

# KANSAS WILDLIFE

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# KANSAS WILDLIFE

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Covers: Redfin shiner by Ken Brunson

# Good News

Conservationists do a lot of worrying—and generally with good cause. If it isn't a boondoggle water project, it's a mining operation, a new interstate highway, a suburban housing development, or a corporate farm cutting into key habitat, threatening common wildlife with hard times and rarer species with outright extinction. Little wonder that wildlife organizations, both public and private, spend much of their time hanging black crepe from the rafters in anticipation of disastrous times ahead.

Somebody has to spread the bad news, but wildlife enthusiasts seem fated to deal with an almost unrelieved diet of gloom and doom. It's enough to put an otherwise sane person in a padded cell. Once in a while, a conservationist has to spend a little time savoring a scrap of good news in the interest of his own mental health. This summer, there are a couple of rays of sunshine worth contemplating.

First is the Chickadee Check-off for nongame. Support for the check-off in its first year was impressive, but there was some concern that hard times might discourage contributions this spring. Not so. Although the number of people who contributed is down slightly, probably because of increased unemployment, the people who *have* contributed have made up the difference. This year's contributions stand at \$128,984, and the Department of Revenue still hasn't finished processing returns. Last year at this time, the nongame check-off had collected about \$124,000.

Anyone who has looked carefully at the problems facing

wildlife in North America knows that the funding sources that have traditionally supported wildlife management won't prevail in the face of intensifying demands on our natural resources. Wildlife must find new support, and the success of this year's Chickadee Check-off suggests that there may be new support available, either from the general public or from the same old hunting and fishing group that is willing to contribute to wildlife in a different way. This year's funds will sustain a number of projects including the recent reintroduction of two former Kansas residents, the swallowtailed kite and the mountain plover. Dr. Jim Parker of the University of Maine has recently placed swallowtailed kite nestlings from Florida in southwestern Kansas Mississippi kite nests. This foster parent program will get into full swing next summer. At the same time, nongame biologist Marvin Schilling has been involved in moving mountain plovers from Colorado into western Kansas. Research efforts funded through the check-off will also continue along with more mundane management programs like the development of bird feeding programs at nursing homes around the state.

As the Chickadee Check-off has gained momentum, another effort with great promise for the future—Fish and Game's Wildlife Education Program—has also hit its stride. Education Coordinator Joyce Harmon began work for the Commission last June and already has her program nearly a year ahead of schedule. By the beginning of school this fall, teachers around the state will

have access to a resource center that will include films, field guides, activity guides, wildlife games, posters, tapes of bird songs, and one of Joyce's pet projects, the skin-and-skull box which will give kids a chance to get acquainted with the fur, feathers, and bones of a wide variety of Kansas wildlife. She is also working on a series of teacher guides and student materials which will be individually designed for each grade level from kindergarten through high school. The theme of all these materials is broadly environmental and intended to make Kansas children more aware of the immense value of the wild resources in their state. Some of Joyce's work is supported by the Chickadee Check-off; the majority is funded by hunters and fishermen. If you're interested in having the Wildlife Education Program in your child's school, contact your school district administrators and have them get in touch with Joyce at the Pratt Fish and Game Office.

The check-off and the education program are a great contribution—the generations coming up will have a chance to learn about wildlife and an uncomplicated way to make their interest and influence felt in wildlife management. If the two programs fulfill their initial promise, wildlife professionals may finally find some relief from two of their most pressing problems: They'll have enough money to get the wildlife management job done (for a change) and a more understandable mandate from a larger, better informed public. And that *is* good news.

the  
original  
weed  
eater—  
has it  
worked  
in Kansas  
lakes?

# Grass Carp

Tom Mosher

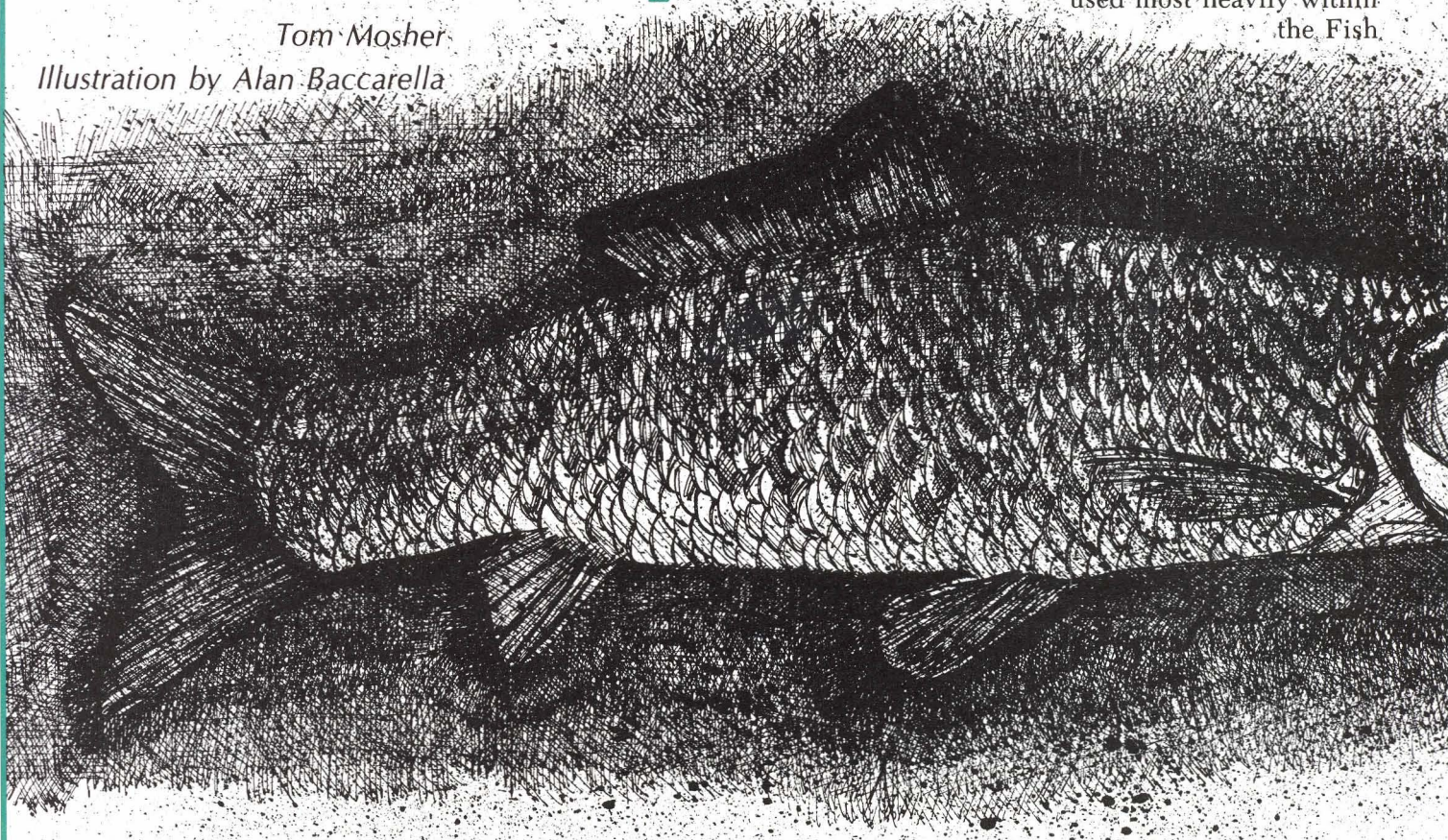
Illustration by Alan Baccarella

Native to the Amur River system and Eastern Asia, grass carp were first introduced to this country in 1963 for experimental aquatic weed control by the Fish Farming Experimental Station at Stuttgart, Arkansas, and Auburn University. By 1978, they had spread to at least thirty-five states through human stocking and dispersal within inland waterways. Grass carp look and behave nothing like their minnow family relatives, the common carp. Despite assurances that grass carp would not harm U.S. sportfishing, a rift developed between the proponents and opponents of grass carp stocking. The proponents claimed grass carp would not harm the environment, and, since they would not spawn naturally, they could never

be the problem common carp have become. However, many fisheries biologists and concerned fishermen were skeptical of their use, and rightfully warned that any exotic fish has the potential to upset the balance of native fisheries populations. There were even reports, true or otherwise, of how dangerous they are to human health since one in the Missouri River jumped over a seine, striking a man in the chest causing him to drown.

Grass carp have now been used to control aquatic weeds by the Fish and Game Commission for four years. They have been used even longer by the state's commercial growers and private pond owners. What, then, is the status of grass carp in Kansas? What has been their effect on aquatic vegetation, water quality, and the sport fishery during their tenure?

Grass carp are probably being used most heavily within the Fish



and Game hatchery system. Steve Mense, manager of the Farlington Hatchery, reports they use grass carp to control plant growth, especially algae, in the catfish rearing ponds. Before grass carp were used, algae often blocked the screens on the outfall structure and prevented draining. As a result, a man had to be stationed on the ponds to brush algae from the screens so water could drain properly. In addition, weeds growing within the rearing ponds often caused young fish to "hangup" in the pond during draining. Steve reports, "We now stock enough grass carp to keep these ponds completely smooth and vegetation free. It makes our job much easier. The only problem comes when the grass carp become excited and actually throw young catfish about while we're trying to net them. Some are thrown so hard their spines stick in workers' clothing."

Unlike hatchery ponds, lakes and pond fisheries benefit from aquatic plants. Only they can convert the sun's energy and in-lake nutrients to usable form for animals.

Algae and rooted aquatic plants support a host of zooplankton and

glers to locate their quarry. Care must then be taken not to remove an excessive quantity of plants from a lake by stocking too many grass carp. However, excessive vegetation protects too many young fish and prohibits use by adult game fish and anglers alike. Fish and Game biologists now recommend stocking ten grass carp per acre in waters that have moderate to dense amounts of vegetation throughout the lake. Stocking rates are decreased when quantities of plants and the area they cover are less. If vegetation is sparse with only occasional small problem areas, most biologists recommend spot treatment with herbicide rather than stocking grass carp. In this way, only the problem vegetation will be removed.

Most state fishing lakes with vegetation problems that received grass carp stockings in 1977 and 1978 were stocked at ten per acre. As a result, anglers have been able to fish areas that previously were accessible only during the early spring months. More importantly, there have been no noticeable adverse impacts on the sport fishery in these lakes, and we have had no severe problems of overgrazing of aquatic plants. At Lyon State Fishing Lake, north of Emporia, the original stock of ten per acre in 1978 has done a good job of controlling the weed problem. In contrast, the vegetation at Cowley State Fishing Lake, east of Winfield, has not decreased despite stocking grass carp at ten per acre in 1977, and adding six per acre in 1980 and ten per acre in 1981. Results such as these indicate we have more to learn on the use of grass carp for vegetation control.

We know that grass carp, like most grazing land animals, prefer lush, succulent types of vegetation. Coontail, pond weeds, algae and duck weed are especially high on their preference list. In addition, they will also eat highly fibrous plants such as cattails and water lily. It is unlikely, though, that they will

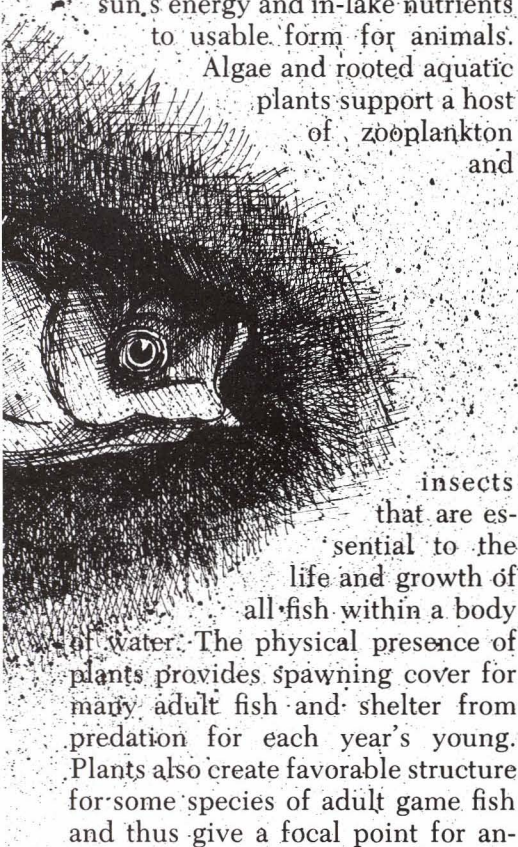
control these plants unless no other vegetation is available.

Learning more about the fish itself has proven to be a difficult task. Grass carp are an especially wary fish that are difficult to sample in the wild. They apparently have keen eye sight, since they easily avoid our nets, even the monofilament nets. When cornered by seining efforts, they easily swim around the ends before they can be trapped. Or if trapped, they jump clear of the seine to make their escape. Electrofishing efforts have also failed. Grass carp have been observed rapidly leaving areas before the boats get close enough to stun them with the electrical field. It is not known whether the approaching boat or the leading edges of the electrical field cause their departure.

Surprisingly, fishermen have had some success catching grass carp on hook and line. In most instances these are caught on worms, although I've heard of some anglers actually tying aquatic weeds or grass clippings on a hook to catch these fish. It is not certain if the grass carp were knowingly eating the worms on baited hooks or if they were simply inspecting the offering. Dave Willis, Fish and Game's reservoir investigator, reports he has seen them attack grasshoppers thrown into rearing ponds, but that they quickly spit them out. In any case, fishermen who have caught grass carp are usually impressed by their hard hitting and strong fighting behavior.

Those anglers who eat their catch have found grass carp flesh to be very palatable. Although boney, the grass carp have mild flavored white meat that is drier than catfish.

Many of the original concerns of those opposing grass carp have proven to be unfounded; however, since naturally spawned grass carp have been found in the Mississippi River, the jury is still out on the total impact on North American aquatic habitats. In any case, it appears the grass carp is here to stay. □



insects that are essential to the life and growth of all fish within a body of water. The physical presence of plants provides spawning cover for many adult fish and shelter from predation for each year's young. Plants also create favorable structure for some species of adult game fish and thus give a focal point for an-



*a heavy stringer?*

*a trophy fish?*

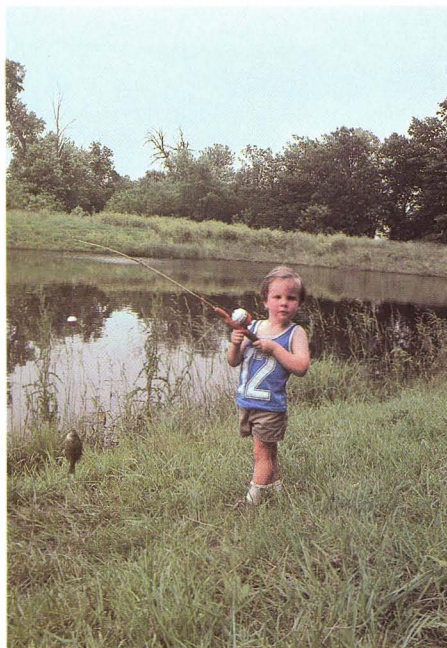
*solitude?*

*companionship?*

## *Quality Fishing: What is it?*

*Don Gabelhouse*

**I**t had been at least a quarter of an hour since the anchor had dropped, but my line was still dry. My fishing partner, on the other hand, had landed a basket of eight- to ten-inch bluegills that were nearly as round as they were long and measured a good two inches between the eyes. To most, this would appear to be a less than fulfilling situation, but for me, it ranks as one of the highest quality fishing trips I have ever had. The reason? My partner was my wife of less than two years, and we were fishing a lake near which my family has had a cabin since the 1930s. I hadn't been there for eight years, and the opportunity to relive childhood memories with my wife was enjoyable to say the least. At that time, Diane had little fishing experience, so seeing her catch all those fish was quite a thrill. Surgically removing her hook from deep



inside their gullets and then rebaiting it were actually pleasurable chores—to a point. Diane's sarcastic

remark to the effect that I would never wet a line because she was doing so well sealed her fate. From that time on, she has unhooked all her own fish and rebaited her own hook.

That fishing trip combined desirable surroundings, preferred species, sizes, and numbers of fish, and the social interaction to make the outing memorable. If we had caught an unusual fish or a particularly large one, the trip would have been the ultimate success.

How different is my idea of quality fishing from that perceived by other anglers? At first glance, one might surmise that people fish in so many different ways for so many different kinds of fish in so many different types of water that it would be impossible to define quality fishing in terms that would apply to all anglers. Granted, it is difficult to

quantify quality fishing although it has been tried. Even so, all anglers share some values, and all the differences of opinion are really just variations of some basic themes. After you boil it down, there are really only four factors which determine what quality fishing is. The importance each factor may assume in an angler's idea of quality fishing may vary, but environmental factors, equipment factors, social factors, and fish factors collectively determine what quality fishing is for all anglers.

Most anglers view fishing as a chance to get outdoors, enjoy the fresh air, and "commune with nature." The places anglers like to do their "communing" vary greatly, however. Some anglers like to fish large impoundments; others like to fish smaller lakes and ponds, while others prefer rivers and streams.

Associated surroundings are also important to anglers. Some anglers prefer to fish "unimproved" areas where few have trod previously, while others like to fish from man-made piers where the grass is mowed and there is a picnic table, barbeque grill, outhouse, or even a

flush toilet nearby. Many anglers like to fish clear water with aquatic vegetation. Others see "weeds" and other structure as threats to their terminal tackle.

An angler may fish in the kind of water he prefers with surroundings he treasures and still not have a quality fishing trip because of the weather. Some fishermen enjoy only a calm, "bluebird" day in the heat of the summer, while others prefer to fish when the waves are lapping over the gunwales of the boat and the rain and sleet are blowing horizontal to the surface of the water. Still others sit on plastic buckets and peer down through holes they have cut in the ice.

Most people quit fishing when darkness and mosquitoes descend, but a few anglers don't even start until lantern light glows around them. Anglers seldom go fishing just to watch wildlife, but a deer coming to drink or a wood duck squeeking overhead can highlight a fishing trip for many of us. The same holds true for sunsets and rainbows like those you see in inspirational paintings at starving artists' sales. One of my all-time favorite fishing trips occurred

when my father and I took to the lake right after a torrential down-pour. Six-pound walleyes and two-pound crappie were the gold we found at the end of the rainbow.

Perhaps the most controversial of the four factors which influence the quality of a fishing trip is the social factor. Some people fish to get away from the rat race and crave solitude. Others tolerate company, often because they have no other choice. It is sometimes hard to be a loner on the Neosho during a white bass run, or below Chetopa Dam when the paddlefish are stacking up, or near water of any type in the vicinity of Topeka, Kansas City, or Wichita.

Still other anglers actually enjoy company, especially when their companions are friends and relatives. Some of my fondest fishing memories are of those evenings spent trolling off a pontoon with my family, well provisioned with sacks of sunflower seeds and red licorice candy. Social interaction is nearly always the key to quality fishing when a father is teaching his child to fish.

There are other anglers who are also interested in "teaching" others



how to fish. To competitive anglers, fishing quality amounts largely to landing more fish than others catch, usually but not always in an organized contest. Many anglers, myself included, realize that competitive angling has its place but don't like to feel that they have to match their partner fish for fish or suffer a ribbing during an impromptu contest. Such trips are of little therapeutic value for the non-competitive angler, usually leaving him more tense than when he started.

In at least one respect, a fisherman is no different than a participant in any other sport—he must have at least some equipment. In fact, to some anglers, how a person fishes is more important than where or with whom he fishes or even what he catches. As we age, most of us find that the stick and string or cane pole that once caught fish for us just doesn't work as well as it once did, and we begin to develop a taste for more sophisticated tackle. The degree of sophistication required depends on the pocketbook as well as the need to catch fish, so some of us still use spincasting reels and fiberglass rods while others use ultralight

spinning gear, or even baitcasting reels and boron rods. There are even a few western Kansans (mainly west of Kanorado) who use flyrods.

Some anglers see quality fishing as not using a rod at all. The thrill of trotlining and limblining comes, not from the gear used, but from setting and running lines. Bowfishing and underwater spearfishing allow the "angler" to choose the fish he wants to catch.

Anglers who use rods and reels differ according to what they like to see tied to the end of the line. A dyed-in-the-wool fly fisherman could have an otherwise quality fishing trip ruined if he were forced to use live bait, cheese, or marshmallows to catch trout. Some anglers fish strictly artificials, and I suppose somewhere there is someone who actually enjoys using shad sides for bait.

Most anglers cannot cast far enough to reach the big ones, so some way to extend the fishing area increases the likelihood of a quality fishing trip. A few anglers like to wade or fish from inner tubes, but many like to fish from boats. Anglers who own small boats usually have

them to get to fish, while those who own big boats complete with live wells, depth finders, and trolling motors or even downriggers often have them not only to get fish but also to "get to" other fishermen. Pride in equipment is among the most important factors in determining the quality of fishing to some anglers.

The fourth and final factor that determines the quality of fishing is the fish itself. Differences of opinion among anglers regarding desired fish species stem primarily from differences in intended use of the fish and the angler's patience. An angler who fishes to provide food for the table and likes plenty of action will probably seek panfish such as crappies, bluegills, and bullheads. The more patient angler may pursue catfish or walleye, especially if he doesn't care to clean a hoard of fish to make a meal. Anglers who value a fish's sporting qualities more than its table quality are inclined to chase large, hard-fighting species like black bass, pike, and stripers.

While nearly every angler has his preferences regarding fish species, most true anglers also appreciate diversity in their catch. This is especially true of the angler who catches an uncommon species or one he has never caught before. I especially enjoy catching a "different" fish if I take it by accident while fishing for something else. Fishermen like surprises, and not knowing what will bite next makes fishing exciting.

It is probably safe to assume that, when a trophy-sized fish of any species bites, the angler on the other end of the line stands to enjoy a quality fishing trip even if environmental, social, and equipment factors are less than desirable. A trip where you were forced to land an eleven-pound bass with your son's canepole because he was busy playing with two dozen other screaming kids will probably be remembered as "quality" even if it was 110 degrees in the shade and the muddy water that surrounded you contained a flotilla of bottles and cans.

*Ron Spomer*



It is fortunate that there is more to quality fishing than just catching big fish. If this weren't the case, few anglers would ever experience quality fishing. For anglers who enjoy quality fishing, it is important that conservation agencies like the Kansas Fish and Game Commission know what effect management practices will have on the quality of fishing as perceived by the angling public. Two of the four factors mentioned above are difficult for agencies to influence; one is occasionally influenced, and the other is highly influenced.

Other than providing ample angling opportunity thereby spreading out the crowd, little can be done to affect social factors. The company an angler keeps is usually of his own choosing. It is also difficult to affect how a person fishes. Regulations provide adequate opportunity to catch fish using a variety of sporting methods (since fishing is a sport, and sports require at least some equipment, catching fish barehanded is not considered sporting.) An angler's methods and equipment are thus limited primarily by his own preferences and pay check.

While it is impossible to transform a Kansas prairie impoundment into a north woods lake, the environment can be manipulated to provide a pleasing setting. Maintaining state-owned waters and adjacent lands is difficult and costly, especially considering losses to vandalism. Since anglers differ regarding what is pleasing, agency personnel strive to provide a diversity of backdrops for anglers and other users on a given impoundment, ranging from well-manicured areas to woolly expanses.

The concept of diversity can also be applied to fishing opportunities as they influence the quality of fishing. For many years, fishing biologists used only those management practices which tended to establish "balance" in fish communities. Since trade-offs among fish species made it difficult or impossible to produce large fish of every species

together in the same body of water, strategies which produce reasonable sizes and quantities of all species were considered most appropriate. Such thinking is still sound as long as anglers who fish a given body of water have no overwhelming preferences for certain fish species.

We are now finding that anglers who fish some state-owned lakes have preferences. According to 1981 creel survey information, seventy-one percent of all anglers interviewed at Brown State Fishing Lake indicated that, if they had to make a choice, they would rather catch bass over fifteen inches long than they would bluegills over eight inches and crappies over ten inches. Forty miles away, eighty-three percent of the anglers at Nemaha State Fishing Lake said they would rather catch big panfish than big bass. Farther south, anglers at Montgomery State Fishing Lake were nearly split on the questions—fifty-three percent wanted big bass and forty-seven percent opted for big panfish. Anglers at Brown and Nemaha can be accommodated by using slightly different management practices which rely heavily on bass harvest restriction through length limits in both cases. Since there is no clear-cut preference among the Montgomery anglers, it is probably best to continue efforts to maintain a "balanced" fish community instead of managing for large bass at the expense of panfish or large panfish at the expense of bass.

Ideally, the Fish and Game Commission could provide a diversity of angling opportunities in close proximity to one another by managing most lakes to produce "balanced" fish communities and some lakes to produce large individuals of certain fish species at the expense of other species less desired by anglers. This approach is especially appropriate if a water body has a capacity to produce good-sized individuals of certain species more than others. To manage for "balance" amounts to trying to make a silk purse out of a sow's ear for those species which do

not thrive in that environment and sacrificing potential for those species that do. Stripers may be a threat to a good walleye population through competition for food, but reservoirs like Cheney that have limited walleye production potential are probably suited for stripers. This is especially true if area anglers perceive fishing quality as the pursuit of a large fish that takes some time to catch. Someone once stated that there is honor in not catching a musky. Some Kansans probably hold the same opinion of stripers.

In addition to providing a variety of angling opportunities in public waters, the Fish and Game Commission is also striving to provide owners and anglers of private impoundments the information they need to produce the kinds of fish they want. Kansas' new pond management booklet provides the pond owner with a series of options from which to choose. The appropriate option depends on whether the owner wants to produce large bluegills and other panfish at the expense of bass quality, big bass at the expense of bluegill quality, or reasonable sizes of both species at the same time.

I hope more pond owners close to Emporia will choose the large panfish option because, to me, happiness is a basket of nine-inch bluegills. Regardless of how many types of quality fishing trips I've had, my favorite type of angling day in and day out is reeling in didoing bluegills. I'm sure my idea of quality fishing will change as I get older; in fact, it already has. I didn't even carry a rod on my last fishing trip, yet it will stand out in my mind for many years because I got to see my three-year-old son Zach catch his first fish, a six-inch bluegill, and release his first bass. And the two of us have even better times ahead. □

*Don Gabelhouse, pond investigations biologist for Fish and Game, has done extensive research on what fishermen expect out of their sport in an effort to tailor management efforts to the desires of the angling public.*



*Little known, little  
appreciated, the “minnows”  
of Kansas are varied—and beautiful.*

# ***Little Fish***

*Ken Brunson*

People have a peculiar attitude when it comes to small native fish—especially ones on threatened and endangered lists. They seem to either sympathize with protecting little fish but are embarrassed to say so or, more often than not, are enraged at the thought of a tiny fish holding up a billion-dollar pork barrel project for some senator's narrow interest constituents. Con-

*The southern redbelly dace shown here are just beginning to round into breeding condition. At the height of breeding season, the males' undersides are intensely red. (Photo by Ken Brunson.)*

troversies that pit a miniscule fish against progress by man and machine are a sensationalistic writer's dream—just look at the press coverage the Tellico Dam episode attracted. Anyway, it naturally develops that many of our rare fish are small organisms that occupy an inordinately large place in the emotional rhetoric of pro and con water project debates.

Actually, most of us show a strong tendency to scatter all fish from one end of the Bo Derek scale to the other. Largemouth bass, of course, fall out toward the "ten" side, the

macho man's kind of animal but not even bass seem to rank with more popular life forms. A recent natural resource report with an anti-hunting slant stated that, besides "shooting only with a camera, it's all right to fish, but please don't pick the flowers." And then there are the vegetarians who carefully substitute fish for "real meat." Smaller fish like our native minnows seldom get any public attention or support at all.

A recent poll of National Wildlife Federation members revealed that some thought that lower life forms might be dropped from the national



threatened and endangered species lists. They seemed to feel that plants, insects, and fish were somehow less important than bald eagles and blackfooted ferrets.

The main stream of society rarely encounters little fish except as bait or in the center of controversy since they are always hidden from view beneath the water's surface. There is no "Greater Wichita Fish Watchers Society," no rabid "minnowers" working on their life lists. To remedy this situation, we've pulled some of these small fish from their hideouts to introduce you to their

fascinating traits and virtues.

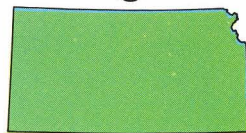
But, first, a few general facts are in order. There are about 130 species of fish in Kansas, according to Dr. Frank Cross, University of Kansas, of which more than half can be considered small fish—less than eight inches adult length. Most of these species can be found in the large minnow family which also includes the common carp and goldfish—both introduced species. Breaking these seventy or so species down, we find about twenty darters of the true perch family which also includes walleye and the now famous snail darter. There are eight chubs besides the common creek chub, about twenty shiners, six madtoms that aren't really mad but look like small bullheads, a couple of topminnows, several other species of minnows closely associated with fatheads (a common bait minnow), and an assortment of rather unique fish such as the red-bellied dace, brook silverside, and banded sculpin. Of course, all fish, even a ten-pound bass start out small, so you may occasionally run into these infants of the fish world. Most of these Kansas fish are well adapted to streams and evolved in a natural plains setting devoid of the abundant lake- and pond-filled environment we know today.

The shiners are perhaps the best known group of minnows. Excepting the golden shiner, these are all from one genus (*Notropis*) and include the red shiner which is probably the most common fish in the state. The Topeka shiner (*Notropis topeka*) is one of our state's threatened species and is running as a candidate for the state fish along with the channel catfish. There is a whole assortment of other less distinguished shiners—the bigeye, bigmouth, sand, river, ghost, blacknose and bluntface. With so many kinds in one group, it is difficult for even experts to sometimes tell which species they're looking at without the help of an identification key such as "Fishes in Kansas" by Dr. Frank Cross and Joseph T. Collins pub-

lished in 1975.

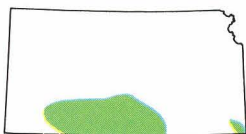
The darters are probably the most inconspicuous fish because they normally rest on sand or gravel bottoms of streams and are not easily captured with a seine. As their name implies, they dart about in quick movements interrupted by motionless rests on the stream bottom, perching on their front lower fins as if ready to pounce on any small morsel of food that may float by. Most darters are known to eat mainly small aquatic insect larvae. The species of this family display more brilliant colors than any other group of Kansas fishes. All the colors of the rainbow can be found in the several members of this group in Kansas including the greenside, banded, speckled, redfin, Arkansas, orangethroat, and fantail darters.

## Orangethroat darter



It amazes me to continually encounter local residents who have fished a stream for years and have never seen orangethroat darters that occur quite commonly in these very waters. This is not so surprising, though, when you consider the habits of this fish. Despite its unique colors and form, it is not an easy fish to see or seine. Like most other darters, the orangethroat stays on the bottom, motionless, until it "darts" to catch food or escape predators. It perches on its front lower fins and can cock its head from side to side to watch for potential food and other distractions from its lower vantage point in the stream. The orangethroat darter is found nearly statewide and occurs in a variety of stream types, but is more common in smaller sand- or gravel-bottomed creeks.

## Arkansas darter



This Kansas threatened species is a rebel. It prefers not to



## the darters

*(Clockwise from near right) Orangethroat, logperch, speckled, channel, banded, and Arkansas. As exemplified in these portraits, Kansas darters are quite colorful. They are not prone to flaunt their appearance, however, since they discreetly skip about the bottom sand and rocks, feeding on such fare as mayfly larvae. They are well suited for life on the bottom, since they do not possess gas bladders and have highly adapted fins on which to rest. Adult Arkansas darters are exceptions; they typically prefer to perch in branches of aquatic vegetation. The logperch is the largest member of the darter group, attaining an amazing total length of over seven inches. (Photos by Ron Spomer.)*





rest on the bottom of streams but is closely associated with aquatic plants—particularly water cress and water primrose. In its primary range in southcentral Kansas, it is found almost exclusively in fairly clear, spring-fed creeks that have an abundant supply of the yellow flowered water primrose. In the aquarium, I have witnessed this fish resting in the branches of the primrose, waiting for food, while ignoring the more typical bottom sand and rocks preferred by the other darters like the orangethroat. As with the other darters, the male Arkansas becomes much more brilliant during its spring breeding season, displaying a bright yellow-orange along its entire belly.

## Red shiner

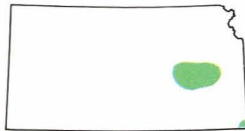


The red shiner is probably the most common fish in

Kansas. It is found in both streams and slack waters of ponds and lakes. A very prolific species, it provides ample forage for a host of predatory fish including largemouth bass. As with many other fish, the Red Shiner has a sheaf of colloquial names. In at least the western part of the state,

locals call this minnow the “red-horse,” although it is probably more commonly known as just “shiner.” The “shiner” available in most bait shops is actually the “golden shiner” and is not the same species. Red shiners seem to be tolerant of a wide range of environmental stresses and this, plus the fact that they spawn from spring to fall, accounts for their wide distribution. Their name is derived from the brilliant red color of the males’ fins in late spring and summer as they “color up” to attract mates for their courtship activities. During this period, they also take on a light blue metallic sheen on their sides.

## Duskystripe shiner



Of all Kansas little fish, the duskystripe shiner may un-

dergo the most marked appearance change from its normal coloration to its spring breeding adornment. Most of the time this fish is fairly drab, displaying only gray-olive and white colors along with its characteristic gold horizontal line about midway down its sides, but in April or early May the male changes into a spectacular suitor for the unaltered fe-

males. Anxious to compete aggressively for the lady shiners, the males turn crimson as they initiate spawning activities over large gravel riffles. As do many other species, the males develop tubercles or pointed bumps on their heads to help them fend off intruders to their territories. The duskystripe shiner is one of those Kansas fish that have an irregular distribution. They are found in Chase, Lyon, and Coffey counties in the Flint Hills but also in Shoal Creek and Spring River in Cherokee County. It is not unusual to find more and different species of fish in the biologically rich portion of southeast Kansas but occasionally a species found there may have a limited and isolated occurrence elsewhere in the state. This small fish is also a good representative of a class of animals biologists refer to as indicator species. It is usually found only in clear, relatively unpolluted water that flows permanently, thus “indicating” a healthy environment. When certain streams that are normally free of pollution become altered, or affected by contaminants, indicator species such as duskystripe shiners are the first fish to disappear.

## Slender madtom




There is a group of small bullhead-like fish in the cat-

fish family that, when seined up by bait-seeking anglers, are quite commonly mistaken for young bullheads. These are the madtoms of which the slender madtom is representative. It is hard to imagine that these fish, which rarely grow to more than a few inches in length, are in the same family as the blue catfish and flathead catfish either of which, at adult size, could gulp a bucket full of madtoms at one feeding. The other madtoms include the stonecat (the most common); the tadpole; brindled; freckled; and Neosho madtom, a Kansas endangered species. A peculiar feature of the mad-

Plains killifish (Ken Brunson)



# the YELLOW Pages



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## LETTERS to the editor

### FOOD SUPPLIER

Congratulations to Ron Spomer for his article, "Back to the Sky," in the March-April issue. It was educational, informative, and--in a word--delightful.

There was, however, one part of the article that disturbed me--the part about trying to rehabilitate injured raptors while feeding them "...just about any other critters we can scrape off the roads." It wasn't so much the tread-marked possums that got to me as the fact that Maure Weigel and Dennis Zehr depend so heavily on such an unreliable source for a vital part of their rehab program.

I raise domestic rabbits on a limited basis, so I phoned Maure and offered to supply the program with as much fresh rabbit as he feels he can use. Forecasting food requirements is nearly impossible, but we've worked out a plan that should provide enough flexibility to keep the birds fed...in spite of their numbers, the time of year, or the availability of Goodyear-burger.

I'm also going to try to raise some cottontails for the program so that the birds retain their taste for wild game. Hopefully, I'll soon be able to help fill this gap in what I consider an important and admirable venture.

I thank Ron Spomer and the editors of *Kansas Wildlife* for

bringing to our attention the Smoky Hills Audubon Society's raptor rehabilitation program. Without this article, we might never have known and--worse yet--might never have had the opportunity to help.

Robert S. Gaetz  
Chapman

*We're glad we could do something to get you and the raptor rehab crew together. It's generous folks like you who make such programs possible. And we're sure Maure and Dennis are more than willing to sacrifice their road-time for other chores.*

### BOOK-LOOKING

I do enjoy the magazine and use the kids' section in my classroom sometimes.

I think I read in this magazine a year or so ago that a new book on Kansas wildflowers was being published. I've been looking for the book. Do you have any information about such a book?

Berta Miller  
Topeka

*Two very good wildflower books have been published. One is *Prairie Wildflowers*, by Clenton E. Owensby; the other is "Wildflowers and Weeds of Kansas," by Janet E. Bare. Owensby's book is published by Iowa State University Press (Ames, Iowa 50010). It is a color guide for the layperson interested in identifying and learning more about*

*these native plants. Bare's book is illustrated with black-and-white photos and provides a detailed taxonomic key to identifying weeds and wildflowers. The Bare book is published by Regents Press of Kansas (Lawrence, Kansas).*

### FAWN FACTS

We are native Kansans who moved to Oklahoma from Wichita in 1976. We fully enjoy your magazine.

We own a ranch east of Sedan. My son, while leaving the ranch one morning, came upon a doe with three new-born fawns. They could hardly get their legs to balance them. He still talks about what a beautiful sight it was. Is it unusual for does to have more than one fawn?

Mrs. Paul Wyman  
Tulsa, OK

*A doe giving birth for the first time usually has a single fawn but, thereafter, twins are more common than single fawns. Triplets are rare. The quantity and quality of food supplies has a lot to do with deer reproduction; if ample supplies of high-quality food are available, a doe will usually give birth to twins.*

### COMPETITION NEEDED?

Tommie Berger, in "Are Bass Tournaments Bad For Bass?" (May-June issue), gives us only a short-term answer. He fails to

point out that the competitive fisherman belongs to the type that has given us "winning is everything" and tarnished almost every sport in the land.

Are we eventually to be blessed with little league fishing in which the Bobcats outfish the Tigers to the whoops of adoring parents? In the long run, our resources cannot support hoggishness. The competitive fisherman, while he might not yet appear on bubble gum cards, is a poor example for anglers of all ages and needs no support from your excellent magazine.

William Harrison  
Wichita

## GIFT-GIVER

I have subscribed to your magazine for many years and find the articles and pictures very representative of our Kansas hunting and fishing. I send subscriptions to my hunting and fishing friends throughout the state, as well as former companions that have moved away. It makes an excellent Christmas gift. I send subscriptions to North Dakota and Texas.

The "It's Wild In Kansas" tee-shirt also makes a great gift. How about offering the shirt again; mine is completely worn out and I would like to order

some more.

Larry Kincheloe  
Wichita

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We welcome letters to the editor, and ask only that they be kept as short as possible. We reserve the right to edit for clarity and brevity, when necessary. Please address all correspondence to: Editor, Kansas Wildlife, Rt. 2 Box 54A, Pratt, Kansas 67124.

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## — SHORT — STUFF

**FERRET NEWS**--Intensive night spotlight surveys conducted in Wyoming by the U. S. Fish and Wildlife Service resulted in at least nine different black-footed ferrets being sighted. Extensive snow tracking efforts this past winter by Idaho State University/Biota Research and Consulting, Inc. biologists resulted in evidence that there may be 11 or more additional ferrets in the same area. Work will continue on the ferrets this summer, and probably next winter, to determine the number of individuals and their distribution.

**THE REAL ISSUE**--The critical issue of water mismanagement in Southern Florida--which is threatening to destroy the Everglades--has been overlooked in the recent controversy over the "mercy kill" of stranded deer in the Everglades, says the National Wildlife Federation. NWF's Dr. Jay D. Hair has characterized the conflict over thinning out starving deer in the Everglades an "unfortunate symptom of the real disease." According to Hair, the real problem in southern florida is a long history of poor natural resource management which has severely disrupted the natural hydrologic system throughout the state. "If these problems--which stem from the combined effects of independent drainage and development projects over the years--are left uncorrected, we will permanently lose the Everglades--one of our most valuable and unique natural resources," Dr. Hair stated.

**FUND RAIDERS**--As the federal budget tightens, vultures are beginning to circle the Pittman-Robert-

son (P-R) Program with the idea of snatching a portion of the money to pay for their pet projects, says the Wildlife Management Institute. The P-R Program is financed by manufacturers' excise taxes on rifles, shotguns, handguns, ammunition, and archery equipment. The money collected is apportioned to state wildlife agencies for wildlife restoration and hunter education programs. Two bills have been introduced to take the handgun receipts away from wildlife and education and give them to crime victims. Congressmen Marty Russo (IL) and Peter Rodino (NJ) have each introduced resolutions which would redirect the handgun tax money (about \$30 million annually) into a special fund to reimburse states for 50 percent of their grants to crime victims.

**REVEALING SURVEY**--Every five years, the government does a major national survey of fishing, hunting, and wildlife-associated recreation. The initial findings from the latest survey have been released and figures show that hunting is alive and well in the U. S. The results show more than 17.4 million Americans over age 16 are hunters. Some 92 percent are male. The average days spent hunting comes to a surprising 19 for all hunting and, to enjoy those days, hunters spend money as well. To be more precise, they spend more than \$5½ billion a year on equipment, licenses, tags, food, lodging, and transportation. Taxes on certain equipment plus license fees provide, on the average, for 77 percent of the annual income of the state wildlife agencies.

**CINCINNATI CHOSEN**--Cincinnati and the Ohio River will be the host city and site for the Aug. 4-6, 1983 world finals of professional bass fishing, according to Ray Scott, president of the 400,000-member Bass Anglers Sportsman Society. Scott said the 1983 Classic will be staged as a "spectator sport," with drive-in weigh-ins held indoors at the Cincinnati Convention Center.

# — SHORT — STUFF

**CONSERVATION TAX RELIEF**--Congressman Robert J. Lagomarsino (Cal.) has introduced revised legislation to provide tax relief to those who sell lands to the U. S. government, state governments, or certain tax-exempt organizations, the Wildlife Management Institute reports. The new bill, H. R. 6465, supercedes a similar measure (H. R. 4680) introduced by Lagomarsino last year. The congressman hopes his legislation will help protect wetlands, which are rapidly disappearing. "As they disappear," he said, "fish and wildlife populations and outdoor recreational and educational opportunities also disappear."

**WHOOPEE NEWS**--The whooping cranes are having another good year. The captive birds at the U. S. Fish and Wildlife Service's Patuxent Wildlife Research Center have produced 28 eggs, 94 percent of them fertile, an outstanding record. In Canada, where the only wild flock of whoopers nests, 15 chicks were reported in the latest count. And a record high of 27 eggs were placed in sandhill crane nests at the Grays Lake National Wildlife Refuge in Idaho, where scientists are hoping to establish a second flock of whooping cranes. Whooping cranes normally lay two eggs, but only one chick survives. Removal of one egg from a crane nest thus does not affect the flock's population.

**NEW DIRECTIONS**--In announcing nine new water project construction starts for the Corps of Engineers, Assistant Secretary of the Army William R. Gianelli said the program "marks a new direction for the federal water resource program," according to the Wildlife Management Institute. The new direction apparently involves local sponsors stating their willingness to help pay construction costs. Letters to that effect have been received by the Corps from sponsors of all nine projects. Gianelli said: "The Administration feels that this new approach allows needed water resource projects to move forward to construction while at the same time reducing the burden on the federal budget. It will also bring local interests into more active partnership with federal government."

**LESS IS MORE**--The South Dakota Department of Game, Fish and Parks is promoting a proven way to pump millions of dollars into the state's economy. The message, reported by the Wildlife Management Institute, is: "Don't mow roadside ditches." Pheasant hunting is a multi-million dollar part of South Dakota's economy, and roadside ditches are among the most productive pheasant habitat in the state. Only pheasant restoration plots provide more. Doug Day, head of the roadside habitat management pro-

gram, feels that ditches will become an even greater help to pheasants as more roadsides are kept from the mowing machines. Day said unmowed ditches "provide a great deal of habitat for nesting. They give hens a place to re-nest when they are forced from fields during early haying operations, and provide valuable cover for pheasant chicks until they are strong enough to escape predators."

**VOLUNTEERISM**--The Bureau of Land Management is using volunteer labor to install watering devices in the California Desert for bighorn sheep. Many springs and seeps in the desert have dried up during the past 50 years, making the areas uninhabitable for bighorns. But through a cooperative effort of BLM, the California Department of Fish and Game and a private group called the Society for the Conservation of Bighorn Sheep, one dry area is being fitted with an elaborate "guzzler" which collects and stores rain and runoff for later use by wildlife.

**FIRST STAMP**--"Bobwhite Quail," by famous wildlife artist David Maass, is the colorful design displayed on the International Quail Foundation's first annual 1982 Quail Research Stamp. This first of issue stamp marks the beginning of a series of stamps and prints by leading wildlife artists. Revenues from the sale of the stamps and prints will be used in quail research and education. The art prints (6½-by-9 inches) are available through major wildlife art dealers or IQF headquarters at \$130 (includes stamp). Stamps are \$5 each, \$20 for plate blocks, and \$50 per sheet of 10 stamps. Stamps are available from IQF, P.O. Box 550, Edgefield, South Carolina, 29824-0550. IQF is a non-profit organization.



**SPEAKING OF STAMPS**--The 1982 Striped Bass Conservation stamps and prints are now available. The program was delayed when the 1982 Striped Bass Artist of the Year, Lee LeBlanc, had to have immediate heart surgery. It was not known if the 74-year-old LeBlanc would survive the ordeal. Even though the prints were ready to be signed by Mr. LeBlanc, the future of the Society's Conservation Stamp and Print program was in doubt. Now, thanks to the artist's recovery, the society's prints are available to the public. The 1982 stamp and print--entitled "Striking Striper"--sells for \$125, complete with mint stamp. Individual conservation stamps are \$5, a block of four is \$20, and a collectors sheet of 10 stamps is \$50. For information on the society, how you can help the striped bass, or the stamp/print program, write to: ASBS, Striped Bass Building, P. O. Box 50, Edgefield, S. C. 29824.

# 1982 EARLY SPORTSMEN'S CALENDAR

## UPLAND BIRDS

### PHEASANT

Season: Nov. 13, 1982 thru Jan. 31, 1983.

Area open: Statewide.

Limit: Daily limit, 4 cocks; possession limit, 16 after fourth day.

### QUAIL

Season: Nov. 13, 1982 (Nov. 20 in a portion of western Kansas) thru Jan. 31, 1983.

Limit: Daily limit, 8; possession limit, 24 after third day.

Area open: Statewide.



### PRAIRIE CHICKEN

Season: Nov. 6, 1982 thru Jan. 31, 1983.

Area open: Statewide.

Limit: Daily limit, 2; possession limit, 6 after third day.

## MIGRATORY BIRDS

### DOVE

Season: Sept. 1 thru Nov. 9.

Area open: Statewide.

Limit: Daily limit, 12; possession limit, 24 after second day.

### RAIL (Sora & Virginia)

Season: Sept. 11 thru Nov. 19.

Area open: Statewide.

Limit: Daily limit, 25; possession limit, 25.

### SNIPE

Season: Sept. 11 thru Dec. 26.

Area open: Statewide.

Limit: Daily limit, 8; possession limit, 16 after second day.

### TEAL

Season: Sept. 11-19.

Area open: Statewide.

Limit: Daily limit, 4; possession limit, 8 after second day.

## WOODCOCK

Season: Oct. 2 thru Dec. 5.

Area open: Statewide.

Limit: Daily limit, 5; possession limit, 10 after second day.

## BIG GAME

### DEER (Residents only)

Seasons: Firearms--Dec. 4 thru Dec. 12, 1982.

Archery--Oct. 1 thru Dec. 1 AND Dec. 15 thru Dec. 31.

Area open: See unit map enclosed with permit application.

Limit: One per season.

### ANTELOPE (Residents only)

Seasons: Firearms--Oct. 2 thru Oct. 4.

Archery--Sept. 25 thru Sept. 29.

Area open: See unit map enclosed with permit application.

Limit: One per season.

### TURKEY (Residents only)

Seasons: Firearms--Oct. 30 thru Nov. 7.

Archery--Oct. 1 thru Oct. 31.

Area open--See unit map enclosed with permit application.

Limit: One per season.

## SMALL GAME

### SQUIRREL

Season: June 1 thru Dec. 31.

Area open: Statewide.

Limit: Daily limit, 5; possession limit, 10 after second day.

### COTTONTAIL

Season: Open year around.

Area open: Statewide.

Limit: Daily limit, 10; possession limit, 20.

### HARE (Jack Rabbit)

Season: Open year around.

Area open: Statewide.

Limit: No daily or possession limits.

### BULLFROG

Season: July 1 thru Oct. 31.

Area open: Statewide.

Limit: Daily limit, 8; possession limit, 16 after second day.

## FURBEARERS

### HUNTING

Season: (Opossum, raccoon, swift fox, red fox, gray fox) Nov. 15, 1982 thru Jan. 15, 1983. (Badger and bobcat) Dec. 1, 1982 thru Jan. 31, 1983. (Striped skunk) Year round. (Otter, spotted skunk, black-footed ferret, beaver, mink, muskrat, and weasels) No open hunting season.

Area open: Statewide.

Limit: None on species which can be legally taken.

### TRAPPING

Season: (Opossum, raccoon, weasel, swift fox, red fox, gray fox) Nov. 15, 1982 thru Jan. 15, 1983.

(Beaver) Jan. 1, 1983 thru Feb. 28, 1983 in the eastern two-thirds of Kansas; Jan. 1, 1983 thru Jan. 31, 1983 in the western third of Kansas.

(Mink and muskrat) Dec. 1, 1982 thru Feb. 28, 1983.

(Badger and bobcat) Dec. 1, 1982 thru Jan. 31, 1983.

Area open: Statewide.

Limit: None on species which can legally be taken.

(Striped skunk) Year around. (Otter, spotted skunk, and black-footed ferret) No open trapping season.

\*Eastern beaver zone--Those counties east of and including Smith, Osborne, Russell, Barton, Rush, Pawnee, Edwards, Kiowa, and Comanche.

\*Western beaver zone--Those counties west of, but not including, those listed for the eastern zone.

### RUNNING

Season: (Opossum, raccoon, red fox, gray fox) June 1, 1982 thru Oct. 20, 1982 AND Feb. 1, 1983 thru March 15, 1983.

(All other furbearers) No open running season.

Area open: Statewide.

Limit: No furbearer can be killed or taken during running season.

### COYOTE

Season: Year around, except during firearms deer season.

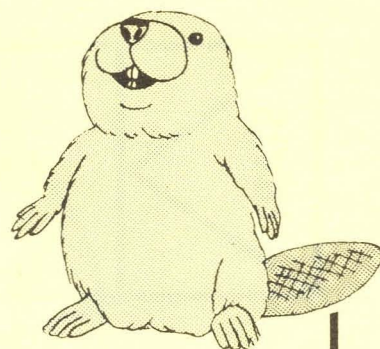
Area open: Statewide.

Limit: No daily or possession limits.

# Nature's Notebook

## by Joyce Harmon

Wildlife Education Coordinator  
Kansas Fish & Game Commission



Games can be a fun way to learn new information or review old. The "Fish & Game Game" is designed for your use with a small group, or for a larger group if multiple copies are made. Adapt the questions to the age group you work with.

## THE FISH & GAME GAME

Construct your game by making copies of the gameboard and backing it with cardboard for sturdiness. Make a life-size gameboard on the playground with chalk, or paint the pattern onto a large piece of canvas or plastic. On this giant gameboard, the participants become the place markers.

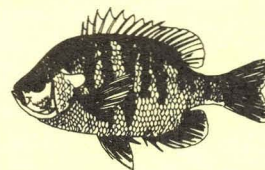
Use a spinner from another game or make your own from cardboard.

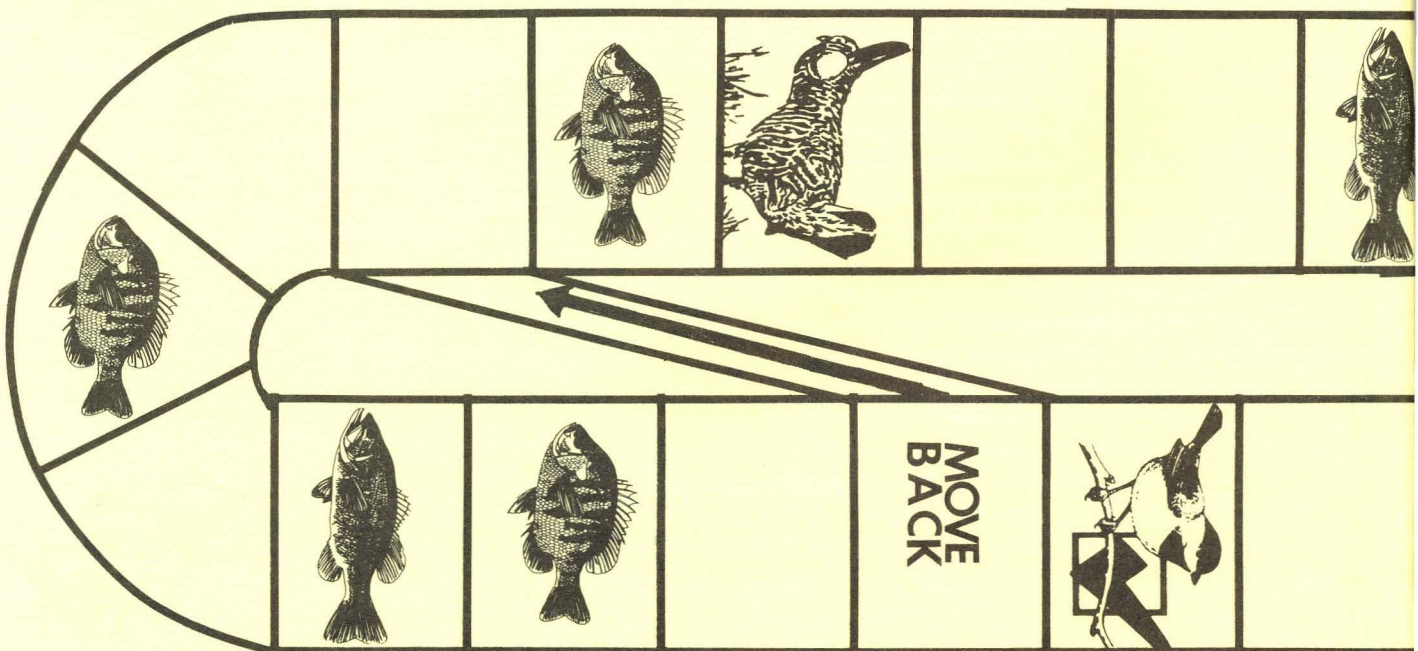
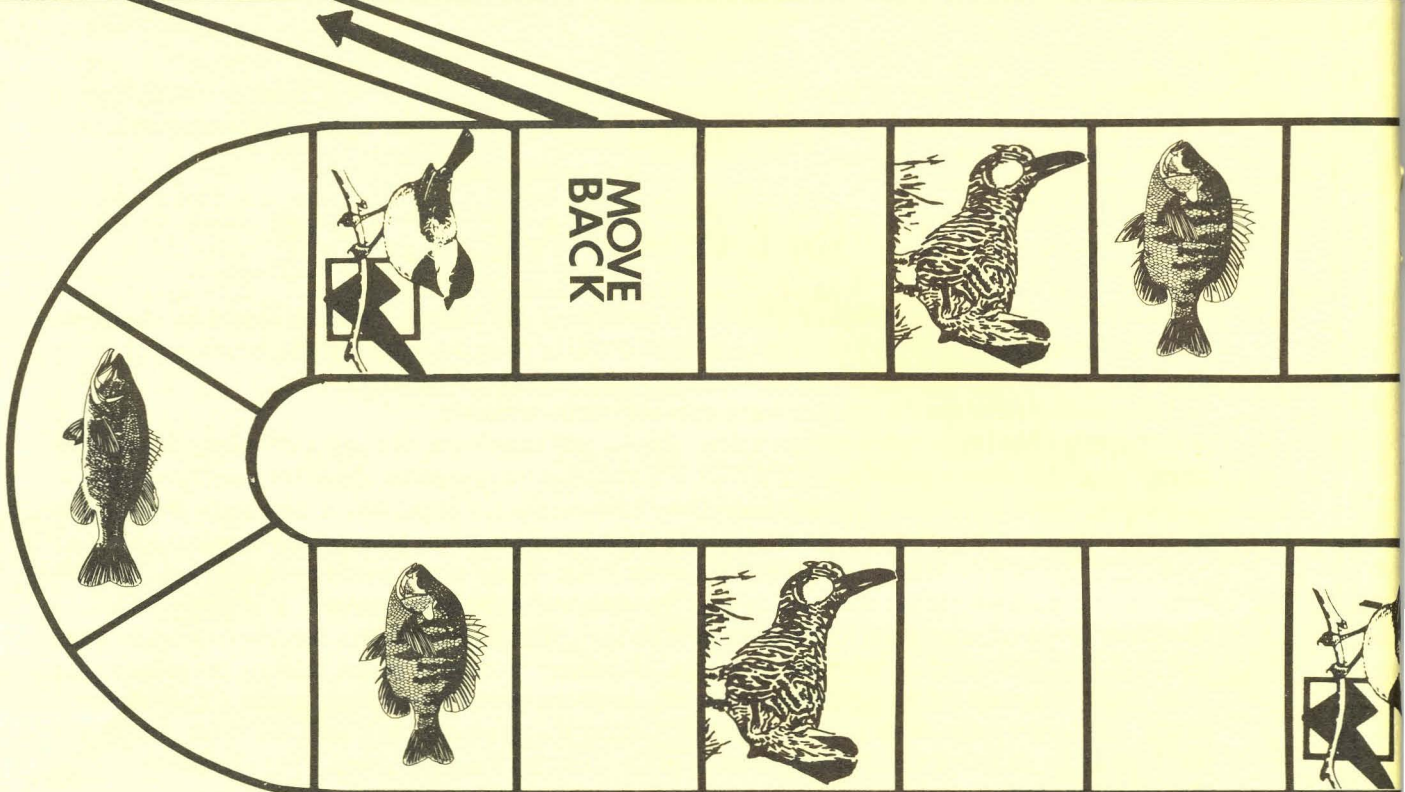
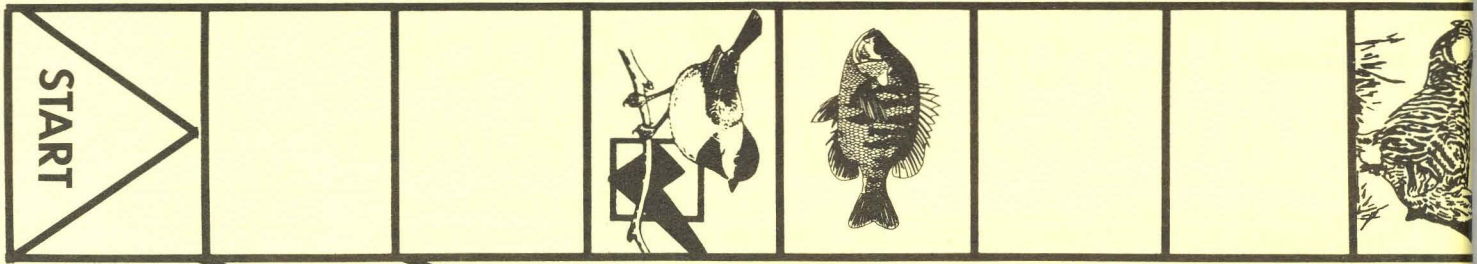
For starters, use the sample questions below. As you gain experience, add your own questions and statements. Use your library and KANSAS WILDLIFE magazine for references. Copy the questions and statements onto heavy stock paper or cardboard. Draw a fish on the top of the action cards and a prairie chicken on the top of the true-false questions. Separate the fish cards from the game cards into two stacks.

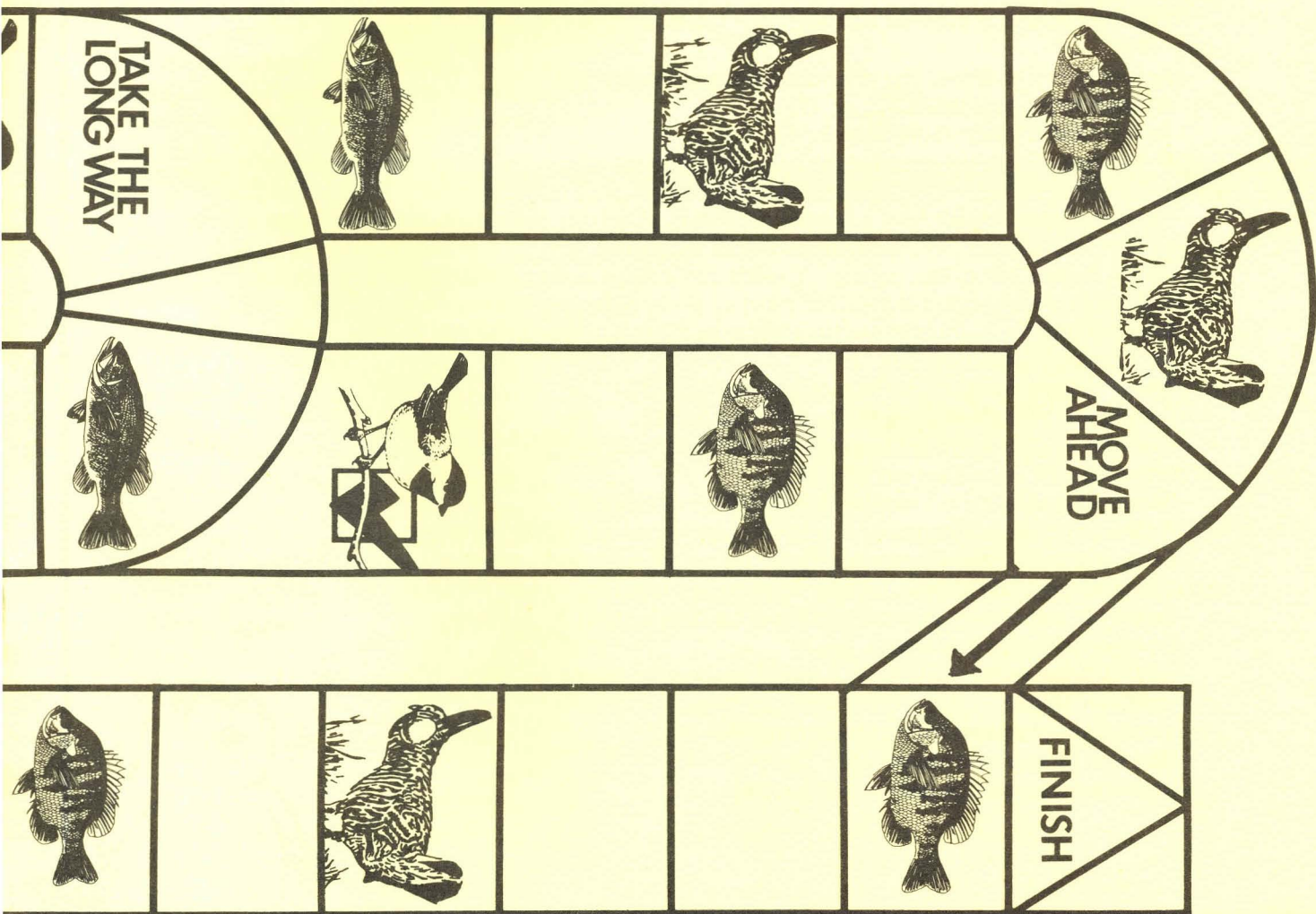
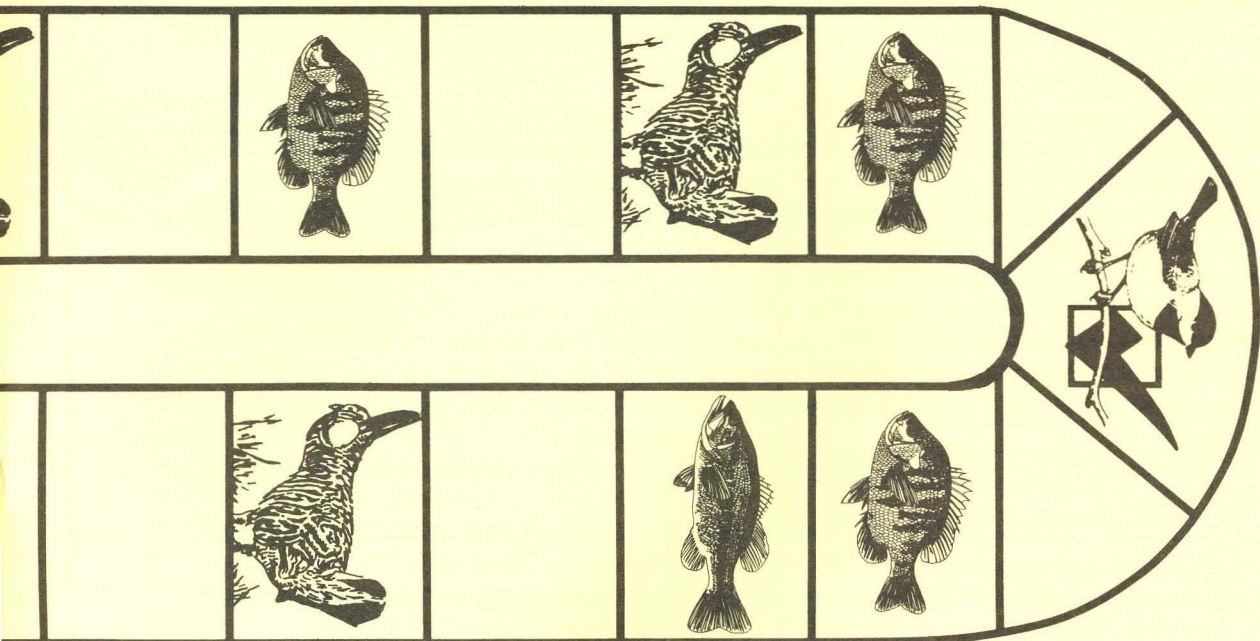
**RULES OF PLAY:** Maximum number of players is six. Assign each player a number to keep the spinning order organized. Select someone to read the cards and operate the spinner. If a player lands on a Chickadee Check-off square, he or she gains an extra spin. If a player lands on a fish, the caller reads a fish card, and the player must do what the card says. If a player lands on a prairie chicken, the caller reads a game card. Whenever the player answers correctly, he or she moves forward two spaces. If the answer is wrong, the player must move back four spaces. Discuss the statement cards with the entire group. If a player lands on an arrow, he or she must move in the direction the arrow points. The first player to cross the finish line wins.

### SAMPLE FISH CARDS:

- Donated funds to the Nongame Wildlife Improvement Program. Move up 4.
- Planted trees for wildlife. Move up 3.
- Drained a marsh. Move back 5.
- Shared your skills of hunting and fishing with a friend. Move up 2.
- Broke the hunting laws. Move back 3.
- Sprayed pesticides over crops on a windy day. Move back 4.
- Kept a bird feeder all winter. Move up 2.
- Read about wildlife and ways you can help. Move up 2.
- Practiced energy-saving activities. Move up 3.
- Built a bird house. Move up 3.
- Built a brushpile for wildlife in your back yard. Move up 4.
- Cut down the fencerow of trees and shrubs. Move back 5.
- Planted crops to the edge of the fence. Move back 4.
- Protected a stream from soil erosion and pollution. Move up 4.
- Spent time observing and studying wildlife. Move up 2.
- Carved initials in trees and harassed nesting birds. Move back 3.
- Informed a group of citizens about the needs of wildlife. Move up 2.
- Kept land for wildlife use instead of mowing or plowing it. Move up 4.
- Brought wild animals into your home as pets. Move back 3.

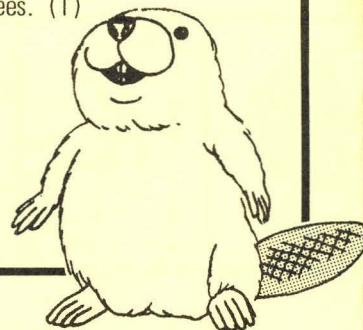






### SAMPLE GAME CARDS:

- Carrying capacity means the largest population a habitat can support. (T)
- Diurnal animals are active during the night and nocturnal animals are active during the day. (F)
- Bag limits are set on hunting and fishing seasons to regulate the number of animals taken. (T)
- Nongame means animals that are not hunted, fished, or trapped. (T)
- The ring-necked pheasant is an endangered species in Kansas. (F)
- Predators aren't important in the environment. (F)
- Rip-rapping a steep bank with rock can help to keep the stream from eroding. (T)
- Habitat is the place that animals live. It provides water, food, and cover for wildlife. (T)
- Fish and game laws are not enforced in Kansas. You just need to use your own judgment. (F)
- Riparian habitat is the most abundant habitat in Kansas. (F; For an extra square forward, define riparian habitat.)
- Fish are stocked in the ponds, lakes, and reservoirs of Kansas. (T; for an extra square forward, tell why they are stocked.)
- W.H.I.P. stands for "Wildlife Habitat Improvement Program" and is designed to provide more habitat in Kansas. (T)
- The poisonous snakes of Kansas are: prairie rattlesnakes, timber rattlesnakes, massasauga, and copper-head. (T)
- Dead trees should always be removed from woodlands before disease spreads. (F)
- Western Kansas has abundant surface water resources for irrigation, municipalities, and wildlife for years to come. (F)
- Channel catfish have deeply-forked tails, barbs at the mouth, no scales, and have been stocked in many lakes and ponds. (T)
- The river otter is a mammal that was once found in Kansas, and will soon be re-introduced to the state. (T)
- An omnivore is an animal that eats both plants and animals. (T)
- A carnivore is a meat-eating animal. (T)
- An herbivore is a meat-eating animal. (F)
- Endangered species are protected by law. Some endangered species in Kansas are: the Neosho mad-tom, black-footed ferret, bald eagle, whooping crane, and peregrine falcon. (T)
- Removing a few animals from a healthy population of animals, such as bobwhite quail from a covey or mule deer from the herd, will not harm the overall population. (T)
- Pintail, mallard, scaup, teal, canvasback, and shoveler are all names of ducks found in Kansas. (T)
- The Central Flyway refers to the route taken by airplanes on their north-south flights. (F)
- Migrations are the monthly moves from wintering grounds to breeding grounds and back. (F)
- All Kansas mammals hibernate. (F)
- When fish sleep during the fall, it is called estivation. (F)
- Reptiles and amphibians are cold-blooded animals. (T)
- Examples of amphibians are frogs, salamanders, and toads. (T; for an extra square forward, list the differences between amphibians and reptiles.)
- Rattlesnakes always give a warning "rattle" before striking. (F)
- A game protector is responsible for enforcing laws to protect wildlife and people. (T)
- Lakes and ponds may become too fertile by runoff from farms, cities, and industrial wastes. This causes an overproduction of algae, robbing the water of oxygen and causing fish to die. (T)
- Kansas has more prairie chickens than any other state in the U. S. (T)
- Pronghorn antelope have antlers. (F)
- Wildlife management programs are funded from hunting, fishing, and trapping license fees. (T)
- Insects are animals. (T)
- Vertebrates are animals without backbones. (F)
- Male wild turkeys have beards. (T)
- Upland game species live only on hilltops. (F)



# THE SCIENCE OF WILDLIFE MANAGEMENT: *The Future of our Wildlife Depends on It*



## Research

The precarious future that many species of North American wildlife faced around the turn of the century provided the impetus for the establishment of our first wildlife parks and refuges. Though initially effective, these early efforts aimed at helping wildlife soon developed serious shortcomings. The concept of providing complete protection, including the elimination of natural predators, to certain species was successful in building up threatened herds of animals, including elk and deer; however, as early as the 1920s, populations in many areas were outstripping their available food supplies.

Such problems helped spur the rapid growth of the modern science of wildlife management. Early wildlife management professionals were the first to recognize the vital importance of vegetation and other aspects of the natural environment that supported wild animal populations. This new understanding of the relationship between wildlife and habitat helped

lead to the practical steps necessary to ensure the long-term abundance and health of certain kinds of wildlife.

Extensive biological research is the foundation on which all management programs are built. Studies on animal numbers, their distribution, food preferences and the like provide a detailed picture of a species' needs and habits.

Bird banding projects, such as these, help determine a species' seasonal and local movements and can provide information on age, longevity and other vital characteristics important in developing successful conservation programs.

Over the years, it has been the American hunter who, through license fees and excise taxes, has provided the lion's share of the funds necessary for these conservation programs.



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KANSAS RESIDENT LIFETIME LICENSE APPLICATION

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Date

Date \_\_\_\_\_

# ACROSS KANSAS

## NOMINEES SOUGHT FOR CONSERVATION AWARDS

The Kansas Wildlife Federation invites any organiza-

tion in the state of Kansas to nominate groups and individuals for the 1982 Conservation Awards Program. Nominees must be Kansas residents. They must have accomplished their work in Kansas, and can be either a professional or layman conservationist. Nominees need not be members of any club or of the federation. Current KWF officers and 1981 award winners are not eligible for nomination. Awards program categories include:

**Governor's Award**--For the achievement considered to have made the most significant contribution to the cause of conservation and natural resources. This effort may be in any of the fields or any combination of them.

**Wildlife Conservationist**--For outstanding achievement contributing to effective management, control, restoration, or replenishment of wildlife resources.

**Land and Soil Conservationist**--For work in land use, watershed and wetlands development or protection, erosion control, recreational development, habitat improvement, and other practices enhancing the quality of land and related resources.

**Forest Conservationist**--For achievement in forest and woodlands development, management, or use.

**Water Conservationist**--For achievement in pollution control, conservation and protection of wetlands and wild or natural rivers, prevention of water quality degradation, or other activity aimed at maintaining or improving water standards.

**Youth Conservationist**--For conservation effort by a person who has not attained the age of 21 during the contest year. Youth groups acting together in a conservation program are also eligible.

**Air Conservationist**--For achievement in obtaining quality air standards, reducing pollution, effecting control of pollution sources, or other action contributing to improved air standards.

**Conservation Educator**--For achievement in educating persons of any age level, or leadership which, by example or demonstration, aids in the education of others.

**Conservation Communicator**--For effectively conveying the conservation message and creating public awareness of conservation issues in the news media.

**Conservation Legislator**--For achievement by a legislator (state or federal) in conservation legislation or other legislative work which took place or culminated in the contest year. Members of legislative staffs also are eligible.

**Conservation Organization**--May include civic clubs, conservation groups, garden clubs, women's clubs, businesses, trade or professional organizations, corporations, and others. Organization may be local, county, or statewide in scope.

**Hunter Safety Instructor**--For achievement in training Kansas youth in hunter safety and ethics. Nominee must be an active instructor and must have been active for past three continuous years in hunter safety instruction.

### NOMINATION FORM

To make a nomination, send four (4) copies of this form and ALL ATTACHMENTS to:

Gerald Prosser, State C.A.P. Chairman  
2220 Polk  
Great Bend, Kansas 67530  
316-972-2060

Name of Nominee \_\_\_\_\_

street . . . number \_\_\_\_\_

city & state \_\_\_\_\_ zip \_\_\_\_\_ A.C. \_\_\_\_\_ Telephone \_\_\_\_\_

Award Category \_\_\_\_\_

Please specify ONE of the categories for which nomination is made. Use a separate form for each nomination and category.

Recommended by \_\_\_\_\_

Name and title \_\_\_\_\_

club name \_\_\_\_\_

street & number \_\_\_\_\_

city & state \_\_\_\_\_ zip \_\_\_\_\_ A.C. \_\_\_\_\_ Telephone \_\_\_\_\_

Date \_\_\_\_\_

### PREPARATION INSTRUCTIONS

Attach a typewritten description, NOT TO EXCEED THREE PAGES, detailing specific acts for which award is recommended. Include such other information as to past recognition, organization memberships, affiliation, past achievements, etc., as nominator feels is pertinent. If additional space is needed use supplementary sheets (8 1/2 x 11) and attach to this form. When a company, organization, publication, etc., is involved, include the name of the president, chief executive officer, sponsor, editor or so forth.

**NOTE TO NOMINATOR:** The following information is needed to assist the chairman with invitations, award engraving, etc.

### INFORMATION ABOUT NOMINEE:

AGE: Over 21 ( ) Under 21 ( ) Specify Age If under 21 include name and address of parent or guardian.

name \_\_\_\_\_

street \_\_\_\_\_

city and state \_\_\_\_\_

zip \_\_\_\_\_ A.C. \_\_\_\_\_ Telephone \_\_\_\_\_

Sex: male ( ) female ( ) married ( ) single ( )

# ACROSS KANSAS

## SHORT TAKES FROM AROUND THE STATE

A Verdigris River trotline has yielded the biggest freshwater drum ever caught in Kansas. The catch--taken on a trotline run by Coffeyville fishermen Arthur Hyatt, Robert Taylor, and Ray Bishop--broke the old record by three pounds. The Coffeyville trio hauled in a 31-pound 4-ounce drum July 14.

\*\*\*

Doug Wyatt, Silver Lake, is on top of the world. Wyatt caught an 81¼-pound flathead catfish on rod and reel while fishing at Melvern Reservoir July 8. Wyatt's catch was about five pounds smaller than the state record flathead--an 86-pounder that was taken on a trotline back in 1966. But Wyatt's catch is a certified world record, according to the National Freshwater Fishing Hall of Fame. The big flathead ranks as the biggest specimen ever caught on 25-pound test line.

\*\*\*

Computers are making life easier for state game protectors... and tougher for Kansas boaters operating on expired or non-existent registrations. Boating records administered by Fish and Game have been entered into a

computer system shared with the Kansas Bureau of Investigation and the Kansas Highway Patrol. The computer enables game protectors to check registration records in a matter of minutes.

## COLOR PRINTS FOR WILDLIFE LOVERS

Over the years, we have had numerous requests for prints of photos which have appeared in *Kansas Wildlife*. Now, Fish & Game's WILDTRUST program offers interested readers an opportunity to obtain 11- by 14-inch color prints of any staff-produced photograph published in our pages. (The credit line adjacent to the photo will tell you who took the photograph; staff members are listed on the

inside front cover of every issue.)

To obtain the print, complete the application and submit it with a \$20 donation (check or money order payable to WILDTRUST) for each print ordered. Mail your order to: Kansas Fish & Game, Information-Education, Rt. 2 Box 54A, Pratt, Ks. 67124. Please allow six weeks for delivery.

Prints of photographs by persons not on our staff may be available through those individuals; contact us to find out where to write them.

NAME \_\_\_\_\_

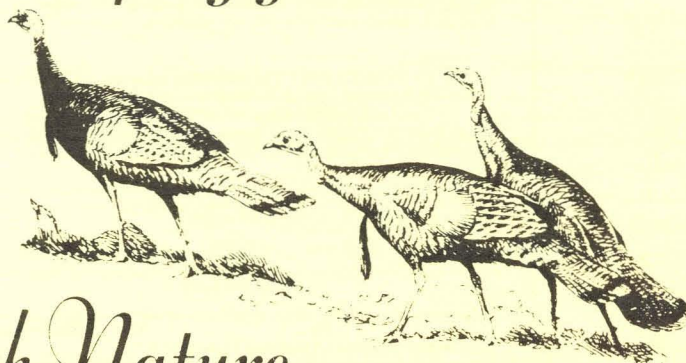
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## KANSAS WILDLIFE

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 Kansas Fish & Game Comm., Route 2, Box 54A, Pratt,  
 Kansas 67124.

toms is the mild irritant exuded by the spines on the side and back fins. This is not a toxic venom but can cause the fleshy part of the hand between the thumb and index finger to ache noticeably after being "punctured" by the stiffened spine tactic used by these small catfish when you're trying to coax them from net to hand to minnow bucket. Unlike some of the minnows, these fish retain about the same coloration throughout the year. Like his small cousins, the slender madtom is secretive, hiding in the rocks of riffles to come out only to snatch an insect larvae or other minute parcel of food.

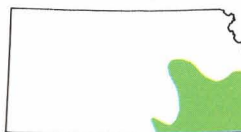
## Plains killifish



The plains killifish is the "exception to the rule" for it exhibits characteristics in its biological needs quite apart from the rest of the subjects of this story. While it, too, bears other common names such as "tiger minnow" and "zebra fish," this eccentric of the stream fishes is in the topminnow family which in Kansas contains only one other noteworthy cohort—the blackstripe topminnow. The killifish is special because, unlike so many other Kansas fish, it is found everywhere in Kansas *except* the southeast section of the state. Some fish species thrive only in pristine water conditions; this species takes up the slack at the other end of the indicator scale. It survives in the main part of the stream current and also in the slack water areas and is very tolerant of certain extremes in water quality properties. Like the large, fighting striped bass, this fish can live in relatively salty water. In fact, during an extensive fish kill in the Medicine River in Barber County in 1981 due to very concentrated brine spilled from an oil drilling accident, the only fish found alive a short distance downstream from the insurgence of saltwater were numerous individuals of this species found scurrying

about in shallow pools on the edge of the brunt of the pollution. And, when the water returned to normal guess which species of fish had the stream almost to itself? The plains killifish has other attributes, though. It is used as a bait minnow although it isn't quite as popular as fatheads and shiners and, being a "topminnow," it characteristically lingers immediately under the water's surface to snatch floating insect prey. In fact, it may be an underrated mosquito larvae control organism.

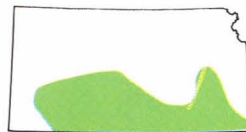
## Blackstripe topminnow



The other common topminnow in Kansas is the blackstripe topminnow which inhabits that part of Kansas that the plains killifish avoids. This more colorful topminnow exhibits similar feeding habits to the plains killifish but there the similarity weakens. The name points out the most striking feature of this fish, the broad black stripe extending from its mouth to its tail. Being a little more selective in its habitat, the blackstripe topminnow prefers fairly clear

water and is rarely found in main-stream currents. It is a rare sight to catch one of these males in top breeding form, with its iridescent light blue flanks.

## Mosquitofish



The mosquitofish, or "Gambusia," is the Kansas wild guppy. It is the only fish in the state that bears its progeny as free-swimming young, skipping the egg laying stage. According to Dr. Cross, the leading midwest expert on small fish, the mosquitofish is probably not as important in mosquito control as its name implies, especially when compared to the topminnows. This is a very productive fish, rearing several broods of young through the summer. It is a common resident of stillwater pools in streams of southern Kansas and does not tolerate cold weather well. Larger individuals display a subtle but pretty blue on their sides. Like most small Kansas fish, mosquitofish seldom live longer than two years and, if produced early enough in the first year of their life, can grow to reproduce that first summer. The male *Gambusia* is markedly smaller than the

*Brook silverside (Ken Brunson)*



## the shiners

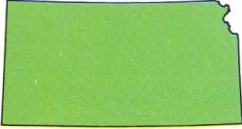
(Clockwise from near right) Redfin, red, bluntface, rosyface, and duskystripe. The shiners fill an important role in the aquatic food chain by serving as forage for many species of sport fish. Like most minnows, shiners have sets of pharyngeal teeth in their gills which filter nourishing microscopic plants and animals from the water. All of our Kansas shiners are relatively small and are found in various species combinations, depending on the types of habitat encountered. Most of the names for these fish originate from the appearance of the male of the species during their breeding seasons. (Redfin and red shiner photos by Ken Brunson; all others by Ron Spomer).





female and has a lower fin adapted to aid sperm transport in the mating act.

## Fathead minnow

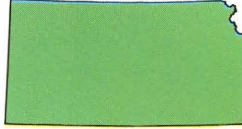
 The fathead minnow is probably the most widely used bait fish in Kansas. Whether imported from outstate hatcheries or obtained locally, this hardy fish is usually sold according to size from seventy-five cents to \$2.00 per dozen in marinas and bait shops across the state. Fatheads are known by such aliases as "Minnesota blacks,"

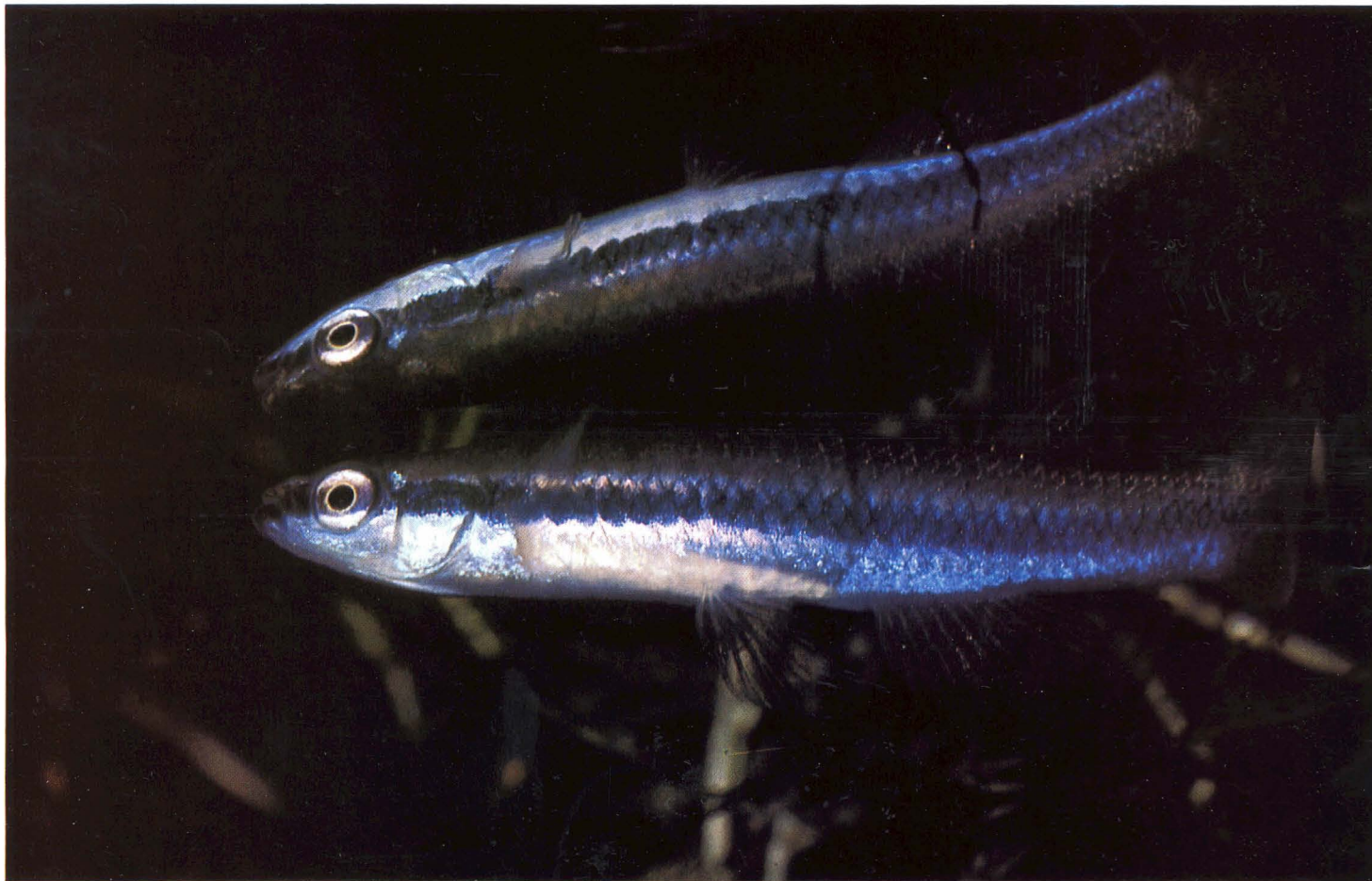
*As the name implies, the blackstripe topminnow spends much of its time right at the surface where its image is often reflected when seen from below. The central stoneroller (right) shows the tubercles common to breeding males in a number of species of small fish. (Photos by Ken Brunson.)*

"chubs" or just plain "crappie minnows." The popularity of this minnow is not only related to its ability to live a long time on a hook but also to its promiscuous spawning abilities and ease of culture. Dr. Bill Pflieger reports in his book, *The Fishes of Missouri*, that a female fathead minnow ". . . may spawn twelve or more times in a single summer and produce 4,000 or more offspring." An amazing production record by anyone's standards. Other factors that contribute to this fish's success include an extended spawning season (April through August) and its tolerance to a wide range of water conditions. The fathead is a filter feeder just like the shiners but also takes in significant amounts of algae and other plant materials along with some aquatic insects. Dr. Cross classifies this species as a "pioneer" fish since it is one of the first "to invade intermittent drainage channels after

rains, and it commonly progresses upstream into farm ponds via their spillways . . . one of the last species to disappear from small, muddy, isolated pools that remain in stream channels during droughts." During peak spawning periods the male fathead develops tubercles on its head and distinctive dark brown and black bands on its sides.

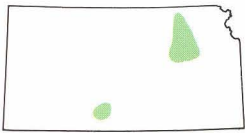
## Central stoneroller

 Believe it or not, the central stoneroller actually does "toss" small grains of sand and gravel aside during its pre-spawning activities. I have observed numerous large six- to eight-inch males busily routing sand in their nest preparation and very aggressively defending their own micro-territory with swift side attacks using their grossly-adorned head armored with



menacing pointed tubercles, to best advantage. Male stonerollers get quite attractive in their breeding colors, especially the back fin which has bands of brilliant dark orange interrupted by black bands. The whole body picks up on the orange emphasis making the entire fish an unquestionably attractive specimen for the females he spends so much energy courting. This species is very common throughout Kansas and spawns usually from March to May.

## Southern redbelly dace

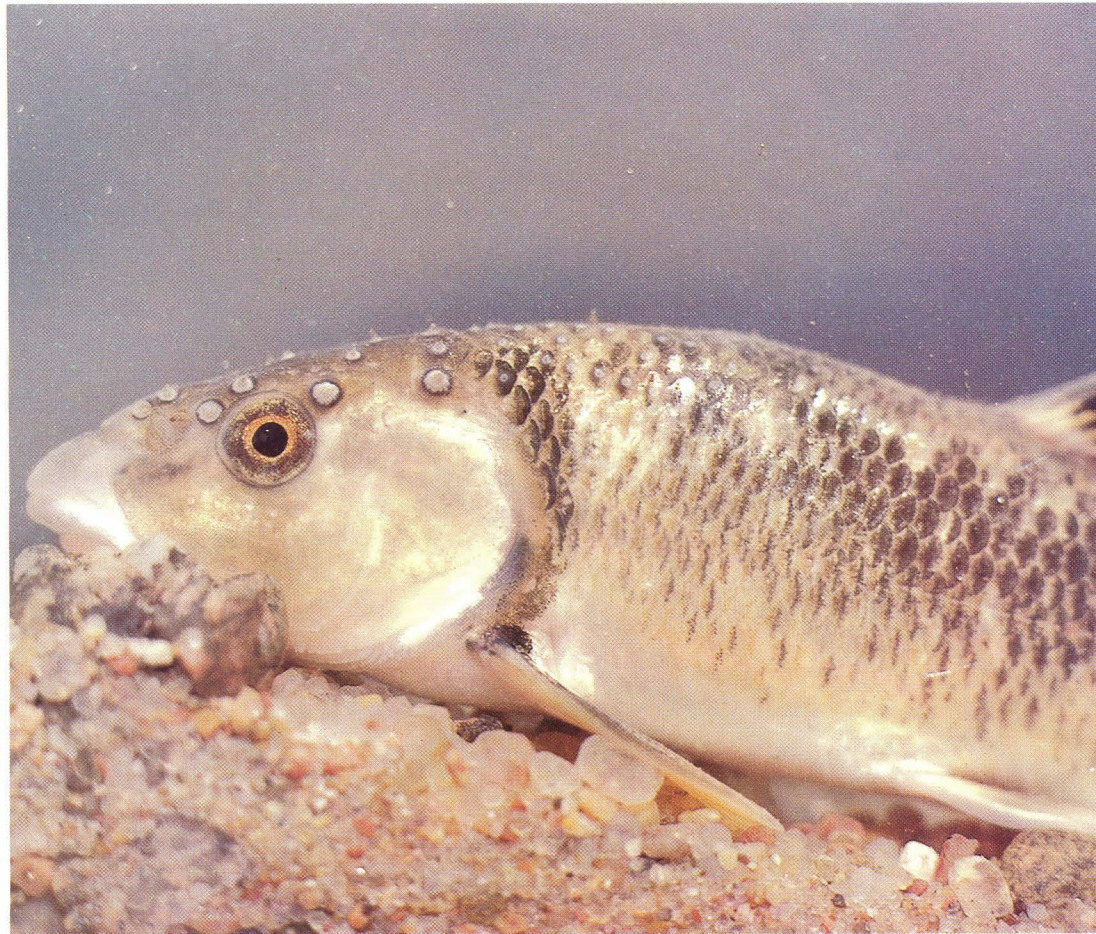


This is another good example of an indicator species.

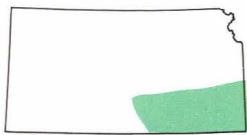
The southern redbelly dace prefers relatively clear, unpolluted streams and is caught many times right next to a spring or groundwater seepage.

The male dace becomes an absolute knockout when in peak breeding form competing for available females in early spring. Their fins are pleasant light yellow; their gold side stripes are set off by two dark lines from nose to tail and their whole underside turns a crimson red. Few other fish reach this height of brilliant coloration. The range of this species is split between its major distribution in the Flint Hills streams of Wabaunsee, Geary and Pottawatomie counties to a lesser isolated area in southern Pratt and Kiowa counties. The latter area is about 150 miles from Mill Creek, west of Topeka, where southern redbelly dace abound, and may represent one of those repeated cases of "minnow bucket" range extensions, the result of human interference. This dace seems intolerant of certain stream disturbances and, since it appears closely associated with a natural resource often greedily eyed

by man—clear, clean, spring-fed creeks—it seems natural to cast an alarmed glance at this fish's distribution even though it currently is not on the state's threatened and endangered species list. As Dr. Cross has remarked, "Unless the remaining springs are preserved in their natural state, undisturbed by livestock or by cultivation of adjacent lands, this handsome fish may disappear from Kansas." Normally, dace live but a few summers. However, in at least one case, an individual kept in an aquarium by Dr. Don Distler at Wichita State University lived almost eight years, and, when the fish finally succumbed to old age, it revealed three or four more yearly growth rings in its scales laid down before it was initially caught and domesticated. The nearly twelve years tallied by this single fish had to be some sort of record and is certainly well above the normal life span for the species.



## Brook silverside



"Different" is about the best way to characterize

this fish. It is similar to the topminnows in that it feeds near the surface of the water, but it has an entirely different body form. Its streamlined shape is adapted to fast water but, surprisingly, the silverside is found in sluggish stream pools and some ponds and lakes of southeast Kansas. When seen in the water, it appears almost transparent; its bones and some of its internal organs are visible. Its name refers to its most obvious color pattern—a striking silver stripe along its side. The brook silverside also has a pretty light green in its back. The beak-like mouth is excellently formed for slurping prey insects from the water's surface. The Kansas Fish and Game Commission has experimented with a close relative of this species, the Mississippi silverside, to determine its ability to provide abundant late year forage for young walleye, white bass and other game fish. Another interesting feature of this critter is the manner in which it carries its forward fins. In normal swimming motion, the fish seems to use these pectoral fins like wings, gently altering their pitch as if to control vertical roll, reminiscent of the way in which salt water flying fish utilize their greatly

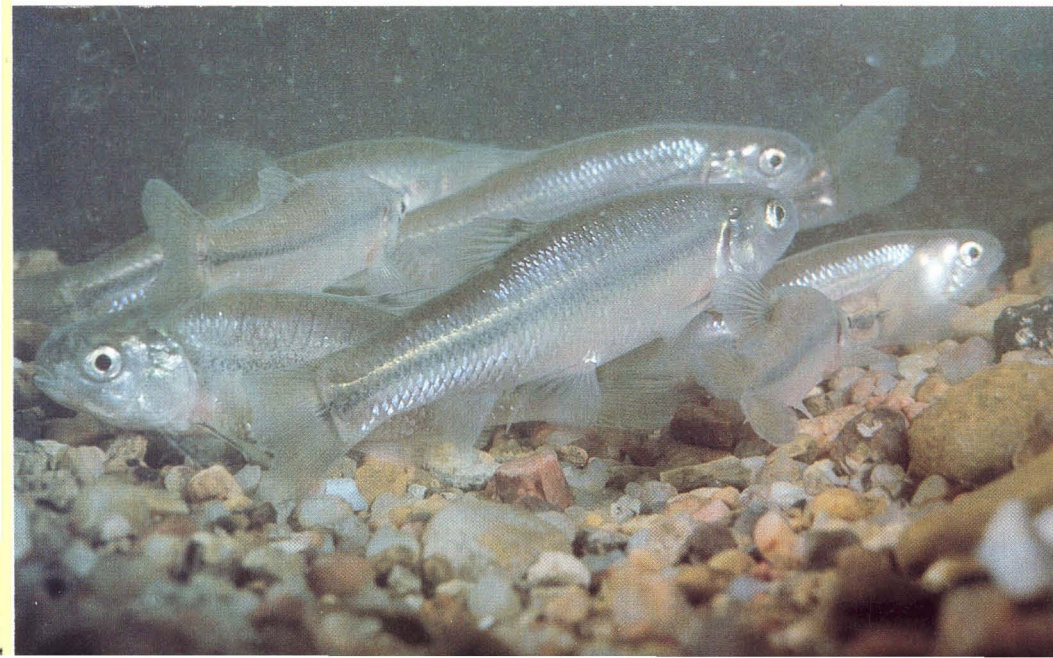
exaggerated fins for gliding short distances above the ocean's surface. Silversides are very attractive fish but also very sensitive and do not tolerate handling and transportation well. For this reason, they don't adjust well to aquarium life.

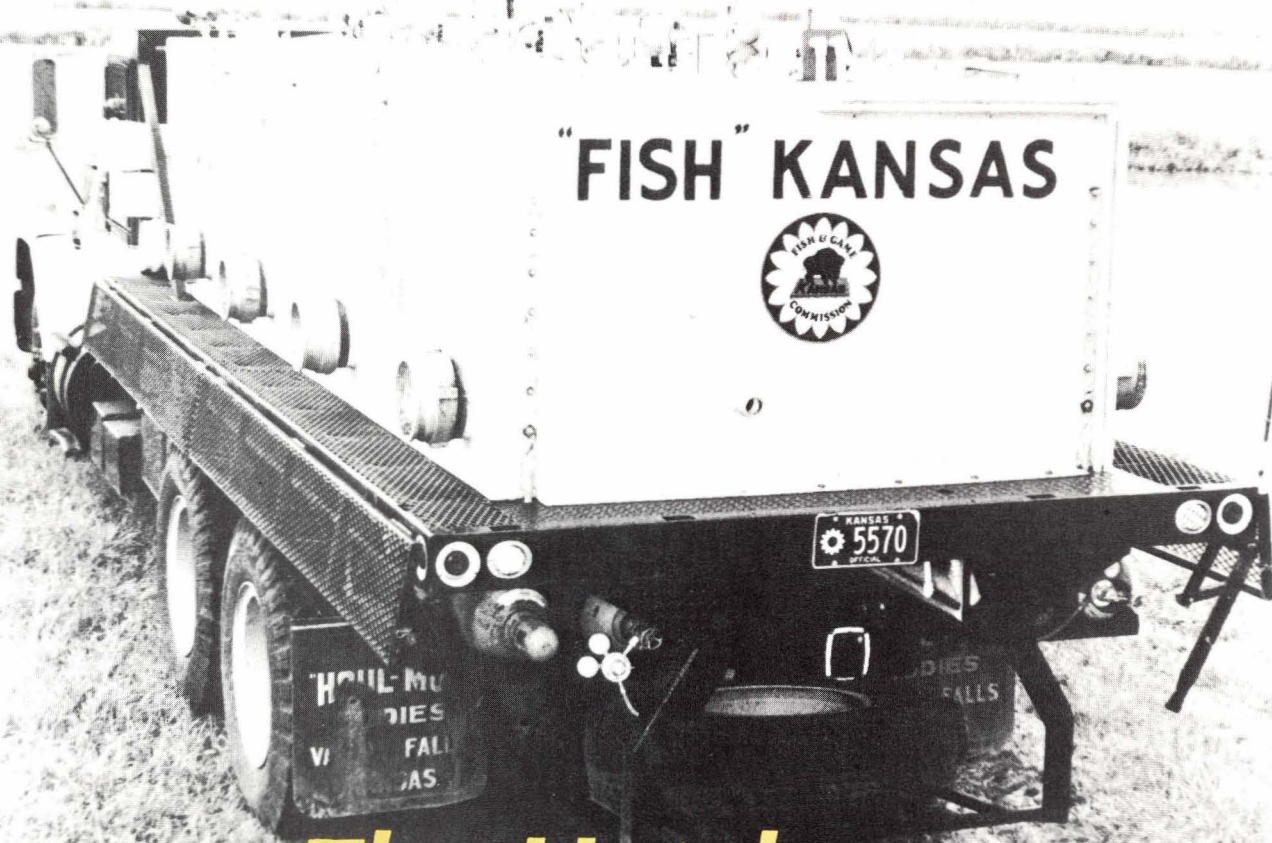
Since there is a growing interest in keeping native fish in homes, which of these species do make good aquarium fish? Orangethroat darters make surprisingly good aquarium pets. An aquarium kept for freshwater tropical fish at room temperature suits these darters just fine although they do better in water temperatures lower than seventy-five degrees. They are very interesting to observe and tame quickly on a diet of frozen brine shrimp, dried tubifex worms and even a little flaked fish food. They keep their colors better in cool water even though they will never approach the brilliance seen in their natural habitat. If darters are kept, the aquarium hobbyist should provide a natural sand and gravel substrate. This bottom may not look as pretty as red and blue rocks but will provide a still pleasing natural setting for owner and fish alike. Red shiners also make great aquarium fish. If you obtain good sized males, they are colorful, inexpensive, and easily tamed although they are more excitable than darters. Redbelly dace are a little harder to come by but can provide a colorful addition to your native fish complement; however,

like darters, dace do better on a diet of brine shrimp. Plains killifish and blackstripe topminnows both make good aquarium pets and, like any shiners, they can be fed plain flake food. Mosquitofish also eat flake food and, along with the topminnows, provide a good complement to the shiners and darters since they hang around the upper parts of the tank. Another addition might be the slender madtom, which provides an interesting contrast to the rest of the aquarium life with its whiskers and its fluid snake-like swimming. All of these species will feed voraciously on brine shrimp. As with any other aquarium, the tank of little fish should not be overstocked. As a general rule of thumb, no more than one individual small minnow per gallon of aerated water is a safe limit, and proper water quality maintenance care should be observed.

Just what is important about little fish? What value do they have? I hope you've at least noticed the diversity of colors, habits, and forms of the highlighted species. There are dozens of species we haven't considered—some with just as much to recommend them. Some of these fish are very useful in telling us what shape our environment is in. Others are more noticeably important as bait minnows. The fathead minnow and shiners are an important food source for scores of predatory species higher in the food chain, besides providing monetary returns for many bait dealers. For some of us, though, it is pleasing enough to know that, in spite of various pollution problems, massive water development projects and dams, and general stream alteration, there are still some places in Kansas you can go to see and experience a rich, diverse native fish fauna that few people know. Efforts made to preserve these native organisms out of respect for the natural history of Kansas always say something positive about our conscience and implies a distaste for a monotonous, sterile environment. □

*Fathead minnows (Ken Brunson)*





## The Hatchery

Bob Mathews

**E**xperience has demonstrated the fact that great and lasting results are only obtained by great and continued efforts, and he who thinks our streams should be alive with fish after two years of feeble effort, is reasoning from some other theory than from cause and effect."

Apparently, D. B. Long was a little frustrated when he made that statement. But who wouldn't have been? After serving nearly two years as Kansas' first Commissioner of Fisheries, Long didn't have a wealth of good news to relate in his first biennial report to Governor John St. John in 1878.

Long had been on the job barely two months when the first mixup occurred. He explained that a federal agent accompanying Kansas' first shipment of fish had failed to

notify him in time to receive them on their arrival. Due to the missed connection, the agent "... took the responsibility upon himself to deposit the entire shipment of 100,000 young shad in the Kaw River at Topeka, claiming that they were in an unhealthy condition, and would not bear further transportation."

Four months later, a sudden rise in the Smoky Hill River near Long's Ellsworth home carried away his meticulously crafted hatching boxes ... and the 100,000 California salmon eggs he was attempting to hatch.

The following year, Long was unable to obtain a single fish from the U. S. Fish Commissioner. The federal suppliers ran out of fish before

they ran out of demand for fish.

It's no wonder Long urged the governor to appropriate money for construction of a state fish hatchery. Two years of "feeble effort" had convinced him that a state-operated hatchery was fundamental to his task. A reliable supply of fish, he explained to the governor, was a necessity. But it took the "great and continued efforts" of Long and several succeeding commissioners to convince the Kansas Legislature.

Finally, in March of 1903, the state's lawmakers passed an act providing for the establishment of a state fish hatchery. Within months ground was broken on a twelve-acre site donated by Pratt County. The Fish Commissioner was in the business of raising fish. During the following decade, an additional sev-

enty acres were purchased adjacent to the initial twelve-acre site. By 1914, the Pratt hatchery comprised ninety-nine ponds, an office building, a residence for the warden, and cottages for three full-time hatchery workers.

State Fish and Game Warden W. C. Tegmeier was proud. "Kansas has no more valuable asset among all her endless treasures than her incomparable fish hatchery, which is unrivaled by any other commonwealth in any nation of the world," he proclaimed.

The Pratt hatchery has been the hub of Kansas Fish & Game's fish production efforts ever since. But its extended term as the main producer of fish for several generations of Kansas anglers is nearly up. By this time next year, work will be underway on a new hatchery at Milford Reservoir.

The Kansas Legislature this year authorized Fish and Game to issue revenue bonds to finance construction of a \$6 million fish hatchery at Milford. The hatchery will be substantially different than the existing

hatchery system, reflecting the changes which have occurred in the field of fish culture. Unlike the shallow earthen ponds which have served for decades, the new hatchery will incorporate the use of 'raceways'—hundred-foot-long concrete troughs in which fish can be reared much more efficiently.

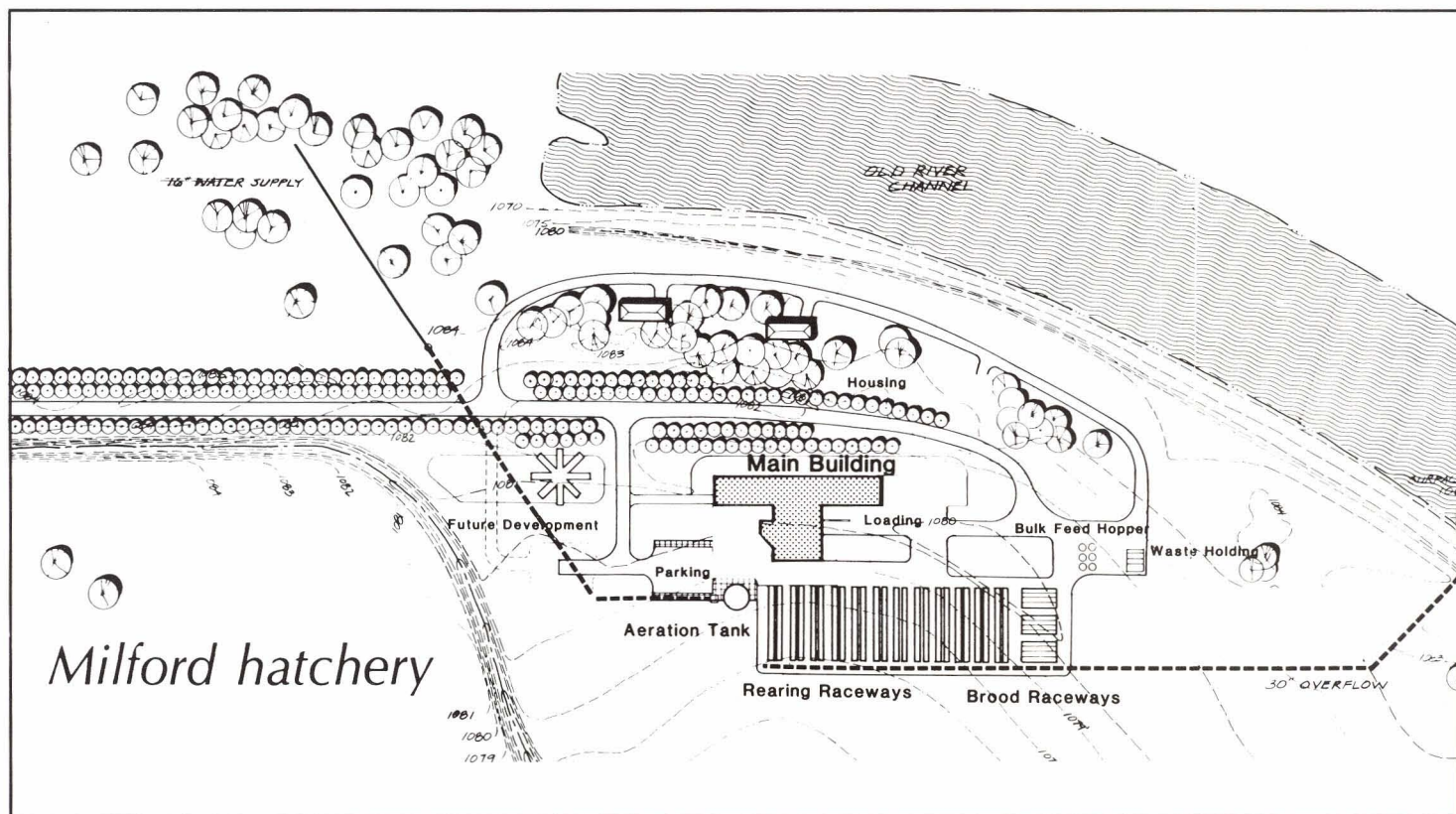
The compactness of a raceway system contributes much to that efficiency. In production capability, a single raceway is roughly comparable to a one-acre, intensively-managed earthen pond. Yet, twenty-four raceways—the number planned for the Milford hatchery—comprise a *total* of less than one-half acre of water surface. The flow of water through a raceway is substantially greater than through a conventional pond; a raceway undergoes a complete exchange of water once every two or three hours, while a pond accomplishes that once every two or three days, at most. The rapid exchange allows many more fish to be contained in smaller space.

Other components of the new hatchery will include surface (lake)

and well water supply systems; a hatchery building for incubation, start tanks, spawning equipment, and offices; wastewater treatment facility; and residences for the hatchery supervisor and his two-man crew.

"The new hatchery is vital to enable us to meet the tremendous demand for fishing in Kansas," said Mike Theurer, chief of fisheries. "We have more than 300,000 licensed fishermen and we estimate there are 300,000 more who are exempt for one reason or another from buying a license. They all want to catch fish. We're anxious to get going on it."

Planning for a new hatchery has been going on since the summer of 1978. It was then the agency contracted an independent consulting firm which documented the inadequacies of the existing hatchery system. They found that by 1985 the demand for fish to be stocked will be three times greater than the agency can produce with its current facilities. The results reported by consultants didn't exactly catch fisheries



administrators by surprise.

"It's no surprise at all when you consider that all three of our hatcheries (Pratt, Meade, and Farlington) were built before we had any federal reservoirs, and only a few city, county, and state lakes," said Verl Stevens, fish culture supervisor. "Kansas has an estimated 50,000 farm ponds, most of which didn't exist forty years ago."

Among the options considered, besides construction of a new hatchery, were renovation projects at Pratt, Meade, and Farlington. But all research showed that sportsmen's money would be better spent building a new hatchery than trying to modernize existing facilities. The uncertainty of long-term water availability at existing hatcheries also was a major concern.

"We have done about all the modification on our hatcheries that we can justify," Stevens said. At the Pratt hatchery, a well was drilled in 1977 to supplement water supply from the Ninnescah River. The recent construction of a distribution pond with water lines connecting it to twenty-five of the eighty-seven ponds enabled culturists to individually control water levels in those ponds. Prior to that, the eighty-seven ponds were connected so that draining or filling a single pond anywhere along the line affected all other ponds in the flow-through system.

The existing hatcheries will continue to play important roles in producing fish, Stevens said, but their function will be more compatible with their capabilities once the new hatchery begins operation.

One of the main advantages of the raceway system is the ease with which fish can be monitored. It is virtually impossible to observe fish in an earthen pond to determine growth, feeding habits, and disease outbreaks.

"With muddy ponds, you can be fat, dumb, and happy because you can't tell what is actually going on in that pond," Stevens said. "You don't know what kind of production you've got until the pond is drained

and the fish are harvested."

It will be much easier for culturists to fine tune production to match management needs with the intensive system. Small groups of fish can be batched for shipment without disturbing other fish in the same rearing unit. It is especially important to monitor fish growth among young predaceous fish, such as largemouth bass or northern pike; if some of the fish in an earthen pond system get a head start in growth, they can easily cannibalize their smaller kin and greatly reduce the number of fish available when the pond is drained and the fish are collected.

Earthen ponds also are subject to all the influences of nature, Stevens continued. Wind, algae blooms, cold fronts, warm fronts, and infiltration of undesirable fish species all are potential problems of a pond hatchery system.

Although it is impossible to control every environmental factor affecting the growth of hatchery fish, there is a substantial improvement in controls which can be applied in an intensive system. The ability to manipulate water temperature, a major factor determining fish growth, will be much improved at the Milford hatchery. In summer, when surface water becomes warm, water will be pumped from the downstream lake to an aeration pond adjacent to the raceways. During winter, the relatively warmer well water will help production through the cold months. Filtered reservoir water will be used for incubators and start tanks, where water quality is especially critical.

"By 1984, the new hatchery could provide up to three times the amount of catfish we are currently stocking," Theurer said. "By 1985, we will be able to up production of walleye fry by more than 400 percent. We will be able to boost production of largemouth bass intermediates by twelvefold. And we will be able to do all that for a cost of about half per fish what we are spending now."

When consulting engineers first

made recommendations for a new hatchery in 1978, their proposal called for an \$18 million facility capable of handling twelve species of fish. But that proposal was too extravagant for Fish and Game commissioners. The consulting team's architects and engineers went back to the drawing board to devise a drastically scaled-down version. The revisions fell in place with the modified goal of Kansas Fish and Game to rear channel catfish and hatch walleye and black bass, instead of gearing the hatchery to the intensive rearing of twelve species. Visitor accommodations were cut to a minimum. Office and storage areas were reduced. Plans for construction of rearing ponds were deleted.

Fish and Game officials hope to have final engineering, design, and specifications completed by Jan. 1, 1983. Bids will then be invited on the project. Construction should begin around July 1, 1983.

Typical of Fish and Game programs, the hatchery will be paid for by the people who stand to benefit most—fishermen. Beginning Jan. 1, licensed fishermen will pay an annual \$3 hatchery fee. The \$3 fee will continue for a period of ten years.

Public support for the hatchery, and the means of financing it, has been strong from the start. Indeed, sportsmen deserve a major share of the credit for their active involvement in promoting the new hatchery.

The face of Kansas has changed dramatically since D. B. Long made his first pitch for a state hatchery. Public fishing waters abound. The sport of fishing has become more sophisticated. Fisheries management and fish culture have made tremendous strides. The Milford hatchery itself will embody many advances made in fisheries biology over the years. If Long were around today, he might be baffled and amazed by much of it. But he would recognize in the faces of today's fishermen that fishing is still, as Long stated a century ago, 'nature's greatest tonic.' □

*The gap between the kill and the mount  
is filled with careful work, craft . . .  
and art.*

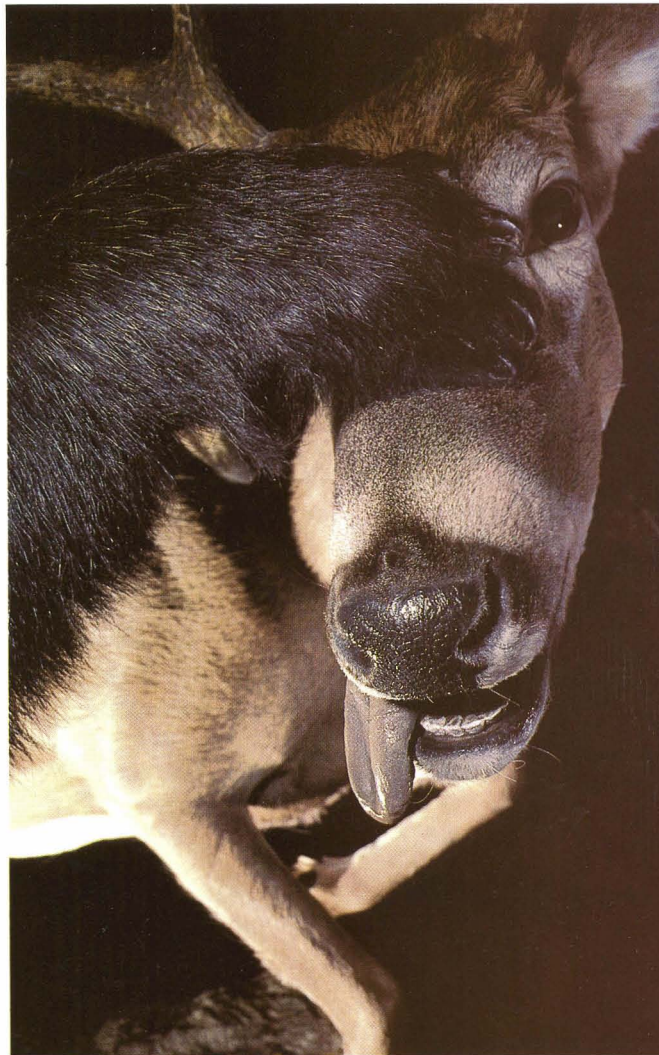
# **Building a Trophy**

Ron Spomer

WANTED: Young men and boys to learn to mount birds, animals, fish. Fascinating! Profitable! Free twenty-four-page book tells how you can learn—at home—to mount all kinds of wild life, big game heads. Also to tan skins and make leather. Send today for this free book.

The ad in back of the outdoor magazines hasn't changed much over the decades. And neither has its appeal. Most young "Dan'l Boone's" succumb to it. Usually when they're fourteen. Old enough to have caught every species of frog, snake and fish in the neighborhood and to have bumped-off a few English sparrows with the BB gun. They've probably fetched pheasants and rabbits for dad and uncle Bill and stared in awe at the iridescent green of a mallard brought back from the mist of the duck marsh. And most importantly, they've recently passed a hunter safety course and fallen heir to the family single shot .22. It's time to start a trophy room.

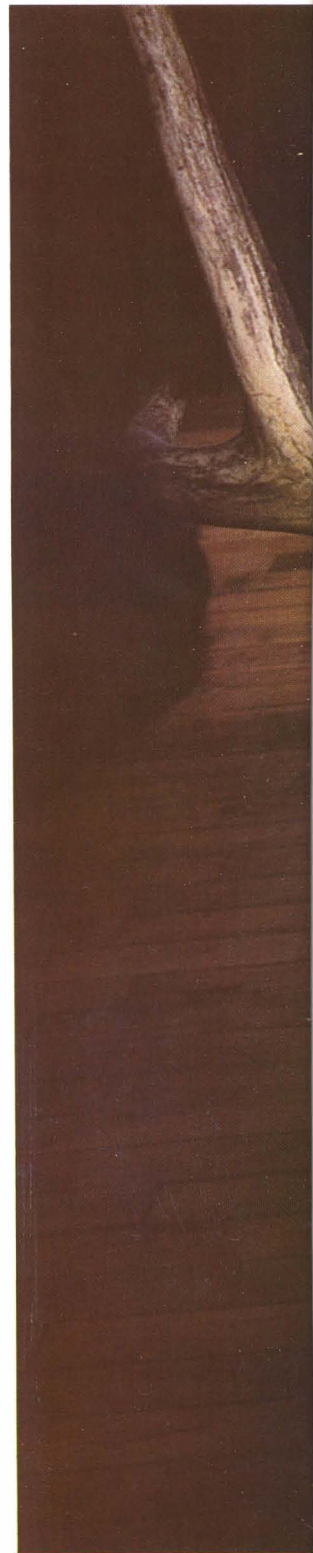
At first glance, taxidermy is a rather simple procedure. Pull an animal's body out of its skin and replace it with an artificial one. One that won't decay. Easy enough for a fourteen-year-old to understand. It's the execution that's confusing. If that first stuffed pigeon ends up looking like it was force fed a softball, the novice must procure another specimen and try again. If the second bird appears to have starved to death and mummified, the usual response is to switch targets. Who wants a mounted pigeon anyway?



Frogs are the logical second subject. Easily procured and—more importantly—easily mounted. According to the directions, you just pull their insides out through their mouths, fill them with modeling clay and squeeze them into shape. But do it gently or pop! They'll burst. Who

wants a stuffed frog anyway?

A squirrel is what a fourteen-year-old's trophy room really needs. A bushy-tailed fox squirrel running up a tree trunk with a walnut clenched in its teeth. First procure an undamaged animal. One with a prime, winter tail. None of this scrawny,





flea-chewed summer stuff. Next, take the insides out. Don't worry about that ear and tail. They can be sewn back on later. Now build the substitute body by bunching excelsior and winding it tightly with thread. In the shape of a squirrel, if possible. Use wadded newspapers when you tire

of looking for excelsior or can't figure out what it is. If mom's sewing thread breaks too easily, try bale twine or dad's fishing line.

If the finished body form won't fit into the squirrel hide, pare it down by tearing out pieces of Ann Landers, the stock reports and Hints

from Heloise. The completed sculpture should be shaped just like a naked squirrel. But chances are it will more closely resemble an arthritic dachshund. Throw it away. But save the skin and stretch it on a board to dry into a crispy, squirrel-skin rug. Who wants a squirrel car-

rying a nut up a tree anyway?

Considering the disastrous results of most first-time stuffing jobs, it's amazing the practice ever developed beyond the bear skin rug stage of pre-history. But it has. To a remarkable degree. Dedicated craftsmen now create mounts that threaten to run, fly or swim away if not bolted down. Fish look wet. Flaring ducks look cautious. The veins near the surface of thin skinned animals seem to pulse with life. Why? Innovation and artistic dedication.

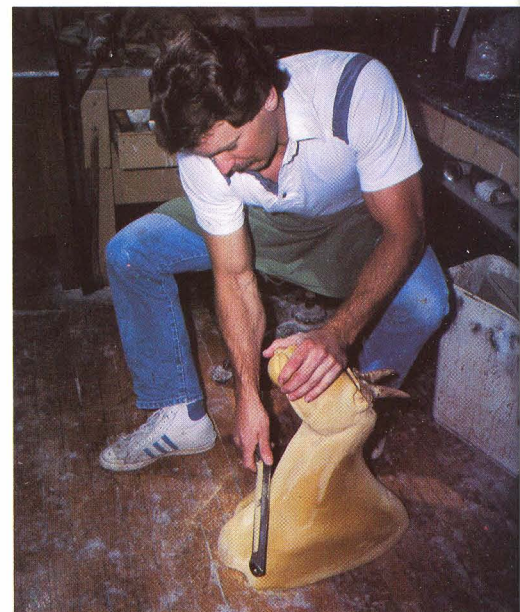
Dozens of taxidermists over the years have devised new methods and ideas to make mounted animals appear more lifelike, but the venerable Jonas Brothers, Inc. of Denver has probably been the most influential innovator. "Since 1908," the company brochures proudly announce, these craftsmen (and women) have taken the lead in developing and/or popularizing safer, faster, more durable and more realistic mounting techniques. No more building bodies from the bones outward. No more poison preservatives. No more excelsior. No more . . .

Mounting a deer head in 1908 was no simple chore. Eighteenth century methods were still in vogue, and that meant using portions of the animal's skeleton. After the hide was removed, scraped of all flesh and dropped in a pickling or tanning solution, the remaining carcass was measured at several places so that the replacement form could be built to the right size. Next, all body parts but the skull were discarded. This important bone was the handiest form available to fill out the head and muzzle, even though it had to be boiled, poked and scraped to remove brains, eyes, flesh and cartilage. When it was clean, it was fastened to a strong shaft of wood that replaced the neck vertebrae and served as the base for reconstructing the musculature. Tow or excelsior (wood shavings then commonly used as packaging material—replaced now with plastic bubbles and "peanuts") was stuffed and wrapped until it resembled as well as it could the shape of

*Jonas Brothers is one of the leading suppliers of taxidermy forms. These forms can be shaped to suit the taxidermist (below), but, even without shaping, they are essentially accurate since they are based on casts and skulls taken from real animals. (Above right and next page.)*

the original deer. Demanding craftsmen covered this rather rough form with smooth clay or stucco, which was also used to fill the hollows where meat had been removed from around the eyes, lips, nose and ears. Leather liners placed inside the ears helped hold their shape. The cured skin was then stretched and sewed over the manikin. Glass eyes, black paint and some careful positioning of lips and other features completed the job. Very effectively too, when the artisan was skilled. A good taxidermist was a sculptor first.

Full body mounts were more difficult and time consuming to create. One method called for the cleaned skull and leg bones to be attached to a wooden framework that roughly approximated the contours of a live animal's body. Again, excelsior was molded, tacked and sewed in the appropriate places to fill out the form. A talented worker could produce a surprisingly realistic facsimile this way, but a critter the size of a bison or elephant could require negotiating major lumber contracts. And the finished mount might weigh nearly as much as the animal had alive. A second technique demanded exceptional woodworking and carving skills of its practitioners, because the skull, pelvis, shoulder blade, and leg bones were replaced with precisely molded wooden copies. These were securely fastened to a wooden frame representing the spine, neck, and belly contours. A wire-cloth sheath shaped a little smaller than the final body contours was fitted around the support frame. A final surface of stucco and sisal fibers was contoured and sanded to perfection before being "sized" with shellac and covered with the preserved hide. Turn-of-the-century taxidermist Carl Akeley (considered by many one of the world's finest taxidermists) devel-



oped this technique to an art in some of his full-bodied African mounts at the Field Museum in Chicago.

About 1910 Coloman Jonas and Akeley (the Fathers of Modern Taxidermy) joined to pioneer the laminated paper head form. This revolutionary manikin was created by sculpting an anatomically accurate model and pouring plaster over it. When the cast dried, it was separated and layers of paper and glue were laid inside each division. When these dried, they were removed and joined to form a light and realistic "dummy." Many taxidermists began making plaster casts of freshly skinned animals in a variety of poses. One even cast an entire horse. Eventually taxidermy supply houses began marketing the paper forms in several standard sizes and poses, such as a large bull elk bu-



gling or a pronghorn with head turned left. The old "deer head stuffers" were free to mount more skins and build fewer form innards. During the plastic age following World War II, various new materials were tried for head and body forms, including fiberglass styrofoam, and several other "foam" plastics. Today's state-of-the-art forms are light, solid urethane plastic foam. Jonas Brothers calls theirs Postex. It can be rasped, chopped or sanded to perfection. Van Dyke's Taxidermy Supply Company in South Dakota calls their material Uafoam, which also can be filed and trimmed. Full body forms, particularly the larger ones such as moose, are still made of laminated paper. Some are filled with urethane foam for added strength. Van Dyke's sells Flex-A-Move forms with hinged legs and

flexible plastic that can be bent slightly to accommodate the more unusual postures. Earliners are now flexible plastic that can be cut to a perfect fit. Glass eyes are manufactured in lifelike colors and shapes for every fish, bird, mammal and reptile imaginable. Fish bodies are sold in lifelike fiberglass blanks "perfect in every detail". Just polish the seams, paint it and, "voila," a trophy mount without even wetting a line. Plastic tongues and teeth are available to fill in the oral cavities of lions, bears, boars, and other big biters. Jonas Brothers recently developed a realistic fiberglass fish throat to stuff down the maw of most popular trophies. Lifelike right down to the gills. Taxidermy is not only better, it's easier. So what does this state-of-the-art

animal stuffing cost? That depends on who's doing the work. For every professional taxidermist who makes a living recreating wildlife, there are probably two dozen amateurs making a little spending money. The Wichita phone book yellow pages lists four taxidermy studios. Kansas City has twelve. Topeka three. Lawrence two. Great Bend one. A little research could uncover at least two dozen pros scattered around the state, and maybe 200 amateurs who are willing to work cheap, often just for the experience. You get, of course, what you pay for. And here's what you pay for, based on prices listed in a 1981 supply catalog:

Whitetail buck urethane head form	16.45
Earliners (plastic)	2.50
Glass eyes	3.90
Tanning chemicals	5.00

Modeling clay or paper mache	2.00
Black touch-up paint	1.65
Sewing thread	2.65

Not included here are tools such as knives, scrapers, nails, pins, needles, etc.

Labor costs, of course, must include craftsmanship and artistic interpretations. Aesthetics are difficult

to assign a pay scale. Jonas Brothers will mount a whitetail buck head for \$295.00. Wright Brothers of Wichita will do one for \$200. A part timer I know will do it for \$100. You might find a beginner who will tackle the job for the cost of materials. The finished product could last from two years to 200, depending on how carefully it was put together. It

might look like a living deer or a distant, wrinkled relative, depending also on how well it was put together.

A deer head is one of the most popular mounts in Kansas, according to Greg Wright, owner of Wright Brother's Taxidermy Studio. He estimates his shop mounted forty-seven of them in 1981. That same

## *good mounts start with the hunter . . .*

### **Field Care**

"Good taxidermy begins in the field" according to "how to" brochures and field guides. But it really begins in a hunter's or fisherman's head. Before you shoot the world record mule deer buck, consider what your bullet will do. A good taxidermist can patch a hole, but it will never look as good as an undamaged skin. If you're considering a head mount (this includes shoulder mounts) place your shot in the heart lung area. This is a good shot for a full body mount too, for a bullet will sometimes remain inside the body cavity. If it passes through without hitting bone, it will not mushroom excessively, so the exit hole should be fairly small. You shouldn't have this problem with fish, but you would with birds. Don't choose to mount a pheasant shot at close range with a 3½-inch magnum ten gauge.

Once you have your specimen in hand, there are various procedures to follow to protect them and provide your taxidermist with good working materials.

### **Big Game Animals**

Do not, I repeat, do not cut the dead critter's throat to bleed the animal. It's heart is not beating and its blood is not pumping through its vascular system. Why tear up the hair and hide where it will show the most? Other actions to avoid include dragging the carcass with the skin on. It won't take long to rub patches of hair off. Avoid getting blood on the cape, and don't tie ropes or wires around it.

The best procedure is to cape (remove the hide from the neck and head) as soon as possible. Start behind the animal's front legs. This gives the taxidermist enough material to work with plus extra for patching. Cut from under the skin out, and slice up and over the back and down under the brisket. Next slice straight up the middle of the top of the neck to between the ears. Here you make a "fork in the road" with one cut leading to the base of one antler, the second to the other. Poke and pry the scalp from around the antlers. Now simply pull, cut and skin your way to the muzzle. Cut deep around the ears and eyes and mouth. Cut the nose off next to the bone. Congratulations.

You've just removed the body from the skin. You now have what taxidermists call a cape. Trim meat and fat from it. If you don't, they'll rot and cause the hair to fall out. Slit the lips open from the inside and scrape the fat from them, too.

If the temperature is above fifty degrees or if you can't get the hide to a taxidermist for several days, you must salt it to prevent hair slipping. Two pounds of non-iodized table salt should be spread evenly over the skin. Don't leave any folds or crevices unsalted. Don't use rock salt. Roll the hide up and store in a cool, dry place. Exposure to heat can ruin it. After several hours the cape can be stretched out to dry slowly. Even if it dries into a hard, stiff crinkle of hair, it will be in perfect condition for mounting if all fat has been removed and the salt has penetrated all parts of the inner skin.

Horns or antlers can be removed by sawing off the top of the skull on a line through the middle of the eyes.

An alternative to all this is to carefully carry the entire deer carcass to your taxidermist and let him do it. Or take your taxidermist hunting with you.

### **Fish**

Fish are easy if you're not six days out in the wilderness. When you net a monster, don't hang it on a stringer or throw it in the mud. Photograph it in color as soon as possible. This will serve as a reference for painting later. Wrap it in cloth, plastic or paper and take it to the mounting man as soon as possible. You can freeze it whole for as long as a year or two if you immerse it in water first.

### **Birds**

Here's another easy one. Simply wipe any blood from the plumage and plug shot holes, nostrils, mouth and vent with cotton or paper. Smooth plumage and roll entire bird in paper to protect it until it arrives at the stuffing studio. Freeze the whole bird to prevent spoiling. If you have a camera, photograph the specimen in color, especially if it is unusual.

year he did seventy pheasants at \$75 each and fifty ducks. Those are the big sellers in the fall and winter. Spring and summer brings a rash of bass, mostly largemouth. Two-hundred of them were immortalized at Wright's last year.

In contrast, Jonas Brothers (you don't have to be brothers to open a taxidermy studio, but it seems to be

the fashion) does sixty percent of its business in African big game. Warthogs and oryx, cape buffalo, impalas, elands, kudu, wildebeests, lions, and elephants crowd the studio in various stages of re-dress. Finished heads survey the premises in silent herds. There are curled horns and twisted horns and spiral horns and ridged horns and rapier horns and scimitar horns and all those other incredible shapes that only the African gene pool can produce. Jonas prides itself on having the most complete collection of forms, measurements, photographs and original plaster casts of African big game in the business. Their technicians have devised techniques to repair and camouflage the most abused skin imaginable, which is important when you consider many African animals have little or no hair to cover damage. Jonas craftsmen can put the right wrinkles in the right places on a snarling lion or grazing rhino. They mold in every arterial bump and ridge that shows through the skin of a Lord Derby eland.

Alaskan big game used to visit Denver often during reconditioning at Jonas, but in recent years license sales in the forty-ninth state have plummeted from 11,500 to 4,200 due to changes in land ownership, subsistence hunting laws and other political factors. Inflated guide fees have also curtailed trophy collecting in North America. How many sportsmen can afford a \$7,000 hunt for a stone sheep in British Columbia?

To many people, hunters as well as non-hunters, the decline in trophy hunting is anything but disheartening. It's a rather disgusting hobby anyway, killing those magnificent animals just to show off. And by shooting the best and strongest, hunters are pushing natural systems in reverse. They're weakening the gene pool by taking the best and leaving the weaker to procreate.

The arguments are old ones to trophy hunters, who have long held that they are the epitome of sports-

men, limiting themselves to specific animals, males only and old ones at that. Through high license fees they help support research and rehabilitation projects for non-game wildlife as well as for the species they hunt. And as long as they take a limited number of animals, survival of the herd is not jeopardized. Better to hunt and eat sheep meat than convert a winter grazing meadow into a cow pasture and doom an entire herd to displacement and eventual death. Besides, that nine-year-old full-curl ram has had the same genes all its life and has had plenty of time to pass them on.

Showing off might be a legitimate complaint for those who like to point fingers. Some hunters and fishermen do indeed use mounted game as proof of their superior skills. They display them like wrestlers and runners and drag racers display their lead, plastic, and bronze statues. Others who harvest nature's produce prefer to take in quantity instead of quality to prove their worth. Game hogs. Sometime poachers. And still others, silent others, kill and preserve magnificent specimens for reasons difficult to define. To honor the animal. To commemorate the hunt. "Preserve the Thrill of the Hunt" the taxidermy ads suggest. "Do Not Lose That Wonderful Memory." Yet memories can be secured without material reminders. The smell of wood smoke, the clatter of falling rocks can conjure strong images for the sheep hunter. Wouldn't a photograph do? Maybe. But would an art collector settle for a photograph of the Mona Lisa?

Beauty inspires possession in man. That idiosyncrasy is his glory and downfall. Rockhounds, butterfly collectors, astronomers, lovers. Capture the fire, the ice, the swift, the eternal, the thundering hooves, the dull ache of rolling, rolling, rolling away prairie in plastic-stuffed pronghorn head? Maybe not.

But it's worth a try.

And the trying just might do it.

