aug. 15, those lucky anglers who had permits for this year should be having a good time. The lake opened Oct. 1, and reports have it that the fish population is healthy, with numerous large fish.

Channel, blue, and flathead catfish, as well as crappie, largemouth and smallmouth bass, walleye, white bass, and wipers were stocked several years ago and have thrived, controlling shad that could otherwise clog the filter screens that allow the lake's water to enter Wolf Creek Nuclear Generating Station's cooling system.

Because of the importance of these predator species in controlling shad, length and creel limits at the lake are strict, making fishing mostly catch-and-release. Although any size of catfish may be kept, the limit is two. Only two crappie may be kept, and they must be at least 14 inches long. The largemouth bass limit is one, with a length limit of 21 inches. The smallmouth limit is one, with a length limit of 18 inches. Only one walleye may be taken, 21 inches or longer. Two white bass may be taken, with a length limit of 14 inches, and one wiper 24 inches or longer may be taken.

Facilities at the lake are in good shape, too, thanks to a $600,000 grant from the Sport Fish Restoration Act, which collects excise taxes on fishing and boating equipment and returns it to the states based on the number of fishing licenses sold in each state. New restrooms, a parking lot, boat ramps, and a check-in building for anglers have been built, and Coffey County has improved the road from U.S. Highway 75 to the lake.

Applications for fishing at the 5,090-acre lake in 1997 are now being accepted. Although the deadline for the first quarter of 1997 – January, February, March – was Nov. 1, the second quarter 1997 deadline is Feb. 1; the third quarter is May 1; and the fourth quarter 1997 deadline is Aug. 1. The fee is $2. For more information or applications, contact Wolf Creek Fishing, P.O. Box 206, Burlington, KS 66839. Applications are also available at some offices of the Kansas Department of Wildlife and Parks and from county clerks.

--Shoup

LENGTHS AND CREELS

Unless otherwise posted or listed in the *Kansas Fishing Regulations Summary*, the following daily creel limits apply to Kansas streams and lakes. City, county, and other locally managed waters often have excellent fishing but may have more restrictive length and creel limits, as posted on the areas. Contact your regional Wildlife and Parks biologist for more information on these lakes.

Species	Creel Limit
Channel and Blue catfish (single species or in combination)	**10**
Walleye, sauger, saugeye (single species or in combination)	**5**
Rainbow trout, brown trout (single species or in combination)	**5**
Black basses (largemouth, smallmouth, spotted, single species or in combination)	**5**
Flathead catfish	**5**
Northern pike (30-inch length limit)	**2**
Striped bass	**2**
Wiper (white bass/striped bass hybrid)	**2**
Crappie	**50**
White bass, bullhead, bluegill and all other legal species	**No Limit**

The possession limit is three times the daily creel limit.

--Shoup

FISHING REG ADS

As with the department's hunting regulations brochure, the sale of advertising will offset the cost of printing and allow the department to produce a much more comprehensive and economical fishing regulations pamphlet, due out in early 1997.

For more information on how you can advertise in the Kansas fishing or hunting regulation pamphlets, contact Daniel L. Bolz, Liberty Press Publications, 500 W. 1200 S., Orem UT 84058, (800) 296-6402.

--Mathews

SHARPTAIL "PIONEERS"

In 1982, the department began a sharp-tailed grouse reintroduction program with the release of 126 birds in Rawlins County, in northwest Kansas. Once native to the Kansas Great Plains, these close relatives of the prairie chicken had been extirpated from the state by the 1930s. Since that first release, 827 sharptails have been released in Rawlins, Rooks, Osborne and Ellis counties. The birds were obtained from North and South Dakota and Nebraska.

Sharptail restoration efforts in Kansas have succeeded in as much as leks (breeding grounds) have been established with long-term histories, and reproduction has occurred. Since all released birds are marked with a numbered aluminum leg band and a colored plastic leg band (red for males, blue for females), it has been possible to identify unbanded sharptails on leks, thereby documenting recruitment into the new populations.

The difficulty in locating new leks, due to the low audibility of sharptails and the extensive areas that they may use, has made detailed assessment of Kansas' restoration difficult when coupled with the occasional lek shifting that has been documented.

General evidence, however, appears positive. The apparent stability of the north Saline River Breaks lek (Rooks County), despite the presence of a few greater prairie chickens, remains the strongest evidence to date that sharptails are established in Kansas. Irregular but persistent sightings by ranchers and the general public support this.

Independent reports of at least one group of 15 to 20 sharptails in the Waldo-Luray area, at least 8 miles from the nearest release, in 1995 provided some of the first solid evidence that sharptails may be pioneering into new Kansas range, effectively finding preferred habitat for themselves. Multiple observations of a group of 8 to 10 sharptails were made in northern Ellsworth County in late 1995 and early 1996 by a ranch hand who had previously worked in the Nebraska Sandhills and was very familiar with the difference between sharptails and prairie chickens. This represents a straight-line distance of 45 miles from the nearest sharptail release site in northcentral Kansas. Sharptails have also been reported in rangelands along the Saline River approximately 20 miles west of the releases.

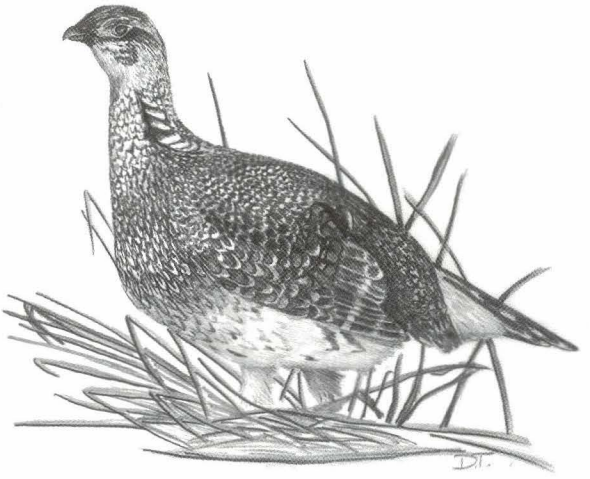
Results of the early releases in Rawlins County are more tenuous. Sightings from the release area have been rare in recent years. A surprising report of four possible sharptails was received from a farmer-rancher in western Gove County. In an unrelated conversation in December of 1995, this individual conveyed his pleasure with a substantial increase in prairie chickens in his area and, in addition, proceeded to describe his observation in the summer of 1995 of four "gray prairie chickens." His unprompted, detailed description of these birds indicated that they were sharptails.

If sharptails are present in that area, it would represent a pioneering distance of 50 miles from the nearest release site in Rawlins County. It is unlikely that these birds, if present, originated from any other source.

Final assessment of the results of Kansas' sharptailed grouse restoration program must be reserved for the future. While results to date appear generally positive, another 15 to 20 years may be needed to say firmly that sharptails are again a permanent part of Kansas' fauna. In the interim, Kansas' sharptails will be subject to the same influences that cause fluctuations of similar species.

Restoration efforts will probably be terminated once the current agreement for sharptail trapping with South Dakota expires, most likely in 1997, 1998, or 1999, depending on trapping conditions in that state.

--Randy Rodgers, research biologist, Hays



BLUEBIRD BOXES

The department's bluebird box and trail assistance procedures are changing. Officially, any organization that would like to participate in our Bluebird Trail Program may obtain as many as 10 boxes supplied by the El Dorado Habitat Center. Make arrangements through district wildlife biologists.

The conditions for receiving boxes are as follows: 1) nest boxes must be placed in proper situations and areas best suited to attracting bluebirds -- chest high, or so, in relatively open country; 2) participants must be willing to supply periodic maintenance to prevent house sparrow or starling use or problems from other pests; and 3) participants must be willing to report season nesting success and other information to the statewide bluebird coordinator, Jim Piland, at 516 U.S. Highway 281, Waldo, KS 67672.

Regions may have some variances in how they operate, but these are the general guidelines. Also, because of Piland's efforts, it's clear that there are a lot of folks involved in bluebird management in Kansas. We hope to have even more success to report after this season.

--Ken Brunson, nongame coordinator, Pratt

GOLDSBERRY HONORED

Mark Goldsberry, manager of Meade Lake State Park, has been honored for environmentalism by the Kansas Wildflower Society. Goldsberry was presented the 1996 Kansas Wildflower Society's "Wayside Award" at the society's annual meeting on Sept. 7 at the University of Kansas.

Speaking on behalf of the society, Fred Meyer of Dodge City said the award is the group's way of singling out individuals or organizations who have made commitments to environmental stewardship and promotion of wildflower growth.

--The Hutchinson News

NEW COMMISSIONERS

On Aug. 16, Gov. Bill Graves appointed two new members to the Kansas Wildlife and Parks Commission. The two -- Adrian Price of Deerfield and Jon Prideaux of Pittsburg -- replace outgoing commissioners Peg Ann Ranney, Dodge City, and Dan Brunetti, Frontenac.

Price is a caseworker for the Department of Social and Rehabilitation Service's Center for Aging in Garden City. Originally from Big Bow, Ks., she and her husband raise wheat and sheep along the Arkansas River near Deerfield, about 20 miles west of Garden City. They have developed conservation projects on their land, including wetlands, food plots, and fishing ponds. Her term will expire in 2000.

Prideaux, an auctioneer and real estate agent, is a 1967 graduate of Pittsburg State University. He is active in both Ducks Unlimited and Quail Unlimited and volunteers as auctioneer for the annual Pittsburg DU Chapter auction. His term will expire in 1998.

With these appointments, the Kansas Wildlife and Parks Commission now has a full compliment of commissioners. Others include Will Carpenter, El Dorado; John Mickey, Atwood; Gordon Stockemer, Wichita; Tom Warner, Manhattan; and John Dykes, Shawnee Mission, who is chairman of the commission.

--Shoup

TEXAS LAKE DEDICATION

On Sept. 7, Ducks Unlimited (DU) and the Kansas Department of Wildlife and Parks (KDWP) hosted a dedication ceremony at Texas Lake Wildlife Area, west of Pratt. The ceremony honored eight DU "major donors" who gave $80,000 to add 320 acres to the area.

Lee Queal, former regional director for DU, introduced the keynote speakers: W. Alan Wentz, DU's national group manager for conservation programs and communications; Steve Williams, secretary of KDWP; and Bob Hawkins, DU's Central Flyway senior vice president.

The eight DU major donors (a major donor is one who gives $10,000 over a period of four years) are Paul G. Benedum, Jr., William F. Bowman, Hugh S. Dennis, Flint Oak, Mark L. Miller, Rodney L. Ringer, David L. Stannard, and Jan and Alan Wentz. Their donations, along with money from Kansas Ducks Unlimited's MARSH program, made this most recent acquisition possible. Of the $80,000 dollars they donated, half went to Texas Lake and half went to Marshal Marsh, a 190-acre marsh and breeding area in Saskatchewan, the heart of North America's duck breeding grounds.

The dedicated area at Texas Lake includes 320 acres. Of this, 160 acres, called the Henry Quarter, was purchased in 1988. The other 160 acres, called the Rice Quarter, was acquired in 1989. Texas Lake, which now encompasses a 840-acre wetland complex, was originally acquired by Wildlife and Parks in 1976. The area is a crucial feeding stopover for migrating waterfowl, providing energy in both spring and fall.

The Texas Lake and Marshall Marsh projects are complimentary components of DU's "Round Trip" conservation initiative, designed to help migrating birds make the trip to both breeding and wintering grounds. Texas Lake is located about 15 miles northwest of Pratt.

- Shoup

RECORD FLIGHT

The U.S. Fish and Wildlife Service (USFWS) estimates that this year's fall flight of ducks will be 89.5 million, the largest in more than 25 years and 16 percent greater than last year's 77 million. This marks the third consecutive season in which duck numbers have rebounded from the drought of the late 1980s and early 1990s.

Generous rains in the northcentral U.S. and southcentral Canada, the federal Conservation Reserve Program, and the efforts of groups involved in the North American Waterfowl Management Plan are given credit for the rebound in duck numbers.

--Shoup

MAGAZINE RATES RISING

On Jan. 1, 1997, the subscription rates and cover price for ***Kansas Wildlife and Parks*** magazine will go up. This is the first price increase for the magazine since 1989, when annual subscription rates went from $6 to $8. The new rates will be $10 for one year, $18 for two years, and $27 for three years. The cover price will go from $2.25 to $2.75.

Several promotions have announced the price increase this fall and encourage readers to renew or extend their subscriptions at the current rates. Extensions of one, two, or three years or new subscriptions received in 1996 will receive a ***Kansas Wildlife and Parks*** magazine hat. This offer is made on a subscription form in the *1996 Kansas Hunting and Furharvesting Regulations Summary*. If you want the hat and are using a different form, write "Please send hat" on the subscription form.

For more information, contact the Pratt Operations Office, (316) 672-5911.

--Miller

Let it Snow!

by Mark Shoup

In Kansas, some winters go by without a flake of falling snow. When snow does fall, everyone gets excited. Snow is more fun than a sandpile. You can sled on it, slide on it, make snowmen out of it, and best of all, you can have snowball fights with it.

Of course, snow isn't fun for everyone. People have to shovel walks and plow streets to remove it. Driving a car on it can be dangerous, especially when it melts and refreezes, making slippery ice. If too much snow falls, ranchers may have trouble feeding cattle. Just getting around can be nearly impossible.

The greatest record snowfalls have occurred right here in North America. The record for one year happened on Mt. Rainier, Washington, from February 1971 to February 1972 when 1,224 inches of snow fell. That's more than 100 feet of snow in one year. The single-day record came to Silver Lake, Colorado, in 1974. They received 74 inches -- more than 6 feet -- of snow in one day.

Of course, most snow in the United States melts in spring or summer. In the polar regions of Earth, snow hardly ever melts. Each year, layer after layer of snow falls and packs tightly. This old, well-packed snow is called "firn." Over the years, firn forms what we know as the polar ice caps. The ice caps still contain snow that fell thousands of years ago and never melted.

Over hundreds of years, firn snow forms a glacier, or long sheet of ice. Glaciers create valleys and rivers, and in the polar regions, icebergs. The world's largest glacier is the Lambert Glacier, in Antarctica. It is 40 miles wide and 250 miles long. When glaciers such as this meet the ocean, they break off, forming icebergs. Icebergs are very dangerous to ships. The worst accident caused by an iceberg happened in 1912. The Titanic, the world's largest passenger ship -- considered "unsinkable" by its builders -- sunk when it crashed into an iceberg in the Atlantic ocean. More than 1,500 of the 2,200 aboard were killed.

Although dangerous, snow is a blessing to the earth. It makes our rivers flow and provides moisture for our winter crops. It helps fill our lakes and provide the water we drink. For the playful, it provides a surface to ski. Snowdrifts transform invisible wind patterns into solid sculptures -- beautiful subjects for the photographer.

But what happens before the snow piles up may be the most fascinating part of snowfall.

Snowflakes begin as crystals that develop

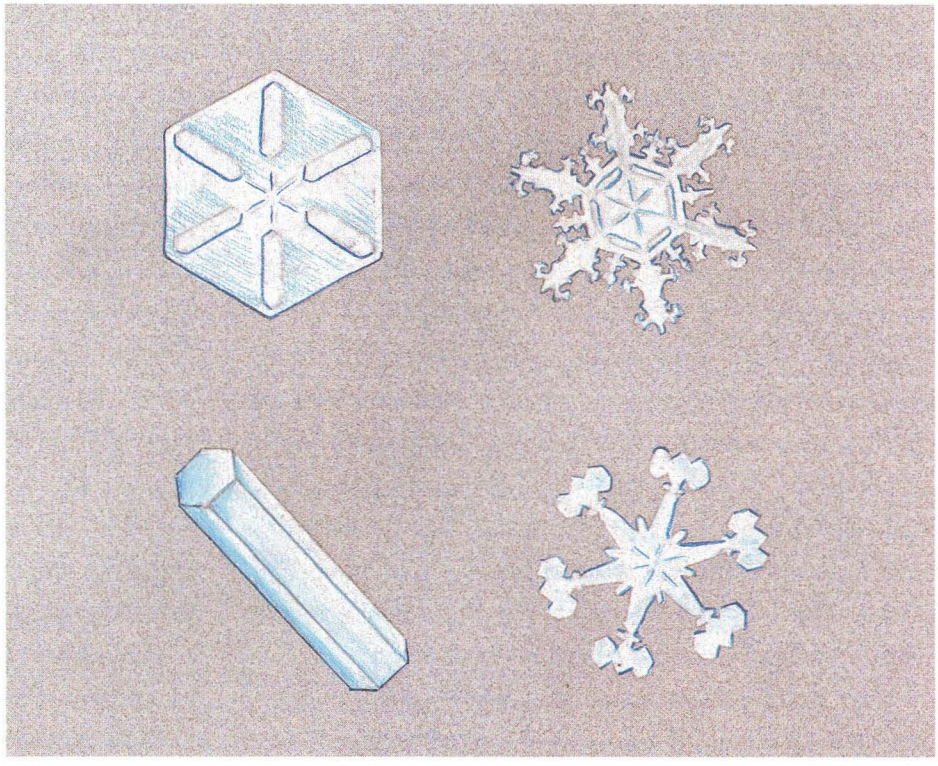
about 6 miles above the earth. The temperature at this height is more than 30 degrees below zero. Snowflakes begin to form when water molecules collect on tiny particles in the air, such as dust or bits of salt from sea spray. These first flakes are simple six-sided crystals. (Six-sided objects are called hexagons.) Although no two snowflakes are identical, they all have six sides. Some snowflakes have six points; others have six flat sides.

As the crystals fall, water molecules stick to them, forming larger flakes. The warmer the air, the better the molecules stick and the bigger the flakes. Although most flakes are about one-half inch wide, they can be much bigger. In 1971, snowflakes 12 inches wide and 8 inches thick fell in Siberia.

Although every snowflake is different, they do come in several basic shapes, including six-pointed stars, six-sided flat plates, and something that looks like a six-sided needle. Others have many offshoot points that make the snowflake look like it has more than six basic sides.

If we have snow this winter in your part of Kansas, you can check the shape of the flakes. Place a black cloth outside to catch a few flakes. (If you cool the cloth in the freezer first, snow won't melt on it as it lands.) Use a magnifying glass to study the different shapes. Draw them. Write down the date and outside temperature with each drawing. Do this several times throughout the winter. Compare snowflake shape with outside weather conditions. What are the similarities? Differences?

There is something magical about waking up on a winter morning to find it has snowed, especially when it's a wet snow and tree limbs, fences, and shrubs are all blanketed in white. But when it snows this winter, take a closer look. The shapes inside the white blanket may be even more magical than the "winter wonderland" they create.



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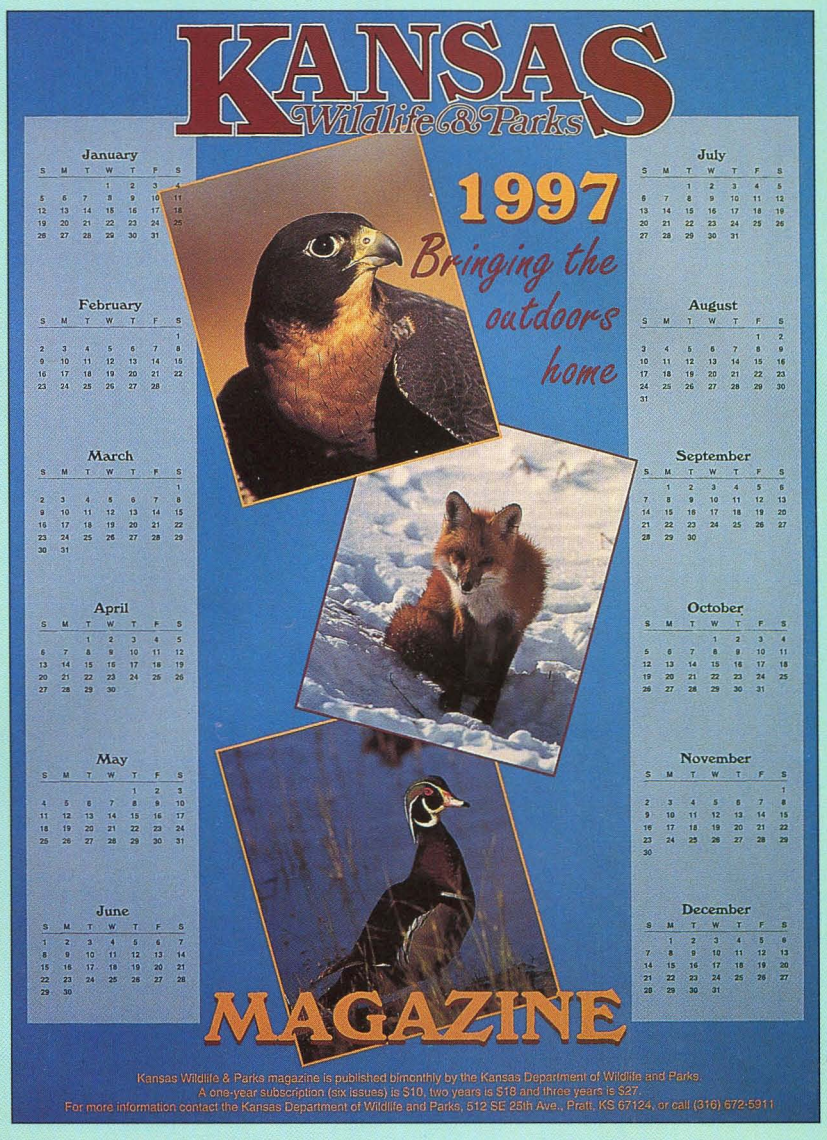

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