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MARCH/APRIL 1985



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KANSAS WILDLIFE

MARCH/APRIL 1985

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Kanopolis Chronicle

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Editorial

New Perspectives

It's spring. It'll be spring for a couple more months, too. What are you going to do about it?

I'll tell you what I'm going to do; I'm going to think new thoughts. Spring is a time of newness and it's a good time for us to rethink some of our opinions and attitudes. Thinking shouldn't be any big deal, and it won't prevent me from doing other things, but I'm going to do more of it this year than I have in the past. I think you should too.

I know what you're thinking now: This guy's some sort of cerebral kook who gets off on meditation. He probably wears sandals and has long hair. He eats alfalfa sprouts and washes infrequently. He may even demonstrate against nuclear power. Well, you're wrong. I do enjoy alfalfa sprouts in moderation, but most of the other things don't apply. I just think thinking has been on the back burner for too long and we're all suffering because of it.

You probably can't wait to wet the bottom of your bass boat or rig a catfish lure or photograph a wildflower or sight in your varmint rifle. The budding trees and warm sun and lengthening daylight have you in their grip. You're succumbing to spring fever. Fine. Just don't take it all for granted. Think about it.

Your brain may be more or less active than mine. I don't know. I don't care to find out, either. But neither of us can stop thinking thoughts. We think like

we breathe — subconsciously. Most of us breathe and think too shallowly, though. It isn't good for us. We need to breathe deeply of fresh outside air once in a while. And we need to penetrate new frontiers with our minds. Otherwise we become stale.

The nice thing about thinking is that you can do it anywhere and often while you're doing something else. Fishing was designed for thinkers. Driving your car to the pond gives you additional thinking time. Before cruise control it cost me to think too deeply on the road, but now I can really get into it without worrying about the consequences.

What are we to think about? That depends, of course. It's good to think positive thoughts, but it's better to think a mixture of positive and negative. That way your thoughts are more realistic. It's best at all times to make your thoughts constructive. That way they're worth something.

You might start by thinking thankful thoughts. I know I will. I'll be thankful for my health and for the opportunity to enjoy spring in Kansas. Then, if I'm not too busy, I might make a mental list of things I really like but never take time to appreciate. The intricate venation in a new leaf, for example, or the rush of teal wings or the smell of a spring cattail marsh. When I hear the rumble of distant thunder, see flashes of lightning, smell the rain, and feel water splash on my face, I suddenly know more than I did before the storm. But only if I take time to think about it. It is possible to go through life without ever thinking. Lots of people do.

Come to think of it, a lot of our problems wouldn't be problems if more people did even a little thinking. Western Kansas faces a severe water shortage but few folks give it much thought. They will, later. People who spend a lot of time telling each other how evil hunting is might ponder for a change ways to help wildlife. Hunters and anglers who recite the same stories over and over in the duck blind and bass boat might instead think of things they could do to

improve relations with non-hunters and get more people to support wildlife conservation projects. Sometimes we all like to act as silly as the football players in the beer commercials, but it's not a good idea to live like that. Those grinning, back-slapping linemen don't. They thought a lot about what they'd get out of that beer commercial before they did it.

I'm going to try to think some original thoughts this spring, some I've never thought before. I may get a good idea from one. Even if I don't, thinking new thoughts will make me a bigger person. It will help me appreciate how hard it is to come up with new ideas and will teach me to respect those of other people. It might, as I exercise my mind, give me understanding I didn't have before. It will cause me to question my opinions and maybe even my attitudes. It will make me much easier to work with too, and I'll be more adept at sliding my thoughts into the minds of others.

Much as I dislike it, I may even spend some time trying to think like a person I disagree with. That's very hard but also very useful. More people should do it.

I may try to solve some problems this spring, to do some heavy-duty thinking. But mostly I'll just think thankful thoughts, original thoughts, and a few thoughts that other people think. That should keep me very busy. If I have time I may sight in a varmint rifle or two, but that will be second priority. I don't want to go through life without thinking.



The aging of a reservoir ...



Kanopolis Chronicle

Gene Brehm photo

Bruce Zamrzla

Where was your favorite “fishing hole” back in 1947? It’s hard to imagine fishing in Kansas without federal reservoirs, white bass or walleyes, but that’s how it was before 1948 when Kanopolis Reservoir was completed.

It’s general consensus among fishermen that a reservoir offers great fishing in its early years, then slowly, or sometimes quickly declines in productivity. Can an aging reservoir ever have good fishing again? Will fishing continue to go downhill? What really happens as a lake ages? Let’s look at what has happened to Kansas’ oldest reservoir.

Kanopolis Reservoir lies on the Smoky Hill River in eastern Ellsworth County about 25 miles southwest of Salina, Kansas. Red sandstone outcrop-

scale. Further development of the irrigation plan does not appear likely in the immediate future. The Smoky Hill River, like other western Kansas streams, is drying up. It is doubtful the river and reservoir could provide the water called for in the original irrigation plan, at least not without drastic water level fluctuations.

At the time Kanopolis was constructed, the effect of large reservoirs on Kansas fishing was difficult to assess. The Corps of Engineers, in a 1948 statement, observed that “this is more water surface than that provided by the combined state lakes now in existence. Conditions for production of fish should be greatly improved as a result of the establishment of a permanent body of water, and it is probable that the lake will be extensively used for fishing.”

What species of fish should be stocked in a reservoir? What kind of fishing would this new impoundment provide? The Kansas Forestry, Fish and Game Commission, as it was then

The census was conducted by local game protectors asking anglers throughout the reservoir and at the stilling basin: “How long have you been fishing?” and “What have you caught?” They then estimated the length and weight of creel fish. From 1950 through 1956 James C. Carlson, State Game Protector from Salina, conducted the survey alone; and from 1957 through 1961 he received help at times from State Game Protectors Leon Hopkins, Willard Jones, and Lester Hauser. During the twelve years of censusing, over 30,000 fishermen were interviewed by these men. Fishing pressure ranged from 16,000 man-days in 1950 to 59,000 man-days in 1956. The average time spent fishing was 3.6 hours per fishing trip, which is very near today’s state-wide average. Catch rates ranged from 0.70 fish per hour in 1959 to a maximum of 2.6 fish per hour in 1952.

All species initially stocked were present in the Smoky Hill River prior to reservoir construction. It is doubtful

Several generations have enjoyed the out-of-doors on Kanopolis Reservoir. Given sustained flow from feeder streams, the impoundment should be productive for many years to come.

pings and rugged hills form a picturesque backdrop.

The project was born in June of 1938, when Congress approved the construction of Kanopolis. Actual work began in December of 1940. Work ceased in December, 1942 due to World War II, but resumed in April, 1946. In May of 1948 construction was completed and the gates were closed. By July 20 of that year the 3550-acre reservoir was filled to conservation pool (optimum level for the designated uses of the reservoir). The total cost of the project amounted to just over twelve million dollars—very cheap by today’s standards!

The original justification for the reservoir was flood control. Other proposed uses for the lake were irrigation and recreation. An irrigation plan was incorporated into the project, with the stipulation that the conservation level could be raised twenty-five feet to provide water for a 20,000-acre irrigation district downstream. After many years of conflict between pro-irrigation and anti-irrigation factions, the irrigation district still exists—though on a much-reduced

called, had no experience with reservoir fish or fishing. As a matter of fact, Kansas had yet to hire a fish biologist. Roy Schoonover became Kansas’ first fisheries biologist in January of 1949.

Stocking at Kanopolis began on April 7, 1948, with 10,000 crappies, 1,000 largemouth bass and 1,000 drum. Later in April an additional 3,000 crappies, 1,000 largemouths and 2,000 channel catfish were stocked. In May 6,000 bluegills and 2,000 channel catfish were stocked. All fish, except the channel catfish, were stocked as fingerlings. The catfish were probably “shorts” (eight- to 10-inch fish).

Kanopolis was truly an experiment in fisheries management. The results of this experiment were documented by a creel census conducted from 1950 through 1961. This census provides insight into fish population cycles, fish stocking, and the aging of a reservoir.

whether the channel catfish or even the crappie stocking had much influence on the early fishery. Both figured heavily in first creel data. Considering that there were no walleyes or white bass stocked, a tremendous largemouth bass fishery might have been expected to develop from the over 170,000 fingerlings that were stocked. Early documents note that by late summer of 1948 fishermen were catching 10-inch bass. The only information available from 1949 is personal communication with fishermen who remember bass fishing as “good” but “not spectacular.” During the census largemouth bass never exceeded more than five percent of the total catch by weight. Peak harvest of largemouths occurred in 1955 after walleyes and white bass had been introduced.

What factors might have prevented the largemouth bass from providing a significant fishery? One possibility was habitat. Kanopolis was clear-cut prior to filling. Very little vegetation of any kind was left in the lake bed. Even when new, Kanopolis lacked protected coves which would have provided optimum

bass habitat. Another factor was turbidity or muddiness. Even during its early years, water in Kanopolis was often turbid. Lack of forage may have figured in as well. No mention is made of gizzard shad in the records before 1957, though shad were probably in the reservoir long before this. If shad numbers were low, however, largemouth production might still have been impaired.

One other consideration was the fishermen. At the time Kanopolis was completed few anglers owned boats that were adequate for fishing a large body of water. Kansas fishermen in the late 40's and early 50's may not have been ready for largemouth bass. Though the creel census does not separate boat and shore fishermen, there is some indication that most of the angling was done from shore—and shoreline access was limited. A final consideration was that few anglers used artificial baits.

During 1950 and 1951 crappies were the most frequently caught fish, making up two-thirds and three-fourths of the total harvest respectively. Carp were dominant by weight, comprising 51 percent of the total in 1950 and 40 percent in 1951.

After record flood waters in 1951 subsided, the channel catfish population exploded. Small catfish were so abundant that the U.S. Army Corps of Engineers requested that the Kansas Forestry Fish and Game Commission remove some of them "to help fishing conditions." The Commission, through extensive seining efforts, removed 15,000 channel catfish in 1952, 34,000 in 1953 and 10,000 in 1954. Anyone who has ever dragged a seine full of fish or removed spiny little catfish from a net would take their hats off to the gentlemen who participated in this ambitious endeavor!

White bass were first stocked in April of 1951, when Roy Schoonover and hatchery manager Seth Way brought 230 seven- to 10-inch white bass back from Grand Lake in Oklahoma. Of these, 117 were stocked in Kanopolis Reservoir and 113 were stocked in Fall River Reservoir. Virtually all of the white bass in Kansas have come from these two stockings. The walleye program began in 1953 when 900,000 fry were stocked. In 1954, 500,000 more walleye fry were stocked, and in 1955 a final stocking of 1.2 million fry was made.

According to census data, success of anglers in fish caught per hour peaked at 2.6 in 1951, and success in pounds caught per hour peaked in 1952 at 1.25.

In 1952 channel catfish and carp comprised a high percentage of the weight of all fish caught.

By 1954 the crappie boom was over and channel catfish made up the greatest percentage of fish creeled by both number and weight. White bass and walleyes had shown up in small numbers during the 1953 creel census. In 1954 the walleye harvest was still insignificant, but white bass comprised about 10 percent of the total number of fish caught. By 1955 white bass were the most abundant species by number and weight in the census. White bass also dominated the weight category of the census from 1956 through 1959. In 1959 carp made up more than 40 percent of the number and over 60 percent of the weight of fish harvested by fishermen.

At this time some biologists were expressing concern over the booming carp population. According to the creel census, fishing pressure dropped while carp numbers increased. Because the lake was becoming more turbid as carp harvests soared, early biologists felt that the carp were responsible for the turbidity. In retrospect, siltation, bank erosion and vegetation loss in the lake were probably more responsible than the carp.

By 1958 the crappie population began to show signs of improvement. Another crappie boom took place during 1960 and 1961. By this time white bass had surpassed carp in both number and weight of fish harvested by anglers. Anglers from all over the state were coming to Kanopolis to fish in the Smoky Hill River above the reservoir during the spring spawning run.

White bass like this one were first stocked in Kanopolis in 1951. By 1975 they had eclipsed crappies as the most frequently-caught fish. Large harvests of two- and three-pound white bass occur at roughly three-year intervals.



What caused these early fluctuations in fish populations? Well, the early crappie and channel cat booms were typical of new reservoirs. The domination of carp in angler harvest during the mid 50s is a bit puzzling. Carp harvest had declined dramatically by 1960, and was never a major part of the total harvest again. Angling technique may partially explain the carp boom. Anglers of the day used natural baits, such as worms, which carp like. Since then the trend in fishing has been toward the use of artificial baits, which carp won't take. It is probable, too, that more anglers actually fished for carp than did during the years that followed.

Drought conditions from 1952 to 1957 may have had some effect on the crappie fishery, as the reservoir remained near or below conservation level. In mid 1957 the drought broke and the lake level rose 20 feet. By 1960 crappies comprised the biggest share of the catch. This improvement in crappie fishing may have been a response to the water level boost in 1957.

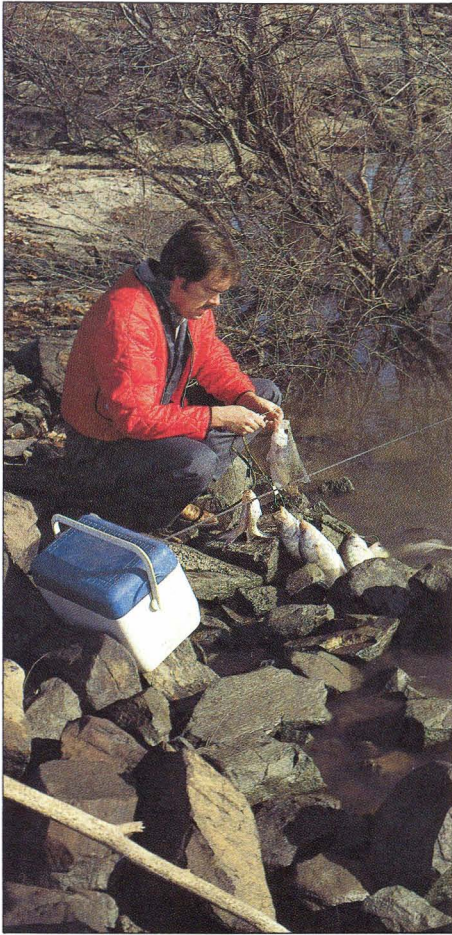
Little information is available about Kanopolis Reservoir during the 1960's. The creel census was discontinued and very little fish sampling was done. Another crappie boom probably occurred, white bass populations cycled up and down and the walleye population declined. Siltation was beginning to have a dramatic effect on Kanopolis Reservoir. The water was becoming more turbid and fishing success was declining.

A creel census was again conducted from 1974 through 1976. Crappie fishing proved very good in 1974; the little panfish comprised over 40 percent of the total harvest by weight and number. White bass and channel cats made up most of the remaining angler harvest.

In 1975 white bass replaced crappie as the most often caught species. Crappie harvest was still good and channel catfish harvest was the same as in 1974. Walleye success rates improved.

Fishing success in terms of fish caught per hour was better in 1975 than in any year on record (except 1951 during the first crappie boom). Harvest in pounds per hour was greater than during *any* previous census year. By this time Kanopolis Reservoir was in its 27th season, well past its expected prime.

In 1976 the white bass harvest climbed above that of 1975, but crappie and channel catfish harvests fell. Walleye take increased to over 10 percent of the total harvest—the best recorded walleye catch ever.



Ron Spomer photo

This fine stringer of crappies was filled off a rocky point—traditional and ideal crappie habitat. Minnows and small jigs both bring crappies to the hook.

From 1977 to 1984 the walleye population remained strong. Kanopolis is building a reputation for big walleyes because of the number of eight-pound and larger fish that are caught annually. The white bass population is still good, but has fluctuated in number and size of fish more than the walleye population. Every third or fourth year Kanopolis has a large population of two- and three-pound white bass. The most recent year for these large fish was 1983. Recent crappie cycles at Kanopolis haven't been nearly as dramatic as those in the 50's and 60's. Several of the past years have yielded excellent crappie catches. In 1983 the crappie harvest was tremendous, equaling *any* previous year in pounds caught per hour. Kanopolis crappies frequently reach two pounds, and one-pounders are common.

Why has fishing remained so good at Kanopolis Reservoir? By 1969 most of the reservoir's upper end above Horsethief Canyon was silted in. Huge mud

flats existed where water once was 15 feet deep. Boat ramps were unuseable. The water had become extremely turbid and fishing activity and success were declining. These reasons and others prompted the Corps of Engineers to raise the conservation level by four feet to "improve recreational use of the reservoir." This rise in the water level immediately improved both the water quality and fishing.

Heavy rains during the spring and fall of 1974 raised the lake level higher than during any year since 1951. Because flooding was statewide, the water was held long enough for flooded vegetation to decompose and enrich the water. The higher water and flooded vegetation provided excellent conditions for white bass, crappie, and gizzard shad production. The fine crappie and white bass fishing during 1975 and 1976 was probably a result of the high waters in 1973 and 1974.

In 1975 a water level management plan for the enhancement of fish and wildlife was developed for Kanopolis Reservoir. The Kansas Fish and Game Commission called for over a four-foot rise in water levels during the spring to flood shoreline vegetation. A summer drawdown was requested to allow revegetation of the shoreline. Fall rains were to be held to attract waterfowl. The plan was adopted in 1975 through a cooperative agreement between the Kansas Fish and Game Commission, the U.S. Corps of Engineers, the Kansas Park Authority, and the Kansas Water Resources Board. It is still in effect today. Fish populations have responded favorably, with the most notable increase evident in the walleye populations. White bass have also increased significantly, while crappie cycles have been less extreme.

Estimates of turbidity using a secchi disc were made at Kanopolis from 1957 through 1969. A secchi disc is an eight-inch weighted disc on which alternating quadrants are painted black and white. The disc is lowered by a string into the water until it disappears. The disc is then lifted until it can be seen and that depth is measured. This is a standard method for measuring water clarity. Readings at the reservoir ranged from seven to 16 inches, averaging less than 10.

In 1969 after the conservation level was raised, secchi disc readings ranged from 15 to 26 inches, and averaged 22. This improvement in the water clarity was due to increased water depth,

which lessened the effects of wind in causing turbidity. From 1975 through 1983 secchi disc readings have ranged from 13 to 52 inches, with a 32-inch average.

During the winter of 1982 the water level was lowered nine feet below conservation pool so that rip-rap could be replaced on parts of the dam. The water level did not reach conservation level again until April of 1984. By May the total increase in lake level was almost 14 feet, bringing it to four feet above conservation level. Over 2,400 additional acres were flooded, of which 1,675 acres had some type of vegetation growing on them. This increased the fertility of the lake and improved fish growth and water clarity.

Secchi disc measurements in 1984 ranged from 36 to 54 inches, for a 42-inch average. Even during high winds the water has remained clear except over shallow mud flats. Summer shoreline seining has indicated high production of minnows, gizzard shad and white bass. White bass fishing early in 1984 was good, though crappie and walleye fishing dipped below average. Summer fishing was slow except for occasional periods of good white bass fishing. The tremendous increase in water surface area and volume may have hampered fishing success. Increased habitat in flooded vegetation and the abundant forage available to gamefish also contributed to fishing success.

In 1983, 2.9 million walleye fry were stocked. Sampling has indicated excellent survival. With the abundant forage available, walleyes should continue to grow rapidly and be large enough for the creel in 1985. Present conditions should stimulate good growth and survival of the healthy 1984 year-class of white bass. These fish could reach catchable size by late 1985.

What can we expect at Kanopolis in years to come? That depends. Western Kansas streams are in trouble. Flows are becoming less and less reliable. This is due in part to land-use practices which have reduced the rate of siltation, but which have also reduced runoff and river flow. Irrigation from the river or from wells in the alluvium, and commercial and urban use of water also affect river flow. The future of Kanopolis Reservoir, like that of other reservoirs, hinges on the demands that we users place on the feeder drainages, the aquifer and the reservoir itself.

Reservoirs need not "die." Kanopolis can fulfill its purpose as a multiple-use facility for years to come. Its destiny will not be determined by the fish biologists that manage life within its water, but by public support of wise or wasteful water policies. □

Now is the time to grab that rod and head for the water. Hungry channel catfish are waiting!



Early Spring Cats

Ron Martini



Gene Brehm photo

fish. If you chum around with some of these fellows, you may have noticed that each year in late February and March they can often be caught in the act of changing lines, lubricating reels and restocking tackle boxes — the sort of things most of us don't get around to until April or May.

A few weeks later, while the rest of us are reading magazine articles about fishing and counting the days until the crappie start biting, these guys are out on the water. And they're not just fishing; they're catching fish! What they know that many of us apparently don't is that catfish can be caught very early in the spring. As a friend of mine who lives and breathes catfish puts it, "As soon as the ice goes off the lake, it's time to go after channels."

There are at least two things for which you must prepare to be a successful spring catfish angler. The first is changeable weather. Anyone who has spent any time in Kansas can tell you just how unpredictable our spring weather can be. A day that begins with blue skies and warm breezes may end with snow and 40-mile-an-hour north winds. As a fisherman, you must be prepared for whatever Mother Nature dishes out.

You'll also need to cater to the gastronomic whims of your quarry. While catfish can be caught on everything from worms to dog food during most of the year, spring cats seem to prefer things that have been dead since the French Revolution. One catfisherman told me, "You can use whatever you want for bait. But if you want to catch anything, use shad sides — good stuff if you can find it." Since all the shad sides I've ever been near could bring an elephant to its knees at fifty paces, I had to ask the obvious question: "How do you know if it's the good stuff?"

"Well, you sure can't go by the smell, because it all smells terrible! The best way to judge shad sides is by the firmness of the flesh. If it's mushy and flies off the hook when you're casting, it probably isn't the good stuff." He added that you can use any shad sides you have left over from the previous year, as long as they've been kept refrigerated.

Maybe your wife is more understanding, but mine has already informed me that I can store my leftover bait in someone else's refrigerator.

This still wasn't enough information

to make me feel confident about catching a limit of catfish. So, since my reputation as an angler was already shot, I asked my catfishing friend: "What are the best areas of a lake to fish?"

"You don't want to fish in the deepest hole in the lake," he confided. "Most of the catfish I hook in the spring are taken in two or three feet of water. I like to fish near weed beds and old logs and log jams. A windy day is better than a calm one. On those days I fish along a wind-swept shoreline where the waves have the mud riled up. I just cast to the outside of the muddy water. The catfish are in there feeding on whatever the waves churn up."

My amigo paused, as if uncertain whether to continue. "If there's a good runoff from a snow melt or an early rain, I fish right at the mouth of the creeks. Those channel cats are lying where the creek flows into the lake, waiting for their food to wash to them."

There is some disagreement as to how to set the hook in a catfish. Most anglers set as soon as they feel a nibble, but my friend insists that he has better luck by fishing with a slack line and letting the fish run eight or ten feet before setting the hook. "If he takes it that far," he said, "you know he really has it and isn't just foolin' around." I guess I'll try both methods and see which works best for me.

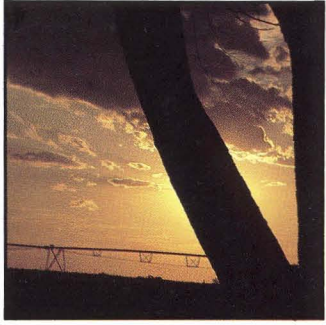
One thing any cat angler will tell you is that if you don't get a bite at a spot in about an hour, it's time to move. There just isn't any sense in wasting your time at a place that looks good but isn't producing bites.

Once you've found an area where the catfish *are* biting, be alert. If you're used to fishing for catfish in the summer, you'll probably be expecting strikes that snatch the rod right out of your hands. That's not the way these fish bite in spring. During this time of the year they approach bait much more timidly, often pecking at it for awhile before they run with it.

Summer tackle will work for spring cats. In fact, greenup is a good time to work the kinks out of Christmas reels, new line and winter-stiff cranking muscles. By the time your friends are ready to go after summer cats, crappies, bass or walleye, you'll have had valuable practice on spring catfish.

Just remember to stay unwound of those shad sides. □

Talked to any die-hard catfish anglers lately? You know the ones I'm talking about — the guys who won't walk across the road for all the five-pound bass in Kansas, but who'll fish all day for a few "eatin' size" cat-



Wayne van Zwooll photo

When Water Won't Flow

Ken Brunson



The season was restless, and he knew it. The long summer drought had scorched the grasslands, and the rider sniffed the crisp breeze in a gesture of solemn approval. As his horse drank from the swirling eddy, whistling pinions heralded a small flock of puddle ducks streaking for a quiet pool just downstream. The Kiowa trained his eyes on the long sleek neck and sword-like tailfeather of a pintail drake. The pool erupted as the small flock took flight again, having sensed the danger of strange company. The Indian turned his mount and headed for the undulating hills to the north. Soon great herds of bison would assail the valley and feast on the lush growth in the wetlands.

Generations of men and pintails have

met at this loop of Rattlesnake Creek, a small prairie stream in central Kansas. Having weathered the effects of drought and other environmental stress for thousands of years, its once dependable flow is finally yielding to new pressures. Rattlesnake Creek is drying up.

The underground aquifer that has nourished Rattlesnake Creek since the Ice Age is slowly being depleted. This immense reservoir underlies a general area known geologically as the Great Bend Prairie, which encompasses about 5,400 square miles south of the Arkansas River in southcentral Kansas. A 1978 Kansas Geological Survey report estimated that this formation held about 45 million acre-feet of water — enough to fill Milford Lake, our state's largest sur-

stream from the Highway 281 bridge north of St. John.

Because of this water quality problem, much of the irrigation centers in the western reaches of Rattlesnake Creek. Historically, summer flows have been poor in the headwaters south of the Kiowa/Edwards county line. Here, though, the stream begins showing good riparian character. Cottonwoods and willows hold bank contours in check while providing a source of food and fill materials for several beaver colonies. As the creek courses an easy gradient to the northeast, its banks narrow and deeper pools appear. The scenery, too, changes as the water moves through several miles of sand hummocks. Little Bluestem, switch and sand dropseed grasses

The cracked earth of dry streambeds lacks the sparkle of water in the sun. In the arteries of western Kansas death is waiting to happen.

face reservoir, over one hundred times. The aquifer measures up to 280 feet thick and occurs near the land surface in its northern boundaries. Even though 40 percent of the aquifer is considered unusable due to high salinity or other problems, the remainder is being used to triple grain production through circle irrigation.

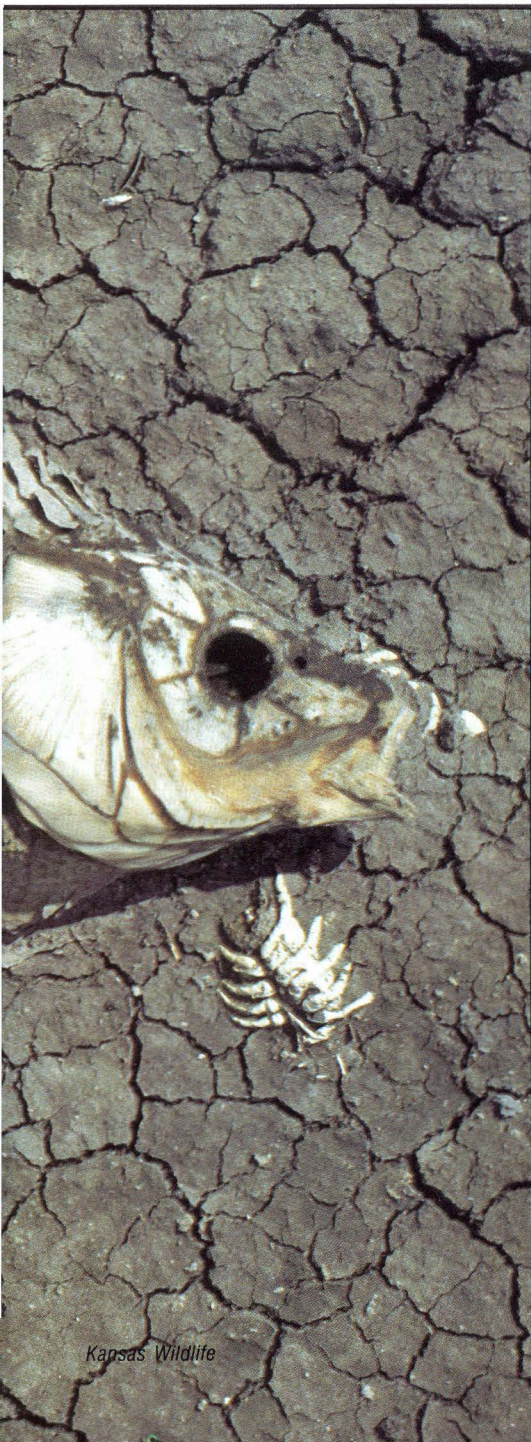
In 1940, thirty years before the proliferation of center pivot systems, there were only 50 irrigation wells in the entire Great Bend Prairie region. Now there are about 4,700. Wells for municipalities and domestic households also exist, but they make up a small part of the total groundwater use in the Rattlesnake Creek drainage.

Quality of the groundwater changes dramatically from west to east. As the water moves through mineral formations toward the eastern half of the basin, it emerges from streambed and banks exhibiting very high levels of salt concentrations in the form of chlorides. The boundary between good flowing water and brackish water is sharply divided at a point about a mile down-

stream along its serpentine course. There is good habitat for coyotes and lesser prairie chickens. In Stafford County south of Macksville, denser tree stands, grassland, grain crops and the water create an attractive and diverse environment. The wildlife here includes whitetail deer, bobwhite quail, ring-necked pheasants, raccoons, mink, channel catfish, Arkansas darters and Rio-grande turkeys.

People who have hunted and fished Rattlesnake Creek know its treasures well. Photographer Gene Brehm, whose work graces the pages of KANSAS WILDLIFE, is a frequent visitor to the stream. "I can think of no area in the state that has a greater variety of wildlife. Deer, turkey, upland game, late-season waterfowl — you name it, it's there. Without reservation, I rate it as my number one spot to photograph Kansas wildlife."

While many things have caused population changes in the wildlife along Rattlesnake Creek, the water itself has been a stabilizing influence — at least

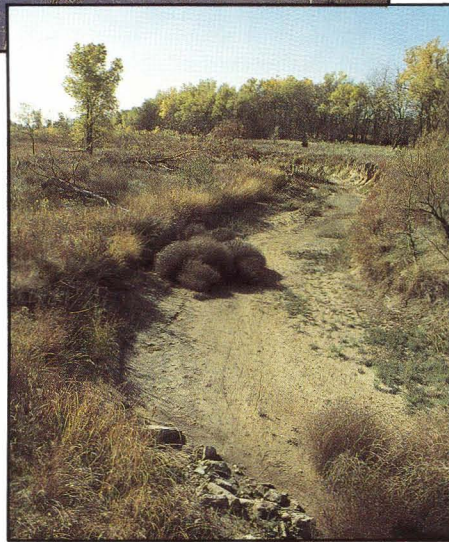


Gene Brehm photo



Gene Brehm photos

Rattlesnake Creek is as beautiful as well as a productive watercourse — when there's water in it. Dry, it becomes a desert for wildlife and meets none of man's needs. Tumbleweeds belong elsewhere.



until recently. The United States Geological Survey gaging station eight miles southeast of Macksville recorded no days of zero flow from 1960 through 1981. However, the past three years have seen periods of zero or near zero flows at this site.

Tom Hart was born in a two-room shanty on the banks of Rattlesnake Creek. He recalls the last time it was dry in this reach — 1915 or thereabouts. He relates: “All the blue racers were under the bridge. It was that hot. But the creek’s drier now than I’ve ever seen it. Used to be a lot of springs, but since there’s been so much irrigation, as soon as the wells start pumping, the creek starts to go down.”

Edna Suiter spent her first 20 years on the Creek. Her grandfather homesteaded a claim on its banks over a hundred years ago. Edna remembers that early drought at a time when the country’s attention was directed toward bigger problems an ocean away. She vividly recounts wildlife experiences: “There used to be lots of trapping and fishing. I remember ducks galore as a child. Dad once shot straight up and the ducks came falling. With one shot, he kept us kids busy for a long time picking up ducks. Dad had a special fishing technique, too. He’d have us kids walk on the ice and scare them down to a hole he had chopped. Then he hooked them with a special fish-getter. We never took more than we could use, though.”

These and other local folks recall an excellent fishery on the Rattlesnake. Sections of the water course had much to offer in the form of constant flow, deep pools, and good water quality — even through some major droughts in the 30’s and 50’s. Don Waters is a younger native of the area. He relates

the condition of the fishery in more recent years: “Through the 50’s, Rattlesnake Creek was one of the better channel catfish streams around. It wasn’t unusual at all to go down to the creek and catch a mess of 18- to 20-inch channels. Now, about all you’ll find are a few bullheads and some of the other fish tolerant of low water conditions.”

The reach of stream immediately above St. John has been especially susceptible to fluctuations in flow. In recent years, though, the trend has been towards more frequent and longer dry periods. I’ve sampled several sections of this stream over the past four years, and the fishery in this area has shown a constant deterioration. Each annual seining evidenced poorer fish populations. The first of my assessments produced many one- and two-pound channel catfish, along with carp, goldfish, a few flatheads, bullheads, sunfish, and an excellent forage population of minnows. By late summer each year this reach of the Rattlesnake dwindled to refuge pools that would eventually dry up. Later in the fall, water would again appear in the stream channel, but not in time to bring skeletons to life. Last year’s sampling yielded only minnows and young carp and goldfish. It is diffi-

cult to prescribe just the right water volume needed for a viable fishery. But all fish need *some* water all of the time.

Below St. John and Highway 281, the creek meanders through shortgrass pastures. With the groundwater being highly mineralized in this area, there are fewer irrigation wells. There are diversions of water from the stream, though. Some of the earliest water use on Rattlesnake Creek was for small duck hunting leases that had vested water rights preceding 1920.

But the biggest waterfowl haven on the stream now is not primarily for hunting. Quivira National Wildlife Refuge encompasses nearly 22,000 acres. When it’s full, about 4,700 acres of marsh and open water provide living accommodations for thousands of migratory birds. Operated by the United States Fish and Wildlife Service, Quivira lies in an ancient salt marsh basin. The area is divided into two main pools: the Little and the Big Salt Marshes. Combined with state-managed Cheyenne Bottoms 30 miles to the north, Quivira represents a major stop-over point in the central flyway. The fall migration may see as many as 100,000 mallards alone using the refuge. Many will stay all winter. Come spring, Quivira becomes a staging area for up to half a million waterfowl, with over 40,000 Canada geese on the refuge at one time.

The refuge also provides home and habitat to many other animals and birds. A bird watcher’s list for the area totals 267 species. The refuge is critical habitat for the nationally endangered whooping crane, while two other endangered species, the bald eagle and peregrine falcon, also use the refuge in the winter. The least tern, a state threatened species, relies on the open mud and sand flats for nesting.

Birds have historically found refuge at Quivira, even before the Fish and Wildlife Service began managing it in 1955. The two marshes were even used extensively for commercial waterfowl hunting soon after the turn of the century. Later private gun clubs assumed stewardship. Originally, neither the Little Salt Marsh nor the Big Salt Marsh received direct drainage from Rattlesnake Creek, so to enhance the water supply gun clubs dug a connecting canal to the smaller unit.

Although the water right for Quivira allows the Fish and Wildlife Service to divert as much as 22,000 acre-feet of water a year into the two marshes from Rattlesnake Creek, they have rarely taken over 5,000 in a given year. For various reasons, including lack of flow

in the stream available for diversion, the 1984 take amounted to only 2,000 acre-feet. Jim McCollum recently assumed the position of refuge manager for Quivira and is already looking into ways to more efficiently use water that may make itself available to the marshes. According to Jim, efforts will be made to take better advantage of spring flows down the Creek. They'll be stored in an enlarged Little Salt Marsh. This reserve will be used later in the year to flood parts of the big marsh and other smaller units for waterfowl in the fall.

Jim is acutely aware of the bleak water supply outlook and the importance of Rattlesnake Creek to those millions of birds. "Rattlesnake Creek is the lifeblood of the refuge. Our major water needs run from August through October. Obviously, if Rattlesnake Creek is dry

during that period, our management abilities are seriously affected. Few of our smaller prairie streams are more critical to so many wildlife populations."

The Rattlesnake is hard to find as it somehow dissolves through Quivira. It reappears, though, on the north side for a short journey to Salt Creek, which drains the Big Salt Marsh. Salt Creek joins the Arkansas River near Alden in Rice County.

A drastic decline in the quality of local channel catfishing in the late 1960s prompted the Kansas Forestry, Fish and Game Commission to research the stream to find answers. The study found wide variations in fish numbers at different sampling sites throughout Stafford County. It was concluded that there was still a good population of fish throughout the reach, but one that showed typical symptoms of crowding and extreme competition for food and space. The drought extending from 1964 to 1967 had a major impact on flows. These drought symptoms were amplified by increasing demands for irrigation water.

Many of the people worried about Rattlesnake Creek are landowners who irrigate from the contributing aquifer. Gary Stimatze is principally a dryland farmer in the dune country south of Macksville. His one irrigated quarter has recently been in wheat. Gary intends to convert it to alfalfa next year. As he puts it: "Alfalfa will use less water than wheat — and much less than corn. I'm sure it's the irrigation that's drying this creek up. In spring, it's flowing fine; come irrigation season it starts going down. When most of the pumps are shut off, it starts to come back. It makes me sick to look at the creek now and remember what it was like 30 years ago. Just north of my house it was actually dry this year — the first time it's been dry in this reach in 50 years."

Don Vossberg is somewhat of a late-comer to the area, only being here about 20 years; but he is one of the folks who grows irrigated corn and milo. Don's reaction to the problem is very typical, "I don't blame it all on the irrigation. Colorado is taking some of the water that used to come down the Arkansas

Wintering waterfowl use the Rattlesnake drainage intensively. As many as 200,000 ducks may congregate on ice-free water in January. This swarm of mallards beats that precious water to a froth as each bird fights for air space. Ducks, though, don't deplete flows.



River. There could be some relationship between the aquifers of Rattlesnake Creek and the Ark. Irrigation does suck it down, but when the trees lose their leaves, it comes back.”

Vossberg is not the only person to implicate Colorado in depleting the Arkansas River. But can Rattlesnake Creek, which doesn't have a direct surface drainage link to Colorado, be in trouble also because our neighboring state is holding back water in the Arkansas River? Hydrologists agree that the Great Bend Prairie aquifer may have some hydrologic connection to the much larger Ogalala formation and the Arkansas River alluvium to the west. Tom McClain of the Kansas Geological Survey maintains that less flow down the Arkansas River may be having some small impact on flows in Rattlesnake Creek through the interaction of their respective aquifers. He states, however, that: “In perspective, the major reason that flows are declining in Rattlesnake Creek is local irrigation, and not Colorado.”

the Republican River of northcentral Kansas is enlightening. The cottonwood/willow association along the Republican is much more extensive than the tree belts flanking Rattlesnake Creek. Fader reported the yearly water use for trees on a reach of the Republican River was less than half an inch over the aquifer.

The Bureau of Reclamation recently completed a special report on water supplies in the Solomon River Basin of northwest and northcentral Kansas. In it they conclude that “The change in phreatophyte (tree) concentration has not been a significant factor in the changed surface water supply.” This was in response to questions concerning reduced streamflows into Kirwin and Webster reservoirs. The question with tree usage is not whether they use much water, but how much in relation to all the other uses. In a region where the average yearly decline of the water table is almost half a foot, it's doubtful that the less than half an inch use by tree corridors is a major contributor to the problem.

The Chief Engineer of the Division of Water Resources on the State Board of Agriculture has had the power to grant water rights since 1945. He must decide if new water rights are in the “public interest.” He has considerable latitude in judging what the public interest really is — short term economic gains or extended use of declining water supplies with considerations for environmental and fish and wildlife resources. Obviously, if there has not been much public interest expressed in protecting base flows, there's little chance of seeing additional water rights denied in order to preserve streams like Rattlesnake Creek.

Some public interest was generated in 1972 with the establishment of groundwater management districts. Rattlesnake Creek is in one — Big Bend Groundwater Management District #5. District #5 has consciously tried to conserve precious groundwater. It was one of the first districts out of five in the state to enact a “safe yield” policy. Put simply, given an average of nine inches of estimated natural recharge to the aquifer per year, future water rights would be limited so as to not exceed that amount of withdrawal. Under this regime, the water table could approach stabilization.

But water levels continue to show declines. Over the whole district, which encompasses about two and a half million acres, the average decline for the past ten years has been about five inches per year. Even if the aquifer were stabilized, the original safe yield policy probably would not help base flows. Ralph Davis, manager of District #5, explains that “At the time the policy was enacted, base flows of the stream were not incorporated into the predictions, and even strict adherence to the nine inches withdrawal and recharge rule would still have affected base flows in Rattlesnake Creek. We're trying to get a better handle on groundwater recharge and surface water relationships. Right now we're doing a pilot recharge project on the Pawnee River, routine water quality and groundwater elevation measurements, a rather complicated recharge rate study in several areas of the district, and a cooperative investigation with the Kansas Fish and Game Commission and the Kansas Geological Survey along the South Fork of the Ninnescah River to determine actual relationships between groundwater pumping and base flows. Similar work is planned for Rattlesnake Creek.”

Late last November, the board members of District #5 made a very tough decision: They cut their own safe yield policy in half. The new policy will allow very little additional well development



Ron Spomer photo

The Arkansas darter is a threatened species in this state. Rattlesnake Creek holds a significant portion of the western Kansas darter population.

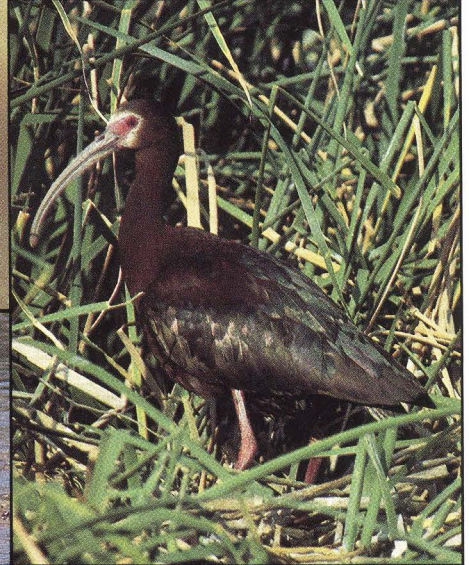
The possible effect of trees in depleting flows has also been mentioned. Trees *do* need water, and some of the larger cottonwoods along Rattlesnake Creek use copious amounts, particularly during late summer when the rest of the land and people are thirsting for all they can get. There are more trees along Rattlesnake Creek now than prior to the major irrigation developments in the area. Just how much impact do the trees have on base stream flows? A report by Fader of the Kansas Geological Survey on

Practices such as terracing and pond construction have been shown to reduce runoff and therefore affect streamflow — particularly in watersheds exhibiting less groundwater recharge than the Great Bend Prairie. Also, a review of precipitation patterns in this area of the state reveals fairly normal yearly rainfall amounts in recent years, but drier than normal summers. The real issue though is not one of ferreting out additional scapegoats for local water problems. Rather, it involves a conscious decision to refine current groundwater use regulations and water right issuance so that base flows are protected.

Ultimately, the State of Kansas decides how much water to appropriate.



Many Kansas creatures live along Rattlesnake Creek and in the wetlands of Quivira National Wildlife Refuge. Clockwise from top: muskrat, channel catfish, bullfrog, white-faced ibis, red fox, green heron, whitetail deer, American bittern, coot, greater yellow-legs. Good wetland habitat is vital to these creatures. It is easy to destroy, very difficult to restore.



Gene Brehm photos (catfish by Ken Stiebben)



"Where's the water?" This black-necked stilt seems perplexed. Those long legs were made for wading!

ening to the problem. Environmental groups are rallying to protect our streams from a flowless future. This support was instrumental in protecting four rivers — the Neosho, Cottonwood, Marais des Cygnes and Little Arkansas — included in the first section of the 1984 State Water Plan.

The Kansas legislature is right now considering streamflow minimums proposed by the Kansas Water Office. Current recommended minimum streamflows for Rattlesnake Creek are very small — reflective of existing conditions. However, these flows may be sufficient to maintain viable wildlife populations and limited fisheries. Endorsement of these flows will signal a true public commitment in protecting some of Kansas' finest natural resources. Other streams are in trouble, and the fate of Rattlesnake Creek will be watched closely by conservationists.

Residents in the Rattlesnake drainage have a voice in determining the fate of this stream, but the presence of state-owned fish and wildlife resources, state and federal threatened and endangered species and a major central flyway marsh elevate the geographic scope of concern. The Rattlesnake Creek issue is much larger than it may appear. At stake is our ability to show responsible natural resource management. Similar issues were discussed last fall in Great Bend, at a conference dealing with the fate of Cheyenne Bottoms. In a moving keynote address, Lynn Greenwalt, past Director of the U.S. Fish and Wildlife Service, summed up the significance of our actions well: "Nothing is of more profound importance than our ability to reach into the future and grasp something of real value to give our children".

Gene Brehm photo

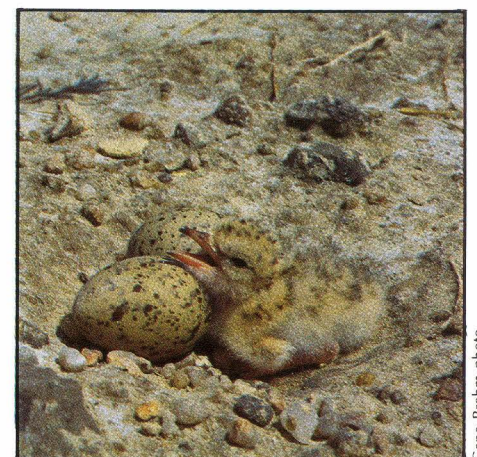
in the western part of the district, since most of this area already exceeds the new policy criteria. The vote was not unanimous; nor was it instantaneous. The board had to consider the general trend of water level declines along with recent information that predicted trouble for the South Fork of the Ninnescah River. No one is certain if this action is sufficient to help Rattlesnake Creek or the other streams in the district. It definitely represents a desire to halt water depletion in the Great Bend Prairie.

Real solutions to depletion of streams like Rattlesnake Creek are the responsibility of all water users. Without measurable support for protection of base flows in Rattlesnake Creek, it is difficult to change water use in the face of economic arguments. Larry Panning emphasizes these economic considerations and points to the positive influences of irrigation in the Great Bend Prairie. Larry has a key role in determining the fate of Rattlesnake Creek, since he serves on the board of District #5, is a member of the Kansas

Water Authority (the principle water policy-setting agency in Kansas) and maintains an irrigation program on corn. "Agriculture contributes to wildlife in Kansas with increased production of forage crops," he says. "Prior to 1965, when pivots really started taking off, we didn't have a deer or turkey season. I give the Fish and Game Commission — and sportsmen — credit for bringing these animals back. But credit is due landowners, too, for increasing the amount of food available for wildlife. There is much better goose hunting than prior to 1965 because of higher current corn production. From an agricultural viewpoint, farmers had a big part in boosting wildlife populations."

Few issues in Kansas generate more heated debate than water problems. The demise of our western Kansas streams and their fish and wildlife resources have not dominated front pages, but there does appear to be a belated awak-

The endangered least tern is a resident at Quivira National Wildlife refuge. This chick will have a tough time surviving, though, if its parents must travel long distances to water, leaving eggs and young attended.



Gene Brehm photo

the center section

Edited by Rob Manes

LETTERS

WHY IS IT?

Editor:

First of all, I would like to thank you for your fine magazine, which my family and I really enjoy. I would also like to thank the Kansas Fish and Game Commission for all the fine work they have done . . .

My only complaint is that they do not allow large caliber handguns to be used on big game . . .

William B. Smithson
Delavan, KS

Dear Mr. Smithson:

The Kansas Fish and Game Commission recently adopted a regulation to allow the use of handguns for deer and antelope hunting during the regular firearms season, beginning this year. In order to be legal, a handgun must use a cartridge with a case length of at least 1.28 inches and a bullet larger than .23 caliber. *Manes*

Editor:

Why is it that black powder hunters can't have a week of deer hunting separate from that of the regular firearms season?

Stan Smith
Lamed, KS

Dear Mr. Smith:

Since most Kansas hunting takes place on private land, the Kansas Fish and Game Commission must be sensitive to the desires of farmers and ranchers. The creation of another hunting season is apt to stretch some landowners' tolerance for hunters. This obviously would not be in the best interest of sportsmen.

The success rate of Kansas black powder deer hunters is not greatly different from that of regular firearms hunters. This indicates that those who hunt with primitive firearms do not need a special season to enhance their prospects of taking deer.

Nearly everyone who applies for a black powder permit is granted one. If a special

season was set aside, it would make the sport attractive to a greater number of people, increasing competition for the available permits. So, a special season might not be in the best interest of black powder hunters.

Further, the demand for such a season has been insufficient to permit establishing one at the risk of inviting deer hunters of other preferences (shotgun, handgun, etc.) to seek their own special hunting slot. *Manes*

Editor:

. . . a friend of mine and I were fishing off a railroad bridge on the Ninescah River . . . a young farmer . . . ordered us to get off his property . . . we didn't move . . . he left us and returned with his daddy, who was nice and ordered us off again . . . who's right?

Pete Dominguez
Wichita, KS

Dear Mr. Dominguez:

The farmer is right. Roadways, railroads, and their bridges are built on right-of-way easements which are purchased from landowners. These agreements only allow construction of the transportation facility across private property. They do not transfer ownership of the property to the county, railroad company, or other involved party. So, the land beneath a bridge is still private property. Therefore, per-

sons who wish to hunt or fish from public roadways and bridges must have permission from adjoining landowners. *Manes*

Editor:

. . . we used to have jack rabbits by the hundreds, but I haven't seen one for 10 years. Could you tell me where I could get about three pairs I could turn loose? I have grandchildren over 20 years old who have never seen a jack rabbit . . .

W.J. Wiggins
Madison, KS

Dear Mr. Wiggins:

Jack rabbit populations have been increasing in recent years across much of their major western Kansas range; but, as you implied, their numbers are far below those that made jacks an agricultural pest around the turn of the century. Particularly in southwest Kansas, jack rabbits have made a substantial comeback and are even considered pests in some areas.

The reasons for the jack rabbit's decline are many and perhaps not fully understood; but some of the key ones probably include destruction of native prairie habitat, natural population fluctuation, and adverse weather patterns during the breeding season. Recent increases in their numbers have been attributed by some to the prevalence of drier springs in recent years.

You might obtain rabbits by live-trapping them in southwest Kansas, where farmers would likely be happy to see them go; but the chance of success in re-establishing a viable population through such a stocking program is slight. If you wish to trap some to show your grandchildren, all you are required to have is a hunting license. *Manes*



Editor:

Your small game license is too expensive, my brother and I will not be hunting anymore in Kansas . . .

M.R. Utter
Evergreen, CO

RESPONSIBILITY

Editor:

For years, I was a strong anti-hunter, but through exposure to hunting, I found myself picking up the hunting bug. In December, 1983, I harvested my first deer. I've been asked many times how I could kill such a "beautiful creature" with "those big, brown eyes." My response to those questions has been to inform these people of the deer management program in Kansas. The game biologists carefully monitor the deer population and regulate it through annual deer hunting seasons. If these beautiful creatures were not harvested, they would soon overpopulate and harass farmers to an even greater degree through crop damage . . . I prefer to share in the responsibility of a healthy, thriving deer herd . . .

As for the rising cost of a deer permit, \$30.00 is a small price to pay . . .

Debbie Schmidt
Pratt, KS

Editor:

I want to take this time to commend your department on the break-up of the deer poaching ring in southeast Kansas and northern Oklahoma.

Please keep up this great work and prosecute these vicious, ignorant people . . .

M. Robinson
Wichita, KS

Editor:

My 13-year-old son has been receiving your magazine for a couple of years. He loves to hunt and fish, and we all enjoy KANSAS WILDLIFE.

. . . we found out that in some other states bowhunters must pass an accuracy test before they can get a permit. Bowhunters themselves have told me that just about anyone can get a bow permit in Kansas. It is difficult to explain to a young hunter that many adults do not respect the law or take the responsibility that must go along with the term "hunter." What would it take to get a law making ac-

curacy in bow hunting and tracking a wounded deer a requirement for receiving a hunting permit?

K. Robinson
Ellinwood, KS

Dear Ms. Robinson:

Archers in general are very responsible hunters, and in fact have developed several programs among their ranks to educate young bowhunters. The Kansas Bowhunters Association has such a program.

The Hunter Safety Program under the Kansas Fish and Game Commission currently contains a short section which deals with bowhunting. The educational materials are being revised to contain a major section on archery hunting, which will include instruction about tracking game and caring for meat in the field. The Hunter Safety Course must be taken by all Kansas youngsters before they go hunting, so the inclusion of an archery section in the course materials will help ensure their exposure to proper and ethical conduct when taking game with a bow. *Manes*

STAMP OF APPROVAL

Editor:

. . . you have a superb magazine, which . . . the entire family enjoys. I have hunted and trapped in Kansas for more than 60 years, and your organization is doing a great job.

A.R. Wells
Lawrence, KS

Editor:

I moved to Kansas in 1979 and I have found the fishing to be great. Although I don't hunt, I have several friends who do, and they all speak highly of your management programs. When I read the letters each month from the few people who are not satisfied with Kansas' fishing or hunting programs, I can only think that these people should take the time to check other states and see how much the people pay for a lot less opportunity to fish and hunt. As for myself, Kansas has it all when it comes to great fishing. As for your magazine, who could find a magazine with any better pictures and quality articles for the subscription rate.

Bill Hersh
Shawnee, KS

Editor:

. . . thank you for portraying coonhunting in a positive light. It was long overdue. Please

keep up the good work. Kansas coonhunters are the state's foremost conservationists. The fees they pay for permits constitute the major financial support for research, to acquire and manage habitat, and protect the species.

Mike Maugans
Sedgwick, KS
Redbook editor,
American Redbone Coonhound Association

GOOD FOLKS

Editor:

Just a note to let you know how very much I enjoy quail hunting in Kansas . . . The quail population goes up and down with the seasons, but the people are always warm and friendly.

Edward B. Hayes
Shelbyville, KY

Editor:

Having just returned from my vacation in Kansas . . . I found the quail to be down (in number) . . . Anyway, we had a nice vacation, ate lots of good food, and met plenty of good people — and that's what a hunt is all about. . .

Everett L. Patrick
Clearwater, FL

BIG DEAL

Editor:

I thought you would be interested in (knowing) how "tough" our Harvey County judge is on game violators . . . fined \$50 plus \$25 court costs . . . for killing two deer on one permit. His license was revoked . . .

Jim Janzen
Hesston, KS

EDITOR'S NOTE

We receive many letters from readers with questions of interest to our subscribers. It is our policy to reply to these letters in KANSAS WILDLIFE whenever possible — but it is also our policy not to print anonymous letters. For this reason, many good questions must go unanswered. If you would like to have an editorial letter printed in this publication, please include your name and the town in which you live. *Manes*

THE LAW

CIVIC DUTY

Because there are so few game protectors in Kansas, wildlife law enforcement officials must rely on concerned citizens to help them keep tabs on violators. One such citizen helped to catch three deer poachers in less than one month — just by making an anonymous phone call.

An Operation Game Thief call was teletyped through the Montgomery County sheriff's office to Kansas game protectors Dennis Knuth and Gene McCauley. The caller said a man who lived near Coffeyville had poached 10 to 12 deer that fall in 1984, and three or four of the deer were still in his freezer.

When Knuth and McCauley went to interview the suspect at his home, he gave consent for a search, which uncovered 65 packages of

involved in another deer shooting two days earlier.

When Knuth and fellow officers Harley McDaniel and Doug Blex visited the suspect at his home, he admitted there was a deer hanging in his garage. He also signed a consent to search his residence. In addition to the illegal deer, the officers found a telephone generator rigged to shock fish, a .22 rifle fitted with a silencer, and a stolen gun.

The man admitted the telephone generator's purpose, and all the evidence was seized. He paid fines and court costs totalling \$325 for the wildlife violations. The matter of the stolen gun and the silencer is still pending. *G.P. Knuth*

TWO POACH '42

Two men from Big Piney, Wyoming were fined \$5,000 each for poaching 42 deer last winter. Their one-year jail sentence was reduced to probation — ten years worth, during which they won't be allowed to hunt or fish in Wyoming. Any wildlife convictions while they are on probation could send them to jail for the full sentence. *Wyoming Game and Fish Dept.*

BIG TIME

Three members of a poaching ring found out that big-time violations can bring big-time penalties. One of the poachers, a Battle Creek, Michigan man, was ordered to spend a year in jail and pay \$24,800 in fines and restitution for his part in a commercial hunting scheme, which included illegal shooting of antelope and buffalo. He was also ordered to do eight hours of volunteer work per week at a wildlife refuge for two years.

Another member of the ring was an established hunting guide from Meeker, Colorado. He was sentenced to three months in prison and ordered to pay \$26,000 in fines and restitution for guiding an illegal desert bighorn sheep hunt. The judge also ordered him to perform 500 hours of public service work and prohibited him from guiding anywhere in the United States.

The third poacher, also from Meeker, Colorado, was convicted of felony destruction of trophy-class big game. He was sentenced to 20 days in jail and two years of probation. He also paid about \$3,000 in fines and restitution.

The charges stemmed from a two-year undercover investigation by Colorado and U.S. Fish and Wildlife Service agents. All three men were sentenced by federal judges under the Lacey Act, which prohibits interstate transportation of illegal plants and animals. *U.S.F.W.S.*

MIXED BAG

Game protectors Tracy Galvin and Mike Smyth received a tip that a Wilmore, Kansas ranch hand had been involved in some deer poaching and maybe a little cattle rustling too. They stopped the suspect on his way home and questioned him about the report. At first he feigned innocence, but then he confessed to shooting one turkey and a deer out of season. After two hours of persistent questioning by the officers, he also admitted killing two other deer illegally. Then, faced with the prospect of going to jail, he said he had been involved in shooting a steer on a nearby ranch. At the Comanche County Sheriff's office, the suspect put it all in writing.

Further investigation led Galvin and Smyth to the first suspect's stepfather, a Udall man who they believed was also involved in the steer shooting and deer poaching.

The Udall man was charged with three counts of taking deer out of season, three counts of taking deer without a permit, and theft of the steer. The Wilmore man was charged with those counts, as well as two more for taking a turkey without a permit and out of season.

Under the prosecution of Comanche County Attorney Curt Campbell, both men were fined \$250 on each of the 14 wildlife violations. In addition, Judge Mike Murphy ordered the culprits to pay \$500 a piece for shooting the steer and \$450 each in restitution to the farmer.

The total paid by the two was more than \$5,000, but Judge Murphy wasn't finished with them. He also sentenced the culprits to 60 days in jail, to be served on 30 consecutive weekends, and he gave them two years of probation during which they may not hunt in Kansas.

The poachers appealed their case to another judge, Don Smith, who lightened the sentence, by doing away with the time in jail and cutting the probation to one year. *Manes*



deer meat. The man said he purchased the meat from an unknown person.

Further investigation by Knuth indicated that the Coffeyville man and a friend had, in fact, shot the deer themselves. So, officers Knuth and McCauley returned to interview the first suspect again, confronting him with the new evidence. This time he admitted that he and his friend had taken three deer in Kansas and one in Oklahoma, and he signed a statement implicating both of them in the illegal taking of deer and spotlighting.

The man's friend had moved to Garden City, but when he learned of the warrant for his arrest, he turned himself in. Both men paid \$400 for spotlighting and taking deer illegally in Oklahoma. In addition, they paid \$1,650 in a Montgomery County, Kansas court.

Less than a month later, the same caller who reported these violations provided Game Protector Knuth with information about another Coffeyville man who he said had illegally killed a deer. The truck he described matched one

ISSUES

STEEL SHOT A MUST

The ingestion of lead shot pellets causes an estimated annual loss of more than two million waterfowl in North America and unknown losses of other species, including bald eagles. To prevent further contamination of waterfowl habitats in the state, the Fish and Game Commission endorses the use of steel shot for waterfowl hunting in Kansas.

Beginning with the 1985-86 hunting season, the Commission intends to require steel shot for all hunting on public areas managed primarily for waterfowl (Cheyenne Bottoms, Jamestown, Marais des Cygnes, Neosho, and Texas Lake). Three other areas — Cheney, Elk City, and Quivira — will remain under a requirement for steel shot use only in waterfowl hunting. Steel shot will be required for waterfowl hunting on all public wildlife areas, beginning with the 1986-87 season, and for all waterfowl hunting in the state, beginning with the 1987-88 season. *Kansas Fish and Game Commission*

KANSAS ACID RAIN

Conservationists in the northeast United States, Canada, and elsewhere are battling acid rain with all the resources they can muster. The killing precipitation, formed by nitrate and sulfate emissions from industry and municipal power plants which burn coal or oil, has left some lakes and streams almost lifeless — but in Kansas, there doesn't seem to be much worry about the problem.

The reason, according to state environmental specialists, is that problems from acid rain are not yet evident in Kansas. Some precipitation in the state has been shown to be highly acidic, but significant damage to plants and other surface structures has not been recorded. Soil and water pollution from acid rain has yet to become a problem in Kansas.

Reasons for a lack of acid rain problems in Kansas are many, but the main one is probably a lack of coal- and oil-fired power plants in the path of the prevailing southwest winds that cross Kansas. The same winds carry sulfate and nitrate emissions from the Midwest to the Northeast. While only a few such facilities exist

to the southwest of Kansas, the number is expanding. Other industrial sources of acid-rain-forming emissions within Kansas are mostly located in the northeast part of the state, where pollutants are carried away by the wind.

Kansas soils offer another hedge against acid rain. Carbonate ions in the soil and in limestone formations neutralize acids naturally, providing a buffer between acid precipitation and water supplies.

Officials from the Kansas Department of Health and Environment say there is no program for monitoring the effects of acid rain in the state, and there are no plans for establishing one in the near future. Some research on acid precipitation is being conducted at universities in Kansas. *Manes*

WILDLIFE LOSES IN CANADA

Canadian officials jolted conservationists throughout North America recently by announcing huge budget and personnel cuts for the Canadian Wildlife Service (CWS), and there is speculation that the CWS may be eliminated by future cutbacks.

CWS is the Canadian counterpart to the U.S. Fish and Wildlife Service. Its activities are nationwide and international, and its problems cause concern throughout Canada and other countries.

Canada's finance minister announced federal positions would be reduced initially by less than one percent, but when the personnel cuts were doled out to agencies, Environment Canada had to shoulder 27 percent of the burden, losing 400 positions. CWS, which is an arm of Environment Canada, was asked to eliminate 84 of its 370-member staff, a reduction of 23 percent. The agency's budget reportedly would be reduced by 17 percent. *Wildlife Management Institute*

WATER RESEARCH

The Kansas Water Authority recommended that the 1986 Legislature give top funding priority to studies of the river basin manage-

ment system, the Dakota Aquifer, and the connection between streamflow and aquifer depletion. Estimations of supply and demand of water supplies, as well as a study of the Water Appropriations Act and how it relates to conservation and environmental issues was also listed as a priority. *Kansas Natural Resources Council*

THINK ABOUT IT

"You are correct . . . we are fighting trapping as a warm-up for an assault on hunting . . ." — *Sean O'Gara, Mobilization for Animals, quoted in UPDATE, W.L.F.A.*

ANTIS ARE AT IT

The Wildlife Legislative Fund of America has joined the Department of the Interior and the U.S. Fish and Wildlife Service (USFWS) as a defendant in a suit brought by anti-hunters to ban hunting on national wildlife refuges.

"This is another in a string of attempts by animal rights groups to stop hunting in the United States," said James H. Glass, president of The Wildlife Legislative Fund of America. "Because of aggressive counter campaigns mounted by sportsmen and other conservationists, their efforts to ban hunting in legislative halls and through the regulatory process have been frustrated. They are now turning to the courts to achieve their political goals."

The suit, filed late last year by the Humane Society of the United States (HSUS), charges that the USFWS has permitted hunting on national wildlife refuges without proper consideration of hunting's compatibility with the purposes of refuges. According to an HSUS spokesman, refuges are intended to be "involute wildlife sanctuaries."

"That is purely a political statement, because laws governing the refuge system are clear," said Glass. "Hunting is an historic, permissible use, dating back to the early days of the system. What is more, hunting is only permitted on 244 of the 424 refuges in the country, so the Fish and Wildlife Service has clearly not given hunters carte blanche access . . ."

"The Humane Society of the United States continually claims that it is not opposed to all hunting," said Glass. "In our experience, the HSUS, like other anti-hunting organizations, is only opposed to hunting during hunting season and just on public and private lands. But other than that, they have no problem with it." *Wildlife Legislative Fund of America*

NATURE'S NOTEBOOK

by Joyce Harmon
Wildlife Education Coordinator
Kansas Fish and Game Commission

Fly SWAT Team



After reading the following paragraphs, answer the questions below. Then see if you can make a three-dimensional model of a housefly. The pattern can be glued onto heavier paper, or a ditto master can be made, with copies run on construction paper.

Houseflies, (*Musca domestica* — Order **Diptera**), are among the most common, and probably the most pesky, kind of wildlife we see. But, it's surprising how little we know about this two-winged species.

For an animal only about three-eighths of an inch long, it can be a bother. Houseflies are found almost anywhere there are people. These insects have reddish-brown **compound** eyes. The female has eyes further apart than the male. Their wings are **transparent**. It might feel like you've been bitten by a housefly, but actually, their mouth parts are more like a sponge for sucking. Sticky pads on their feet allow them to walk nearly anywhere.

The female lays up to 600 eggs from summer to frost. In warm weather the eggs hatch in eight to twelve hours. The fly larvae, or **maggots**, eat decaying plants and animal matter. Bacteria are often spread by flies because they lay their eggs on decaying material. Adult flies can spread diseases, such as typhoid, dysentery, and cholera, by emptying their stomach contents at each place they feed, and by carrying diseases on their feet.

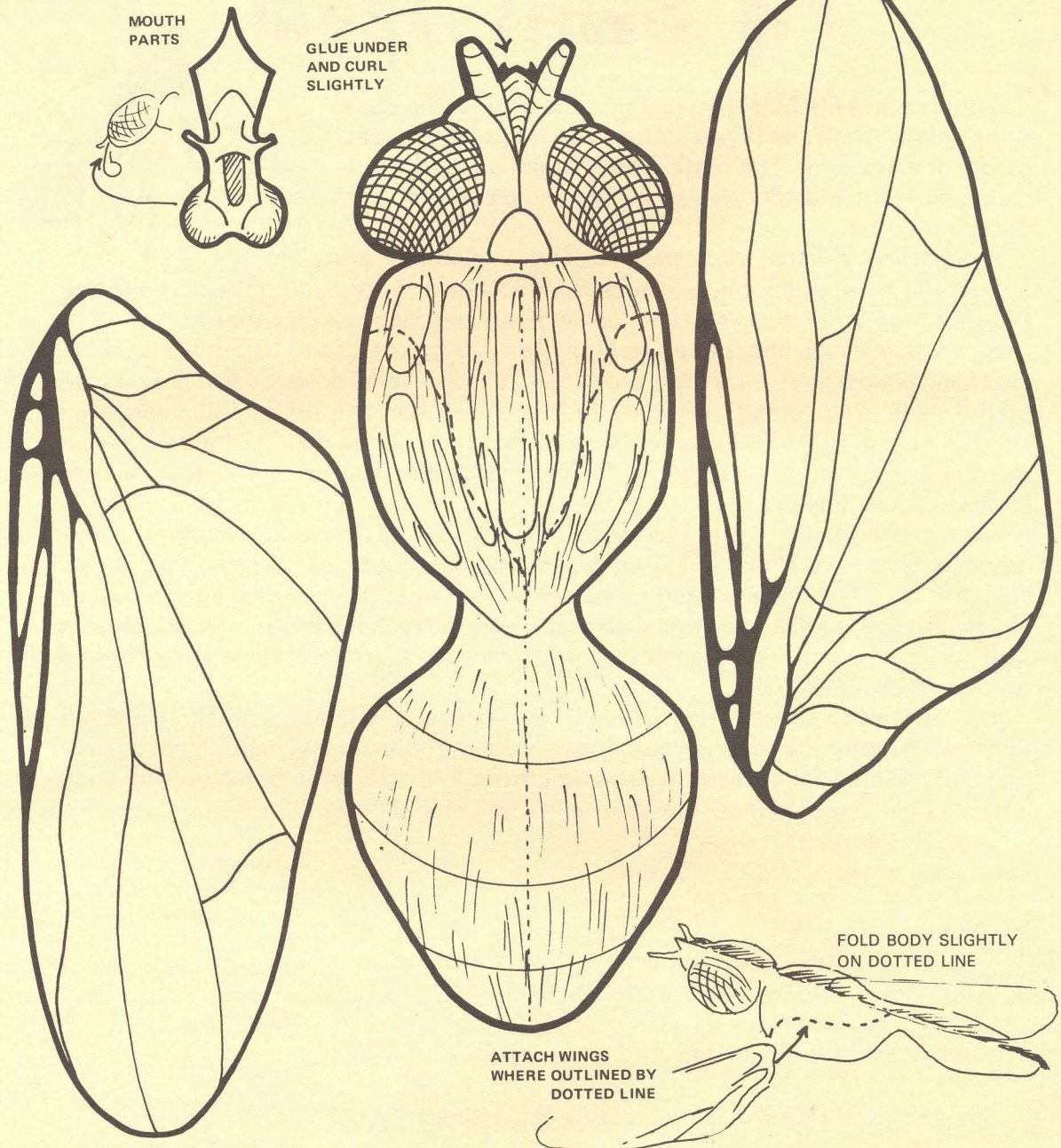
It is difficult to control the number of houseflies in an area because 10 generations can be produced in one year. That means that one female might have five and one-half **trillion descendants**, or offspring, from April to September! Now you know why you can swat flies all day and never get the last one.

1. Flies have _____ eyes.
2. Diptera means _____.
3. The genus-species name of the housefly is _____.
4. One female fly could lay _____ eggs.
5. Fly larvae are called _____.
6. Look up the definitions of each of the words in bold type.

WILDLIFE IN ANOTHER

DIMENSION

Housefly



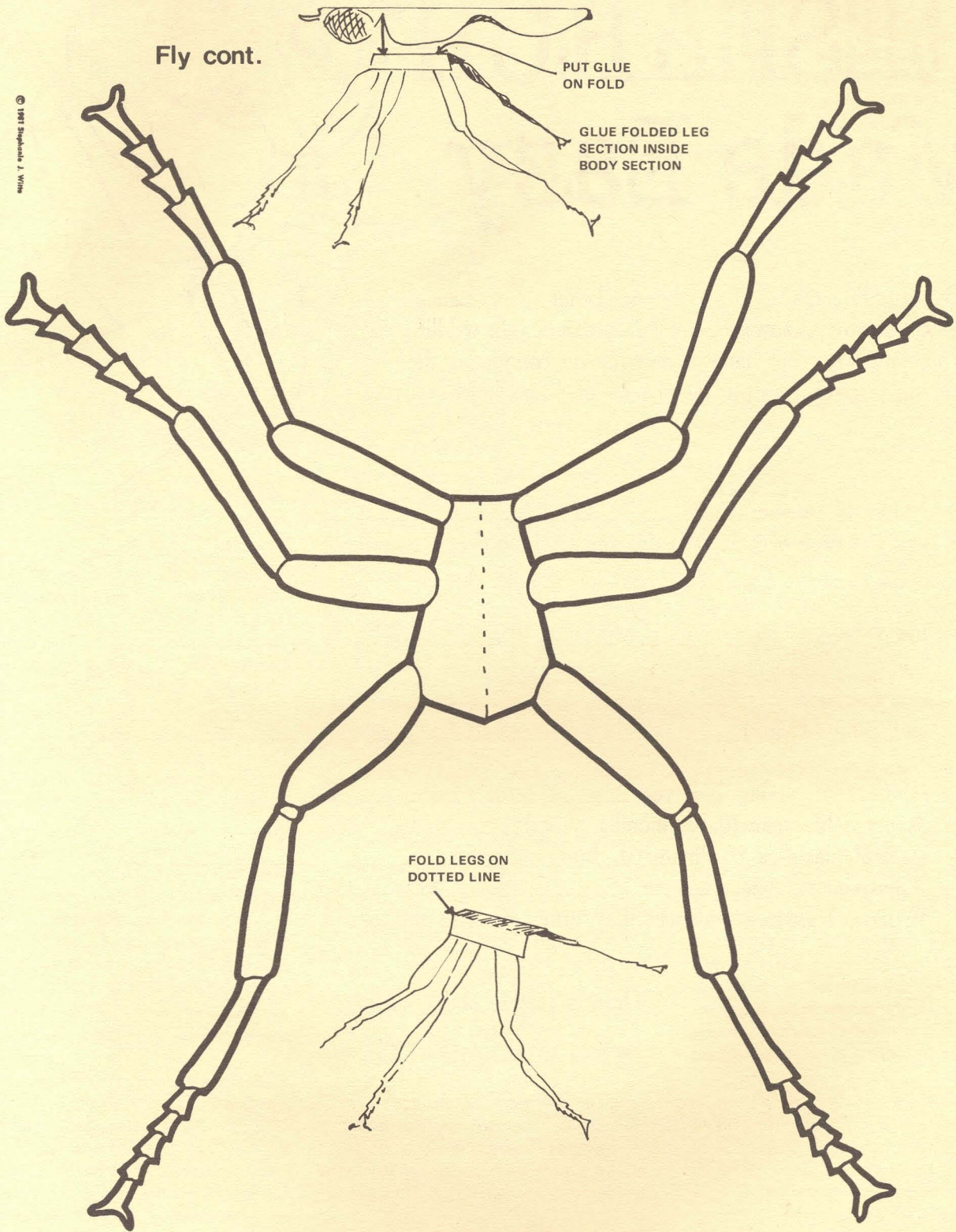
© 1981 Schenck & Wolf

Fly cont.

PUT GLUE ON FOLD

GLUE FOLDED LEG SECTION INSIDE BODY SECTION

FOLD LEGS ON DOTTED LINE



RESEARCH Made Easy



Biologists research wildlife so they are better able to manage it. The more they know, the more they can benefit wildlife and habitat. Try your hand at research by completing the following research form on the species of your choice.

Name of species: _____

In what type of habitat is this species found?

Food preferences _____

List predators
and prey (if any) _____

Number of young per year _____

Average life span (days, months, years) _____

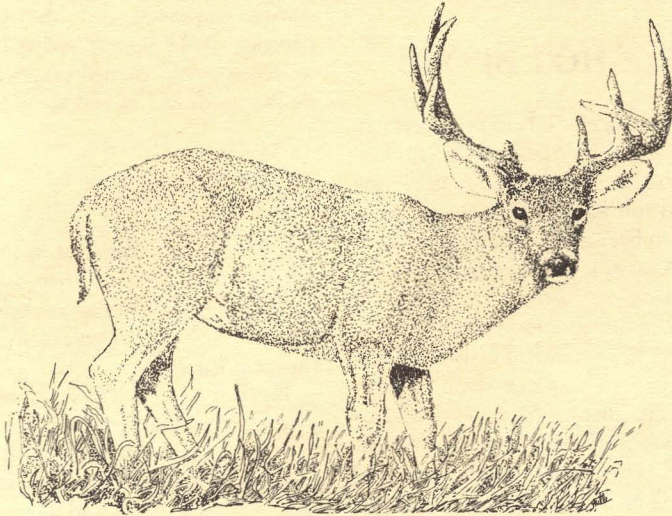
Animal classification (mammal, bird, etc.) _____

Approximate size: Length _____; Weight _____

Write at least five sentences that further describe the animal.

Draw a picture of the species:

HUNTING



MULETAIL DEER

Is this a mule deer or a whitetail?

It could be either — or both. Hunters and biologists have encountered deer that show traits of both muleys and whitetails. Although little research has been done on the topic of cross breeding among wild deer, some general characteristics of whitetail-muley hybrids have been recognized.

Even in pure-bred deer, antlers may not be a reliable identification key. A non-typical mule deer rack can be difficult to distinguish from that of a whitetail. Still, cross breeding is apparent in some antlers. One side may be obviously whitetail and the other muley, or a hybrid rack may simply appear to be a non-typical specimen from either species.

Other features often show the effects of hybridization too. The ears on a cross breed are often shorter than a muley's and longer than a whitetail's. Cross breeds generally have longer, wider tails than mule deer, and the underside usually takes on the distinctive look of a whitetail.

Other more obvious features lean toward the whitetail. Overall body shape of cross breeds tends to be more elongated, as are whitetails, and hybrids are usually larger deer.

Glands located on the hind legs are usually about four inches long on mule deer, one and one-half inches on whitetail, and three inches on hybrids. Glands near the eyes also show the effects of mixed blood lines, being about the size of a quarter on mule deer, a dime on whitetails, and a nickel on hybrids.

Deer experts say cross breeding among whitetail and mule deer is uncommon in Kansas, but will increase in frequency as the state's deer population grows. *Manes*

M*A*R*S*H* IN KANSAS

About three million dollars in Ducks Unlimited funds will be available to state waterfowl management programs through DU's M*A*R*S*H program (Matching Aid to Restore States Habitat). The program will provide money to state wildlife agencies based upon the amount of funds raised by Ducks Unlimited volunteers in each state. The money, which may be available either in matching funds or as outright grants, will be used for development and acquisition of waterfowl habitat. Kansas could receive as much as \$55,000. *DU*

PICKLING YOUR GUN

At the season's end, many hunters lay their guns aside and forget them until the first chance to shoot comes the next year. During the months of bass, catfish, and crappie fishing, a good gun can become a corroded mess, if proper care isn't taken.

First, the gun should be cleaned thoroughly, with special attention given to areas where dirt can be hidden and hard to remove. On pump shotguns, the inside of magazine tubes and areas

hidden by forearms are prime spots for dirt and corrosion. On automatics, friction rings and gas ports are often overlooked in the final cleaning. Scope rings, bolts, and receiver mechanisms are likely places for rust problems to occur on rifles.

On all guns, trigger assemblies, chambers, and receivers should be carefully cleaned and lubricated. Even areas which are too tight for dirt to enter can draw moisture, resulting in pitted metal parts and cracked wood. To avoid this, the gun should be disassembled, cleaned, and wiped with a lubricant.

Guns should not be left in plastic, leather, or vinyl cases for long periods, as these materials hold moisture which occurs through condensation. Cloth cases are better for off-season gun storage, but it is best to leave guns uncased. If a situation requires a gun to be cased for a long period, some experts recommend spraying the inside of the case lightly with a moisture-repelling lubricant. Solvent-type lubricants can make rebluing more difficult, and should never be allowed to remain in contact with wood or rubber parts.

Finally, guns should be stored in places of low and constant temperature and humidity. Although most cabinets are designed otherwise, guns should be stored either in a horizontal position or with the barrel down. If a gun is leaned barrel-up, oil may find its way into the stock, staining the wood and damaging the varnish. In addition, constant pressure on the recoil pad can stress and deform it. *Manes*

HUNTING CASUALTIES

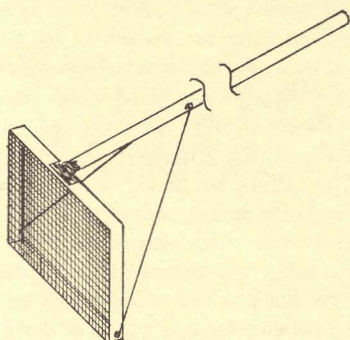
There were 21 fewer hunting accidents in Kansas during 1984 than in 1983, and none were fatal, a claim envied by other states. Seven of the 32 people involved in firearms mishaps shot themselves.

Only about 19 percent of those injured were wearing blaze orange. Hunter Safety Coordinator George Schlecty said, "Most of the accidents occurred among pheasant and quail hunters. If these people would wear blaze orange, the number of accidents would be greatly reduced."

In one of the accidents, a man was attempting to kill a deer illegally with a .22 rifle, when his stray bullet struck a hunting companion in the back.

"I think the biggest factor in reducing the number of accidents last year was the low upland bird population, which lead to fewer hunters going afield," said Schlecty, "but I think people are learning to handle their guns more carefully in the field too." *Manes*

FISHING



EASY CRAWDADS

For many Kansas game fish, the crayfish is one of the best natural baits. Largemouth bass, smallmouth bass, and channel catfish are especially attracted to a lively, tail-hooked crawdad. The problem is in collecting an adequate supply of these fish-tempting baits.

Crawdads are found in most Kansas streams and in some ponds, but in many areas of the state the best concentrations are found in small tributaries, too narrow and snag-filled to seine. Crawdads can be caught by hand, but it isn't a very efficient method, and once your capture efforts have stirred up bottom muck, it doesn't work at all. The solution lies in constructing a simple, but effective bait catcher.

The catcher consists of a 16- by 24-inch frame of one- by two-inch material. One side of the open rectangle is covered with quarter-inch mesh hardware cloth secured with poultry net staples. A six- to ten-foot handle of one-inch PVC pipe, wood, or other suitable material is attached to the frame with a two-and-one-half-inch gate hinge, which allows the frame to be folded against the handle for transportation. A piece of braided nylon cord attaches to the handle about 18 inches above the frame and to the far corners of the frame to prevent collapse during use.

The catcher is operated by pulling it through the water as near the bottom and as fast as possible until the business end can be raised and pulled to the bank. Muddied water is no deterrent to success, since it isn't necessary to see the intended quarry. In fact, it sometimes helps to stir things up a bit in order to dislodge crawdads hiding under bottom material. A half-dozen passes through productive water is usually sufficient for a day's supply of first-rate bait.

Ross Manes

CRAPPIE HOT SPOTS

When it's springtime in Kansas, anglers turn to crappie. Even devoted bass busters and channel cat enthusiasts find themselves neglecting their favored fish for at least a couple creels full of eager-to-bite, good-to-eat black or white crappie. In Kansas, there are no limits on crappie in state-managed waters, so anglers can enjoy all the fast fishing they want.

Kansas has been known for decades as a state that offers some truly great crappie fishing, and decent populations of black or white crappie exist in waters of every region in the state. For 1985, fisheries experts say the best crappie fishing will be in larger reservoirs, and they name the top six spots: Marion, Fall River, Toronto, Melvern, Perry, and Glen Elder reservoirs. *Manes*

BOATS: AL OR GLASS

Boat buyers are faced with many decisions about motors, depth finders, seats, and all sorts of gear; but a more fundamental decision deals with hull construction. Should it be aluminum or fiberglass?

Where price is concerned, aluminum may have a slight edge, but similarly outfitted aluminum and fiberglass boats will be fairly close in cost.

Fiberglass generally makes a quieter hull, dampening noise of movement in the boat, as well as waves and brush against the outside of the hull. An aluminum boat can be silenced with a raised, carpeted floor. The insides of the hull can be covered with outdoor carpet or other dampening material to further reduce noise.

Fiberglass boats used to be considerably heavier than aluminum ones, making them more difficult to handle in tight situations; but today's new compounds, such as kevlar, have allowed construction of lighter fiberglass crafts. Proponents of fiberglass hull construction say a little added weight makes a boat ride smoother and gives stability in rough water.

Most john boats are aluminum. The light weight of these unadorned crafts makes them popular among anglers who frequent streams and small impoundments. Fiberglass, which allows more innovative hull designs, is more

popular among fishermen who favor large, open waters.

Where durability is concerned, aluminum boats again have an edge. Fancy, glittering finishes on fiberglass are easily defaced by shoreline rocks, brush, or even sand. Boat dealers emphasize that damage done to fiberglass in the form of gell coat cracks and scratches is only cosmetic and generally constitutes no danger of leakage. *Manes*

CARP BAIT

Carp baits are almost as interesting as the fish themselves, ranging from disgusting concoctions to appetizing potions. Below are some recipes, which carp enthusiasts say are sure bets for good fishing.

Blend one cup of flour with one cup of cottonseed meal. Next, mix together one cup of corn flakes, one cup of oatmeal, one cup of molasses, one cup of water, and one-fourth cup of vanilla. Finally knead the two mixtures together, adding extra flour until it becomes a thick dough that will stay on the hook.

A simple, but effective bait is reportedly prepared by moistening cornflakes with strawberry soda pop. The damp flakes are kneaded into tasty dough balls.

Mix together a package of strawberry or banana gelatin powder, two cups of corn meal, two tablespoons of sugar, and one cup of flour. Add the dry mixture and one tablespoon of vanilla to two cups of boiling water, and stir until it becomes a thick paste. Then spread it on a flat surface to cool. When it reaches room temperature, place it in plastic bags and refrigerate the bait until it is used. *Manes*

BOAT FIRES

Batteries and fuel tanks in boats can easily slide so that they come into contact, a combination which can lead to serious trouble. When the battery terminals touch the side of the fuel tank, the result is often a dangerous fire.

The most frequent cause is an improperly secured battery or tank. Side terminal batteries, which are becoming more common in boats, add to the problem. When a boat is turned sharply and the battery is not properly secured, it can slide, putting the terminals in contact with the tank, resulting in a fire or explosion.

To prevent this, the battery should be contained in an insulative box that is secured in place. A plastic battery box both insulates the terminals against shorting, and contains any spilled corrosive fluids which might damage the boat. *S.D. Game, Fish, and Parks*

NATURE

SOMETHING WILD IN YOUR BACK YARD

If you do something wild in your back yard, the Kansas Fish and Game Commission would like to give you credit for it through the Backyard Wildlife Habitat Certification Program. The program, which is supported by the Nongame Income Tax Checkoff, offers recognition for people who improve living conditions for wildlife around their homes.

If you would like to receive a Backyard Wildlife Habitat Certificate and colorful sign reading "I did something wild in my back yard," send your name, address, phone number, and property size to Kansas Fish and Game, Box 4034, Wichita, KS 67204. Also, include a description of plantings, feeders, nest boxes, or other habitat improvements you've made. Photographs (slides preferred) or drawings of the area are needed as well. These will not be returned, so keep copies.

The Backyard Wildlife Habitat Program is not only for homeowners. Wildlife habitat can be provided at many types of residences, including high-rise apartment balconies. *Joe Schaefer*

BEAVER BUILDERS

At one time or another, beavers have probably changed almost every watershed in North America. For example, a 1960 excavation down to bedrock revealed the area now called Boston Common was created by beavers. *National Wildlife*

WISDOM

"To waste, to destroy, our natural resources, to skin and exhaust the land instead of using it so as to increase its usefulness, will result in undermining in the days of our children the very prosperity which we ought by right to hand down to them amplified and developed."

Theodore Roosevelt
President 1901-1909
quoted by NSSF

FIREFLY FACTS

Each species of firefly has its own unique coded series of flashes, which is recognized by the opposite sex of their species.

"Firefly" is the common name for beetles in the family *Lampyridae*, which produce light from chemicals in their bodies.

Firefly larvae are called "wireworms." They are found in the soil and in decaying wood. In some species the females are wingless and are called "glow worms." Fireflies are found in most parts of the world. *from Something Wild!, Robert F. Clarke, Ph.D.*

THE "V" MYSTERY

There are many theories to explain why geese and other migratory birds fly in a "V" formation. Experts believe the main one is to make flying easier.

One of the older theories says that the "V" formation allows lead birds to part the air for those that follow, requiring less total energy use by the flock. This means that the lead bird becomes tired and must be replaced periodically to rest behind another leader.

Another theory says that the air passing over the birds' wings creates an updraft in the interior of the formation. Each bird flies with its wingtip over the updraft from the bird in front of it. Again, this requires that the leader be rested from time to time.

A third theory says some birds migrate in a "V" formation because their eyes are on the sides of their heads. Flying in this fashion allows them to see each other. Only the lead bird must turn its head to see the others, reducing its streamlining and causing it to work harder than the rest of the flock. *Manes*

BIRD NAPPING

Most birds sleep in roosts or old nests close to where they feed, but some grouse will dive into snow banks to catch 40 winks. *Ranger Rick Magazine*

DEAD WHOOPERS

Eastern equine encephalitis, a virus spread by an uncommon species of mosquito, is responsible for the deaths of seven endangered whooping cranes at the Patuxent Wildlife Research Center. The virus was transmitted to the birds by a species of mosquito which is not known to bite humans.

Biologists don't know what brought this mosquito in contact with the whooping cranes, which are kept outdoors, but they believe the onset of cold weather killed any remaining mosquitos. They ended their strict quarantine of the crane area at the Laurel, Maryland, wildlife facility when they determined that the virus is not spread from bird to bird. The recent deaths represent the first time the encephalitis virus has been documented among whooping cranes.

The remaining captive whooping cranes appear healthy, according to Patuxent biologists. Nine sandhill cranes, non-endangered cousins of the whoopers, have been inoculated with a vaccine used to prevent encephalitis in humans, with no adverse side-effects. Vaccinations of whooping cranes thought to have been exposed to the virus may follow as a preventive measure. *U.S.F.W.S.*

IT'LL KILL YA

The most dreaded of poisonous mushrooms are two members of the *Amanita* group. One is the death cup, and the other is the Fly Amanita. The poison of the death cup acts like the venom of a rattlesnake, and there is no known antidote. *The Kansas School Naturalist*

CRAZY COYOTE

A rural Mills, Nebraska woman was attacked by a coyote when she attempted to scare the predator as it was killing ducks and geese in her farmyard. Instead of retreating, the coyote attacked the woman's neck and face area. Her screams attracted the family dog, a blue heeler, which distracted the coyote long enough for the woman to escape. Her son then shot the coyote.

Tests for rabies indicated the animal was not infected, and the woman suffered only cuts and scratches. The blue heeler is getting special attention for its heroics. *Trapline Journal*

NOTES

PHOTO CONTEST

A photo contest sponsored by the Kansas Nongame Wildlife Program gives shutter bugs a chance to show their talents and win some cash. For 1986, photos of meadowlarks, monarch butterflies, and ornate box turtles will be considered. First prize is \$100, second prize is \$50, and third is \$25. Framable eight-by-ten-inch prints of the winning entry will be available to Kansans who donate to the Nongame Program through the Chickadee Income Tax Checkoff.

Only Kodachrome slides will be accepted, and the entry deadline is August 1, 1985. The judging will be done by the Nongame Education Committee, and Kansas Fish and Game staff. All slides will be returned to the owners, but Fish and Game assumes no responsibility for damage to the pictures. Entries may be reprinted for the purpose of promoting the Kansas Nongame Wildlife Improvement Program. The contest is open only to people who live or work in Kansas. *Joe Schaefer*

WILD CALENDARS

At \$5.00 each, the 1985 KANSAS WILDLIFE Calendars are a real bargain — not just for the price, but because the Richard Plasschaert paintings in it are among the finest you will see.

The calendars may be obtained by writing to KANSAS WILDLIFE, Rt. 2, Box 54A, Pratt, KS 67124. Make checks payable to "KANSAS WILDLIFE Calendars." *Manes*

WILDLIFE WEEK 1985

The National Wildlife Federation and its state affiliates have chosen soil as the focus of National Wildlife Week 1985. "SOIL — we can't grow without it" is the theme for the popular annual observance, taking place March 17 through 23. Millions will participate in Wildlife Week, bringing a new awareness of our soil resources to classrooms, nature centers, and homes in every state, the Virgin Islands, and Puerto Rico.

To help America Celebrate Wildlife Week, the National Federation and its state affiliates will distribute more than a half-million Wildlife

Week-education kits free-of-charge to educators across the country. Among the materials included in the kit are two colorful posters, an educator's guide, 36 mini-poster stamps, and an overhead transparency. For more information, contact the Kansas Wildlife Federation, Box 720, Junction City, KS 66441. *National Wildlife Federation*

TAXIDERMY'S BEST

The Kansas Museum of Natural History and the University of Kansas will sponsor the Third Annual World Taxidermy Championships May 28 through June 1. The event will consist of a number of competitions in various categories, including a new commercial division. The best entries will compete head-to-head in the Master Division for the Best in the World exhibit. More than 700 participants from across the country are expected to take part in the competition.

After the judging is finished, the exhibits will be open to the public. Eighteen seminars held during the competition will include topics such as fish carving and bird mounting.

For more information about the World Taxidermy Championships, contact the Public Relations Office, Museum of Natural History, University of Kansas, Lawrence, KS 66045, (913) 864-4540. *David Lassiter*

AGRICULTURE AND WILDLIFE HANDBOOK

In cooperation with the U.S. Fish and Wildlife Service (FWS), the Kansas State University Extension Service and the Great Plains Agricultural Council have published a 600-page handbook on increasing wildlife with agricultural techniques. The book, "Guidelines for Increasing Fish and Wildlife on Farms and Ranches," combines the efforts of more than 80 wildlife management and agricultural experts from Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming.

Information in the publication includes income opportunities, introduction to specific guidelines for increasing certain species of wildlife, introduction to habitat management,

and the basics of wildlife management. There also is an appendix on educational aids for teaching wildlife habitat improvement. Copies may be obtained for \$27 each by writing: Wildlife Habitat Handbook, 118 Umberger Hall, Kansas State University, Manhattan, KS 66506. *U.S.F.W.S.*

HUNTING AND FISHING DAY CONTEST

The 1985 National Hunting and Fishing Day Poster Contest will feature 67 prizes totaling over \$6,000 in U.S. Savings Bonds. The deadline for entries in the national contest will be April 19, 1985.

National prizes, including a Grand Prize of a \$1,000 U.S. Savings Bond, will be awarded to students who best illustrate the 1985 contest theme, "Why Wildlife Needs America's Sportsmen." The contest is open to all students in grades 5 to 12, with a Junior Division for grades 5 to 8 and a Senior Division for grades 9 to 12.

In addition to the Grand Prize, national prizes include \$500 savings bonds for First Place, \$250 bonds for Second Place and \$100 bonds for Third. First, Second and Third prizes will be awarded in both the Junior and Senior divisions. Both divisions will share a total of 15 Honorable Mention Prizes of \$75 savings bonds and 45 Merit Awards of \$50 savings bonds.

In order to be considered for national awards, posters must first be winners in local contests sponsored by schools, sportsmen's clubs, conservation organizations, newspapers, or other groups. To give youngsters time to research and prepare their posters, contests should be organized as soon as possible.

For information on how to sponsor or participate in a local National Hunting and Fishing Day Poster Contest, write: NHF Day Poster Contest, P.O. Box 1075, Riverside, CT 06878. *NHFD*

DUCK STAMP WINNER

An Oklahoma artist's watercolor painting of a lone male cinnamon teal won the 1985-86 Federal Duck Stamp Contest. The painting, by Gerald Mobley, will serve as the design for the this year's Migratory Bird Hunting and Conservation Stamp. Mobley's design was selected from over 1,500 entries during a two-day judging event held at the Department of the Interior in Washington, D.C. in early November. *U.S.F.W.S.*



Bob Gress photo

It's **RED** in 1985...

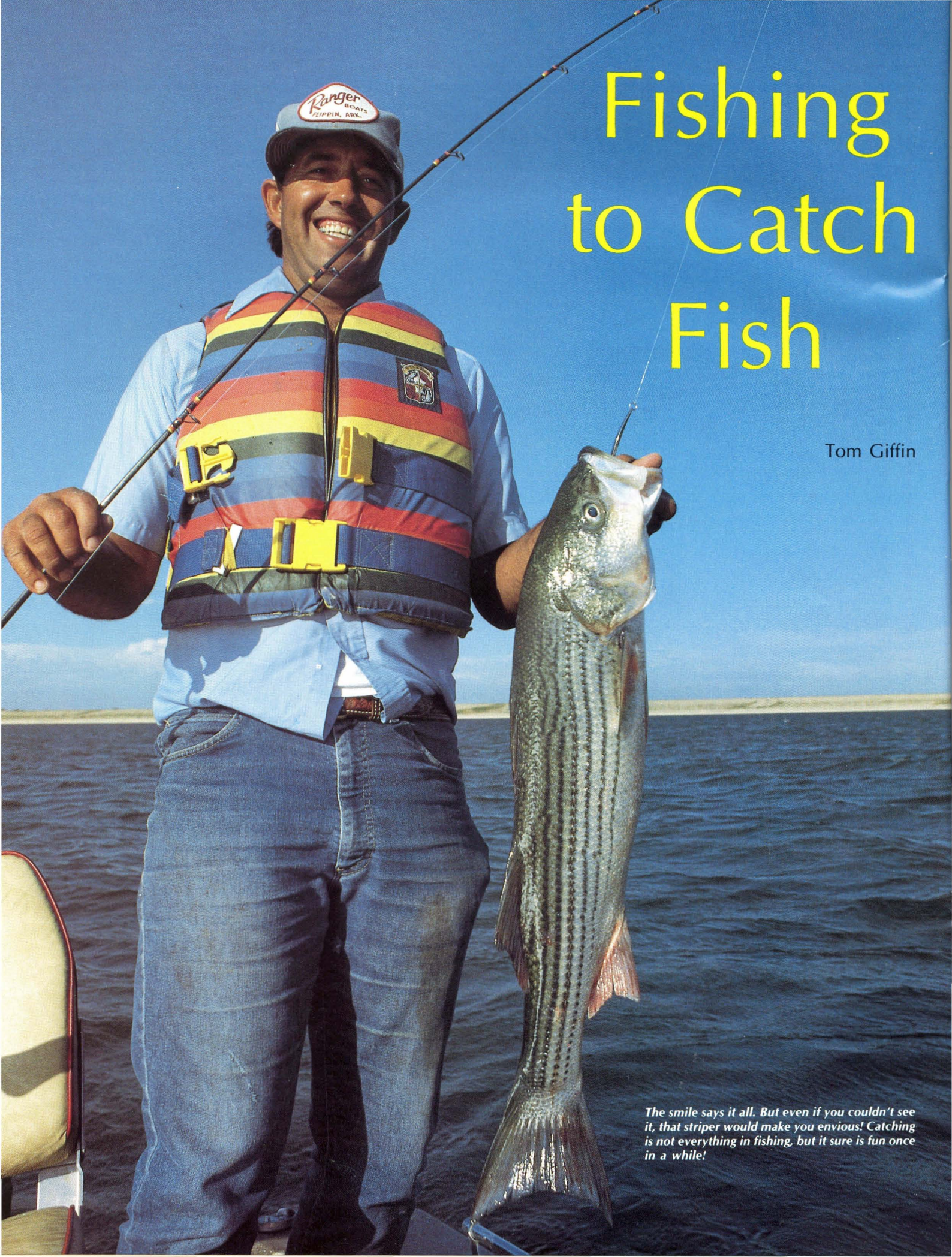
The northern cardinal has been designated the Kansas nongame species for 1985. Commonly known here as "Red Bird," the male cardinal is the only bright red bird with a crest in Kansas. A black patch adorns the base of his thick bill and his throat. The female is reddish-brown with a scarlet crest and some red on her wings and tail.

Cardinals are year-round residents in just about every county in Kansas but occur much more frequently in the eastern half of the state where their food and cover requirements are better met. Cardinals are commonly found along hedgerows and woods margins and in urban neighborhoods with mature shrubs. Nests are made from small twigs and built in thick vegetation usually about six feet from the ground. Each pair of cardinals produces two or three sets of eggs a summer and two to five young are raised each time.

Cardinal diets consist mainly of wild seeds and cultivated grains. They also eat caterpillars, grasshoppers, beetles and other insects when they are available. Wild fruits such as grape, mulberry and dogwood are relished in the fall.

You can help cardinals by supplying sunflower and melon seeds at winter feeding stations, providing good habitat with fruit-bearing shrubs and maintaining a daily water source. You can help all nongame species by contributing to the Kansas Nongame Program on the state income tax form.

A free 8 x 10 copy of this photo is available at Kansas Fish and Game and state tax offices for those who contribute to the Nongame Program in 1985.

A man wearing a blue cap with 'Ranger BOATS KEPPIN, A.W.' on it, a light blue shirt, and a colorful striped life vest is smiling broadly. He is holding a fishing rod in his right hand and a large striped bass in his left hand. The background shows a body of water under a clear blue sky.

Fishing to Catch Fish

Tom Giffin

The smile says it all. But even if you couldn't see it, that striper would make you envious! Catching is not everything in fishing, but it sure is fun once in a while!

Most people go fishing for one of two reasons. The first and to many the only reason is to relax and get away from the pressures of every-day activities. In other words, to enjoy the solitude and beauty of nature. The second reason is simply to catch fish. If fishermen are honest with themselves they'll admit that catching fish is only a small part of the pleasure of fishing. Still, if one continues to fish over a period of time without catching some fish, much of his enthusiasm for the sport can be lost — even if, from an optimist's point of view, those non-productive hours of fishing are just dues paid for the good fishing that is going to begin shortly.

If your optimism is about used up you can greatly improve your chance of

underwater currents carrying small bait fish and other food items to concentrate them in select locations. Such concentrations will bring predator fish into these areas. By fishing these locations during windy periods, you'll stand a better chance of filling your stringer.

A good example of this phenomenon is the gathering of channel catfish which occurs in the fall along the dams of Fall River Reservoir, Toronto Reservoir and Marion Reservoir after the wind has been out of the north for several days, concentrating the shad in larger numbers. At these times not only can you *catch* channel catfish in these areas, but you can actually see large channel catfish feeding near the surface on the trapped shad.

After the wind has stopped or

switched direction, fish will remain temporarily concentrated. As prey fish and other organisms move out of these areas the fish that have been feeding on them will also disperse.

A few things to remember when fishing under windy conditions:

1. Fish shorelines receiving an on-shore wind.

2. Fish points of land projecting out from protected areas — both sides of the point and the point itself.

3. Fish coves if the wind is blowing into the cove.

4. Fish the "mud line zone" — that area between clear and muddy water. Currents change speed and direction in these mud line zones and food and fish will concentrate here.

5. *Avoid* fishing big water on the side from which the wind is blowing. This is the protected side with little wave action. Fish have generally moved out of these areas to locations where food is more concentrated.

6. Fish into the wind — you'll have a better "feel" when a fish picks up a bait.

7. Fish top-water baits when the wind is blowing; fish are less easily spooked by bait or angler then. If wave action is heavy, increase the action of your bait to make it noticeable.

8. When boat-fishing, move your craft into the wind to fish. Not only do you have more control over boat speed, but if winds should increase to dangerous velocity you can easily turn around and return to the dock.

Sometimes it's nice just to relax with rod and reel. But here's what to do if you think it's time to bend that rod!

catching fish by considering the following: 1) Weather conditions — including those of the week prior to fishing and fronts about to move into the area. 2) Water conditions, especially temperature and clarity. 3) The season of the year. 4) Habits of the fish you are trying to catch, including its food preferences and the types of food available.

If you take these four things into account and put a little thought into your fishing trips, your success rate *will* improve!

Weather fronts are an extremely important factor affecting fish. For several hours prior to a weather change and as a front moves into an area, fish increase their movements and feeding activity. This is an ideal time to be on the water. Shortly after the front has moved into the area and usually for a period of one to two days afterward, fish activity declines. The period following a front can be spent to better advantage repairing equipment or catching up on odd jobs. As a general rule, don't expect to catch fish eight to 36 hours after a front has moved into an area.

Wind action on water also affects fish movements and feeding. Wind speed, direction and duration all contribute to fish behavior patterns and determine where the fish will be located. Wind action over a period of time will cause



Rains which result in runoff can produce some excellent fishing. Coves, the upper ends of lakes, and small ditches and creeks flowing into lakes or rivers all are excellent sites to fish runoff. Fish move into these areas to feed on food organisms being carried by the runoff. The best fishing in runoff conditions occurs in the first one to four hours after runoff begins. Fishing for channel catfish is very good during runoff. Baits such as rotten shad, sponge bait and fresh shad are best.

Water conditions — clarity, level and temperature — also affect fishing success. Increasing turbidity due to wind action or runoff will generally slow feeding activity. Sight feeders will either move to locations where water clarity is improved or will be less likely to see potential food items or fishermen's baits. The opposite may occur when waters change from extremely clear to some intermediate condition where clarity is such that sight-feeding fish can see food items but visibility is

reduced to such an extent that fish are less wary and more aggressive. Baits should be worked slower in more turbid waters since the distance a fish can see the bait is reduced.

An increase in water level means more acre-feet for a given number of fish, thus reducing the number of catchable fish per acre-foot. But fish are seldom, if ever, equally distributed and tend to concentrate in preferred locations. During all seasons except winter, high water levels entice fish into newly-flooded areas to seek food and

fish more available to predators. Under these conditions, look to areas of deep water adjoining shallows. Stream channels and steep drop-offs near points are good bets during periods of prolonged low water levels.

The seasons of the year certainly affect fish activity. As water temperature decreases in the fall, fish require less food because of reduced metabolic rates; one meal will take much longer to be digested. In late fall fish move into deeper water. There they find less disturbance from wind, reduced currents

deeper water. Mud flats are good areas to fish in early summer to catch white bass, walleyes and channel catfish. These areas are even better if they adjoin old river channels or other deep-water locations. Submerged trees, brush piles and under-water islands with either rooted vegetation or rocky substrate are good spots to find largemouth bass, spotted bass, flathead catfish and crappies.

Fish become less active in mid summer, for several reasons. First, high water temperatures mean reduced oxygen levels in the water — right when metabolic demands have been increased by warmer temperatures. Fish respond by conserving energy when they can and taking advantage of cool spots in the water. During mid summer fishing will be most productive at night, on cloudy days, and at dawn or dusk. Best bets are shaded areas and deep-water pockets.

In summary, most fish species move to shallower waters in the spring and fall and when light levels are reduced. They swim to deeper water in summer and winter and under brighter light conditions. Fish select the depth of water which provides them with optimum temperature, light and oxygen conditions.

Here are activity profiles and a few tips for Kansas' most popular gamefish:

Largemouth Bass: . . . sight feeder; spawns at water temperatures near 70 degrees F; almost always found near heavy vegetation. **Spring:** Fish the shoreline. **Summer:** Fish deep, submerged creek channels, timber and brush piles at water depth of eight to 20 feet. Watch for feeding activity in open water on schools of shad; then fish both shallow and deep to catch fish. **Fall:** Fish shoreline, points, weed beds. **Winter:** Fish deeper water — eight to 30 feet; move bait very slowly.

Smallmouth Bass: . . . sight feeder; spawns at water temperatures of 60 to 70 degrees F; prefers cooler water temperatures than other black bass; frequents rocky areas, clear water. Fish the rocky parts of lakes and the brushy holes and riffles of streams. This species is almost impossible to catch in winter, late fall and early spring since it becomes almost dormant at low water temperatures.

Black and White Crappie: . . . sight feeders; spawn at water temperatures of 55 to 65 degrees F; ac-



Gene Brelim photos



These anglers know any brushpile could hold a bragging-size bass. The largemouth at boatside is proof they're looking in the right places. The dinner-table scene below is one most anglers never see, but it's educational. Look at that cover!

cover. Home in on submerged islands, heavy stands of submerged vegetation, the upper portions of coves and the confluence of rivers, streams, or ditches. If water levels are allowed to rise over a period of time, water clarity will generally improve, with a subsequent increase in feeding activity, especially in those areas listed above.

Decreases in water level make bait

and concentrations of food moved into still water by wind in the shallows.

In spring fish move from deep water to shallow shorelines which will provide both suitable spawning sites and warmer water temperatures. Here prey species will also congregate, providing food for accelerating metabolisms.

As summer approaches fish disperse from shoreline locations and move into

tive all seasons. **Spring:** Fish one to six feet deep near rocky or brushy areas. Minnows and small jigs are both very effective. **Summer:** Try depths of eight to 30 feet with minnows as bait. Key in on deep-water brush piles. **Fall:** Fish four to 12 feet deep in brushy areas with minnows or jigs. **Winter:** Fish in six to 20 feet of water with minnows or jigs. Crappies are very lethargic in cold water and bait must be worked slowly to get results.

Channel Catfish: This fish relies

water. In early summer good catches of channel catfish can be had by fishing deep pools where gar are seen surfacing. Channel catfish feed on the eggs of spawning gar. Baits work best on the bottom of such pools. Channel catfish are susceptible to setlines placed six to 15 feet deep in reservoirs. Bank lines in pools below riffles are good locations in streams; set line baits do very well here with baits two to six inches below surface. **Fall:** Set lines as in summer. Shad concentrations play an important part in channel catfish location in the fall. Wind

gree water. Live bait is best for flat-heads; sunfish, goldfish, carp, crayfish and worms are popular. **Spring:** Fish rocky areas in or near water six to 15 feet deep. **Summer:** Fish deep river channels, suspend baits one to two feet off bottom. **Fall:** Fish areas between shore and deep river channels. Submerged timber and large brush and tree piles in 10 to 20 feet of water are good locations in both summer and fall. **Winter:** Locate the deepest hole in a river or on a lake. Fish about a foot off the bottom, using large sunfish and carp for bait.

Walleye: . . . sight feeder; spawns at water temperatures of 45 to 55 degrees F. Minnows, worms, spinners and jigs are the best baits. **Spring:** During March and April fish the face of dams and rocky areas, one to eight feet deep. **Summer:** In May and June fish the mud flats, points and submerged islands. Later troll river channels and deep pools, mud flats at night. In deep pools vertical jigging is a good method. **Fall:** Fish the shoreline or mud flats. Walleyes have a highly developed sense of sight and feed mostly in the subdued light of cloudy weather and at night. **Winter:** Troll very slowly in the deepest part of a lake or river.

White Bass, Striper and Hybrid Wiper: . . . sight feeders; spawn at water temperatures of 55 to 60 degree F. Jigs, minnows, deep-running crank baits and spinners are good baits. **Spring:** Fish river and creek channels and rocky-sandy flats in lakes, as the fish are spawning there. Trolling is an effective way to locate fish concentrations — usually in two to five feet of water. **Summer:** Fish mud flats, submerged islands and river channels in lakes, also deep pools in streams. Diving crank baits or jigs are effective. Fishing at night with light to attract bait fish is especially productive if you're after white bass. **Fall:** Fish mud flats, points and sandy gravel areas. Trolling is again effective, especially in and below shad schools. Go as slowly as possible and keep baits near the bottom.

Sunfish (including bluegill, green sunfish, redear and warmouth): These fish can provide some excellent angling in late spring and summer. In late May through July fish shorelines in weed beds or submerged timber with worms or small spinner baits. Cast into the shoreline. In summer, fish six to ten feet deep and suspend your bait about one foot off the bottom.

Drum: Fishing for this species is especially productive in June, July and early August. Fish with worms on the bottom on mud flats in four to eight feet



Gene Brehm photos



Depending on your quarry and the weather conditions, you can get fast action both off points and in protected coves. A motor isn't necessary in backwaters but provides mobility and safety on large impoundments.

primarily on its sense of smell to locate food and can be caught under muddy water conditions. At flood times, fish runoff water with stink baits. **Spring:** Fish upper ends of lakes and reservoirs. Also try mud flats and weed beds near shoreline and riffles and pools below riffles in streams. Worms are good bait. **Summer:** Fish submerged river channels and mud flats in six to 15 feet of

considerations are very important on large lakes. Fish fresh shad for good results. **Winter:** Fish deep river channels, 15- to 25-foot depths in lakes and deep pools in streams. Rotten shad sides are the best bait.

Flathead Catfish: These fish seek their food through both sight and smell. Spawning takes place in 75-de-

of water. Fish at night during early summer months.

Carp: Carp provide fine angling in the heat of the summer, both day and night. Fish brush piles and weed beds. Use a small treble hook, as this fish has a small soft mouth. Playing a carp will help prevent the hooks tearing out. Good baits include canned corn, dough baits and worms. Carp are quite spooky and you must be quiet while fishing.

Kansas has many productive streams, lakes and ponds. If you're itching to dunk a lure, decide first what species you want to catch, then investigate suitable habitat in your area. Here are some waters that produce consistently good catches:

Anglers in search of the season's first fish are usually after spawning walleyes on rocky dams or shorelines. The best walleye water in northeast Kansas is Melvern Reservoir. In the southeast

none of the large impoundments are walleye hotspots, but Hillsdale is probably the best. Marion takes top walleye honors in southcentral Kansas, although the new El Dorado Reservoir is improving. Northcentral Kansas is a haven for walleye enthusiasts, with five reservoirs—Glen Elder, Lovewell, Milford, Kanopolis and Wilson—providing good fishing. Glen Elder and Milford are the best of those. In western Kansas, where water is scarce, Kirwin and Webster reservoirs can provide some top-notch spring walleye fishing.

Early fishing for crappies can also be good. Currently the best crappie reservoirs in Kansas are in the southcentral and southeast regions of the state, at Big Hill, Marion, El Dorado and Hillsdale reservoirs. In northern Kansas, Perry and Milford offer good crappie fishing, and several others around the state produce nearly as well: Clinton, Melvern, Pomona, Tuttle Creek, Elk City, Fall River, Toronto, Council Grove, Glen Elder, Kanopolis, Cedar Bluff, Sebelius and Webster all yield respectable crappie catches.

Though short-lived, white bass spawning runs are enjoyed by many Kansas anglers. Pomona, Marion and Cedar Bluff are some of the best waters for these fish. Other good impoundments include: Cheney, Melvern, Tuttle Creek, Elk City, John Redmond, Fall River, Toronto, Glen Elder, Milford, Kanopolis, Wilson and Kirwin reservoirs. Many of these also offer good open-water white bass fishing during the heat of the summer.

Good striped bass fishing can be had in Wilson, Cheney and Glen Elder reservoirs. Wipers (white bass-striped bass hybrids) are relatively new to the state, and are not found in most lakes. Kirwin and Sebelius are the best large reservoirs for anglers who want to try these hard-fighting crossbreeds. Both lakes are in northwest Kansas.

Big Hill and El Dorado reservoirs command nearly all the attention among Kansas black bass fishermen. Both boast huge expanses of submerged timber. In early summer these waters provide some of the fastest action in the country for smallmouth bass as well as largemouths. Four other Kansas reservoirs—Melvorn, Hillsdale, La Cygne and Glen Elder—are also highly rated for black bass.

Summer is the season for channel catfish, and of the state's reservoirs only Kirwin and Webster are rated less than

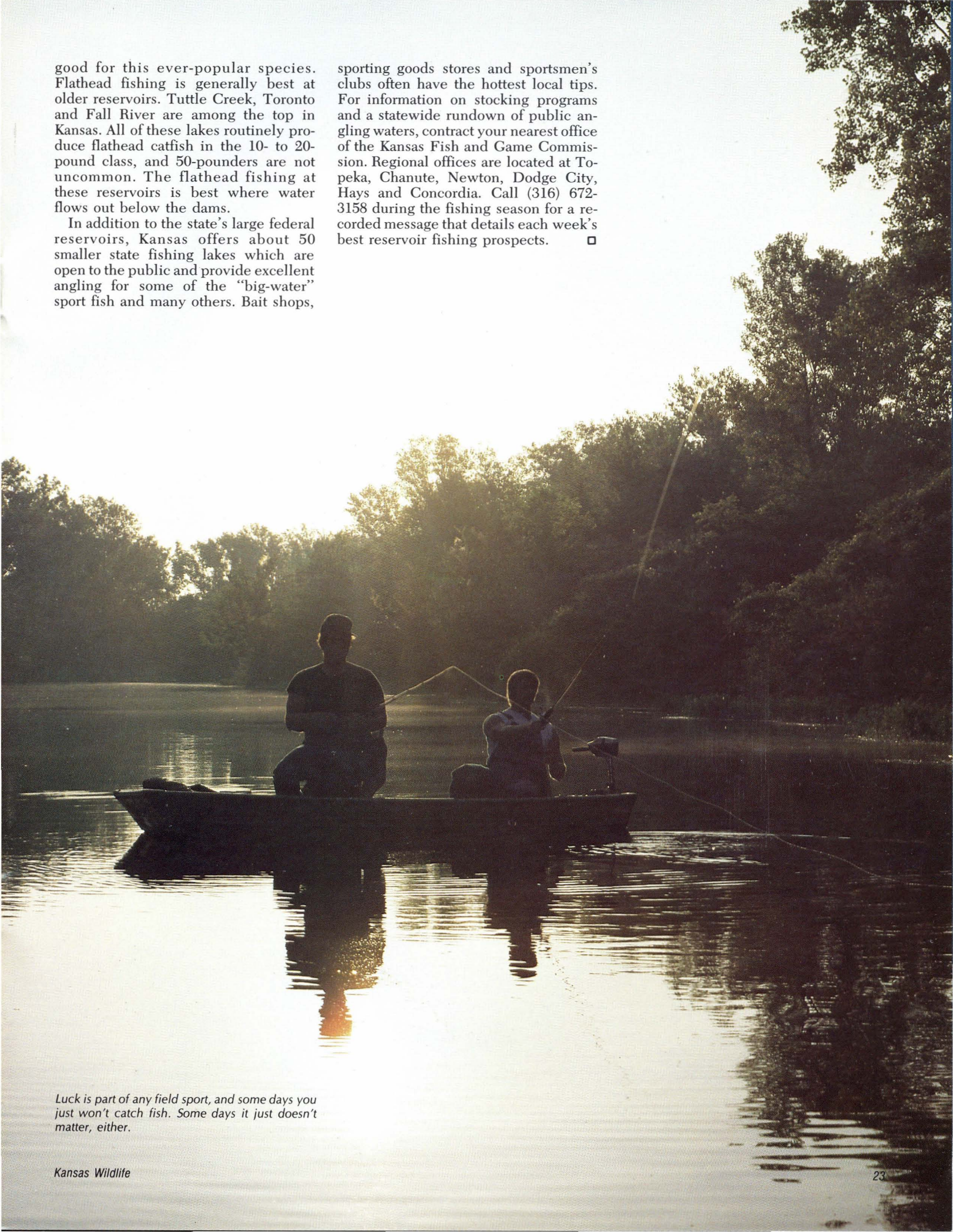
"I got one!" And a quiet day in the boat is suddenly different. Your heart beats with the frenzy of Ol' Bigmouth's tail, and you wonder if that line will hold!

Gene Brehm photo

good for this ever-popular species. Flathead fishing is generally best at older reservoirs. Tuttle Creek, Toronto and Fall River are among the top in Kansas. All of these lakes routinely produce flathead catfish in the 10- to 20-pound class, and 50-pounders are not uncommon. The flathead fishing at these reservoirs is best where water flows out below the dams.

In addition to the state's large federal reservoirs, Kansas offers about 50 smaller state fishing lakes which are open to the public and provide excellent angling for some of the "big-water" sport fish and many others. Bait shops,

sporting goods stores and sportsmen's clubs often have the hottest local tips. For information on stocking programs and a statewide rundown of public angling waters, contact your nearest office of the Kansas Fish and Game Commission. Regional offices are located at Topeka, Chanute, Newton, Dodge City, Hays and Concordia. Call (316) 672-3158 during the fishing season for a recorded message that details each week's best reservoir fishing prospects. □



Luck is part of any field sport, and some days you just won't catch fish. Some days it just doesn't matter, either.

A dramatic night sky with lightning and silhouetted trees. The scene is dark, with a large, jagged lightning bolt striking from the upper left. In the foreground, the dark silhouette of a large, leafless tree dominates the right side. To the left, a smaller, rounded tree is visible. In the distance, another lightning bolt strikes near the horizon, illuminating a patch of clouds. The overall mood is intense and powerful.

*FIRE
FROM THE
HEAVENS*



Lightning is one of those things that will never be adequately described in print. Even photographs fail — though these hint at its unbridled power, its percussive suddenness. Once in a while everyone should take time to witness the booming and thrashing and violent churning of the heavens. The experience provides a perspective, one we don't often get elsewhere. It makes us feel small; and small we are.

Lightning can be a fearsome thing — the "bolt from the blue" that springs from the dark and powerful world beyond the clouds, the realm we do not understand, the source of which makes us afraid. But lightning can also be seen as a connection. In one blinding, stunning, immutable instant heaven and earth are linked. There is something very wonderful about that. Teenagers these days would say it's awesome. I guess I would too.

—Wayne van Zwoll

photographs by Gene Brehm





The Extinct: Losses and Lessons

Joe Schaefer

***It didn't just happen then;
it's happening now. Then
we were ignorant; now
there's no excuse.***

Think of the Kansas outdoors without any deer, pheasants, meadow-larks, squirrels or cardinals. A ridiculous fantasy, you say? The fact is, dozens of wildlife species that once roamed these plains are now present only as fossil remains or in the memories of old timers. About 22 species have been extirpated from Kansas within the last 100 years. Some of these are no longer part of Kansas' wildlife fauna but can still be found in other areas of the United States. Others will never be seen again, anywhere.

Centuries ago, extinction was a natural process that occurred with environmental changes. Perhaps 99 percent of all animal species that once existed are now extinct. The slow, natural rate of



extinction allowed for new species to evolve that were better adapted to the changed world.

Recently, the extinction pace has been stepped up by man's increased ability to alter most of the earth's habitats. Until about 1600, the worldwide extinction rate was roughly one species every 50 years. Approximately 75 mammal and bird species were lost between 1600 and 1900, and another 75 species since 1900, a rate of nearly one per year for just these two classes of animals. The passing of many lesser-known species goes unrecorded. Some scientists estimate as many as one to three extinctions may be occurring daily in all groups of animal life, and if this acceleration continues the rate could reach one per hour

in just a few years. Worldwide, at least one million species of fauna are likely to be lost in our lifetime. This rapid unnatural pace does not allow for replacement by evolution of new species.

Habitat alteration is at the root of many wildlife problems. Some animals are very specialized and even slight changes in their environment may jeopardize their survival. For example, wildlife simply cannot adapt fast enough to the rapid land use changes in Kansas. During the past five years, total urban acreage in the state increased about 14 percent. Some counties have experienced as much as a 200 percent increase. Kansas rangeland and prairies are being replaced by irrigated croplands. Water supplies in the state are

The plains elk was a common animal at the time of Lewis and Clark; now it is gone. The only elk in Kansas today are those in refuges. These animals are raised from stock imported from mountain states where the Yellowstone or Rocky Mountain strain is successfully managed.

being depleted. Our rivers have been channelized, our streams dammed and our water polluted.

Kansas prairies used to be the home of thousands of wapiti (elk), bison and white-tailed jack rabbits. Large predators like the gray wolf, grizzly bear and mountain lion also were important components of the Kansas ecosystem. The once-continuous prairie has been transformed into a mosaic of fenced pastures

Kansas Extirpated Wildlife

Mammals

1. White-tailed Jackrabbit
2. Red Wolf
3. Gray Wolf
4. Grizzly Bear
5. Black Bear
6. River Otter
7. Mountain Lion
8. Wapiti
9. Bison

Birds

1. Swallow-tailed Kite
2. Ruffed Grouse
3. Sharp-tailed Grouse
4. Passenger Pigeon
5. Carolina Parakeet
6. Common Raven

Fishes

1. Bigeye Chub
2. Pugnose Shiner
3. Blacknose Shiner
4. Trout-Perch
5. Western Sand Darter
6. Iowa Darter

Amphibians and Reptiles

None

Invertebrates (incomplete list)

1. Hickory Nut Mussel

KANSAS ENDANGERED WILDLIFE

<i>Species</i>	<i>Limiting Factors</i>
Black-footed Ferret	destruction of prairie dog towns
Gray Bat	human disturbance of colonies, insecticides, destruction of caves
Peregrine Falcon	pesticides
Whooping Crane	hunting in 1800's, habitat alteration
Eskimo Curlew	market hunting in 1800's, habitat alteration
Bald Eagle	pesticides, habitat alteration, shooting
Neosho Madtom	river channelization, siltation, impoundments
Pallid Sturgeon	river channelization, pollution, commercial fishing
Sicklefin Chub	channelization
Central Newt	reduction of suitable undisturbed ponds
Grotto Salamander	never common in Kansas
Greybelly Salamander	never abundant in Kansas
Cave Salamander	restricted range in Kansas
Small Amphibious Snail	unknown
Warty-backed Mussel	unknown
Heel-splitter Mussel	never common, drainage and periodic drying of quiet water areas

KANSAS THREATENED WILDLIFE

<i>Species</i>	<i>Limiting Factors</i>
Prairie Falcon	pesticides and shooting
Least Tern	channelization of rivers, market hunting, pesticides
Blue Sucker	siltation, impoundments
Arkansas Darter	water depletion
Topeka Shiner	siltation, pollution, impoundments
Alligator Snapping Turtle	channelization
Northern Crawfish Frog	wetland alteration and drainage, lowering of water table
Riffle Beetle	unknown, species not discovered and named until 1978

with non-native grasses, croplands, highways, railroads, cities and other developed areas.

Habitat alteration was not the only factor that led to the demise of prairie wildlife. Genetic swapping has also affected some species. The red wolf, once native to Kansas, has hybridized with the coyote. This mixing of genes will, over time, eliminate all the pure-bred red wolves. Habitat alteration is responsible for the adaptable coyote's movement eastward into the red wolf's previously exclusive range.

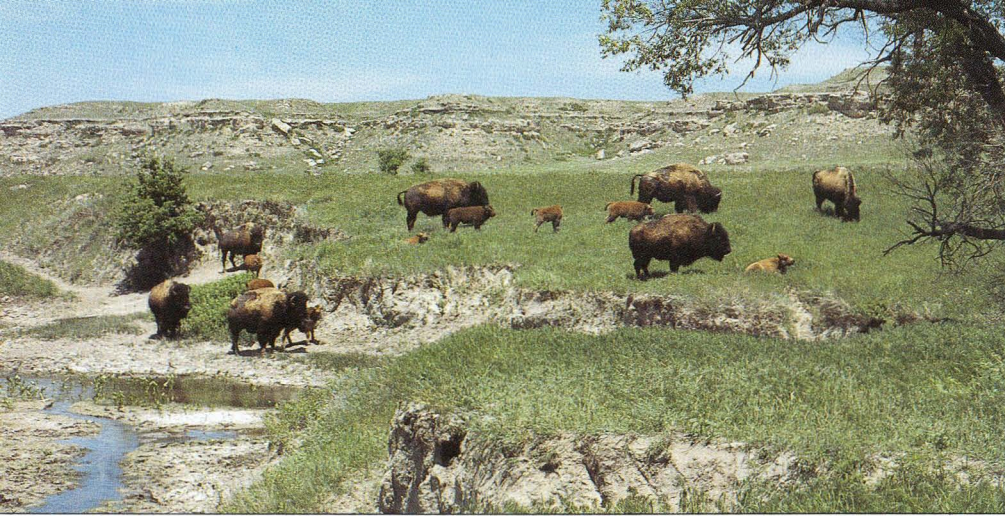
The widespread use of chlorinated pesticides such as DDT played a role in eliminating some wildlife species. When ingested, these chemicals impaired gonad function and caused production of extremely thin-shelled eggs. The eggs of raptors like swallow-tailed kites and peregrine falcons were destroyed by the weight of the incubating females.

Usually more than one factor is responsible for driving a species to extinction. The history of the passenger pigeon is a case in point. This species was once the most abundant bird on earth. There were more passenger pigeons in the 1800s than there are black birds, starlings and house sparrows today. Many influences contributed to the elimination of this bird. First, the pigeon had a very specialized diet; it fed exclusively on beechnuts and acorns. During our pioneer era, many potential nest and food trees were chopped down or burned to make room for farms and settlements.

A low biotic potential also worked against the pigeons. Although many perching birds, such as robins, lay four to six eggs per clutch, the female pigeon produced only a single egg per nesting. Too, the reduction of flock size by hunters may have deprived the birds of the stimulus required for mating and nesting.

Finally, the bird's decline was hastened by persecution from market hunters. Every imaginable instrument of destruction was employed, including guns, dynamite, clubs, nets, fire and traps. Pigeons were burned and smoked out of their nesting trees. The last wild pigeon was shot in 1900.

Market exploitation took a heavy toll on many other species as well. By the late 1800's, markets, railroads, manpower and guns were developed enough to overharvest game populations. While the destruction of the bison herds was also a government goal in an effort to bring the plains Indians to their knees, the vanishing of the bison as a free-ranging beast was the most dramatic result of overharvesting wild



Gene Brehm photo

Token bands of bison are maintained in Kansas, remnants of herds of unimaginable size that cloaked the native-grass hills and swarmed, a chocolate tide, through the yellow dust of prairie washes.

game that the world has ever known. Other species, too, felt the pressure of a meat-hungry nation and suffered because man's ability to kill exceeded his capacity to reason.

Without any restrictions on the taking of game, market hunters sold thousands of animals per month to restaurants, meat markets and clothiers. By 1900 there were only 500,000 deer left in the whole United States — a small remnant of the countless millions that once existed. About 90 percent of the wild turkey range was gone, and only 50,000 elk remained from a herd that was once 10 million strong from coast to coast. This country's big game animals had been reduced by 80 percent.

Predator populations subsequently suffered from a diminishing food supply. Many carnivores were also persecuted because they were thought to compete with man for what game was available. The dramatic and continuing loss of so much wildlife finally sparked action by a few concerned citizens in the late 1800s. The first game laws were passed in 1861 to stop or limit hunting of particular wild game species in Kansas. Hunting was made a privilege to be enjoyed by all citizens as the law permitted and lost its status as an unregulated right. Enforcement of these laws was lax at first, however, and the indiscriminate harvesting of game continued well into the early 1900s.

Legal sport hunting has never been a threat to the existence or survival of game animals in the United States. In fact, this wildlife management tool has benefited most wildlife species. Hunting is now regulated so that only the surpluses of the most common forms of wildlife are harvested. Many techniques learned in the management of wildlife that is hunted are now being used to help preserve species in danger of extinction.

In the early part of this century the only thing that was being done to keep more species from extinction was the

regulation of wildlife harvesting. Habitat alteration continued to jeopardize wildlife populations. Finally, the U.S. Fish and Wildlife Service began a program in 1964 specifically directed to species that were declining in numbers. A Rare and Endangered Species Committee was organized and an "endangered" classification was established for those species in imminent danger of extinction in the wild. Then the federal Endangered Species Preservation Act of 1966 required the Service to develop and maintain an official Endangered Species list. This act also provided funds for habitat acquisition and management of listed species.

In 1969 the Endangered Species Conservation Act was passed. It gave the Service the authority to list foreign animal species and to restrict their import. In 1973, the Endangered Species Act recognized "threatened" species as a category for those species likely to become endangered within the near future, and provided protection to native species in both classifications. It included tough penalties for people found guilty of harming threatened or endangered wildlife. This act also authorized cooperative agreements between the Service and state conservation agencies to fund the research and management of listed species. Currently, there are 185 endangered species and 45 threatened species in the United States, as listed by the U.S. Fish and Wildlife Service.

In order for a state agency to enter into a cooperative agreement with the Service, endangered species legislation on the state level was needed. So in 1975 the Kansas legislature passed the Nongame and Endangered Species Act. This act charged the Fish and Game

The gray bat is an endangered species in this state, to date found only in the storm drains of Pittsburg. The last recorded sighting of a black-footed ferret in Kansas was in 1957. It is now one of the rarest mammals in North America.

Commission to prepare a list of wildlife that has shown evidence of population decline. From this list, the Commission was to determine which ones were threatened or endangered. In 1976, a seven-member Endangered Species Steering Committee and five species evaluation groups recommended 137 species for possible endangered or threatened listing in Kansas. The list was eventually reduced to 24 in 1980. There have been four petitions received by the Fish and Game Commission to consider additions to the list (one toad, five frogs, two snakes and seven muskels). However, no additions have been made.

The goal of the Kansas Threatened and Endangered Species Plan is to improve the status of these species to the point they no longer need to be listed. In order to achieve this goal, the plan



Gene Brehm photo



LuRay Parker photo

includes six objectives: 1) to determine where our listed species are occurring and their relative abundance; 2) to determine the habitat needs of these species; 3) to supply these needs wherever they are limited; 4) to protect existing critical habitat; 5) to restore populations wherever habitat and other conditions are favorable; and 6) to protect listed species from violations against the endangered species acts. Currently, federal funding, Fish and Game's general fund and the nongame income tax fund are supporting efforts in all of these areas.

Some people may say "So what if a few of 1.5 million species of wildlife become extinct? That won't affect me." Unfortunately, this belief that things have no value unless they are directly beneficial to man is quite prevalent in today's society. Each individual animal and each species are important compo-

nents of the various ecosystems. We do not fully understand these complex systems, but we do know that every organism affects to a greater or lesser extent every other organism within the same system. When a species becomes extinct, the orderly balance of nature is lost. Constraints on the more opportunistic and aggressive species are reduced, resulting in further imbalance.

Many endangered species have a very low tolerance to minor environmental change. Because any change that affects another animal may eventually affect humans, those species serve as indicators of environmental quality for us. A good example of this value came when we discovered that the insecticide DDT was detrimental to several birds of prey. This warning signal eventually led to the banning of many insecticides that are dangerous to humans.

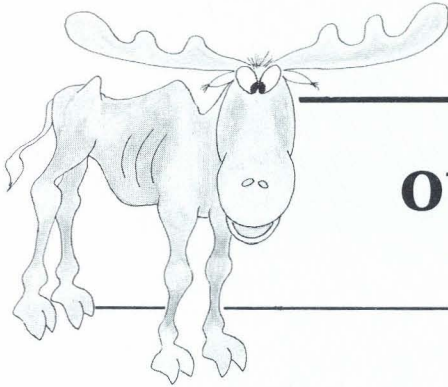
The extinction of a bird like the

whooping crane would be an awesome loss to science. This bird represents the end product of many millions of years of evolution. It has genetic material found nowhere else. Its anatomy, physiology, and behavior patterns are unique among all organisms on earth.

One never knows in what way some obscure animal may be of direct value to man. Penicillin, for example, has saved the lives of millions of people. Its source is a slimy green mold commonly found on rotting oranges. Perhaps some species now on the verge of extinction will eventually enable us to cure cancer. □

As someone once said, "Extinction is forever." There is no second chance to bring back a unique part of the life of our planet. The ghost-like forms of these whooping cranes should remind us of that. There aren't many of the big birds left. It is up to us to see that there is never a last one.





off trail

... with *Stub Snagbark*®

Have you ever thought about boards? We owe a lot to boards. Most of us live in houses built with boards and work in buildings that have at least a few boards in them. Boards look dead and, in truth, aren't all that active, but they all came from living trees. Boards are to trees what Kraft sliced American in cellophane is to real cheese.

Boards are good for wildlife too. Ants, termites and other small creatures make their homes in boards. Some even eat the wood fibers, digesting the cellulose, I suppose, much as a cow is able to use the cellulose in grass fibers. No, I don't think termites are ruminants, but I don't really know. All I know is that termites would have a tough go of it if all our homes were built from concrete blocks.

Larger animals also use boards. Piles of boards left outside can attract pack rats, mice, chipmunks, squirrels, rabbits, even small birds. Once when I was living in snake country I found a rattler curled up next to the corner of my board shed. I got my camera, then crawled on my belly to within a couple feet of the coiled snake. Ground-level photos of reptiles are always more impressive than those taken from five or six feet in the air. As I snapped the shutter, a loud buzzing erupted from the pile of boards beside me. A larger snake wanted his picture taken too and was crawling toward me on top of the pile. Though close-ups of rattlers from underneath their chins make interesting photos, I

declined the pose. I don't lie down next to board piles anymore.

Boards tell stories. In those knots and rings, woodpecker holes and termite tunnels is the history of a living organism. The smell of some boards is like the smell of the woods, the rough texture of their surface a kind of reflection of life where things rarely come easy. Smooth boards are never as interesting as rough ones. A board that has been stained or varnished isn't really a board anymore; it's furniture. Particle board is the grated cheese of the lumber industry and I don't like it at all. Cardboard is handy for lots of things, but it isn't board per se.

All true boards have splinters. That's how you can tell a board from a tree and from tree products that aren't boards. Splinters can be a nuisance, but there's something very honest and basic about a splinter. It helps, if you get a splinter, to shrug your shoulders and say "oh, well, it's just a piece of cellulose."

The squareness of boards always bothered me. There's nothing wrong with injection-molding plastics or casting aluminum in an artificial shape, but I think it's a shame to do a tree that way. Trees all come in unique shapes. No two trees are exactly the same, or, if they are, you'll never prove it. They're like snowflakes, beautiful because nature made each in an original form. Boards without bark, planed to certain dimensions and cut squarely to a predetermined length, are no doubt more useful

than boards of random shape, but they're also less interesting. Who would want all snowflakes cubed?

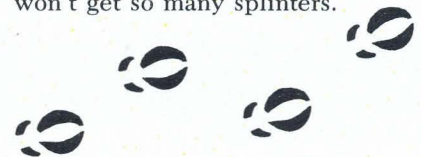
Some boards get the last laugh, of course. No matter that they're cut perfectly, then planed and edged. They won't be controlled. They warp. And just so they won't be like other boards they warp in a singular fashion. You can't predict how a board will warp.

As hard as we try, we'll never completely strip a board of its personality. Each has a unique grain structure, color pattern and weight. Some boards float better than others. There's a lot of difference in strength between boards too. And all boards react individually to changes in environment and climate. Boards, come to think of it, are a lot like people.

When log cabins came into vogue as vacation homes, I'll bet a lot of boards got anxious. They probably remembered the advent of the metal boat hull and linoleum floors. Logs, after all, can do anything a board can do in a wall. But after looking at homes and cottages built with both logs and boards, I think a good rustic board comes across just as woody as a log, and you can get several boards out of one log.

People are using boards for lots of things they didn't a few years ago. Picture frames used to be finely finished, but boards are now considered more tasteful, the rougher the better. Board fences are coming back too. And boards are replacing panelling in some rooms. The rustic look is in.

Still, one of the best uses for boards is the boardpile. It's not a front yard type of thing, but if you put it in the right place and keep it free of cardboard, particle board and other contaminants, it looks OK. It is sort of basic and honest, like a splinter. A boardpile is so useful to so many creatures, everybody should build one. When you do, look at each individual board as you handle it. Give it a name — perhaps the name of a person it reminds you of. If you treat boards gently and with respect you won't get so many splinters.



Fishing is more for philosophers than outdoorsmen. The sleepy sheen of a lake, the carefree gurgling of a brook, the bellicose roar of the surf all have messages, if we would just heed them. Sometimes catching fish seems to destroy the integrity of the water, and keeping fish robs it. Yet the depths remain fertile, giving us plenty for our minds as well as our bellies.

—V. Woodmont

