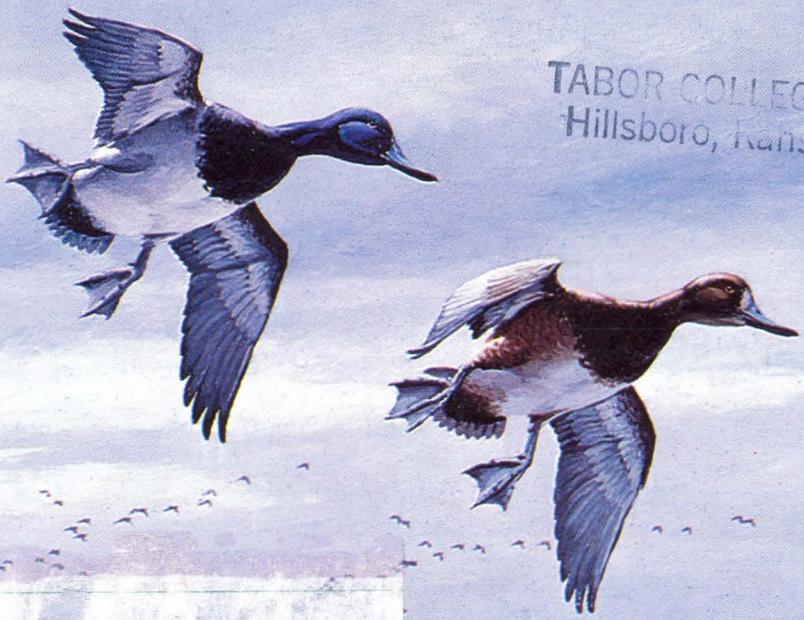


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KANSAS FISH & GAME

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KANSAS FISH & GAME

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**Cover Credits—Working the Bay—Bluebills by David Maass, courtesy of the artist
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Editorial

SKYBUSTERS

There were two of us, draped with equipment and all the clothes we could wear and still walk. Between us, we had seven dozen decoys, one heck of a load, especially while wading through three feet of water and smartweed at five in the morning. Daylight and the beginning of the day's shooting were still two hours away, but we could see headlights pulling into the parking lot behind us and knew we were none too early. The wind was out of the northeast, and when the wind was there, only one point on the lake was worth setting up on.

Duck hunting is generally an all-or-nothing arrangement. In order to really savor the sport, a hunter has to be in the right place—usually a freezing marsh—at the right time—usually many hours before sane people even hear their alarm clocks. In exchange for the investment, the interested hunter may work a dozen really good flights of ducks in a season, and anyone who has ever lain under a flock of fifty mallards as they hang in the morning sky knows the exchange is worthwhile.

We had the right spot, the right day, the right time, the right spread of decoys. The first morning flight swung downwind from us, still high, and set their wings. We could hear the small talk in the flock as they dropped. They were about eighty yards out and about that high when two shooters straightened up out of the cattails to the south and emptied their guns. They stung one hen and watched her lose altitude slowly while the rest of the flock receded into the sky; then they

squatted back down and waited for the next flight. They worked our next three bunches the same way without ever getting a duck, and I'm sure they would have been happy to sit there the rest of the day if we hadn't picked up our blocks and headed for the car. The last we saw of them, they were walking south toward another bunch of decoys on a smaller puddle.

The charitable explanation for their behavior was that they just didn't know any better. They hadn't bothered to roll out of bed until an hour after we had been on the road and had picked their shooting place at random without noticing our spread. They didn't know enough to realize that the ducks hanging over their heads were all responding to our decoys. Their ignorance explains why they were there—it doesn't excuse them.

There were a lot of reasons to come away from that day with a poor opinion of those two. They obviously figured that their time and well-being were more important than ours. They committed half a dozen breeches of etiquette, insulted us, and stole a rare perfect morning. Their most glaring sin, however, was that they didn't understand waterfowl or waterfowling and didn't care to understand either one. They were there to pull a trigger, and as far as we could tell, they would have been as happy shooting clay birds or beer bottles—happier maybe, as long as there were more to shoot.

The essence of hunting is in what the hunter learns before he pulls the trigger, and in the case of a skybuster, that isn't much.



National Wildlife



It used to be known as the Midwest Wildlife Art Show, a once-a-year event that brought together the best wildlife artists in North America. In the seven years of its existence, however, the Ducks Unlimited-sponsored art show has outgrown that billing.

Its new name—the National Wildlife Art Show—more accurately defines the scope of the event. Artists from across the U.S. and Canada will convene at Kansas City's Crown Center Hotel March 16-17 to assemble an unparalleled collection of wildlife art.

Besides offering show-goers an opportunity to view and buy top-quality paintings and sculptures, the event raises money for use by Ducks Unlimited. Last year, participating artists each donated one piece of art to be auctioned off the final night of the show. More



**March 16-17, 1979
Crown Center Hotel
Kansas City, Missouri**



Art Show

than \$40,000 was raised and donated to DU's waterfowl conservation efforts.

This year's show should be the most impressive ever. In the past, space limitations held the number of artists participating to less than 100, but more space is available this year.

The quality of artwork submitted also is a major factor determining the size of the show.

"We do reject artists sometimes," explained Bill Anderson, chairman of the show's judges committee. "If we get many good applicants, we could accommodate as many as 150 artists, but if we only get 85 or 90 bona fide artists, then that's all we'll have," he said. More than 500 artists queried the show's sponsors to express their interest in participating.



Management with facts or feelings?



Vic McLeran

Controversy surrounds the Kansas bobcat—

ESSA and the Bobcat

Neil Johnson

Concern started with a Reader's Digest article claiming that the bobcat was endangered in Kansas. People throughout the state became worried about the fate of the bobcat. As the price for pelts rose to highs of over \$150, the interest peaked. Then in the fall of 1977, the Endangered Species Scientific Authority ruled that all bobcat pelts intended for export had to be tagged before they left the United States.

First, let me set the record straight. The bobcat in Kansas is not endangered; in fact, its population is slowly increasing. The fact that it is not frequently seen by the average Kansan is due more to its life

ounces and have spotted fur. Eyes do not open until the kittens are nine to ten days old. These kittens are active and play around the den. They are weaned at the end of the second month. The litter or part of it might stay with the female through the fall, but the young are usually on their own by early January when the breeding season starts. About fifty to seventy days after breeding, the female will have her litter. Some female bobcats are capable of mating their first winter and have been known to live up to ten years.

Bobcats generally hunt during the evening. Their prey is generally rabbits and small rodents. They have

“Unless the uncontrolled exploitation is stopped, the bobcat, which until recently occurred in every one of the 48 states, may vanish from the nation.”

Hope Ryden, *Reader's Digest*

history than to its population density. The bobcat is the second largest predator in Kansas, but because of its secretive and nocturnal habits, it is very rarely seen. Even if the bobcat were active during the day, sighting one would be difficult, because the cats mainly inhabit broken, rugged terrain that few people ever get into. Yet last year when we asked archery deer hunters to report the total number of bobcats they saw, they recorded seeing 896 cats.

A bobcat is usually born in late April or early May. Litter size ranges from one to five kittens with an average of three. These kittens will weigh about twelve

also been known to take chickens and other farm animals, deer, and small game.

The bobcat is found in nearly all of Kansas. The blackjack, post oak woodlands known as the “Cross Timbers” region of southeast Kansas, the Bluestem or Flint Hills grasslands in the eastern one-third of the state, the counties bordering Oklahoma on the south and southwest, and the habitat associated with the Arkansas and Cimarron River drainage support the largest bobcat populations. Areas adjacent to these high density areas have lower populations. The overall state population is probably between 10,000 and

12,000 bobcats.

The harvest of cats by trapping license holders has increased from 373 in 1970 to the 1977-78 harvest of 1,700. Over these eight years, the harvest of bobcat has fluctuated and so has the price paid for a pelt. The harvest, though, is not determined simply by price paid for a pelt. In 1973, the average price paid in Kansas was \$24 and we harvested 1,170 cats, yet in 1975 the pelt price rose to \$51 and our harvest dropped to 789 cats.

In the 1977-78 season, bobcats harvested had the following age distribution: There were thirty-eight percent juvenile or cats of the year, thirty-nine percent were one-and-one-half years old, while twenty-three percent were older than two-and-one-half years of age. The oldest bobcat in our sample of the 1977-78 harvest was eight-and-one-half years old. The increase in harvest and the high percent of juveniles in the harvest indicates that the cat population of Kansas is at least

tion of six federal agencies and the Smithsonian Institution to serve as the Endangered Species Scientific Authority. According to the agreement, these two authorities are to work together under the terms of the convention. The Management Authority, which is the permit office of the U. S. Fish and Wildlife Service acting for the Interior Secretary, controls the exporting of the listed species. Their responsibility is to certify that the species were obtained legally before they are exported. The ESSA role is to make sure that export of the species will not be detrimental to the survival of the species in the U. S.

Now we go to the November 2-6, 1976 meeting of the parties to the convention at Berne, Switzerland. It was at this meeting that the Felidae, the wild cat family, was listed on Appendix II. The sequence of events leading up to this listing is not really clear since it did not follow the normal procedures for listing species. But it is clear that Great Britain proposed the listing.

“The increase in harvest and the high percentage of juveniles in the harvest indicates that the cat population in Kansas is at least stable, if not increasing at a slow rate. The overall state population is probably between 10,000 and 12,000 cats.”

stable if not increasing at a slow rate.

Then why ESSA and the embargo on exporting untagged bobcat pelts? To understand the situation, we have to go back to September 12, 1973. At that time, representatives of various nations met and signed a convention on International Trade in Endangered Species of Wild Fauna and Flora. In this convention, three lists were established—Appendices I, II, III. Species listed on Appendix I were considered either endangered or threatened. Those on Appendix II were species which needed to be monitored to find out whether commercial use was threatening their existence. Appendix III covered all other species.

Each nation which signed the convention agreed to set up two groups, one called the Endangered Species Scientific Authority and one the Endangered Species Management Authority. In the United States, the President assigned the Secretary of the Interior as the Management Authority, and established an organiza-

The proposal was the 307th of 623 amendments that were considered at the four-day meeting; as a result, there was practically no time to consider the ramifications of including an entire taxonomic family in Appendix II. Great Britain justified its request by pointing out that many of the world's big cats were under pressure from the fur industry and trade in cat pelts should be monitored. That was the extent of justification on the issue.

The convention stipulated that the ESSA needed to obtain evidence that export of pelts was not detrimental to the survival of the species. In the fall of 1977, the ESSA decided that there was not sufficient evidence to support export. But also there was no real biological evidence to show the bobcat was going to extinction. Therefore, in October they notified state authorities that bobcats taken in the 1977-78 season for export had to be tagged and included in a statewide monitoring program.

The ruling was met with an outcry from nearly all state wildlife departments and the International Association of Fish and Wildlife Agencies. The agencies questioned the federal government's right to make such rules, but, more important, they doubted the biological soundness of the program. ESSA seemed determined to read the biological facts to suit themselves—when bobcat harvest was decreasing, they took it as a sign that the population was declining. If harvest increased, they felt it indicated an overharvest. Many states openly wondered whether restrictions on exports would do anything to protect the bobcat in any case.

For the 1977-78 season, Kansas indicated to the ESSA that, because of the late notification and the short time period until the trapping season, pelts would not be tagged. In December, because of nationwide confusion and criticism concerning the ESSA program, ESSA announced a "Workshop on Certain Furbearing Species Included in Appendix II of the

We keep track of total harvest and distribution of harvest by surveying hunters and trappers. One piece of biological information we have not been able to collect is the condition of bobcat habitat in the state. Habitat evaluations are extremely time-consuming and expensive and are often outdated even before they're finished.

Our management program covers all the phases outlined by the Furbearer Workshop. We control harvest through seasons and regulations, and we have established a maximum safe harvest level of 3,500 bobcats. In addition, we will be tagging all bobcat pelts taken in the 1978-79 season. To have a pelt tagged, the person must bring the pelt and carcass into any Fish and Game office. At this time, the carcass is surrendered to the Commission so the age and reproductive information can be obtained.

If you do catch a bobcat this season, please contact your local game protector, game biologist, district or

“—this cat has never been very visible. Count yourself lucky if you have ever caught a glimpse of him sitting high in a tree or disappearing furtively into dense ground cover.”

Hope Ryden, *Reader's Digest*

Convention on International Trade in Endangered Species of Wild Fauna and Flora.”

In this workshop, twelve of the leading bobcat biologists in the U. S. were assembled to work up a management framework. Their objective was: "To determine as specifically as possible what biological information and management programs will ensure that harvest of these species is not detrimental to their survival or to the species maintaining their normal roles in the environment." They outlined the general program a state needs to have to allow the ESSA to find that bobcat pelts can be exported. The program outlined two major areas that needed attention—the collection of biological information on bobcats and management of bobcat populations.

The Kansas Fish and Game Commission has expanded its effort on furbearers to cover both of these areas. In the area of biological information, we collect carcasses from trappers in order to determine the age structure and reproductive success of Kansas bobcats.

regional office to make arrangements to get the pelt tagged. Please try to bring the cats in at reasonable times, skinned, and in fairly fresh condition.

Whether we agree or disagree with what has happened in the last year, one fact can't be disputed: our knowledge of the bobcat and our management practices have been improved drastically. The important question is whether we can afford this level of management. The level of management that has been prescribed is significantly more intense than it is for our major game species such as quail and pheasant. A second question is whether the federal government has the authority to dictate harvest levels for bobcats in Kansas. These two questions directly affect the Fish and Game Commission's ability to manage wildlife in the state.

How a federal bureaucracy in Washington can obtain a better knowledge of the management of wildlife resources in the state than the state wildlife agency itself, remains a mystery.



Under the Ice:

Jerry Hazlett

Illustrated by Diane Lake

It is early spring and the ice has just gone off the ponds and lakes. It was a long, hard winter with many days in January and February below freezing. Those bone-chilling winds didn't make it any better. Snow-fall was typical until that big one in early February. Moisture was in short supply in the fall, and the winter snows didn't help much.

"Say, I remember that my pond was about three feet low last fall. I wonder what it looks like now? Guess I'll go over to the pasture and see."

"What happened? Look at those dead fish! Great big channel cat, and over there, bass. All my fish have died!"

Numerous phone calls and inquiries are made of Commission personnel, with such typical questions as, "What happened to my fish? Are there any left in the pond? Are the ones left safe to eat? Will we be able to catch fish from the pond this year?"

It is an alarming sight as the landowner looks over a pond full of dead fish and thinks of the pleasures they would have provided during the summer. On the other hand, the situation may not be as serious as he first thinks.

For most of us to understand this situation, it is necessary to know how cold temperatures affect ponds and lakes, and, in turn, how the fish are affected.

Water is an amazing substance. Because of its unique chemical and physical properties, it is a substance upon which all life depends.

Water is heaviest in weight (density) at 39.2 degrees Fahrenheit. At temperatures above and below 39.2 degrees, water is lighter in weight. This is also true for frozen water. In the fall and early winter as the air temperature cools to an average range of 30 to 40 degrees, the water temperature also cools, with the surface layer cooling faster than the deeper layers.

When the surface layer reaches 39.2 degrees, it is heavier than the deeper, warmer layers and sinks to the bottom, forcing the warmer water to the surface. The warmer water then cools to 39.2 degrees, and the water temperature from surface to the bottom is approximately the same. As the surface layer cools below 39.2 degrees, it is lighter in weight, and eventually freezes. Because ice is also lighter, it remains on the surface, sealing the pond. As the cold of winter persists, the pond continues to freeze downward from the surface. Because of these density properties of water, it is virtually impossible for an entire pond to freeze in Kansas unless the pond is extremely shallow.

Fish and other pond life are quite well adapted to this cooling process, even though it seems quite hostile to us humans. Fish, like amphibians and reptiles, are cold-blooded animals. This simply means that the body temperature of fish is approximately the same as the temperature of the water.

Because they are cold blooded, most fish carry on life functions in a rather wide range of temperatures. Some species have a greater tolerance for wide temperature ranges than others, but, in general, most Kansas species do quite well during the cold temperatures of winter and warm temperatures of summer.

As the water cools in the winter, the life functions of

gated in the deep water. On most days during the winter, game fish seem to feed most actively from about 10 o'clock to 3 o'clock when the sun is high. Even clear ice drastically cuts down on the amount of light underwater, and when snow accumulates, fish may be in almost total darkness. The middle of the day is the only time when sight feeders like bass, bluegill, and crappie have enough light to find their prey. Light coming through a hole in the ice may attract fish from a short distance for this reason. The ice fisherman who is willing to spend the time, brave the ice, and endure the cold can have excellent fishing. With a good depth finder, and a lot of patience, he can find concentrations of fish. After determining the movement routes and deep water congregating areas, an ice fisherman can fill a freezer with fillets.

Under the ice cover of ponds and lakes, fish kills can, and do, occur. This is called winterkill. Many factors can cause the death of fish in winter, but winterkill is usually associated with the death of fish due to the lack of oxygen. Fish must absorb dissolved oxygen from the water through their gills to carry on respiration. Most of the oxygen dissolved in pond water is a product of photosynthesis carried on by algae living in the water. For algae to carry on photosynthesis, sunlight must penetrate the water. It is generally thought that as snow accumulates over the ice, effective sunlight penetration is reduced. With less sunlight penetrating the water, the photosynthetic process of algae is reduced and less oxygen is produced. At the same time, dissolved oxygen is being used by water organisms as well as by other chemical processes, such as decay. An imbalance occurs—demand for dissolved oxygen is greater than the supply. Eventually, fish begin to die from the lack of oxygen. The fish that were winterkilled are trapped under the ice until the spring thaw when they float to the surface.

Winterkill, on one hand, can be quite detrimental to pond fisheries if the oxygen supply is too low for a long period of time. On the other hand, partial winterkills may not be detrimental, and can be helpful to the pond fisheries and fishing.

Fortunately in Kansas, most winterkills are not severe enough to harm the overall fish population of a pond. Many ponds and lakes contain crowded populations of bluegill, crappie, or shad. These fish grow slowly, have poor body conditions, and are not too attractive to the fisherman. Usually, these fish are in a stressed condition before freeze-up and are the first to die during the winter as the oxygen level decreases. Not all die, but the population is thinned appreciably and the fish that remain grow fast and provide good fishing during the summer. Thus, the thinning of overpopulations by periodic winterkills can improve pond fishing.

At times, severe winterkills do occur in Kansas ponds and lakes. These usually happen when a pond is too shallow due to improper construction design, silt

How Fish Survive and Why They Die

fish continue, but at a reduced rate. Digestion and respiration slow down. Growth rates and normal movement from place to place decrease. Even feeding is sluggish and becomes quite sporadic.

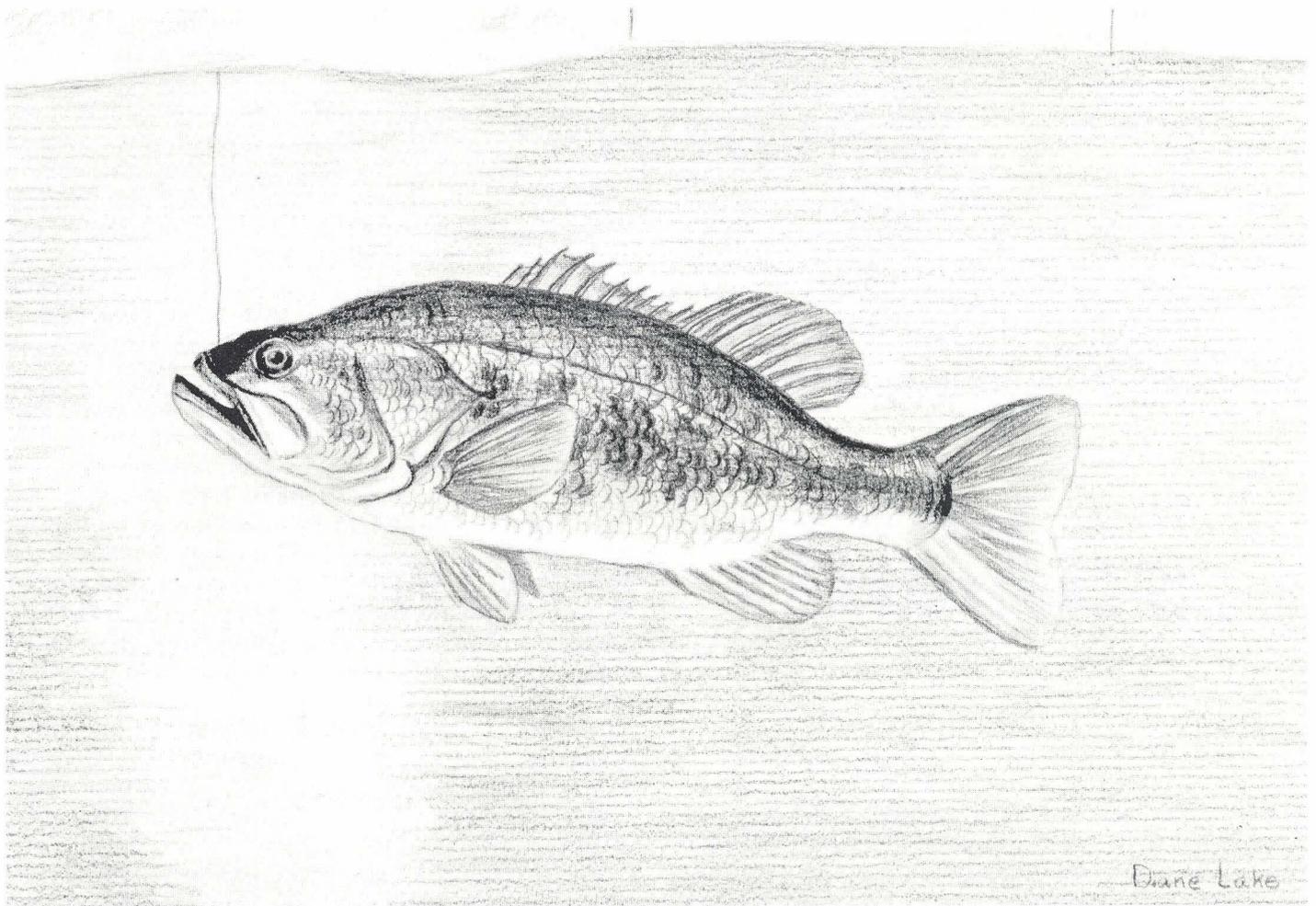
During the sluggish winter period, fish tend to congregate in groups of their own kind. Slow swimming movement from place to place is done as a group, rather than as individuals, and over pre-established routes within the pond. When not moving from place to place, each group tends to spend much time lying quietly in deep water that has rock drop offs or other structures which attract the fish. The schools sometimes hug the bottom, but more often they lie suspended over deep water close to the structure that attracts them in the first place.

Even though active foraging has slowed, sporadic feeding does occur while the group is in its winter movement route and also while the fish are congre-

accumulation or severe drought conditions. Ponds that contain excessive amounts of vegetation and algae are also subject to severe winterkill. Under these conditions, the dissolved oxygen level in water covered by ice and snow becomes so low that most of the fish in the pond are killed. When this happens, crappie, bluegill, largemouth bass and walleye are the first to die. Channel cat die next. The more hardy fish, such as bullheads and carp, are the last to die, and are very seldom wiped out completely. These selective die-offs often allow undesirable fish to take over a pond.

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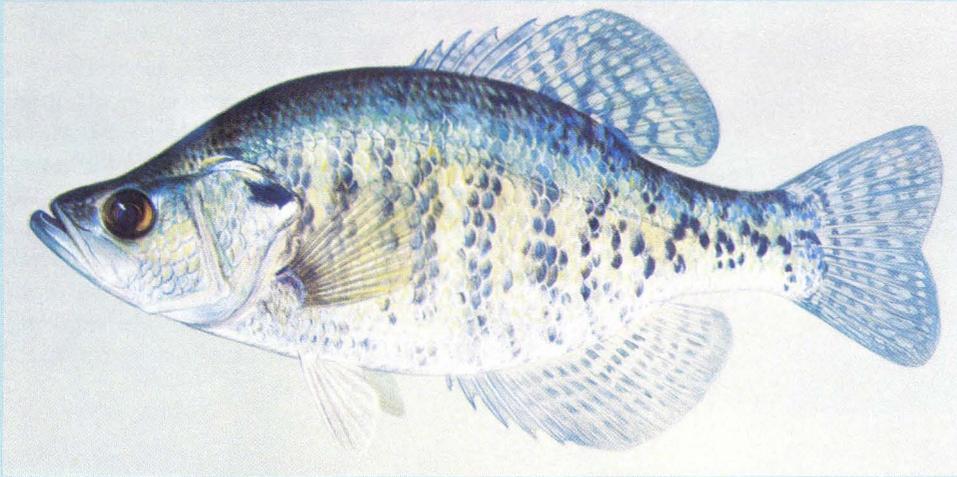
The corrective action taken will depend on the existing conditions at the time of the kill. Water depth is very important in preventing winterkill. The pond may have been built too shallow, or it may have silted in, with no water deeper than eight feet. If so, it needs to be deepened to provide water at least eight to ten feet deep. Your pond may have been several feet below normal level going into winter. You will need to consider methods of getting more water into the pond in the future. Your pond may have had an excessive



If your pond should experience a winterkill, the severity of the kill needs to be determined in order to know what kind of corrective action, if any, should be taken. When looking at the dead fish, determine what kind were killed, the number of each different kind and the different sizes of each kind. If there are just dead bluegill or crappie, the chances are that the kill has improved the condition of your pond. Go ahead and fish it during the summer and compare the fishing to last year's. If fishing is as good or better, winterkill did not harm the pond. If you observe that a large number and several different sizes of largemouth bass and channel cat are dead, your pond will need some atten-

tion. growth of aquatic plants and algae as winter approached. Future corrective action should include some form of controlling this growth.

Once you have corrected the conditions that led to the kill, largemouth bass, channel cat, and bluegill populations should be re-established. However, any fish remaining in the pond should be eradicated either by draining the pond or by applying fish toxicant properly before stocking. With proper corrective action, winterkilled Kansas ponds and lakes can once again provide you with many hours of enjoyable fishing.

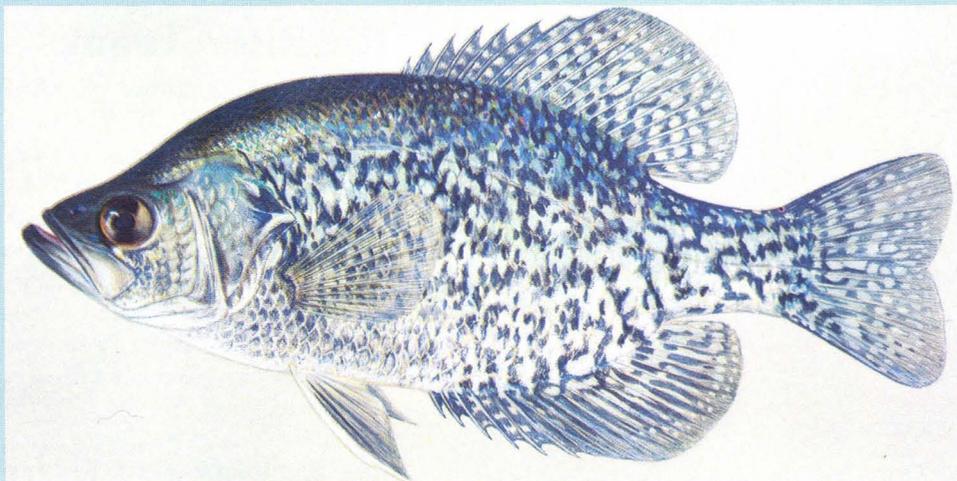


White Crappie

A favorite of Kansas anglers and found in nearly all waters of the state, white crappie closely resemble black crappie. The white crappie has five or six stiff spines in front of the fin located on its back, called the dorsal fin. Body markings include faintly dark vertical bars.

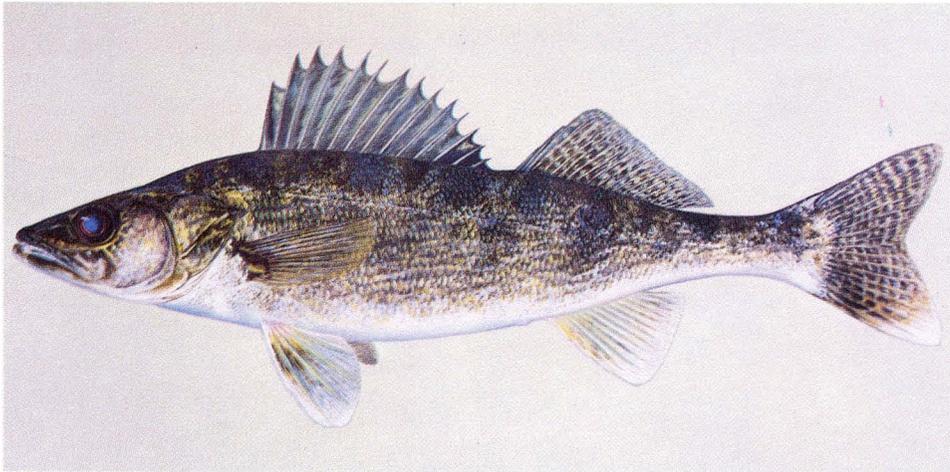
Kansas Fishes

Illustrations by Maynard Reece, courtesy of Iowa Conservation Commission



Black Crappie

Not as abundant as the white, black crappie have seven or eight stiff spines in front of the dorsal fin. The body is peppered with black splotches; no vertical barring. This species seems to prefer clearer, cooler water than the white.

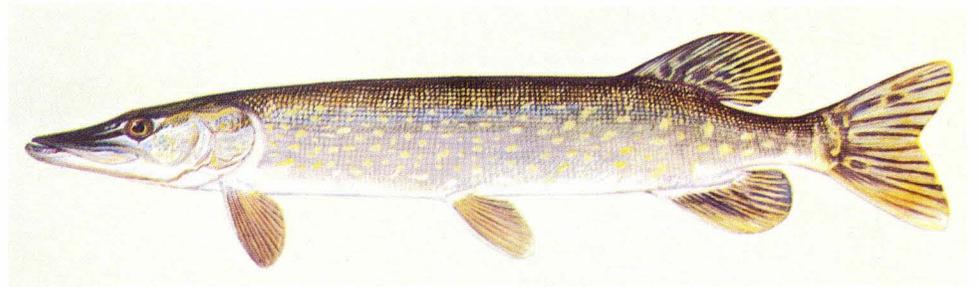


Walleye

Considered one of the kings on the table, the walleye is a much sought after inhabitant of most large federal reservoirs in Kansas. Note the two separate dorsal fins and torpedo-shaped body. This predator has teeth you should avoid while taking out the hook.

Northern Pike

Another voracious predator, the northern is built for speed. Often called "snake", its trim figure and large teeth are unmistakable.



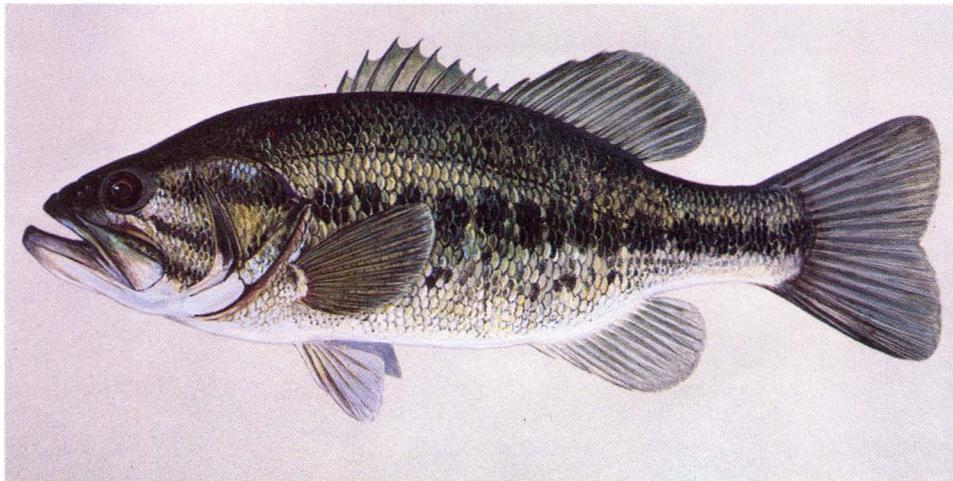
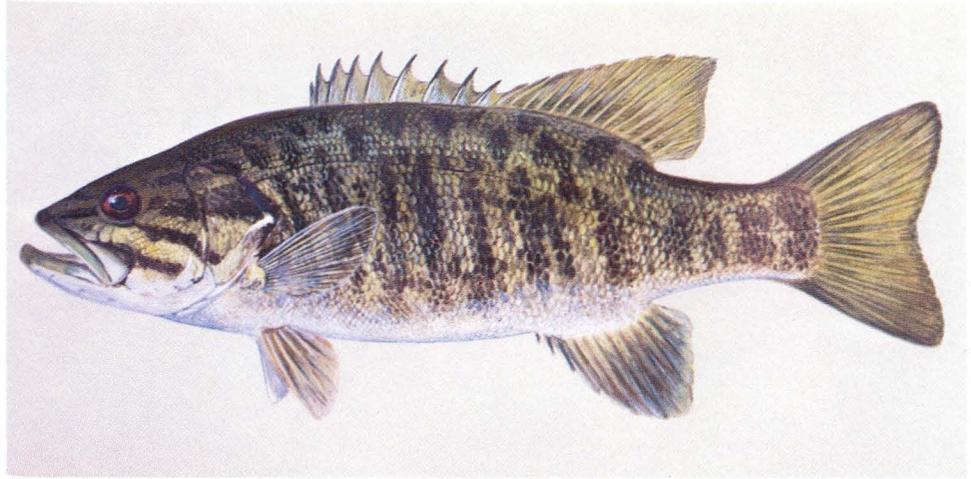
Rainbow Trout

Recent introductions of rainbows by the Fish & Game Commission should establish this species as a real Kansas trophy fish in the future. It has a uniquely colored body and a small fatty fin behind the dorsal. Rainbows have been introduced at Cedar Bluff Reservoir and spillway, Webster Reservoir spillway, below Tuttle Creek Reservoir in Tuttle Puddle, the Rocky Ford Fishing Area, and Wyandotte County Lake.



Smallmouth Bass

Sometimes called “bronze-back”, the smallmouth has vague vertical barring on its sides. Note jaw extending to just below eye. The species is being introduced to more Kansas waters because of its fighting ability but is much more limited in distribution than the largemouth. Populations are developing in Milford and Clinton reservoirs in northeast Kansas.

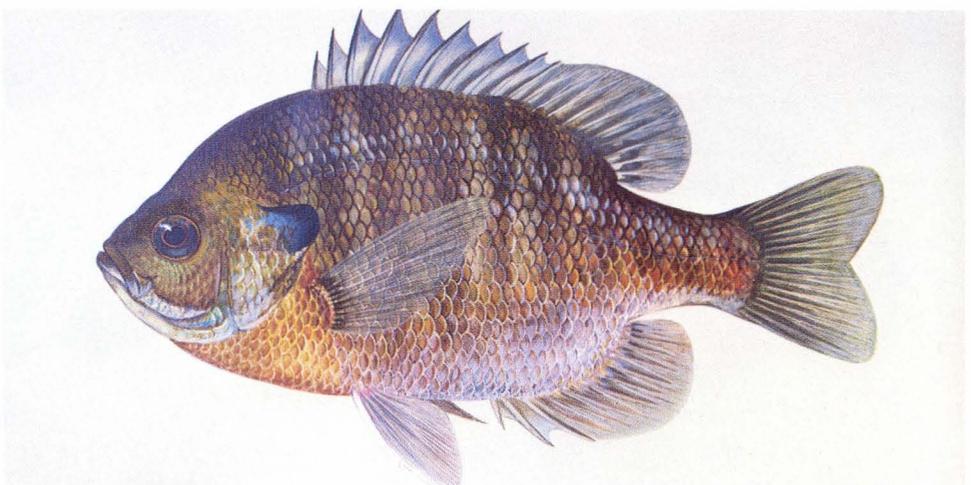


Largemouth Bass

As its name implies, this species has the largest mouth of any bass. The jaw extends behind the eye—not just to the back edge of the eye, but behind it. Body color varies with water and time of year, but generally largemouths are green-backed with light sides and a dusky lengthwise stripe. Not shown is the spotted bass, common to Flint Hills streams and lakes, in which the jaw goes below but not beyond the eye. The spotted bass has a darker more diamond-shaped pattern on its lateral line.

Bluegill

The small mouth and blue-tipped tab on the end of the gill cover are dead giveaways for this panfish. The bluegill's body is rounder than the green sunfish's or warmouth's; it often has faint vertical barring on its sides.



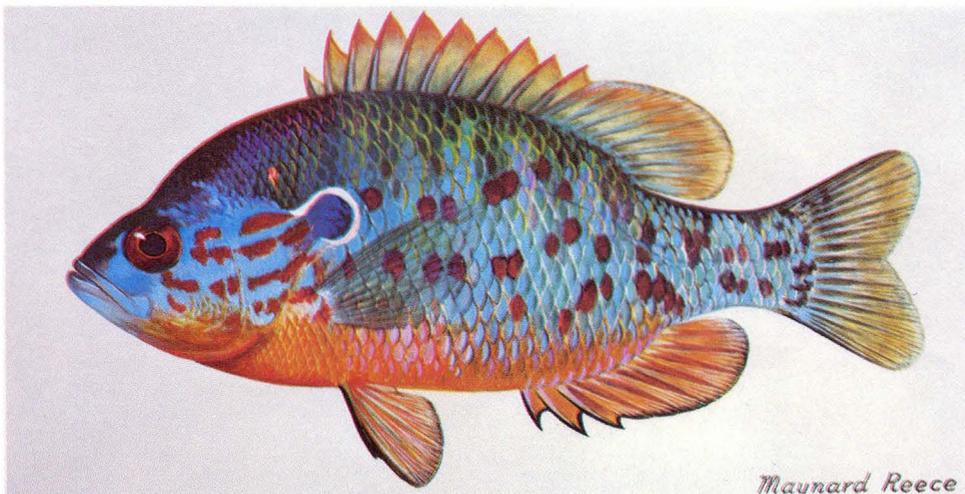


Warmouth

This yellowish-brown panfish has red eyes and a mouth that is considerably larger than the bluegill's. It is mainly found in lakes of eastern Kansas.

Green Sunfish

The green body, large mouth, and usual yellow-edged fins are key identifying marks of the green sunfish, very abundant throughout Kansas. This state ties the world record for green sunfish at two pounds, two ounces taken from the strip pits in southeast Kansas.



Orangespot Sunfish

Rarely caught by anglers, the orangespot sunfish just doesn't quite make it to eating size. One of the state's most colorful fishes, orangespots are found throughout Kansas.

the YELLOW Pages



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PLANTING FOR WILDLIFE

What can one person do to help provide for the needs of wildlife? The state forester can tell you.

The office of State and Extension Forestry, Kansas State University, is accepting applications now for low cost tree and shrub seedlings for use in wildlife habitat plantings. Since trees and shrubs are an important component for many species of wildlife, one person can improve the wildlife habitat significantly in his or her corner of the world by planting more trees and shrubs.

Plants available include six kinds of shrubs, twelve deciduous trees, and four evergreen trees. Also available is a "wildlife bundle" consisting of five Manchurian apricot seedlings and twenty-five seedlings of each of the following: Austrian pine, autumn olive, Bessey cherry, tatarian honeysuckle and Nanking cherry.

These plants can also serve as windbreaks, field shelterbelts, woodlots (timber, fence posts, firewood, etc.), or erosion control. Applications and assistance in designing conservation plantings are available at County Extension Offices.

"If recent trends continue," said Extension Forester William Loucks, "we expect over 7,000 Kansans to plant about 1.4 million seedlings on some 2,500 acres."

† † † † †

FACT OR FICTION

Sooner or later every fisherman must concoct an unbelievable fish story. It's one of those unwritten rules of the sport. Of course, there are some who take their story-telling more seriously than others. An example is the folks who annually sponsor the Gladding International Sport Fishing Museum's Annual Tall Tales Contest. They rewarded the best story-tellers last year with expense-paid fishing trips to Ireland, no small reward for a few paragraphs of bold exaggeration. The contest attracts some pretty fantastic accounts, like the following, a runner-up entry submitted by Alan Matthew, an Indiana fisherman and story-teller:

I was spending the summer at Grandpa's cottage and was on the lake at daybreak, beating the lily pads with a cork bug. It was one of those mornings when the lake was blistered all over with swirls of feeding fish and there was just enough chill to appreciate my knit underwear, compliments of Grandma.

The bug was sucked in by a huge bass who then charged out of the weeds like a bull with a bee in his ear, tearing yards of line from my small fly-reel. When the old moss-back stopped to catch his breath I looked down to see only two turns of line left on the spool. Right then and there I was willing to concede defeat until I noticed some yarn trailing out of my left cuff. Immediately I stripped to my undershirt, cut the line from the spool and attached it to the yarn with a blood knot. I was just about to trim off the ends

(continued)

when the bass ran again. Well sir, that yarn reeled off my sleeve so fast it wore the hair off my arm and a bothersome mole from the back of my hand. I made a mental note to determine the test weight of Granny's yarn later.

That monster soon tired and I knew in a few more minutes he would be mine. Fate was against me, however, as Granny had skipped a stitch about four inches above my elbow. The resulting loop let enough slack into the line for old bucketmouth to rid himself of that painful morsel, which he did, his bassy sneer being visible from a distance.

In lieu of the trophy fish I had the one-sleeved undershirt mounted as testimony of the incident, should anyone doubt this account.

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TEAL PAINTING TOPS DUCK STAMP ENTRIES

A colorful close-up of a pair of green-winged teal ducks on the water painted by Kenneth L. Michaelsen of Ft. Bragg, Calif., has won the 1979-80 Duck Stamp competition at the Interior Department in Washington, D.C.

Michaelsen's design will be reproduced on next year's Migratory Bird Hunting and Conservation Stamp purchased by waterfowl hunters 16 years of age or older, conservationists, and philatelists. Revenues from sales of the stamp are used to buy additional wildlife habitat under a program administered by the U.S. Fish and Wildlife Service.

Michaelsen, 42, is a professional wildlife artist who won the 1978-79 California state duck stamp contest with his painting of hooded mergansers. This year was the first time he had entered the federal duck stamp competition.

The California artist's work won over 373 other entries, a record number for the contest. Entries are judged on the basis of immediate visual impact, composition and design, style, lasting first impression, and distinctiveness.

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**LETTERS
 to the
 EDITOR**

EDITOR:

I'm writing to tell you how much I enjoy taking Fish & Game Magazine. I think the pictures you use are really great. But, one thing, I haven't seen any Brittany's. You see, that's my kind of dog. I have three Brittany's and my family and I think they are one great dog. So, would you please think about having some pictures of them in your magazine. And if you can't find any good-looking Brittany's, let me know.

**KENNETH STAUCH II
 KANSAS CITY, KS.**

'COON SCHOOL EDUCATES YOUNGSTERS

Most of the raccoon living around Lake Perry State 4-H Center "lit out" for parts unknown early in November of 1978 as some 60 boys descended on the camp for the first Raccoon Hunting and Trapping School.

"If you had that many boys stomping around your home, you might leave, too," said Bob Henderson, Kansas State University's extension wildlife damage control specialist.

Henderson worked with 4-H outdoor specialist John Abell to organize the event. Sponsoring the school with K-State's Cooperative Extension Service were the Kansas Fish & Game Commission, the Kansas Federation of Houndsmen and the Kansas Fur Harvesters Association.

Men from all four organizations served as instructors. However, the idea was so unusual that it brought in men from all over the country, to teach or just to find out how they might organize such a school in their states. Though Kansas has never had the problems among its fur harvesters that some states do, houndsmen and trappers traditionally have not been too friendly, Henderson pointed out. "I believe this is the first time anyone in this country has got a number of them together," he added.

Henderson believes that young and/or inexperienced fur harvesters cause many of the abuses in fur harvesting. In addition, he thinks

that the high prices pelts bring now are causing sound ethics and conservation practices to give way to greed. He said that the common hope of the men in the four sponsoring organizations was that education, such as that provided by the school, can help solve some of these problems.

(Kansas Extension Service Photo)



THIS IS WHAT YOU DON'T DO -- Leonard Jirak, Kansas Fish and Game fisheries biologist from Burlington, explains one of the hazards of setting trap lines for raccoon to boys attending the Kansas Cooperative Extension Service's hunting and trapping school.

(continued)

The school was a mixture of talks, demonstrations, movies, hands-on experience and field activities. Fish and Game personnel helping lead these activities were as follows: Stan Brown, regional game supervisor in northeast Kansas; Leonard Jirak, fisheries biologist in southeast Kansas; Neil Johnson, furbearer biologist from Pratt; Gene McCully, fisheries biologist from Winfield; and Verle Warner, area manager at the Maxwell Game Refuge.

Representing other states' agencies were Ken Kelm, extension trapper for Missouri's Conservation Department; Jerry Riedel, extension trapper for South Dakota's wildlife department; and Don Sievers, who is with Iowa's Conservation Education Center.

With the other instructors at the school, these men talked about the life of the raccoon. They showed the boys how to spot tracks and helped them run lines of traps around the 4-H camp. They explained skinning, fleshing, and stretching and let the boys try out those skills. They helped the houndsmen guide the boys through marshes, dry creek beds and hillside brush in their chase after baying dogs. While the boys were back in camp in their bedrolls, they even led a chase themselves--after some out-of-season hunters.

Henderson thinks the Fish and Game men's best contribution was in another area, however.

"When a boy's been out in the field with a man who obviously really knows his stuff and enjoys hunting or trapping as much as the kid does, then it means more when that man starts talking about conservation or ethics or obeying the law," Henderson said. "For instance, when Stan Brown told those boys it's no fun trapping if you stay up all night worrying about catching a dog, they believed him because he was someone they like and looked up to. When Leonard talked about letting the little raccoon go to grow another year, those kids listened because he'd shown them he loves trapping as much as they do and he knows a lot about it.

"The men from the Fish and Game Commission and other instructors showed those boys that it's possible to have fun and to be a person others would admire and yet still strictly observe all the written and unwritten laws. And they helped the boys see why the laws are necessary."

(Kathleen Ward, Assistant Extension Editor, 4-H and Youth)

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ABOUT THOSE KITES . . .

(Editor's Note: The following account, written by an assistant professor of biology at State University College of Fredonia, N. Y., summarizes observations gleaned from years of studying the behavior of Mississippi kites in Kansas, Oklahoma, and Texas. The species has been publicized extensively for its occasional aggressive behavior toward humans. The most recent incident involved the killing of 28 kites near Ashland last summer in retaliation for the birds' harassment of some Ashland residents.)

By JIM PARKER

The kite is a small and relatively unaggressive as hawks go. It's about the size of a crow, but is an aerial speedster, and it is quite social. At Meade, Ks., State Park and Lake I've watched over a hundred at once, and their nests are often very close together. During our northern winters, the kites are somewhere far to the south in Central or South America. The kite is fascinating and beautiful to watch, and it eats large numbers of large insects. I have recently completed writing an article in which the entire history and present

(continued)

status of this species is reviewed, and I can say with confidence that its regional populations in the southeastern and southcentral United States are doing very well. In no way can this species be considered endangered, but of course this is no justification for unreasonable and needless destruction of kites. For good reason this species is protected by federal and state laws; as are all hawks and owls and most other birds.

Kites will respond aggressively to humans near the kites' nests, and this is the source of the problem in Ashland and Liberal; and maybe also in other towns now that the kite has become so common and willing to nest in towns. Many birds, mammals, snakes, etc. will eat kite eggs, nestlings, and even the adult kites on the nests. Naturally, like other animals (and humans), kites try to defend against threats to their families, and they consider us one of them. After all, wouldn't another animal as big as a house make you feel threatened? How many of us would have the courage to stay and fight against such an enormous adversary.

How do kites defend their nests? One way only; by diving aggressively at intruders. Now, in over ten years of kite study I've been at nearly 1000 nests, often time after time, and I've climbed to hundreds of these nests and handled and banded the nestlings. Never once has any kite actually hit me. Finally, in 1977 I encountered a female courageous enough to lightly strike and scratch one of my assistants, but only after he was well up into the nest tree. In other words, the kites are good bluffers. And consider, what would be the result if a one-half pound kite actually hit a human? Undoubtedly the kite would be killed.



Actually, I must admit that having kites diving at me is pleasantly exciting, but certainly that's because I know that no real danger is involved. If I find a particular kite too aggressive to suit me, it's easy to do something about it without having to harm the bird. One has only to thrust at the kite with a hand or hat to discourage it, and sometimes just facing it will be enough. Kites tend to be most aggressive well into the nesting season when they have nestlings, and sometimes even then they will become used to people and become less aggressive. Anyway, the period when they are present and aggressive is short, a few weeks. And if one wishes to prevent the birds from returning next year, he need only remove the old nest that the kites might reuse, and remove any new nests the birds might begin next spring before eggs are laid. This is something that should be done in cooperation with or by authorized fish and game personnel, and only for the rare, extremely aggressive kites.

What I'm saying is that the problem is not really major, and it can be turned into a pleasant experience if we are reasonably willing to adjust just a little to this species — it's probably been around longer than we have on this earth and has some sort of inherent rights. Killing the birds in large numbers, as was apparently done near Ashland, is not only unnecessary, it's also downright unreasonable and undignified for an intelligent species that considers itself the steward of this planet. I must admit that when I first read of the killing of the 28 kites, I made a mental comparison between it and Custer's massacre of Black Kettle's band of Northern Cheyenne, mostly women and children. Neither was justified. I have great respect for the people of western Kansas and the Great Plains in general, but I feel I must make a plea for a reasonable, positive response to the kites' actions. If nothing more, it's one of the few species of our national wildlife that seems to be able and willing to live with us. For this, it should not be penalized.



It's The Law.

— Two Picher, Okla. men paid fines totalling \$550 in Cherokee County District Court for illegally hunting deer in Kansas. Game Protector Harley McDaniel arrested Bethel Scobee and Everett Livesay November 19 for hunting without a nonresident hunting license, hunting deer with firearms during closed season, hunting deer without a valid Kansas deer permit, and hunting on private property without permission.

— Jack F. Riley, Leoti, was arrested October 8 by GP Larry Dawson for attempting to take an antelope without a valid permit. Riley paid \$100 plus court costs in Logan County District Court.

— Raymond E. Palmer, Garden City, was arrested by GP Bruce Peters on November 14 and charged with three counts of illegally taking deer. A Kearny County District Court judge ordered Palmer to pay \$450 in fines.

— Two Barber County men were arrested November 20 by GP Gene Hitt for attempting to take wild turkey during closed season and hunting without landowner's permission. It was an expensive hunt for David L. Howard, Kiowa, and Charles A. Thurman, Medicine Lodge. Each paid \$308 in fines and court costs.

— Timothy M. Groce, Atchison, did 30 days in jail and paid a \$250 fine for taking a coon during closed season. GP David Hoffman arrest Groce October 26.

— GP Jim Kellenberger arrested Arbor Lee Colbert, Tulsa, Okla. November 12 and charged him with four counts of possessing a hen pheasant during closed season. It cost Colbert \$300 in fines.

— Daniel L. Baker, Parsons, paid a \$150 fine in Labette County District Court for attempting to take a deer during closed season. Baker had been arrested by GP Dudley Foster.

— Mickey R. Hinman, Parsons, paid \$210 in fines after being arrested by GP Foster for hunting without a license and taking a deer during closed season.

— Donald W. Lilly, Colby, was fined \$250 plus costs in Wallace County District Court on a charge of hunting deer out of season. GP Kenneth Knitig filed the charges.

— Matthew B. Hays, Mullinville, was fined \$105 for possessing a raccoon during closed season. GP Bill Hill arrested Hays November 7. He was fined in Kiowa County District Court.

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NATIONAL WILDLIFE WEEK MARCH 18-24, 1979

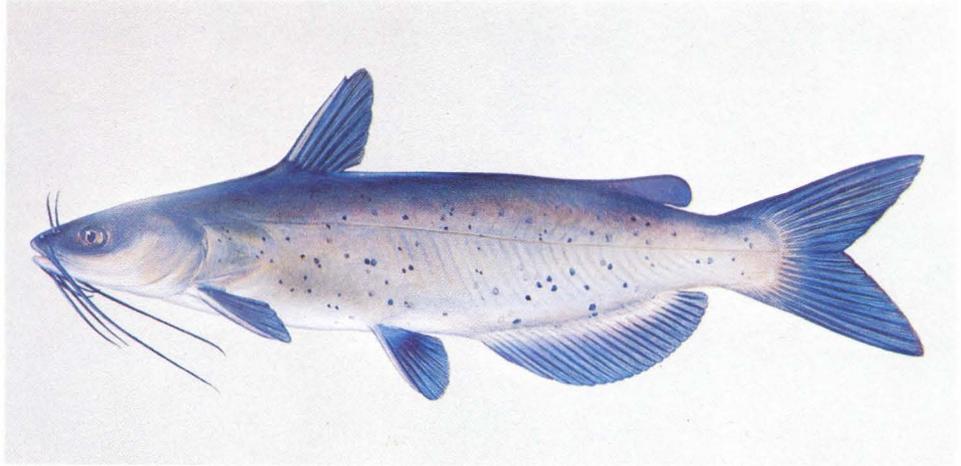


Conserve Our Wildlife

JOIN AND SUPPORT THE NATIONAL WILDLIFE FEDERATION
AND STATE AFFILIATES

Channel Catfish

There are no scales on any of the catfish family. The deeply forked tail and general color separates the channel cat from other catfish family members. The blue cat is not shown but resembles the channel except that the blue cat has a heavier body and is usually much more blue or silver in color, with a rear belly fin having about thirty-two rays instead of less than thirty in the channel catfish.

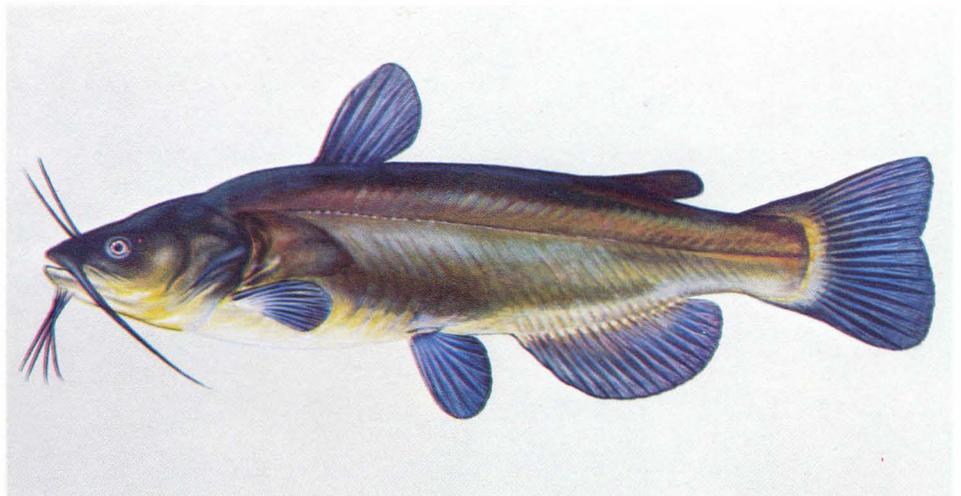


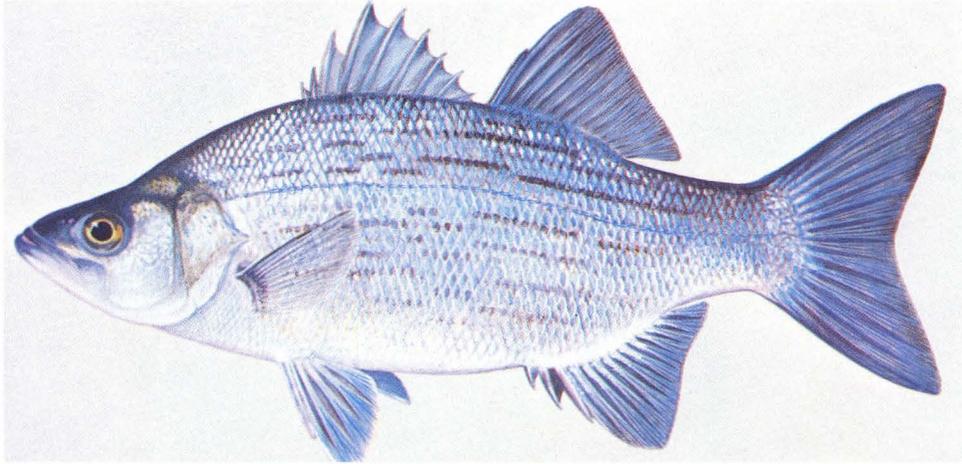
Flathead Catfish

A broad, flat head, with body coloring of yellowish brown mark this species which is often referred to as the “yellow cat”. It may reach 100 pounds or more, preferring pools of large streams and spillways of large reservoirs.

Black Bullhead

This catfish does not have a forked tail. Its barbels under the chin are darker than the skin in that area, distinguishing it from the yellow bullhead, not shown, which has light colored chin whiskers.





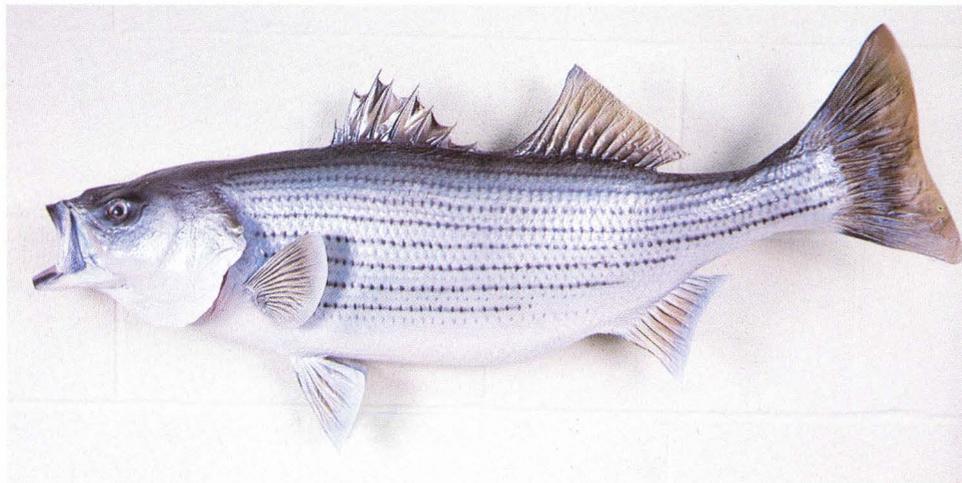
White Bass

An abundant sportfish, existing in large schools in most Kansas federal reservoirs, white bass up to two pounds, can be caught by the dozens. Since recent introductions of the striped bass into these same waters, biologists feel that anglers may be misidentifying some of the smaller stripers, thinking they are white bass. White bass seldom weigh more than three pounds, although Kansas held the world record for many years—a five pound, four ounce from Toronto Reservoir. The lengthwise stripes on white bass are faint and often broken. White bass are deeper bodied than stripers and not nearly so torpedo-shaped. White bass have a single series or a patch of small teeth on their tongues which can be felt with your finger.

Striped Bass

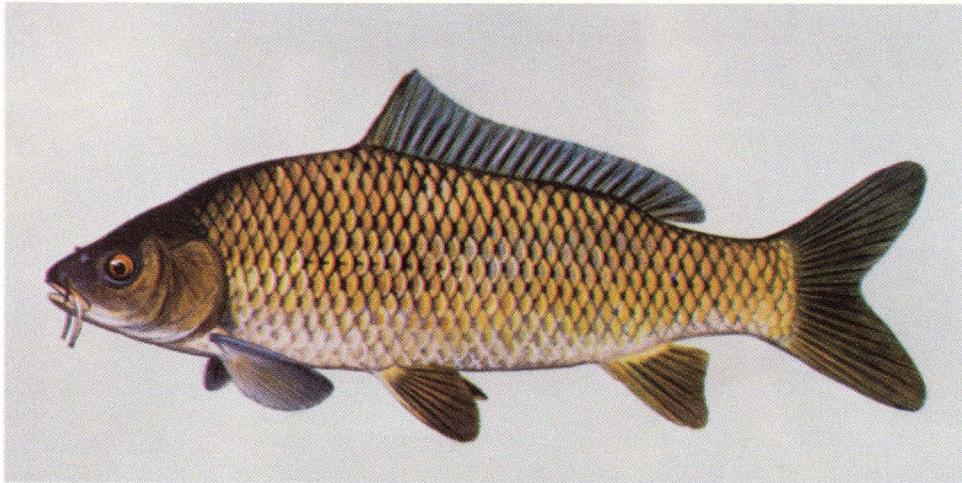
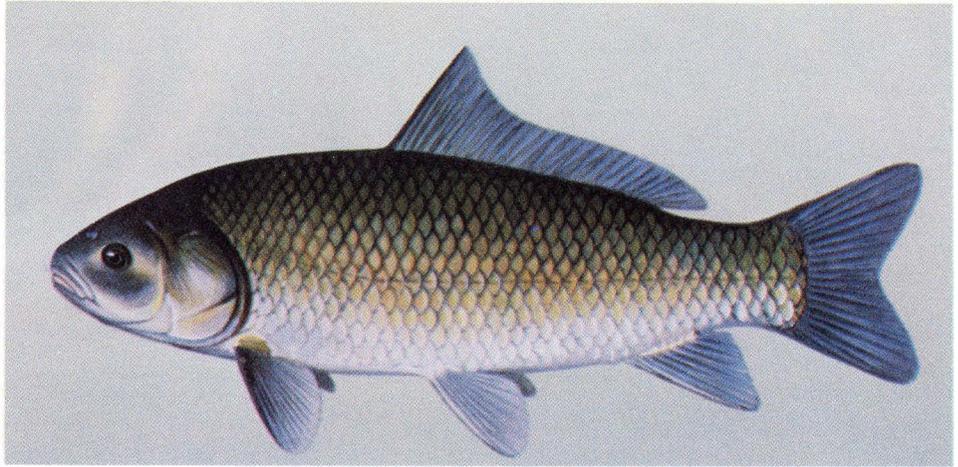
Introduced to many large federal reservoirs in Kansas, the stripers are reaching fifty pounds in Kansas, but when they are less than five pounds, they can be mistaken for white bass. As the name implies, stripers have distinct, unbroken lateral lines on their sides. The tongue of the striper has two parallel patches of small teeth which you can feel with your finger. There is no limit on the number of white bass that can be taken.

Striper-white bass hybrid—Kansas biologists have crossed the striped bass with the white, producing a hybrid known as the “wiper”, not shown. It appears that wipers combine the best characteristics of both the striper and the white bass. The wiper gets much bigger than the white and adapts to varied conditions better than the striper; wipers are stocked in impoundments where stripers won't do well. Wipers look about the same as white bass until they reach three pounds or so. Then they take on the appearance of the striper, except their lateral striping is not nearly as distinct and they are not quite so torpedo-shaped.



Bigmouth Buffalo

Seldom caught by anglers because it eats plankton on the bottoms of streams and lakes, the buffalo lacks the chin barbels found on carp. Buffalo may reach more than fifty pounds in Kansas and are found in the eastern one-third of the state.

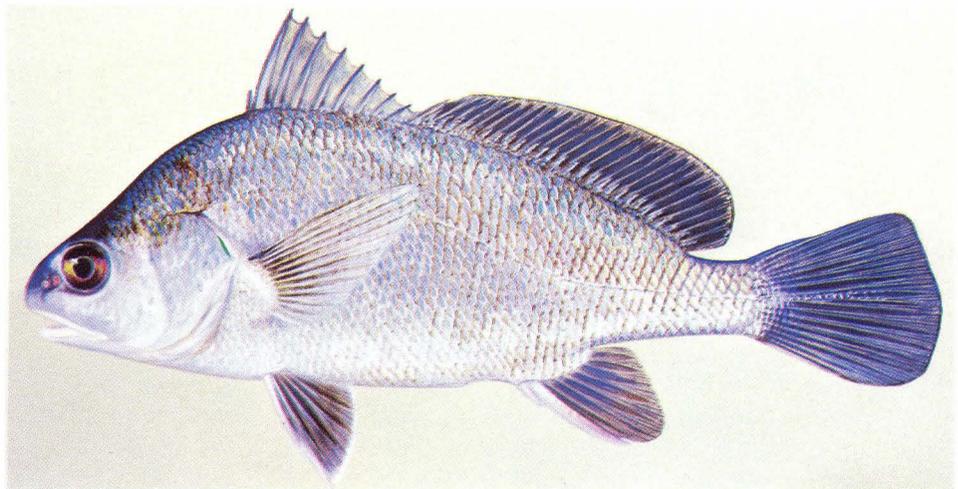


Carp

Found throughout Kansas, the carp is the largest species of the minnow family. Two barbels on each side of the mouth and a saw-edged spine at the beginning of the dorsal fin are key identification marks.

Drum

A highly arched back, straight belly line, and a rounded tail distinguish the drum. It's name comes from a "booming" sound thought to relate to reproductive activities which are largely unknown.



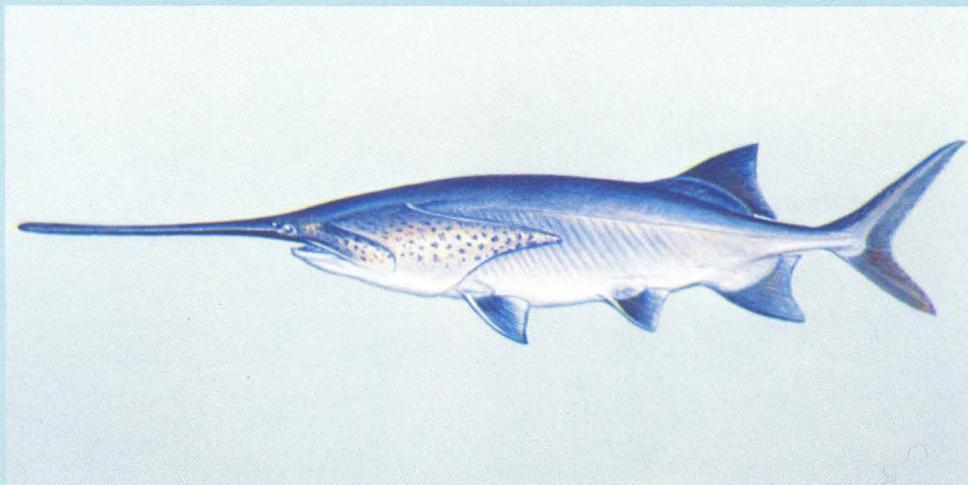
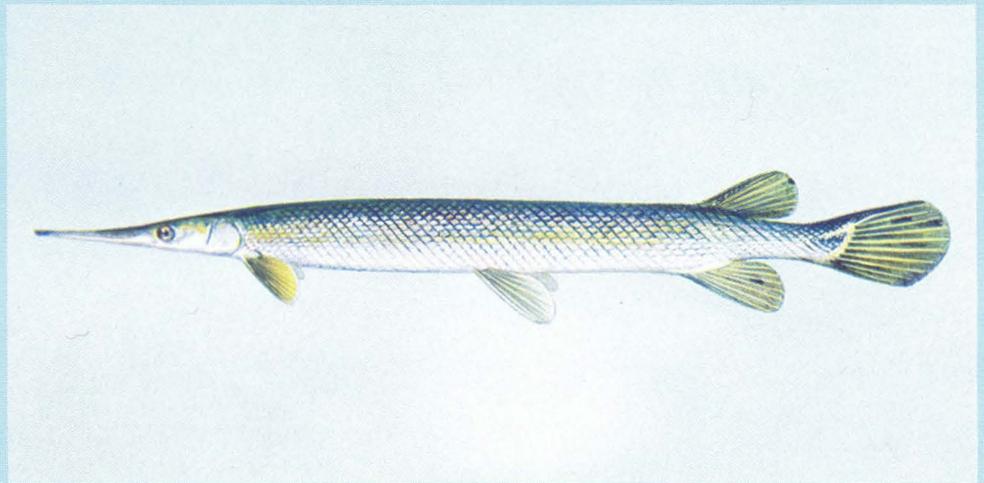


Longnose Gar

Its beak is much more slender and long than the shortnose gar's. This species has reached more than thirty pound in Kansas, compared to the shortnose which seldom get above three or four pounds, and the spotted gar which is usually less than five pounds.

Shortnose Gar

This streamlined predator differs from the longnose gar by having as you may have guessed, a shorter nose. The shortnose gar's jaw is always less than twice as long as the rest of its head. The shortnose differs from another gar, the spotted which is common to some southeast Kansas waters, in that the shortnose never has dark rounded spots on the head.



Paddlefish

Also called the spoonbill for obvious reasons; once you see one, you'll never forget it. This prehistoric species is common in the Marias des Cygnes and Neosho Rivers during spring as it makes upstream spawning runs. Paddlefish may reach more than 100 pounds. They have no teeth, relying on a straining mechanism to feed on microscopic plankton.



Ken Stiebben

Gulls: A Natural History

Bob Mathews

Lt's a long way to the ocean from where we sit. But the airy, buoyant flight of gulls is as much an element of the prairie as it is the seashore. Thanks to their opportunistic lifestyle, gulls are the most widely-distributed of all birds. They can be seen all over the world, from the arctic to the tropics, and are regular visitors to every state in the U. S.

In the opinion of most, a gull is a "seagull." But

we're told that statement is not true, technically. According to ornithologists, there just is no such animal as a seagull. Gulls that live by the sea. Yes. But, seagulls. No.

Of the forty-four species of gulls in the northern hemisphere, at least a dozen visit Kansas during spring and fall migrations. In Kansas, gulls are associated most often with farmland. Franklin's gulls and ring-

billed gulls are regularly seen following the path of farmer and plow in the spring for the insects, larva, and worms in the overturned earth, or working over the fields during the fall for grasshoppers. Herring gulls can be seen scavenging along the edges of our lakes and reservoirs for dead fish, garbage, mussels, dead birds, worms, or anything they consider edible . . . and that includes just about everything.

Despite the minor differences between types of gulls, all of them share certain traits. Foremost among those is the bird's gargantuan appetite. Gulls are physically equipped to thoroughly enjoy their gluttonous dispositions. With its wide mouth and expandable gullet, the gull is capable of gorging itself with food equal to more than one-third of its own weight. Its digestive system has been likened to an electric mixer, with its ability to dissolve anything from bones to fish hooks.

Most gulls live where land and water meet, making it possible to exploit food available in either environment. Primarily, gulls are thought of as scavengers. An incalculable amount of refuse is removed from the world's beaches, highways, parking lots, rivers, and garbage dumps by the family of gulls.

Some species, especially those common along the coasts, are adept at diving for fish just beneath the surface of the water. Some are polished in the art of thieving fish from other birds who have obtained their prey honestly. Many gulls, especially those species that live in the interior of the continent, are primarily insect-eaters. Almost all species will, in varying degrees, jump at the chance to feast on the eggs of other birds nesting near them.

Another asset gulls possess is their ability to drink either fresh or salt water. Special glands, located under the skull and just above the eyes, concentrate the salt in the gull's body and flush it to the nasal cavity. From there it exits through openings in the bill. The excreted salt is then flicked from the bill by an abrupt shake of the head.

A gull's appetite for insects, especially, makes him a valuable friend of the prairie farmer. One early observer—Dr. J. A. Allen—studied the gulls visiting one midwestern farm region and reported that “the stomachs of those gulls that were killed were not only filled with grasshoppers, but some birds had stuffed themselves so full that these could be seen when the birds opened their mouths. And it was a curious fact that the gulls captured the grasshoppers in the air and not by walking over the ground. Sailing around in broad circles, as though soaring merely for pleasure, the birds seized the flying grasshoppers easily.”

Herbert K. Job, a clergyman and photographer who wrote several natural history books early in the 1900's, described the prairie farmer followed by a troupe of Franklin's gulls this way:

“Without sign of fear they alight in the furrows close behind him, and with graceful carriage, hurry about to

pick up the worms and grubs which the plow has just unearthed. Often have I watched the plowman and his snowy retinue, and it appeals to me as one of the prettiest sights which the wide prairies can afford.”

The classic example of gulls befriending man occurred in Utah in 1848. The first Mormons to move to the state had just settled there and had planted wheat near the Wasatch Mountains. Their very survival through that first winter depended on the yield of their crops. Before the grain was fully ripened, though, millions of crickets arrived and began feasting on the wheat.

The settlers' dreams were withering like their crops before the horde of oncoming insects. But God smiled on the pioneers with a flock of feathered saviors. Thousands of California gulls appeared, floated down from the sky, and devoured the swarm of insects. Today, a pair of bronze gulls stand on a pedestal in Salt Lake City memorializing the miraculous and timely visit of the birds.

Many gulls are effective predators, although the extent of predation varies from species to species. The

The gull—in Alaska, eating ground squirrel—





Ken Stebbins

—at Webster Reservoir, eating shad.



Leonard Lee Ruse

Black-headed gull, a European bird which ranges along the Atlantic coast of the U. S., is skilled at catching fish by plunge-diving, a technique in which the bird drops quickly to the water's surface and immerses its head and breast to capture its prey.

Herring gulls have been observed snatching newly-hatched loggerhead turtles from the beaches along the Florida coast.

The glaucous gull, an occasional visitor to Kansas, is one of the largest and most predatory of all gulls. It raids the nests of other birds for eggs and chicks and even preys on the adult birds of some of the smaller species.

The predation by gulls on the eggs and chicks of other species of gulls and seabirds is a source of some concern to naturalists. In some parts of the world, one species of gull may dominate nesting grounds to the detriment of other bird species nesting in the same area.

One researcher observed adjacent nesting colonies of great black-backed gulls, laughing gulls, and terns. The larger black-backed gulls raided tern nests and preyed on the downy chicks. Although mobbed by the terns, the larger gulls were able to continue their incessant raiding. It was estimated that about 1,500 tern chicks in one colony alone were devoured during one summer. Meanwhile, the laughing gulls nesting in the area demonstrated a trait common to several species of gulls. One or more of the gulls would continually rob terns of the fish they were bringing back to their nests, either by chasing the tern until the fish is dropped or ripping the fish from the tern's bill.

The Franklin's gull, while not generally regarded as a predator, apparently includes small rodents in its diet on occasion. Two biologists from Northwest Missouri State University reported that they examined the stomach contents of one specimen and found two fresh mice and a prairie vole.

"It is not known whether this individual was a scavenger or predator but the consumption of two fresh mice at the same time makes us suspect predation," wrote David Easterla and Doyle Damman. "The intact prairie vole was a particularly large individual; we marveled that so large an item would be swallowed whole."

Another curious habit of gulls is their propensity for dropping clams and other shellfish from the air to the ground below to get to the food inside the shell. Although they were once thought intellectually incapable of distinguishing a hard ground surface from a soft surface, some recent investigations indicate the gulls frequently prefer paved roads and parking lots as drop zones. Although immature gulls were less efficient than adults, the mature gulls usually dropped the shells to a hard surface even when it entailed traveling some distance over mud and sand to reach it.

Some species of gulls today have expanded their



Ken Stebbins

range and enlarged their populations to problem proportions, but that was not always the case. Herring gulls, perhaps the most commonly seen type of gull, were in danger of being exterminated from the North Atlantic coast in the 1890's. Eggers regularly visited the islands and bays where the gulls nested and robbed eggs. Millions of the birds were shot for their feathers. Their demise was so dramatic that the National Audubon Society hired wardens during the breeding season to protect the few remaining colonies.

One witness to the decline wrote that “. . . millions of these graceful birds that enliven the dullest marine picture have been sacrificed for no more worthy end than to rest entire or in mutilated sections on women's hats.”

Legal protection and the gulls' adaptability enabled

them to recover from their near extermination. The herring gulls along the Atlantic coast have increased their numbers and expanded their range since the turn of the century. In metropolitan areas, they have caused concern in recent years for the potential hazard they present to aircraft. Fatal crashes have resulted from collisions between birds and planes.

Biologists hired to study the problem found that gulls, even those that lived in remote colonies far from populated areas, depended to a large extent on the refuse they could scavenge from dumps and beaches. If a dump was closed down, the number of gulls invariably dropped from thousands to a few dozen. Various techniques have been applied in many areas to control local gull populations, including egg destruction in nesting colonies, use of repelling devices, and

shooting. Recordings of birds in extreme distress have been broadcast on runways in attempts to disperse them. Trained falcons have even been used in Canada and Great Britain to chase gulls away from the area, but, obviously such a project is limited because falcons are rare, delicate, and costly to train.

Efforts are still underway to establish effective controls on gull populations. Ironically, gulls themselves sometimes contribute to these efforts. Along the east coast, one gull species devoured so many chicks of another species that they threatened to wipe them out altogether.

The herring gull's relatively large size and early nesting habits have caused certain other species to move further inland or further out to sea to escape the

The larger gulls are usually not ready to breed until their fifth summer. By then the drab, brownish garb of immature gulls has matured through a succession of molts to the sparkling nuptial plumage adults acquire in their fourth winter. Normally, three eggs are laid and incubated for four weeks. Eggs are usually irregularly spotted or scrawled with brown, blue, olive, green, or gray.

Gulls are hungry from the start. Both parents feed the chick by regurgitating partially digested food either into the chick's mouth or onto the ground beside the nest. At six weeks, the youngsters are flying and at two months they are able to fly well enough to escape most of their enemies.

Most gulls enjoy a long life. Fifteen or twenty-year-



Ken Stebbins

competition. In some New England colonies, an increase in herring gulls has been associated with a decrease in laughing gulls and terns.

The ring-billed gull is easily driven away from its breeding grounds, due to its preference for remote, unsettled regions. As a result, its breeding range has been gradually curtailed as the country has become settled, although its historic breeding range was nearly as extensive as that of the herring gull.

One of the largest gull nurseries in the western hemisphere is located on the Maine coast. Gulls also nest on many Canadian lakes and along the Atlantic, Pacific, and Arctic coasts of Canada, as well as islands of the Great Lakes. Franklin's gulls and ring-billed gulls nest around lakes and marshes in the interior of Canada and the northern U. S.

old gulls are not uncommon. Surveys of banded ring-billed gulls revealed some birds live more than 30 years. Herring gulls have lived as long as 36 years in the wild and one captive female herring gull lived to 49.

While many wild creatures are struggling to survive in a world with a diminishing capacity for wildness, the gull is able to thrive on the discards of man. For their benefits as scavengers alone, gulls deserve our appreciation. As the exalted subjects of countless legends, poems, photographs, drawings, and paintings, they have earned our envious wonder. By their own adaptability, they have insured themselves a prosperous future. Any bird with a ravenous appetite for bugs, carrion, and garbage has a definite edge over most other creatures.



"Cautious Trio" by David Maass, courtesy of artist and Wild Wings, Inc., Lake City, Minnesota 55041

The Other Turkey

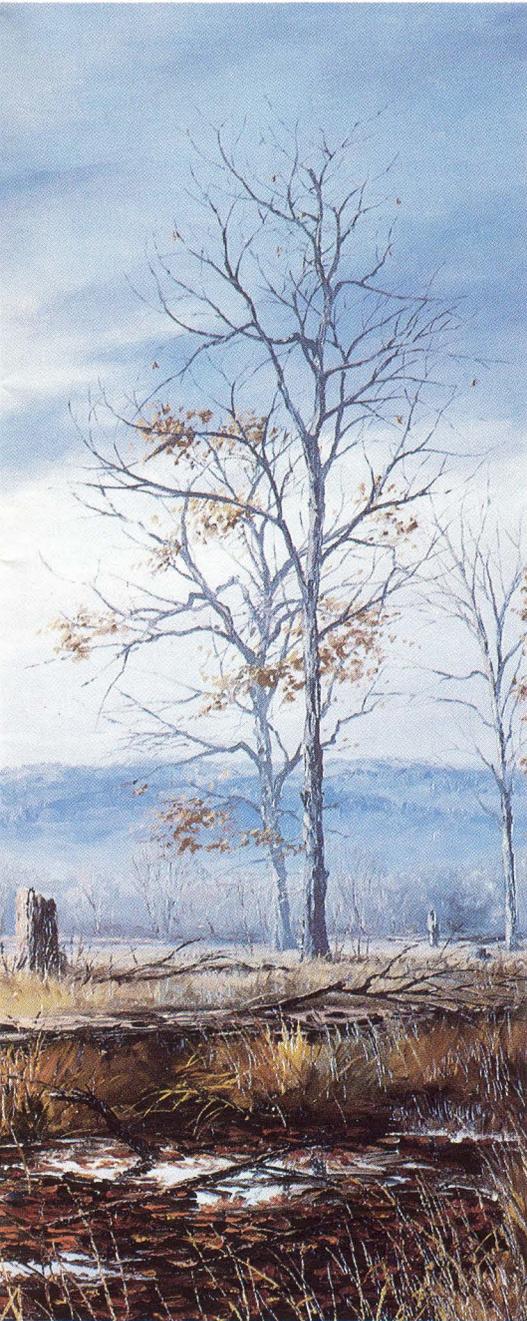
Kansas' eastern wild turkey program . . .

Terry Funk

Considering the drastically different kinds of country that exist in Kansas, some students of geography have said that the boundaries of the state are in the wrong places. It's pointed out that most of Kansas is Great Plains grassland and that the eastern state line should have been established just east of the Flint Hills and the western boundary at the foot of the Front Range of the Rockies. That way, we'd have a state with some uniformity.

As it is, a major boundary between grass and timber runs right through the state, and along with it, the range boundaries of many species of wildlife. The bobwhite quail, the mule deer, the white-fronted goose, the snow goose, the cinnamon teal, the pronghorn, and a host of less spectacular animals reach their eastern or western limits in Kansas. This variety of climate and vegetation also makes Kansas one of the few states that will support two subspecies of the wariest of game birds, the wild turkey.

The common turkey in the state today is the Rio Grande. The Fish and Game Commission first introduced the Rio Grande in the early sixties when wild birds were brought in from the King Ranch in Texas and released throughout the state in 1964 and 1966. Even though the birds were moved into harsher climate outside their historic range, they have done quite well. Their estimated population in their thirty-county



Kansas range is near 6,000.

The center of the Rio Grande's original range was in Texas where the birds seemed to prefer brush-grassland mixtures usually near water. Streams in this country often support pecans and oaks that furnish roosting sites and some food, but the Rio Grande subspecies has adapted well to the open country above the watercourses, too. As a result, these birds have found the breaks of the Cimarron, Arkansas, and Medicine Lodge rivers much to their liking.

The same taste for open country that has allowed the Rio Grande to thrive in southwestern Kansas has excluded it from the southeast. Something in the behavior of the bird balks at Ozark hardwood timber; no one knows for sure what it is, but it has stopped the bird's spread much east of Wichita. Enter another subspecies of the wild turkey, *silvestris*, the eastern bird of the big timber.

In many ways, the eastern turkey is much the same as the Rio Grande. The plumage of the two birds is about the same. The iridescent reflections of the body feathers of the Rio Grande are more green, gold, and copper, less the purplish bronze of the eastern. Tips of tail and flank feathers are paler on the Rio Grande than on the eastern giving the southwestern bird a slightly lighter color. Diet varies surprisingly little. Both take fruits like cherry, blackberry, and dogwood in season, graze on wild and tame grasses, forage on insects, and dote on acorns where they can get them. The eastern leans heavily on acorns, beechnuts, hickory nuts, and other mast especially during the winter, but it's hard to tell how much of his preference is innate and how much is due to the almost constant presence of the nuts. Either subspecies will take grain when the opportunity presents itself.

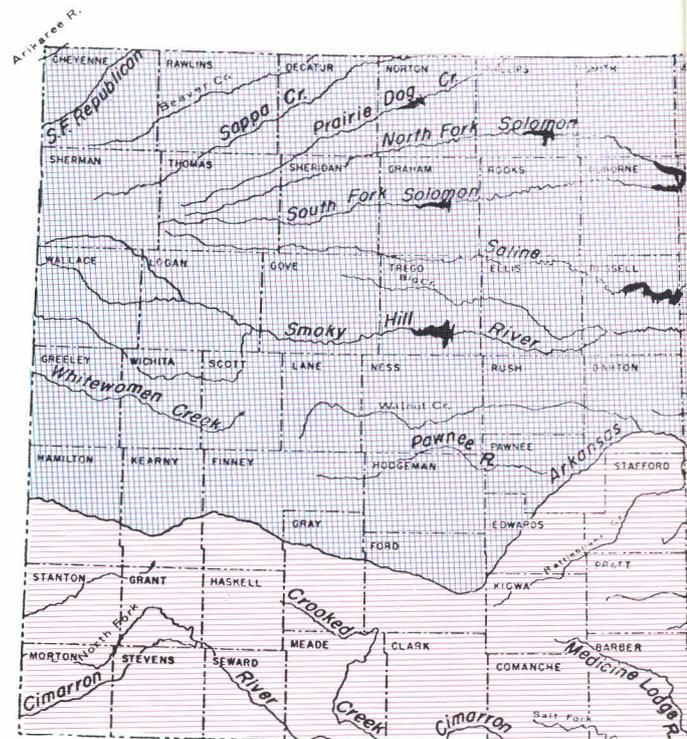
The most obvious difference between the two is habitat. For years, turkey experts assumed that, because the eastern turkey was found mainly in blocks of timber 10,000 acres or more, the bird would not tolerate more open habitat. Research over the last twenty years has slowly discredited that notion. Specimens in the Kansas Museum of Natural History indicate that the eastern turkey ranged far out into the plains along timbered rivers in the 1830's. Easterns may have existed in pockets in western Kansas at a time when trees on the plains were even rarer than they are now. Wildlife managers who have worked with eastern turkeys find them flourishing in small blocks of timber surrounded by intense agricultural activities. The eastern's apparent taste for big woods may well have been the result of ruthless meat hunting pressure in the late nineteenth and early twentieth centuries when most Americans were farmers and many were struggling to raise families on ground that was too steep or too poor to be farmed. In any case, the eastern has expanded its numbers and range in response to careful management and the abandonment of waste land over the last thirty years. Today, eastern turkey researchers

feel that the eastern can make it in any woodlot that will support a whitetailed deer.

Encouraged by the discovery of this new facet of eastern turkey biology, Kansas wildlife biologists began watching the westward expansion of Missouri's eastern turkeys out of the Ozark woods with interest. It occurred to them that a turkey that could make it in Missouri might be able to fill the turkey void in south-east Kansas. A swap was engineered—Kansas prairie chickens for Missouri turkeys. The Missouri easterns were released in Linn and Chase counties where they have done well over the last four or five years. Populations in these two areas are so well established that we have made plans to trap birds out of the flocks for introduction to other areas in the eastern third of the state. The process sounds simple, but with the eastern, it may be a problem.

Much has been made of the difference in "wildness" between the Rio Grande and the eastern. It's hard to say why two such close relatives should show a fundamental difference in temperament, but some researchers swear that it exists. Rio Grandes are usually trapped with a large, tent-like drop net which is set over bait. The turkeys start using the bait regularly in two to three weeks and are taken fairly easily. Eastern trapping requires more time and manpower. Bait sites are selected and baited no later than late September. As

Distribution of turkeys in Kansas



 Major Rio Grande range

winter approaches and natural forage gets harder to find, the easterns begin to lean on the artificial food source, and the amount of bait is increased to encourage them to come in regularly. When the birds are using the bait daily, a rocket net is hidden on one side of the site. The net is carried over the birds by solid fuel rockets attached along the leading edge. Some eastern biologists insist that the birds will not come to the bait unless the net is completely camouflaged; other technicians don't find the easterns nearly so wary.

Many hunters also feel that the eastern is the ultimate challenge. One experienced southeast Kansas hunter who has tried the Kansas Rio Grande and Missouri easterns says that "an expedition after Rio Grandes is a shoot; a trip after the easterns is a hunt." Much of this apparent difference may be due to the habitat of the two birds. The Kansas Rio Grande is confined to the brush and streamside trees along watercourses and ravines. As a result, Rio Grande flocks are fairly easy to locate. In addition, the Rio Grandes tend to move in large flocks which are easier to locate and keep tabs on than individual birds. This flocking tendency among Rio Grandes may be the reason that some hunters have trouble calling them—it's tough to lure a gobbler away from hens he already has.

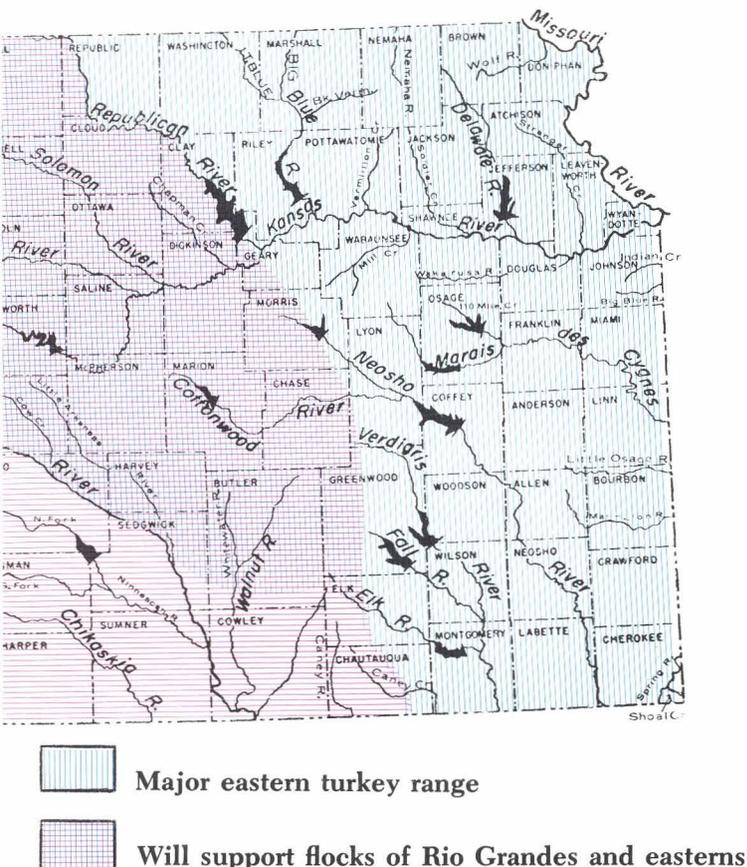
Typical eastern turkey habitat is harder to hunt than

Kansas Rio Grande turkey country. Big tracts of oak-hickory timber offer abundant food and water everywhere, allowing the birds to wander at random while feeding and making them harder to locate. Easterns don't seem to flock up as readily as Rio Grandes, either. This makes it tougher to trap a large number of easterns, and it may mean that the birds are slightly more wary. A gobbler following a flock of hens can be lulled into a false sense of security more easily than a bird coming in to the call on his own.

It will be a few years before Kansas hunters have a chance to assess the differences between the two subspecies, but it will be interesting to find out whether the eastern's reputation is due mainly to the habitat he has favored for years or whether his wariness is a deep-seated part of his character. One thing is for sure—in Kansas, he won't find the huge tracts of timber he's associated with farther east. It will also be interesting to find out how much woodland he really needs. If the historians and nineteenth-century biologists were right about the existence of eastern turkeys in isolated pockets of timber beyond the Flint Hills, a transplanted eastern population may eventually move into large parts of the state that have not seen wild turkeys in generations. On the other hand, they may run into the same kind of invisible barrier that has kept the Rio Grande from moving farther east. Fish and Game biologists can only make the introduction and hope. They are increasingly certain of one thing, however: eastern turkeys should do well in the eastern third of the state.

The speed of the reintroduction program depends primarily on finding a good source of wild-trapped turkeys. Natural reproduction in the Kansas flocks will supply a few birds, but transplants from other states could establish new flocks much more rapidly. Most states that have eastern turkeys are in the final stages of stocking in their marginal range, and two of them have indicated that they may be able to supply turkeys as soon as 1980. One swap would involve a three-way trade with two other states. Another possible deal involves Mississippi turkeys. Kansas trading other stock in such arrangements includes the greater prairie chicken; fish, including walleye and channel catfish; bison; and native forb seed for wildlife plantings. The outcome of negotiations for a turkey swap are hard to predict, but hopefully, we will arrange out-of-state shipments of birds to supplement our current populations in the near future.

The future of the Kansas turkey looks bright. Populations of Rio Grandes continue to expand; more permits are being issued to hunters every year, and more Kansans are becoming aware of the bird as a game animal and a wildlife resource for nonhunters. If plans for the eastern turkey work out, the populated eastern part of the state will soon have a chance to enjoy its own wild flocks, and an eastern turkey season could be as close as 1984.



I can well recall my early years growing up on my dad's Labette County farm and enjoying the chase after elusive quail coveys around the hedgerows and woodlots of our small claim on the world. The mornings were always cold during quail season, especially toward Christmas after most bird hunters had given up the season. My brother and I took off as soon as the morning chores were done, quite often without breakfast, walking fast to keep warm. Toward mid-morning when the hunger really hit, the chill of the day came with it, settling to our bones and taking a little of the enthusiasm out of our hunt.

It was at these times that my mind would often wander and I would try to imagine what it was like to be part of one of the coveys trying to survive a Kansas winter.

I realized early that a quail is a fragile bird. Unlike the mallards that visited our pond, a bobwhite couldn't travel great distances in search of food. He wasn't endowed with the seasonal drowsiness of the woodchuck that lived in our brushpile and slept through the winter without ever having to contend with the snow. He couldn't resort to barking apple trees as our fence-row rabbits did or depend on a cache of nuts like the local squirrels. How did he survive?

The winter energy demands of the upland birds are amazing. A bobwhite requires an average of 44,700 calories a day during the winter just to stay warm and

Winter Food *for* Upland Birds

Roger Wells

even more if he has to dodge many predators, search for food, or move any distance from food to roosting cover. As the weather gets colder, these requirements go up accordingly. At five degrees above zero, the same quail will use 64,600 calories a day to maintain his body temperature.

To keep up with these energy drains, quail and other upland birds have to have high energy food and lots of it. Before the introduction of agriculture, Kansas game birds depended on a wide range of native food plants that were not only highly palatable but nutritious. Maximilian sunflower, compass plant, Jerusalem artichoke, ragweeds, annual sunflowers, black samson, prairie clovers, dogwood, thistles, and a multitude of others were—and still are—preferred food in the upland bird's diet. Seeds from the sunflowers, ragweeds, and dogwood supply about 4000 useable calo-

ries per gram. A bobwhite's crop will hold a little more than two grams of seeds, so he has to find enough of these wild seeds to fill his crop six times a day to get the 44,000 calories he needs to stay alive during normal winter weather.

In the days before the plow, these native plants produced enough seed to carry game birds through the harshest Kansas winter. The major problem the birds faced was finding the food that was there. Many native plants drop their seed early in the winter, and the seeds are usually small and easily covered by deep snow. As winter dragged on, more and more of the stalks were stripped of food, and the survival of prairie game bird populations was decided by the whim of March weather. In most years, winter broke in time to expose buried food and bring on new plant growth and insects. Occasionally, the snow persisted, and time ran out for thousands of quail and prairie chickens.

Grazing and cultivation in Kansas changed the food habits of native upland birds considerably. Cattle cropped the native grass more intensely than buffalo or elk ever had. Cows showed a preference for many of the broad-leaved plants that were the cornerstone of the game bird diet. Notice someday as you're driving through a piece of Kansas rangeland how many more wildflowers there are on the road shoulders and ditches than there are in the pastures. Even with modern rangeland management and the introduction of exotic



grasses, Kansas cattle show a taste for young native sunflowers and legumes, and wipe them out before they can produce seed for winter coveys.

When this situation developed, game bird populations were forced to find another source of winter food. For many, that new food supply was waste grain from wheat, corn, and milo fields. These grains had been bred for high yield and food value which benefited wild game as much as the domestic livestock and human consumers for which they were developed. Corn and milo yield about 3700 calories per gram, comparable to the calorie content of the best native foods. Prairie chicken and quail populations grew with this new food source, and around the turn of the century, the pheasant moved into the grain fields as well. Plowed ground also encouraged a variety of annual weeds, native and alien, that produced excellent

winter food.

The domestic grains are superior to native food sources in one respect—tame grain is easier for birds to find than smaller native seeds when snow is on. When corn or milo is left standing, the stalks lodge and put the grain in easy reach of a ground feeding bird. Mechanical pickers usually leave whole ears or seed heads on the ground; when a pheasant or quail finds one, he's set for the day. Piles of spilled grain where the pickers are emptied are also bonanzas for late season feeding.

Birds that don't have an adequate supply of choice native or cultivated foods will resort to less desirable forage when times get tough. Sumac, rose hips, partridge peas, buckbrush, lespedeza, and smartweed are all low energy foods that birds will turn to as a last resort.

The inadequacy of these foods as winter staples for upland birds became clear to me while I was still in college. While at Kansas State University, I worked as a research assistant for Dr. Robert Robel who was investigating the energy needs of bobwhite quail. In one project, we fed samples of native foods to quail and monitored their weight changes. Quail fed on multi-flora rose hips had to be removed from the experiment on the fourth day of a six-day feeding trial because they had lost nearly fifty percent of their body weight in only three days. Our results with lespedeza and smartweed seeds were about the same. In the wild where no alternative food was available, quail could starve to death in a matter of days with their gizzards full of these rations. When there are no high-calorie seeds, the birds will stuff their crops with anything they can find including grass, sticks, or bark. There's little nutrition for quail or pheasants in such material, but the birds at least feel full while they're dying.

In such emergencies, wild birds can live on stored fat for awhile. Kansas State research has shown that quail will lose weight in severe winter weather even when they are feeding on corn or milo—the energy demands in extreme cold are so great that the birds can't eat enough food to keep up. However, quail that have been feeding on top quality food have more fat than birds that have been forced to live on less nutritious forage. It has been shown that a healthy quail with access to corn or milo carries an average of 113,500 calories in fat reserves. Without high energy food, his reserves are closer to 66,000 calories. When forced by an ice storm or heavy snow to go without food, he falls back on these reserves to supply the 66,500 calories a day he needs just to maintain his body heat. It doesn't take much in the way of higher mathematics to show that his life expectancy in such situations is less than three days at best. In the wild, quail will lengthen their survival time a little by roosting in tight coveys to conserve body heat and by staying in heavy, weather-proof cover.

Prairie chickens and pheasants are hardier than quail

because they are better able to scratch down to snow-covered food and because they are larger with less surface area for their body weight, an arrangement that cuts down on heat loss. Still, no matter what their size, all resident game birds eventually face the threat of a particularly hard winter and stress from lack of food.

A sudden winter die-off is the most spectacular result of scanty winter forage and heavy weather. Biologists in the northern Mid-west have reported quail die-offs that may affect statewide populations of quail for a year or more. For larger birds like pheasants, the effects of a tough winter may not be as visible, but they can be just as devastating. All birds must carry some fat reserves through the winter to breed efficiently. The rigor of mating displays, nesting, brood rearing, and molting make severe energy demands on all species of game birds, and early spring food supplies aren't often plentiful enough to allow a weak bird to recover from winter. Stressed birds tend to delay their nesting in an attempt to regain the peak of health they require for successful reproduction. In pheasants, the delay may be as much as two weeks, and even after the stressed hen begins her nest, her troubles aren't over. Because of her poor physical condition, she can't produce eggs as fast as a healthy hen and settles for a smaller clutch. If the first clutch is lost, late chicks from the hen's re-nest have less chance of surviving than earlier young. In cases of extreme stress, the weakened hen may not even try a second nest if she loses her first.

Spring and early summer bring another test of a game bird's health—the contest with predators. Predation accounts for a certain number of deaths in the healthiest population. In most years, these losses are balanced by the summer's production. Weakened breeding birds are less likely to supply the young that normally replace birds lost to predators, and there is a greater chance that the breeders themselves may be a step slower and more vulnerable to a fox, farm dog, or hawk. The disease-causing organisms have a better chance with weakened birds, too. The pathogens that cause coccidiosis, equine encephalitis, and other game bird diseases are almost always around. The effect they have on a population is usually negligible except when an entire population is already struggling to survive.

Upswings and declines in game bird numbers can seldom be explained simply. Populations can rise in the face of seemingly overwhelming handicaps if they have one or two things going their way, especially if the bright spots favor the nesting hen and young broods. A hard winter alone may not mean a poor hunting season the next fall unless it combines with a lack of summer cover or food, a scorching summer, a poorly timed series of thunderstorms, hail, or any of a thousand other variables. However, a variety of winter forage plants does give a pheasant or quail a slight edge in the spring, and once in a while, that edge makes all the difference.

