

# KANSAS

*Wildlife & Parks*

MAY/JUNE 2000

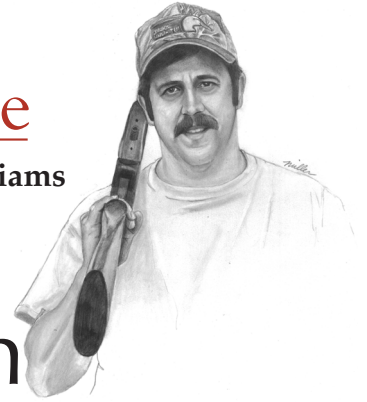
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# The View From Here

by Steve Williams



## Getting Permission

Anyone who likes to hunt or fish knows that acquiring access to property can be a time-consuming and sometimes frustrating affair. Fortunately, many Kansas landowners are generous with the opportunities found on their property, and it's still possible to gain access. However, leasing and access charges are becoming more common in some areas of the state.

The simple fact remains that Kansas is not blessed with a great deal of public land. The department's Walk-In Hunting Area (WHIA) and Fishing Impoundment and Stream Habitat (FISH) programs continue to expand, but not everyone lives close to enrolled tracts. Also, these areas may not offer the opportunities you are seeking.

The easy answer to the access problem is to only hunt and fish on public and department-leased lands. Don't get me wrong, these areas can, and do, provide excellent opportunities. But as most of you are aware, there will be competition from other hunters during peak times of the year. The alternative is up to individual hunters and anglers — how hard they are willing to work to gain access to private property.

Foremost, always gain permission before entering private land for any reason. People who hunt and fish without permission are trespassers and poachers, not hunters and anglers. And like it or not, these outlaws have made it tougher on all law-abiding sportsmen.

Put yourself in the shoes of the landowner. They are letting you come into their backyard. They are trusting you to conduct yourself in a safe, ethical, and legal manner. Imagine looking out of your back window to find an uninvited guest sitting in your deck chairs and throwing trash all over your lawn. You would undoubtedly be upset. It usually does not take many of these episodes for landowners to close their land to everyone. Who can blame them?

There is no secret formula to gaining access, but you will increase your odds by planning ahead. For instance, the second Saturday in November at 6:00 a.m. is not the time to knock on someone's door and ask to hunt pheasants. Plan to spend at least a few days in September scouting for suitable pheasant habitat, then politely approach the owner of the property and ask permission to hunt during the upcoming season. A county plat map, which shows property boundaries and names of

landowners, is an invaluable tool. You can usually find these at County Abstract offices or County Clerk's offices.

It can be a good idea to initially contact the landowner by phone, especially if you're not sure where he lives, but you should ask to visit in person. When you ask to hunt, be honest and specific. Tell the landowner what kind of hunting you are interested in, and don't assume that because you have permission to hunt pheasants in November that you can return later to hunt deer. Ask for clear instructions on property boundaries, areas that are off-limits, and where you should drive and park. Give the landowner a description of your vehicle, and agree from the start on how many will be in your party and when you want to hunt. Some landowners may want you to check each time you hunt, others may not want the bother. Never assume that having permission last year carries over to this year. Always contact landowners prior to each season.

Once you have gained access to private property, there are several things you can do to increase your chances of being invited back. As I already have mentioned, your conduct as a guest on the property is critical, but so is your interaction with the landowner before and after the hunt. Always offer landowners at least a portion of the game you harvest — dressed and packaged. Ask the landowner if they enjoy other wild game. They may not like pheasant, but they may enjoy the crappie you have in your freezer. Even if they refuse your offering, I guarantee they will appreciate that you asked.

You can also ask the landowner to contact you if they need help fixing fence, moving hay, or any other farm chores. Again, they may never ask, but they will remember that you offered.

The relationship between sportsmen and landowners is critical to the perpetuation of our hunting heritage. If you are like me, you do not have 200 acres behind your house teeming with wild game and a 10-acre pond full of lunker bass. When we are fortunate to acquire access to these opportunities, we need to remember to respect the land, and just as important, the landowner.

*Steve Williams*

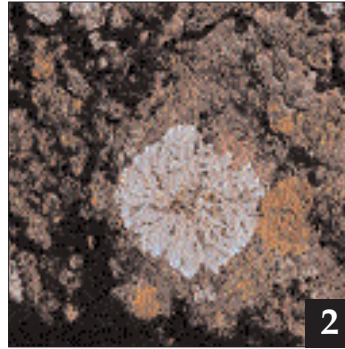
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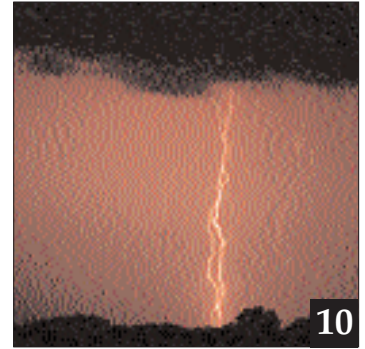
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**About the covers**

**Front:** Largemouth bass are popular with anglers, and Kansas biologists work hard to produce top fishing. Mike Blair photographed this scene with a 55mm lens, f/11, 1/125.  
**Back:** A female tiger swallowtail makes a beautiful addition to a summer gayfeather. Blair used a 400mm lens to capture the moment. f/11, 1/250.



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

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# Lichen Lore

by Karen F. Yates

*environmental specialist, Missouri Department of Health, Jefferson City*

photos by Mike Blair

*What you might have simply called “moss” on the rock or tree you stepped over is really a fascinating organism called a lichen. Thousands of species of lichens provide color in unusual places and an interesting study of their relationship with algae.*



Consider this merger. Two partners from different nations cooperate to be successful in business. The dominant partner provides facilities and raw materials. The other uses these to manufacture the company's product — food. Both survive and profit from the relationship.

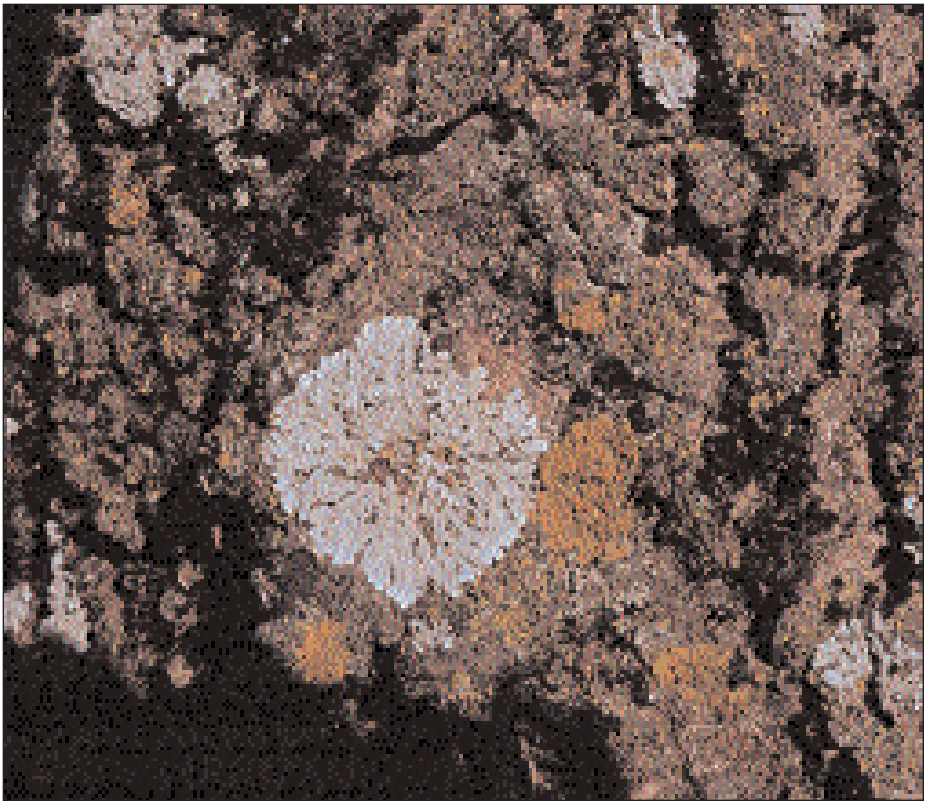
This could be a Wall Street marriage of two financial kingdoms, or it could picture an alliance between two biological kingdoms in the Kansas outdoors. There is a common union between fungi and algae that results in many unique organisms found throughout the state. These are called lichens (pronounced *like-ins*).

Lichens don't make the news like corporate mergers. Most people ignore them. Only observant individuals notice their unobtrusive presence on tree bark, fallen limbs, rocks, and bluff faces. Yet once the eye is trained to recognize favorable habitats, lichens can provide outdoor enthusiasts with a fascinating tour of Lilliputian architecture. These colorful organisms paint unexpected accents on the monochromatic landscapes of winter and early spring.

Scientists describe the lichen partnership as "mutualism" or "symbiosis," meaning that the involved fungus and algae depend on each other to succeed. Each contributes by doing what it does best. The biological "bottom line" is a union greater than the sum of its parts.

Fungi, which form the bulk of the lichen, are often associated with death, disease, and decomposition. They populate forest floors and abandoned fields as toadstools and mushrooms. They invade homes, creating musty basements and moldy bread. But within the lichen, fungi are cooperators. As a lichen-partner, the fungus protects algae in a sort of microscopic greenhouse constructed of its own water-absorbent threads. This provides the algae with shelter and shade.

Algae normally live in association with aquatic habitats. As the other lichen-partner, algae or algae-



Gray star lichen is pale with narrow, wandering fingers. It is common on the upper limbs of trees. There are 13,500 lichen species in the world.



Jewel lichen is a striking, deep orange with disks less than 1/50-inch wide. It is common on native limestone and fence posts, and may be seen on concrete in cities.

like bacteria feed the cooperating fungus. Algae contain the pigment chlorophyll which is necessary to synthesize sugar. Protected by the fungus, algae share food and vitamins. The lichenologist Trevor Goward observed that lichens are merely fungi that have discovered agriculture.

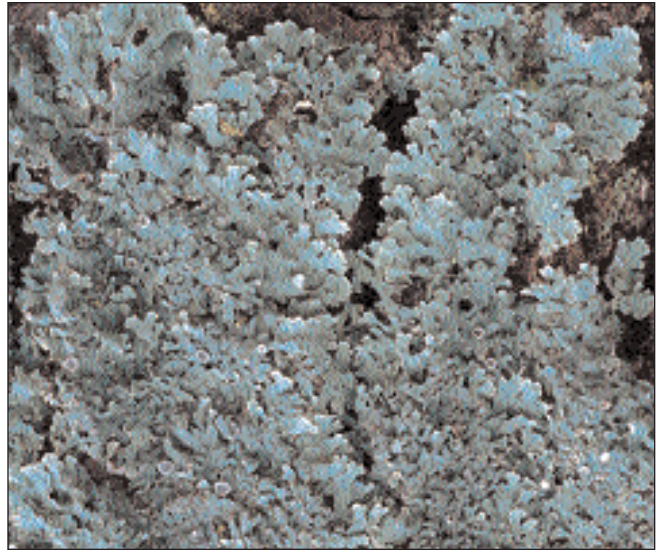
Clearly a successful alliance, lichens cover 8 percent of the world's land surface. Of the 13,500 lichen species, many are survival specialists in the world's most barren environments, including deserts, tundra regions, and the tallest mountain peaks. These ecosystem pioneers require only light, moisture, air, key minerals, and a stable substrate such as bare rock or a tree trunk.

If an essential growth element such as moisture becomes limited, lichen metabolism shuts down. It enters a life phase somewhat resembling the suspended animation imagined by the writers of science fiction. Dehydrated and appearing lifeless, the lichen is safely transported through time into a season or year when moisture is again abundant. The sponge-like lichen quickly absorbs any available rain or dew and resumes its biological processes. Mountain-summit or tundra-inhabiting lichens possess their own unique adaptations that allow for optimal growth during short, cool summers.

Lichens are not conspicuous when the weather is dry. But with moisture, the fungal tissues swell and pigments become deep and bright. The rich, bold colors seen in a few of the more common species range from yellow to orange to red. Many other lichens are a subtle gray or white touched with green. Black and brown lichens are not uncommon, and many lichens display more than one color. This wide array

of pigmentation fosters heat absorption during cool temperatures in some species, and in others shields the algal colonies from prolonged, direct sunlight.

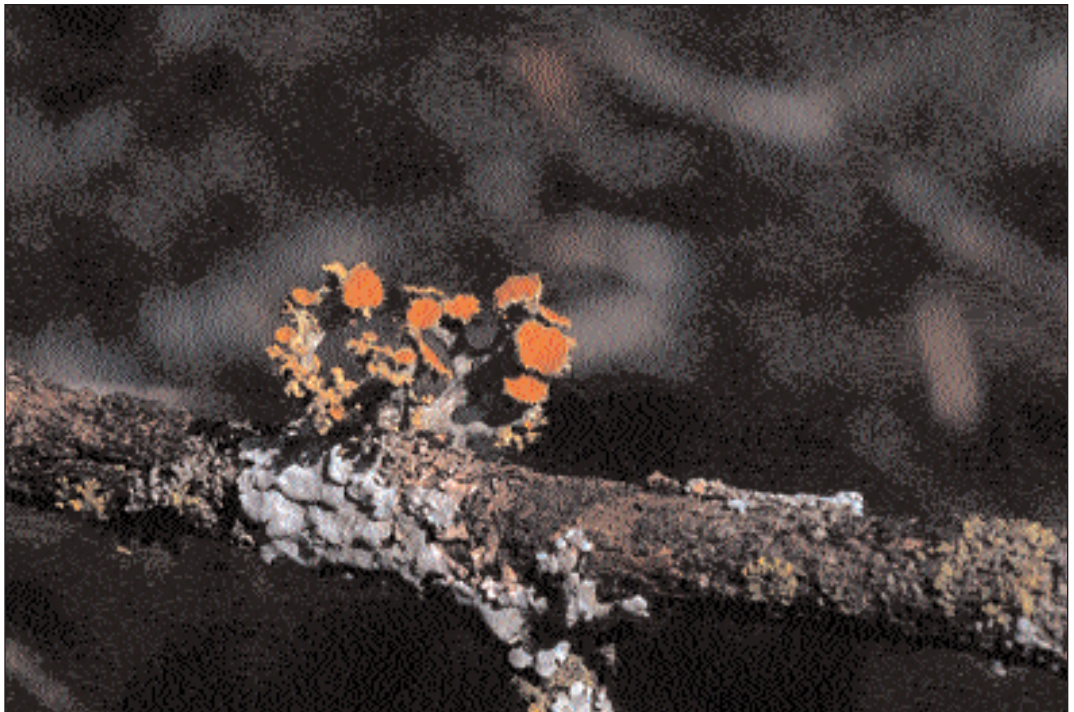
Resourceful humans throughout history have devised methods for extracting and using lichen pigments. There are numerous accounts of Native Americans using lichens as a color source for dyeing fabrics and baskets. Paints made from lichens have been used on clayware as well as on the human face and body. Before the advent of inexpensive synthetic dyes, human urine was fermented and boiled with certain lichen species in Scotland. This offensive concoction yielded the warm brown woolsens that eventually were trademarked as Harris Tweeds. Ancient Roman chroniclers



Several species of shield lichens exist in the state. They form leafy mats on boulders, decaying logs, and tree bark.

and the Bible make reference to a vibrant, purple-blue dye derived from lichens.

In addition to pigments, lichens produce other complex organic compounds. Some of these are thought to protect lichens from grazing microbes and animals or competing plants. A number have been tested with success for antibiotic and antiseptic properties.



Gold eye lichen is one of Kansas' most colorful lichen species. It is often found on the twigs of Osage-Orange in eastern Kansas. It prefers bright light conditions wherever it grows.



Lichens often intermix to form striking and colorful patterns on natural and artificial substrates.

Similar to members of the plant kingdom, lichens also produce aromatic compounds. The oak moss lichen of eastern Europe has been a standard ingredient in fine perfumes for centuries.

Probably the most unique human use of lichens is as a biological indicator of air pollution. At the dawn of the industrial revolution, botanists noted the decline of some lichen species in Europe's major cities. Investigation continues today, with a focus on the decline of once-common lichen species downwind from coal-burning power plants and cities choked by vehicle exhaust.

In spite of lichens' chemical defenses, animals commonly eat them. Insects, slugs and snails, and microscopic mites are some of the tiny creatures that derive nourishment from lichens. Small mammals such as voles, bats, and rabbits consume them. In the arctic and tundra regions, lichens are an important food for musk ox, caribou, and reindeer. This is to be expected in latitudes where lichens are the dominant vegetation. However,

research in Maine and New York also document lichen usage for food by local white-tailed deer.

Excellent insulation and camouflage, lichens are used as nesting or cover material by numerous birds and mammals. Several lizards, a salamander, and the well-known gray treefrog all mimic the lichen communities upon which they live with their matching skin patterns.

Lichens have several growth forms, each suited to a unique environmental niche. Probably the most familiar lichens are the crusty, blister-like, rounded patches found tightly attached to the surfaces of rocks and trees. Hard to the touch when wet, *crustose* lichens colonize even man-made materials such as sidewalks, brick buildings, and cemetery headstones.

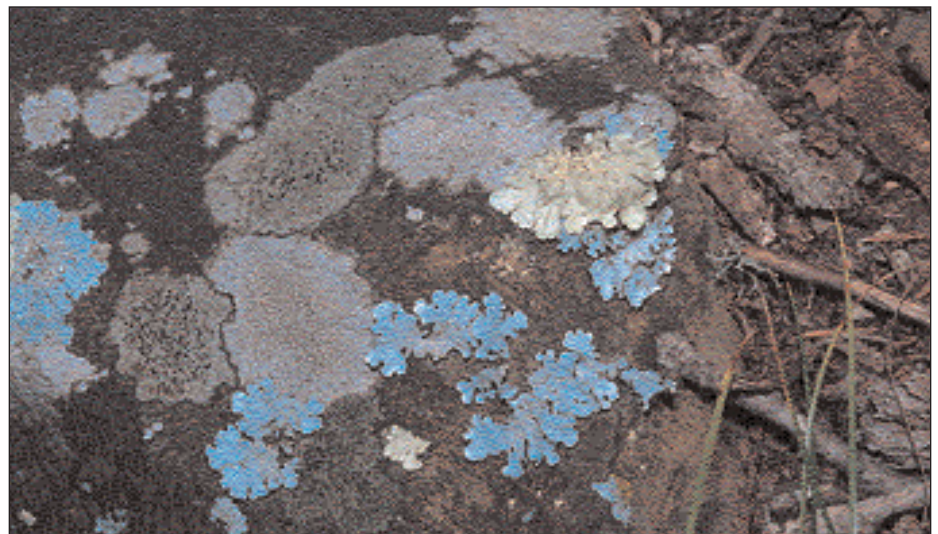
In order to obtain nutrients, some species manufacture acids that dissolve the rocks on which they reside, contributing a biological component to the erosional forces that turn man's monuments to dust.

Other bark-dwelling lichens occur in groups of flat, scale-like lobes. As with the crusty lichens, scaly lichens in no way harm the

trees or shrubs on which they live.

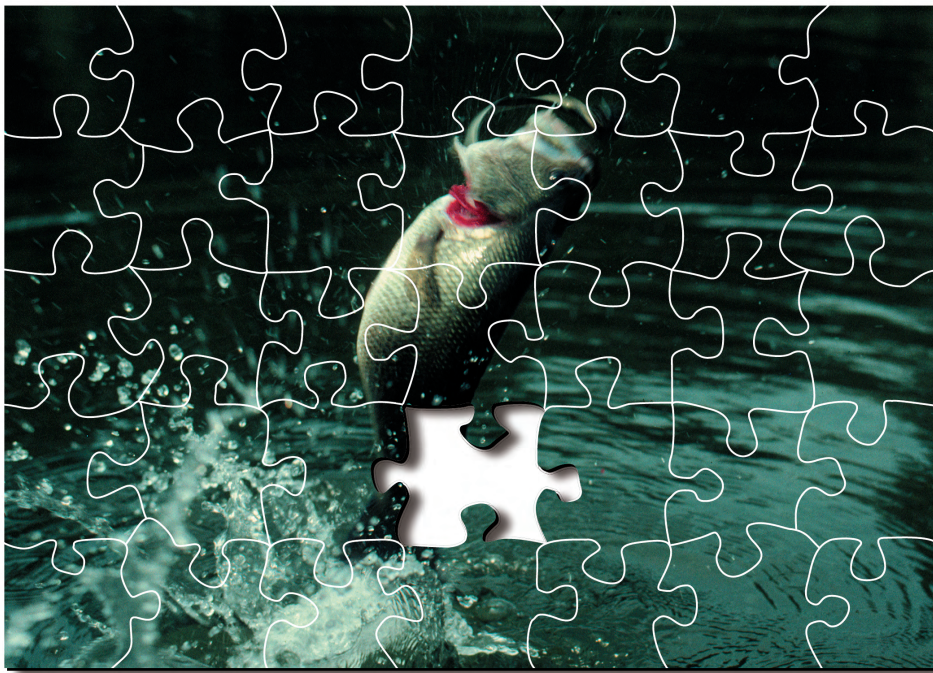
The *foliose* lichen growth form looks like a miniature, leafy plant with flat, leaf-like lobes. The *fructicose* growth habit, on the other hand, is upright and branching. One of the most well-known fructicose lichens, the reindeer lichen, has long been used for miniature trees and shrubs by hobbyists and decorators. A hand lens or magnifying glass is an indispensable tool for investigating lichens. Close scrutiny will reveal a variety of textures and designs that rival any man-made tapestry: velvet, satin, flowing stripes, or rough, earthy homespun. On the other hand, (and in the company of children), it is possible that inspection of lichen habitats may propel the viewer into an imagination-filled escapade upon miniature verdant picnic grounds with dew-filled goblets set for a fairy holiday. Or, it is possible to draw back in perspective and scan the larger, more tangible landscape. Here, swathes of subtle lichen colors and textures mark rain's pathways season after season as it sheets quietly over rocks and trees.

Finally, it is possible to come away from a lichen investigation with more knowledge of our world, grateful that this corporate merger of the biological kingdom can leverage the power to make us pause and contemplate. 🍄



Boulder lichen is a spreading, foliose lichen that grows on exposed acidic rocks. It forms extensive patches on Kansas bluffs and rocks, often growing with other species.





food. Terrestrial vegetation quickly drowns out and decomposes after a lake is filled, though it provides habitat for a period of time. Long-term maintenance of this habitat becomes an important goal for fisheries biologists.

There are several ways to attempt this. One means of replenishing underwater habitat is drawing down a lake's water level during summer months. This allows new plants to become established on the exposed lake bottom. When the lake is refilled, newly-flooded plants serve as fish habitat. Unfortunately, these don't last long. After a couple of seasons, they disappear along with their benefits.

Periodic manipulation of water levels would be a useful management technique if it weren't for several complications. To have any real impact on the survival of young fish, drawdowns would have to exceed what is practical for large Kansas reservoirs. To be successful, changes would require a minimum 20 percent to 30 percent decrease in a lake's surface area. Such a change in lake size and depth would cause problems for other recreational users of the lake, such as sail boaters, water skiers, and campers.

Large drawdowns also affect important water reserves. Many Kansas lakes serve as municipal water supplies for metropolitan areas. To preserve this resource, drawdowns are limited to 10 percent of available water by the Kansas Water Office. Also, most of the state-owned reservoir storage is committed to water contracts. It is not possible to effect meaningful drawdowns at most locations. Even so, water-level manipulation is a good choice on smaller bodies of water. Where practical, it is the most cost-effective method for increasing largemouth bass num-



## Bass Habitat: Solving The Puzzle

by Ron Marteney  
*district fisheries biologist, El Dorado*

photos by Mike Blair

***It's been a fact that as Kansas reservoirs age, largemouth bass habitat deteriorates and bass numbers decline. However, a recently completed study may hold some promising answers.***

El Dorado Reservoir was regarded as one of the best bass angling lakes in Kansas for the first few years after it was impounded in 1981. Unfortunately, as the lake aged, the quality of bass fishing declined. Normal fisheries management techniques such as stocking and length limits were imposed to try to slow or stop this natural problem. Early efforts may have been marginally successful, most critical for newly-hatched bass. Natural reproduction supplied good numbers of young fish, but

few survived to adulthood. It became clear that improved fish habitat would be necessary to restore the lake's bass population.

Not all Kansas reservoirs enjoy a bass bonanza like El Dorado, but most share similar problems with habitat loss as they age. Aquatic habitat provides food and cover, especially in the form of submerged vegetation. Aquatic plants add oxygen to the water, help young fish hide from predators, and harbor a variety of insects and invertebrates which serve as fish

bers.

A second possible solution to provide aquatic habitat lies in the introduction of aquatic or semi-aquatic plants. Unlike dry-land vegetation which pioneers mudflats and then drowns out when submerged, aquatic plants thrive in shallow water. Under favorable conditions, they maintain themselves year after year while providing needed habitat benefits. Unfortunately, aquatic vegetation is seldom found naturally in large Kansas impoundments. Even the state's oldest reservoirs harbor little of this important vegetation.

Several factors inhibit aquatic vegetation in reservoirs. One of the most obvious is wind. Because Kansas reservoirs have little wind protection, they are subject to continuous wave action. Waves stir up bottom sediments on gradually sloping shorelines and make it difficult for aquatic plants to become rooted. Also, wave action diminishes water clarity, so that aquatic plants cannot get enough light to survive.

Another problem is seasonal fluctuation of water levels. This is especially true in eastern Kansas reservoirs. Spring runoff usually causes high-water conditions. Most aquatic plants can't tolerate extended periods of high water.

When flooded, the light these plants need for photosynthesis isn't available, and they quickly die.

These factors discourage growth of aquatic plants in large reservoirs, but they don't preclude them. Some light has been shed on this mysterious lack of vegetation by a rather recent discovery. Studies by Corps of Engineers Waterways Experiment Stations have shown that common carp and turtles may prevent natural establishment of aquatic plants in some large mid-western lakes. The rough fish and turtles graze on new aquatic plants and prevent them from developing and colonizing favorable habitat. This finding may hold the key to producing natural vegetation in many reservoirs.

Understanding that El Dorado bass fishing was in decline because of limited habitat, and considering the options of establishing that habitat, the problem of growing aquatic plants was addressed in light of this new information. It was easy to conceive a project to investigate whether protected aquatic plants could survive at El Dorado, but the funding to undertake such an effort was not initially available.

Fortunately, in the mid-1980s, Section 1135 of the Water Resources Development Act made money available to the U.S. Army Corps of

Engineers for cost-shared habitat projects benefitting fish and wildlife on Corps lands. In 1995, the Kansas Department of Wildlife and Parks submitted a project proposal to improve fish habitat at El Dorado by planting various types of aquatic vegetation while excluding carp and turtles. The Corps of Engineers evaluated the proposal for feasibility and cost-effectiveness and, after minor modifications, accepted it for funding. The estimated total cost of the two-year project was \$265,000. Seventy-five percent of the total cost was underwritten by the Corps of Engineers. The remaining portion was funded by Wildlife and Parks in the form of in-kind services such as labor and equipment.

In the early spring of 1996, El Dorado Reservoir was drawn down four feet to make it easier to build and install various types of enclosures required for the project. The enclosures used were developed by the Corps of Engineers Aquatic Ecosystem Research Facility in Lewisville, Tex. to protect newly planted aquatic vegetation from common carp and turtles. Unfortunately, spring rains that were expected to refill the lake failed to materialize. As a result, the lake remained four feet low throughout the summer of 1996.

Planting efforts were initiated in



The photos above show before and after scenes of the enclosure project at El Dorado Reservoir. A variety of aquatic plant species were planted in coves with fences to keep out carp and turtles. While protected, many of the plants did quite well.

June 1997 after the lake refilled. Several agencies cooperated. Personnel from the Corps' Aquatic Ecosystem Research Facility joined with Corps personnel from El Dorado and John Redmond reservoirs, along with KDWP personnel from the Great Plains Nature Center, Cheney, and El Dorado Reservoirs. In just three days, hundreds of aquatic plants were planted in various locations around the lake.

Aquatic plants utilized fell into three broad categories: emergent plants such as bulrush and arrowhead; floating-leaved plants including waterlily, american lotus, and spatterdock; and submerged plants such as coontail, eel grass, pond weed, and water star grass. Twelve species were planted.

Vegetation was planted in the various types of cages or pens built the previous year. It was hoped that protection from carp and turtles would allow the plants to become firmly established and, subsequently, to spread to other parts of the lake by means of seeds, runners, or fragments washing up along the shoreline and taking root.

First-year growth and survival was evaluated to determine which species did best at El Dorado Reservoir. As anticipated, some species did very well while others did poorly.

A second planting was completed at El Dorado Reservoir in June 1998. At that time, species which grew best in 1997 were more heavily planted. In addition to fine tuning the species list, several new shoreline areas adjacent to established planting sites were fenced and planted with aquatic vegetation. Larger enclosures were tried in some areas to lessen wave-action damage to the leaves of water lilies and lotus. Three-year results from the 1997 and 1998 plantings are encouraging. The most important finding is that a variety of aquatic plants can and will grow at El Dorado Reservoir when they are protected from carp and turtles. Other factors such as wave action and water clarity, while still impor-



Aquatic vegetation may be the missing piece to the reservoir largemouth puzzle.

tant, may not be as critical as once thought.

Results of the study also indicate a need to periodically inspect and repair the enclosures. Protective pens and cages were damaged by shifting ice, floating logs, and a variety of other catastrophes. When damaged, the pens were quickly invaded by carp and turtles, and the vegetation growing inside them was soon eliminated.

Based on information learned to

this point, the new goal for El Dorado was to find a plant species that was capable of growing without any artificial protection. Fortunately, there appears to be a plant that meets this need.

Water Willow (*Justicia americana*) is native to the eastern half of the United States. It is capable of growing in water up to about three feet deep. Once established, it spreads rapidly by seeds and fragments. It transplants easily. It can withstand fairly long periods of flooding and, best of all, it appears to be unpalatable to carp and turtles.

No one knows for sure whether this plant will provide the final answer to habitat needs at El Dorado Reservoir, but it appears promising. Over the next few years, a concentrated effort will attempt to establish water willow in as many suitable sites as possible. If everything goes as planned, the amount of habitat available to bass and other sport fish should increase significantly as this plant spreads throughout the lake. ♡



Biologists are excited about the potential of water willow (pictured at left) to provide critical habitat for bass and other fish species in our large reservoirs. The plant is native to eastern Kansas waters, grows on just about any substrate in water 3-4 feet deep, and is drought and flood resistant.



Mike Blair photo

# Lightning and the Outdoorsman

by Gerald Almy

*freelance author, Maurertown, Virginia*

***With frequent spring and summer storms in Kansas, it's easy to become complacent about the danger. But lightning strikes 250-300 people each year in this country -- killing 100. Electrical storms deserve respect.***

A cold northeast wind whipped across the lake, slicing through our sweaters and rain gear like a sharp knife. Dark, gray clouds hung ominously overhead, so low and thick they seemed like a blanket about to settle down on top of us.

But we had only been on the lake an hour and, big bass were on the

bite. We had taken three husky specimens on jigs with pork trailers and were just easing up under power of the electric motor to a favorite bass hangout when we heard the rumble of muted thunder. Paying little attention to the noise in the distance, we tried to focus on inching our lures over the brush littering the underwater hump to

entice more big bass to bite.

Gradually, though, the thunder grew louder, closer and more ominous. Bolts of lightning flashed through the gray skies to the east. They seemed far enough away to get in a few more casts, but we were losing our concentration on the fishing and kept glancing more frequently at the threatening skies.

We didn't want to quit, but both of us were thinking things could get dangerous any minute. As we cast, a strange sizzling, crackling sound began to emanate from our graphite rods. It was troubling, but big bass were on the prowl. How could we leave? We wanted at least one more fish before we made our break for cover.

Arching out our casts simultaneously, we watched in wonderment at the scene that unfolded next. Our lines did not come down out of the air. Instead, the jigs hit the water, but the monofilament stayed in an arch in mid-air. Then, eerily, the lines began to rise, lifting another ten feet higher. As our rods sputtered and hissed in our hands, the lines hovered in suspension.

Totally unnerved, we jerked the rods forcefully to break the electric charge holding the lines in mid-air, then reeled in frantically.

"Let's get out of here!" my friend muttered as he cranked the big outboard and put the boat on plane towards shore. As we sped to safety, a deafening lightning bolt cracked into an oak tree barely 200 yards away on land.

To this day, both of us count our blessings and shake our heads, wondering how we could have been so naive and careless to stay on the water as a dangerous electrical storm approached. We could easily have become two of the 250-300 people across the country who are injured each year from lightning strikes, or worse, two of the 100 or so who die.

When you think of how much lightning occurs, those may seem like modest figures, but the danger is real. At any given time, 2,000 thunderstorms are in progress over the earth's surface. Lightning strikes the planet 100 times each second. On average there are 45,000 thunderstorms each day and 16 million per year. In the United States alone, about 100,000 thunderstorms occur each year.

Outdoorsmen and women are among the most vulnerable to lightning, and when a bolt does strike a person, death or serious injury is

common. The human body is actually a good conductor of electricity. If a strike hits the head, as it usually does at the highest point, it can run down the brain stem and along the spinal cord, causing respiratory arrest. A strike through the chest can bring heart fibrillation and circulatory arrest. A shock to the lower body can bring muscle spasms, serious burns or temporary paralysis.

Hunters, fishermen, boaters and campers are all particularly vulnerable. The graphite fishing rods my friend and I were holding when we encountered the electrical storm compounded our exposure. Graphite is a conductor of electricity, whereas a material such as fiberglass or split Tonkin cane is not. A conductor held above its surrounding acts as a lightning rod because it's the highest point around.

Any charge developed overhead in the air or a cloud, I learned later, would be attracted to the high point of the rod as a path of least resistance to the ground. This is not to say that it's safe to use a fiberglass rod in an electrical storm, though. If the electrical charge becomes strong enough, even that material can become a conductor. Graphite is just particularly dangerous, as is boron.

The sputtering, crackling sound coming from our rods was evidence of a charge developing on the rod and discharging back into the air. The graphite fibers in our rods were actually being moved by the electromagnetic field developing around the fishing rod.

The fishing line hanging in the air was like a charge you sometimes get from rubbing a cat's fur. The charged line was attracted by the

cloud-air charge, causing it to hang suspended.

One thing in our favor was that we were in a fiberglass boat, but experts say this is still dangerous and would not have prevented us from being killed or injured had lightning struck near enough. Aluminum is even more dangerous, however. Says Jim Campbell, emergency warnings meteorologist with the National Weather Service. "If you were fishing in an aluminum boat, the lightning wouldn't have to strike you directly to electrocute you. It could hit the water 100 yards away and you could still be injured or killed."

If it struck even closer, directly through the fishing rod, it would likely travel down the rod, through the arm, heart and diaphragm, then down the legs. It could possibly even strike a hole through the bottom of the boat.

In Minnesota a 31-year-old angler was fishing a lake when lightning struck the tip of his



Gerald Almy photo

It's tempting to stay on the water as a thunderstorm approaches because the fish are usually active. But lightning is a real danger and should be respected.

graphite rod, entered his right hand, then exited through his right foot. In Indiana an angler took a direct hit through his arm that traveled up his shoulder then down through his body and out his thigh, leaving a hole over an inch wide and causing serious nerve damage.

The lesson is clear. My friend and I — like countless other anglers each year — carelessly tempted fate when we stayed on the water during the electrical storm. The lightning strikes may miss, but then again, they may not. If they don't, that could be your last fishing, camping, or hunting trip. And don't think rain has to be falling. Frequently lightning strikes prior to the onset of a thunderstorm.

One way to tell how close a storm is involves counting how many seconds elapse from the time you see the lightning bolt until you hear the thunder, then dividing by five. If a bolt of lightning hits in the distance and 10 seconds elapse until you hear the thunder, it's two miles away. But electrical storms can develop and people can be struck without even hearing thunder at times. Carrying a battery-operated National Oceanic and Atmospheric Administration (NOAA) weather radio in the boat is a good idea. Even a regular AM radio can warn of approaching storms indirectly. If the station signal becomes filled with static, lightning is striking nearby and it's time to head to shore.

If a storm hits and you can't get to land and safety, stay low in the center of your boat. If it's a metal one, try to put seat cushions, ropes or other material between you and the metal sides and bottom. Don't dangle any extremities in the water, and put down your fishing rods—even if they're fiberglass. Disconnect electrical equipment and lower any protruding devices such



Mike Blair photos

Keep your eye on approaching storm fronts and move to safety when lightning is evident. An open pond bank is no place to be with a graphite rod in hand during a lightning storm.

as outriggers or antennae. And of course, wear a life vest.

If you're fishing from shore, don't think you're safe when an electrical storm approaches. Chances are you're the highest point around and could easily be struck. Your line could also conduct electricity from a strike out in the lake or river. Says Campbell, "if your line is in the water it's going to be wet, and water is a good conductor of electricity. Lightning could hit the water and travel up the line, giving you a jolt of electricity."

Whether you are in a boat or fishing on shore, seeking a safe haven is the best solution. However, if you are caught in a storm and suddenly feel a tingling sensation, and the hairs on the back of your head or on your arms stand up, this is a sign the situation is critical. Immediately put down your fishing rod and drop to a crouched position with hands covering your head. This will help diffuse the impulse of

the lightning bolt. After it strikes, immediately move to a safe area.

Hunters can also be at risk in a lightning storm, though the danger is less frequent because of when most thunderstorms occur. Summer is the peak period, with most lives lost during July, June, and August, in that order. May is the next most dangerous month statistically, followed by September, December, April, October, and March. January, February, and November were the three months with the lowest likelihood of lightning deaths, according to a 20-year NOAA study.

Waterfowlers, especially, are at risk in electrical storms, since they are often on the water and can be the highest point available for lightning to strike. In woods, the hunter is in somewhat less danger, unless he stands beside a tall tree or a lone tree out in a clearing. In this case the danger can be extreme. Fifteen percent of all lightning deaths occur when the victim was standing under a tree. "A grove of trees in a

low area is all right, but a single tree out in the open is a magnet for lightning," says Campbell.

Guns, of course, have metal parts and can act as lightning rods. Campbell recommends putting down a gun if a storm is nearby and lightning is close. If you are in an open field and there isn't time to reach cover, head for a low area such as a ditch or ravine. "You don't want to be the tallest target in an open field," he says.

If you are hunting in a group and are caught in a storm, spread out. Keep everyone several yards apart because a charge could hit one person and travel through them to others in the group.

Don't be fooled into thinking lightning will only strike immediately below the main storm cloud. It can strike up to several miles away. If a storm is in the general area, the situation is potentially dangerous and should be treated as such. Always crouch if you're exposed

and feel a strike is coming. "Do not lie flat on the ground," cautions Campbell, "because generally the ground is wet. If you expose a large area of your body to this moisture, there's a higher risk of being electrocuted."

If an automobile is close by, it's a fairly safe haven. Lightning that hits a car is transferred around the metal skin, down into the ground. Don't touch any metal parts of the car while you wait out the storm. Avoid exposed vehicles like an ATV or an open jeep.

The danger of thunderstorms varies from region to region, but lightning can kill and injure anywhere. In northern states, 20-50 electrical storms take place in an average year. The Colorado Rockies are rated as the fourth most dangerous location in the country, with 60 to 70 per year. Florida is the most lightning-prone location of all, with 80-120 storms a year. This is also the state where the most deaths occur.

Over a 23-year study period, Florida topped the list with 235 deaths, followed by Texas with 127 and North Carolina with 125. Pennsylvania was fifth, with 91. New York was tied for sixth with Arkansas and Louisiana. Each had 90 deaths. ⚡

### Lightning Insights

\* Lightning can be described most simply as a giant spark. Lightning occurs when the electrical potential in a storm builds up enough to overcome the insulating properties of air.

\* The air near a lightning strike is heated to 50,000 degrees Fahrenheit — hotter than the surface of the sun. However, that occurs for only about one-millionth of a second. This extraordinarily hot temperature is what causes burns when lightning strikes.

\* More than two out of every three people struck by lightning survive. One park ranger was struck seven times and survived each strike.

\* Most lightning storms come in the afternoon; 70 percent occur between noon and 6 p.m.

\* A small cabin in an open field is not a safe place to take shelter, especially if there is a tall tree next to it.

\* Lightning can strike a telephone pole, travel up the wire and kill or injure a person on the phone. An average of one death a year occurs this way. Never talk on a phone during an electrical storm.

\* Lightning strike victims often need immediate mouth-to-mouth resuscitation and heart massage to survive.

\* Stay off of hilltops, open fields, beaches and water during electrical storms. Those locations can make you the highest point and most likely conductor of a lightning bolt.



You can calculate the distance to lightning by dividing the number of seconds between flash and thunder by five. For example, if you count to 10 between lightning and rumble, the strike was 2 miles away. That's close enough — it's time to head to safety.



# BUTTERFLIES IN THE HOUSE

by Pat Silovsky

*Milford Nature Center coordinator, Junction City*

photos by Mike Blair

***The Butterfly House at the Milford Nature Center allows visitors to walk with the butterflies and learn about this fascinating insect's life story.***

There are approximately 700 species of butterflies in North America — just about as many species of butterflies as birds. But because they are small, their names and habits are not nearly as well known as those of birds. Butterfly houses are becoming a popular attraction, and they can help foster an appreciation for butterflies and other invertebrates while emphasizing the need for conservation of threatened habitats around the world.

The butterfly house at the Milford Nature Center was built with just such goals — to increase awareness of butterflies found in our region and to attract attention to butterflies and their habitats worldwide. We also hope to encourage people to plant gardens that attract butterflies and other wildlife. We want people to learn that butterflies are as watchable as larger, more



charismatic wildlife.

No one is really sure how the word butterfly originated. A commonly held idea is that the word was derived from the bright yellow sulphur butterflies abundant in England and Europe. Their bright color reminded people of butter, hence the name “butter-colored fly,” which was shortened to butterfly. Another theory is that the name was originally flutterby, referring to the insect’s manner of flight, and that this was later changed to butterfly.

Whatever the origin of the name, butterflies are captivating creatures. It has only been in the last few hundred years that people even suspected the connection between earthbound caterpillars and winged adult butterflies. The unique process of metamorphosis and the relationship between caterpillars, butterflies, and plants is emphasized in many ways within the walls of the butterfly house.

We began our butterfly house in the summer of 1995 as an intern project for a Kansas State University



The Butterfly House at the Milford Nature Center was built in 1995. The 20-foot-by-48-foot structure covers an existing wildflower garden.

student. The idea came from a visit to a butterfly house at the Adirondack Visitor Center in upstate New York during a Watchable Wildlife conference. With guidance and a list of suppliers from the Adirondack staff, we decided to plunge ahead.

The house is a 20-foot-by-48-foot

wood-frame structure, erected over an existing wildflower garden. A fine netting of 60 percent shade cloth was custom made and stretched across the frame. A path, designed for one-way flow, meanders down the center. Benches, brightly-colored banners, and the soothing sound of running water help to create a relaxing atmosphere in the house.

Because caterpillars and adult butterflies have very different needs, our gardens must accommodate both life cycle stages. Caterpillars (larvae) eat leaves and adult butterflies sip nectar. Furthermore, different species require different kinds of plants. We designed our gardens to provide host plants for three species of butterflies — the monarch, painted lady, and black swallowtail. Trying to raise too many different species of butterflies with limited resources could be disastrous. Monarch caterpillars feed on milkweeds, and we have four species of milkweeds in our gardens. Painted ladies feed on hollyhocks and members of the mallow family. Black swallowtails feed on



Visitors can wander through the garden on a path, observing butterflies and caterpillars on preferred food plants. Interpretive signs explain the fascinating life cycles of butterflies.



One of the species at Milford is the Monarch. Each season, chrysalids are purchased from biological supply houses. When caterpillars hatch within the garden, they are removed and fed in small containers to prevent them from depleting the garden's plants.

parsley, dill, fennel, and plants from the wild carrot family.

Each season, we begin by purchasing chrysalids or caterpillars from biological supply houses. Painted lady caterpillars are readily available, and we generally begin by ordering about 100 caterpillars.

The first monarchs we obtain for the season are chrysalids, but they are expensive, so we order only a dozen at a time. Our sources for black swallowtail caterpillars are local gardeners who find the boldly marked green, black, and yellow caterpillars on their parsley, fennel

and dill. We gladly accept these contributions and quickly begin rearing them for release in the butterfly house.

Caterpillars of each species are reared indoors in small deli containers fitted with screen tops. Supplying food for the growing caterpillars is not an easy task. Caterpillars are ravenous eaters. Leaves of the different host plants are collected daily from wild or cultivated plants. The leaves are rinsed in a dilute solution of bleach to kill bacteria, then rinsed again and allowed to air dry. One hundred or so caterpillars can eat an entire gallon-sized Ziplock bag of leaves in a day or two. Containers must be checked several times a day to see if more food is required. After nearly two weeks of eating, the caterpillars make their way to the screen lid to prepare for pupation. Chrysalids usually form in a day, after which they are taken outside into the butterfly house and placed in a screen cage. Adults emerge 10-15 days later.

The average life expectancy for an adult butterfly is 14 days in captivity but less in the wild where predators take a toll. Because the adults live only a short time, they immediately begin mating and egg-laying. Females will only lay their eggs on the food plant of the caterpillar. A female butterfly generally



A wide variety of plants are maintained in the house to provide food sources for both caterpillars and butterflies. Each species requires different host plants.

deposits one egg at a time and may lay more than 50 eggs in her short life. Eggs are laid with a covering that glues them to the leaf and then hardens to form a protective, waterproof shell. The eggs of the monarch are green, those of black swallowtails are pale yellow, and the painted lady's eggs are pale green. Most eggs hatch in 5-10 days.

Eggs are left in the butterfly house to hatch, and the tiny caterpillars remain in the house until they are 1/2 to 3/4 of an inch long. When they reach this size, we usually transfer the caterpillars indoors to rear them. If we left all the caterpillars in the butterfly house, they would destroy their host plants, leaving nothing for future generations.

Adult butterflies drink nectar with a long tube called a proboscis. The nectar sources in the butterfly house are varied and include non-native tropical plants (which we overwinter in a greenhouse), as well as native plants. Some excellent sources of nectar are confetti plant (*Lantana*), Pentas, butterfly bush



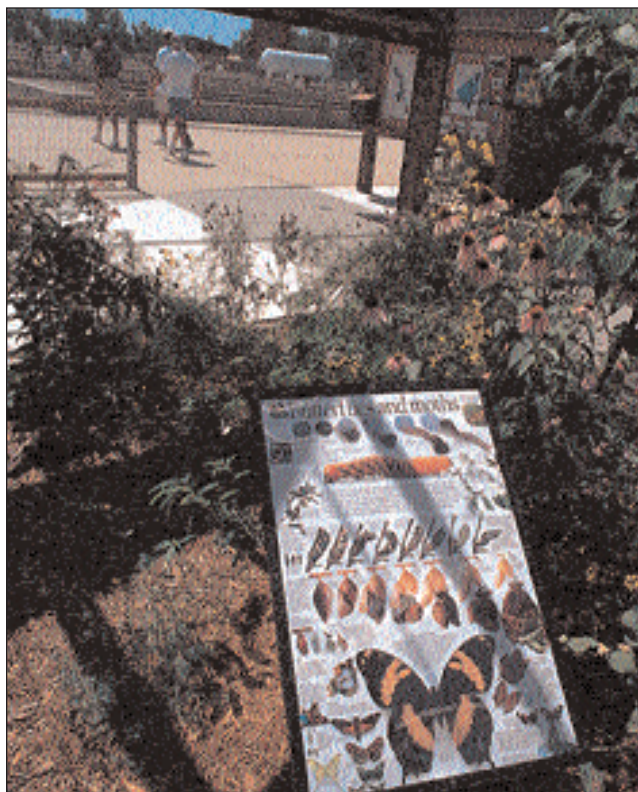
Black swallowtails are also raised at the Butterfly House. Local gardeners provide swallowtail caterpillars which are raised indoors before being transferred to the house.

(*Buddleia*), purple coneflowers (*Echinacea*), bee balm (*Monarda*), gayfeather (*Liatris*), lemon mint (*Monarda*), Joe-Pye weed (*Eupatorium*), and Illinois bundleflower. Artificial nectar is also supplied in a butterfly feeder.

The summer of 2000 will be the fifth season for the Milford Nature Center Butterfly House. Each season has been a learning experience, and no two seasons have been alike. Garden spiders and assassin bugs ate most of the butterflies in the first year. (It never occurred to us that other arthropods would become the major predators.) More than a few times, we have had more caterpillars than adults. (Adults don't live long enough for their offspring to

reach maturity before they die.) And grasshoppers have infested the gardens a time or two. (The small nymphs made their way through the shade cloth and became "trapped" as they grew.) Several Nature Center box turtles live in the butterfly house now and always come promptly when they see someone in the house, waiting to be given a nice, fat grasshopper treat. (Their charm outweighs their potential to eat the guests of honor.) Prairie-lined racerunners scurry under the door and a few Great Plains toads also find the butterfly house a charming place to live. They don't seem to inflict serious damage, but they have been known to eat a butterfly now and then.

All in all, the butterfly house is improving each year. This year we will add two large interpretive signs explaining butterfly life cycles and monarch migration. The path was concreted last year, and many new plants were added. Look for the butterfly house to be at its peak during the months of August and September. We will open the doors in late May and keep it going as long as the weather permits and the butterflies cooperate. ♡



Interpretive displays allow visitors to learn about native butterflies, as well as critical habitats necessary to survival.



# Fishing With A Bow

text and photos by Mike Blair  
*associate editor/photographer, Pratt*

*Bowfishing for rough fish can be a unique experience for anglers and good stalking and shooting practice for bowhunters. And best of all, carp and other rough fish are found statewide in creeks, rivers, ponds, lakes, and marshes.*



“**T**ulu macha! Tulu macha!” the Nepalese teenager shouted as he danced out of the way of my fishing line. Holding a recurve bow in one hand, I struggled against the lunging carp as it ran for deep water. It was a big one — 12 pounds — and it made quite a commotion as it surged through a riffle in Little Sugar Creek.

No match for the braided fishing line, the carp flopped onto the rocks and was quickly in hand. I hefted the fish to a grinning Shuria Manshakia, a foreign exchange student touring the United States. As a

16-year-old Kansas 4-H member, I’d been asked to show the visitor from Nepal how youth spent their time in our state. Naturally, I took him to the creek for a day of bowfishing.

It hadn’t gone as expected. Mulberries which normally attracted fish to the surface had quit falling, and for half an hour, we never saw a carp. This was made more difficult by a language barrier. Shuria spoke only halting English, and I knew nothing of Nepalese. We talked politely as best we could, sweating in the Kansas late morning. He said that his grandfather had taught him to read palms,

and offered to show me the future. I extended my hand, and learned I was to father 12 children and serve as a U.S. president. Just then, we saw the fish.

It was twice as big as a normal creek carp, swimming just under the surface some 30 feet away. I drew the heavy fiberglass arrow and held high for the long shot with my 40-pound bow. The arrow lobbed in for a lucky hit, and the water exploded as the carp fought to escape.

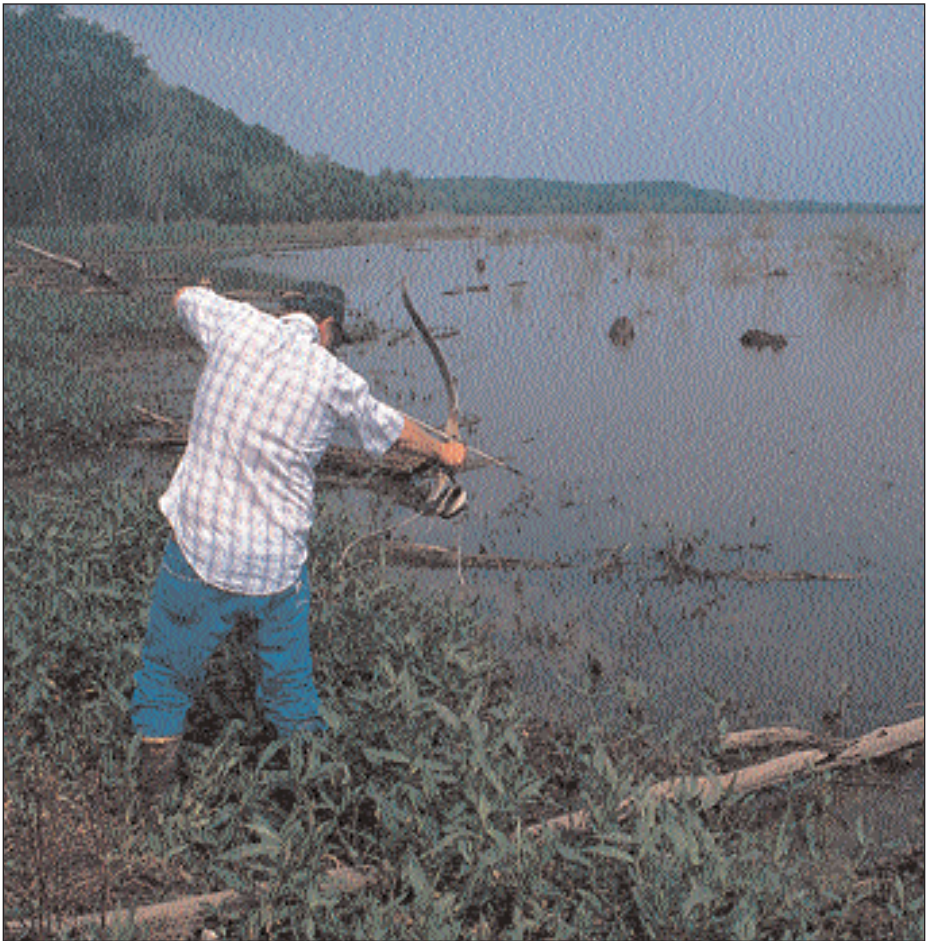
The excitement that followed made the morning worthwhile. Shuria was thrilled with a suc-

cessful hunt, and I learned the only words I know of his high mountain language: tulu macha — big fish! We parted that afternoon, never to meet again. He may still be reading palms. For sure, I'm still bow-fishing.

So is anyone else, who has known the rush of stalking and harpooning a large Kansas rough fish. All non-sport fish can be taken legally with bow and arrow, and species such as carp, buffalo, gar, and white amur can often redefine an angler's perception of "big." Some of these fish can weigh nearly 70 pounds, and weights above 20 pounds are common. They are accessible throughout the state, flourishing in ponds, lakes, streams, and drainage ditches. They move readily when it floods, providing key hunting opportunities. Finally, since they are considered "trash fish" that muddy waters and crowd out more desirable sport fish, bow-fishing is allowed on nearly all public waters. It's usually easy to get permission on private property, as well.

Bowfishing is an exciting blend of fishing and hunting. Thanks to the abundance of rough fish, it's usually not hard to find targets in shallow water. Even so, knowledge of fish and their habits is useful. One may boat, wade, or simply sneak along a shoreline when searching for fish. The sport is like hunting in that it often requires a stalk on spooky quarry. A fish is shot with a barbed fishing arrow attached by line to a reel on the bow. It is then reeled or pulled in by hand. Due to the difficulty of seeing fish in water, most shots are taken at close range.

Equipment for bowfishing can be sophisticated or simple. Fortunately, start-up gear can be quite inexpensive. Since there is no minimum draw-weight requirement for bowfishing, practically any long, recurve, or compound bow can be used. Crossbows are also legal. However, to ensure adequate cast of heavy fiberglass fishing arrows, bows with draw weights of at least 25 pounds are recommended.



Shallow backwaters or marshes are great places to find carp. In addition to bow, arrow, and reel, a pair of sunglasses with polarized lenses will help you see fish in the water.

A variety of commercial bow reels is available, ranging from large spincast reels such as the Zebco 808, to shoot-through or inexpensive spool models which must be hand-wound. Suitable reels can also be fashioned from small cans or wooden wedges. Reels can be taped to the bow or mounted with various commercial adapters. Line capacity varies by reel type, but generally, 20 yards is adequate.

Heavy fishing line is needed. Line attached to fishing arrows is constantly worn by brush, rocks, and fish scales. Fishing arrows may penetrate or hang up in underwater stumps, roots, or rocks, making it necessary to pull the line with considerable force to retrieve the arrow. Hundred-pound-test braided line provides strength without affecting arrow flight at short range. New, thin-diameter lines with even higher test weights are also good choices.

Fishing arrows are made of solid fiberglass to withstand the normal shocks associated with bowfishing. These arrows resist bending or breakage when shot into submerged rocks or large fish. Because they are heavy, they shoot differently than wood or aluminum arrows. Practice is necessary to gain accuracy. Bowsights aren't necessary but are helpful.

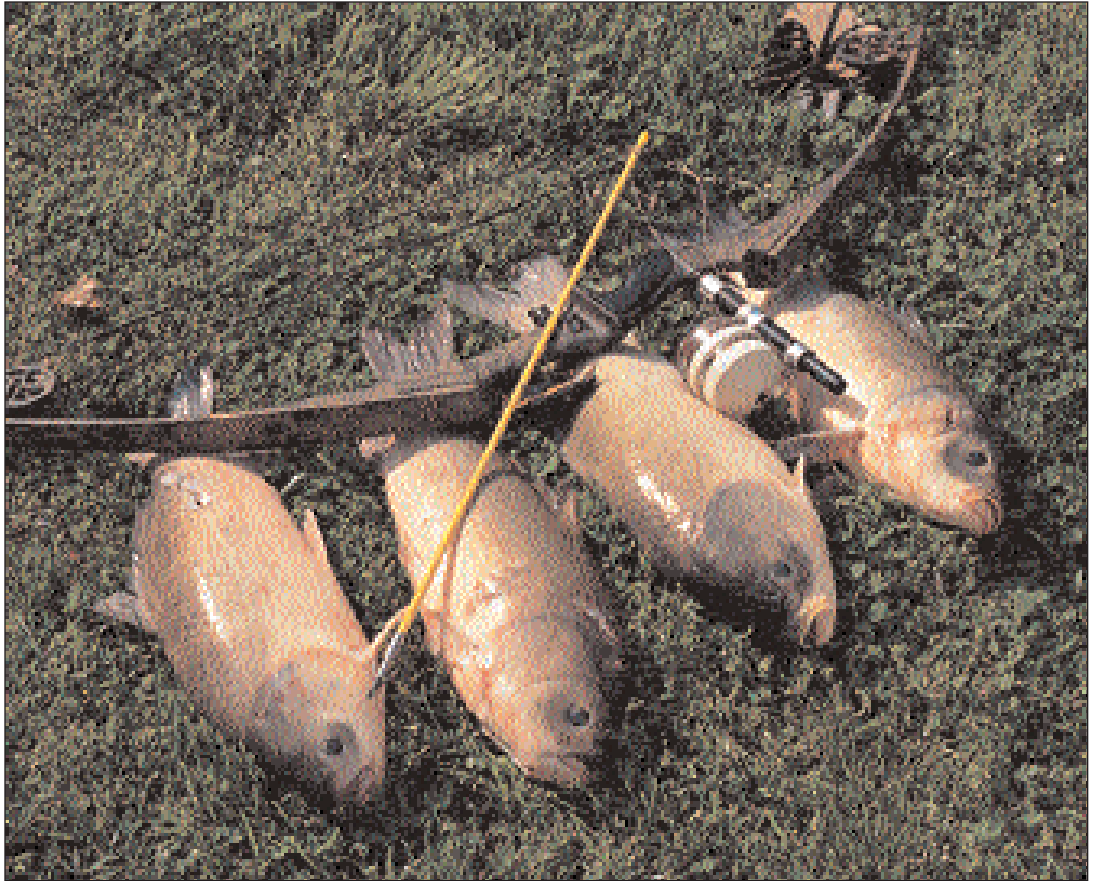
Finally, arrowhead selection is important. Legal bowfishing heads must be barbed to prevent fish from escaping the arrow. Inexpensive models have smooth, cone-shaped points best suited for small fish up to about 10 pounds. These points must be disassembled by unscrewing to remove the barb, allowing the arrow to be removed from the fish. Unfortunately, this may result in losing the point or barb in deep water, ending the hunt. More expensive arrowheads

have hardened chisel points that cut through the thick scales and bones of larger fish. Barbs on these arrowheads can be reversed without disassembly to allow easier fish removal. The extra cost is worth it.

Bowfishing is a close-range sport, due in part to sight restrictions. Fish may be located in various ways. Deep fish in clear water are sometimes noticed when clouds of mud are churned from the bottom as they feed. Unseen, tailing fish may swirl the surface, causing ripples to tip their presence. Swimming fish may bounce against weeds, betraying their courses. Rough fish often slurp loudly through surface vegetation to reveal themselves. At other times, fish swim high out of the water, golden backs gleaming and visible for great distances.

Fish may be shot at any depth they are seen, but aiming is made difficult by light refraction through water. This phenomenon is illustrated by standing a pencil in a filled drinking glass. The pencil appears "broken" at the junction of air and water, since light rays bend as they pass through the surface. To bowfishers, this means that a submerged fish is actually deeper than it appears. Shooting directly at the fish may cause a high miss.

The problem increases with distance and depth. Though complex formulas can yield a precise aiming point, bowfishers have to make quick estimations as fish move. Generally, for a fish swimming 10 feet away and a foot below the surface, the aim point should be about six inches under



A variety of rough fish species can be taken with a bow, including bigmouthed buffalo, pictured here. Rough fish are most vulnerable to the archer during the spawn and when they move during floods.

the target. Trial and error is the only way to learn.

Fortunately, most shots are taken when refraction is not a problem. Fish often break the surface to provide easy bow shots at close range. Particularly during flood conditions, pioneering rough fish some-

times wriggle into water so shallow they appear beached. At other times, they swim along the surface to feed on floating seeds. Gar often lie at the water surface on summer days to gulp air. Surface targets always provide the fastest bowfishing and most exciting hunts.

Calm water is usually best. Fish tend to be more active at the surface, and it's also easier to locate them by sight and sound. However, calm water makes stalking difficult, since movement and water disturbances quickly alert most fish. Rough fish are wary and spook easily. When one fish bolts, nearby fish also swim for cover. Wade slowly to reduce ripples, and place feet carefully to avoid stumbling. Good bowfishing is available throughout the summer, depending on what foods are available.



Grass carp, or white amur, are a challenging quarry common in farm ponds. They also get big. This one weighed 57 pounds.



When high water floods terrestrial vegetation, it isn't uncommon to hear and see carp foraging in very shallow water. The fish often move into fast currents, crossing roads to reach new food sites and pioneer new water sources. They are easy targets at such times.

Carp, drum, buffalo, and white amur all relish the cottony seeds of willow and cottonwood. In June, rivers, ponds, and lakes are often alive with the sucking mouths of feeding fish. Fish cruise at the surface, concentrating on floating debris immediately in their paths. These fish can be stalked and intercepted, or often, in the manner of herons, a bowfisher can simply wait quietly for fish to swim past. In deep water, a flat-bottomed boat can make a good shooting platform.

Creekside mulberries always provide good shooting for carp and other non-sport fish. For a month, dropping berries signal an easy feast, and rough fish in large numbers stay close by.

Gar provide bowfishing's most challenging action. Sometimes, they lie in cover near brushpiles, waiting for unsuspecting prey. Their black backs are noticeable but may be overlooked when lying still among logs and limbs. At other times, they patrol

a pool, surfacing momentarily to gulp air before returning to the depths. A surfacing gar often presents only a five-second target, little time to spot, draw a bow, and aim at the disappearing thin line. Fortunately, surfacing gar usually provide many opportunities in an afternoon.

Carp and most rough fish eat quantities of insects, and surface vegetation is a prime feeding site through late summer. Big fish force their way through weeds, sucking at dislodged bugs and spiders. This can provide easy surface bowfishing on preoccupied targets.

Bowfishing's best opportunities come during the spawn. Beginning in April, rough fish congregate in shallow water to lay their eggs in debris and vegetation. Spawning is noisy and obvious. Splashing fish can often be spotted from hundreds of yards away. Fish numbers are often incredible, with pods of fish so thick that one shot may result in multiple hits. Spawning may take

place several times each year, especially when water fluctuates into normally dry vegetation. Last year I shot spawning carp in April, June, and late August.



Many public waters such as Marais des Cygnes provide excellent bowfishing, and benefit from rough fish control.



Floods also provide excellent shooting. Rough fish eagerly move into inundated fields to feed. Road crossings make good hunting places, particularly when water is rising or falling. Fish crossing these shallows are easily spotted, and the danger of stepping into deep water is reduced. Bowfishing a flooded road can provide action as furious as a salmon run on an Alaskan stream.

There are neither size nor creel limits on non-sport fish, but ethics come into play. Bowfishers should be sure of their targets to avoid shooting sport fish. Since it is easy to shoot more than a hundred pounds of rough fish in an outing, think about disposal. Don't shoot fish and leave them on the bank. Some anglers clean and preserve

their catches, some share as food with others, some donate to animal rehab centers, and some freeze for later use as trap baits, etc. Bowfishing catches may not be sold.

Bowfishers must possess a valid Kansas fishing license unless exempt by law. Fishing arrows must have barbed heads and must be attached to the bow by a line. All waters are open to bowfishing unless otherwise posted. Bowfishing is not permitted within 50 yards of any occupied boat dock, swimming area, or picnic site. For courtesy's sake, bowfishers should not intrude on other anglers.

Few outings are as certain to provide shooting opportunities as bowfishing. This is a fine introduction to the Kansas outdoors, and adventure waits as close as the nearest creek.

The romance of the bow and arrow adds interest, and the excitement of a fish on the line is unforgettable. There is no better way to meet tulu macha. 🏹



#### Tips On Fishing Arrows and Points

Fishing arrows come equipped with rubber fletchings and a predrilled hole at the rear of the arrow for line attachment. In normal rigging, the fishing line is threaded through the hole, extended along the shaft, and tied to the arrowhead. Many bowfishers remove the fletchings (they don't improve the flight of heavy fiberglass arrows and usually tear free anyway), and modify the arrow to provide a quick-release system.

To modify a fishing arrow, enlarge the rear hole of the arrow by re-drilling it with a 1/8 inch diameter drill bit. Tie a 3-inch-long loop at the end of the fishing line and insert the loop through the arrow, doubling it back over the nock. To remove a fish, simply push the arrow through so that the fish is confined only by the fishing line. Then unloop the line over the nock and detach the arrow. Stringer the fish and slide it off the fishing line. Attach loop to the arrow to resume. This system does not allow fishing line to be attached directly to the arrowhead, which might secure a shot fish if the arrow should break. However, in all the years I've used it, this has never caused a problem. - the author



# Paradise

by Kathy Pritchett  
*Parks Division, Pratt*

photos by Mike Blair

*They took all the trees and put 'em in a tree museum,  
And they charged all the people a dollar and a half just to see 'em.  
Don't it always seem to go  
That you don't know what you've got 'till it's gone.  
They paved paradise and put up a parking lot.  
—Joni Mitchell, "Big Yellow Taxi," 1970*



Most of us don't give trees much thought. Of course, we plant them in our yards and rake their leaves in the fall, but we don't think about how important they are to our daily lives – unless they're gone. Trees don't seem like such a big deal, and aren't even a part of the historic image of a Kansas prairie landscape. Yet the trees that existed here a hundred years ago were as vital to life as the ones that exist now. In the early days, trees on the prairie meant water; the stately cottonwood that is our state tree marked streams for travelers.

Humans are adaptive creatures. When trees were not abundant enough for use in building homes, pioneers substituted stone or sod. When trees were not available for fuel, they substituted buffalo or cow chips, or oils. When trees were not available for fence posts, they used stone.

Nevertheless, once the bare necessities were provided, early settlers began making improvements to their homesteads. Many planted cedar trees for windbreaks and Osage-oranges for fences. Other trees were planted to provide lumber or food. Some were planted for aesthetic value, such as the redbud for its colorful spring show, or others to remind the travelers of home. The shady avenues in our towns and cities today are the result of man's efforts to adapt.

As outdoor recreation grows in importance, so does the need for trees where man goes to recreate. Trees are very important to parks. Imagine a July picnic in Kansas without the cooling shade of a leafy tree. Experienced campers know the comforting effect of a windbreak on a tent. Trees and shrubs also serve as campsite dividers, affording privacy and a sense of "getting away

from it all."

Because of the importance of trees, managing them is a time-consuming, high priority goal of the Kansas State Park system. New campsite areas, such as those at Hillsdale State Park, need trees that require intensive labor. At other parks, erosion may threaten trees. At some, diseases, insects, rodents or beavers may pose problems. Drought stress may require extra work. Always, camper activity affects trees. Park trees must be constantly evaluated and provided with appropriate care.

During the past decade, flooding has been the most significant factor affecting state park trees in Kansas. The devastating floods that inundated the Midwest in 1993 and 1995 had many far-reaching effects. High water affected many locations, destroying an estimated 500,000 state park trees. While some trees were uprooted and lost in the



immediate inundation, others died as a result of prolonged submersion or because deposits of sand and silt starved their roots of oxygen. Other trees survived the initial devastation, but succumbed to disease or high winds in later years as a result of the stress of flooding.

Glen Elder State Park lost all but 24 trees below the contour line 30 feet above conservation pool. At Prairie Dog State Park, thousands of trees succumbed to the flooding of 1994 and 1995. Most of those trees were cottonwoods from the riparian areas adjacent to shoreline camping sites below conservation pool. Wilson State Park lost nearly 75 percent of its trees in the 1993 flood, including most big trees that were close to the water. Although many of these were replaced, half were lost again in the flood of 1995. At Milford State Park, the actual number of trees removed as a result of flood damage was not counted,

but 28 workers from the Job Training and Placement Act program spent nearly six months doing nothing but tree removal. The Milford Friends Group annually sold firewood from these trees during the years 1993 through 1999. In 1994, the group coordinated a community firewood sale that carried off 52 truckloads of wood.

All flood-stricken parks faced a mammoth job of removing dead trees and replacing them with new ones. In the aftermath of the flooding, many agencies and programs participated in the recovery of the state parks. The Federal Emergency Management Agency (FEMA) provided manpower and supplies. Later, the AmeriCorps program provided workers. The Kansas National Guard provided manpower and heavy equipment. Initial dollars and efforts went to critical facilities and services. Friends groups and local volunteers provided hours of labor. In some cases, they also provided trees.

Partly as a result of this need, a cooperative effort of several agencies developed the Lindsborg Regional Tree Growing-Out Station. The station was developed as a partnership project by the City of Lindsborg, the National Tree Trust (NTT), and the Kansas Urban Forestry Council (KUFC). Funded as part of a \$20 million NTT program which sought to establish a major tree-growing station for each state, the five-acre Lindsborg site was developed to help plant trees in central and western Kansas.

During its first two years, volunteers at the station potted about 30,000 seedlings a year. Distribution of trees began after two years. Four years later, the station has grown out more than 100,000 trees. In 1996, the Department of Housing and Urban Development nominated the Lindsborg station as one of the "top 25 innovative problem-solving projects in America."

Kanopolis State Park Manager Rick Martin serves as liaison between the station and the Department of Wildlife and Parks. The tree grant opportunity eventu-

ally involved parks employee assistance from Kanopolis, El Dorado, Tuttle Creek, Webster, Cheney, Milford, Crawford, Pomona, Eisenhower, Scott and Toronto state parks. To date, more than 6,000 trees from the station have been planted in state parks.

At the same time, Martin also coordinated the transfer of more than 10,000 small Scotch pines to the Lindsborg station from the El Dorado Habitat Center. These trees, produced through a cooperative project between the Department of Wildlife and Parks and the Department of Corrections, were spared from becoming casualties when the Habitat Center's tree-producing section was closed. Through Martin's efforts, an inmate crew from the Ellsworth Correctional Facility now assists at the Lindsborg station. This ultimately benefits tree replacement in Kansas state parks.

One of the first beneficiaries of this work was Wilson State Park. Many hackberry and locust trees were planted, but these soon developed disease problems. The most successful tree planting at Wilson has been lacebark elms received through a program sponsored by IGA stores. In this program, children received elm seedlings and planted them in the parks. The program not only supplied trees, it exposed the children to the park and gave each child a personal stake in his or her tree.

Wilson established a new procedure to help ensure the survival of newly-planted trees. The staff ran a line of PVC pipe near tree plantings, then drilled holes in the pipe, placed emitters in those holes, and ran tubing directly to the root system of each tree. The system is utilized during extremely dry conditions and has contributed to the survival rate of the trees.

Webster State Park has planted about 1,500 trees since the flood of 1993. About 500 of these trees have come from the Lindsborg station, with about 300 more scheduled for pick-up in March. Approximately 700 trees were provided by K-State forestry. However, the best success

with tree planting has come from a project in which AmeriCorps members, the inmate crew and various seasonals transplanted about 300 cottonwood saplings from dense stands on Webster Wildlife Area. Some of these trees were also planted on Glen Elder, Cedar Bluff and Wilson State Parks. Webster has had the best luck with plantings of cottonwoods, ash, hackberry, redbud, and hawthorn.

Milford State Park has hand-planted more than 800 trees since 1994. Approximately 150 of these needed replacement without the impact of flooding, but the rest were related to flood damage. Another 1,000 trees were moved from remote areas of the park utilizing the tree spade. This provided trees up to 12 feet tall to create shade as fast as possible. Other saplings were planted in a nursery setting for later transplanting to the campgrounds.

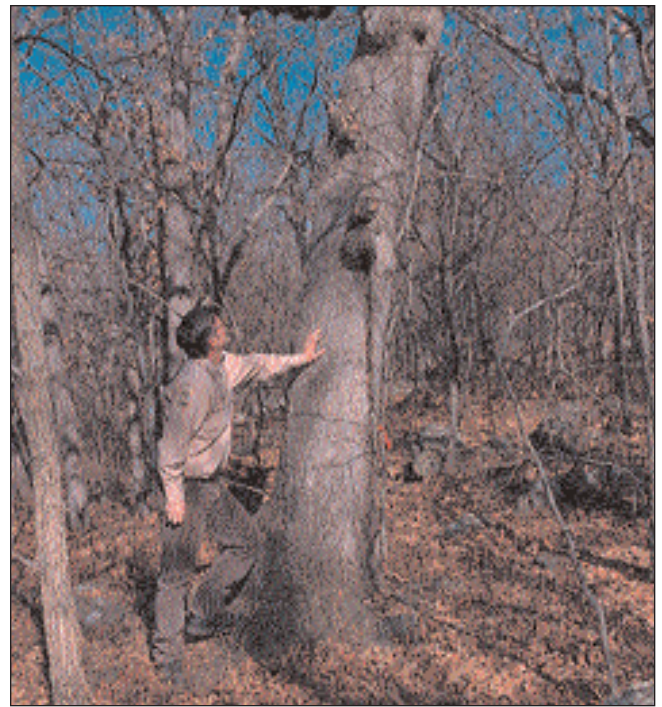
Some Kansas state park trees that provide shelter today were around during a great part of the nation's history. A few of the dead oak trees removed after the flooding at Milford State Park were 140 to 158 years old, meaning they would have been saplings at the beginning of the Civil War. Some of the living post oak and blackjack oak trees at Toronto State Park date back as early as 1728, nearly 50 years before the Declaration of Independence. These ages are confirmed by university scientists who bored the trees with special tools to measure their ages.

Toronto and Fall River State Parks are heavily timbered and popular for their trees. Native forests cover large areas, but several hundred new trees are planted in campsites at these parks each year. Disease, man-induced injuries, previously-planted species not adapted to Kansas, and natural decline take a toll every year. Flooding is common at both parks, though the worst flood came in the fall of 1998. The goal is to plant disease-resistant

native trees that are adapted to environmental conditions in southeastern Kansas. In campgrounds, preferred species are relatively fast-growing, such as green ash and hackberry.

All Kansas state parks generally try to plant native or well-adapted trees to reduce establishment problems. However, experiments continually seek to find other suitable species.

One example is baldcypress planted in the flood plains of Toronto and Fall River State Parks. The closest natural stands of baldcypress are found in southwestern Arkansas and southeastern Oklahoma, but they have taken well to conditions that exist at Toronto and Fall River Reservoirs. Baldcypress trees planted several decades ago on the west side of the lake at Toronto State Park are doing well. The Department has been



Not outwardly impressive, this post oak is one of a handful at Toronto State Park determined to be nearly 300 years old.

planting several hundred of these trees annually for the last several years due to their ability to survive the harsh conditions on these reservoirs. Baldcypress is seasonally drought-tolerant and can survive in the dry Kansas summers. This species is also able to tolerate extended periods of flooding, making it an ideal choice for the frequent water rises that occur on these reservoirs. It is highly resistant to disease and insect damage, and the flattened tops of mature trees resist wind damage. The cypress is a relatively fast-growing tree, so it works well for plantings in parks with high visitor traffic. A fibrous root system holds the soil and helps prevent erosion along shorelines. Finally, baldcypress is the only shoreline tree at these two reservoirs that the beavers will not chew on or cut down. This may be due to the fact that it is a gymnosperm with volatile oils in the sapwood that make it unappealing to the beaver.

Such successes may not work statewide. Milford State



Following the 1993 flood, Glen Elder State Park lost nearly all its park trees. Replanting will restore the shady habitat.

Park has also tried planting baldcypress trees since the flood, but growth and survival at this more northern location has been poor.

Out west, Prairie Dog State Park has experimented with the Austree, which grew quickly but froze the second year. It sprouted after the freeze, but has not proven to be an adequate substitute for native species.

Glen Elder State Park replanted more than 15,000 bare root seedlings and 1-inch to 6-inch diameter saplings. While the park staff worked continuously to plant and protect these trees, volunteers also contributed more than 2,000 hours to the reforestation effort. The park received and planted trees from K-State, the Lindsborg Tree Growing Out Station, AmeriCorps and Catlin's IGA, the City of Beloit, Louisiana-Pacific Trees for America, the Kansas Bowhunters Association, and private donations. Many of these trees are now 10-25 feet tall.

One interesting tree-related project may have future implications for the Kansas state park system. As part of a master's thesis project, a condition class survey is underway

on the landscaped areas at Eisenhower State Park. The survey's goal is to verify the condition of trees as observed by management. Eisenhower was not particularly hard-hit in the flood of 1995. Trees lost were mostly replaced in 1997. Eisenhower's tree management concerns are more geared to the pattern of planting during its development, rather than flood loss. In earlier years, certain tree species became available through various programs, leading to a tree monoculture. For instance, green ash trees were widely planted in the park several years ago. Those green ash have now become infested with ash borers, and large numbers of trees in close proximity are being lost.

Another purpose of the survey is to determine the effects of intensive recreation on park trees. The trees are continually stressed when campers drive nails or wrap wire hangers around them. They are also stressed by lawn mower and trimming damage during park maintenance. Information learned from this study may help with future tree planting design and culture.

Hazard control is an important aspect of tree management in all Kansas state parks. Dead trees are not only unsightly, they can be dangerous. Diseased, damaged, or deteriorated trees can break and fall on campers and vehicles. This was a major concern at Meade State Park after a devastating wildfire in 1995. Huge numbers of trees had to be removed and replaced following that loss.

Growing trees in state parks is often a difficult task. At Cheney State Park, for instance, shale



Flooding caused severe damage to most Kansas state parks in the 1990s. High water suffocated roots and eroded the soil to kill trees.

layers lie so close to the surface that trees can't develop proper root systems. This makes them vulnerable to toppling in high winds, and more susceptible to death from drought. Young trees must be watered in dry conditions, including the winter. Chemical control of grass around trees can help to prevent damage from trimmers and mowers. Staking helps prevent wind damage, wrapping with plastic prevents sunscald, and wire cages prevent damage from rabbits and rodents on seedlings.

The many tree problems in Kansas state parks require constant attention and work. Because of this, it is important that campers and recreational users treat state park trees with respect. Staking systems should be left undisturbed. Trees should not be nailed or pruned for kindling. They should not be bumped with vehicles. Young trees with fragile branches should not be climbed.

More than 150,000 trees have been replaced in Kansas state parks since 1996. However, much remains to be done, and it will take many years before these new trees reach their full potential. Trees are a beautiful and crucial component of state parks, and the Kansas Wildlife and Parks is committed to maintaining them at their best. ♡



There are many threats to newly-planted trees. Wire cages protect from rabbits, mowers, and ball players.



# TO BUILD A DREAMING POOL

by J. Mark Shoup  
*associate editor, Pratt*

photos by Mike Blair

*The world today is sick to its thin blood  
 for lack of elemental things, for fire before the hands,  
 for water welling from the earth . . .*

*— Henry Beston, The Outermost House*

**W**ater holds a magical attraction for most folks. Whether it's a white-water river or a blue-ribbon trout stream, a large reservoir or humble farm pond, water is always a magnet for humans. Anglers, boaters, swimmers, picnickers — young and old find solace, regeneration, peace in the presence of water.

What more timeless overture between young and old than, "Let's wet a line!"?

A body of water is something most nature lovers long to own.

Those lucky enough to live in the country can satisfy this longing by installing a "farm" pond. I put the adjective in quotation marks because you don't have to be a farmer, or use the pond for farming, to install and enjoy a farm pond.

But a farm pond can be more than salve for the soul. It can capture runoff water and provide water for livestock and gardening, as well as attract a wide variety of wildlife. It can enhance the value of any property. In deepest winter, a pond can even bring out the Wayne

Gretzky or Katerina Witt in us. For children, a pond can provide hours of year-round entertainment much more attractive than the streets, malls, and movie houses in town.

So you want to put in a pond. Where do you start?

When starting a new business, the primary axiom is "location, location, location." While such emphasis may not be as strong when building a pond, location is certainly important. If you are counting on natural drainage to fill the pond, topography will dictate where you put it. Your local Natural Resources and Conservation Service (NRCS) office can help you determine the best spot to catch runoff for a watershed pond.

Land use above the dam will also be an important consideration. Agricultural land may erode, causing siltation that may fill a pond in a few years. Cropland runoff may also contribute pesticides and excessive nutrients that can kill fish or cause explosions of aquatic vegetation. A buffer of pasture between cropland and the pond is preferred.

If a well is needed to fill your pond, the location options are greater. In this case, try to pick the spot that contains the most clay in



the soil. (A soil survey map may be obtained from your local NRCS office.) Clay or sandy clay are the best soils. Avoid areas with outcrops of shale, limestone, sandstone, or other imbedded materials. For aesthetic reasons, a pond near trees is always nice. Trees also block wind evaporation and harbor insects, which can provide food for fish. However, thirsty roots may offset this benefit.

Cost can vary greatly, depending on the topography and soil type of your land and whether you dam or drill. One landowner may spend \$2,000 or \$3,000 for a 5-acre pond while another landowner may have to spend \$6,000 to \$10,000 for 1/2 acre. However, shortcuts designed to save money usually end in disaster. Get professionals to do the work right. Costs can be held down by leaning heavily on your NRCS agent for technical assistance. Be sure to ask them what services they provide, from soil analysis to pond design.

Once you've decided where you want to put the pond, you must research how best to build it. The first place to check is the NRCS office. Ask them to test your soil to see if it is capable of holding water. This will require primarily clay soil.

(If your soil is too sandy, there are still options, which will be discussed later.) There may also be erosion-control issues that need to be addressed.

If you are going to fill the pond with groundwater, a permit from the Kansas Department of Agriculture, Division of Water Resources will be needed. Also, a structure permit is normally required on the dam if it will impound 30 acre-feet of water or more at the lowest elevation on the dam. A water appropriation permit is normally required if more than 15 acre-feet of water will be impounded by the dam.

Drilling is an expensive option — perhaps \$2,000 to \$5,000. Also, there may be some reason you cannot obtain a recreational-use water right. Get the permit first, then dig.

In any of these cases, apply for and obtain the permit BEFORE proceeding. The permit process may take two months or more, and you will likely want to fill your pond as soon as it's built.

If your soil is porous, the conservation district can provide advice on liners or mixing clay in the soil. Additional advice on development and maintenance of a farm pond

may be obtained from the Department of Wildlife and Parks and Kansas State University.

(Note: Caution should be taken before spending much money on soil additives such as bentonite, which is sometimes touted as a cure-all for sandy-soil ponds. While bentonite itself is a sticky, water-tight clay that swells when wet, there is no way to guarantee that a certain amount will seal a pond. If you do use such additives, be sure to disc them into the soil well and pack the soil afterwards with a sheepfoot packer. Seek the advice of pond specialists before proceeding. Once the pond has water in it, fixing leaks can become a nightmare.)

The next step is to find a contractor. Look in the telephone directory under "Excavating Contractors." Be sure to quiz potential contractors on their experience with ponds. Ask them if they can give you advice as the project develops, particularly concerning what soils seal, preventing leakage, and dam construction, depending on the type of pond you are installing.

Also, ask for advice on filling the pond, particularly if there is some danger of the pond's seal being



Building a pond requires much advanced planning. Soil must be typed and permits secured before starting. Make sure the contractor has experience building ponds.

eroded. It may be necessary to lay down plastic or some other kind of splash guard before the pond is filled. Advise the contractor that you are going to stock fish (if you are). According to the Wildlife and Parks' *Producing Fish and Wildlife From Kansas Ponds*, spring-fed ponds should be at least 8 feet deep over at least one-quarter of the impoundment. Runoff ponds should be 15 feet deep over one-quarter of the impounded area in western Kansas and 10 feet deep over that much area in the east.

Once you have contracted, the fun begins. Just watching the project evolve is fascinating, and once the pond begins filling, it's like magic. Within a few days, depending on method of fill, that huge hole becomes a crystal-green lake. But there's still plenty of work to do. In fact, this is when the real fun begins.

Considering that this will be a recreational pond, it should be fenced from all livestock to prevent damage to the dam, spillway, and other construction. (If water is needed for livestock, allow only one or two watering points.) Plant grass and other vegetation on the dam and banks to prevent erosion. Native grasses, legumes, and forbs will provide erosion control as well as wildlife habitat. Dams may need the extra protection of rip-rap.

For many new pond owners, stocking fish will be the highlight of the experience. Here, too, advice is necessary.

"Stocking the proper ratios of the proper fish is critical to a healthy fishery," says Wildlife and Parks Fisheries Section chief Doug Nygren. "We usually recommend some combination of channel catfish, largemouth bass, and bluegill, and from there you can choose to manage your pond for the optimum numbers of the species you want."

For initial stocking, Nygren recommends 500 bluegill fingerlings, 100 channel cat fingerlings, and 100 largemouth bass fingerlings per acre, with 2-3 pounds of fathead minnows added for initial forage. One alternative is to stock the bluegill, channel cat, and fathead

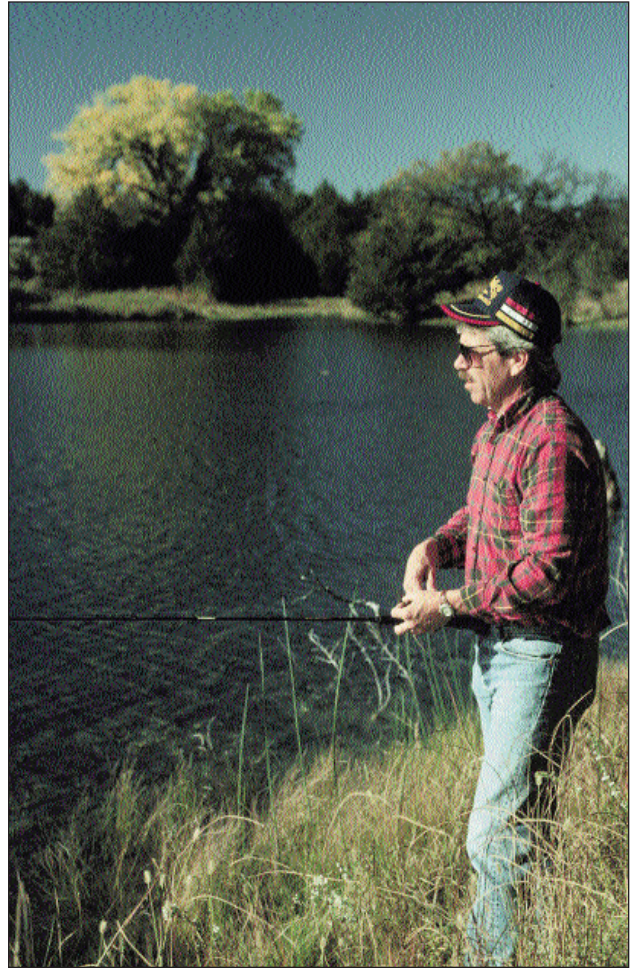
minnows in early spring and then add 8-inch bass in late summer. This will ensure a healthy bass population and allow the channel cat and bluegill to grow before the heavyweight predator is added.

"This formula will take at least one year before the pond is fishable," says Nygren, "but you can create an instant fishery by stocking big fish." By big fish, Nygren means 50 8- to 12-inch bass, 200 4- to 5-inch bluegill, and 50 8- to 12-inch channel cat per acre. This will minimize loss if a wild fish population is present.

It will also be more expensive. Stocking fingerlings will be less than \$200 per acre. Count on several times that for 8- to 12-inch fish. (The Department of Wildlife and Parks will stock ponds free of charge if the owner agrees to allow public access to the pond for 10 years after stocking.)

Fish management options include the all-purpose option — designed to grow catchable numbers of all species; the panfish option — designed to maximize the number of keeper bluegill or other panfish; the big-bass option — designed to produce consistent numbers of large-mouth bass over 18 inches; and the catfish-only option — usually designed for muddy ponds where bass and bluegill cannot see well. (A few turtles and bullfrogs can provide additional pleasure to your pond, especially for children, without damage to the fishery.)

In each case, harvest must be controlled. Restocking may be required every few years. All these options are outlined in the booklet, *Producing Fish and Wildlife From Kansas Ponds*.



Wildlife and Parks district fisheries biologists can provide technical assistance for proper fish stocking ratios.

Maintaining water quality will be an important component of a your pond success, both for fish health and swimmers' enjoyment. Water should be free of contaminants and have high oxygen content. To maintain these qualities, water depth must be maintained, and water may need to be aerated. Ask your NRCS agent about this.

Before you stock, you will likely need to add some habitat enhancements, such as sunken trees or old tires, for cover and spawning sites. In addition, you may want to "inoculate" your pond with a 5-gallon bucket of pond water from another successful pond. This will provide phyto- and zooplankton vital to the very small fish, especially fathead minnows. (More advice on this and other stocking options is available from your local fisheries biologist. Contact Wildlife and Parks' Pratt



Operations Office to find that person's name and phone number.)

"Once a pond is installed and the fish stocked, a few management concerns should be kept in mind," says Nygren. "Aquatic vegetation should be encouraged but controlled to provide a balance of cover for prey, and forage areas for predators. Plants also harbor beneficial insects and produce oxygen. But too much vegetation can deplete oxygen when plant materials die. Vegetation should be controlled when it covers more than 20 percent of the surface area of the pond."

Also take care to protect your pond from damage. Wave action, muskrats and beavers, leaking, washout, turbidity, and shoreline deepening are all threats to your cherished investment. Seek technical assistance through your local biologist or county agent at the first sign of damage to your pond.

While fishing, swimming, and picnicking are the most obvious reasons for putting in a pond, many

people like them because they attract wildlife.

Buffer strips of unmowed native grass and forbs adjacent to farm ponds can lure wildlife, providing cover and nesting and denning areas for a variety of species. The strips can also prevent erosion and keep your pond clean.

"Kansas lowland switchgrass will give you a jungle," says wildlife biologist Charlie Swank of Ellinwood. "It's great for a lot of species, but it may be too tall for quail, and some people. You might want to use a shorter species of switchgrass, such as Blackwell. Combine this with Maximilian sunflower and legumes, including alfalfa, sweet clover, partridge pea, and Illinois bundleflower. Shrubs should include American plum, wild currant, fragrant sumac, sand plum, and choke cherry. If you want trees, eastern redcedars are hard to beat. Both black locust and honey locust are also popular." Sawtooth oak will produce acorns

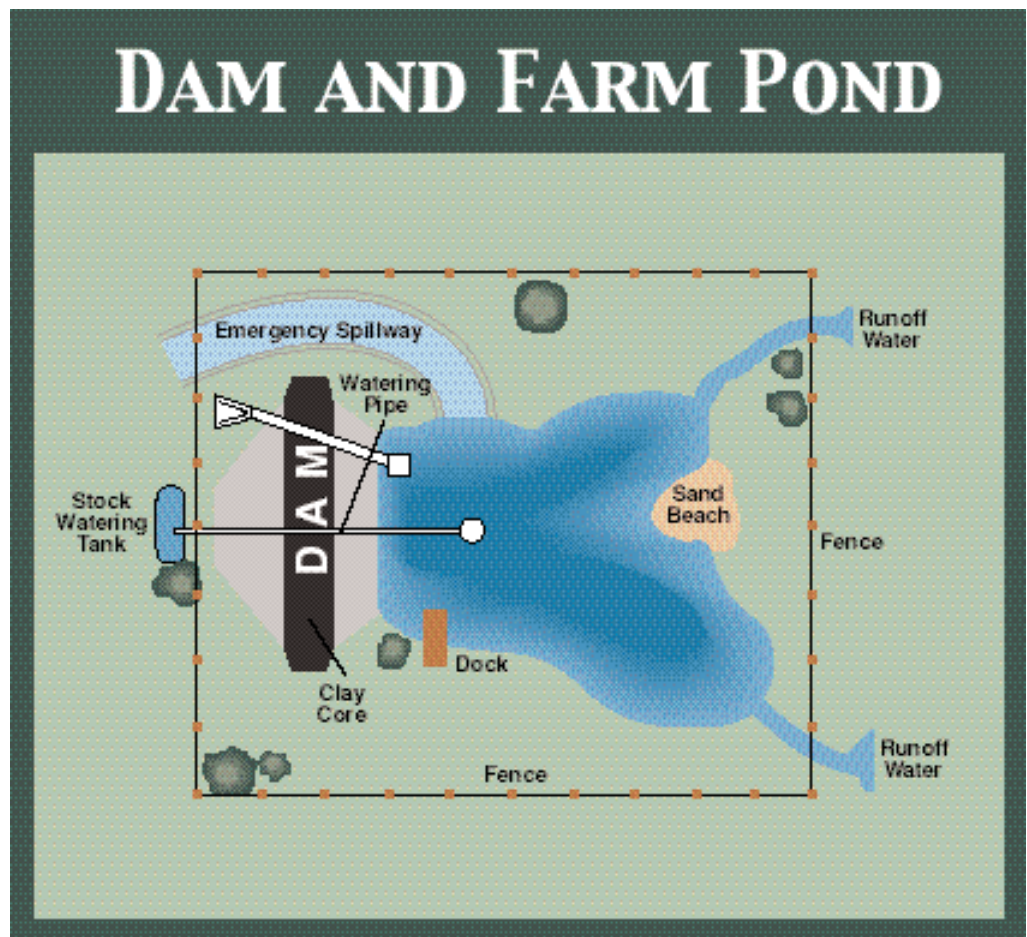
within five to eight years of planting and may provide a quick-growing alternative in some areas.

Avoid planting woody vegetation on or around dams because the roots can be destructive. Plantings should be planned to allow the greatest amount of "edge" and diversity for wildlife. Once again, contact your local biologist — in this case, wildlife biologist — for technical assistance and planning.

Developing a pond on your property can magnify its value many times over. Imagine sitting next to a serene body of water as the summer sun sets. The barbecue smokes; the kids fish. A top-water lure glides across the surface, and all is right with the world.

If you are lucky enough to have this little piece of heaven on earth, share it with a kid. Pass on the tradition, and perhaps one day, when you are old, sitting by this pool and dreaming about these days, someone may tap on your shoulder and ask, "Hey, Grandpa. Let's wet a line!"

Building your own farm pond will be less frustrating if you plan first. Enlist the help of professionals and use all the resources available to you. Before you start, contact the Natural Resources Conservation Service, the Kansas State University Extension Service, and the Kansas Department of Wildlife and Parks. All of these sources can provide valuable information and assistance.



# Conservation Officer

text and photo by Mike Ehlebracht  
*conservation officer, Great Bend*

***Fifth in the series profiling the men and women who patrol our state enforcing wildlife and outdoor recreation laws.***



Dick Duling seems to have a “nose” for wildlife violators. In fact, he has several noses that have been credited with snooping out all sorts of crimes.

Duling is a conservation officer with the department stationed in Franklin and Osage counties. Aside from being a boating enforcement specialist, Duling has carried a long and intense interest in raising and training bloodhounds. He started his career as a park ranger 14 years ago. After two years as a ranger, he moved into a CO position, where he has spent the last 12 years.

Boating specialists are primarily responsible for checking boaters and fishermen in any given region of the state. Anyone who has visited a Kansas reservoir in the summer knows that this can be a huge responsibility. The goal is to keep our waters safe and enjoyable for all citizens. Boating specialists develop a keen eye for the not-so-obvious. On busy weekends, our lakes hold the “usual” folks, doing the “usual” things. But there are also slightly sinister things afloat. These can include everything from drug deals

to floating brothels. COs like Duling take on the special challenge of working to detect these and other crimes, along with safety violations, all while on the water.

Duling got his start in law enforcement through his association with others already in the field. Now he enjoys serving the boating public and wildlife enforcement in general. In addition to training bloodhounds, Duling also likes fishing, hunting and even boating. He shares a common frustration with other COs when wildlife law enforcement is viewed as “not quite as important” as other types.

Some of Duling’s more interesting cases involve, not surprisingly, his bloodhounds. On more than one occasion, he has been called to track down a suspect for another agency. In one such case, Duling used his hound to trail a suspected car thief from the abandoned car all the way to a jail cell. The suspect had been booked in for another offense, and Duling’s dog picked the suspect’s belongings out of all the others. The suspect then confessed.

There have been some close calls as well. Once Duling assisted in trailing an armed suspect who knew he was being pursued. The suspect was forced into the open and other officers captured him. He later told officers that he considered shooting “the guy with the dog” to get away. Duling has also used his hounds in wildlife cases. They were called on to help round up a fleeing deer poacher. When the dog showed up at the suspect’s front door, he confessed.

The first time I met some of Duling’s dogs, he had them in back of a van used for transportation. I opened the door, and except for the occasional snoring sounds, you wouldn’t have known there was a dog inside. Most of the dogs I’ve been around would have been bouncing off the walls. They say that dogs and their owners are often similar in personality and looks. I would say that Duling is a nice, laid back fellow. But rest assured, when it’s time to do the job, he’ll have his nose to the ground. ♡

Edited by Mark Shoup

### RAPID SERVICE

Editor:

I recently contacted Mike Miller regarding additional information from an article of his in *Kansas Wildlife & Parks* magazine. Mike returned my mail (e-mail) within fifteen minutes of my sending it. He gave me a little info that I requested and informed me that he was sending my request on to an expert on the subject, Ron Marteney, fisheries biologist at El Dorado Reservoir. Ron contacted me, answered every question, and is sending me additional information. This is real quality work. These guys enjoy their work and want everyone to enjoy the outdoors of Kansas. The state should be real proud of their work.

I have found that KDWP seems to always present a helpful hand. I feel that I always get my money's worth on my licensing dollars that make it to your organization. Good work. Thanks.

*Charles (Chuck) Reese*  
McLouth

### ALABAMA READER

Editor:

I've been reading your magazine down here in Dixie. I know that you have a Becoming an Outdoors Woman program. We have one here, too, which I recently attended. I've also attended workshops in Washington state. This year, I took Rock Climbing - again - because I wanted to make sure I understand the belay system. I also made it up the advanced wall again. Last time I got a nickname -- Spiderwoman.

I took Flyfishing - again! I finally conquered the double haul and the shooting double haul. I got 70 to 80 feet of line out, maybe a little bit more, and I landed it just where I wanted it to go! I caught a sunfish. Only hit myself in the back once.

Then I took Sticks to Staffs. I got a stick of huckleberry and sanded off the high spots, left some of the bark on it, and sanded for about three hours. Then I took

the wood burner and burned in BOW 2000, burned in a fish on one of the knot-holes, used the knothole for the eye, and burned in the scales. Then I saw this spot for a mountain with some trees in front of it, and finally, I drilled a hole and put in some leather strapping and a few earth-toned beads. Then I put my initials on the lower part of it and oiled it with linseed. I'll wait a few weeks and put on some wax. Fun, relaxing class.

I took Talking Turkey, and went on a mock hunt. The teacher was the tom, and he really had us rolling. We went into the woods and called. I got my yelps, clucks, and purrs down pretty good. It's almost that time, and I'm going to get my city boyfriend out there this spring with a slate and shotgun.

I got filthy all three days I was there, but it comes off.

Anyway, we had a speaker who was blinded in an accident when he was 20 years old. This didn't stop him from hunting, though. He spoke and had us all rolling. Very good sense of humor.

We also had a lady in a wheelchair who will not be in attendance at our October workshop because she's going antelope hunting in Montana!

These folks were an inspiration to me, as the entire BOW program is. I hope Kansas' BOW is as successful as Alabama's.

*-Mitsy Meadows,*  
*Huntsville, Alabama*

### WATER "FOUL" SEASON

Editor:

It is late October in southcentral Kansas, and the opener of duck season is shaping up like it always does. After half an hour of seeing nothing, I suddenly notice a duck flying directly toward me. It's too big for a teal, about the size of a small widgeon. I draw down on the hapless dabbler and stroke my trigger as he crosses the 30-yard mark. The first cloud of steel 4s from my 12-gauge barely fazes the duck, but I splash him with a follow-up shot. With eager anticipation, I wade out through the tepid water to make my

retrieve. Elation turns to disappointment when I realize I've just flamed another 2-pound mosquito.

Slingshotting the offensive *Anopheles* into a weed bank, I sneak a glance over my shoulder, hoping my actions were not witnessed, so I won't have to count the insect against my bag limit. No need to worry; there are no ducks within 200 miles of southern Kansas.

Now it is three months later, near the end of January. While hunting quail with my dog, Elmer, I am shocked by the unbelievable number of ducks circling the same 2-acre pond. Not spoonbills or coots; they are all mallards and pintails, prime ducks. The noise is deafening as they pour in, louder than a B-52 on final approach. Ducks are so thick, I could take a six-bird limit by closing my eyes and slinging a handful of gravel into the air. Alas, duck season ended three weeks ago.

Apparently, the waterfowl pundit who decides duck seasons must have slept through wildlife biology class. He has split Kansas into three arbitrarily-oriented zones that divide the state into western, central, and eastern thirds. This "expert" has failed to account for the fact that ducks migrate from north to south during hunting season.

Why not divide Kansas into northern, central, and southern thirds delineated by I-70 and Highway 54? Open the northern zone first, when ducks fly in from the north. Delay opening the central and southern zones, respectively, to allow southern resident to take advantage of higher waterfowl concentration as ducks fly to the south.

Upland and deer seasons are fantastic, but some quack has ruined duck season. Please consider modifying waterfowl season, so we residents of southern Kansas may use our shotguns to harvest ducks instead of using them in self defense against ravenous hordes of blood-sucking parasites.

*Mike Mackay, Mulvane*

**Dear Mr. Mackay:**

**Duck zones divide the state to match hunt seasons with the preferences of**

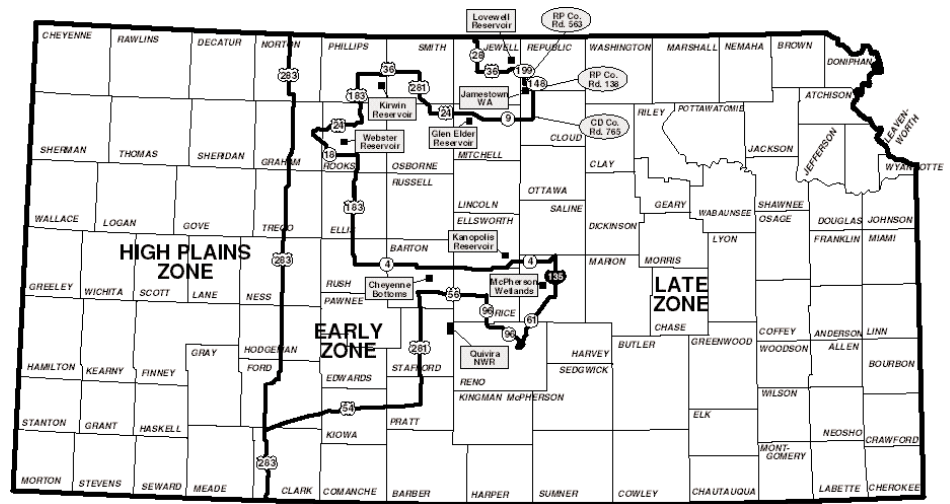
duck hunters. Like you, all hunters usually want the season open when ducks are present in the area they hunt most. The presence of ducks is influenced by habitat type and latitude, *but habitat type is the most important component.*

In fact, a good marsh in southcentral Kansas usually will hold significant numbers of ducks prior to a reservoir in northcentral Kansas, which is more attractive to late season mallards. A good duck marsh on the coast of Texas may even hold significant numbers of ducks prior to the buildup of mallards on a reservoir in Kansas.

Ducks begin migrating through Kansas in late August and continue migrating into and through our state until late December. The timing of migration, as well as peak numbers, varies considerably from year to year, depending on temperatures and precipitation in and to the north of Kansas. As a result, the desires and preferences of duck hunters vary from area to area, and to a certain degree, from year to year.

During recent years, Kansas has been divided into three zones, the Early Zone, the Late Zone, and the High Plains Zone. The High Plains Zone is not really a zone, but a management unit that extends from Canada south through Texas. Extensive banding and survey work during the late 1960s and early 1970s indicated that mallards located in the western part of the Central Flyway (basically west of HY 283) received less harvest pressure and could safely provide additional hunting opportunity and harvest, which is why the season length is always longer in the High Plains Zone of Kansas.

Unfortunately for Kansas residents, most ducks and duck hunters in our state occur east of the High Plains line. The U.S. Fish and Wildlife Service does allow the state of Kansas to set a season in the High Plains independent of the remainder of the state, and that is why it is called the High Plains "Zone." The U.S. Fish and Wildlife Service did not design the High Plains Zone to match the season dates with duck abundance or hunter season preference. Fortunately, the extended season length usually eliminates the criticism of a "closed season when the ducks are in" there.



The Early and Late Zones are true zones, which are intended to allow seasons to better match the presence and availability of ducks. The Early Zone includes management areas such as Cheyenne Bottoms, Jamestown, and the McPherson Wetlands. These areas tend to attract and hold ducks early in the season and lose ducks when cold weather arrives and freeze-up occurs. To a large degree, the remainder of Kansas holds ducks later or is more oriented to late-season mallard hunting.

Almost all hunters have an opinion as to when they would like to have the season open and close, based on their experience on the areas that they hunt. The problem is that season length is limited by the federal government, and with limited days it is difficult, if not impossible, to satisfy everyone. Department staff and the Commission consider *long-term* migration chronology and harvest history, as well as season preference data from hunter surveys when recommending and setting the seasons.

The Central Flyway is considered the "Boom or Bust" Flyway, and Kansas is located in the heart of this Flyway. We tend to bounce between wet and dry conditions, and early and late freeze-ups. The species composition of the fall flight also changes in response to habitat conditions on the breeding grounds. Thus, no two waterfowl seasons in Kansas are alike.

In addition, Kansas is a diverse state, having early season habitat, such as

ponds and marshes, interspersed across the state with reservoirs and rivers. If you combine this diverse habitat base with a duck migration that begins in late August and extends well into December, you end up with widely varying opinions amongst hunters as to just when is the best time to set the season.

After seasons when the weather is warmer and dryer than normal with a delayed migration, most individuals who comment on season dates want a later season. After years when ducks are abundant early in the fall, and/or late season opportunity is limited due to mallards shortstopping north of Kansas or early freeze-up, most hunters then request additional early season hunting opportunity.

*Department staff base most recommendations on 5- or 10-year trends, not the characteristics of the most recent year.*

A good approach to being involved in the season setting process, as well as gaining an appreciation for the preferences and opinions of other duck hunters, is to attend and testify at the late-August Commission meeting, when waterfowl seasons are established. Besides providing input into the regulatory process and gaining an awareness of the desires of other hunters, some who attend annually view it as an entertaining event, equal to, or better than a good duck hunt.

*- Marvin Kraft, Waterfowl Program coordinator, Emporia*

## FIGHT DRUGS: RECRUIT YOUNG HUNTERS

Ask a law enforcement officer if the War On Drugs is being won or lost in the United States. The officer will probably look you in the eye and respond that it is being lost. Why are we losing this war? There is no single answer or point of blame. Lack of parenting, understaffed law enforcement agencies, a [weakened] criminal justice system, and social and economic problems may all be contributing to drug abuse in the U.S.

Conservation officers (COs) in Kansas are dealing with drug users, dealers, and producers at a level that probably none of us expected when we decided to become game wardens. Kansas Department of Wildlife and Parks (KDWP) COs are finding drugs on fish and wildlife poachers and on recreational boaters. We find drugs being produced or grown on boats, on riverbanks, and in fields. COs stationed near I-70 in western Kansas, where law enforcement is in short supply, are often called upon to assist Kansas Highway Patrol troopers who have stopped drug traffickers.

KDWP has begun a massive campaign directed toward the recruitment and retention of young hunters. This all-encompassing campaign will involve most employees in the department, many of whom have always done this very thing with the youth of Kansas through school and public programs, hunter education, and news releases. However, the new Hunter Recruitment and Retention Program re-emphasizes these efforts and creates new programs aimed at introducing the youth of Kansas to ethical hunting and helping make hunting a permanent part of their lives. You can bet that Kansas COs will be leading the way in teaching young Kansans the sport, art, and science of hunting.

Hunter recruitment will benefit the wildlife of Kansas through the money spent by these hunters and the conservation ethic instilled in them, and it will ensure that hunting will remain a strong tradition in the lives of Kansans. But the added benefit of this campaign may be fewer youths getting tied into the wrong crowds that might introduce them to drugs. A young person who is caught up in the tradition and excitement of hunting, fishing, and enjoying the outdoors may be less likely to enter into the world of drugs.

—Jim Robinson,  
conservation officer, Goodland

## ALL SHOOK UP

Last January, Conservation Officer (CO) Brian Marks, Concordia, investigated a report of Walk-In Hunter Area (WIHA) signs being moved from some nearby areas to some property that a landowner charged hunters to hunt on. While Marks was working with the landowner and changing the signs back to the proper WIHA areas, he noticed a person walking along some plum thickets on the other side of the field from the road. The person was wearing hunter orange.

When Marks passed the man the second time, he wasn't

wearing any hunter orange but appeared to be fixing fence.

About three hours later, Richard Harrold, Special Operations Section chief in the Pratt Operations Office, got a call from the "fence fixer." He confessed that he had been quail hunting and had laid down his shotgun and taken off his hunter orange when he had seen Marks. He also confessed that he then began acting as if he was fixing fence when he saw the "game warden" go by. But when he had gone back to get his shotgun and hunter orange vest, they were gone.

The caller said he had seen the "warden" go by several times and figured he had come back and picked up his shotgun and vest. He thought Marks had taken them and wanted to confess, so he could get his stuff back.

Ironically, Marks hadn't noticed that the man was carrying a gun, but when Marks went back to investigate after Harrold called him, he walked over to the spot he had last seen the man and found everything the guy thought was taken. When the guy had gone back to where he thought he had left his stuff after "fixing fence," he had looked around the wrong plum thicket, he was so shook up.

The guy was a nearby landowner and hadn't purchased his 2000 license, and he was hunting on his neighbor's land. His wife thought it was all very funny. Marks did not and gave him a ticket for hunting without a license.

—Shoup



## Legislative Work

For some Wildlife and Parks personnel, the busiest time of the year occurs during that peak holiday weekend when all the campers descend on the public lakes and state parks. For others, it might be during the middle of the fall hunting seasons. For some of us, however, the truly hectic season occurs when the Kansas Legislature is in full swing.

*At the time of this writing in mid-March*, the 2000 Kansas Legislative Session is almost two-thirds complete. Wildlife and Parks employees who act as liaisons to the legislature are providing information, drafting testimony, and attending hearings, all in hopes of effectively communicating our vision to provide outdoor recreation opportunities through the stewardship of the state's wildlife and park resources.

Happenings in Topeka may sometimes seem far removed from fields and lakes enjoyed by our constituents, but the actions of our elected legislators can impact every facet of Wildlife and Parks activities, and by extension, the people whom we serve. Decisions by the Legislature set the budget, establish new programs, and enhance outdoor opportunities. Ultimately, the Legislature directs our mission as a state agency.

This year is no exception. Currently, legislative budget committees are debating what level of funding, if any, should be allocated for Wildlife and Parks to acquire and develop wetland property adjacent to current agency wetlands. A joint Senate and House conference committee has yet to decide whether persons over the age of 65 should begin paying one-half price for hunting and fishing licenses, as well as to enter a state park. As always, other legislative committees are closely examining our ongoing efforts to manage deer and to reduce deer populations in certain parts of the state. Right now, the results of these debates and others are unknown, but the decisions will affect Wildlife and Parks in the coming years, and may affect the natural resources and the people of Kansas for a longer time period.

The Kansas Legislature meets annually from early January through early April. Keeping track of the various proposals that are offered, altered, or dropped during that time can be confusing. To help interested constituents keep abreast of ongoing legislation, Wildlife and Parks provides a weekly Legislative Report on the various bills that directly impact our agency. The report briefly summarizes each bill and its current status. If Wildlife and Parks has provided public testimony on the bill, the department's position is also stated. The report is available at our website - [www.kdwp.state.ks.us](http://www.kdwp.state.ks.us) - and provides a link to the state website where the text of each bill can be obtained.

The actual legislative process itself can be confusing. Generally, legislative proposals are introduced in the form of either a Senate bill or a House bill in early January. House bills are then referred to the appropriate House committee for consideration, and must be "recommended favorably for passage" before being addressed by the whole House. The bill is then debated on the floor of the House, and may be amended, before the House votes on it. If approved by a majority of the House, the bill then goes to the Senate, where the process starts over. Senate Bills must go through the same process.

In order to keep the process moving, House bills other than budget bills are usually required to be passed by the House before the middle of the session, and vice versa. This process allows the other side of the Legislature time to adequately consider, amend, or approve the bill before the end of the session. Both the House and the Senate must pass the bill with the same wording before it can be sent to the Governor for signature. Since the two sides often disagree, conference committees involving both representatives and senators often play a critical role in the legislative process. These committees try to work out compromises when the House and Senate have passed different versions of the same bill.

For citizens interested in participating in the legislative process, the most

common opportunity to voice an opinion is when a bill is in committee. A hearing for a bill must be announced ahead of time by the committee chair and is usually announced at the end of the week before the scheduled hearing. In addition to Wildlife and Parks' website report, announcements of bill hearings can be found at the state's website either by reading the daily calendar that includes notice of upcoming hearings or by searching for information about the bill itself in a "bill tracking" section. Even if a person can't attend a hearing, the committee will accept written testimony and make it part of the record.

However, as noted previously, the committee hearing is only the first in a number of steps before the bill will become law, and each bill could be dramatically changed or could be killed at any of these steps. Consequently, public input continues to be important even after a bill is out of committee. By the same token, just because a bill has already had a hearing doesn't mean opportunity to impact the legislation has passed.

Wildlife and Parks tries to remain active at every step of the legislative process in some way, and legislators often look to state agencies for advice concerning proposed legislation. However, legislators ultimately are responsible to their constituents, and input from Kansas citizens can be much more important than any recommendation from Wildlife and Parks.

The department does not ask constituents to support or oppose legislation, but we do provide information and the department's position so that people can form their own opinions. More importantly, we encourage anyone who has an interest in the Kansas outdoors to be involved in the legislative process.

Anyone interested in becoming more involved in legislative issues related to Wildlife and Parks, or any other legislative issue, may visit the department's website, the state legislative website - [www.ink.org/public/legislative/index.cgi](http://www.ink.org/public/legislative/index.cgi) - or call their legislator directly.

-Clint Riley,  
agency attorney, Topeka



# T N C TENTH

Although the Kansas Chapter of The Nature Conservancy (TNC) actually started its work in the mid-60s, it was 10 years ago last fall that TNC opened its doors for business in a small office in Topeka. Here's a look back at TNC accomplishments in Kansas:

*--Plains Keeper*

**1965**

TNC embarks on its first land protection project in Kansas with the purchase of 80 acres between the Arkansas River and the Little Arkansas River in Harvey County, acquired jointly by TNC and Bethel College. Bethel College assumes sole ownership.

**1971**

The 916-acre Konza Preserve is acquired for prairie ecological research. Ownership of this area is transferred to K-State.

**1972**

Eighty acres of pristine forest are purchased in Douglas County and named for donors Ethel and Raymond Rice.

**1972**

At the request of the Kansas Forestry Fish and Game Commission (now KDWP), TNC acquires 1,818 acres in Clark County to establish the Big Basin Prairie Preserve.

**1972-73**

2,188 acres of Flint Hills upland prairie are purchased in Butler and Greenwood counties through the generous funding of Katherine Ordway. With the headwaters of the South Fork of the Cottonwood River on the property, it hosts one of the best occurrences of the endangered Topeka shiner.

**1973**

Mr. and Mrs. Wilson Dingus donate 167 acres in Linn County, which becomes the Dingus Natural Area.

**1974**

The Kansas Department of Wildlife and Parks acquires the Big Basin Prairie Preserve from TNC.

**1974**

Thirty-two acres purchased in Douglas County beside the Ethel and Raymond Rice Woodland. This new forest preserve is named the Roy and Eleanor Wall Woods. This same year, both the Rice Woodland and the Wall Woods are transferred to the University of Kansas for ecological research. They are jointly known as the Baldwin woods.

**1977**

A 7,220-acre ranch next to the Konza Preserve is purchased, and a bid is successful to add another 480-acre tract, expanding the preserve to 8,616 acres. The acquisitions are funded by Katherine Ordway.

**1980**

Ownership of the Dingus Natural Area is transferred to the Kansas Ornithological Society.

**1989**

The first, and only, Kansas state TNC director is hired: Alan Pollom opens the Kansas Chapter office in Topeka. Pollom hires two other staffers.

**1990**

TNC acquires a 300-acre tallgrass prairie in Johnson county, called the Prairie Center, from the Grassland Heritage Foundation. TNC transfers ownership to the state of Kansas. The preserve offers walking trails, catch-and-release fishing at the lake, picnic areas, and a primitive camping area.

**1990**

7,312 acres in Barton County are purchased to begin the conservancy's Cheyenne Bottoms Preserve, next to the state's 20,000-acre Cheyenne Bottoms Wildlife Area.

**1991**

The Kansas Chapter receives the Outstanding State Progress Award of The Nature Conservancy for accomplishments such as the acquisition of 7,269 acres (year 2000 total) at Cheyenne Bottoms, a balanced budget since the office opening, important leadership, and support for the Playa Lakes Joint Venture of the North American Waterfowl Management Plan, as well as initial contract negotiations for the future of Marais des Cygnes National Wildlife Refuge.

**1992-93**

TNC and the U.S. Fish and Wildlife Service cooperate to protect 5,836 acres along six miles of the Marais des Cygnes River in Linn County. The U.S. Fish and Wildlife Service establishes the Marais des Cygnes National Wildlife Refuge.

**1994**

A private landowner donates an easement on 331 acres of his property along the Blue River.

**1996**

Eighty acres are purchased in Anderson County for the Welda Prairie Preserve. Another 48 acres are acquired to add to Welda Prairie in 1998.

**1998**

The latest addition to the Cheyenne Bottoms Preserve is 480 acres.

**1999**

16,320 acres of shortgrass and mixed grass prairie are purchased in Logan County to establish the Smoky Valley Ranch Preserve. Tracts of 160 acres and 320 acres of neighboring property are added to bring the preserve acreage to 16,800 acres.

## TRACKING MIGRANTS

The techniques used to keep track of wildlife populations varies from species to species. For instance, there is only one survey conducted for doves, called the Dove Call Count Survey. This survey, conducted in May of each year across the United States, consists of a number of survey routes 20 miles long. The person running the route begins at one half hour before sunrise and stops every mile to look and listen. The doves seen and the number of doves heard are recorded. We have 26 of these routes in Kansas.

Ducks are surveyed several times a year. The first survey is conducted during May on the breeding grounds (Alaska, Canada, and northcentral U.S.). This survey is conducted using fixed-

winged aircraft flown along established routes or transects. Ground counts are also conducted.

This survey is followed by the July Production and Habitat Survey, which is conducted in the same manner and provides estimates of the number of duck broods and the number of ponds. The results of these surveys are used to develop a Fall-Flight Index. The fall flight estimate for 1999 was 105 million ducks.

Ducks are surveyed once more during the first week in January. This Mid-Winter Waterfowl Survey is used primarily to track the distribution of waterfowl (ducks and geese) throughout the winter range of these birds.

The population status of sandhill cranes is determined by conducting a survey in March of each year when these

birds stage along the Platte River in Nebraska. It is the one time of the year when a large proportion of these birds is present in one area. This Survey is conducted with observers in fixed winged aircraft, using photographs.

Canada and white-fronted goose populations are tracked using winter surveys, conducted by people on the ground as well as in aircraft. Snow goose populations are surveyed on the wintering areas with Canada geese and during some years by using photographs of the breeding colonies located in the Arctic breeding areas during the summer.

Wildlife and Parks conducts additional surveys of waterfowl in early September and continuing through March.

*-Marvin Kraft, Waterfowl  
Program coordinator*

## Wingshooting Video

Have you ever tried to teach someone to shoot a shotgun? Did you find yourself trying to analyze what you do so that you could explain it to your student? Then did you change your mind several times about how your student should try to consistently break those elusive clay targets? Well, there may be no help for you, but the Kansas Department of Wildlife and Parks may offer some relief for your student.

Wildlife and Parks has produced a new video for those just learning to shoot a shotgun. Entitled "Wingshooting Basics", the video was produced for use in the state's hunter education classes.

The video covers the topics of stance and gun mount while highlighting the technique of shotgun shooting known as the swing-through method. Computer-generated graphic models offer a visual picture of what expert wingshooters see when they look down their gun barrels. These graphic demonstrations may be helpful to even highly-experienced shooters who lack formal training.

The swing-through technique of shooting is used almost exclusively in wingshooting schools designed for beginning

wingshooters, and this is the method described in this video. The idea behind the technique is that the shotgun barrel is mounted behind the target (when shooting a crossing target), and the gun is then swung quickly - but smoothly - to catch and pass the target. As the gun's barrel passes the front of the target, the trigger is pulled as the swing is continued.

The key element of this technique is that the swing must be continued during and after the moment that the mind

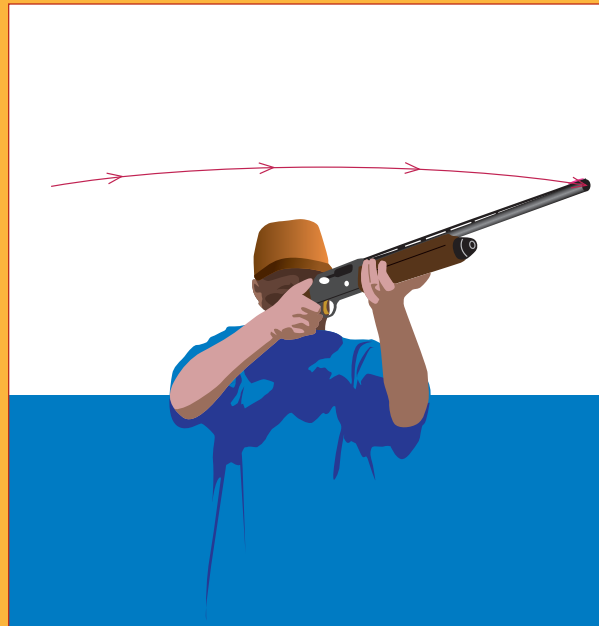
orders the shot. If done properly, a lead is established automatically and without conscious thought. If the mind does not order the shot until the barrel passes the front edge of a crossing target, there will be a split second of reaction time before the gun fires. That split second allows the gun to swing farther in front of the target, establishing the proper lead.

There is no better technique to teach beginning wingshooters. Even if you are an experienced shooter but have never tried the swing-through method of shooting, you should. It simply works.

The video "Wingshooting Basics" is just eleven minutes long and can be purchased for

\$10.60 from the Department of Wildlife and Parks' Outdoor Store in Pratt. Phone (316) 672-5911 for more information.

*-Gene Brehm, videographer, Pratt*





# THE POND Virus

by Mark Shoup



**H**aving recovered from the gardening virus that almost killed me in the summer of 1998, the following summer I found myself ailing again. It was *Virosis aquaticus*, or the pond virus.

This fever peaked last August when I discovered the ideal location for a pond between two shelterbelts behind the barn, an area pinched with giant ragweed the size of coconut trees. Buried in this jungle were some 20 railroad ties – the remnants of an old fence – rising 6 feet in the air.

After hacking through the ragweed with machete, ax, and chain saw and digging, pushing and pulling on one beam for about an hour, I realized that this was actually a genetically-altered tree with a taproot the depth of a nuclear missile silo.

Absently munching apples, Rose and the boys would check on my progress from a nearby corral fence, out of curiosity, concern, or need for comic relief. But they soon wearied of this entertainment and left for town.

*Alright*, I thought, *I'll show them*, and slipped over to borrow the neighbor's tractor. Strangely, the tractor seemed to expend little energy extracting the stubborn posts, and soon they were all pulled and neatly stacked on a concrete pad where Rose would undoubtedly find use for them (and me) in her landscaping plans.

When my concerned family returned, I was sitting on the patio sipping ice tea. As Rose toted groceries into the house, she stopped and looked at me sympathetically. "It's just too big a job, isn't it, honey?" she opined. "It's okay. You're tired."

(At this point, I must note that Rose was not too keen on the idea of a pond. Her two greatest concerns were that it would either leak or one of the boys would drown. At times, either possibility seemed to carry equal weight.)

I pointed to the stack of railroad ties and

said, "Naw, that little job was just a matter of leverage. It took a few tries to get the knack of it." Rose eyed the stack of posts, then me, opened and closed her mouth, and just walked into the house with the groceries.

But my mind was elsewhere; tackling the jungle and excavating a crater therein required the help of combat engineers. The next morning, we awoke to the roar of a big D7 Cat firing up. "What is that?" Rose asked through sleepy eyes.

"That's the Army here to dig the pond." Okay, it wasn't the Army. I had called a local dirt mover the previous evening. The real work had begun. Over the next two days, we all watched in fascination as Mr. Simpson, the dozer man, carved a symmetrical hole in the ground 200 feet long, 80 feet wide, and some 10 feet deep. The boys got to ride on the big machine, and even Rose seemed interested.

Now the hole was dug. It was an impressive hole where once stood the northernmost segment of rainforest in the known world. A nice, big, smooth, beautiful hole.

"That's a nice, big, smooth hole, honey," Rose observed. She ignored "beautiful" but didn't neglect to ask, "Where's the water?"

Had I forgotten to mention the well? Yes, we would have to drill a well, the electrical line for which would run through Rose's garden. "But it will be underground," I assured her. If this project had not yet tested my wife's love, I felt it would soon do so. But Rose, ever surprising, just said, "Don't let them rip out my cotoneaster."

To my great relief, the drillers cut neatly through the garden without harming a leaf. Now Rose was actually getting enthusiastic. "Can we fill the pond now?" she asked.

Not quite yet. Having sandy soil in our country, clay would have to be brought in.

Bags of it. Big bags. Many big bags. Enough big bags to cripple the K-State linebacker corps. To be precise, some 40,000 pounds of bentonite, so named because those who work with it are bent for nights to come.

After I managed to have this evil substance stacked on palates around the "pond," Rose must have taken pity on me. Either that, or she wasn't ready to become a single mom. Anyway, she convinced three foreign-exchange students that it would be a really good deal to tote 100 pound bags of powdered lead around all afternoon in exchange for a good meal.

These kids really must have had to struggle for a meal back home because in four hours, the bags were laid out and opened, and the dusty material that would seal anything from Swiss cheese to White House leaks was scattered about the pond floor.

Next, my neighbor, Phil, came by with his big tractor and disced the bentonite into the soil. "Now we are ready to fill!" I proudly announced that day.

"I hope it doesn't leak," Rose demurred. *Why are women always such skeptics?* Beautiful clear blue water filled the pond all that week.

Then it leaked.

Apparently, that magic dust called bentonite had failed to swell "fifteen times its size when wet," as touted in the literature. Rose, to her credit, did not rub it in. She didn't have to. At least the kids hadn't drowned.

Within a month, I was left to fret through the winter about transforming a crater half full of brown soup into a pond that would hold fresh water and fish and provide a haven for my kids, where all their friends would want to camp and play, safe from the streets of Prattopolis.

In March, it came to me. Cow poop. One evening, I rushed home and began lining the pond with prairie hay. I would then fence off the pond and let my neighbor's cattle attempt what Army combat engineers, exotic ingredients, and valiant efforts of foreign nations could not. I'd let those cows poop and stomp and pack that earth until the pond was afraid to leak.

My ideas are never half-baked (although they are sometimes burnt). If the pond still leaks, Rose will have plenty of fertilizer for her garden.

# Raceway Walleye

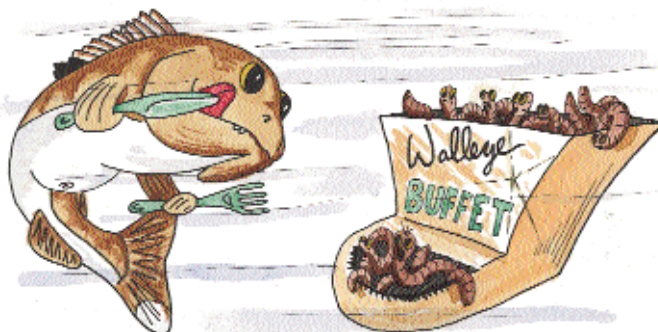
Historically, supplemental stocking of walleye into Kansas waters has consisted of five-day-old fry or 2-inch fingerlings; however, fisheries management biologists have asked for larger stock walleye because they survive better.

This need for larger walleye has challenged fish culturists to figure out how to efficiently raise large numbers of intermediate (7-8 inches) walleye. Supplying intermediate walleye would allow for additional research that could determine the best stocking regime for individual lakes and provide the best walleye populations possible.

To provide intermediate walleye in one growing season (about 4 months), a three-phase culture technique was developed at the Milford Fish Hatchery.

Training Phase I starts with 45-day-old, 2-inch walleye fingerlings that are stocked into tanks. (Walleye fingerlings are grown to 2 inches in hatchery ponds.) To obtain the target size of 7 to 8 inches, walleye fingerlings must be trained to eat a formulated feed mixture. Training Phase I takes approximately 14 days. Automatic feeders are used at Milford to ensure that feed-quantity requirements are met. These auto feeders are on timers set to feed every 5 minutes for 22 hours a day.

Walleye tanks are cleaned daily to remove waste and uneaten feed. Fresh water is also maintained. To prevent cannibalism, tanks must be sorted (graded) every few days so that larger fish stay with



larger fish and smaller fish stay with smaller ones.

In this phase, walleye fingerlings are provided with 24 hours of artificial lighting for a longer feeding period and increased success in training.

Training Phase II trains fish to eventually accept formulated pellets. Generally, the main concern of Phase II is to train walleye to accept larger formulated pellets, which will provide additional nutrients. A 22-hour, 5-minute feeding regime is maintained with the amount of food per day increasing as fish grow. Providing the fingerlings with the correct feed amount and correct feed size is critical to prevent loss of previous training.

Intensive daily cleaning of tanks is required. An increase in fresh water also helps reduce possible stress. Maintaining the correct density and an acceptable size range within the tanks increases success. The 24-hour lighting technique is continued in Phase II.

In the Feeding Phase, walleye are transferred to outside raceways. After five weeks of training, walleye are ready for the major growth period. All fingerlings that make it to this phase are feeding on formu-

lated pellets. Cannibalism is minimal as long as enough food is available. Walleye fingerlings are graded into three major size groups and stocked in outside raceways.

Nutritional requirements of growing fingerlings are supplied with formulated pellets using automatic solar-powered feeders. The amount of feed is calculated to allow each fish to eat 3 to 5 percent of its body weight each day. Feeding occurs every 15 minutes for 15 hours. Each week, daily feed amounts are adjusted.

Providing several gallons of

fresh water each hour and a daily cleaning of raceways helps maintain water quality. At the beginning of this phase, only one-third of the raceway is used. By the end of this phase, 100 percent of the raceway is required to provide the correct density. No additional artificial lighting is used.

Approximately four months after beginning Training Phase I, walleye intermediates are ready for stocking.

Ecological differences among Kansas lakes apparently plays a big role in determining if the traditional stocking regime of fry/fingerlings will be successful or if larger intermediate walleye are needed. In lakes with stable populations of other predaceous species, larger intermediate walleye may be needed to avoid heavy losses to predators. Lastly, larger intermediate walleye may be required to establish a population in a lake where fry/fingerling stockings were never successful.

*-Harold Jagerson,  
fisheries biology specialist,  
Milford*

Milford Fish Hatchery Intermediate Walleye Stocking Program			
LOCATION	1997	1998	1999
Melvem Res.	12,411	15,241	27,494
Milford Res.		510	485
Osage SFL		605	
Carbondale - East		2,063	1,807
Sabetha Pony Creek		1,710	
Milford Supply Lake		1,000	
Woodson SFL		882	
Pleasanton - East		626	641
Bourbon Co. Lake		1,044	
Crawford SFL		754	757
Lake Shawnee		2,100	
	<b>12,411</b>	<b>26,535</b>	<b>31,184</b>

1997: 7.0-inch walleye, 1998: 5.5-inch walleye, 1999: 7.5-inch walleye.

## Sticky TICKS

Ticks are prolific: females lay from a 2,000 to 11,000 eggs apiece, depending on species and how full of blood they get when they feed. It only requires two out of that egg mass to reach maturity in order to maintain the population.

The highest mortality in ticks probably occurs when eggs are eaten by ground beetles, mice, and birds or when the eggs or larvae die from lack of humidity. Lack of larvae finding a host accounts for some deaths. There is a similar gauntlet of weather factors, host-finding success, and predation evasion run again in the nymphal stage and again in the adult stage.

If any factor favors the local tick population in a way that more of them are successful, easily 20 or 30 times the population-maintenance number can survive, and a dense population occurs. Sometimes there are favorable conditions for consecutive years, and truly phenomenal populations result. "Seed ticks" are always numerous because these are the newly hatched six-legged larvae. Their abundance in a given location may be because that location is home to numerous hosts of adult ticks.

Lone star ticks, which are more abundant than other species in eastern Kansas and also the only species we usually encounter in the seed tick stage, are mostly associated with wooded areas.

The tiny seed ticks are mostly gone by late September. The pin-head-sized nymphs are typically around through most of October. The adults are already low in number for the year.

Outdoorsmen and women who can't use repellents can dress in a way to keep ticks from getting onto the skin. Tuck trousers into stocking tops or boot tops, shirt into trousers. Put a band of duct tape around each clothing juncture and twist it so the second wrap is sticky side out. Put another such band just below or just above the knee. --Don Mock, Department of Entomology, K-State

## THE FAWNING SEASON

May and June are the primary fawning months for deer in Kansas. Well over half of all whitetail fawn does breed before they are one year old, usually giving birth to a single fawn. After that, twins are the norm; triplets are not unusual.

Mule deer does seldom breed before they reach one and a half years of age, when they give birth to a single fawn. In succeeding years, twins are normally produced.

In Kansas, the majority of fawns are born in late May and early June, following a gestation period of about 202 days. This indicates that the majority of does are bred from mid- to late November. Fawn does, breeding for the first time, may breed later in winter. Because of this, newborn fawns may be seen as late as July or even August.

At birth, fawns weigh from 6 to 9 pounds. They are essentially scentless for several days. This helps protect them from their primary predators, which include coyotes and free roaming dogs. Fawns remain relatively inactive for the first three or four days after birth. The spots they are born with serve as excellent camouflage.

The doe doesn't stay with her fawns at this time, intentionally staying away to avoid attracting predators. However, the doe always knows where her fawns are, and returns to nurse them four to six times per day.

Humans who find a fawn hidden in this way often assume that the fawn is lost or has been deserted. This is rarely the case. The doe is probably somewhere nearby hiding from sight and will return to care for the fawn once danger is past. Humans should leave these areas as soon as possible and leave the fawn undisturbed. They should not attempt to "rescue" the fawn because in all probability, the fawn does not need help.

Even if the young fawn runs from its hiding place, the doe will find it. If a fawn feels that it is lost, it will "bleat" to its mother. A doe will respond to this call from a surprising distance.

Fawns depend on their mother's milk until approximately five weeks of age. At two to three weeks, they begin to forage on tender, new-growth, vegetation such as grass, weeds, crops, and leaves. By the time a fawn is four months old, it is usually weaned from the doe's milk but may travel with the doe throughout its first winter. As the next fawning season approaches, the doe may show aggression to its grown fawns and drive them from her home range, so she may again fawn in her own territory without intrusion.

Female fawns will often establish territories very close to, and sometimes overlapping their mother's territory. However, the doe will seldom allow buck fawns to remain within her home range and will aggressively chase them when encountered.

Fawn survival seems to be extremely high in Kansas when compared to non-agricultural states. Studies performed in other states have shown a close relationship between maternal nutrition and fawn survival. A Missouri study found that does restricted to a 7-percent protein diet lost 42-percent of their fawns; a 27-percent loss among mothers fed a 10-percent protein diet; and 100-percent survival when does were fed a 13-percent protein diet. Because Kansas' wild deer have access to a variety of high-protein and high-energy foods, nutritional deficiencies are probably rare.

Fawn survival in Kansas is probably most dependent upon predator densities and the feeding habits of those predators. Predation by coyotes varies widely across the state, and not all coyotes pursue deer with the same fervor. While Kansas coyotes have been observed taking adult deer and nearly grown fawns, many more coyotes have been observed in close proximity to deer without pursuing them. In the regions of the state where short grasslands dominate the landscape, coyote predation seems to be highest. However, the severe mange infestation present in Kansas' coyotes during the 1990s has resulted in a drop in coyote numbers nearly statewide. While no studies have been conducted, there may be a correlation between this drop in predator numbers and the recent surge in deer populations statewide.

--Gene Brehm, videographer, Pratt

**"WATCHING WILDLIFE"  
ON SALE**

Wildlife and Parks has announced a half-price sale on the guide, "Watching Kansas Wildlife," by George Potts and Bob Gress. For the next few months, this book will only cost \$5 plus shipping. Phone (316) 672-5911 for details.

-Ken Brunson, wildlife diversity coordinator, Pratt

**4TH ANNUAL  
GOVERNOR'S FISHING  
CLASSIC SLATED**

On June 6 & 7, Kansas Governor Bill Graves will host his 4th Annual Governor's Fishing Classic and will be inviting anglers from across the nation to join him in a unique fishing experience, while supporting a good cause. Approximately one hundred fifty young people from the Hooked On Fishing-Not on Drugs program will participate and fish with the Governor. The Classic, organized and sponsored by the Kansas Wildscape Foundation, Wolf Creek Nuclear Operating Corporation, and Coffey County Economic Development/Chamber of Commerce, will take place on June 6 & 7 in Burlington, with the fishing tournament on Coffey County Lake (formerly Wolf Creek Lake).

Classic activities will kickoff with the celebrity golf tournament on June 6 followed by an evening BBQ event with the Governor and an auction of celebrity items. The tournament will begin the morning of June 7 and conclude with the Governor's Awards Banquet.

The funds raised from this event will be used by the Kansas Wildscape Foundation to provide such programs as "Hooked On Fishing" and other such programs that create outdoor opportunities for the enjoyment of the youth and all citizens of our state.

For more information, contact Jenee Armbrister of Kansas Wildscape at (785) 843-9453.

*Chad Luce*  
KS Dept. of Wildlife & Parks

**SPECIAL EVENTS 2000****MAY**

Date	Location	Event
3	Wilson	Field day for Felton Middle School 7th grade students
6	Meade SP	Meade Bird Walk
6,7	Wilson	Camper and RV expo
7	Wilson	Mountain Bike Race
13-14	Lovewell	Lovewell Walleye Tournament
13	Cedar Bluff	Lake Association Fishing Tournament
17	Wilson	Sunset Zoo from Manhattan program
20	Prairie Dog	NE Bass Federation

**JUNE**

Date	Location	Event
3-4	Milford	Kansas Walleye Assoc. Tournament - Rush Creek Marina
4	Lovewell SP	(or 11 - free day) Lovewell Kids Fishing Derby
10-11	Prairie Dog	Bassin' America (NE), High Plains Bassmasters, Prairie Bassmasters
11	Lovewell SP	Lovewell Elks Club Flag Day Ceremony
17	Milford	Like Father Like Son Tournament - Rush Creek Marina
18	Milford	Milford Lake Walleye Tournament - Thunderbird Marina
18	Kanopolis SP	Kanopolis Father's Day Horseshoe Tourney
24	Milford	KS Bass Anglers Assoc. Tournament - Thunderbird Marina
25	Milford	KS Bass Federation Tournament - Rush Creek Marina

**JULY**

Date	Location	Event
1	Lovewell SP	Lovewell Fireworks Display
2	Wilson	Fireworks display
3	Kanopolis SP	Kanopolis Fireworks Display
4	Prairie Dog	Fireworks Display
4	El Dorado	Fireworks Display
8-9	Prairie Dog	Bassin' America (NE)
16	Lovewell SP	Lovewell Sand Castle Contest
21-23	El Dorado	Vietnam Veterans Family Reunion
22	Milford	Jackpot Buddy Bass Tournament Rush Creek Marina
28	El Dorado	Prairie Port Concert
28-29	Milford	Bluegrass Festival
29-30	Prairie Dog	Colorado Trophy Teams Bass Tournament

**AUGUST**

Date	Location	Event
4-6	Prairie Dog	Colorado Bass Federation
5	Kanopolis SP	Kanopolis Sandblast Volleyball Tournament
5-12	Milford	Jack Mc Donald Church Camp - Group Shelter
12	Lovewell SP	Lovewell Fun Day
12-13	Prairie Dog	Husker Bass Club
12-13	Cedar Bluff	Lake Association Fun Days
19	Cedar Bluff	Lake Association Carp Derby
20	Milford	Twin Rivers Bass Tournament - Rush Creek Marina

**SEPTEMBER**

Date	Location	Event
2-4	Milford	Buffalo Barbecue - Eagle Ridge Shelter
22-24	Milford	Medora Church Camp - Group Shelter
23	Milford	Kansas Bass Anglers Tournament - Rush Creek Marina

**OCTOBER**

Date	Location	Event
18	Wilson	Second annual ECO-Meet
20	Kanopolis SP	Kanopolis Haunted Hike
28-29	Prairie Dog	McPherson Bassmasters

by Mark Shoup



Everybody loves a rabbit, especially that wascally one that frustrated Elmer Fudd and slam-dunked with Michael Jordan. But did you know that Bugs Bunny isn't really a rabbit? He's a hare.

Note the long ears, the big front teeth, and the large back legs. (Okay, Bugs doesn't have any front legs, but you know what I mean.) A rabbit's ears are much shorter, the front teeth not so big, and the back legs, while also well-suited for hopping, not nearly as big as the hare's.

A hare is bigger, too. The most common Kansas hare, known as a black-tailed jackrabbit (*Lepus californicus melanotis*) weighs from 3 to 6 pounds, while the cottontail rabbit weighs 2 to 3 pounds.

So besides those things, what's the difference between a rabbit and a hare? Which would win a race? Would the cottontail win while the over-confident jack took a nap during the race? Would the jackrabbit win by a hare?

Actually, the jackrabbit would leave the cottontail in the dust. While the cottontail can run as fast as 18 miles per hour, the jack smokes the track at up to 35 miles per hour. Add to this its ability to

zig-zag at nearly full speed, and you have a critter well adapted to the open plains of western Kansas, where most are found. Its sharp eyesight, large ears, and speed help the jack avoid predators on the high plains.

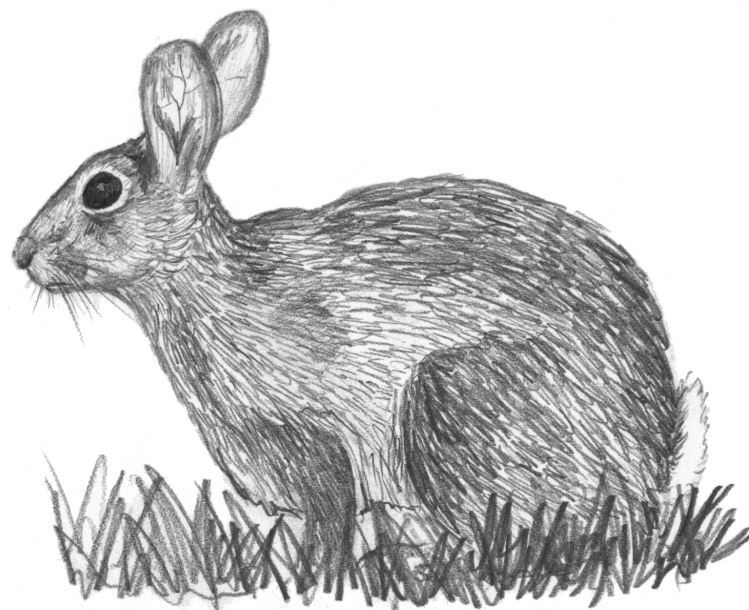
The black-tailed jackrabbit is the only common hare in Kansas. Like all hares, young jackrabbits are covered with fur, and their eyes are wide open at birth. Jackrabbit young are born in a bowl-shaped depression in the earth, called a

"form," lined with fur from the mother's chest. Jackrabbits can produce four litters of eight "kits" each year. To avoid attracting predators, the mother leaves the kits in the form during the day and comes back several times to feed them at night.

Young jackrabbits can leave the nest after they are only one month old.

The jackrabbit's long ears aren't just for better hearing. On hot days, these ears help reduce the hare's body heat.

Although they are larger than cottontails, jackrabbits have hind tracks that may appear smaller because they run on the toes of the hind feet. The long heels do not leave marks when the animal is running. Jackrabbits would rather hop than walk. They hop 5 to 10 feet at a time. When running full tilt, a jack can hop 20 feet or more in a single



bound.

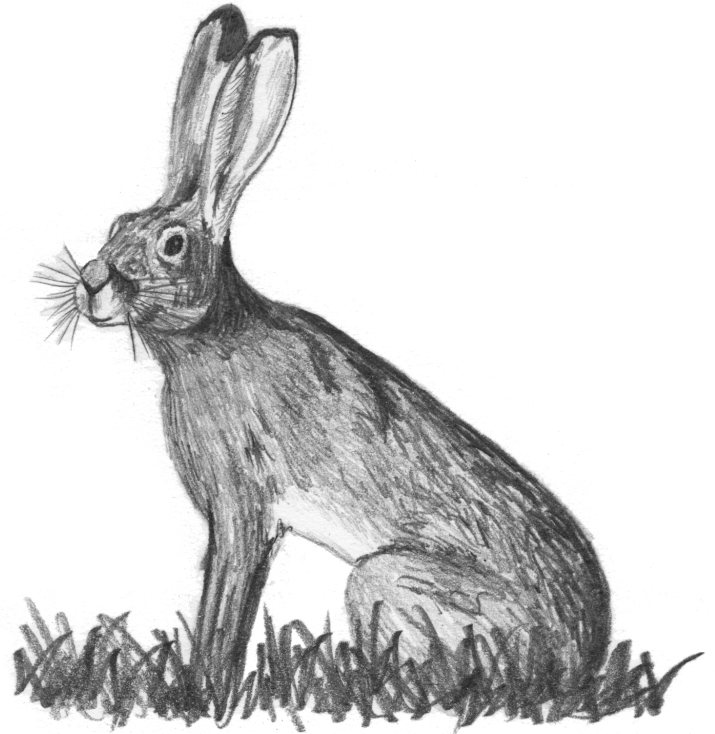
When they bolt across the prairie at that amazing 30 to 35 miles per hour, jacks occasionally jump into the air to get a look around and flash the white underside of the tail if being chased by a predator. Jackrabbits will also thump the ground with their big hind feet to signal danger (kind of like another famous thumper).

The small-eared cousin of the jackrabbit, the cottontail (*Sylvilagus floridanus*) can be found anywhere in Kansas. However, this cute little fellow -- which looks more like Peter Cottontail than Bugs Bunny -- prefers wooded areas to the plains and pastures occupied by the jackrabbit. And much like Joel Chandler Harris' Brer Rabbit in the Uncle Remus tales, the cottontail loves the safety of a briar patch.

In fact, any old weedy field or junkpile can attract cottontails. This is why they are often seen in towns, usually in early morning or late evening.

Both jackrabbit and cottontail eat grasses and leafy vegetation in the summer and woody or dried vegetation in winter. Cottontails also enjoy a meal of fallen fruit, berries, and (like Peter Cottontail) garden vegetables.

Also like the jackrabbit, the cottontail has sharp hearing and a keen sense of smell. Its eyes are set well back on the sides of its head, providing a wide field of vision. Cottontails are quick, though not as fast as the jackrabbit. And they will swim if they have to. (I once saw one swim the Arkansas River to avoid a dog.)

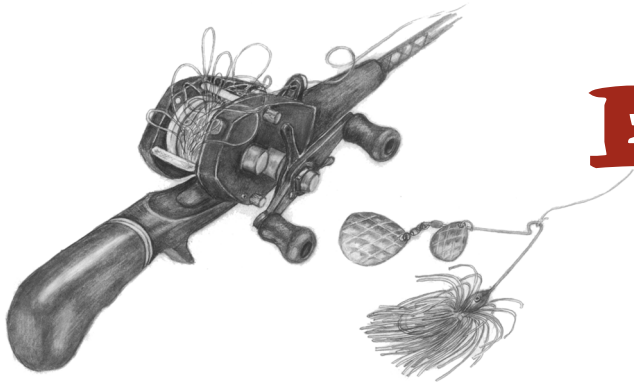


The cottontail nest is much like a jackrabbit's but is usually located within the cover of brushpiles or thickets. The average litter is five young, and an average of four litters are born per year, from March through September. Unlike jackrabbit young, cottontail kits are born blind and naked. However, they are fully furred and on their own within 16 days!

Both cottontails and jackrabbits are major food sources for predators such as hawks, owls, foxes, coyotes, and bobcats. Primarily because of predation, wild rabbits seldom live more than one year. Young usually comprise about 80 percent of the population, but the production of large and numerous litters keep their populations, especially those of the cottontail, strong and healthy.

Three rabbit species that are rare in Kansas are the desert cottontail, the white-tailed jackrabbit, and the swamp rabbit. No joke, Kansas has a swamp rabbit. The swamp rabbit lurks about the marshy areas of far southeastern Kansas. It looks very much like the cottontail except that it is bigger, weighing from 3 to 5 pounds.

Whether it's cartoons, folk tales, or real-life natural history, everyone loves a hare-raising story about one of these charming creatures. Everyone, that is, except Farmer Brown.



# Backlash

by Mike Miller

## Old Dogs

I have to face it. At 12 years old, our black Lab is in his twilight years. The gray on his muzzle makes that obvious, but he's remained healthy until recently. I have to face it.

Magnum has been a great dog — not a great hunting dog, but I take the blame for that, mostly. But he made up for his failings in the field with a wonderful personality — a mellow, happy-go-lucky attitude that makes us smile daily. Even with stiff joints and obvious pain in his step, he still acts like a puppy, flopping at our feet to have his belly scratched, woofing at us when we return home to show us he's happy were back, and begging to curl in our lap when he's cold. (I know an 80-pound lab is too big to sit in my lap, but he doesn't.)

He knows he will get special treatment because of his age and he takes advantage of it. He sneaks onto the bed, knowing we're too soft-hearted to make him get down. He slips off to the laundry room, curls up on a blanket, and uses an effective sad-eye look to stay inside on cold or rainy days. He still retrieves the newspaper each morning, but his trips through the front yard and to the end of the driveway take much longer now. He knows I won't get too angry if he takes time to check the trees and bushes for smells of dog intruders.

How my wife and I have become so attached to a dog, I'll never know — yes I do. I've been through this a couple of times before — it doesn't get any easier. I know his time with us is running out. I have to face it.

Even with impending grief, I smile whenever I think of Magnum. I always will. If dogs can be optimists, he's one. Never been in a bad mood, never uttered a gruff growl or angry bark. He's always exhibited a simple joy and happiness. A tiny milk bone treat still makes him quiver with puppy-like anticipation. Perhaps that is what has endeared us to this dog.

Everyone loves puppies. Even the coldest soul is warmed by a puppy. I've heard it said that puppies are great until they grow into big dogs. But there's something to be said for old dogs. Old dogs teach us to cope. They take what life has given and they exist without complaint. Their devotion to us, regardless of how diffi-



cult life has become, never wavers. Magnum is still as excited to see us when we've been gone for an hour as he is when we've been gone for a week. He lies by the front sliding glass door, patiently waiting for whichever of us is gone to return. He still refuses to eat much unless both my wife and I are home. It's impossible not to love and admire that kind of loyalty and devotion.

Life goes on, and we'll have to cope just like Magnum does with his arthritis and other ailments. We'll have to face it one day soon. I know that. But in the meantime, I'll smile with joy each time he walks stiff-leggedly over and sits on my feet, content just to be close. I'll laugh when he "sneaks" onto the bed at night, as ungraceful and awkward as he may be. And I'll scratch his ear for a moment each time he's there. I won't take any of these moments for granted. They may not be an option tomorrow. ♡

