

KANSAS WILDLIFE

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Contents

a look back

Visitors to pre-settlement Kansas found endless vistas swarming with a rich variety of wildlife. According to their accounts, early Kansas was an awesome sight

4

the electronic fisherman

Sonar, microprocessors, graphic displays, digital readouts. Modern technology is helping thousands of anglers de-mystify the habits of fish cruising the featureless expanses of today's lakes

14

the sandhill returns

Modern research has shed much light on the biology of sandhill cranes. Investigation has revealed some surprising results and supplanted many long-held misconceptions

17

sky dancer

This stylish aerial showstopper may look like it belongs exclusively in the Central American jungle, but the scissor-tailed flycatcher is a common sight on the plains .

22

out of their depth

Understanding the seasonal movements of fish can make all the difference in the heft of your stringer. A fisheries biologist reviews the seasonal "up and down" tendencies of several species

28

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Pheasant by Ed Wards

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Fishing clinics . . . sporting goods manufacturers'
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. . . barbecued buffalo . . . sportsmen's club
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Cessna Activities Center, Wichita





*early visitors
found beauty
on the plains—
much of it
is here still.*

a look back

Rob Manes

The first records of the vast grasslands now known as Kansas were made by a Spaniard, Francisco Vazquez de Coronado. Serving under Viceroy Antonio De Mendoza in Mexico, Coronado was commissioned to venture north in search of the fabled seven golden cities of Cibola. “Quivira”, rumored to be the richest of the cities, was said to have streets paved with gold and doors inlaid with jewels.

In 1541, Coronado and his men entered southwest Kansas. They found no cities of gold,



Scott County bison by Gene Brehm

only an expanse of grass that outran the imagination. Coronado wrote that there were “no more landmarks than as if we had been swallowed up in the sea where they (his men), strayed about because there was not a stone, nor a bit of rising ground, nor a tree, nor a shrub, nor anything to go by . . . The country seemed round as if a man should imagine himself in a three-pint measure, and could see the sky at the edge of it, about a crossbow shot from him, and even if a man only lay down on his back he lost sight of the ground.”

The vista was endless, no roads, no fences, only numberless droves of wild animals—the North American counterpart of Africa’s Serengeti Plain.

“My silence was not without mystery and dissimulation when I spoke of the plains and of the things of which I will give a detailed account in this chapter,” Coronado wrote. “For these things are remarkable and something not seen in other parts. I dare to write of them because I am writing

at a time when many men are still living who saw them and who will vouch for my account. . . . I wish to describe the bulls . . . They have very long beards, like goats, and when they are running, they throw their heads back with the beard dragging the ground. They have a great hump, larger than a camel’s. The horns are short and thick, so they are not seen much above the hair. They have a short tail with a bunch of hair at the end. When they run, they carry it erect like a scorpion. The bulls traveled without cows in such large numbers that nobody could have counted them . . .”

The land of Quivira is thought to have been in present-day Rice and McPherson counties. Coronado and his men ranged the area for almost a month. They found no treasure, only Indian villages, but they were pleased by the surroundings:

“. . . rich black soils well watered by arroyos,



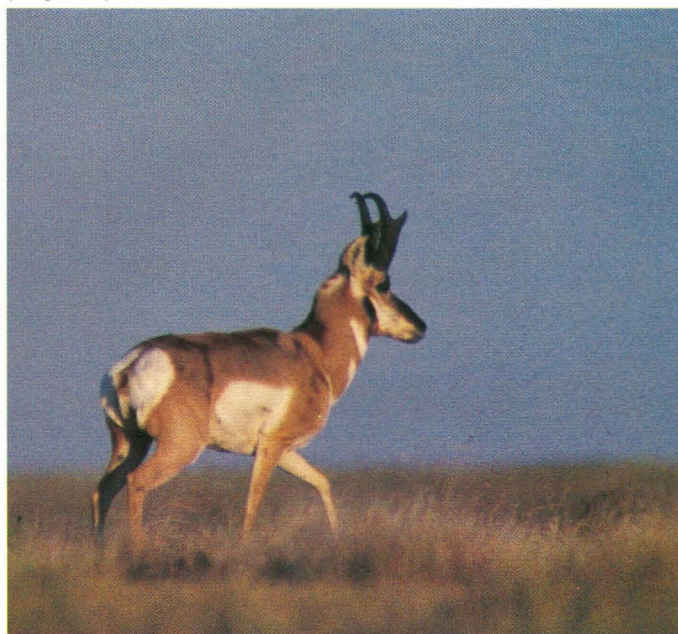
springs and rivers”

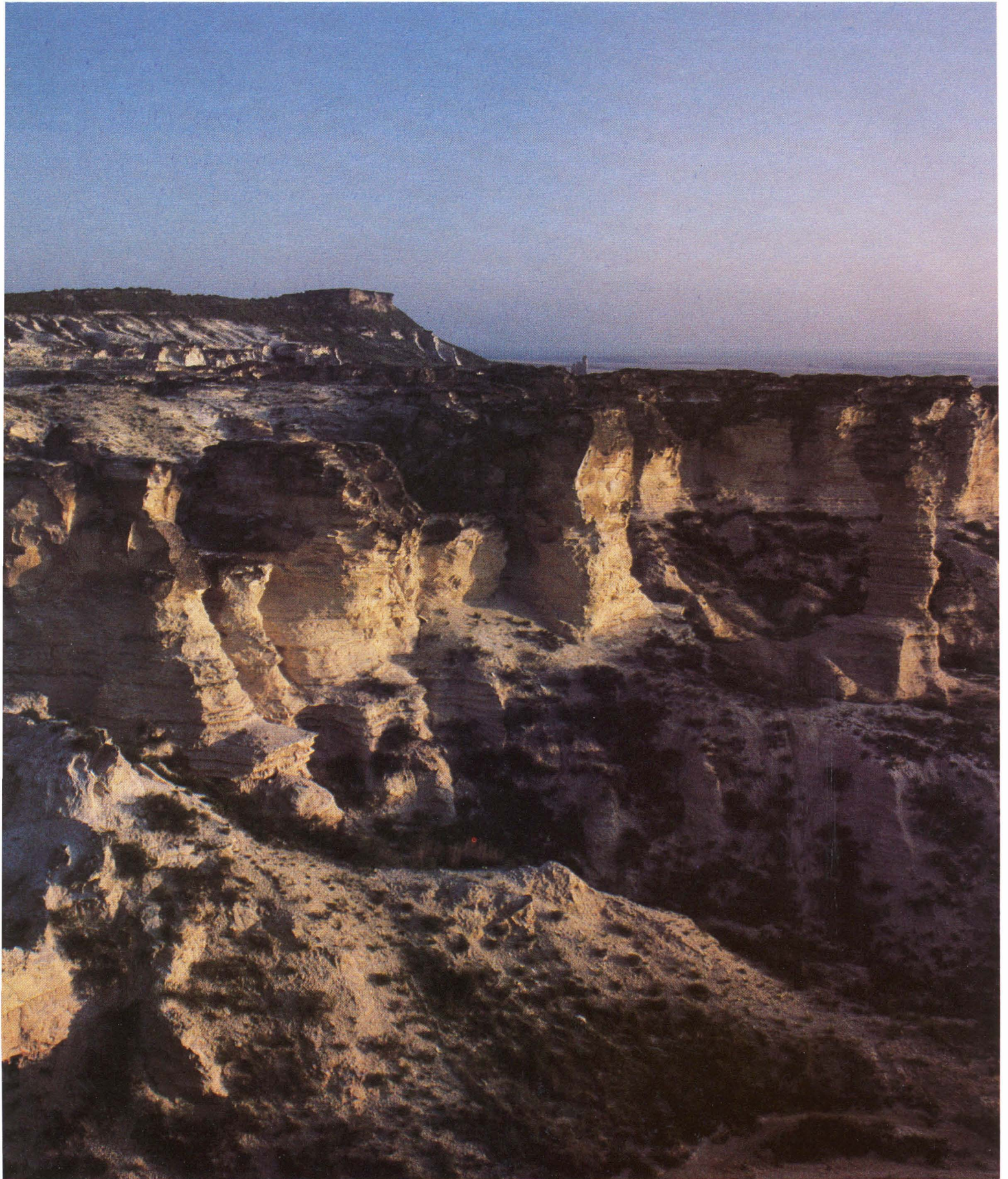
“ . . . it is not a hilly country, but has tablelands, plains, and charming rivers with fine waters”

Dispatched to lead an exploration of the newly acquired vast prairie country in 1809, Lieutenant Zebulon Pike met with sights that were foreign to his eyes. For lack of a better frame of reference, he compared Kansas’ great plains to the endless African deserts. In crossing the unboundried Flint Hills, Pike observed, as he wrote it, “buffaloes, elk, deer, cabrie, and panthers.” The cabrie he referred to are pronghorns, commonly called antelope. A “panther,” or mountain lion, has not been confirmed in the state since around the turn of the century, but many experts seem convinced that the big cats roam the state today.

Meriwether Lewis and William Clark came to the Kansas grassland 250 years after Coronado’s expedition. The American explorers were privileged

pronghorn by Gene Brehm





to see and hunt the magnificent herds that ranged over the state in the early 1800's. As they reported, it was easy for a man to live on the richness of the land in those days:

"We saw immense herds of buffalo, Elk, deer and Antelopes. Capt. Clark killed a buffalo and four deer in the course of his walk today; the party with me killed 3 deer, 2 beaver, and 4 buffalo calves. The latter we found very delicious. I think it equal to any veal I ever tasted . . .

"This scenery already rich, pleasing, and beautiful was still further heightened by immense herds of buffalo, deer, Elk, and Antelopes which we saw in every direction feeding on the hills and plains. I do not think I exaggerate when I estimate the number of buffalo which could be comprehended at one view to amount to 3,000 . . ."

A journal entry made by Lewis on April 22 of 1807 noted large, canine predators acting in their capacity as one of nature's tools for culling out the weak and less fleet-of-foot:

" . . . Captain Clark informed me that he saw a large drove of buffalo pursued by wolves today, that they at length caught a calf which was unable to keep up with the herd. The cows only defend their young so long as they are able to keep up with the herd, and seldom return any distance in search of them . . ."

In August of 1819, Major Stephen H. Long recorded an early view of northeast Kansas along the Kansas River:

" . . . its valley, like that of the Missouri, has a deep and fertile soil, bearing similar forests of cottonwood, sycamore, and interspersed with meadows; but in ascending trees become more and more scattered, and at length disappear almost entirely, the country at its source being one immense prairie."

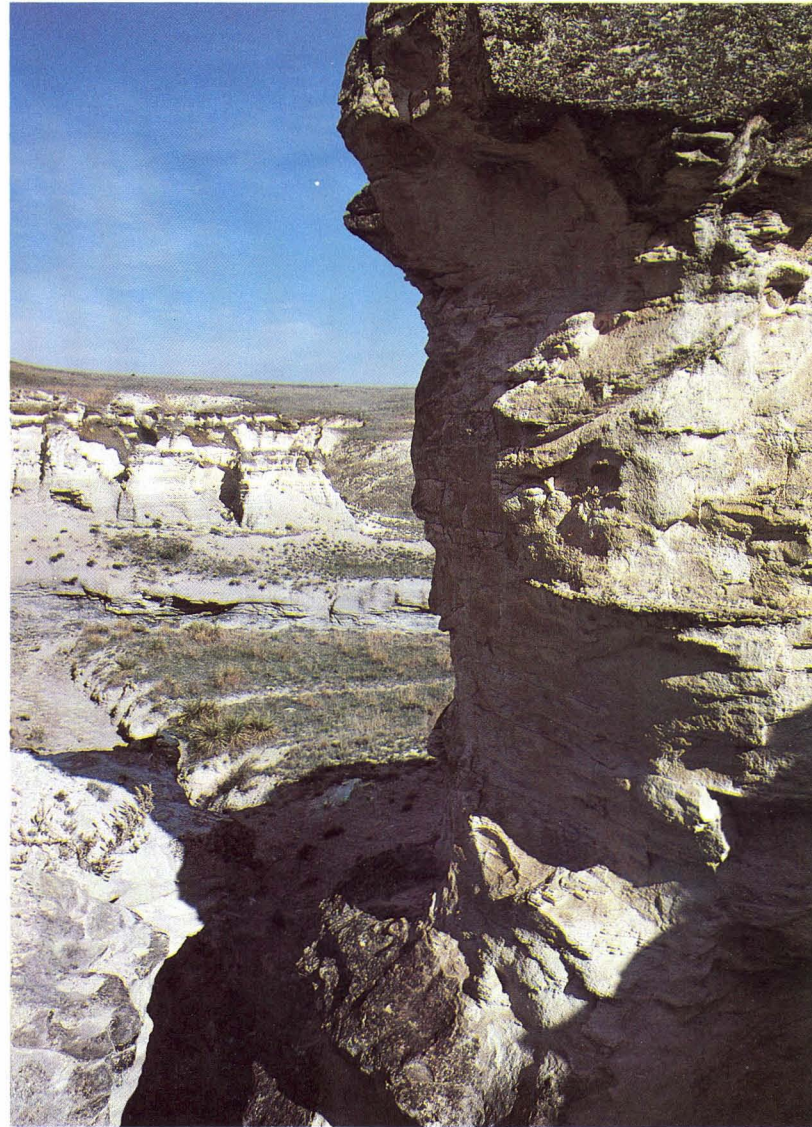
Some years after the Lewis and Clark expedition, a German doctor, Fredrick Wislizenus, had an encounter of a different kind with the Great Plains. Wislizenus wandered away from his party and stumbled onto the edge of Cheyenne Bottoms. In a moment of extremely poor judgment, he decided to cross the sink and spent most of two days in the marsh. Although the traverse nearly killed his horse and threatened to separate him permanently from his companions, he wrote more with amazement than irritation:

"All sorts of water birds swarmed around from all sides. Never have I seen such quantities of swans, cranes, pelicans, geese, and ducks as were here. The swamp was fairly covered with them, and they seemed to feel themselves so safe that I could have killed hundreds of them with the shot barrel of my double-barreled weapon."

mule deer by Gene Brehm



Logan County bluff by Chris Madson



Another early settler, James Mead, hardly paused when naming Russell County's Paradise Creek. "A paradise of game," he called it, "buffalo, elk, black-tailed deer in bunches of fifteen or twenty, turkeys in abundance, beaver, otter, and hungry wolves in gangs."

The Jacob Fowler exploration party crossed the "White River" (now the Walnut River) in early October of 1821. Their crossing was near the sight of present day Arkansas City. By the 13th of the month, they were at the mouth of the Little Arkansas River, where Wichita would be. By October 19, Fowler and his men rounded the "great bend" of the Arkansas River in Barton County. This was his journal entry on that day:

" . . . We set out at the usual time and at 8 miles west we passed a point of Red Rocks about 600 yds from the (Arkansas) River and at Eleven miles crossed the paney River (It was the Walnut creek they forded on the 19th. They crossed "Pawnee Fork" on the 20th.) . . . this is the Second stream We Have Crossed since passing the little arkenssaw. We found a good ford and Sterred South 50 (degrees) west Six miles to the Bank of the (Arkansas) River—the land level as far as the Eye Can see. Some Cottonwoods on the Banks and Some Bushis. The Red Rock, is evidently a volcanic production is porous like pomestone but heavier than common Sand stone . . ."

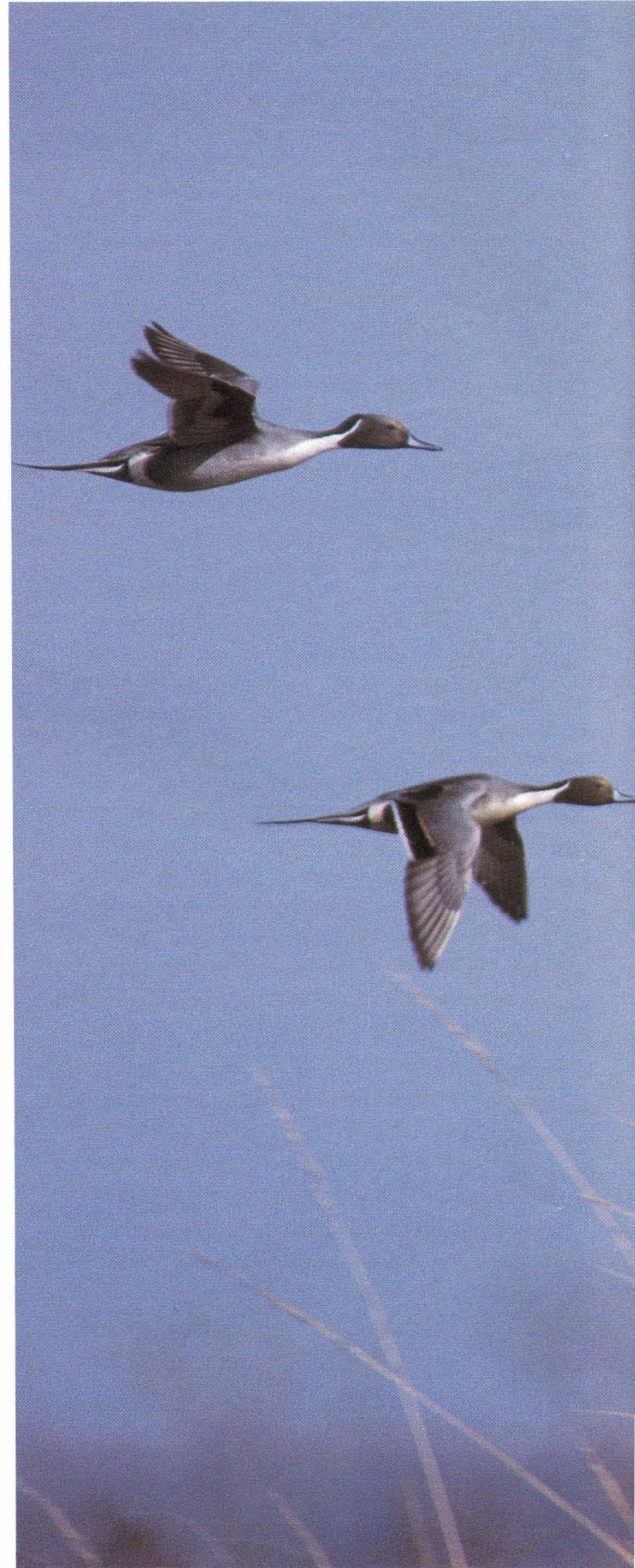
Fowler's "Red Rock" was the later-famed Pawnee Rock in what is now southwest Barton County. He appears to have been the first to make mention of that Santa Fe Trail landmark.

A pioneer supper at Wilder House in Fort Scott November 14, 1867, featured a menu that testified

waterfowl at Quivira NWR by Gene Brehm



pintails at Quivira NWR by Gene Brehm







sandhills, Stafford County by Gene Brehm

to the incredible wild abundance of the grass country:

Fish

Baked Black Bass
Boiled Red-horse

Roast

Canvas-Back Duck
Saddle Venison
Red-head Duck
Gray Squirrel
Wood Duck
Killdeer

Wild Turkey
Opossum with persimmon jelly
Butter-ball Duck
Black Bear
Gray Duck
Sage Hen
Crane
Gray Duck
Buffalo
Mallard
Brant
Goose

Cold Ornamental Dishes

Bastion of Rabbits, a la Shiloh
Boned Turkey, decorated with jelly
Boned Partridge, a la Pawnee
Sunfish au Beurre, de Montpelier

Relev

Wild Turkey, braised with oysters
Broiled Prairie Chicken, in parsley sauce
Rib of Antelope, a la Regeance
Buffalo Tongue

Entrees

Rissoles of Jack Snipe, a la Pompadour
Fillet of Curlew, a la Rouenaise
Ivit of Venison with Port Wine
Fillet of Wild Goose, a la Marmaton
Fillet of Teal Duck, a la Drywood
Fillet of Plover, a la Prairie
White Crane Salad, a l'Osage
Woodcock Fricassee, a la Wolverine
Noix of Fawn, a la Balltown
Coon Chops, a la Marais des Cygnes

Dessert

Wild Fox Grapes
Black Walnuts
Hazel Nuts
Bush Cherries
Paw Paws
Pecans
Apples

A mid-1800's hunting party led by Colonel Richard Dodge southeast of Dodge City enjoyed a couple of weeks of fast shooting. Their bag included two red deer, eleven antelope, 154 turkeys, five geese, hundreds of ducks (mostly teal), thirty-two grouse, nine hawks, three owls, two badgers, seven raccoons, and eleven rattlesnakes. In all, they took 1,262 animals in twenty days. "Nowhere in the world," said Dodge, "could one find a greater variety of wildlife."

There were gentler souls than Dodge also abroad on the grasslands. Missionary John Pratt came to Kansas in 1837 to bring the Gospel to the Indians. His impression of the plains was a peaceful one: "Leaving Boston in April with my wife, we

reached the then territory May 14, being about four weeks in slow travel. The territory at that time was in perfect quiet, and a most beautiful country it was. My first look at a green open prairie on a sunny day seemed to be a look at the ocean, with which I was familiar, but this was "Flora" in her gayest attire; the eye was too limited in its capacity to take in such wide and far extending area of beauty"

John J. Ingalls concurred with Pratt. One of Kansas' best-known writers, Ingalls ventured this opinion on the grasslands in the early 1870s:

"Grass is the most widely distributed of all vegetable beings and is at once the type of our life and the emblem of our morality. Lying in the sunshine among the buttercups and the dandelions of May, scarcely higher in intelligence than the minute tenants of the minic wilderness, our earliest recollections are of grass; and when the fitful fever is ended and the foolish wrangle of the market and the forum is closed, grass heals over the scar which our descent into the bosom of the earth has made, and the carpet of the infant becomes the blanket of the dead.

"Grass is the forgiveness of Nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grown green again with grass, and carnage is forgotten.

"Streets abandoned by traffic become grass-grown like rural lanes and are obliterated. Forests decay, harvests perish, flowers vanish, but grass is immortal. Beleaguered by the sullen hosts of winter, it withdraws into the impregnable fortress of its subterranean vitality and emerges upon the first solicitation of spring. Sown by the winds, by the wandering birds, propagated by the subtle agriculture of the elements, which are its ministers and its servants, it softens the outline of the world.

"It bears no blazonry of blooms to charm the senses with its fragrance or splendor, but its homely hue is more enchanting than the lily or the rose. It yields no fruit in earth or air, and yet, should its harvest fail for a single year, famine would depopulate the world.

"For all these reasons, it can be said with justification that the Blue Stem Hills represent Kansas to the nation"

And who could consider Kansas at any length without homage to the sunflower? In 1903, Senator George P. Morehouse of Council Grove began his campaign to make the sunflower the emblem of Kansas. In a preamble to the bill, he made these assertions:

"Whereas, Kansas has a native wild flower common throughout her borders, hardy and conspicuous, of definite, unvarying and striking shape, easily sketched, molded and carved, having

armorial capacities, ideally adapted for artistic reproduction with its strong, distinct, disk and its golden circle of clear glowing rays—a flower that a child can draw on a slate, a woman can work in silk, or a man can carve on stone or fashion in clay; and whereas this flower has to all Kansans a historic symbolism which speaks of frontier days, winding trails, pathless prairies, and is full of the life and glory of the past, the pride of the present, and richly emblematic of the majesty of a golden future, and is a flower which has given Kansas the worldwide name, 'the Sunflower State'" □

Maxmillian sunflower by Ron Spomer

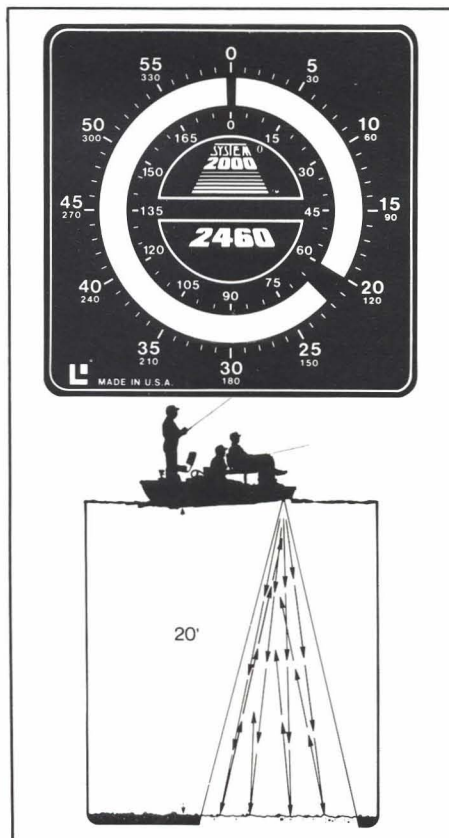


*transistors and
microprocessors
have
revolutionized
the angler's
art.*

the electronic fisherman

Steve Hawks

A flat bottom of gravel or hard clay provides an even reflective surface which is displayed on the dial as a single, thick band.



A hundred fishermen would probably offer a hundred different reasons for wetting a line. Some consider it a sport, some an art or a back-to-nature experience, and there are those who claim it has strong medicinal powers. Nearly any fisherman will admit, however, that the day is just a little better if he catches fish. One angler may be ecstatic over catching a one-pound bluegill; another may turn his nose up at anything less than a ten-pound walleye. But regardless of their special prejudices, anglers like tight lines, and tight lines aren't always easy to come by. To be successful, a fisherman has to have several things going for him.

First, and most obvious, he needs a place to fish. He needs effective tackle and should know how to use it. Finally, he has to understand the habits of the fish he is after.

This last factor has become increasingly important since the 1930s. Before that time, Kansas fishing was confined to rivers where an experienced angler could read cover, water depth, and bottom profile from the bank. Since the 30s, we've built dams at a rate that would gratify the most energetic beaver, and the impoundments that have been created present a number of problems for a fisherman. The most challenging is finding habitat and fish. Many anglers troll or drift on large lakes, hoping to cover enough water to finally stumble onto the fish. Sometimes, Lady Luck smiles on them; sometimes she doesn't. More sophisticated anglers work at finding contour maps of the lake bottom. The maps are better than nothing, but it takes an experienced eye to identify features on the map that are likely to produce fish. And maps of large lake bottoms don't stay accurate for long. Silt, wave action, and high water all rework underwater habitat with surprising speed, leaving the angler to grope for fish in thousands of acres of featureless water.

The problem wasn't unique to fishermen, of course. British and

American destroyers spent much of World War I groping for German submarines in the North Atlantic, and, at the beginning of World War II, all the naval combatants knew they had to find a way to “see” an approaching underwater enemy before he had a chance to set up a torpedo attack. Defense technicians in Britain and the U.S. took cue from what they knew of bat navigation and developed an echolocation system called sonar. The sonar system transmitted a pulse of sound and waited for an echo coming back from distant objects. Metal objects like 180-foot German U-boats reflected sound particularly well. By accurately timing the interval between the short pulse of sound and the echo, the machinery could give an accurate estimate of the submarine’s range. The sub’s direction could be determined by listening for echoes in one direction at a time. Sonar operators soon found that their instruments picked up all sorts of underwater objects including large schools of fish. After the war, a few commercial fishermen picked up surplus sonar units to zero in on salmon and other marketable pelagic fish. It was during a short stay on one of these boats that the Lowrance family first began thinking about sonar as a sport fisherman’s tool.

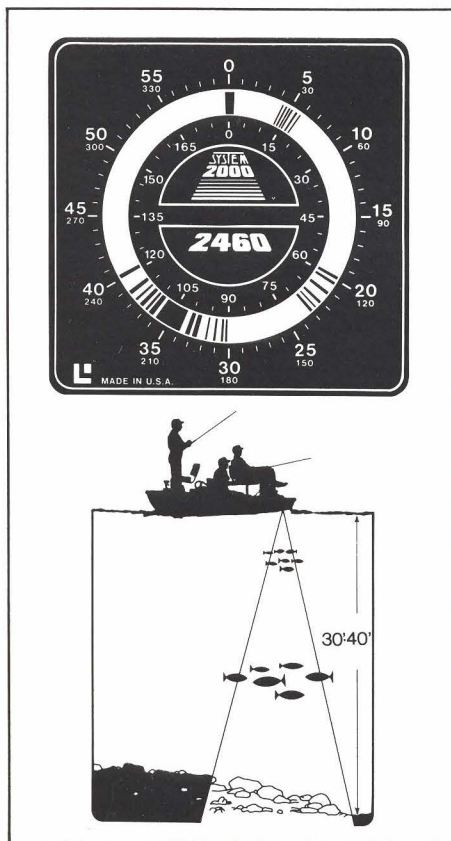
There were two major stumbling blocks. The first was the size of the sonar unit. The boxes of vacuum tubes that made the machine go would have sunk the average john boat. And there was also a lack of sensitivity. The Navy developed its sonar with low frequency sound waves because the low frequencies penetrated water best and gave a longer range. The resolution of these low-frequency units wasn’t too high, but since the Navy was looking for boats, not fish, they weren’t too concerned. A fisherman, on the other hand, needed to see the separation between underwater cover and nearby fish—how else could he tell the difference?

The Lowrances solved both prob-

lems after years of garage tinkering. The transistor replaced the sonar unit’s vacuum tubes and made the instrument portable. The Lowrance Lo-K-Tor transmitted a high frequency sound which reduced its effective range a little but also boosted its resolution. The resulting unit was the first “fish locator” that could actually locate single fish.

As the transistor has been shouldered out of the electronics business by the more sophisticated microchip, the fisherman’s sonar unit has undergone drastic modification and improvement. He now has a choice of three displays: digital, flasher, or graphic print-out. The digital display supplies a simple read-out on water depth. Built primarily as a navigation aid, it can also help a fisherman locate underwater bluffs, submerged river channels, and shallow flats that attract fish. The flasher is usually circular with a depth scale printed around the out-

Bigger fish are revealed on the dial as thicker, brighter signals than small fish. The thin signals above and below the wider main bottom signal indicate an uneven lakebed.



side. A light flickers around the scale, flashing at every depth that has an echo. The thickness of the light band relates to the strength of the echo and can tell an experienced fisherman a lot about the composition of the bottom and the cover above it, besides showing individual fish. The graph actually draws a picture of what the sonar unit is picking up.

The most sophisticated of the new sonar units provide far more information than just water depth and bottom composition. Thanks to the power of their signals and sensitivity of their receivers, they can pick up dense aggregations of plankton and small bait fish; they show downriggers and lures; they can separate a fish from the bottom signal when the fish is as little as six inches above it; they can even sense and record water temperature differences as small as two degrees. This last feature makes it possible for a fisherman to locate the thermocline in a lake which can be a critical piece of information through the summer.

An experienced operator can sometimes even identify particular fish species by combining what he knows about the creature’s preferred cover types and water temperature with the information he gets from the sonar.

The demands that are placed on this equipment are severe. Nearly all sonar units are subjected to pounding and high-frequency vibrations when the boats on which they are mounted get underway. They are regularly doused, often with corrosive salt water. And through it all, they keep working. About the only two things that put sonar units off their feed is electric interference from big motors, nearby bilge pumps, or aerators—and what is known as “cavitation.” Cavitation is technically the formation of a partial vacuum on some part of a swiftly moving object. With sonar units it is most likely to occur when the transducer is installed where a stream of bubbles or a

pocket of air interferes with the sound pulse. This may occur in the backwash of a prop, or just behind rivets, ribs, or strakes that disturb the smooth flow of water. Air bubbles reflect sound beautifully—the air trail of a scuba diver registers clearly on most sonar units—and when a bubble is against the transducer itself, most of the sound pulse is bounced back into the machine before it has a chance to get out.

For this reason, sonar manufacturers are careful to advise their customers on transducer installation. When the sonar is installed on wooden or aluminum hulls, they recommend that the transducer be mounted through or outside the hull into water that isn't picking up bubbles from the wake, motor or other interference. Many of the top-flight fiberglass bass boat companies epoxy transducers on the *inside* of the boat's hull. The sound penetrates the glass without difficulty and continues into the water below. Sonar works the same way on ice, too. A fisherman can wet a spot with a little antifreeze, set the transducer in the puddle, and get excellent

signals from the bottom and any fish that happen to be around. That sure beats cutting a hole through forty inches of ice and jigging for half an hour to get the same information.

While the fish locator is probably the most useful electronic tool a fisherman can buy, it is by no means the only one. Fisheries researchers have long known that fish tend to seek out water in a specific temperature range, and they have found more recently that the water's acidity and dissolved oxygen content also influence fish movement. As fishermen began applying this information to their sport, they demanded equipment that monitored these water conditions without a lot of fuss. And they got it.

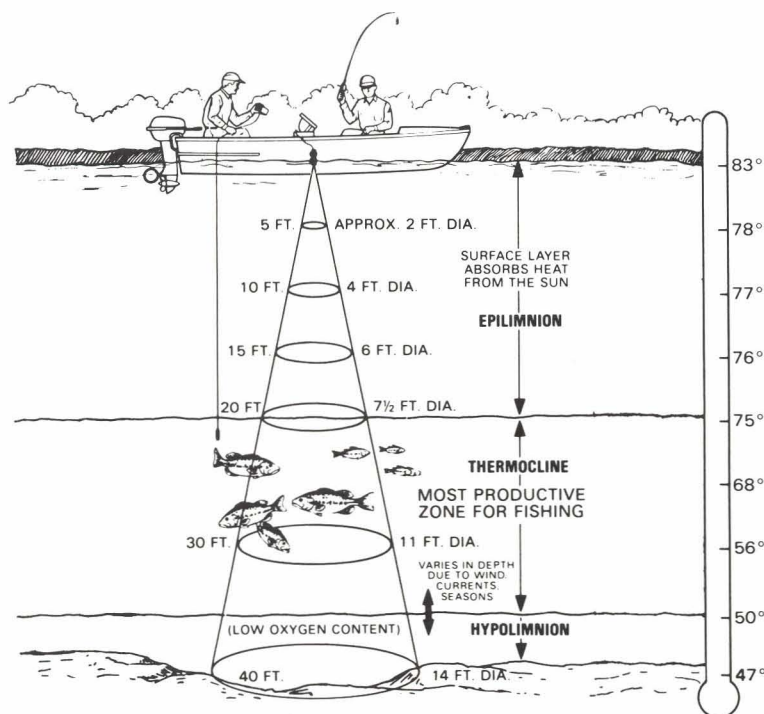
A new temperature gauge gives a digital read-out of surface water temperature even while the boat is moving. When the fisherman decides to stop, he can lower a remote gauge on a wire to find out what the water temperature is where the fish are. A similar instrument will provide a measure of dissolved oxygen. Water acidity isn't generally a problem in the Midwest, so pH meters

here are rare, but in parts of the Southeast and Northeast where acidity runs high, few serious fishermen are without one.

The electronics revolution in fishing has its detractors. Many people avoid sonar simply because of its cost—a portable flasher unit may cost as little as \$90, but top-of-the-line boat-mounted sonar graphs may run more than \$600. A few fishermen avoid electronic gear on principle. "It's one thing for a commercial salmon boat to use sonar to locate fish," they say. "It's quite another when a 'sport' fisherman uses it. Part of the sport of fishing is limiting yourself. You don't pick the most efficient equipment; you pick the equipment that gives the fish a fair chance and is fun. Besides, when every fisherman on the lake has sonar, we're running the risk of overharvesting our fish."

Their comments take up two questions, one ethics, the other of management. The management issue is easy to set aside. If and when overharvest becomes a problem, creel limits or other regulations should solve it. The ethical problem is another matter. Darrell Lowrance recently commented: "I hope our technology never reaches the point where we can produce sonar instruments, or instruments of any kind, that will identify species of fish or assist in catching them. We never want to remove the element that the fisherman must be a student in order to make himself a better angler. Only through learning and personal research can he gain a full appreciation of the fishing world."

The choice between ethical and unethical behavior still rests with the fisherman himself. The electronics industry has given him the tools he needs to learn more about his quarry. That increase in knowledge is all to the good. The final test of his approach to his sport has little to do with the tools he uses. How he uses them is what counts. □



A fish locator tells the angler where the fish are; an electronic thermometer tells why. The thermometer probe is lowered into the water, and gives an instant reading of water temperatures at various depths. (Illustration adapted from Lowrance Electronics, Inc. material)

Steve Hawks is the northeast region fisheries supervisor for Kansas Fish & Game.

the yellow pages

edited by Ron Spomer

WRITING READERS “?&...!”

New Rules

Editor:

There are some changes needed regarding hunting rules and propagation for pheasant and quail in Kansas.

The trend to bare ditches must be reversed. Ditches and roadside areas need to be left natural wild and in some cases even planted to create natural wild results. Wall to wall farming has ruined the breeding grounds and defensive vegetation for both pheasants and quail. These birds cannot propagate and survive without adequate cover.

The number of hunters now overbears the number of birds. Plus, the hunting season is too long and steady and the hours are wrong. It is very important to change the opening hour for hunting from a half hour before sunrise to 10:00 a.m. Hunters going into roost areas in the dark cannot tell hens from cocks and kill off fantastic numbers of hens. There is also a hunter safety factor involved in the later start.

We must consider game limits with the numbers of hunters in the field. The limit of pheasants should be 2 per day. Quail should be 5 per day. These numbers would

allow birds to expand in production and later maybe the limits could be increased.

Last, the farmer should receive payment from Kansas F&G for fallow ground practices and 2 or more standing rows of crops for bird feed.

These measures will improve Kansas hunting for years to come, whereas failure to do so will surely produce a useless hunting state like South Dakota, the former pheasant capitol of the nation.

Louis D. Fieger
Topeka

Dear Mr. Fieger,

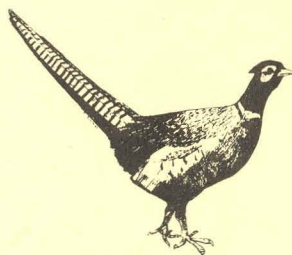
We certainly appreciate your concern for Kansas pheasants and quail. A concerned and dedicated public is the only thing that will save most wildlife species when push comes to shove. Only we can raise a defense on behalf of wildlife when it is threatened by greed, ignorance or unplanned development. But before we do, we should arm ourselves with the most accurate information available.

You're right, bare ditches don't benefit ground nesting birds. Neither does "wall to wall farming." In fact, studies during the 1960's and early 1970's identified habitat loss and alteration as the number one cause of pheasant and quail declines nationwide. Yes, grain feeds these birds, but all the food in the world does no good if the critters have no place to reproduce and escape weather and predators.

Although it seems as if there are more hunters than birds on opening weekend, the odds really aren't that bad. For instance, in 1981,

183,200 pheasant hunters bagged 1,260,000 pheasants. The average harvest per hunter for the entire season (which was a long one running from mid-November through mid-February) was 6.88. This harvest did not reduce next season's population because the birds reproduced well. Good nesting cover and cooperative weather determine year to year populations. Hunting is simply a bonus. We get to take the excess, and careful management governed by decades of studies and practical experience makes sure we don't overdo it.

Your comments about a mid-morning opening hour and a bag limit of 2 cocks daily are unusual in light of your opinion about South Dakota hunting. South Dakota has had a two or three cock daily limit and a noon opening hour for years.



Uncomfortable

Editor:

I have just finished re-reading the letters to you in the March-April, 1983 issue. I observed that two of the letters objected to a letter in which the writer stated that "Modern fencerow-to-fencerow and chemical

farming..." is the biggest threat to wildlife, and to us all.

These two letters, one written by the president of the Kansas Fertilizer and Chemical Institute, quote some very interesting and similar statistics. The thrust of these statistics does not seem to be to disprove the statement that chemical pesticides and their users and supporters are killing off the wildlife, so much as to prove that it is all right, these poisons increase profits more than a few quail ever did.

Jim Widrig, of Beloit, says that we are better off than most other peoples of the world, because "About 1.6 percent of the U.S. population is engaged in farming" and goes on to show that even in mighty Japan, 13 percent of the population is farmers.

Great. Except that, to those of us born and destined to die in the concrete caves, living our lives of quiet desperation while reading the letters from the farmers who would not let us on their lands because some of us are slobs, the number is scant comfort. I am much more comforted by the vision of W. Darrel Kelsey, who feels "Pity for those many millions of my fellow Americans who are prisoners of concrete, brick, and smog, and to wonder why the Maker of it all has blessed me so."

Why should the farmer produce so much that I have to pay taxes to buy his overproduction, taxes to store it, and taxes to give it back to him as a reward for temporarily reducing his overproduction?

Why should I be grateful to pay only "13.8 percent" of my income for

food, when it means that I can pay 40 percent of it to the Feds, and half of what is left to the Gas Service Co.?

If crops like fruits and vegetables could not be produced in commercial quantities without chemicals, how did we survive before DDT?

The rivers I fish in are so poisonous that only a fool would eat their fish. The ducks I hunt are laced with Endrin, Heptachlor, PCB's and bad breath, and all of you in the know recommend that if we kill a limit, we not eat it. Every piece of research that I have read that details the presence of poisons in game fish, animals or birds, concludes that foodstuffs this poisonous could not legally be sold anywhere in this country, and yet these gentlemen want to comfort me with their vast profits and cold numbers. Gentlemen, I am not comforted.

Jeffrey K. McFadden
Kansas City, MO

No Respect

Editor:

When I read "Chemical Resistance," in Letters to the Editor, I was enlightened to see that it was written by a farmer.

I myself am not a farmer, but have relatives who are, some of whom do use chemicals and some who do not. Both sides yield bountiful crops each year.

Although I am not a farmer, I am very much against the poisoning of our earth.

I, like Don Merchant, was upset when I read "Pesticide" in the March-April

issue. However, you would only expect such a letter from the president of a chemical institute. As Don brought out, it's a billion-dollar business.

No one person owns our land. We only buy the right to use it, and we should use it wisely. In other words, no one has the right to destroy or poison our land for the purpose of making a dollar. As our Creator and the rightful owner of this land has stated, "He will bring to ruin, those ruining the earth."

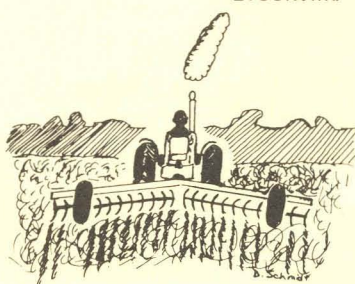
People who claim to be so concerned about starvation in the world want us to believe that they use the chemicals and poisons for this reason, to feed the growing population of the world.

This is, however, hard to understand when we have such a surplus and, in fact, the government is paying our farmers to set aside acreage (PIK).

I would like to know how many farmers turned this PIK program down because they want to feed this hungry world.

I do not want to be misunderstood. I believe that farming is an honorable profession. I'm sure that there are some farmers who really do not know how serious the use of chemicals is to our environment, but for those who do realize how harmful it is, I can have little or no respect for them, because they are jeopardizing the future of our children, ourselves and our earth for the short-term profit of a dollar when it is not even necessary.

Marvin Mikulecky
Brookville



No Lone Wolf

Editor:

Thumbing through a handful of copies of KANSAS WILDLIFE preparatory to passing them on to a granddaughter and her husband, I noticed a letter in the yellow pages of the January-February issue I did not recall having read. It was a letter from Marita Lee, Quenemo, about having seen an animal she suspected of being a wolf and went on to tell of her husband and several other people in the area seeing something within a few days they too thought was a wolf.

This was especially interesting to me when I noticed that she said the sighting was in July, 1976. Prior to my retirement in late 1974, my work took me to nearly all parts of Kansas, and not long before my retirement. I too was convinced a wolf crossed the road in front of me. Even the area could have lent some significance, for I was on my way home from Paola to Lawrence and was cutting across country up through Wellsville.

Something running out of the pasture toward the road caught my eye. It shot under the fence, crossed the road diagonally and ran into the field on the other side. Not knowing that the last known wolf recorded in Kansas was in 1905, I was convinced I had seen one. Something else had flushed him and he was moving on the double, but without much time to study detail the picture in my mind was something too large for a coyote, too tall at the withers, something about the

back end different than a dog, upper part of its body grayish but darker than is common for a coyote. Granted that the observation time was brief, for I too was cruising right along, I would estimate that I was within about 30 feet of him before he shot off the road into the grader ditch.

Because the picture that fastened itself in my mind that day was so definitely wolf, not dog or coyote, Mrs. Lee's letter was especially interesting to me.

Cliff Howe
Lawrence

Raccoon Preservers



Editor:

I have hunted in Kansas all my life, and participate in the fine sport of raccoon hunting. The furharvester license is the most expensive of any Kansas small game license, and yet I see nothing being done for the raccoon or raccoon hunters. I am also upset with the running season on raccoon. Any other hunter may run their dogs on their game anytime they wish. It has also been brought to my notice that there have been several articles on raccoon hunting submitted to your magazine, and yet in the last years that we have subscribed to your magazine none have

been published. Coon hunting has been looked down upon too long. Raccoon hunters love our sport and want to preserve it.

Mickey L. McLaughlin
Augusta

Dear Mr. McLaughlin,

We ran a comprehensive article on furbearer management in our January/February 1981 issue. We have a raccoon hunting story planned for an upcoming issue. We just haven't had a suitable article submitted recently. Hang in there, though, we'll get to it.

While \$15 may seem like a lot for a license, furbearer's do realize economic gain from their sport. One mink or one raccoon will pay for a license. In addition, furbearer management is an expensive business. I won't list all the research being conducted on other species, but on raccoons we are monitoring populations through an annual bow hunters visual survey, a statewide road-kill survey, a jawbone analysis for age (\$2.45 each), carcass study for age, reproduction and general health, and some disease testing (\$7.50 to \$15 per disease). We will soon begin population density studies and radio telemetry work with raccoons.

By the way, no dogs may be run on Fish and Game lands unless they are open to hunting during legal seasons. Rabbit and coyote hunting is legal year round, so dogs can be used to run them. Fox running seasons are the same as raccoon running seasons.



Just Enjoy

Editor:

I would like to take this opportunity to tell you how much we have enjoyed the publication KANSAS WILDLIFE. We have been enjoying this long before the name change. Keep up the good work on articles. The photographs are superb.

Mr. & Mrs. J.W. Friesbie
Wichita, KS

Bad Birds

Editor:

We have a problem that I'm hoping you can solve. We have had a martin house for four years, but for the last two, the starlings have been terrible. We tried the idea in the March-April issue of KANSAS WILDLIFE by putting shiny aluminum pie pans in the houses. It doesn't seem that the starlings are nesting as yet, but they are harassing the martins. Tonight, a starling really attacked the martin and might have injured it. So far, it can still fly. If we didn't live in the city limits, I'd get my shotgun out. Any suggestions at all? I and my neighbors would be appreciative. If possible, rush an answer.

I talked to the County Extension Office and he said the holes should be 2½ inches in diameter. The holes on our

house are 2½ inches, should they be smaller? We're willing to try anything.

By the way, we love your magazine. Keep up the good work. Could you identify the locations on some of your pictures, what reservoirs, etc.? Thanks again!

Robert J. Kozicki
Wichita, KS

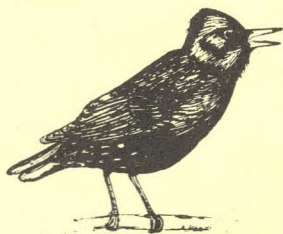
Dear Mr. Kozicki,

I sympathize with you. Cities are notorious refuges and breeding grounds for starlings. It's encouraging to hear you and your neighbors are interested in combating the problem. A good neighborhood control program can reduce the starling population significantly. Try the following ideas:

**Place mouse or rat snap-traps in cavities being used by starlings.*

**Devise a spring-loaded door over entrance holes on your martin house. Trip the door closed when a starling is inside.*

**Tape or otherwise block entrance holes to cavities occupied by starlings—whether they are in them or not. If this increases pressure on martins, investigate with city officials, options for shooting starlings with air rifles.*



**Purchase live traps from hardware stores, bait them and cross your fingers. Don't release the starlings alive in other areas. They'll either return or plague someone else.*

Good luck to you, and bad luck to your starlings.

News: Please Rush

Editor.

I recently had the opportunity to read a newsletter issued by our Kansas Fish and Game Commission. All that I can find on it is, "Please Rush—News for Kansas Sportsmen," printed along the bottom edge of the mailing address side. It had information in it pertaining to the state paddle fish record being broken twice, restitution for fish kill and confiscated articles being auctioned. To me it was a very informative publication. I am wondering if it would be possible to have my name entered into the mailing list for it? It would be good information for our state volunteer Hunter Safety instructors. The publication had been mailed to radio station KKAN at Phillipsburg, Kansas. Your consideration would be appreciated.

Robert M. Foster
Plainville

Dear Mr. Foster,

Our Fish and Game Newsletter is exactly what you read. It is mailed to radio stations, newspapers and other media whenever the Commission has news it feels the general public would like to hear. This method of distribution is much more cost effective than individual mailing. That's why the News is not available to individuals. If you aren't seeing or hearing as much about Fish and Game as you think you should, tell your local editors and broadcasters. We'd love the increased coverage.

WALLACE ART ON LOAN

BEAUTY & the BEASTS



Who would spend 100 hours of his life laboring over one 16 x 20 inch hard board? Ron Wallace would and does, and the results are worth his effort.

Ron is a wildlife artist, self-taught. Although he has worked with many subjects, he finds the most satisfaction in capturing nature in her best moments — a startled drake wood duck jumping from a stream, a black lab waiting for its first retrieve of the season — and he does

it with exemplary attention to detail.

Ron prefers to work with pen and ink and oils on hard board, two media he has found effective for duplicating the detail and contrasting smooth color of wild animals.

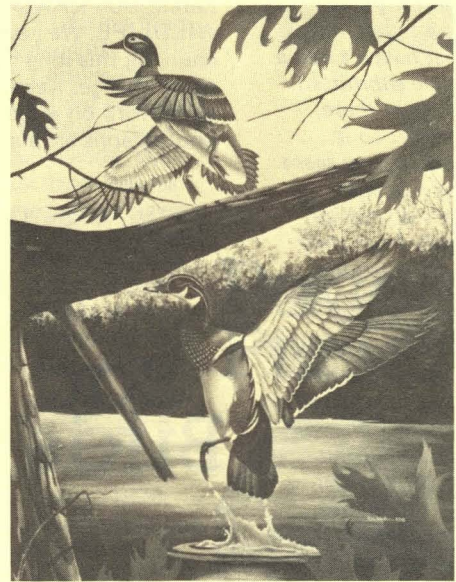
Neosho, Missouri, was Ron's natal home, and he credits its rural atmosphere with instilling in him a deep appreciation for nature. He currently lives in rural Olathe, Kansas, with his wife, Shirley, who carves decoys. Ron continues to spend much of his time in a duck blind, studying waterfowl in its natural habitat. He keeps his technique polished at Gill Studios in Lenexa where he is employed as a commercial artist.

Wallace paintings hang in private collections and commercial galleries. Many

have been reproduced in magazines. Ron has won awards in Missouri and Kansas and has exhibited at the Ducks Unlimited National Wildlife Art Show in Kansas City and at the Kansas Fish and Game Art Show in Wichita.

From mid-August through September, Wallace

paintings will be displayed in Pratt at Fish and Game headquarters, the Medical Arts Building, Chamber of Commerce and various banks. Prints will be available through the Fish and Game Wildtrust program. Contact Jan Royston, Kansas Fish and Game Commission, RR2 Box 54A, Pratt, KS 67124.



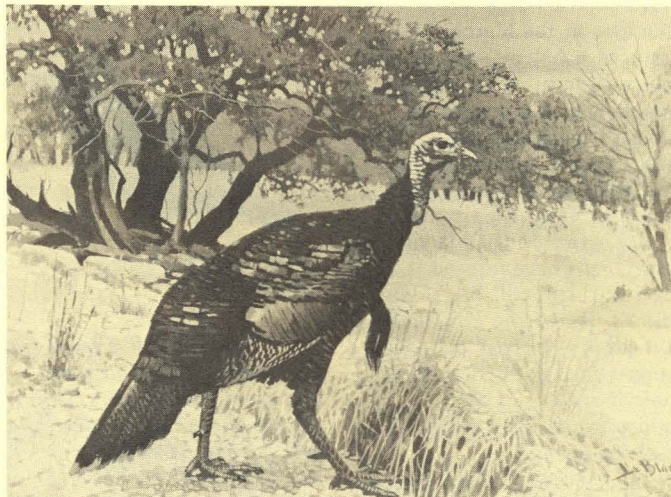
TURKEY STAMP

"Sultan Stroll" by Lee LeBlanc is the 1983 Wild Turkey Stamp Print issued by the National Wild Turkey Federation (NWTF).

The print is the eighth in the series of limited edition prints. The iridescent qualities of the wild turkey highly complements this longest running, annually issued series offered by any private conservation organization.

The prints will be signed and numbered. The highly sought-after art prints measuring 6 1/2" x 9", are sold through major wildlife art dealers nationwide. Consult your local gallery in reserving the 1983 print.

The primary purpose of



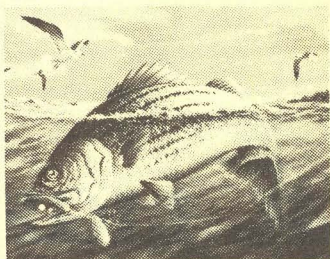
the NWTF Stamp Print program is to raise funds for the benefit of the American wild turkey. Not only has the program been successful; it has grossed well over one million dollars for the welfare of the stately birds.

NWTF is the only national organization dedicated solely to the wise management and conservation of our nation's wild turkeys.

In the early 1930's, the wild turkeys numbered as few as 20,000. Today, through steadily improving restocking and management programs, state game agencies have produced a population of almost 2 million wild turkeys.

BASS STAMP

A dramatic watercolor of a feeding Striped Bass thrashing half out of water with a Mepps Spinner has been selected for the 1983 Striped Bass Conservation stamp-print. Flying overhead, gulls flirt with the remains of the striper's meal and tell anglers where the school is located. Almost every striper fisherman has been drawn to a feeding school of Stripers by gulls, and Jim Killen has captured the scene with "Gulls over Stripers."



Jim Killen ranks among the nation's foremost wildlife artists. Having done artwork for numerous other conservation organizations, Killen is known for his ability to create valuable collector's pieces, and the 1983 Striped Bass stamp-print should fall in line.

The Killen Striped Bass stamp-print has been published in a limited edition of 750 signed and numbered prints for the American Striped Bass Society, a national, non-profit conservation organization headquartered in South Carolina. Only 4,000 Striped Bass collector stamps have been published in mint singles for \$5, blocks of four for \$20 and a collector's sheet of 10 is \$50. The Killen stamp-print is \$125 complete with mint stamp.

For information, write A.S.B.S. National Headquarters, P.O. Box 50, The Striped Bass Building, Edgefield, SC 29824.

PULLING TOGETHER

HUNTING



Under the theme of "Let's All Pull Together," the North American Association of Hunter Safety Coordinators has announced a new Associate Membership classification open to individual sportsmen and sportsmen's groups interested in helping young hunters acquire the skills and knowledge that will help them become safe, responsible and ethical hunters.

A non-profit organization, the North American Association of Hunter Safety Coordinators (NAAHSC) includes all state and provincial officials having responsibility for administering hunter education programs. The goal of NAAHSC is to ensure the future of hunting by improving hunter education. Today, every state and province in North America offers hunter education under the leadership of a coordinator within the game or wildlife agency. In addition to the basics of safe gun handling, students are taught responsibility afield, wildlife identification, field care of game, survival and other basic skills, depending on the needs for such information within each state or province.

With the help of 40,000 volunteer instructors, more than 700,000 students graduate from programs every year.

The National Rifle Association, the International

Association of Fish and Wildlife Agencies, the U.S. Fish and Wildlife Service and the National Shooting Sports Foundation have all joined with the NAAHSC coordinators in aiding and abetting the effort to teach hunters to be safe, responsible and knowledgeable.

As an Associate Member of the NAAHSC, you will have the satisfaction of knowing that you are part of an international organization dedicated to

providing the outdoor education and skills necessary for the lifetime enjoyment of properly conducted ethically oriented hunting.

The NAAHSC has prepared a new brochure fully explaining their Associate Membership program. You can obtain the brochure, together with a membership application, by writing to: North American Association of Hunter Safety Coordinators, P.O. Box 428, Brighton, IL 62012.

DANGEROUS DEER

Princeton Township, New Jersey, effectively banned hunting in 1972 when it passed an ordinance forbidding the discharge of firearms within the corporate limits. Since then, deer numbers have increased and deer-car collisions have gone up 342 percent, according to the Wildlife Management Institute.

Reports from New Jersey say that Princeton landowners were concerned with problems of controlling hunting on their estates and pressured the Township Committee to ban the sport altogether. But only the State has authority to set game seasons and control hunting, so the Committee decided to

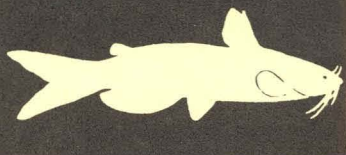
prohibit firearms discharge instead. This reportedly was done for residents' safety, even though the Chief of Police said that no person in the Township had ever been injured in a firearm accident involving deer hunters.

Township police stated that there were 33 deer-car collisions in 1972 when the ordinance passed. By 1976, the number had risen to 81. And in 1981, 113 were reported to authorities. It appears that hunters with firearms have a much better public safety record in Princeton Township than either the white-tailed deer they once kept under control or the Township Committee.



YOU LIGHT UP MY NIGHT

FISHING



When the sun goes down and the bullfrog chorus starts singing country songs, that's the time to go summer fishing. 'Course, you'll need a light.

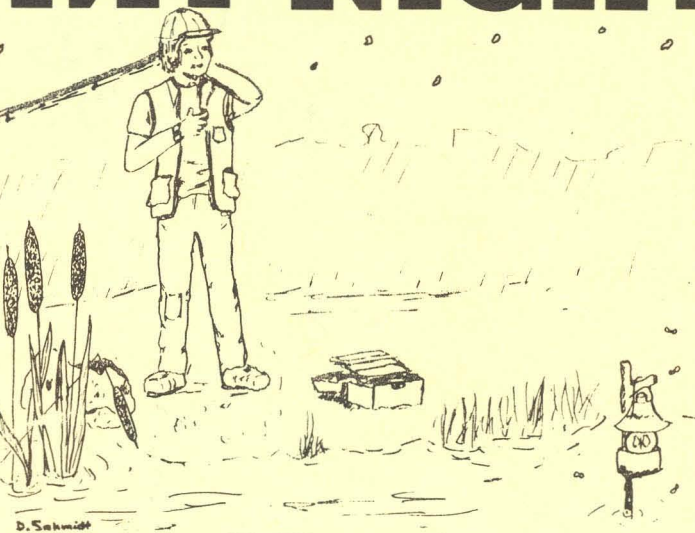
Now, some folks like the sure-footed security of shore for night fishing. They do well on small ponds where bass and bluegills haunt the weed lines after dusk, watching for night critters trapped in the water. If you know a pond well, know where the snags are and aren't, it's possible to cast floating lures, retrieve them with lots of noise and ruckus, and catch fish. Bunches of them. But many fishermen are uncomfortable casting from shore in the dark. If you're one of them, turn on the lights.

If you hang a light over the pond, it will attract moths and beetles that will fall into the water, struggle to get free and call fish to dinner. Throw your lure into that smorgasbord . . . Jitterbugs and hula poppers are good lures for this. If you fly fish, cast tiny poppers for bluegills and deer hair flies for bass. Black is the best color because it shows up as a silhouette against the light above.

Lights work well on big waters too, especially for white bass. The trick is to cruise the lake over ten to twenty feet of water, watching your sonar unit for

stacked fish. When it shows at least two heavy bands, one atop the other, anchor and put your lights on. You can hang gas lanterns or use the electric units that float inside specially designed styrofoam buoys. The top layer of fish will be suspended shad, the lower bunch predatory white bass just waiting to swim up and thrash through those bait fish. Sometimes there is even a third layer below the bass. These are often walleyes, catfish or drum. The purpose of your lights is to hold the shad in position while you cast to the big fish below them. Just why the shad hang around the lights no one knows. They may "key" off them like moths key off the moon. Whatever the reason, as long as the shad stay put, you should have good fishing. One angler told about the time he was picking off white bass under a school of shad when his sonar indicated a layer of big fish moving in under the bass. "Walleyes," he thought, and tied on a jig. He took his limit of two- to four-pound walleyes.

Odd colored jigs and spoons seem to work best for this fishing. Gray, brown, gray and white. Minnows are always good. If you suspect catfish are lying under the bass, try shad sides for bait. It helps to be quiet in the boat. No scuffing tackle boxes against the floor.



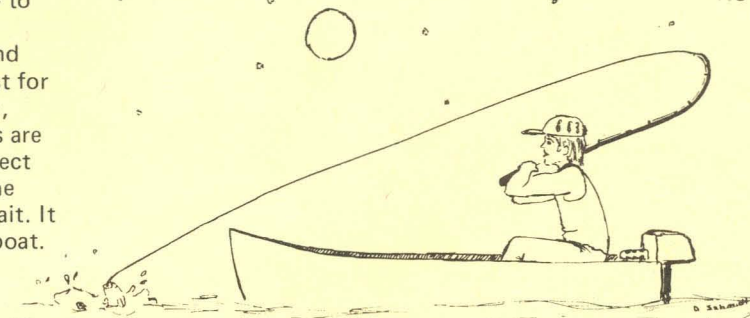
D. Schmidt

NATURAL LIGHT

There is one more night fishing method — natural light. On most clear summer nights there is enough sky light — from stars and moon — to give you a real adventure. Tie your lure on early, and then try your darndest to keep it, because you don't want to turn on any lights for re-tying once your eyes become accustomed to the dark. If you have more than one rod and reel, rig all of them for quick changing in case of a snag or break-off. Again, dark lures are best. Cast them toward shore if you're in a

boat and drag them back with plenty of commotion. Work an area repeatedly to give fish time to find your offering. You'll be striking by feel and sound, and the sounds will sometimes scare you half to death. A two pound bass erupting from a dead-calm pond sounds like a cow taking a bath. The tugging at the end of your line will be equally oversized and mysterious. You'll wonder if you'll ever get excited about daylight fishing again. This night action can light your fire.

RS



D. Schmidt



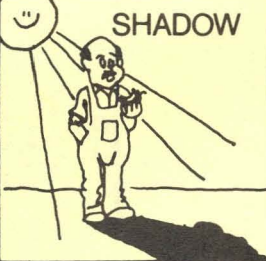
Nature's Notebook

by Joyce Harmon

Wildlife Education Coordinator
Kansas Fish and Game Commission

Don't miss exploring outdoors and discovering more about wildlife.




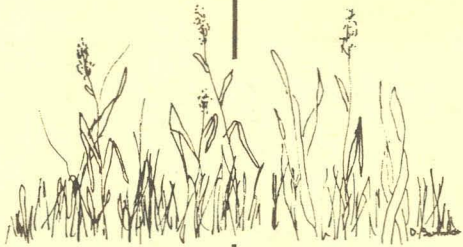
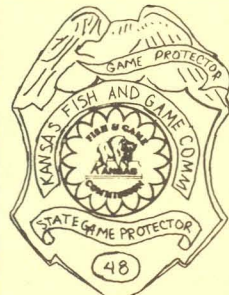
B I N G O

SOIL 	CLOUD 	FLY 	BIRD SINGING 	LEAF 
PRAIRIE 	WIND 	TREE 	SEEDS 	AN ANIMAL MOVING 
AN ANIMAL EATING 	SPIDER 	free	BUTTERFLY 	FLOWER 
FISH 	GRASS 	HOLLOW LOG 	HILL 	NEST 
LAKE, STREAM OR RIVER 	RAIN OR DEW 	MUSHROOM 	SHADOW 	PINE CONE 

CHECK OFF WHAT YOU SEE. YOU DO NOT NEED TO PICK ANYTHING.


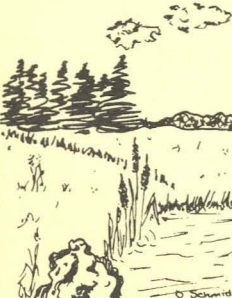
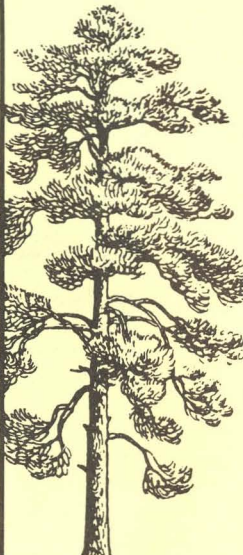

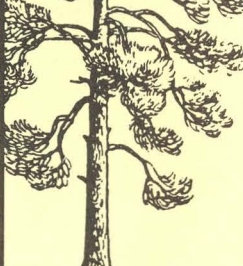

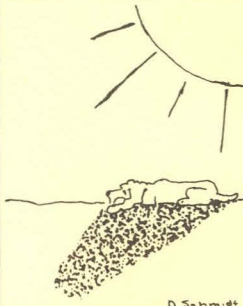



How much can you learn and observe of wildlife each month? Use these calendars to help guide your study.

AUGUST

1st week	<p>"He who knows what sweets and virtues are in the ground, the waters, the plants, the heavens and how to come at these enchantments, is the rich and loyal man."</p> <p>—Emerson</p>			<p>August 2, 1868 Opening of the first upland game bird season. Before this time these birds were not protected by law.</p>	<p>Upland—The higher ground of a region, above the level where water flows. Upland game animals include prairie chicken, pheasant, quail, etc.</p>	
2nd week	<p>August 1954 Passage of U.S. policy on fish & wildlife conservation at small watershed projects. The goal of this policy was to conserve the nation's land and water and the wildlife that depends on it.</p>	<p>Watershed—The area drained by a river, stream or creek.</p>		<p>August 9, 1950 Passage of the Dingell-Johnson Act (D-J). The funds from taxes on fishing equipment are used for fish restoration projects.</p>	<p>Observe the fish in your area. How many species can you identify?</p>	 <p>D. Schmidt</p> <p>August 15, 1904 The last known Kansas cougar was shot near Catherine, Kansas, in Ellis County.</p>
3rd week	<p>Explorers Long and Pike labeled Kansas the "Great American Desert". The name remained on maps until after the Civil War.</p>	<p>Grasses once covered much of Kansas and the other plains states. What kinds of grasses can you find? Make a collection.</p>	<p>Prairie—Land with grasses and flowering plants; grassland.</p>		<p>What species of wildlife would you expect to find in short, mid, and tall grass prairies in Kansas?</p>	<p>Species—A group of individuals that resemble one another and are able to breed among themselves but not able to breed with members of another species.</p>
4th week	<p>Be aware of Hunter Safety Education courses in your area getting organized for fall.</p>	<p>If you were born on or after July 1, 1957 you must have a hunter safety card to hunt or purchase a hunting license.</p>	<p>Review the laws that protect wildlife. We need to be aware of both state and national laws.</p>	<p>Hunting ethics—The standards or rules of conduct of a good sportsman; showing respect for wildlife habitat and people.</p>	<p>Make a list of the reasons you think hunting ethics and law enforcement are important to wildlife and people.</p>	<p>The job of the game protector is to conserve wildlife through education and law enforcement.</p> <p>Get to know your local game protector.</p> 

As the days become shorter and we enter the special season of autumn, here are a few things you should be aware of.

SEPTEMBER

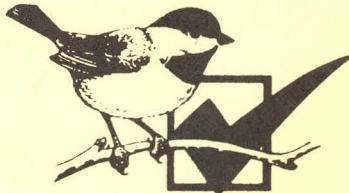
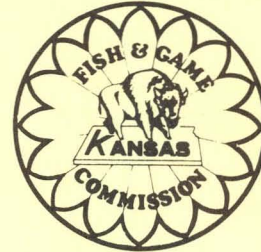
<p>Opening of dove hunting season.</p> 	<p>Pittman-Robertson Act. Passed September 2, 1937. Provides funds from excise taxes on hunting equipment to be used for wildlife restoration, research and land acquisition.</p>	<p>Conservation—Wise use of natural resources.</p>	<p>September 3, 1964 Passage of the Wilderness Act to preserve national wilderness areas.</p>		<p>Wilderness—An area where the earth and its community are untrammelled by humans. Humans are visitors who do not remain.</p>		<p>1st week</p>
	<p>Habitat—The place in which an animal lives. It must include food, water, and cover. This involves escape cover, winter cover, cover to rear young, and space to play. Loss of habitat is the biggest single threat to wildlife.</p>	<p>Study the habitats around you. Use all of your senses. What smells, sounds, feels or looks different in the fall?</p>	<p>Name some renewable and some non-renewable resources.</p>	<p>Hunt—To search for game animals for the purpose of catching or killing. Hunting is now regulated under comprehensive laws in every state. Sport hunting removes the surplus of wildlife.</p>	<p>September 10, 1875 The American Forestry Association began. Its goal is to protect the nation's forests.</p>		<p>2nd week</p>
<p>Game—Animals that can legally be hunted, fished or trapped.</p>		<p>Fall equinox—Day and night are equal in length.</p>	<p>Study the sun and observe shadows.</p>		<p>NATIONAL HUNTING & FISHING DAY Sept. 24, 1983</p>		<p>3rd week</p>
<p>Migratory—Birds and other animals that make an annual trip to a different area. Distance may be long or short, depending on the species. *</p>	<p>Observe flight activity of birds for several weeks. What directions are the flocks headed? What kinds of birds are they?</p>		<p>Flock—group of birds, sheep or goats. Count the birds in each flock you see.</p>	<p>Diving ducks—Ducks that prefer deep water as in lakes and bays. They feed by diving below the surface and take flight from a running start.</p>	<p>Puddle ducks—Ducks that prefer shallow water. They are surface feeders and take off nearly vertically. Also called dabbling ducks.</p>		<p>4th week</p>

* The next issue of "Nature's Notebook" will feature waterfowl migration.

Symbols of Significance

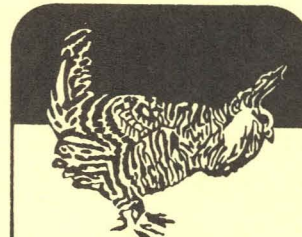
Symbols are letters, figures or other characters used to represent something. The Kansas Fish and Game Commission uses several symbols. How many of these have you seen before?

A buffalo, map of Kansas and a sunflower combine to form the symbol or logo for the Kansas Fish and Game Commission. This agency is responsible for managing all wildlife and habitat resources in the state. Each of the 50 states has a similar agency.



This chickadee represents 22,600 nongame wildlife species found in Kansas. Kansas Fish and Game's Nongame Wildlife Improvement Program or "Chickadee Checkoff" works with all wildlife that is not hunted, fished or trapped. Taxpayers can make donations to the program on their state tax form each year. The program has helped reintroduce swallowtailed kites and mountain plovers, provided bird feeders to nursing homes and enhanced a wide variety of research and educational programs. Don't forget to take the opportunity to help with these important projects when tax time rolls around.

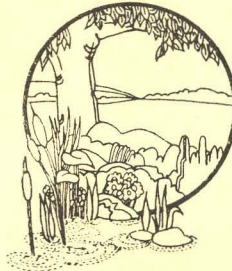
The prairie chicken symbolizes the abundance of wildlife we have in Kansas. Understanding and appreciating wildlife and habitat are the goals of the Wildlife Education Service. This program provides free educational materials to Kansas school and workshops for Kansas teachers. Education is needed for young and old to be more aware of the value of our wildlife resources.



wildlife
education
service

KANSAS FISH AND GAME

WILDTRUST



Wildtrust is another Fish and Game program that lets people help in the important role of conserving our natural resources. Individuals can make tax deductible donations to help the cause of wildlife. These donations brighten the future for wildlife and for future generations of Kansans.

W.H.I.P. is the nickname for a very important project going on across the state. See if you can figure out what each of the letters stands for by completing the puzzle below.

W 9 12 4 12 9 6 5
H 1 2 9 20 1 20
I 13 16 18 15 22 5 13 5 14 20
P 18 15 7 18 1 13

KEY: A B C D E F G H I J K L M N O P Q R S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
T U V W X Y Z
20 21 22 23 24 25 26

EAGLE POACHING

REVEALED



Between 200 and 300 bald eagles were deliberately killed over the last 3 years on and near a national wildlife refuge in South Dakota to supply feathers, beaks, talons, and bones for a lucrative black market in Native American artifacts, according to a major Federal undercover operation concluded last June in eight States.

The 2-year investigation by special agents of the U.S. Fish and Wildlife Service is expected to result in the charging of up to 50 individuals for their involvement in the killing or sale of 19 species of Federally protected birds. Eighty Federal and State conservation officers began contacting subjects and executing arrest or search warrants June 15 in Florida, California, Utah, Oklahoma, Montana, Colorado, North Dakota, and South Dakota. Large quantities of bird parts and finished craft items were seized.

The bird feathers and parts were used to manufacture "authentic" reproductions of Indian artifacts such as headdresses, rattles, jewelry, lances, hair ties, wing and peyote fans, whistles, and other ornaments. The items were then sold to collectors and hobbyists in other parts of the Nation and in Europe, where interest in American Indian artifacts is strong.

Interior Secretary James Watt said that the investigation indicated that

the "feather traffic" exists in most States. "Nationwide, it is thought to be directly responsible for the slaughter of at least 300 bald eagles every year along with other protected species. Last year's bicentennial celebration of the naming of the bald eagle as our Nation's symbol brought news that the species is beginning to recover from a number of threats," Watt said. "That's why it is particularly saddening to learn of this wanton slaughter."

The killing of migratory birds and sale of their feathers and parts are prohibited under the Migratory Bird Treaty Act. Bald eagles and golden eagles are also protected

under the Endangered Species Act and the Bald and Golden Eagle Protection Act.

Service enforcement officials note that this case differs from others in the past in that never before have such large numbers of whole carcasses been offered for sale, nor have so many individuals been charged with killing migratory birds at one time. During the investigations, agents were sold 24 freshly killed bald and two golden eagle carcasses along with parts from a mix of 25 bald and golden eagles and hundreds of items made from other Federally protected bird species including hawks, owls, songbirds, scissor-tailed flycatchers, and anhingas.

Many of the scissor-tailed flycatchers were killed in Oklahoma where they are the State bird and a protected species. These birds are desired because of their two long tail feathers that are used to make decorative fans. Typically between 30 and 40 of these birds must be killed to make a single fan.

The majority of the bald eagles were killed on or adjacent to the Karl E. Mundt National Wildlife Refuge in South Dakota and Nebraska that was established in 1974 as a sanctuary for wintering and migrating eagles. Most were killed with baited traps or shot at night while roosting in trees.



Someone is going to pay. For their part in creating such scenes as this, suspects arrested after a two-year investigation will soon learn the real price of their actions.

Young & Wise

You don't have to be old to be wise. Gary Cromer and Dan Melson proved that.

The 13 year old Pratt boys were exploring along the Ninnescah River on March 1, when they happened upon another teenager dressing out a deer. They knew him, talked to him briefly and left to report the poaching to Game Protector Tracy Galvin.

By the time Galvin got to the scene, the poacher had removed the deer. Galvin took blood and hair samples, but when the case came to court, it was the testimony of the two 13 year olds that convinced the judge beyond a shadow of a doubt.

Robert Briggs was found guilty and sentenced to 30 days in jail, placed on one year probation and fined \$50 plus \$19 court costs.

The Kansas Bowhunters Association rewarded Cromer and Melson \$100 for assisting in the conviction of Briggs. That \$100 is a standing offer to anyone with the courage and wisdom to stand up and defend the public wildlife resource. The two teenagers also received Hunter Ethics awards from the Kansas Game Hunter Safety program.

The old and wise among us could learn a lot from these two teenagers.

Fish Tales

When telling stories, fishermen routinely stretch the length of their catch.

That sometimes fools a fellow fisherman, but it rarely works on a Game Protector.

While taking a creel census on Big Hill Reservoir June 7, Kansas Game Protector, Dudley Foster, heard anglers tell of a man who was stringing several big bass. But no one thought they were big enough to meet the 15 inch minimum length limit. Foster motored over to check the fisherman.

Sure enough, Gordon Miley of Chanute, had been having excellent luck, but no matter how much he exaggerated the size of his largemouth bass, they just couldn't measure up. All eleven were shorter than the 15 inch minimum size. And eleven were six too many for the daily creel limit.

Miley paid the court \$194 for his imprecise measuring and counting.



D. Schmidt

Big Catch

Four Fish and Game employees reported an unusual catch at El Dorado Reservoir May 21 and 22.

Bob Thomas, Dean Deutsch, Charles Schmidtberger and Charles Ward worked the lake Saturday and Sunday and caught seven persons with bass under the legal length limit, ten folks with no fishing licenses, six without boat registration, eight with insufficient life saving devices in their boats and one who was fishing with more than two rods at once.

The four law enforcement men didn't get any fillets for their efforts, but they didn't have to clean any smelly fish when they got home either.

DYING DOMINOS

NATURE



Nature is like a line of dominos. When one piece of it falls, it rattles destruction all out of proportion to its size.

Reverberations from the latest tipped domino are beginning to worry biologists in the plains states. They've noticed a drastic decline in cottonwood trees along rivers and streams in Kansas, Nebraska and Colorado. That spells hard times for hundreds of wildlife species that depend on those trees for food and shelter.

A 1960-1978 study along the South Platte River documented a 50 percent decline in cottonwoods on a grazed plot of ground. An ungrazed plot lost 30 percent of its trees. Those statistics are doubly disturbing when one learns that young trees are not sprouting to replace

the dead ones. Regeneration just isn't happening along the Colorado River drainage, the Gunnison, the Rio Grande or the Arkansas. Where the cottonwoods have died, the non-native tamarisks have invaded, choking all other vegetation and creating relatively sterile habitats.

Of course, cottonwoods weren't the first domino to tumble — water was. Researchers aren't positive, but evidence points toward lower water tables and altered high flows as the culprits in the tree losses. Hydrologists have documented a 90 percent shrinkage of the South Platte River channel. The Arkansas is essentially dry from the Colorado/Kansas border to Great Bend. In essence, our rivers and trees and wild animals living among them are being sacrificed for corn and alfalfa. When the trees are gone, so will be the heron rookeries, the raccoon dens, the orioles, the warblers, the vireos, the deer, the beavers, the mink, the kingfishers, the muskrats, the red-tailed hawks, the screech owls, the foxes, the wood ducks . . . a long line of nature's dominos.

RS

Drag Net

Martin Herbert Behrend's netting party turned into a real drag when two Game Protectors crashed it.

GPs Paul Miller and Rick Campbell didn't have an easy time locating the celebration. They had to endure two all-night stake-outs near a boat ramp after a fisherman told them about an illegal gill net he'd spotted. But their perseverance paid off. At sunrise on the second day, the net owner, Martin Behrend, boated out to

claim his net and five others. When he brought them back to shore, Miller and Campbell charged him with taking fish by illegal method and possessing an illegal fishing device. They couldn't charge him with possessing illegal fish because he'd dumped them overboard when he saw the GPs waiting for him back at the ramp.

After the judge made his ruling, Behrend's fishy party cost him \$1000 plus court costs and his 1300 yards of gill net valued at \$2000. Miller and Campbell credit the alert fisherman/sportsman who reported the first net with saving Tuttle Creek Reservoir anglers hundreds of fish.

GIVE AND TAKE

NATURAL ISSUES



Once again the Federal government is helping itself with its left hand and slapping itself with its right. And wildlife is feeling the pain.

The Congress is considering legislation to protect wetlands nationwide, something it says deserves immediate attention. But at the same time the U.S. Army Corps of Engineers is trying its best to weaken the 404 permit system designed to protect those valuable wetlands.

Senate Bill S.1329 was introduced by Senator John Chafee (R.I.) as the Emergency Wetlands Resources Act of 1983. Chafee said, "At present the modification and destruction of wetland habitat is the single most important factor affecting migratory waterfowl abundance. Wetlands, however, are important for many other reasons. They contribute to the production of fish valued at several billion dollars annually. They provide millions of Americans with opportunities for recreation, support a major proportion of the nation's multimillion dollar annual

fur harvest, provide natural flood control and help supply pure water. In all, wetlands contribute from \$20 to \$40 billion a year to the national economy.

Those statistics don't seem to impress the Army, which oversees the Corps. They've proposed rule changes to the 404 permit system that would eliminate protections for bottomland hardwood swamps, playa lakes and Alaska's tundra, exempt federally funded projects (hydroelectric dams, irrigation facilities and highways) from requiring individual permits and review before filling or dredging wetlands, allow the Corps to approve dredge—or fill activities by "letters of permission." Such letters shield projects from public scrutiny; reduce public comment period on individual projects from 30 to 15 days; allow the Corps to issue general permits without obtaining certification that they comply with state water quality criteria.

This peculiar dichotomy seems to be a product of politics in this nation. One side spends tax dollars to solve a problem while the other wastes tax money exacerbating it.

It may be time for taxpayers to speak up. Do we want wetlands valued at \$40 billion a year or do we want to spend millions each year destroying them?

A Piece of Your Mind

Writing an effective letter to your Congressman or

Senator is easy, if you're prepared. The biggest obstacle to letter writing is the assumption that your efforts are a waste of time—that one missive won't make any difference in the mind of your busy legislator. Nothing could be more untrue.

"On several occasions, a single, thoughtful, factually persuasive letter did change my mind or cause me to initiate a review of previous judgment," Rep. Moris Udall, D-AZ, once said. "My mailbag is my best 'hotline' to the people back home."

Write your senator or congressman, but make sure your letter is readable, coherent, timely, accurate and nonthreatening. Here are 9 steps to make it easy.

Step 1: Write the correct address on the envelope and at the top of a sheet of paper. Names and addresses are listed on the next page.

Step 2: Don't worry about using "Honorable" or other fancy title in the salutation. Write to him just like you would your Aunt Sally. Be sure to include the date in the upper righthand corner.

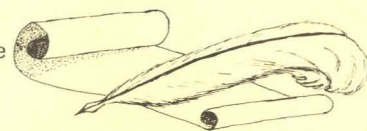
Step 3: Tell him what you are concerned about. *Don't* tell him everything you're concerned about, it will only confuse him. Pick out one subject and stick to it. For instance, "I'm concerned about everything I hear about selling off public lands. I don't think we should do that." If you know the number of the bill that concerns you, include it for clarity.

Step 4: Use your own words. Personal letters are more effective than form letters or petitions. Legislators want to know how a bill affects you individually. Be descriptive. Attach with your letter

pertinent editorials from local newspapers.

Step 5: Keep your letter to one page. Its chances of being read are much greater. Handwritten letters are fine if the writing is legible.

Step 6: Assume, even if you know better, that your congressman or senator hasn't made up his mind on the issue you're writing about. Ask him for his views. This will require him to write *you* a letter to explain his position (or the lack of it). Always ask him for his position on the subject.



Step 7: Don't write him more than once every two months on the same subject. His computer will identify you as a kook on that subject and your views will not be valued. Also, don't threaten or berate him. This will lead the congressman, senator or legislator to dismiss the letter writer as an emotional nuisance.

Step 8: Don't mention that you belong to a citizens group, like the National Wildlife Federation. Legislators, who usually know the position of the group, will assume you are writing a letter contrived by the group, and thus may not give your letter the individual importance it deserves.

Step 9: End the letter saying, "Sincerely yours,". Sign your name, then very neatly print your name and address. This is critical because it identifies you as one of his constituents.
—From National Wildlife Federation

WHERE TO WRITE

Sen. Nancy Landon Kassebaum
304 Russell Senate Office Bldg.
Washington, D. C. 20510

Sen. Bob Dole
Hart Senate Office Bldg.
Washington, D. C. 20510

Congressman Pat Roberts
1519 Longworth House Ofc. Bldg.
Washington, D. C. 20515

Congressman Jim Slattery
1729 Longworth House Ofc. Bldg.
Washington, D. C. 20515

Congressman Larry Winn, Jr.
2268 Rayburn House Ofc. Bldg.
Washington, D. C. 20515

Congressman Dan Glickman
1507 Longworth House Ofc. Bldg.
Washington, D. C. 20515

Congressman Bob Whittaker
332 Cannon House Ofc. Bldg.
Washington, D. C. 20515

DU Goes US

In a recent Supreme Court decision, Justice Harry Blackmun noted: "The protection of migratory birds has long been recognized as a national interest of very nearly the first magnitude."

That protection has been under the continued siege of civilization with the annual loss of some 458,000 U.S. acres of wetland habitat.

Today, at its annual convention in Williamsburg, VA, Ducks Unlimited announced its intention to help stem the loss of productive wetland habitat with the second of a two-phase program. The thrust of Phase II will be to restore replenish and maintain areas in the United States most critical to breeding North American waterfowl.

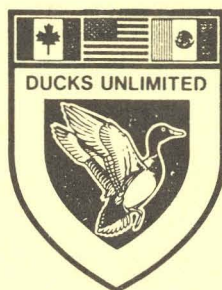
"It is a unique approach for two reasons," said DU President Robert Eberhardt. "First, for the past 46 years, Ducks Unlimited has concentrated its conservation efforts in Canada, where some 75% of the continent's waterfowl breed. DU's move into the U.S. came because its officers and professional

biologists decided that the resource could wait no longer.

"Second, no other private conservation organization has the resources or expertise of Ducks Unlimited. DU has been in the wetlands conservation business since 1937. It has saved millions of wetland acres and untold numbers of wildlife from needless destruction."

Phase I, which was announced last month, entails an agreement with NASA to inventory and monitor wetlands in the U.S. and Canada with information supplied by Landsat 4, the most sophisticated communications satellite in the world.

Once mapped, the lands will be studied by Ducks Unlimited and officials of the U.S. Fish and Wildlife Service and state agencies to determine



the areas of highest potential productivity for waterfowl and wildlife.

DU will concentrate its efforts in Montana, the Dakotas, Minnesota and Alaska, because those states are responsible for raising more than 85% of the nation's waterfowl.

Wetlands in the United States have been disappearing at an alarming rate since man first began to tame the land for his own welfare. The Soil Conservation Service has estimated that of the original 127 million acres of wetlands in the United States, 82 million remain. And those are going fast.

Our work in the U.S. will result in our scope becoming truly continent-wide. Since 1974, Ducks Unlimited has been involved with wetland projects in Mexico, providing haven for wintering waterfowl.

Ducks Unlimited raised \$34.7 million last year and boasts 455,000 members. With such considerable resources, we believe that DU's entry into U.S. wetland habitat restoration will, indeed, make substantial inroads into saving one of our national interests.

Criminal Raid

Last year, the President's Task Force on Victims of Crime recommended that Congress raid the Pittman-Robertson (P-R) Program to finance a new federal effort to compensate crime victims. The P-R Program is supported by excise taxes which sportsmen and women pay on arms, ammunition and archery equipment. The receipts are collected by the federal government and apportioned to state wildlife agencies by the U.S. Fish and Wildlife Service. P-R is the

backbone of America's success in conserving wildlife resources.

This year, a bill (H.R. 2470) was introduced in Congress by Rep. Marty Russo (Ill.) to divert the excise tax on handguns from P-R into the crime victims' fund. This bill would reduce the P-R money available to states by about \$30 million annually.

Kansas received \$2,200,800 in P.R. money in fiscal year 1983.

Menu, Please!



Sixty million Americans feed wild birds, and almost everything they need to know about what seeds birds like is in the National Wildlife Federation's new booklet, "Wild Bird Feeding Preferences."

When birds are offered a commercial seed mix, some types of seeds disappear faster than others — because different birds prefer different kinds of foods.

"Wild Bird Feeding Preferences," by Dr. Aelred Geis and Donald Hyde, Jr., tells you that the purple finch's favorite seed is the oil sunflower. You will also discover that the titmouse likes peanut kernels, and the house sparrow prefers white proso millet. In all, the preferred foods of over two dozen birds — including the cardinal, chickadee and scrub jay — are listed.

It rates seeds according to their appeal to 13 wild birds, listing 16 commonly used seeds that range from black-striped sunflower and golden millet, to fine cracked corn and wheat. The U.S. Fish and Wildlife Service

Urban Wildlife Research Program conducted the research on which this publication is based.

The booklet's cover drawing, by noted wildlife illustrator, Bob Hines, shows these 13 birds in their normal feeding positions, with the American goldfinch on an elevated feeder eating sunflower seeds, and the brown-headed cowbird on a feeding table.

Dr. Geis' earlier publication, "Relative Attractiveness of Different Foods at Wild Bird Feeders," was published three years ago by the U.S. Fish and Wildlife Service, and was the all-time most requested publication in its series.

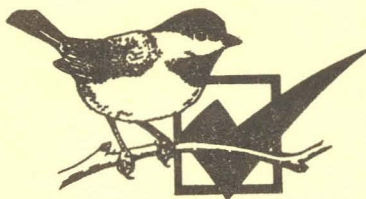
"Wild Bird Feeding Preferences" is available in single copies or in bulk, at the following prices: single copy, \$1, 2-25 copies, 60 cents a copy; 26-50 copies, 45 cents a copy; 51-999 copies, 35 cents a copy; and more than 1,000 copies, 25 cents a copy. Write to: Wild Bird Feeding Preferences, Dept. 157, National Wildlife Federation, 1412 16th St., NW, Washington, D.C. 20036.

Chick-a-dee Checks

Taxpayers like wildlife, if the nongame "Chickadee Checkoff" program is any indication. Contributions to this fund stood at \$119,108 as of June 10, 1983. That is \$5,350 less than at that time in 1982, but \$8,430 more than the same time in 1981.

Taxpayers donate any amount they wish to the nongame program by checking a box on their Kansas state income tax forms. The monies received are used to benefit wildlife species not hunted, trapped or fished. Some of the

projects funded thus far are reintroduction of mountain plovers, construction of bird feeders, purchase of educational materials, and monitoring raptor populations.



More D-J Needed

Well over \$100 million could be added to state sport fisheries and recreational boating programs if legislation (H.R. 2163) recently approved by the House Merchant Marine and Fisheries Committee is adopted by Congress. Under the Interior Department's Dingell-Johnson program, about \$40 million would be received from motorboat fuels tax receipts and more than \$30 million from expanding the tax to include a variety of sport fishing equipment and earmarking present import duties of foreign-produced boats and tackle. Recreational boating safety programs would receive up to \$45 million of the motorboat fuels revenue. Kansas received \$886,970 in D-J funds in fiscal year 1983.

Heard it thru the grapevine

High concentrations of ozone in the air cause between \$2 billion and \$4.5

billion in annual crop damage, according to a recent report by the U.S. Office of Technology. These losses represent about five percent of the nation's total yearly farm output. However, because these estimates consider ozone damage to only a few crops, total losses probably are much higher.

Serious air pollution damage to grapevines, for example, has been observed by agricultural researchers at Cornell University, with grape yields reduced by as much as 20 percent. But, Cornell research also has led to conclusions that present concentrations of acid rain are not hurting fruits and vegetables. Toxic enough to kill fish in hundreds of lakes and streams, acid rain would have to become much more acidic to cause significant damage to vegetable crops, and even more acidic to affect fruit crops adversely, Cornell studies show.

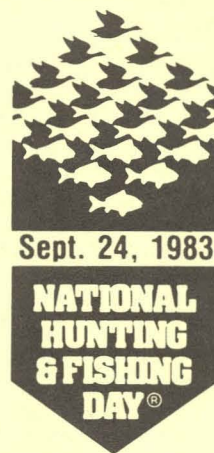
Air pollution and acid rain are caused by emissions from industries, power plants, automobile engines and other fossil fuel combustion. Ozone occurs naturally in low concentrations, but becomes more concentrated in many areas because of atmospheric reactions that produce ozone from emissions.

NHF DAY

September 24 will be National Hunting and Fishing Day, according to the National Shooting Sports Foundation which coordinates the annual event. This year's theme, "A Day for a Lifetime," highlights the fact that many people do not have the pleasure of hunting and fishing simply because they have never been exposed to it. NHF Day gives hunters and anglers the opportunity

to introduce the great outdoors to others for a lifetime of enjoyment.

To find out how to join with other sportsmen and participate in National Hunting and Fishing Day, write Bob Davis at NHF Day Headquarters, P.O. Box 1075, Riverside, Connecticut 06878.



Watt A Waste

Stop spending and balance the Federal budget! Good advice, but Interior Secretary, James Watt, does not seem to be following it.

Watt, often criticised by conservationists for his insensitivity to the resources he's charged with protecting, is apparently just as insensitive to the Federal budget dilemma. In his haste to give coal mining companies access to federal coal reserves, he sold leases in the Powder River Basin that lost the Federal Government \$100 million in 1982, according to the General Accounting Office.

In late June, the House was working to defer Watt's proposed sale of nearly one billion tons of coal in the Fort Union Region on the Montana-North Dakota border.

MAD DOG!



The cry "mad dog" is one that has struck fear in the hearts of men for centuries. The rabid animal, its nervous system riddled with virus and its salivary glands seeding infection, is a menace to man as well as domesticated creatures and wildlife. This is a disease that should concern outdoorsmen, especially those of us who hunt with dogs.

In spite of a rare cure, human rabies is, for all practical purposes, a fatal illness. It is, however, almost totally preventable.

First, let's look at the animals that get rabies. Mostly they are carnivores — dogs, cats, livestock and wildlife, especially skunks, foxes, raccoons and bats. Feral dogs and cats serve a reservoir too. Rabbits and rodents are considered only rare carriers of this disease.

Recent figures indicate about 85 percent of reported animal cases were wildlife. The other 15 percent were livestock, dogs, and cats.

The control of rabies in dogs and cats is simple vaccination either with a one-year or three-year vaccine available from your veterinarian. Mass vaccination drives in communities are one way to reduce the number of potential rabid animals. Elimination of strays and curbing the "dumping" of unwanted pets would also help. Rabies in cats is on the rise in the country; the number of reported cases exceeded the number for dogs in 1981.

Your chances of encountering a mad dog are slight, but make sure your dogs and cats are vaccinated (and avoid any animal that is behaving strangely).

Rabies in wild animals is another matter. The best advice is to be wary of wildlife that has lost its fear of man. In the furious form of rabies, animals are irrational and viciously aggressive. At another stage there is a paralysis of the throat and chewing muscles so the poor creature foams at the mouth; the lower jaw may drop. Avoid animals that act in bizarre ways.

Wild carnivores — skunks, bats, foxes and raccoons — are assumed rabid unless proven otherwise. For other animals, each case must be handled individually. Usually there is little risk.

Some outdoor activities require greater precaution and warrant taking the vaccine before exposure; spelunkers, due to bat exposure; outdoorsmen who spend lots of time in or near Mexico where there is a considerable rabies risk; and trappers, especially if they work with foxes, skunks and raccoons, or live in the southeastern United States where there has been an increase in rabies in raccoons.

If bitten by a wild animal, kill the attacker with as little damage to the head as possible. Immediately wash the bite and any areas where saliva has contacted you vigorously with soap and water. According to Dr. David Gremillion, a specialist in infectious diseases, "A vigorous soap and water washing of the bite wound is as important or more important than the actual immunoprophylaxis (immunization or shots)."

The dead animal should then be packed in ice. Call the state health department to find out what to do with the animal, and seek medical advice and treatment for yourself. — *Dr. George H. Hulsey; from National Wildlife Federation*

KS Birds Clean

Chemical pesticide contamination is a problem in bald eagles, Montana ducks and Times Beach, Missouri, but not in Kansas pheasants—not even those living in high pesticide use counties.

Laboratory tests performed last April on 60 wild Kansas pheasants showed them to be remarkably free of accumulated pesticides. Most of them had chemical residues in their body tissues too low to quantify. That's good news to hunters and the Kansas Fish and Game Commission, which feared Kansas birds might be storing potentially dangerous levels of man-made chemicals.

The Kansas study was prompted by 1981 research in Montana that had uncovered high levels of endrin and other pesticides in ducks and other birds. Fearing that Kansas birds might be similarly contaminated, the Kansas State Board of Agriculture, Kansas Department of Health and Environment, and Kansas Fish and Game Commission began a pesticide monitoring program last December.

They decided to test pheasants because these popular game birds occur throughout most of the state, are non-migratory and live in a restricted range. If any of them tested "hot", researchers would know where to look for the contamination.

Instead of testing at random, the agencies selected sample birds from three pesticide-high-use-areas and one low-use-area. Three counties were randomly selected from within each of these four areas, and five pheasants were collected

from each county during December, 1982, and January 1983. After combining the tissues of all five birds in each county, the Federal Food and Drug Administration laboratory in Kansas City tested them for several chlorinated, organophosphorus, and carbamate residues.

Birds taken from Kearney and Greeley counties were void of residues. The samples from Wichita, Butler, Sedgwick, and Washington counties had .005 ppm of hexachlorobenzene, an amount ten times lower than that considered safe in foods for human consumption. The Washington County sample also registered trace amounts of pentachlorobenzene, heptachlor epoxide, and dieldrin.

Marshall County birds showed .006 ppm pentachlorobenzene, and trace amounts of HCB showed up in the remaining counties sampled—Sumner, Riley, Rooks, Phillips and Smith.

It appears that pheasants in the counties tested are not accumulating persistent organochlorine pesticides. Dieldrin and Heptachlor were banned from use in Kansas in 1975 and 1976 respectively. DDT has been outlawed for years, and most endrin use was cancelled in 1979. The substitutes for these persistent pesticides are organophosphates which decompose more readily and don't accumulate in body tissue. Birds can be poisoned and killed outright by organophosphates, but such incidents have not been documented in Kansas.

This first test indicates that Kansas pheasants, and most likely quail and other wild game birds, are safe for human consumption. Because pesticide application varies from year to year, birds will be tested every two or three years.



photo by Gene Brehm

*how hunting
fits in crane management*

the sandhill returns

Chris Madson

The fall of 1916 was a grim time to launch a conservation effort. A firestorm raged in Europe—the war-to-end-all-wars was stalemated in France, and both sides were digging in, badly bloodied but firm in their resolve. It is a measure of the biological crisis that had developed in North America that the representatives of Canada

and the U.S. took time that year to sign an agreement that had nothing to do with the war. It was the Migratory Bird Treaty, a plan drawn up by American conservationists to halt the alarming decline of North America's migratory game birds.

The treaty had been almost thirty years coming. As early as the mid-1880s, observers like George Bird Grinnell and Gilbert Pearson, two of the founders of the National Audubon Society, had decried the slaughter of waterfowl and shorebirds. Avid hunters themselves, they called on other sportsmen to limit their kill and give up spring shooting. At the same time they recognized that an effective migratory bird conservation program couldn't work without interstate and international cooperation. After a convoluted struggle in Congress that spanned ten years itself, the nation finally signed the treaty in 1916 and ratified it two years later on July 3, 1918.

The sandhill crane was one of many birds that were ruled off-limits by the 1918 treaty act. Hunting probably had little to do with the decline of sandhill populations. Their numbers plummeted in the late nineteenth century as the southern reaches of their breeding grounds were invaded, drained, and plowed. This habitat destruction continued long after the treaty act became law, so it was no surprise to conservationists that sandhills and most other migratory birds showed few signs of recovery in the twenty years that followed. It took the drastic expansion of the national wildlife refuge system in the late 1930s and expanding state efforts to stimulate sustained growth of the migrant flocks. And, even then, sandhill populations were slow to respond.

All of the world's crane species are what scientists call "K-selected." The term refers to a complicated population dynamics equation, but the upshot is fairly simple—cranes have a conservative approach to the problem of survival.

Adult-birds are long-lived. Sandhills commonly survive into their late teens and an occasional bird may even celebrate its twenty-fifth birthday in the wild. Sandhills mate for life, lay no more than two eggs a year, and usually raise only one chick to flight stage even though they are attentive, energetic parents.

This strategy has its advantages. Unlike most waterfowl species, adult cranes don't invest a lot of energy in hatching and raising chicks that will be lost before migration. Since breeding cranes live so long, a year or two of poor nesting isn't as critical as it would be for a population of quail or mourning doves. The crane's approach to life provides continuity and minimizes short-term fluctuations in population size. All things considered, it's been a successful approach. Crane fossils have been found that are sixty million years old, and there is evidence that some of our modern species have remained unchanged for as long as three million years.

The great disadvantage of the K strategy is that it doesn't handle drastic changes well. A population of older individuals tends to be bound by tradition and may not pioneer into new habitats when old haunts disappear. And when a crane population suffers a major decline, the recovery is a long, slow process.

For mid-continent sandhill cranes, the upswing after the Dust Bowl took twenty years or so. It wasn't until the late 1950s that wildlife managers in Saskatchewan began hearing complaints. Canadian wheat farmers generally swath their grain and leave it in the fields some time before threshing and storing it. Sandhills dote on these fields. One researcher estimates that a flock of fifty birds can demolish a quarter section of swathed wheat.

Biologists with the Canadian Wildlife Service and the U.S. Fish and Wildlife Service took these complaints and the increasing spring concentrations of sandhills

on the Platte River as evidence that the population had come back. The Fish and Wildlife Service granted a one-month January season to New Mexico in 1961 and allowed Texas and Alaska hunters to take part the following fall. The Canadians opened seasons in Manitoba and Saskatchewan in 1964; Colorado opened in 1967, and in the next five years, the Dakotas, Oklahoma, Montana, and Wyoming also started hunting sandhills. Crane kill averaged about 7,800 birds that first decade with a 1970 peak of 12,500.

The rapid expansion of mid-continent sandhill hunting worried many non-hunters and a few biologists. Through most of the Sixties, managers had assumed that the sandhill population contained fifteen to twenty percent juveniles, a strong indication that the flock could support substantial hunting pressure. When a study in Saskatchewan reported that only three to five percent of the birds observed were juveniles, the Fish and Wildlife Service began hearing complaints from a new sector. The National Audubon Society began a series of its own crane studies, and at least two major national magazine articles questioned the expansion of the season. The controversy focused on several questions:

—How accurate were the FWS estimates of crane population? Mid-continent sandhills congregate in huge flocks on Nebraska's Platte River each spring, a unique chance for a census. But the numbers sometimes showed wild fluctuations. In 1964, there were 156,000 sandhills on the Platte; the following spring, only 80,000 showed up. A flaw in the counting procedure might have explained the difference; the weather might have had some influence, or the decline might have been real, the result of an unexpected nesting failure or high mortality on the wintering grounds. No one knew for sure.

—Would hunting endanger the greater sandhill? The scientific community had recognized three



subspecies in the mid-continent sandhill population—the greater sandhill, the Canadian sandhill, and the lesser sandhill. Not even a trained crane specialist could separate the three without careful measurement, dissection, and statistical analysis. Still, the greater sandhill had been classified as rare by the federal government until the early Seventies, and no one wanted to jeopardize its recovery. If the greater migrated through hunting zones at the wrong time or stayed too long, non-hunters warned, they could be at risk even if the overall crane harvest was fairly small.

—Would sandhill hunters mistake other birds for targets? Whooping cranes occasionally migrate with sandhill flocks, and other long-legged wading birds like great blue herons and common egrets might

conceivably be mistaken for cranes by a shooter who didn't know his birds.

—Finally, did the sandhill offer any challenge to the hunter? Most non-hunters perceived the crane as a large, lumbering target grown trusting and vulnerable after decades of protection. As for the table quality of the bird—most people assumed that any long-legged water critter was sure to have the gastronomic quality of a raw merganser.

The biological reservations expressed by the anti-sandhill-season faction in the early Seventies had some basis. There were gaps in our understanding of crane biology, gaps that couldn't be tolerated in the management of a K-selected species. Stirred to action by the complaints, the Fish and Wildlife Service expanded its sandhill re-

Crane hunters approach their sport much like goose hunters: set up a large spread of decoys (silhouettes, modified full-body goose decoys, and gray rags) in a grain field the birds are using consistently . . . and wait. (Photo courtesy Texas Parks & Wildlife Department)

search and population analysis. Now, after a decade of additional investigation, one FWS biologist suspects there may be “better information with which to manage these cranes than is available for any other migratory species of population.”

The most comforting statistic is the current population estimate. In 1961 when the first hunting seasons were opened, the coordinated spring crane count turned up 136,000 birds. The 1982 spring count was 570,000. Although there have been some improvements in the survey methods since 1961, there is no doubt that the difference

in these two estimates is real and reflects a hefty increase in the number of mid-continent cranes.

New information on the sandhill's population dynamics and breeding biology also gives cause for optimism. Sandhills are more productive than some technicians had expected. In some flocks, twenty percent of the adult pairs hatch and rear two young. The proportion of young in the population may vary from nine to twenty percent and usually averages ten to twelve percent. Annual losses are low. Researchers estimate that only two to six percent of mid-continent's cranes are lost to causes other than hunting.

Little wonder the flocks have grown. These population figures mean that hunters could take between 25,000 and 58,000 cranes a year without reducing the overall population. Last year's continent-wide kill and crippling loss was about 17,000. Research on other

game species has shown that, as harvest goes up, non-hunting losses often decline. If this is true with cranes, the harvestable surplus is much larger than these figures indicate.

As biologists have monitored the sandhill population more carefully, they found that the cranes' breeding success changes very little from year to year. Many other arctic nesters have "bust years" when key nesting areas don't thaw out when they should. Sandhills are spread so thin over the arctic that local weather conditions have very little effect on overall production. No one has ever recorded a "bust year" for sandhills. And the birds haven't begun to occupy all available nesting habitat.

Thirty years ago, there were fears that the sandhill was a fragile species hanging on by a thread in a world that had left him behind. Today, the picture is radically different. The mid-continent sandhill

turns out to be a surprisingly robust bird with a large, well-protected breeding stronghold and a burgeoning population, a species that has not only survived hunting but has thrived in spite of it.

But what about the greater sandhill? The Fish and Wildlife Service estimates that seven percent of the mid-continent's sandhills are greater, and the subspecies seems to show up in the hunters bag about that often. Since there has been little change in either proportion in the last few years, FWS biologists aren't too concerned about the future of the subspecies.

A single wildlife biologist has done more in the last five years to wipe out the greater sandhill than all the hunters who ever pulled a trigger. Dr. Tom Tacha, a research biologist at Southern Illinois University, has made exhaustive measurements on more than a thousand mid-continent cranes, poured all the measurements into a computer, and looked for distinctions among the three subspecies. He couldn't find any. When he considered the measurements of one body part—say, length of toe—the statistics left some hope for differences that might mark subspecies. When he looked at two or more parts at once, however, there was no sign of subspecies. The computer showed the thousand-bird sample to be a single, indivisible group with the range of body sizes one would expect in any group.

One of the tests of a subspecies is that its members tend to mate with their own kind. Using older information on sandhill subspecies, Dr. Tacha found that fourteen of forty adult cranes had picked mates of a different "subspecies." It seems that the cranes themselves can't recognize the races we thought were there. As it turns out, the early work that separated the subspecies was based on small samples. It took Tacha's giant study to show that there is only one sandhill subspecies in the mid-continent.

Dr. Tacha suspects that mid-con-



Texas Parks & Wildlife Department

continent cranes are split into two groups, not on the basis of body size or shape but by a difference in nesting grounds and migration routes. What Tacha calls the "Gulf Coast subpopulation" nests in Manitoba and central Canada, migrates through western Minnesota and the eastern Dakotas to Washita National Wildlife Refuge in Oklahoma, then moves on to the Gulf. Tacha's "west Texas subpopulation" nests in western Canada and migrates through eastern Montana and the high plains to wintering grounds in Texas, New Mexico, and points south. In the spring, both flocks mix on the Platte before moving north. Since much of the sandhills' selection of mates occurs on the Platte, this mixing keeps the two subpopulations from drifting apart genetically.

So much for biology. Today, no scientist familiar with sandhill cranes will argue that the mid-continent population is overhunted. But there are other concerns. The one most commonly expressed is the risk a sandhill season poses for whooping cranes. The two species have a similar profile, and a young whooper even has a brownish color scheme that faintly resembles the sandhill's. In spite of the similarities, however, the risk isn't nearly as great as it seems. To begin with, there are only about 80 whoopers in the central U.S. Although they sometimes migrate with sandhills, it's unlikely that a sandhill hunter will even see a whooper within gun range, much less shoot at him. The Last Mountain Lake area in Saskatchewan is a staging area for both sandhills and whoopers. Sandhill hunting has gone on there since 1964, and a whooping crane has never been injured or killed. Aransas Wildlife Refuge, the winter home of the whoopers, was established in 1937 and has been ringed with waterfowl leases ever since it was created. In the forty-five year history of the refuge, only one whooper has been shot. The bird was fatally wounded in the early

1950's by a goose hunter shooting in heavy morning fog. He was arrested by other waterfowlers in the area and turned in. If the records of the last forty years are any indication, high-tension electric wires pose a far greater threat to whoopers than hunting.

The only other marsh birds that even remotely resemble sandhills are the great blue herons and common egrets. It's hard to believe that any hunter could mistake either bird for a sandhill, but there may be a few shooters who need to brush up on their birdwatching before drawing the crane permit. FWS biologist Harvey Miller notes that crane hunters in the Dakotas have an uncanny ability to age sandhills on the wing. When they found out that young birds were more tender than adults, many of these hunters started looking for juveniles in the flocks. Harvey says that up to sixty percent of the birds taken in some parts of these states are juveniles. That goes to show that a hunter can turn into a mighty effective birder when he's motivated.

Many non-hunters feel that cranes offer no challenge as game birds and are miserable table fare. According to the people who hunt the birds, nothing could be further from the truth. Serious crane hunting is nearly identical to serious goose hunting. The key to success is finding the right spot, usually a grain field the cranes are using consistently. The first flights come off the roosts before sunrise, so a crane hunter is well advised to have his decoys and blind arranged before light. Some hunters use silhouettes; some use modified full-body goose decoys, and nearly every crane spread features plenty of gray rags. Serious hunters try to have a spread of at least 200 decoys.

Most hunters lie down on the downwind side of their decoys, since cranes, like geese, often land on the downwind side or flare to one side before they reach the head of the spread. Everyone who has ever hunted sandhills swears they

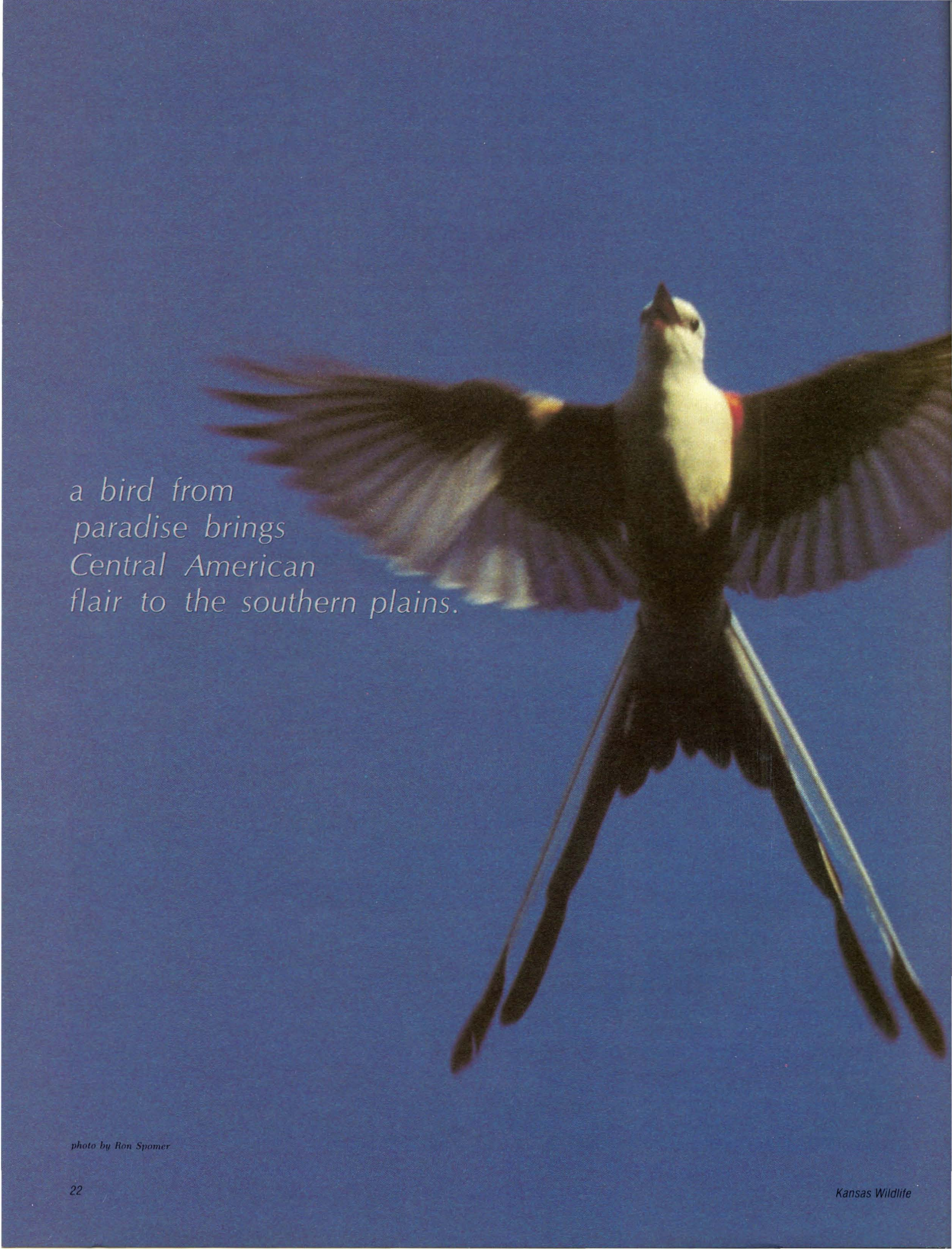
have eyes like an eagle's and are far more skittish than the average Canada goose. The shooting, when (and if) it comes, is surprisingly difficult. Most hunters underestimate the crane's range and speed and shoot behind their targets. No challenge? Don't bet on it.

The man who started the tale about the sandhill's poor table quality had obviously never eaten one. Unlike most wading birds, sandhills prefer grain to fish. By the time most hunters have a chance to shoot a crane, the birds have been on a diet of wheat, oats, and milo for a month or more, and they are delectable. Tom Tacha ate plenty of sandhill during his research work and recommends that the bird be filleted into thin strips, tenderized, and fried.

Nash Buckingham, one of the South's premier outdoor writers, once mentioned that he bought his first hunting license for a crane hunt. He traveled up to North Dakota from cotton country "with his father and 'the judge' just to shoot sandhills. The year was 1902.

The Buckinghams obviously took their crane hunting seriously. It's hard to say how many other hunters of the time shared their interest, but judging from the lack of written accounts of crane hunts, the sport never had many followers. That isn't to say that the crane couldn't support tradition. The sandhill has all the makings of an outstanding game bird. He's wary, responsive to decoys but not too responsive, a delight in the sky, an impressive trophy on the ground.

Of course, there are many people who choose not to hunt cranes, and that's fine. Unfortunately, all too many non-hunters hung black crepe and mourned for the sandhill when crane seasons began to expand. That's a strange reaction. The return of huntable surpluses of cranes seems to be reason for celebrating, not mourning. Something tells me the men who closed the season in 1918 would be pleased to see it open again. □

A photograph of a bird, likely a Central American screech owl, in flight against a clear blue sky. The bird is shown from a low angle, with its wings spread wide and its long tail feathers trailing behind. The bird has a white head and neck, a red collar around its neck, and dark brown wings and tail. The text is overlaid on the left side of the image.

*a bird from
paradise brings
Central American
flair to the southern plains.*

photo by Ron Spomer



Ron Spomer

sky dancer

They come to us from Central America, which shouldn't surprise anyone who's seen one. With that gray, pink-salmon, and red-orange plumage and those incredible tail feathers, they look more like exotic dancers than hard-grit Kansas prairie birds. In reality, they are a little of both.

Scissor-tailed flycatchers spend half of each year lolling about the warm, open lands from Mexico south through Panama. They tough-out the rest of each year on the plains of the southcentral United States, raising their broods in safety amid scattered trees and hunting

Continued



If you got it, flaunt it. The conspicuous tail of the scissor-tailed flycatcher is longer in the male than the female of the species. However, both put the tail to effective use to brake, turn, and guide their flight while hunting. The tail also figures prominently in the acrobatic aerial show that occurs during courtship displays. (Photo by Ron Spomer)

insects over the grasses bent under the relentless south wind. But they do it with such style!

You've heard it said that what you have is not as important as how you use it? Well, scissortails have it and know how to use it. Beak tip to tail tip, the average male is fourteen inches long, and nine of those are tail. Any bird with a tail longer than its body is bound to attract attention, but it's what the male scissortail does with his that puts him in the spotlight . . .

"Mounting the air to a height of perhaps a hundred feet," Hubert Brandt wrote in Arthur Cleveland Bent's *Life Histories of North American Flycatchers*, "he starts his routine by plunging downward for about a fourth of the distance, then turns sharply upward to nearly the previous height; and he repeats this up-and-down zigzag course several times, emitting meanwhile a rolling, cackling sound like rapid, high-pitched hand-clapping. This

he seems to produce by loud snapping of the mandibles, or it may be a vocal effort . . . The last upward flight may take him still higher, and his path then becomes a vertical line. When the flycatcher reaches the zenith of this flight, so vivacious is his ardor that over he topples backward, making two or three consecutive reverse somersaults, descending like a tumbler pigeon, all the while displaying to his mate the soft, effective, underwing colors.

This active display is remarkably emphasized by the long, flowing tail that becomes an expressive banner of showmanship, and it is then that one realizes its nuptial significance. That dual appendage, the like of which is possessed by no other North American bird, adds to every movement the smooth, effortless rhythm of superb body grace; and consequently the aerial ballet of the scissor-tail is incomparable in flowing, graceful action and flirtatious courtship interpretation."

Naturally, these excesses are inspired by a comely female scissortail watching admiringly from perch or nest. With her six- or seven-inch tail, she could play a convincing supporting role in the sky dance, but she prefers to let the light shine

on her beau. Behind every great man . . .

Both sexes put their long, split tails to more utilitarian uses, opening and closing them as necessary to brake, turn sharply and otherwise maneuver while hunting. This scissoring action is also prominent during a flight pattern that has been referred to as a "bizarre aerial gyration." While flying business-like in a straight line, a scissortail will suddenly dart upward into a series of seesaw moves, screaming all the while and snapping its tail. Maybe this erratic behavior is what has led Mexican peasants to believe the loco scissortails feed on the brains of other birds.

For all their aerial grace, scissortails aren't the world's best engineers. One famous pair tried building its honeymoon cottage on the vanes of an operating windmill—over and over and over . . . Completed nests have been described as loosely constructed, carelessly built and bulky. I can



verify that. I watched one literally fall apart under the strain of a growing family last summer.

The nest site was one of those good-news, bad-news affairs. The good news? It was located at the end of a ponderosa pine bough just six feet off the ground so a curious photographer could poke his lenses into it. The bad news was that the soft, pine bough foundation was not designed to support five fat nestlings.

During the egg and naked baby stages, things went smoothly. The cradle swayed peacefully in the June wind. But as more and more grasshoppers were stuffed into those gaping mouths, the nest acquired an appreciable lean. I wanted to remain the noninterfering observer, but I needed those subjects for pictures. Besides, I couldn't force myself to abandon them to their fate. I interfered by weaving a sturdier support twig under the nest. That worked well until the thunderstorm hit.

I'd been photographing the adults feeding their offspring for an hour before the ominous cloud bank forced me to grab my camera and dive into the car. The wind began to switch, the nest to twitch. The female hovered excitedly over the pitching nursery, then made the mistake of landing on it. Down came the cradle, babies and all.

Here was my second opportunity to play the objective scientist and let Nature take her course. Would the adults locate their toppled young and protect them from the storm? The female flitted about the empty bough and repeatedly tried landing where the nest had been. Just as the rain began pelting the dusty road, she side-slipped to the ground and disappeared in the grass. "Okay," I thought, "She's located the little beggars and is brooding them." For the next half hour the clouds spit and sputtered. In another half hour, the wind blew itself away, and I stepped out to see how things had gone. Not very well.

Mom scissortail had been sheltering only one nestling. The others had apparently scrambled off. I found two of them, wet and cold, hiding in the grass. The other two had disappeared. Perhaps, I hoped, the male is caring for them. I propped the nest back on the bough, replaced the dry chick, and scooped the wet ones into my hands. By now, though, my hands-off policy had been compromised too often, so I abandoned it and carried the bedraggled birds back to the office, dried them, set them in a styrofoam cup in the sunshine and played

Scissortails spend much of their time on a low tree branch or fence wire waiting for the next foray into a grassy field or roadside ditch for insects. Grasshoppers comprise a large share of the scissortail's diet, a characteristic long admired by farmers of the southern plains. Since the turn of the century, this species has expanded its range northward into Nebraska. Wandering individuals of the species have been sighted in New England in recent years, far removed from their historic range in the southcentral U.S. (Photo by Ron Spomer)



substitute parent, catching grasshoppers and forcing them down their recalcitrant throats. After two hours of this, they were back on their feed, so I returned them to their shaky home where mom and pop resumed responsibility. I hope I didn't perpetuate a genetic predisposition toward poor nest site selection.

In spite of this typically shoddy

house construction, scissortails are dedicated parents, defending their broods from all comers. Trespassing scissortails from bordering territories are set upon with a fury and escorted back from whence they came. Crows and hawks enter scissortail country at their own risk. The feisty flycatchers pursue the big predators "with the utmost fury and persistence, often lighting on their

backs and doing them all the damage they can by savage stabs with their bills," according to *Birds of America*, a 1917 classic. Scissortails ignore most song birds unless they approach within thirty feet of an occupied nest. I've seen scissortails and eastern kingbirds peacefully cohabiting the same cottonwood. That's somewhat surprising, since the two species have similar hunting styles and are both members of the Tyrannidae family (tyrant flycatchers).

Back in 1912, a professor F.E.L. Beal studied scissortails extensively and reported they rarely settled upon the ground, yet more than forty-six percent of their diet was grasshoppers. He postulated that the birds snatched the hoppers when they took long jumps or short flights. Samuel Rhoads in 1892 reported observing scissortails "for hours gleaning insects in the open pastures and salt flats near Corpus Christi, alighting without hesitation in the short grass to secure or devour their food." Bent proposed that this ground feeding may have been to blame for the worn appearance of the flycatchers' long tail feathers in late summer. Whether or not Kansas scissortails ever feed on the ground probably depends more on habitat than habits. Where native grass is tall and rank, the birds find plenty of grasshoppers, crickets, moths and caterpillars in the upper levels of vegetation. Where pastures are short, they undoubtedly drop to the ground to snatch their prey. They most commonly hunt from a fence, highline or tall weed perch, flying out to ambush passing insects. Because of their taste for grasshoppers, ornithologists raised scissortails as a banner of protection for farmers at the turn of the century, and by 1912

For most folks, the unique tailfeathers of the scissortail are put to best use by the birds themselves. Unfortunately, plumage poachers in the southern plains have other ideas. Souvenirs, such as the peyote fan shown at right, bring as much as \$700 on the black market. Since each peyote fan may contain as many as eighty feathers, forty scissortails must be killed to make a single fan.



photo by Gene Brehm

the species was "enjoying the needed protection" and seemed to be "increasing in Texas and are extending their range," according to Bent.

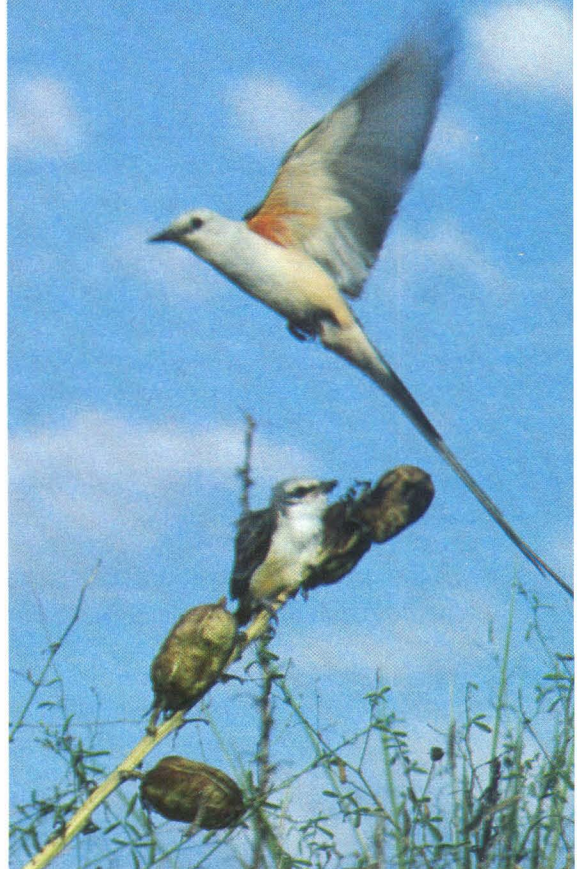
That extension has reached into Nebraska, and wandering individuals have been sighted as far northeast as New England. During the summer of 1982, a pair of scissortails enthralled the birding community in South Carolina by nesting there for the first time ever. But while these two pioneers were enjoying the traditional southern hospitality, their kin on the plains were suffering.

Plumage poachers are again at work. U.S. Fish and Wildlife agents recently arrested a ring of shooters, sellers and buyers of scissortailed flycatcher tail feathers. (See Eagle Poaching story in Yellow Pages this issue). These criminals build "authentic" Native American peyote fans from tail feathers, using as many as eighty in each fan, which sells for as much as \$700. Since each flycatcher has just two long tail feathers, forty must be killed to

make each fan. The poaching is difficult to control since the birds are spread over a large chunk of country, are easily taken from roadsides with small firearms that make little noise, and are small enough to hide nearly anywhere. Besides, the poachers only need the two feathers, which they quickly pull, leaving the carcass behind. The poaching is particularly bad in Oklahoma where the scissortail is the state bird. But as more and more law enforcement pressure is concentrated in the Sooner state, inventive poachers will move to other areas, like Kansas. Concerned citizens would be wise to investigate any suspicious activity along roadsides, especially when they hear small arms fire. Scissortails deserve better than immortality in a souvenir fan.

The scissortails that survive the breeding season begin drifting back to Central America in September. They fly mainly at night, and by the time they reach Texas, they've gathered in large flocks that glean insects from fields. They roost in numbers too, as witnessed by Mrs. Florence Merriam Bailey: "At sundown, when Mr. Bailey shot a rattlesnake at the foot of a big oak in camp, the report was followed by a roar and rattle in the top of the tree and a great flock of scissortails arose and dispersed in the darkness. They did not all leave the tree, apparently, even then, although some of them may have returned to it, for when daylight came, to my surprise a large number of them straggled out of the tree. How one oak top could hold so many birds seemed a mystery. Before the flycatchers dispersed for the day the sky around the mott was alive with them careering around in their usual acrobatic manner making the air vibrate with shrill screams."

By mid-October, they leave Texas in flocks of a hundred or more, feeding as they go in the twilight. Their winters are really no vacations, for protection is far from guaranteed in Central America where people are too busy revolting



and trying to keep body and soul together to worry about song birds. In fact, scissortails are eaten in some areas. Persistent pesticides are also a threat south of the border where DDT and its kin are still widely used and abused. But perhaps the greatest threat is the same one shared by many of our migrating perching birds—habitat loss. Uncontrolled development in third world countries is turning native forests and grasslands into wastelands. Perhaps because the scissortails prefer open country and have proven their ability to coexist with man and his agricultural changes here in the U.S., the species won't suffer unduly with increased cropping down south. At least we can hope so.

Because we have need for the scissortail. By July, a plains summer resolves itself into a monotonous procession of dust-colored days, bleached and sun-blasted, a time of year that generates an undefined craving for something exotic. Enter the scissortail, a sudden flourish in the white heat overhead, a flicker of color and flair from the southern side of the rainbow. And the day suddenly feels a little lighter. □



Photo courtesy U.S. Fish & Wildlife Service

*where do shallow-
water fish spend
their summers?*

out of their depth

Tommie Berger

Is fishing in Kansas getting more complicated? When I was a youngster years ago, we thought channel cats, carp, and bullheads were the only types of fish to catch. Now, we've got bass and walleye, white bass and stripers, crappie and trout, and the list goes on and on.

Articles are written every day on fishing for this fish or that fish, and most are written by so-called experts who make it sound awfully easy. Some anglers who have learned how to catch certain species say that fishing is getting better and better. Other old timers say that fishing is worse now than it's ever been. Some say fishing is good in new lakes but all the old lakes are "fished out".

Is the fishing getting tougher these days? If so, what are the factors that affect fishing the most, and what can a fisherman do to increase his success? Can fishermen be expected to think like a fish and determine what a fish is doing when he's not biting? Is he down there watching your lure go by, or is he somewhere else in the lake where you are not fishing?

Because I'm a fisheries biologist, I'm expected to know the answers to questions like these. Luckily, my job allows me to look for some of the answers by doing studies that help me know more about what the fish are doing than the average angler.

Let's first look at a few of the factors that affect the location of fish in a given lake, pond, stream or res-

ervoir. There are four factors that I feel are most responsible for fish movement or fish location—water temperature, habitat, food, and angling pressure.

All fish are cold-blooded; therefore, their body temperatures are the same as the temperature of the water they live in. Fish are totally at the mercy of their watery environment. Everything they do depends on the water temperature. At cold temperatures, they are sluggish and don't eat much. As the water warms, they all move into the shallows with spawning on their minds. The increased activity means they require more food to survive and grow. When the water gets too warm, they seek cooler areas—deep water, shade—or they become uncomfortable and less active.

Habitat, too, is quite important. As everyone knows, each species of fish has a specific type of environment it prefers, and each may prefer different habitats during different seasons or even different times of the day. Some fish, like bass and crappie, prefer brushy, timbered areas for feeding and spawning. Other species, like white bass and stripers, are more open-water oriented. Catfish seem to be able to adapt and be comfortable in any habitat, be it open water, brush, rocks, or aquatic vegetation. In order to think like a fish, an angler must know what type of habitat he should be fishing in or around to catch the species he is after.

Food, of course, is as critical to a fish as it is to a fifteen-year-old kid. Every fish will spend most of its time near a source of food. An angler must be aware of what the species he's seeking eats during different times of the year, and he must match his bait to the natural food available, if that's possible. I predict that most fish will eat almost any time under almost any condition if you can get your bait (the bait he's familiar with) right in front of him and present it as naturally as possible. (That's a pretty big statement, but I'll stand by it!)

To the surprise of a lot of people, fishing pressure can have a tremendous effect on fishing success. A number of studies have shown that high fishing pressure means reduced angler success, and that's not because the lake has been "fished out". Even a fish has some memory, and after he's seen twenty lures swimming by his nose, or better yet, been hooked by one or two, he learns pretty darn fast. Think how many unintelligent fish have ended up in the frying pan, leaving the wiser ones to produce more wise ones. Compare fish with pheasants who seem to be learning to run more these days, or deer who change their habits when the woods get filled with hunters. Fish are no different, and our angling pressure is increasing every year as people have more leisure time and more interest in outdoor recreation.

Taking all these factors into account, back in 1979, I got to wondering what the crappie in my favorite little lake were doing in the summertime, and why no one caught many during that time of year. Where did they go when they moved out of the shallows after spawning, and what were they doing all summer that kept them so well hidden? I set about developing a research project to find the crappie and develop some ideas on what habitat, water temperature, and food they needed. I got some interesting results.

For those of you who are not familiar with it, Clark State Fishing Lake is a 300-acre impoundment on Bluff Creek in northcentral Clark County, some forty-five miles southeast of Dodge City and sixty miles west of Pratt. Most of you who've seen flat, windy southwest Kansas won't believe your eyes when you drop into the canyon that holds this beautiful little lake. It's an oasis in the desert, and use by anglers, campers, and picnickers is high.

Built in 1940, the lake is forty feet deep at the dam and has an average depth of seventeen feet. It has a

diversity of habitat from brushy shorelines to steep drop-offs, quite a bit of aquatic vegetation, and nice, clear blue water. It contains a diverse fish population that includes largemouth bass, walleye, white bass, channel catfish, crappie, bluegill, green sunfish, bullheads, carp, and gizzard shad as a food fish for all the others.

As with many other lakes in the state, crappie fishing is good in the spring. Boat anglers drifting minnows and jigs throughout the main body of the lake have excellent luck. Other anglers find lots of crappie spawning in shallow water around the brushy shorelines and coves. But, after May, the crappie all but disappear, moving away from the shoreline so that even the drift fishermen don't seem to find many. Serious anglers suspected that the crappie moved out to deep water, found a cooler layer, and suspended somewhere in the middle of the lake in large schools. Some wondered if these crappie ever ate anything during the summer. I was beginning to wonder myself, but I knew they had to be there, eating and growing because, in the fall, I caught good numbers of crappie in my yearly test nettings.

The study included the use of vertical gill nets, which I constructed to sample fish in a water column in the lake from top to bottom in depths up to thirty-five feet. I constructed six nets, each twelve feet wide, half with one-and-a-quarter-inch mesh and half with two-inch mesh. Gill nets are entanglement nets and are fairly effective in sampling many of our common species of fish.

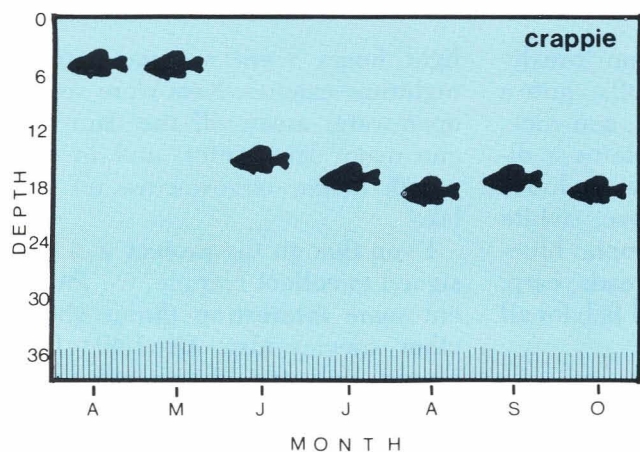
The nets were set and run one twenty-four-hour period per month from April through October both in 1980 and 1981. As we ran the nets, we kept track of the kinds of fish we caught and the depth at which we caught them. Catches during day-

light hours were separated from nighttime catches. Nets were set in open-water areas, off the dam, off one major lake point, and in the mouth of the largest cove on the lake.

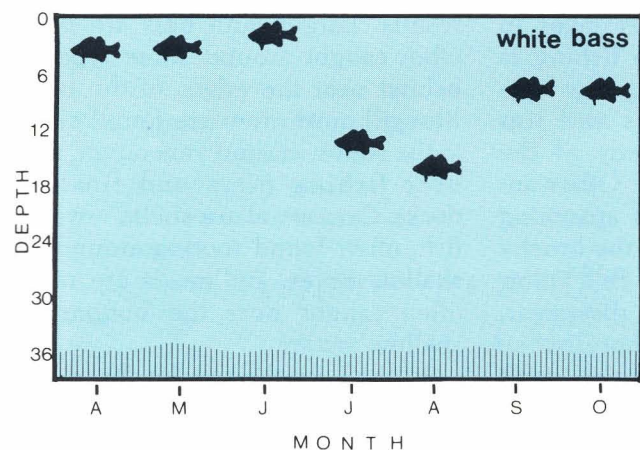
Even though the project was designed to collect crappie, we found out some interesting things about other species also. Of 1,494 fish caught, only ten largemouth bass, six bluegill, and six carp were taken. We failed to catch a single bullhead. Most fishermen would expect these results. Largemouth bass are most often caught around some type of habitat near the edges of the lake. Bluegill most often are found close to the edges, around vegetation, and near fishing piers and floating docks. Carp are also a shallow-water fish, often found rooting around in shallow coves. Bullheads are most often caught near the bottom in shallow water.

So much for the species that don't frequent open water. We knew that the crappie were out there somewhere, and they proved to be the most numerous fish taken during the study. Most crappie were in open water from June through September. They were particularly abundant in the open during the warmer months of July and August. The spawning urge drew them to shallow water in April and May, and they left the open, deep-water zones again in October, probably moving to shallow areas to fill up on groceries for the winter.

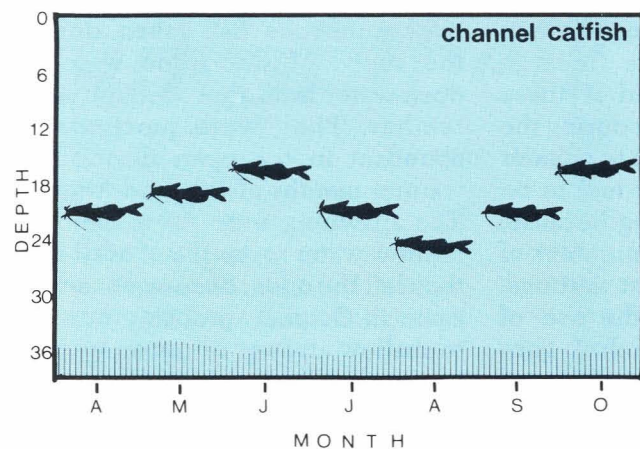
The depths crappie preferred did not vary as much as we expected. Although crappie were taken as shallow as three feet and deeper than twenty feet, it appears that they spend most of their summers at depths between fifteen and nineteen feet. Apparently, water temperature makes little difference to a crappie since temperatures varied quite a bit from March through October. Structure is rare in



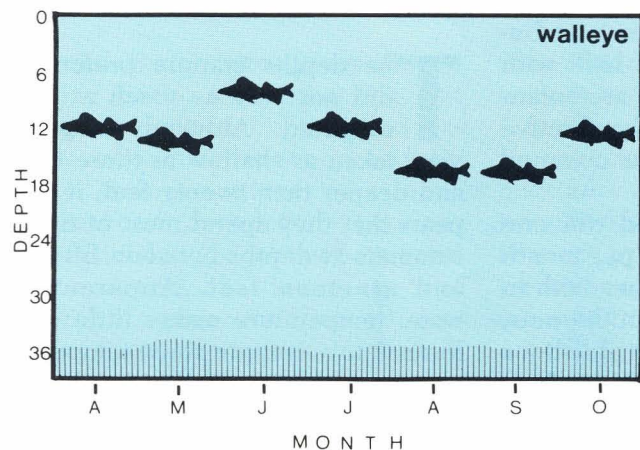
April and October bring many crappie to stickups and brush-piles in shallow water, but many remain in open water at depths from 17 to 19 feet.



White bass are true open water fish, but their preferences may vary from as shallow as 5 feet in June to over 20 feet in August.



In April and September, channel cats were found at depths averaging over 21 feet. In August, they moved to cooler water below the 26-foot mark.



Walleye use rocky shallows during the early spring spawn. In June and July, they move to flats in 7 or 8 feet of water. In August and September, they show up around 20 feet deep.

open water, but I'm sure that crappie will concentrate around brush-piles, points, and edges of vegetation located in water fifteen to nineteen feet deep, especially along steeper drop-offs. So, except for April, May and October, I'd surely fish for crappie in depths of fifteen to nineteen feet. Daytime or nighttime seemed to make little difference to crappie numbers or depth.

The second most common open water fish was the channel catfish, much to the surprise of many!

Well over 300 channel catfish were collected in the two study years. Most were there in April and October, but moderate numbers were present in all months throughout the summer. Channels were taken in depths from one foot down in thirty-five feet of water, all the way to the bottom. When averaging all fish and depths, channels appear to spend most of their time down around the twenty-foot level. During different months, the mean depth varied from fourteen to twenty-six feet. The channels were deeper during the hot months of July, August, and September. More catfish were caught at night than during the day, and they were shallower at night.

Most of these catfish are under two pounds and are probably feeding on small shad and aquatic insects. It appears that anglers do not need to fish on the bottom to catch channels, but just how would one go about fishing for suspended catfish? I guess just anchor the boat over deep water, put on some worms, liver, or prepared bait and lower the bait down about twenty feet and let it hang there over the side of the boat. Maybe that's a new technique. I sure have never seen anyone fishing for catfish this way!

Two other game fish species—white bass and walleye—showed up fairly consistently in the open-water vertical gill nets. Both are known to use open water, especially the white bass. Everyone knows they spend most of their time cruising far from shore, ready to attack an un-

suspecting school of shad at any moment.

White bass were most common in open water in June through October and were most numerous in September. Crappie and channel catfish outnumbered white bass in the nets simply because there are fewer white bass in the lake. The mean depth of this species varied more than it did for other species. In June, September, and October, they were found in water less than ten feet deep—in June as shallow as five and a half feet. In August, perhaps due to warmer water temperatures or the location of shad schools, they were down near the twenty-foot mark, and, at any time during the summer, they were shallower at night.

Walleye were the least common of the open-water species. We netted only sixty-one during the two-year study. This may be partly due to the low population density at Clark and the locations of our nets which were far from classic walleye structure. Moderate numbers were caught in open water in all months but May. Depth distribution was somewhat surprising. Walleye appear to cruise at fairly shallow depths over deep water, sometimes as shallow as seven feet. They seem to spend a lot of time no deeper than fourteen feet, except during the hot months of August and September when they got down to seventeen to twenty feet.

Walleye are fairly difficult to catch in this lake, as they are in most small lakes. In small lakes like Clark which have fair to good walleye populations, the seven- to twenty-foot level that the fish seem to prefer is completely ringed with aquatic vegetation. Walleye like vegetation as a habitat type, and I think that, even though some venture to deep water to feed, most spend their time in and along the

deep edges of the weedbeds. Few walleye ever see any of their favorite baits while lying in the weeds. The few that are caught during the warmer months are taken by fishermen trolling with diving type crankbaits along the edges of the vegetation line. To my surprise, daytime and nighttime showed little difference in walleye numbers or depth.

Even though this study was done on a western Kansas lake, the principles we discovered ought to apply to other lakes. Of course, knowing where the fish are is half the angler's battle; the other half is knowing how to catch them. (One comment here for those who understand lake stratification, Clark does not stratify down to thirty-five feet or so. If your lake stratifies during the summer, apply these principles to areas above the layer of bad water only.)

The crappie are out there, suspended somewhere between fifteen and nineteen feet, probably feeding on shad and aquatic insects in the hot summer months. You'd better fish deep, fish slow, be patient and try to find a brushpile just about that depth. I think the crappie are quite spooky during this time, and an anchor rope or snagged lure shaking the brush can send them scattering.

It is difficult for some fishermen to believe that channel catfish are out there in open water, but they are. It may be difficult to change old habits in regards to fishing on the bottom for catfish, but there are fish suspended out there to be caught if you can develop a technique that gets at them.

White bass are known as an open-water species and they behave true to form at Clark, feeding on shad or other small baitfish far from shore. In lakes with heavy fishing pressure, especially those with lots of boats, white bass tend to get pretty spooky. They will school up

and chase shad, but they seldom stay on the surface very long. You'd better ease up to a school of feeding whites and throw lures that closely match the shad size, or you will be quickly out of luck.

Walleye will spend some time out in the open and can be caught on trolling lures, but I still contend that they spend lots of time buried deep in the weedbeds. If you can invent a lure that swims naturally in and around the vegetation without getting hung up, you'll make a fortune and have a blast!

I haven't mentioned gizzard shad except as a baitfish but they do frequent the open water of those lakes that contain them. They spawn in shallow water, but the young are schooling fish which spend most of their time out in the open. Our vertical netting efforts caught lots of shad.

If fishing is tough for you, if you want to master techniques for fishing for a different species of fish, or if you want to learn how to catch your favorite fish year around, keep this article in mind. At least if you know where your favorite fish spends most of his time, you'll spend most of your time with your bait in front of him. Remember, you've got to think like a fish.

Keep in mind that water temperature, habitat, food, and fishing pressure all affect your angling success. Lots of anglers fish shallow water around the shoreline and have limited success. Fish do have memories and do react to angling pressure by moving to different areas or by simply not biting on a bait they've seen time after time. Learn where your favorite fish should be; don't use the baits everybody is using; don't be afraid to fish the middle of the lake, and fishing just might get easier for you. □

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Covers: Red fox by Gene Brehm

