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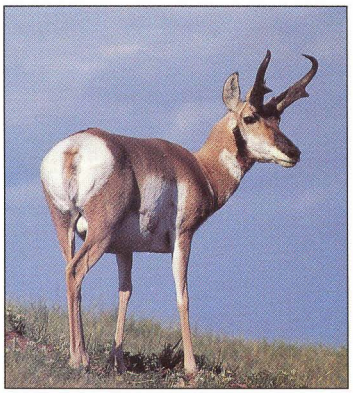

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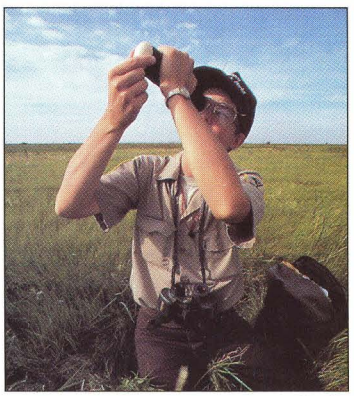

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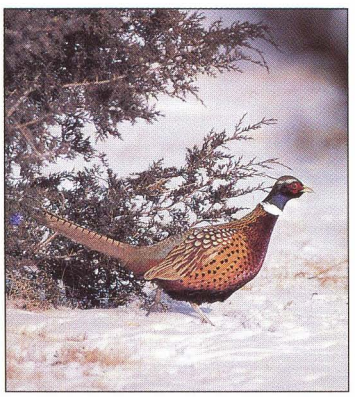

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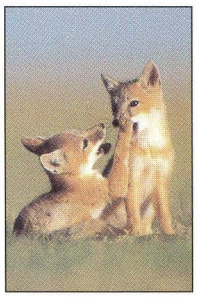

About the Covers

Front: Withstanding hot temperatures and hordes of biting flies, Mike Blair snapped this playful exchange between two swift fox kits in Gove County. 600mm lens, f/8 @ 1/250. **Back:** Two fishermen enjoy the peace of a farm pond in central Kansas. Mike Blair photograhed the scene with a 55mm lens, f/11 @ 1/500.

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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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The Treasure Of Solitude

A few months ago, I read a report that rural areas are losing population. I live in a small rural community and wouldn't trade it. I mean, I don't want to see the community shrivel up and die, but the fact that our region of the nation isn't growing in population doesn't exactly break my heart. It's strictly selfish motives that generate this attitude.

By now, many of you who read this magazine have read about the fortunes of Kansas; the great outdoor resources available. I have pleaded with you not to take these resources for granted. But there is another, more subtle, treasure that I will acclaim today: solitude.

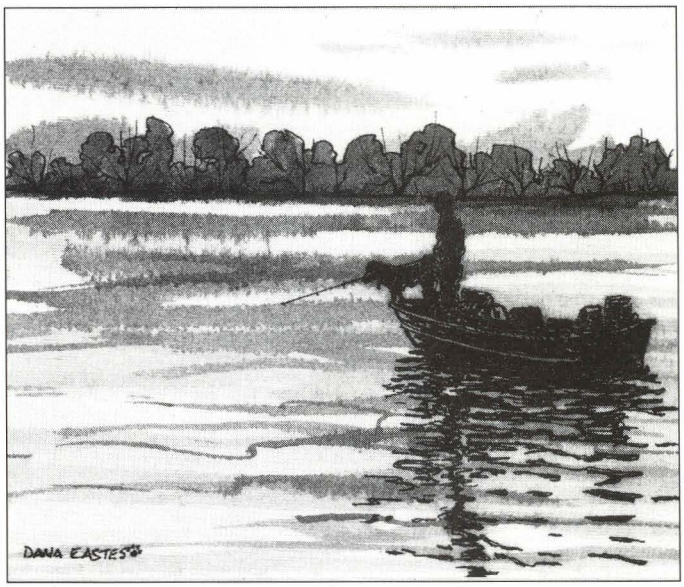
Plain, simple, peaceful . . . solitude. It's a treasure so readily available to many of us that we don't even consider it a value. But it is, especially when you associate it with our outdoor resources, tremendously valuable. In many regions of the U.S., the competition for outdoor recreation is so great, solitude is not a word spoken in a conversation about the outdoors.

If you're still not sure what I'm referring to, I'll explain further. I spent the last day of this year's quail season many miles from any human concentration. I drove off the gravel road to a two-rut lane, then off the lane and into a huge pasture (I was still only 25 miles from my home). Then I followed my Brittany another mile into the grassland . . . and I breathed deeply.

We raised only two coveys. I shot just two birds. That probably doesn't sound too successful, especially by Kansas standards, but I returned to town physically tired and mentally revitalized.

In the four hours I spent trying to keep up with my dog in the rough draws, I heard not another human sound; no vehicles, voices, dogs barking. I saw little evidence of human encroachment. It was just me, my dog and the birds.

I talked to the dog, to myself and cussed the covey that flushed wild and outwitted me. I drank in the sights of bluestem ridges and cedar-choked draws. I stepped gingerly through the spring-seep marsh and smelled the rank mud as I broke through the frozen surface. I quit well before dark and just sat on the tail gate drinking a soda. I had not thought about work or everyday pressures through the entire time. I told the dog how well he'd done and how much I had enjoyed this last hunt of the season. I would not brag of limits killed, or huge numbers of birds seen, but I was supremely satisfied.

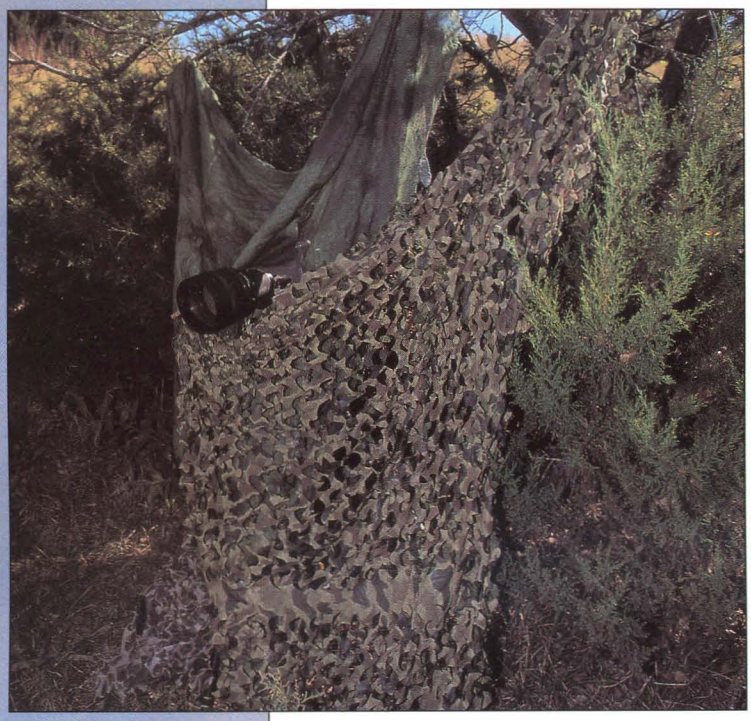


Dana Eastes illustration

I, for one, will not cry for more development or "progress." If the masses are migrating away from here, then so be it. We are fortunate indeed to have what we have. And to be able to enjoy it in such undisturbed fashion is what sets our state apart.

Mike Miller

So... You Want To Be A Wildlife Photographer



400mm f/11 @ 1/125

text and photos by Mike Blair
staff photographer

Wildlife photography is exciting and rewarding, but to consistently take good photos, you need technical understanding as well as knowledge of nature.

There are two exciting moments in wildlife photography. The first is when the camera is fired at a shy animal at close range. The other is when the finished images arrive to forever capture the magic of those moments afield.

Good pictures record the thrill of the outdoors and often provide insights into animal behavior. But to obtain consistently good photographs, patience and luck must be reinforced with the right equipment. Without it, a quest for wildlife in its natural setting is a waste of time.

Single-lens-reflex (SLR) cameras are best, due to light weight, lens interchangability and through-the-lens exposure metering. Images are recorded as seen through the lens, a feature not offered by some cameras. All these are important advantages for field work.

Today's SLR cameras are highly sophisticated, usually offering a variety of program modes. Many present such an array of exposure, metering and focusing programs, that only a seasoned photographer can even understand them — the same individual who is least likely to need them.

Generally, manual cameras are the simplest, most dependable cameras for outdoor use. But to capture those occasional fast-breaking moments, automatic cameras with manual override are good choices. I use a Nikon F3, an aperture-priority automatic with manual override. This camera is a compromise between sophisticated, circuitry-bound models that easily break down under field conditions, and simple manuals that could miss a photograph under rapidly changing light conditions.

Regardless of camera choice, there is no substitute for a thorough understanding of lighting, exposure and camera function. If you're unwilling to learn the relationship between f-stops and shutter speed, the potential of your work will be reduced to happenstance.

Good lenses are a must in wildlife photography. Telephoto lenses make subjects appear closer and are desirable when dealing with wild animals. Telephotos of at least 200mm are recommended. Though more expensive, the 400mm lens is an ideal combination of optics and versatility. Longer lenses are often not practical.

Photos like this require a thorough understanding of lighting, exposure and camera function. Blair uses Kodachrome 64 color slide film because of its true color reproduction and the quality of its enlarged image.

Lens speed is an important consideration when shooting in dim light. The speed of a lens is its largest possible aperture, or lowest f-stop number. Since peak wildlife movements occur at dawn and dusk, the lens must be capable of transferring adequate light to the film plane for a bright image. To do this, it should be at least f/5.6 or faster. Fast lenses cost more but pay off in results.

Zoom lenses are worthy of consideration, since they do the jobs of several lenses at once. Once scorned for poor image quality, modern zooms now provide excellent camera optics. Some have close-focusing features which make them doubly attractive.

A sturdy tripod is essential for sharp wildlife images. Long lenses magnify camera motion, and due to weight, it is difficult to hand-hold telephotos without some blurring. ALL my wildlife photos are taken from a tripod, or other steadying device. When shooting from a vehicle, a beanbag balanced on the window ledge serves well.

Another indispensable tool for serious wildlife photography is the motor drive or auto-winder. Both devices automatically advance the film, leaving the photographer to concentrate on focus. Rates vary between two and six frames per second. Generally, the faster the subject, the more valuable these devices are.

Many kinds of film are available. An important consideration is film speed. An ISO number on the film box tells the light sensitivity of the film. The higher the number, the better the film is for shooting in dim light. But fast film renders poor detail and often doesn't enlarge well. Slow speed film yields better image quality and enlargement potential, but makes it harder to shoot under poor light conditions. So the tradeoffs must be weighed against the desired image quality.

A variety of color print films are available and are fairly forgiving of exposure errors. They're costly, since for every frame — good or bad — a negative and print must be paid for. Color print films in the ISO range of 50 to 200 have good characteristics for outdoor use.

Perhaps the best overall nature films are transparency (slide) films. These produce remarkable sharpness and can be projected or printed with excellent results. Since they make a "positive" image, they are less expensive to use in the long run. Poor photos can be thrown away, saving money to print the best ones. Both Kodachrome 64 and Fujichrome 100 are excellent nature films.

Good equipment is crucial to successful wildlife photography, but is truly secondary to knowledge of the subject. Many well-equipped photographers fail when they can't get close enough for satisfying photos.

How close is close enough? For frame-filling photos of a songbird, for instance, you need 25mm of lens for each foot of distance. Even with a 600mm lens, that requires a stalk to within 8 yards — no easy task with sharp-eyed birds. Deer-sized animals are easier, but even they must be within 30-40 yards for a good picture with a 400mm lens.

So the photographer must rely heavily on stalking skills. Most wildlife species are equipped with one or more finely-tuned senses which help detect danger, and this "wildness" makes them hard to approach. Overcoming the distance barrier to record close-up portraits and behavioral traits is the greatest challenge of wildlife photography.

It is important to know your subject's defenses. If birds are the target, then camouflage must overcome keen eyesight. Silence will be necessary to approach rabbits, which have excellent hearing. Deer rely on their sense of smell to warn of danger; set up your blind upwind of a trail and your chances are ruined. Predators like coyotes have a combination of sharp senses which make them difficult subjects.

Knowledge of the animal also dictates when to be in the field. Kangaroo rats are nocturnal, and waiting near a burrow during daylight hours is a waste of time. For the same reason, attempting to photograph fox squirrels at daybreak is fruitless; better results are obtained at mid-morning. Knowing the habits and habitats of wildlife is an important advantage to the photographer. The library can be a good source of information.

Fortunately, there are many tricks to help fool wild animals into camera range. Among others, these include blinds, bait stations and calls. A hidden photographer does best when the animal comes to him or her. Using photographic blinds along game trails is often productive.

Camouflage clothing is a must. Many animals have little or no color perception but easily see the glare from human skin or light colored clothing. Face nets and gloves are also useful items of disguise.

Animals with sharp eyesight must often be photographed from a blind. Blinds may be as simple as a large cardboard box or as elaborate as wooden or metal permanent structures. Portable blinds constructed of burlap and aluminum pipe or angle iron can be backpacked into desired areas and left until the animals grow accustomed to them. Once they accept the blind as part of the landscape, the photographer has an excellent vantage point.

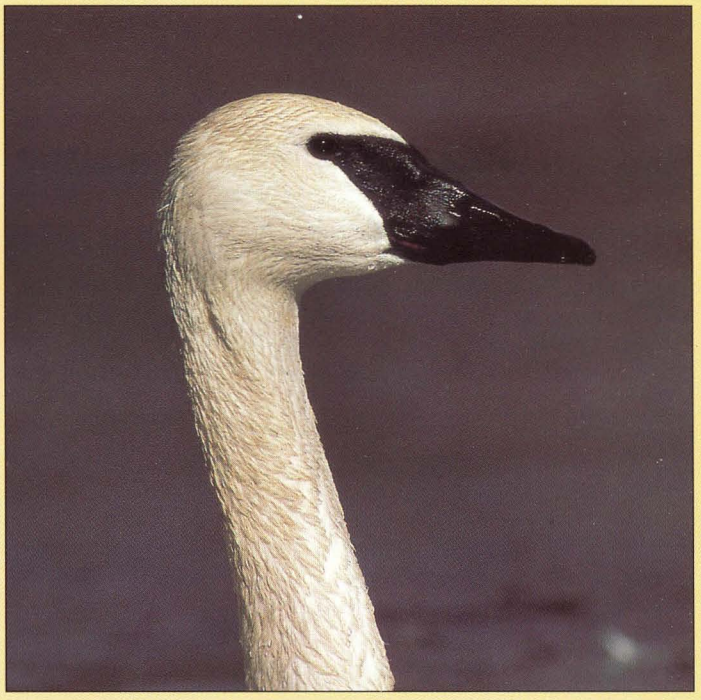
Blinds work particularly well around nest and den sites during spring months. However, to avoid driving a family of animals from their home, it is best to set the blind some distance away at first, then gradually move it closer. Learning as much as you can about an animal before you go out to photograph it will help you avoid disaster. Golden eagles and other raptors may give up a nest site and eggs if you approach too close too quickly.

A good way to bring animals close is with the use of calls. Predator calls attract crows, woodpeckers, bobcats, coyotes, owls, hawks and sometimes deer. Cassette tapes of owl calls attract both owls and songbirds that mob them.

Rattled antlers during the autumn rut may lure both bucks and does. Turkeys respond readily to calling, especially the gobblers during the spring. The same calling and decoy techniques used by hunters can work for photographers.

Finally, patience is a must. Sometimes it takes hours, days or even weeks to get a desirable photo. Rain, cold, dust, heat, wind, mosquitoes — all can be expected. But experiences gained on the way to good pictures allow fascinating insights into the natural world. And when that great shot does come along, the reward will bring life to your outdoor experiences for all to see.

400 mm f/8 @ 1/250



600 mm f/8 @ 1/500

***Exposure**

Camera light meters are designed to read every scene at a tonal value of 18 percent gray. Since this is the average value of most photographic situations, the camera meter is usually right. However, exposure problems occur when subjects or backgrounds are very light or dark in color.

Stated simply, the camera perceives black as 18 percent gray. Following the meter's advice, it produces a black that looks gray on the photo — and all lighter colors are lightened by the same percentage, resulting in overexposure. Conversely, the camera also sees white as 18 percent gray. White becomes dingy gray in the photo, and all darker tones are darkened even more — resulting in underexposure.

Solution? Turn camera away from subject to meter an average reading in same light as subject. Meter from gray card, from green grass, or from northern sky 30 degrees above horizon on clear day — all roughly equivalent to 18 percent gray. Using these settings, return to subject and take photo.

Tips: When shooting dark animals (bison, red-winged blackbird, etc.) open aperture 1/2 stop from average reading to record details in fur or plumage. On white subjects, stop down one stop from average reading to avoid washout of detail.

400 mm f/9.5 @ 1/60

400mm f/8 @ 1/250

105mm micro f/16 @ 1/60

***Perspective**

When possible, always film wildlife at its own level. For small subjects, lie prone on the ground. For nesting birds, climb to nest height. Elaborate blinds are sometimes necessary.

Set up to avoid distracting backgrounds. "Sky-lighting" an animal against the horizon produces excellent images. Look for situations when animals in sunlight can be filmed against shadowed backgrounds. Use medium f-stop settings to help control depth of field.

600mm f/5.6 @ 1/500

***Lighting**

Set photographic blinds to take advantage of lighting conditions. Frontlighting is often best for portrait work or for "freezing" action. Sidelighting produces shadows that add a third dimension, and a sense of mystery to the subject. Backlighting separates an animal from its background, and it's also useful in recording airborne seeds, droplets of water, or dust.

Tips: For frontlighting, use a gray card exposure value. When sidelighting, add one stop of light. When backlighting, add two stops of light to record details in shadow area.

◀ 600mm f/8 @ 1/250

400mm f/8 @ 1/125 ▶

600mm f/5.6 @ 1/500

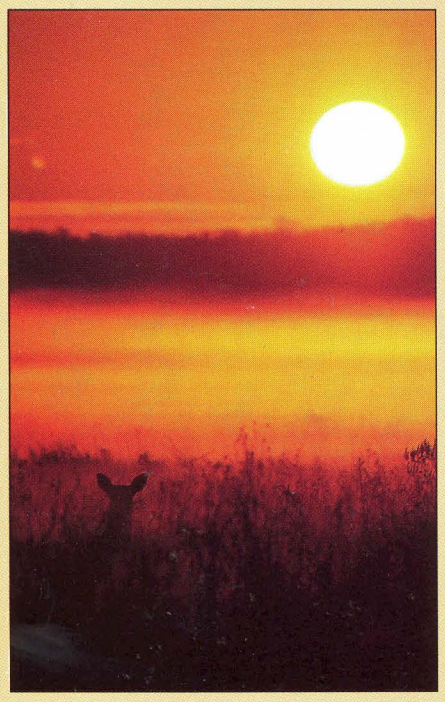
600mm f/5.6 @ 1/125

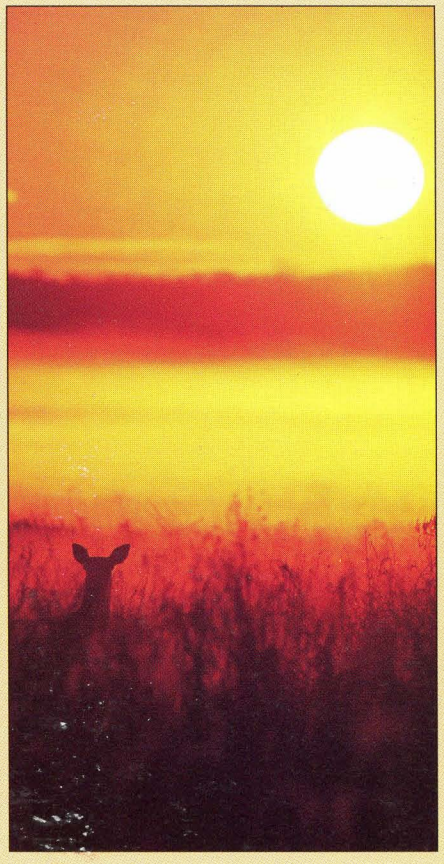
***Action**

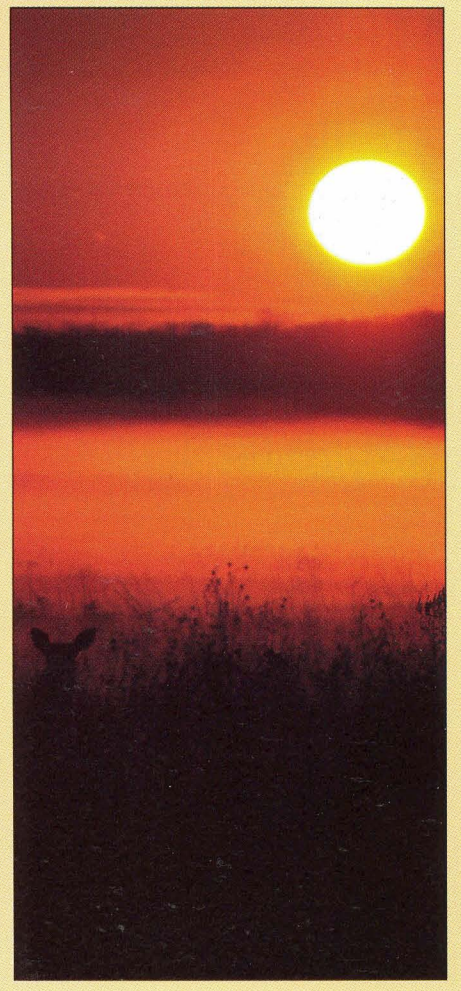
Subject motion can be a problem when animals are running or flying. Fast shutter speeds are necessary to prevent blurry images. For flying birds, use 1/500 or 1/1,000 to freeze wings. Running animals at medium distance can be captured at slower speeds like 1/125 or 1/250. Always pan, or smoothly track, a running animal with the camera.

Best average exposure depends on film used, but for Kodachrome 64, f/11 at 1/125 provides an ideal balance of color saturation, depth-of-field and action-stopping ability for casual subjects.

◀ 400mm f/16 @ 1/1000
400mm f/22 @ 1/1000 ▶
▼ 400mm f/11 @ 1/1000



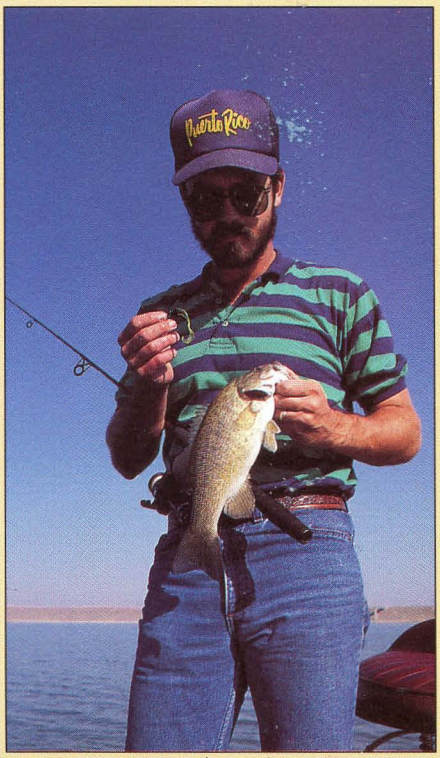




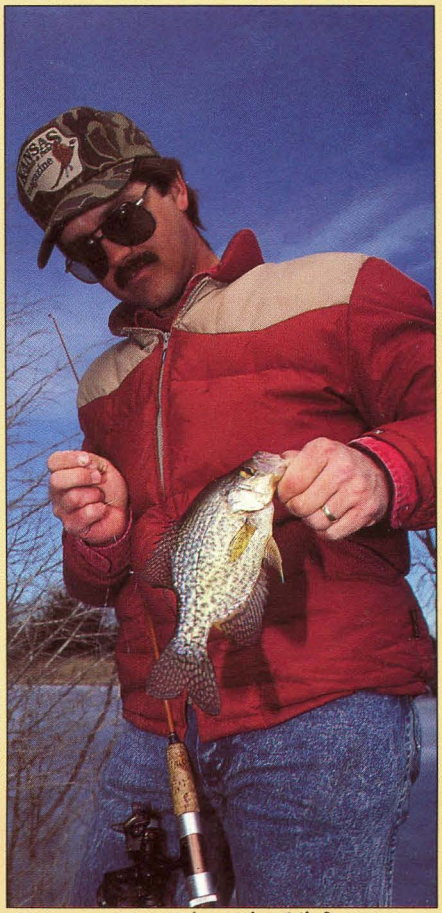
***Bracketing**

Difficult lighting conditions complicate choice of exposure. Bracketing by one or two f-stops on either side of the average ensures a pleasing photo. Shooting into a low sun where foreground subjects are important is a situation where bracketing is helpful.

400mm f/11 @ 1/60 flash



24mm f/8 @ 1/250 no flash



24mm f/8 @ 1/25 fill-flash

***Flash and Fill-flash**

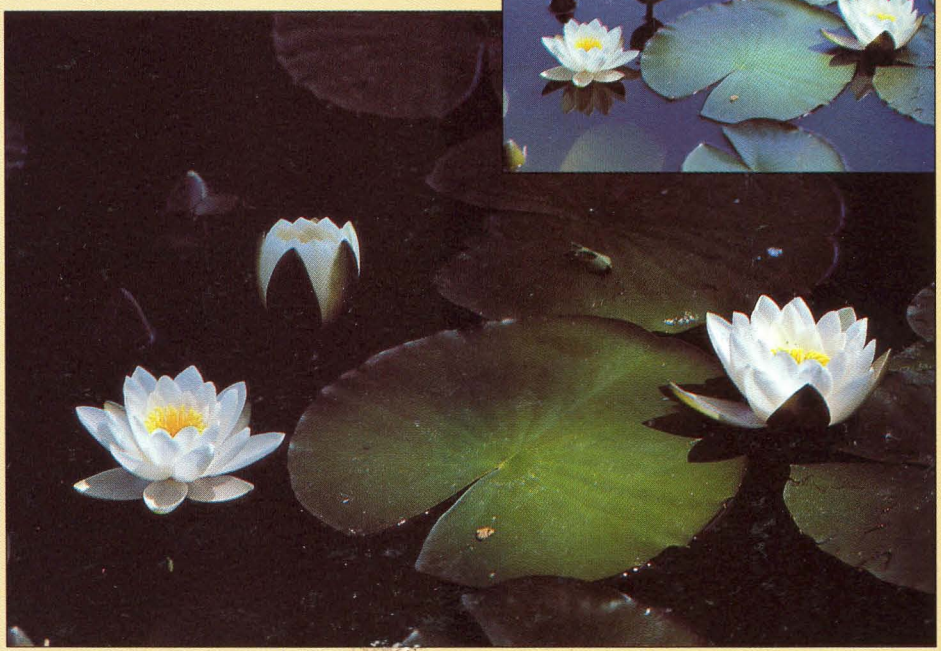
Small flash units permit great depth-of-field necessary for closeup work, as well as "instant sunlight" for deep shadows or nighttime conditions. Several units aimed at the target from different directions help prevent harsh shadows. PC cords and slave units permit several flashes to be fired simultaneously.

Fill-flash is designed to reduce shadows produced by natural sunlight. It is most effective when the flash is approximately one f-stop weaker than the natural light intensity (see flash manuals for technical details). Use fill-flash to lighten shadows on faces, such as those caused by hat bills.

24mm f/22 @ 1/60
star filter

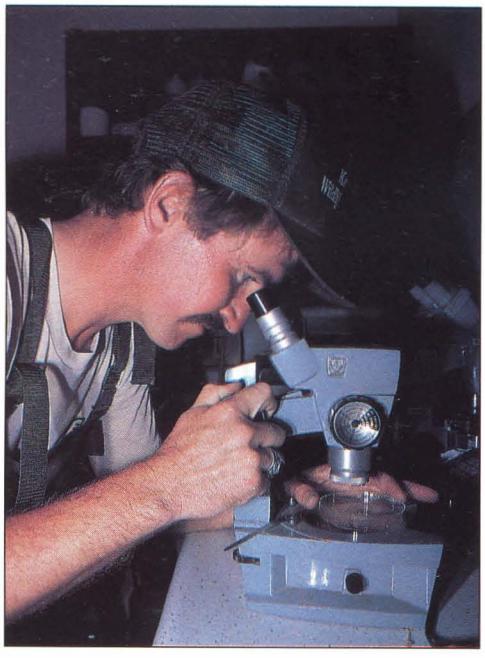
***Filters**

Most nature photographers use filters sparingly. An exception is the polarizing filter, a $12 item that dramatically reduces glare and saturates image color. The starburst filter may also be used to add exciting highlights to a scenic.



55mm f/5.6 @ 1/30 polarizer, inset: 55mm f/5.6 @ 1/125 w/o polarizer

Fish Culture: A Look Into Fishing's Future



by Mark Kumberg
hatchery assistant
Pratt

photos by Mike Blair

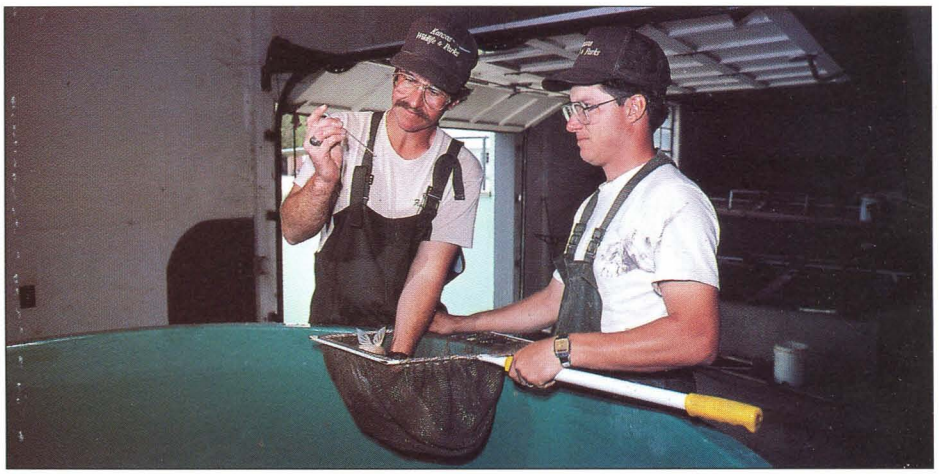
Using highly sophisticated equipment and techniques along with time-tested methods, Kansas hatcheries provide literally millions of sportfish for Kansas waters each year.


KA 997 L

Fish hatcheries have been an important facet of conservation agencies since their beginning in the early 1900s. In Kansas, fish and wildlife conservation evolved from the first hatchery built, the Pratt Fish Hatchery. Fish culture systems have seen dramatic changes, especially in the past 50 years. The first hatcheries were simply protected ponds where fish were allowed to reproduce naturally, then the fry removed and stocked into public waters. What we've learned over the years and technological advancements now allow us to efficiently produce more and bigger fish. And the science of fish culture produces species that were previously impossible to provide and creates popular hybrids that fill a void in many fisheries.

There are basically two kinds of hatcheries. Many new intensive hatcheries have been built across the nation. The intensive system utilizes high volumes of water in smaller rearing spaces such as raceways compared to the extensive systems that usually consist of earthen ponds. The intensive systems are a product of technology as the water is filtered through microscreens or sand filters to remove contaminants. Some even use ultraviolet treatment systems which destroy a large percentage of the bacteria in the water. The new age of electronics is evident as there are sensors and alarms to let workers know if water levels get low or high, temperatures fluctuate or if electrical systems fail. Automatic feeders with timers allow fish to be fed as needed simply by setting a dial. Water temperatures are regulated by heaters or chillers to fit the need of hatchery operations throughout the year.

The science of fish culture has also benefitted from some exciting new techniques. Cryopreservation of fish semen is one. The technique was recently used on Kansas walleye with great success. The walleye program relies on catching fish from reservoirs, removing eggs and fertilizing them with sperm. The eggs are then hatched in hatcheries and the fry stocked or raised to fingerlings. As the spawning period progresses, the number of fertile males caught usually decreases. Males are the first to arrive at the spawning area and are abundant before most of the females arrive. Being able to take sperm and keep it until females are caught greatly improved this program. With cryopreservation, semen is collected by aspiration, extenders (antibiotics, salts and sugars) are added and vials of the semen are placed in an ice bath and kept at a temperature just above freezing. Sperm can be stored several weeks by using this method.



Eggs from a female striped bass are examined to find out if they're ripe. A hormone injection sped up this natural process so that culturists could fertilize the eggs with sperm from a male white bass to produce the popular hybrid, the wiper.

Another culture advancement that has benefitted Kansas fishermen involves the use of hormones. One of the hormones used to manipulate ovulation in fish is called chorionic gonadotropin. It has been used on striped bass, white bass and walleye at Kansas hatcheries. In this process, a female is catheterized to determine if it is an eligible spawner. If so, an injection of the hormone is administered into the muscle just below the dorsal fin. Egg samples are taken periodically through the catheter to determine when they mature or are ripe. The hormone speeds up this process. When it is determined that the eggs are ripe, they are removed by applying pressure to the fish's abdomen then fertilized with sperm. In Kansas, this technique has allowed culturists to create the popular striped bass/white bass hybrid, the wiper. Some states have used this method to obtain channel catfish spawns earlier than normal so that the resulting young benefit from a longer growing season.

As we learn more about fish, we discover how little we actually know. Keeping track of fish in their natural

Eggs in the bowl are fertilized by hand, then transferred to holding jars where constantly circulating water and the culturist's watchful eye ensure high hatch rates.

habitat is one way to learn more about them so that management programs can be tailored. To keep track of fish movements and habits, they must be marked. One method, radio telemetry, involves implanting a transmitter inside the abdomen of the fish before releasing it back to the reservoir. A radio signal receiver is used to track the fish's activities. Another method of marking fish involves feeding fish food treated with tetracycline. The tetracycline is absorbed into growing bone. Biologists can differentiate between hatchery-raised fish, fed the treated food, and naturally produced fish by putting bone samples under an ultraviolet light. The tetracycline shows up fluorescent. Data gathered can tell biologists how effective stocking programs are compared to natural recruitment.

Following a fish with a radio transmitter implant, biologists learn more about fish behavior and habits. This information can help them form management and stocking plans.

Genetic manipulation is another important tool in fish culture across the U.S. Some fish producers sell a triploid (has three sets of chromosomes) grass carp. Because triploids are generally sterile, this genetic manipulation allows managers to stock grass carp to control weeds without fear the fish will reproduce and threaten native populations. Some states also require that certain stocked species be triploid to eliminate any chance that original stock will be mutated by hybrid stock. To induce triploidy, the eggs are treated with temperature shock or hydrostatic pressure to keep the extra set of chromosomes from falling off, which usually occurs just after fertilization. If this event can be blocked, the result is a three-chromosomed individual, or triploid, that cannot reproduce.

As more has been learned about aquatic ecology, modern hatchery systems have maximized carrying capacities. Fertilizers are applied to increase phytoplankton (microscopic aquatic plants) densities which in turn allows zooplankton (microscopic aquatic animals that larval fish feed on) populations to proliferate. Zooplankton populations are monitored to ensure that numbers and sizes are adequate for optimum fish survival and growth.

The past decade has also seen significant innovations in training predacious species of fish such as largemouth bass, striped bass, striped bass hybrids and walleye to eat prepared feeds. Not too many years ago, biologists considered it impossible to culture these species on artificial feed because of their predacious nature. But modern training techniques allow these fish to be fed many different diets. Ground up fish or krill (a small marine organism) is fed to fingerling fish initially, then small amounts of dry fish food are added until a totally dry diet is fed. By controlling the diet, a much faster growth rate can be established and at the end of the first growing season, the fish may reach 5 to 6 inches. These intermediate-sized fish have a much higher survival rate when stocked in reservoirs and lakes than smaller fingerlings.

Modernization of hatchery equipment has also made great strides in the past 10 years. Digital oxygen and pH meters allow us to easily monitor water quality parameters that previously entailed burdensome chemical procedures. Digital scales make weighing small fish and chemicals much more accurate. Pond liners are available to stop pond leaking and isolate the pond water from the soil interface. Many hatcheries have built internal "kettles", or holding basins, with fresh water supply that greatly reduce stress on fish when ponds are harvested. Fish pumps actually pump fish and water from a raceway or pond into hauling tanks and minimize handling of fish. In the early days, fish were hauled in cream cans or drums on horse-drawn carts. Modern hauling vessels are well-insulated tanks with electric aerators and gaseous or liquid oxygen systems that replenish dissolved oxygen in the water as the fish deplete. Some even have on-board refrigeration systems to keep the water cool during long hauls in the heat of summer. Many modern hauling tanks have quick-connect fittings to allow full tanks of fish to be stocked in a matter of seconds. And today's tanks can transport thousands of pounds of fish.

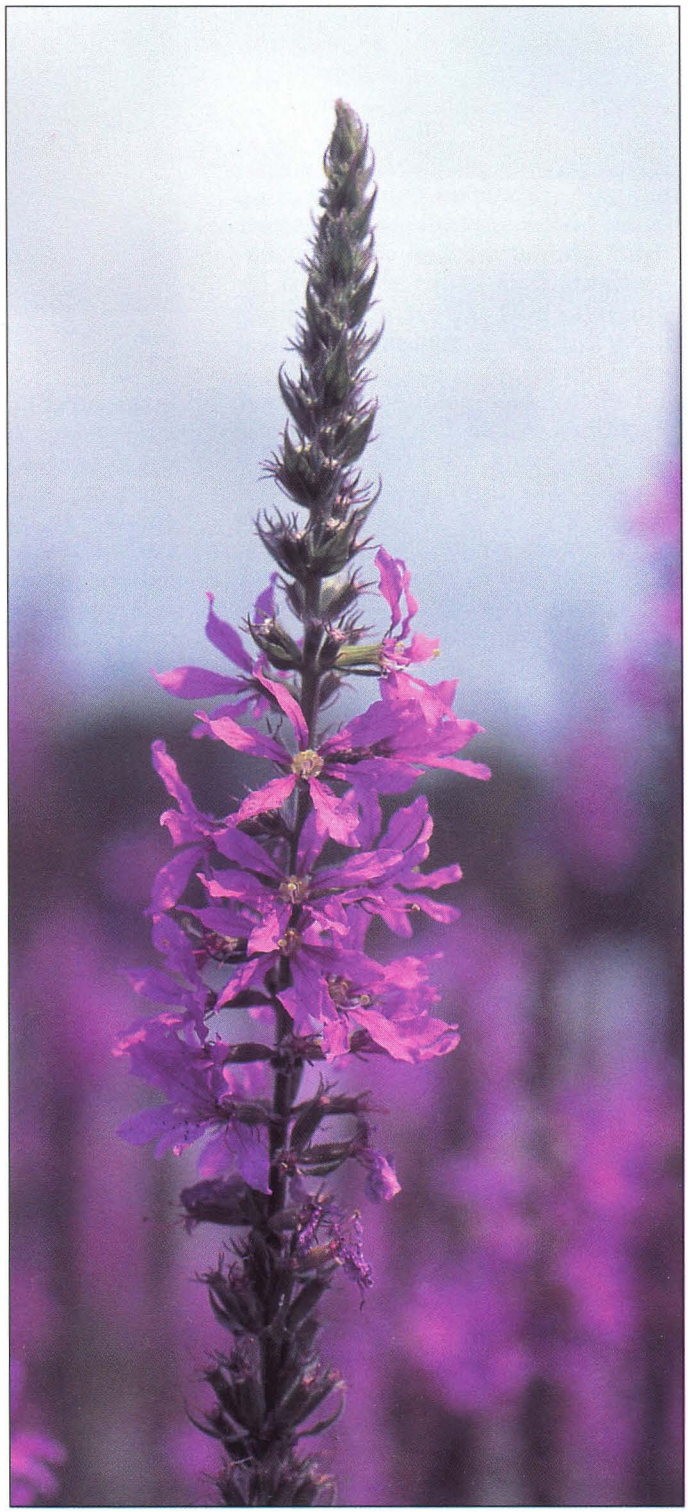
Of course the computer is also becoming an important tool on today's hatcheries. The large amount of data accumulated during culture operations can be stored and used later to determine correlations between different parameters which may be beneficial to fish production. Computers also operate many of the sensors and alarms found on modern intensive hatcheries. If the past 50 years is any indicator, hatcheries should have a promising and productive future. The Department utilizes both intensive and extensive hatcheries and enhances operations with technological improvements as they are developed. With perseverance and dedication, the production and quality of fish should continue to improve, insuring a quality fishing experience for all anglers.

The Purple Plague

by Karl Keith Karrow
field supervisor, Marais des Cygnes Unit

and Francis Earl Durbian III
seasonal naturalist, Marais des Cygnes Wildlife Area

photos by Mike Blair



Purple loosestrife is an introduced plant that aggressively invades and takes over wetlands, degrading the habitat's value to wildlife. Biologists are concerned after finding loosestrife in east-central Kansas wetlands.

The purple plague is taking over some of America's prime wetlands and Kansas is not immune. Purple loosestrife, a moist-soil, perennial weed, has been slowly moving westward across the United States, displacing natural vegetation of marshes and other wetland areas. Marshes dominated by purple loosestrife are of little value to native wildlife. This plant has found a niche were it can survive and thrive, and only through careful management can this plant be controlled.

This hardy native of Eurasia is believed to have come across the Atlantic Ocean as a stowaway in the sand ballast of sailing ships during the early 19th century. After establishing a firm population on the Northeast coast, purple loosestrife spread eastward along the canal systems of eastern and central United States. Loosestrife colonized an estimated half million wetland acres per year. It has been cultivated and sold as an ornamental, and planted by bee keepers as a source of nectar for their bees, further adding to the spread. By 1985 this immigrant had spread to all of the continental United States, except Montana, and all of the provinces in Canada. Purple loosestrife is well established in Missouri, Nebraska and Oklahoma. It has also been found at Marais des Cygnes Wildlife Area and other sites in Linn County, in east-central Kansas.

An established stand of purple loosestrife will have drastic effects on native plant and animal populations. When this plant dominates a marsh it can be so dense that the area becomes impenetrable to wildlife as well as humans, and if not controlled, this condition appears to be permanent. Clumps of mature plants form thick mats of veg-

etation that resist decay and exclude other water loving plants such as cattail, rushes, and smartweeds. Purple loosestrife grows in stands so dense that nest platform construction and travel for waterfowl broods is virtually impossible. This plant does not provide good wildlife cover. Although terrestrial mammals may feed on young shoots, it is not palatable to a majority of aquatic mammals and birds.

Not only is this weed harmful to wildlife, but it can also drastically reduce the forage value of wetland pasture and wild hay meadows, making them unsuitable for grazing livestock.

Purple loosestrife is commonly confused with fireweed, blue vervain, and blazing star, but is easily distinguished once its basic characteristics are recognized. Purple loosestrife grows to an average height of 5 feet and has a square-shaped stem that supports a tall, showy, spike-like panicle of purple flowers. Blossoms start to bloom in June and continue into September. Each flower has 4-6 petals and a spike may consist of 15 or more flowers. The lance shaped leaves are 2-4 inches in length, attached directly to the stem, and grow opposite each other. After fall frost the leaves turn red, then fade to a dull brown in winter. Throughout winter stems retain a spiraling row of brown seeds which drop and sprout in spring.

Purple loosestrife is capable of invading most marshland or wetland habitats. A general rule of thumb is that if an area has cattails or other moist-soil plants, it can support purple loosestrife. It commonly occurs in floodplains, marsh edges, drainage ditches, seasonally flooded impoundments, and stream or river margins. This plant can tolerate up to 50 percent shading and is a very prolific seed producer. Mature plants may have up to 30 stems and produce one million seeds. An established stand may contain 80,000 stalks per acre and produce 24 billion seeds. The seeds, which may be viable for several years, are spread by wind, water, animals and humans, with flooding being the main method of dispersal. Seedlings rarely flower their first season, spending their energy on growth rather than reproduction. Purple loosestrife may also reproduce vegetatively. Pieces of stems, roots, or leaves can sprout and grow under favorable conditions.

Periods of drought may enhance the spread of the plant, as exposed mud flats provide perfect growth conditions. This poses added problems to waterfowl managers, because marshes are commonly drained to expose mud flats to allow desirable plant species to grow. These mud flats may be colonized and dominated by loosestrife.

The best control of purple loosestrife relies on early detection of pioneer plants. Eradication of invading plants, before they produce seeds, is much easier and cheaper than controlling established stands. Landowners, duck club managers, and other professional land managers should actively search for and eradicate plants on their properties. Wetlands managed for waterfowl hunting are particularly vulnerable to invasion of this plant. If purple loosestrife becomes established, hunting opportunities will be drastically reduced and remedying this situation is

Purple loosestrife, an aggressive invader, spreads quickly and has been documented in eastern Kansas. Because it grows in such dense stands, the wetland plant crowds out all other native vegetation and even inhibits wildlife use of the habitat.

Research on control of purple loosestrife is ongoing. If you think you've found purple loosestrife, contact the Kansas Department of Wildlife and Parks or the local agriculture extension office. Control of the plant is important, but so is the method used as some may do more harm than good.

prohibitively expensive. Considerable investment in hunting property development can be jeopardized if this plant is allowed to dominate a marsh, making it unsuitable to ducks and geese.

Much research has been conducted and is still being conducted on control of this weed. Purple loosestrife has a high degree of resistance to herbicides and is extremely hard to control. Glyphosates have shown to be the best form of chemical control. Rodeo, Roundup, or 2-4-D, applied in mid-August provide almost 100% shoot reduction, but hand spot spraying may be needed for two years after the original application. Chemical control does have its drawbacks. Many herbicides cannot safely be used near or in wetlands. In addition, some herbicides have negative side effects such as reducing wetland invertebrate populations, which are an important food resource for wildlife. ATV spray rigs may cause more damage than the purple loosestrife, aerial spraying affects other desirable plant species, and hand spot spraying is time consuming and costly.

Water level manipulation may provide control and prevention of purple loosestrife. Flooding with 12 inches of water for a period of 4 weeks will kill seedlings. Biological control measures such as sowing Japanese millet or smartweed on exposed mud flats may also suppress purple loosestrife seedlings.

Physical control measures such as mowing and tillage may reduce the vigor of the plants and, when followed, by a herbicide application, may provide control. Late summer mowing followed by flooding is also an effective measure. When the degree of infestation is small, hand pulling is an efficient control measure. When using this method it is important to remove all of the root so the plant will not grow back. Whenever controlling by physical or mechanical methods, care must be taken to remove and safely dispose of all plant materials to prevent them from contributing to the spread of this plant to other non-infested areas.

Several species of beetles prey on purple loosestrife in its native range. Experiments by the United States Department of Agriculture and the United States Fish and Wildlife Service utilizing introduction of these insects to control purple loosestrife show promise. In the future, this may be the most economical and ecologically safe method used to control this plant.

Due to the destructive capability of this weed, anyone finding it on their property should report it to their agricultural extension office and Kansas Department of Wildlife and Parks district biologist. These same organizations will also be able to provide technical assistance in the eradication of this plant from private property.

Although a beautiful flower, purple loosestrife is one more example of how an introduced species can cause real problems when it finds a niche in its new home, just as with the house sparrow, house mouse, starling, carp, and the Norway rat. It may take over wetlands when it gains a foothold and is an unwelcome newcomer to North America. Unfortunately it is here to stay, but by studying and learning more about this plant, we will better understand how to control it and prevent future wetland losses.

center section

Edited by Mark Shoup

LETTERS

"NOTEBOOK" PROJECT

Editor:

Were we ever pleased to find the cutout of the meadowlark in the January/February issue of KANSAS WILDLIFE AND PARKS. Our youngest daughter, Alexa (second grade), used it for her Kansas Day project at school.

She colored the bird according to the directions provided, and we used the facts listed to make a nest in a grass setting. Parents were encouraged to help, so Alexa and I went to a nearby field and cut various types of grasses while her daddy screwed a small bowl into the center of a piece of wood to act as a nest. Then he drilled holes in the wood around the nest. We glued the grass individually into the holes. Alexa painted the bowl and wood with glue, to which we attached cut up grasses. Other grasses completed the nest, and we obtained eggs from a local department store.

To make the meadowlark cutout stand up, we glued toothpicks to the legs, and to make the bird fuller, Alexa stuffed it with cotton balls.

Thank you for the child's section. It provided us with a wonderful project.

Carolyn A. Kitchens
Belle Plaine

KANSAS RECOVERY

Editor:

When I was growing up in Trego County, western Kansas was an ecological disaster area. I was nearly five years old before I saw green grass. The beloved cottonwood trees survived the devastating drought and dust storms. However, what few other scraggly trees and bushes that were left were hosts to the hordes of grasshoppers, which ate all their leaves.

That is my childhood memory of Kansas.

What a joy to see the color photos of plants and wildlife in Kansas now. Conservationists should be praised for assisting with some of the regeneration of areas that were so badly abused. I know much remains to be done, but I have confidence that the nightmare memories of western Kansas will not be repeated. Keep up your efforts.

Joan Stanton Woodard
Lenexa

EARLY READER

Editor:

I am renewing my subscription to KANSAS WILDLIFE AND PARKS. The only issue that I have missed since the first one was while I was in World War II. The first issues were only a section or two, with no pictures.

I was the first wildlife biologist [for the Department] -- Sept 1, 1934. I was 82 in April.

Les Brown
Eureka

IT'S ONLY RECYCLE

Editor:

I refer to your article "It's Only Litter" (KANSAS WILDLIFE AND PARKS, Jan./Feb. 91, Page 30). Last October, we moved from Elkhart to Coggon, Iowa. Due to Iowa's 5-cent can and bottle deposit law, it is a genuine pleasure to drive down the highway without seeing all the can and bottle litter.

Kansas could do as well.

Granted, it is a little bit of a hassle to save cans and bottles, but the difference in the view makes it well worth while. It would be great to see it nationwide.

Henry J. Anderson
Coggon, Iowa

RECYCLE REGS

Editor:

I'm writing this letter to inform you of a concern I have with the Kansas Fishing Guide and the Kansas Hunting and Furharvesting Guide. I noticed that neither was printed on recycled paper.

There are billions of tons of waste every year thrown into the landfills of Kansas and the nation. Studies show that those numbers could be cut in half if Americans wouldn't waste so much and if they recycled. If you will make the switch to recycled paper, others will follow, and our environment will have a better chance of lasting longer.

Aaron Myers
Hillsboro

Dear Mr. Myers:

Thank you for your inquiry concerning the use of recycled paper in our hunting and fishing brochures.

In the past, expense has prohibited the use of recycled paper, which in the midwest can cost twice as much as unrecycled paper. The reason for this seems to be demand. Printers tell me that only a handful of midwestern paper mills produce recycled paper. For this reason, they are able to demand a premium price.

I am happy to announce, however, that beginning in fiscal year 1992 (July 1, 1991), both the Kansas Hunting and Furharvesting Guide and the Kansas Fishing Guide will be printed on 100-percent recycled paper. A printing contract signed last year will allow us to do this. The Blackford Company of Lebanon, Oregon, won the contract on bid, and our agreement with them defrays all costs for production and

printing of these brochures. In return, Blackford receives money from advertising in the publications.

With production costs to the Department -- and to the Kansas sportsman -- virtually eliminated, the Department can now afford recycled paper.

Again, thanks for your concern. Your letter was instrumental in this effort. --*Shoup*

BOIS D' ARC

Editor:

In the Sept./Oct. 1989 issue of *KANSAS WILDLIFE AND PARKS* magazine (Page 14), there appeared an article about Osage orange trees. When I read the article, I was interested enough to have torn it out of the magazine to save it.

Now I need to know where I can buy seedlings and whether Osage orange will grow in zone five.

Dorothy H. Johnson
Lockwood, NY

Dear Ms. Johnson:

As you know from reading the article, Osage orange, commonly called bodark from the French *bois d' arc* -- meaning "bow wood" -- was highly valued by Plains Indians as wood for bows.

Osage orange is a hearty tree transplanted from northeast Texas to Kansas in the mid-nineteenth century. To my knowledge, it grows well throughout the state, and most of northern Kansas is in growing zone five. I was told by people who sell seedlings at a Topeka nursery that it would "probably" do fine in New York.

Your best bet, however, would be to contact the New York Cooperative Extension, Forest and Resources and Land Use Division, Department of Natural Resources, 117 Fernow Hall, Cornell University, Ithaca, NY 14853-3001. --*Shoup*

WHY MELVERN?

Editor:

Your recent article on the subject of the change of name of this park gave no hint or suggestion as to why it was named Melvern State Park in the first place. Why was this so casually consigned to oblivion?

While a nonresident subscriber, I would be interested in an article explanatory of what had been intended to be memorialized with the use of the name "Melvern." Please explain.

Conn Withers
Liberty, Missouri

Dear Mr. Withers:

Although it may seem obvious, Melvern State Park was named for the reservoir it adjoins. The reservoir, in turn, was named for the nearby town of Melvern. This is the case with most state parks in Kansas.

What you might find interesting, however, is how the town -- still named Melvern -- got its name. Early settlers plotted the town site in 1870, and one of those settlers, Charles Cochran, chose the name "Malvern" for the Malvern Hills in his native Scotland. Unfortunately, in the shuffle of paperwork between local and state agencies, the name was misprinted as "Melvern."

The misprint stuck, and "Malvern" was thus casually consigned to oblivion.

I hope this answers your question. For more information, contact the U.S. Army Corps of Engineers office at Melvern Reservoir, RR 1, Melvern, KS 66510, (913) 549-3318. --*Shoup*

SWANS/SWAMP RABBITS

Editor:

I would like to know if Kansas is good for swans. If it is, why don't we have a few.

Also, I would like to see swamp rabbits stocked in southeast Kansas. There were lots of them in the 1930s.

Jack Gearhart, Sr.
Oswego

Dear Mr. Gearhart:

Thanks for your concern about the fate of swans and swamp rabbits in Kansas. According to *Birds in Kansas*, by Max Thompson and Charles Ely, swans were never plentiful in Kansas. They may have been more plentiful prior to the twentieth century. Tundra swans are rare migrants through the state today, sometimes seen in early and midwinter, usually in the eastern half of the state. Trumpeter swans are rarer yet, although a few have appeared in recent years on La Cygne Lake (see KANSAS WILDLIFE AND PARKS, July/August 1989, Page 30).

As you correctly point out, the swamp rabbit was plentiful in southeast Kansas during the 1930s. Today, very few remain because of habitat destruction. The swamp rabbit requires very wet, swamp-like conditions, such as periodically flooded timber or shrub-covered wetlands. Few such areas remain in Kansas due to draining of wetlands for farming and channelization of streams for flood control. These activities, in combination with logging, simply leave very little habitat for these large, semi-aquatic rabbits.

Although wildlife biologists in the state are quite concerned about this habitat loss, it would be pointless to reintroduce them in areas absent of the necessary requirements for their survival. --*Shoup*

KOCHIA OR HEMP?

Editor:

As a 72-year resident of Kansas who still can hunt and fish, I enjoy your magazine very much.

I belatedly read the Nov./Dec. issue of *KANSAS WILDLIFE AND PARKS* and the article on weeds on Page 37. Unless I am mistaken, the picture labeled kochia should have been hemp or marijuana.

Leland Frost
Esbon

Dear Mr. Frost:

I can certainly understand your point. Kochia, at the time of year this photo was taken, looks much like hemp or marijuana. My weed experts, however, assured me that the plant is kochia.

There are subtle differences that are difficult to see in the small photo. Hemp has more serrated leaves and kochia branches from the main stem more noticeably than hemp. --*Miller*

LAW

CO OF THE YEAR

Jeff Gayer, Pratt, has been named the Shikar-Safari International Wildlife Officer of the Year. The award, which is presented to one officer per year in each state, recognizes "exemplary performance of duties in the protection of wildlife, enforcement of game laws and implementation of conservation programs." Recipients are nominated by officers within the state. He received the award at the Wildlife and Parks Commission meeting in El Dorado last March.

Gayer has been with the Department of Wildlife and Parks 14 years. After graduating from McPherson High School in 1972, he went to Bethany College in Lindsborg and earned a B.A. in recreation and park administration. In 1977, he joined the old Park and Resources Authority as a park ranger, then moved to the old Fish and Game Commission (the two agencies have since been combined into the Department of Wildlife and Parks) as a conservation officer for Reno County. In December 1989, Gayer moved to Pratt to cover training officer duties for the Department and has since been permanently appointed to this position.

His current duties include scheduling and certification for all conservation officers in the state, liaison with the Kansas Law Enforcement Training Center, providing law and regulation updates to all Department officers, and teaching firearms range instructors. Gayer also acts as Department liaison with the Association of Natural Resource Planners, an organization charged with planning and coordination of training for wildlife officers throughout the United States and Canada.

"I also enjoy public presentations, hunter safety classes and work with Boy Scout groups," he adds. In his spare time, Gayer is involved in a project to raise and release wild-strain mallards.

When asked what sparked his devotion to wildlife resources, Gayer's answer is simple. "I feel fortunate my dad brought me up respecting the outdoors," he says. His father spent a great deal of time with him, hunting and fishing, and the family camped together whenever possible. Gayer was also influenced by a retired McPherson conservation officer who befriended him.

This background led to an intense respect for nature and the men and women devoted to its conservation. "It boils down to the fact that conservation officers will go the extra mile to take care of what's there and make sure it's there for everyone to enjoy," he adds.

When asked about the award, Gayer is reluctant to talk about himself. "I was totally surprised," he says. "It usually goes to a field officer, but it's not for just me. It's for all of us who are working to protect the resource."

Shikar-Safari International is a private, international hunting and conservation organization with 200 chapters worldwide. --*Shoup*

ANTELOPE POACHED

On February 9, Department biologists and biologists from the Colorado Division of Wildlife trapped 49 antelope near Lamar, Colo. These antelope were then released at the Cimarron National Grasslands, on the south side of the Cimarron River between Highway 27 and Wilburton.

Unfortunately, a sad note was added to this release late Feb. 13 or early Feb. 14. One of the released antelope was poached. The remains were found in late morning the 14th.

Wildlife and Parks and Forest Service staff performed post-mortem examination of the antelope and found that it had been shot. To make matters worse, the doe was carrying 2 fawns. The poacher who committed this crime killed not one, but three animals.

Anyone with information regarding this incident should call Wildlife and Parks or Forest Service officials, or Operation Game Thief, 1-800-228-4263. Your call is confidential. --*Mike Mitchener, wildlife biologist, Liberal*

APPLICATION FRAUD

In July 1990, three members of one family applied for resident deer permits. All three listed a Topeka address as their residence. Unfortunately for the three, the Postal Service was unable to deliver the permits because they were not at the address listed. The permits were returned to the Department because the trio had been gone from the address too long to forward first class mail. When the permits were returned, a Tennessee address -- apparently from forwarding cards they had filed with the Post Office -- was printed on the envelopes.

Region 2 assistant supervisor Rob Ladner and officers Bill Burlew and Jim Hale did some leg work and discovered that the family's utilities had been turned off because their house had burned down in 1987. Further investigation revealed that they all now had Tennessee vehicle tags and drivers' licenses.

When they did not receive their permits, one of the applicants called the Department asking where they were. When advised that the permits were undeliverable at the listed address, the caller said they were out of town and asked that the permits be sent to a friend in Topeka. Ladner told them that this could not be done, but that his Topeka office would hold the permits until they could pick them up personally.

In the meantime, Ladner obtained arrest warrants for the three. When deer season arrived, so did two of the suspects. Charged with making a false representation to secure a resident deer permit, they were arrested immediately and placed in Shawnee County jail on $1,000 bond. One suspect was put a on a year's diversion. The other was fined $718 and $32 court costs. There is still an outstanding warrant for the third suspect. --*Shoup*

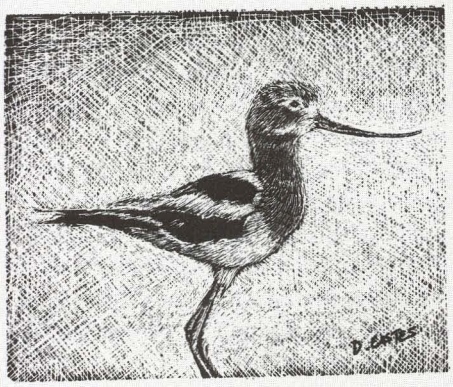
ISSUES

WETLANDS MONTH

Congress has approved the Environmental Protection Agency's (EPA) request to designate May 1991 as American Wetlands Month, the first of what the agency hopes will become an annual celebration and recognition of wetlands.

EPA's office of Wetlands Protection staff is currently preparing a schedule of events for May to promote new public and private wetlands protection, conservation and restoration efforts, and to recognize ongoing protection initiatives. Among the activities EPA has persuaded communities to undertake are organizing local groups to work toward protecting wetlands, speaking to school children or youth groups about the importance of protecting wetlands, volunteering time or money to wetlands protection organizations, cleaning up degraded wetlands and taking elected officials to visit a wetland.

For more information, contact American Wetlands Month, Judy Johnson or Lori Williams, EPA Office of Wetlands Protection, 401 M Street SW, A-104-F, Washington, DC 20460, (202) 382-5043. *--National Wetlands Newsletter*



DIAPER DELIVERY

One of the most obnoxious forms of all litter is the disposable diaper. Anyone who has ever used a busy state or community park can attest to this fact.

Even more obnoxious, however, is the environmental waste produced by plastic diapers. According to a national study called the Learberger Report, 16 billion disposable diapers are used each year in the United States alone. This amounts to more than 12,000 tons of waste per day feeding our landfills and the loss of 800 million trees yearly for the sake of a minor convenience.

Of course, many parents argue that disposables keep baby drier, but this may not be true. High-tech diapers have become so super absorbent that wet pants may go unnoticed, allowing an infant's skin to remain close to waste for a longer period of time than with cloth diapers.

So what's a concerned parent to do, especially when a newborn arrives? Sometimes we feel we are just too busy to wash diapers, and this added work can seem formidable. Now there is an answer: diaper services. Hospitals across the country, realizing the health and economic benefits of cloth diapers, are using diaper services, and so are individual families. For a cost much lower or comparable to disposables, a diaper service will pick up diapers once a week and leave freshly washed diapers on your doorstep.

One such service in southcentral Kansas is Wee Care, 315 East Ave. North in Lyons. Wee Care services not only Lyons, but towns as far away as Pratt, St. John and Kingman.

As a father who has changed many diapers, I can assure readers that cloth diapers are little more work than disposables, and much cheaper. We used them with our first child, who has never had a serious diaper rash, and we plan to use them on our next, due this summer.

For more information, call (316) 257-BABY, or check your local yellow pages for other diaper services. *--Shoup*

POLITICAL WRITE

Readers often ask whom they can write in order to express opinions concerning legislative issues that affect them. The following list of Kansas U.S. senators and representatives should help. *--Shoup*

Sen. Bob Dole
141 Hart Senate
Office Building
Washington, DC 20510

Sen. Nancy Kassebaum
302 Russell Senate
Office Building
Washington, DC 20510

Rep. Dan Glickman
1212 Longworth Building
Washington, DC 20515

Rep. Bob Whittaker
332 Cannon Building
Washington, DC 20515

Rep. Pat Roberts
1519 Longworth Building
Washington, DC 20515

Rep. Jim Slattery
1729 Longworth Building
Washington, DC 20515

Rep. Jan Meyers
1407 Longworth Building
Washington, DC 20515

ENVIROMENTALITY

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

ANGLER ACTION

Answers to some of the most asked questions about water pollution, and how citizens and organizations can combat it, are now available in a free 24-page booklet from Anglers for Clean Water.

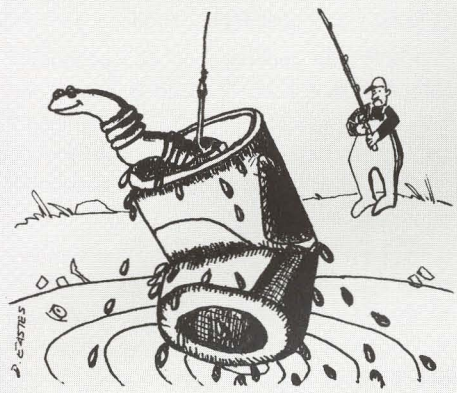
An Angler's Guide to Environmental Action, a handy pocket-sized booklet, is jam-packed with ways to identify and report water pollution. While giving citizens valuable tips on working with government agencies, it also tells how to successfully slog through bureaucratic mire. The booklet also stresses the benefits and need for positive attitudes and actions and tells how to play hardball to keep local waters healthy.

In addition to listing 10 warning signs of water pollution, the booklet tells citizens what to do next. Tips on what kind of information to gather, who to call, how to use the Freedom of Information Act and how to find groups with similar concerns are included.

A layman's view of the Clean Water Act is also included. If you don't know a dioxin from a PCB, the booklet's chemi-

cal glossary defines those and other technical words commonly in the news. EPA regional offices with contact names, addresses and phone number are listed, along with addresses and phone numbers for securing several information directories.

The booklet can be obtained free of charge by writing *An Angler's Guide to Environmental Action*, Anglers for Clean Water, Inc., c/o B.A.S.S., Inc., P.O. Box 17900, Montgomery, Al 36141. --*Anglers for Clean Water*



ENVIRO-DIAL

Telephone consumers will now be able to contribute a portion of their monthly long distance bill to help support the environment, according to MCI Communications Corporation. Four leading environmental groups -- Ducks Unlimited, Inc., National Audubon Society, National Wildlife Federation and The Nature Conservancy -- have joined forces with MCI in a unique alliance to benefit the environmental community. The program is the first funding effort to unite the four environmental groups with a corporation.

Under the agreement, MCI will contribute 5 percent of the monthly long distance payments of new customers enrolled in the program to these four organizations. Enrollees will receive the same rates as other MCI customers.

For more information, call 1-800-234-1051. --*DU News*

REFUGE INPUT

The U.S. Fish and Wildlife Service is seeking ideas from the public on management of the Service's (USFWS) National Wildlife Refuge System. A series of 31 public meetings will be held across the country beginning in March to allow interested individuals and others an opportunity to offer suggestions on management options. [These options include how the public might be allowed to use the refuges in the future.]

The planning effort, entitled "Refuges 2003" to honor the 100th anniversary of the nation's first refuge -- Pelican Island in Florida -- is aimed at planning management programs and policies for the next 10-15 years on more than 450 refuges in the 93-million acre National Wildlife Refuge System. Following the meetings, a draft environmental impact statement will be developed and public hearings will be held to allow additional comment by interested parties. The document is expected to be completed late next year.

Those interested in meetings for the region including Colorado, Kansas and Nebraska should contact the USFWS Region 6 office, (303) 236-7904. Those interested in meetings for the region including Missouri should contact the Region 3 office, (612) 725-3519. Those interested in meetings for the region including Arkansas should contact the Region 4 office, (404) 331-0295. Those interested in meetings for the region including Oklahoma and New Mexico should contact the Region 2 office, (505) 766-3940. *USFW News Release*

FARM PROGRAM GUIDE

The 1990 Farm Bill offers some new incentives to farmers who want to protect soil and water and reduce inputs. To help farmers understand and take advantage of these new incentives, the Kansas Rural Center (KRC), a nonprofit organization in Whiting, has helped develop a 32-page booklet, the "Farm Program Options Guide."

Under the new Farm Bill, farmers have more sustainable agriculture options. According KRC, disincentives of the old bill against resource-conserving crop rotations have been removed, and more funds are now available for conservation projects. In addition, the Conservation Reserve Program has been expanded, and farmers who implement water quality plans can get as much as $3,500 a year to install farming practices that reduce chemical use in areas vulnerable to groundwater contamination.

The 32-page guide explains each sustainable agriculture-related program and takes farmers through step-by-step processes for assessing whether each option makes economic and conservation sense.

"The farm bill cuts commodity program payments by 15 percent," says Jerry Jost of KRC, "so it's imperative that farmers make the most of opportunities in the bill to use sustainable farming without loss of income. This guide will help farmers evaluate their options."

The "Farm Program Options Guide" is produced by the Midwest Sustainable Agriculture Working Group and is available through its member organizations. Send $3 for each copy to the Kansas Rural Center, Rt. 3, Box 116, Lawrence, KS 66044. For more information, phone (913) 841-7044. --*Kansas Rural Center*

STOP LEAKS

A leak that fills a coffee cup in 10 minutes will waste more than 3,000 gallons of water a year. --*EarthWorks*

COURTS AND CORRIDORS

A California court has ruled that the federal government must consider the impact logging will have on biological diversity. The U.S. Ninth Circuit Court of Appeals halted Forest Service plans to hold a fire recovery timber sale in which dead and diseased trees would be removed from a 3,325-acre site in the Klamath National Forest in California.

Environmental groups had brought the lawsuit, charging that the timber salvage and harvesting plan would affect the "biological corridor" -- a crucial migratory route between two wilderness areas in the region. Such a corridor provides paths for wildlife and shelter in which plants can propagate.

The court agreed that the government had not taken a hard look at the impact its plans would have on migrating species. The court halted the clearing and ordered the Forest Service to study the issue further.

Conservationists predicted that the ruling would establish legal grounds for protecting forest ecosystems, stepping beyond current provisions to save individual species under the Endangered Species Act. --*Los Angeles Times*

FISHING

STRIPER STRATEGY

Kansas striped bass fishermen employ three basic techniques: trolling, live bait and vertical jigging. Trolling is probably the most common. In late spring and early summer, before the stripers have moved to deep water, deep-diving plugs than run 15-20 feet deep are preferred. Stripers are caught along creek channels and at the edge of drop-offs. One trick is to attach a big buck-tailed jig on a leader behind the plug. The plug keeps the jig at a constant depth and the wobbling motion gives it action, often drawing vicious strikes.

Since most plugs won't dive more than 20 feet, a down rigger is necessary for trolling when the fish are deep. Stripers are sensitive to water temperature and may suspend within a narrow depth range. Since the down rigger will hold a trolled plug precisely at the desired depth, it is ideal for catching midsummer stripers.

Live bait is probably the best striper fishing method and has accounted for the last two state record fish. Live bait is especially effective when the fish are in deep water later in the summer. A variety of bait fish will work including green sunfish, but many veteran striper fishermen prefer gizzard shad, the striper's natural food. Shad are caught with seines or cast nets. It takes specially equipped bait wells to keep the delicate shad alive, but stripers will readily hit dead shad. Dead or alive, the shad are still fished or slowly drifted along sharp drop-offs or main-lake river channels.

Another popular striper fishing method is vertical jigging spoons or slabs. This is usually most effective when warm water temperatures concentrate stripers along specific structure in deep water. Using a depth finder, stripers are located and marked with buoys. The fish are relatively stationary at this time, so it's not difficult to stay over them. White, chartreuse and silver jigging spoons are dropped to a depth just above where the fish are holding and jigged (striped bass will more readily take a bait from below).

There's usually no doubt when a striper hits the lure, and then the fun of fighting this strong, hard swimming fish begins. --*Mike Miller*

FISH HABITAT

It all started when county planner and recycling coordinator Monty Wedel had an idea. The local landfill was reaching capacity and new arrangements were needed for handling solid waste. Wedel saw the recycling of Christmas trees as a good way to raise public awareness about landfill space. He also felt that a highly visible program would help promote curbside recycling, composting, processing newsprint for animal bedding and subsidizing recycled plastic.

Although Christmas trees were recycled elsewhere in Kansas, this program had some unusual twists. The Manhattan Parks and Recreation Department had a longstanding agreement with the local Optimist Club to provide a location for a Christmas tree lot in Long's Park. Riley County provided advertising to the Optimists, and they announced that trees would be collected at the park after the holidays. The Parks and Recreation Department then made arrangements with Kansas Wildlife and Parks fisheries biologist Chuck Bever to transport the trees to Tuttle Creek Reservoir to expand the existing fish attractor program.

The Riley County Fish and Game Association then became involved. Club members and other volunteers bundled the trees and helped place them in the lake. Bever had identified areas of the lake where the tree bundles would be most effective.

Through this arrangement, many more brush piles were placed in the lake than had been previously possible. The program has operated for three years now with over 1,600 trees transported to Tuttle Creek this year. Reaction from all participants has been positive. Wedel feels that Riley County has benefitted through public perception of the project.

"We do it more as a way of creating awareness than for real saving of landfill space," says Wedel, "but trees are a piece of the total puzzle in waste management."

City Park Supervisor Mike Huff likes the idea of supporting a program that provides recreational benefits for the entire community. 'We not only support recycling, but we see citizens in the community able to experience improved fishing," he says. --*Marty Burke, region 2 wildlife information representative*

KIDS 'N CRAPPIE

For anglers young and old, spring is a long-awaited release from months of winter captivity. It's time to untangle fishing line and organize tackle boxes. It's also when youngsters ask the timeless question, "Can we go fishing?"

The fish most anticipated is crappie. Once water temperatures reach the mid-fifties, crappie are on the move, seeking nesting sites. This exodus gives parents the perfect opportunity to introduce children to the outdoors.

Although crappie can be found in streams and farm ponds, they seem to prefer the rather quiet water of lakes and reservoirs. Like white bass, they stay in schools, usually around submerged vegetation or sunken trees and brush piles. Fishermen can find plenty of action by locating one of these spots and dangling bait into the school. Wherever trees or brush stick up from the water can be good. Although boats are an advantage, they are not necessary. In many lakes, brush piles are placed near boat docks and are often marked with buoys. As the water warms, crappie move closer to the bank, eventually spawning in as little as 2 feet of water. At this time, they are much more accessible to bank fishermen.

Many fishermen find that crappie cannot resist minnows. This is the youngster's ideal bait -- easy to use and effective.

Equipment does not need to be fancy, either. Depending on the age of the child, beginning fishermen may want an inexpensive spinning reel or a simple cane pole with a bobber. The cane pole works well for young children -- from ages 3 to 7 -- because it eliminates the impulse to reel in too frequently and keeps the bait in the vicinity of fish. A pencil bobber attached 3 to 8 feet above the bait is all that's needed to experiment until fish

bite.

As youngsters gain experience, they can move on to more sophisticated crappie fishing techniques. "Doodlesocking" (dipping a light jig in shallow water structure along a shoreline or in brushpiles) is one of these methods and can be very effective. Small plugs, spoons, spinners and even flies are good baits when presented properly. The advantage of using artificial lures is that minnows don't have to be bought and cared for on each outing.

Crappie are popular with fishermen because they are easily caught and are excellent table fare. Their delicious white meat will please even those non-fishermen in the family. The real bonus of spring crappie fishing, however, is development of a child's love for the outdoors -- a love that will make life richer and create an air of household excitement and anticipation as each spring rolls around. --*Shoup*

MILFORD UPDATE

Throughout the last six years, many steps have been taken to turn the hatchery around, including improved water quality, increased staff size, acquisition and modification of existing equipment, and a better understanding of the "high tech" state-of-the-art facility, knowledge only acquired through time. As a result of these improvements, fish production has increased annually for virtually all fish species produced.

The past year was the best to date. Species of fish and approximate numbers of fish produced at Milford are listed below:

Walleye fry
53 million
Sauger fry
150,000
Saugeye fry
2 million
Largemouth bass fingerlings
88,000
Largemouth bass intermediates
80,000
Channel catfish fingerlings
98,000
Channel catfish intermediates
225,000
--*Tommie Crawford, Milford Hatchery manager*

FOR WHAT IT'S WORTH

Is Wildlife Management Detrimental?

by Mark Shoup

Anti-hunting groups increasingly attempt to discredit all wildlife managers and agencies, both federal and state. A recent nationally syndicated column claimed to moderate the anti-/pro-hunting debate by listing the successes and excesses of both groups. However, the article concluded with an attack on wildlife management agencies -- an attack taken directly from anti-hunting campaign rhetoric.

The argument goes something like this: "Wildlife agencies manage for hunters, who pay their bills. Therefore wildlife agencies manage for game species only, to the detriment of most other species. This is damaging to biodiversity." The thinking is that when you manage an area for deer or pheasants, you are hurting the area's other nongame wildlife.

"Biodiversity" is a the catch word that has become popular with pseudo-environmentalists in recent years. Last fall, an Esquire article decried the loss of "biodiversity" due to wildlife management efforts. Most anti-hunting publications use this concept in their attacks on state conservation agencies.

What does "biodiversity" mean to those who use the word so freely? Does it mean habitat to support the greatest number and variety of wildlife? Throughout Kansas, wildlife benefitted as natural grasslands were broken and replaced with croplands and shelterbelts. Chickadees, Cooper's hawks, juncos, kestrels, and prairie chickens increased populations. Coyotes thrived. More food and more "edge" habitat made this possible although the delicately balanced ecology of the grasslands was altered forever.

Black-footed ferrets, buffalo, elk, whooping cranes and wolves suffered irreparably from development. Today, there are few places on earth where an undisturbed North American grasslands environment can be witnessed, but development increased wildlife numbers in the Great Plains, at least initially.

Is this "biodiversity?"

It's an easy argument to say that managing land for the relatively few game species is damaging to the majority of other species, but it doesn't wash. In *Restoring America's Wildlife*, John M. Anderson, Director of the National Audubon Society's Wildlife Sanctuary Department since 1966, says that "we cannot save game species from the drainage ditch and bulldozer without providing suitable living space for nongame. A marsh that is ideal for mallards and muskrats produces a myriad of critters [such as] warblers, grebes, wading birds, silky dogwood and prairie dock." Planting grasslands and woodlots for pheasants and quail has equivalent effect on upland areas.

Money from fishing and hunting licenses and Pittman-Robertson (P-R) funds (excise taxes on hunting equipment) have funded virtually every game management program in the country. Like it or not, it's a fact that thousands of nongame wildlife species have benefitted from the sale of guns and shells, without getting shot at.

According to the Department of the Interior, one of every ten projects now undertaken with P-R funding is designed specifically to benefit nongame. P-R funds have contributed about 35 percent of New York's Endangered Species Program. In Wisconsin, P-R funds help provide research and habitat for raptors, timber wolves, barn owls, sandhill cranes, pine martens, shorebirds, terns and loggerhead shrikes. In Kansas, P-R funds have contributed to nongame habitat and population surveys, creation of backyard habitat, habitat demonstration projects and numerous prairie restoration projects.

As the list goes on and on, one fact becomes clear: beyond such concepts as bluebird and wood duck nesting boxes, single-species wildlife management is a fallacy. Wildlife managers use funds dedicated to game species to enhance habitat for all wildlife. This dedicated group of men and women would have it no other way. Without their efforts "biodiversity" would be argued as a historical term, not a biological one.

HUNTING

EAGLE RESCUE

A group of hunters got a surprise recently when their bird dog pointed an unusual bird. While upland bird hunting near Arrington, in Atchison County, the dog pointed a bald eagle that was perched on a branch in a tree row. Realizing that the bird was sick and unable to fly, Ron Nelson contacted Wildlife and Parks unit supervisor Gary Bernasek for assistance.

Bernasek and conservation officer Ray Beisel arrived to discover the eagle had moved from the original location. Again, members of the hunting party came to assist. Rodney Gruber, Holton and his son located the eagle on the ground next to a creek bank. The Grubers had stayed to check on the bird because they were concerned that it might fall prey to coyotes.

Although the eagle did not look injured, Bernasek and Beisel wrapped the bird in a blanket to aid in handling and to avoid any injury during transport. The eagle was taken to wildlife rehabilitator Kristie Kennedy of Lawrence who later took it to Wildcare Center in the University of Kansas Animal Care Unit.

The eagle was having difficulty breathing when received at Wildcare but recovered somewhat after it was given fluids. A preliminary examination indicated that it had a respiratory infection. It was given antibiotics, and it regained some strength while being tube fed.

Unfortunately, the eagle did not survive, but the efforts of a special group of Kansas sportsmen who cared enough to rescue an ailing bird gave it a chance. -- *Marty Burke, region 1 wildlife information representative*

MODEL 100 REPAIRS

In July 1990, Winchester Arms Company issued a product safety warning for owners of all Winchester Model 100 rifles.

In response to what one Winchester official termed "an occurrence," the company warned Model 100 owners not to use their rifles until receiving further notice. The company said that the problem would be investigated and owners would be informed of how and when they could have their guns repaired. However, to be informed of Winchester's progress on this issue, owners were asked to fill out and send in a coupon that was attached to the bulletin.

The problem with Model 100s apparently is in the rifle's firing pin. Once fired, the firing pin sometimes breaks and stays open, causing the next cartridge to explode before it is chambered. Winchester officials now say a new firing pin has been designed and is being tested.

Since the July notice, no further information has been publicly released by Winchester. However, Winchester public relations manager John Falk says that those who sent in the coupon should have received a letter concerning their Model 100s in late March.

Those Model 100 owners who are unaware of this warning should not use their rifles and should contact Winchester immediately. For more information, call Winchester Product Service, 1-800-852-5734. --*Shoup*

BIG GAME DATES

This year, the firearms deer season will run Dec. 4-15. This is approximately one week later than in recent years.The new dates should help deer hunters to plan their hunts without sacrificing time with family and friends over Thanksgiving Day weekend, and to avoid conflict with holiday bird hunters. The application date for firearms deer permits is July 1-12.

Of interest to landowners is a change in the landowner/tenant permits. The $15.50 permit will be offered for those landowners and tenants who wish to hunt an entire deer management unit. For those landowners who prefer to hunt on their own property, the $10.50 hunt-on-your-own-land permit will still be available. Hunt-on-your-own-land permits may be obtained from July 1 until the end of the season.

Other changes this year include 1) allowing assistance with a deer hunt if the person helping has a deer permit, either filled or unfilled; 2) establishing the fall turkey archery season to run concurrently with the fall archery deer season; and 3) limiting elk permits for the Cimarron Grasslands unit to two antlerless-only elk this year.

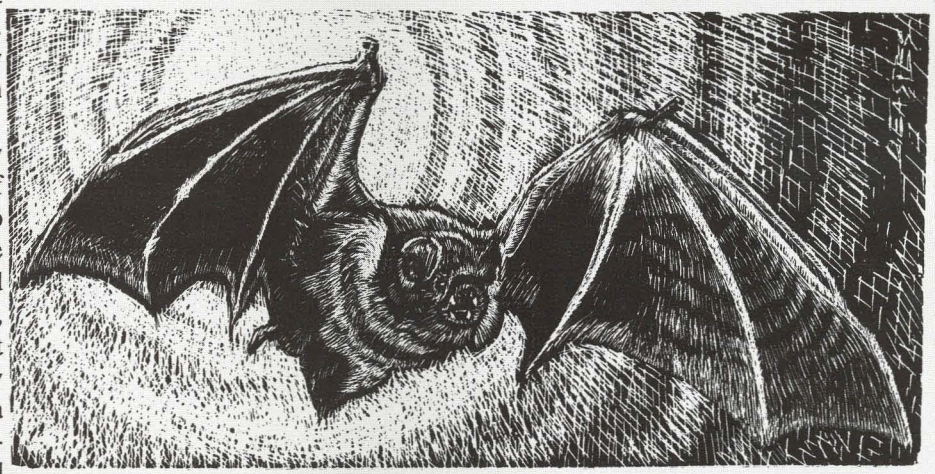
The fall turkey firearms application period will be Aug. 1-16; the turkey firearms season will be Oct. 9-20. The antelope archery application period will be June 1-Sept. 20; the archery antelope season will run Sept.21-29. The firearms antelope application period will be June 1-14; the antelope firearms season will be Oct. 4-7. The elk application period will be Aug. 1-16; the Cimarron Grasslands elk season will be Sept. 28-Oct. 6; the Ft. Riley elk season will run 9 days between Sept. 1 and Oct. 31. --*Shoup*

NATURE

BAT FACTS

Contrary to popular belief, bats are among the most sophisticated and beneficial animals on earth. There are no blind bats. Bats do not become entangled in peoples' hair, and they pose less threat to human health than household pets. Despite the notoriety of vampire bats, they account for less than one third of one percent of bat species and live only in Latin America.

Like dolphins, bats navigate and communicate using ultrasonic systems that far surpass current understanding. They are also highly intelligent, even trainable.



Although many people are aware of only one or two kinds, there are nearly one thousand species of bats, most as yet unstudied. They make up almost a quarter of all mammal species and come in an amazing diversity, from the world's smallest mammal -- the bumblebee bat of Thailand, which weighs 30 percent less than a penny -- to giant flying foxes in Java with 6-foot wingspans. Bats occupy almost every habitat worldwide, except for the most extreme desert and polar regions.

Some 70 percent of bats eat insects. Others feed on fruit or nectar, and a few are carnivores. Some of these are specialists that use huge feet and claws to gaff fish from ponds. Frog-eating bats use extraordinary low-frequency hearing to locate and identify frogs by their calls.

Nearly all perceptions of bats reflect our level of understanding. Bats are feared most in temperate regions, such as the United State and Europe, where they are small and live in caves or other places difficult to observe. In China, Southeast Asia, and islands in the Pacific and Indian oceans, many bats have wingspans of several feet and conspicuously roost like birds in treetop colonies. In these places, bats are often highly respected and generally not feared.

In the balance of nature, bats are by far the most important controllers of night-flying insects, including pests such as cutworm and corn-borer moths and mosquitoes. Some of North America's most widespread bat species are capable of capturing 600 or more mosquitoes in an hour. A single endangered gray bat from the southeastern U.S. may eat 3,000 insects in a night. In Bracken Cave, Texas, a colony of 20 million Mexican free-tailed bats (the largest known bat colony in the world) eats 250,000 pounds or more of insects nightly! *--Merlin D. Tuttle, Bat Conservation International*

AQUA TERRA

Unlike surface water, groundwater does not flow in a series of lakes and rivers. Instead, the precipitation that seeps into the ground fills the pores of rock formations much like water fills a sponge.

Formations that yield usable amounts of water to springs or wells are called aquifers. The amount of water an aquifer is able to hold depends upon the type of rock layers above and below the aquifer. Sandstone, a highly porous material, allows water to seep through easily. Limestone, however, is permeable but not porous -- water can flow easily through its cracks and fissures.

Two main types of aquifers are *confined* and *unconfined*. Impermeable materials such as clay and shale form a boundary at the top and bottom of *confined aquifers*. This material prevents groundwater from easily flowing through its cracks and pores and may help protect confined aquifers from contamination.

Unlike confined aquifers, *unconfined aquifers* are not protected by overlying layers of impermeable material and are therefore more susceptible to contamination. The top of the unconfined aquifer is called the water table, which is usually located a few feet beneath the surface. The water table in unconfined aquifers varies depending on the amount of usage and precipitation.

An *alluvial aquifer* is an unconfined aquifer beneath and adjoining a stream bed. In this aquifer, water is stored in sand, gravel or other sediment. The bottom of an alluvial aquifer can be shallow or very deep, depending on the permeability of the soil or rock beneath it. A saturated alluvial aquifer ensures that a stream will keep flowing. If the aquifer is depleted or dries up, so will the river.

Groundwater is part of a continuous cycle known as the hydrological cycle. As the earth warms, water evaporates from moist ground, plants and surface water. The air and water vapor rise into the atmosphere, where the air cools and the water vapor condenses to form clouds. Precipitation in the form of rain, hail, sleet or snow falls to the earth. Some of this precipitation evaporates before it reaches the ground; some of it runs off the earth's surface into streams, rivers and lakes; and some of the precipitation soaks into the ground. Aquifer recharge occurs when water from precipitation percolates through the soil until it reaches the saturated zone of an aquifer. Only water that has reached the saturated zone is referred to as groundwater. *--Missouri Department of Natural Resources*

NOTES

TEACHER WORKSHOP

The Martha Lafite Thompson Nature Sanctuary, located in Liberty, Mo., a few miles north of Kansas City, has announced its annual workshop for teachers, to be held June 10-14. The workshop is called Teaching Conservation Through the Outdoor Classroom.

For more information or a registration form, call (816) 781-8598. Participation is limited, and classes fill quickly. --*Tom Hein, editor, Martha Lafite Thompson Nature Sanctuary Newsletter*

RABBIT TUMORS

Researchers at Kansas State University need rabbits infected with a virus known as Shope papillomavirus. The disease can occur in either jackrabbits or cottontails and produces horn-like tumors on the animal's head. The virus is also known to cause cancer and is similar to a carcinogenic virus in humans.

The researchers hope to better understand the relationship between this virus and certain cancers in humans through the study of infected rabbits. Anyone observing or shooting a rabbit with horn-like tumors should contact Kevin Church, Department of Wildlife and Parks, Wildlife Investigations Office, P.O. Box 1525, 1830 Merchant, Emporia, KS, (316) 342-0658. --*Shoup*

PUDDLER PREMIER

A new wetlands wildlife magazine for children made its debut in March. Called *Puddler*, the slick color magazine features illustrations, drawings and photographs to enhance a variety of stories.

According to the premier issue's introduction, "*Puddler* is a children's magazine with a critical mission -- to help nurture respect and affection for North America's wetlands and the wildlife that live there." Future issues will include information about wetland wildlife, general ecology, ecosystems and animal behavior, wildlife adventures, animal folklore and tales, as well as quizzes, puzzles and interactive features designed to instruct and stimulate young minds.

Subscriptions to *Puddler* come with $5 Junior Greewing membership (12 years old and younger) in Ducks Unlimited. *Puddler* is also available to educators. For more information, contact Greenwing, Ducks Unlimited, One Waterfowl Way, Long Grove, IL 60047. --*Shoup*

DASHING KANSAN

A new biography of Lewis Lindsay Dyche is now available from the University of Kansas Museum of Natural History.

Dyche's abilities as a naturalist, taxidermist, explorer and showman made him a popular figure in Kansas and the nation. He was a driving force in the growth of the KU Museum of Natural History. In 1909, Dyche was appointed Kansas Fish and Game Warden. In this capacity, he embarked on an ambitious plan to build the world's largest freshwater fish hatchery in Pratt.

Dyche studied taxidermy with renowned conservationist W.T. Hornaday at the Smithsonian Institution and prepared a wildlife panorama for exhibit in the Kansas Building at the 1893 World's Columbian Exposition in Chicago. In 1894, he explored Alaska with Dr. Frederich A. Cook. He participated in the American Museum of Natural History expedition to "rescue" Lieutenant Robert E. Perry in Greenland in 1895. --*KU Museum of Natural History*

CAMPING CHECKLIST

Air mattress, batteries, blankets, camera and film, coffee pot, compass, cooking utensils, cooler, dish pan and pot scrubbers, eating utensils, first aid kit, emergency devices (flares, mirrors, etc.), flashlight, folding chairs and stands, fuel, ground cloth, hand ax, ice or ice substitutes, insect repellent, jug of water, knife, lantern, lighter, mantles, maps, matches (and waterproof container), writing material, plastic zipper bags (wash and reuse), prescription medicine, radiant heater (cold weather), rope, shovel, sleeping bags, snakebite kit, soap (biodegradable), stakes, stove, sunglasses, suntan lotion, tablecloth, tent and poles, toilet paper, toiletries, tool kit, towels, trash bags, water container, and water purification tablets. --*Coleman Camping Company*

FREE DAYS JUNE 8-9

Many folks plan their summer vacations around bargains and events at public areas throughout the state, and with summer approaching, those events are taking shape. One of the greatest bargains in the state is coming June 8-9. It's the Kansas Free Fishing and Park Entrance Days. For two days, boaters, fishermen and day campers will have free access to the 24 state parks in Kansas (overnight camping not included). To ice the cake, both the casual fisherman and the late license buyer will have a weekend of grace during which they will be able to fish without a license.

This a perfect way for family and friends to begin the summer. Kansas has one of the most diverse systems of reservoirs and waterways in the country, so this is also an opportunity to check out that lake or stream you've always wondered about. The variety of sport fish is wide, too, with largemouth, smallmouth and spotted bass, striped bass, crappies, walleye, bluegill, white bass, wipers, and channel and flathead catfish to choose from.

This year's celebration is designed to coincide with National Fishing Week, June 3-9. Last year, more than 1,000 National Fishing Week events were held thoughout the country.

For more information, contact the state park or Wildlife and Parks office nearest you. --*Shoup*

WINDBREAK COURSE

October 21-25, an in-depth course for all public and private agencies is being offered by the Soil Conservation Service (SCS) on "Windbreak Technology."

Registration will be about $40. Registration is restricted, so apply early. Contact Keith Ticknor, Regional Forester, SCS, Federal Building, Room 345, 100 Centennial Mall North, Lincoln, NE 68508-3866. --*K-State Cooperative Extension*

NATURE'S NOTEBOOK

by Dana Eastes

The Colorful Cardinal Shiner

Notropis cardinalis

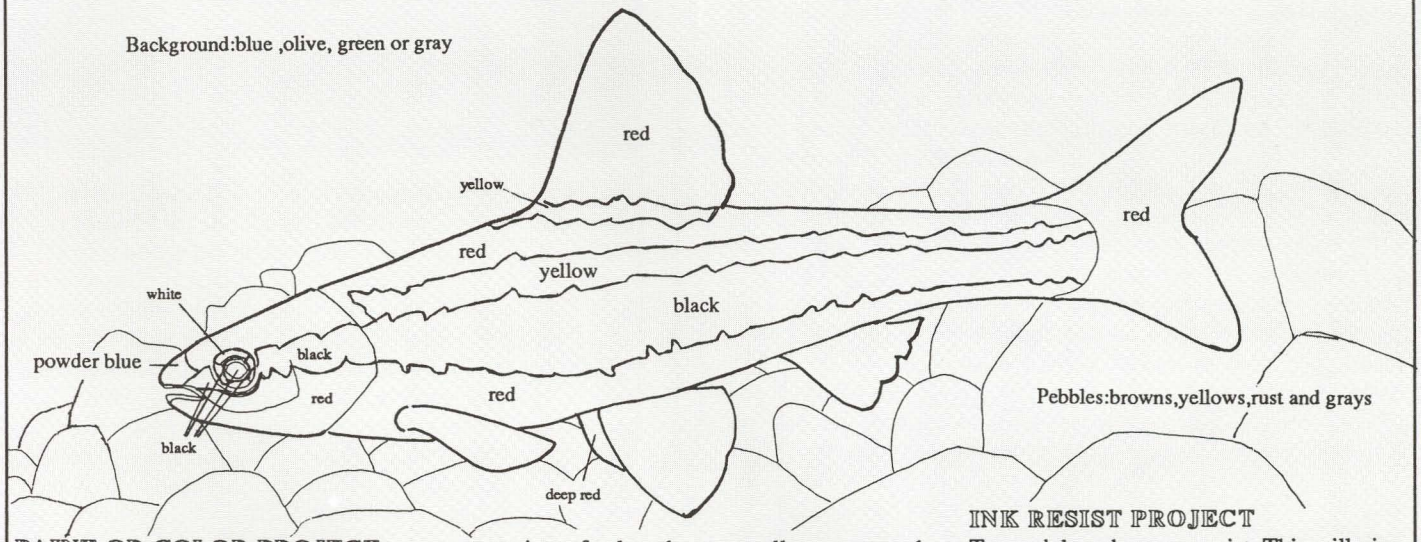
In this Nature's Notebook, you will learn about a newly discovered fish in Kansas, called the cardinal shiner. You will also get to color, paint or do an ink resist and find out how brilliantly colored and interesting this little fish is.

The cardinal shiner makes its home in headwaters of the Neosho River Basin and in the Spring River located in the Flint Hills. Small populations are also found in Oklahoma, Missouri and Arkansas. Cardinal shiners like small pools with current and faster water called riffles. They thrive in the gravel-bottomed, clear, cool streams and small rivers of the Flint Hills.

Cardinal shiners spawn in the spring and lay their eggs in small pit-like depressions dug by the males on clean, gravelly riffles. During the spawn, the males have a brilliant red body and fins and a blue snout. Females are not as colorful. Cardinal shiners can be 5 inches long and live 3 years. They eat aquatic insects and insects that fall into the water.

This new minnow was discovered by Dr. Richard Mayden while doing his Ph.D. research for the University of Kansas. Dr. Mayden also discovered the duskystripe shiner and the bleeding shiner.

Although this unique little fish is new to the list of 139 Kansas fish species, its survival is threatened by the ongoing destruction of Flint Hills streams and rivers.



PAINT OR COLOR PROJECT

Follow the diagram above to color or paint the cardinal shiner on the following page.

MATERIALS: Crayons, markers, watercolors or tempera paint.

COLORS:

cardinal shiner: Crimson or bright red fins and body, with horizontal black and yellow stripes running the length of the body. A powder blue patch on the end of the snout.

Gravel or pebble habitat: rocks can be a variety of colors: browns, yellows, rust, and grays.

Background: Can be blue, olive green, or gray.

SUGGESTION: If you're doing this as a classroom or home project, drawing and painting materials will work best if you make copies from the magazine. You may even want to try a heavier paper in your copy machine. Try enlarging the image if you have that option.

INK RESIST PROJECT

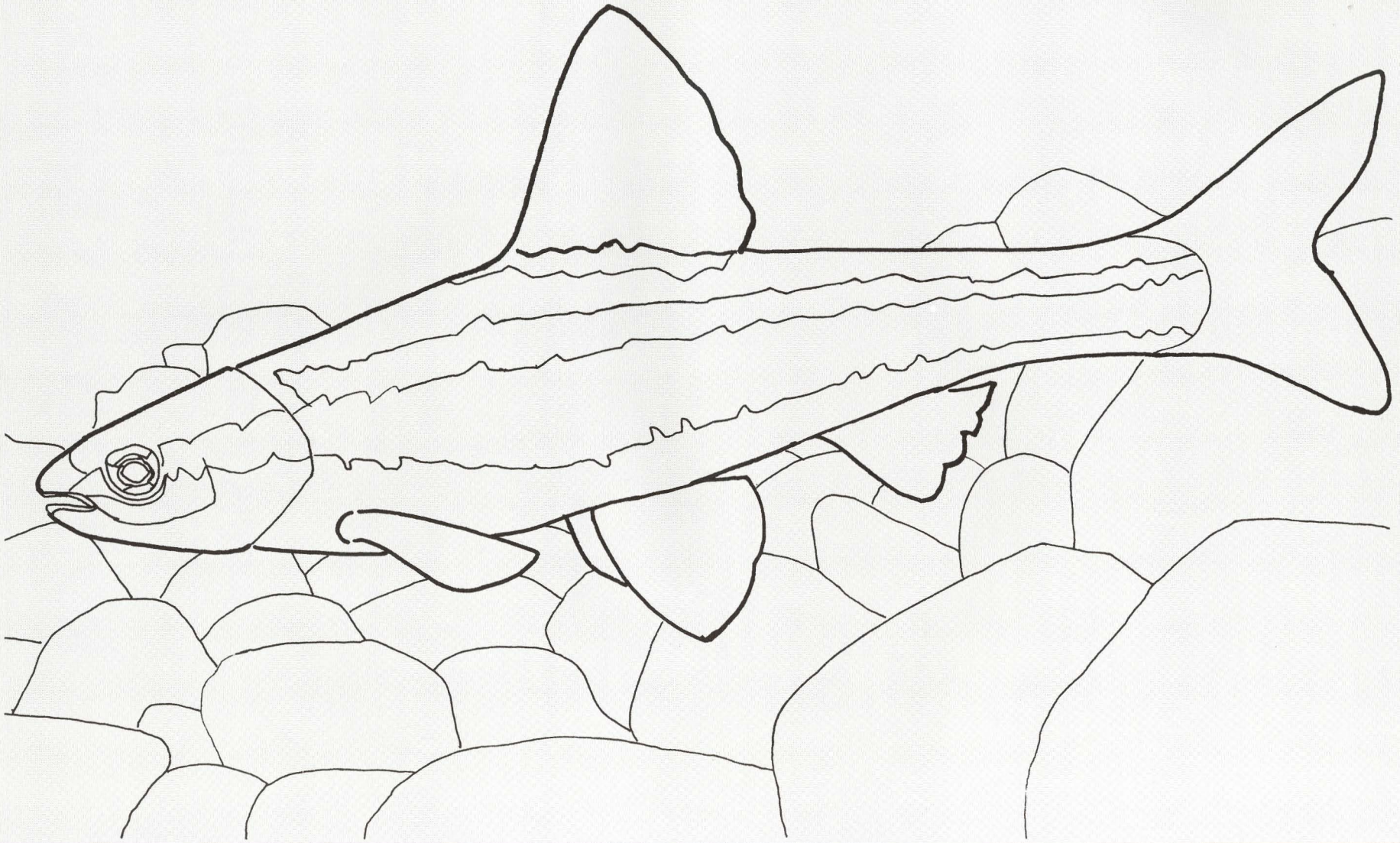
Try an ink and crayon resist. This will give your picture a stained-glass effect. The ink will run into the cracks where there is no waxy crayon.

MATERIALS: water, sponges, india ink and crayons.

Using crayons color the cardinal shiner with its appropriate colors. Next, with a damp sponge cover your picture with india ink, wait a few seconds to let the ink soak into the cracks and wipe off the excess.

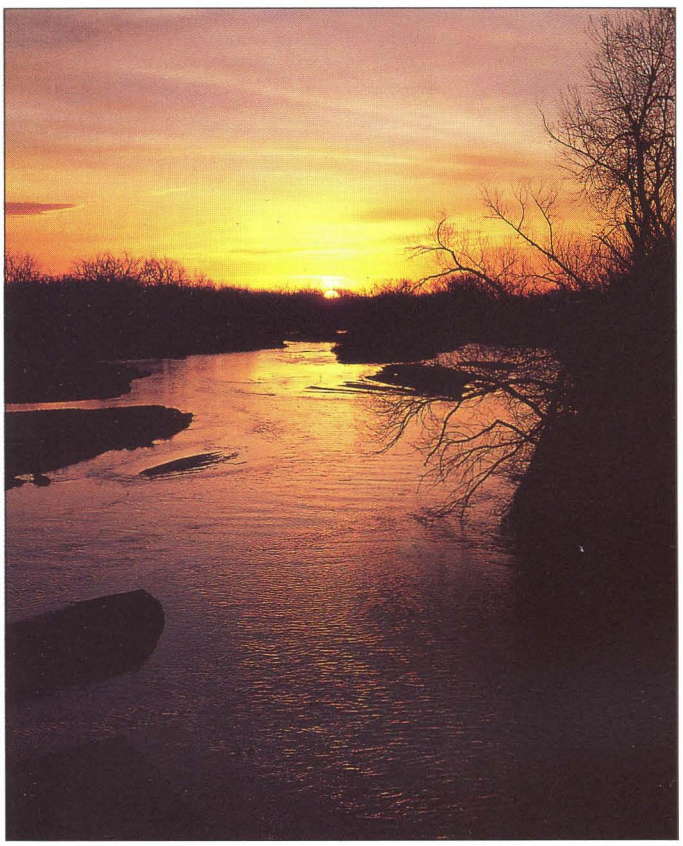
Cardinal shiner

Notropis cardinalis



Ark River Log

by Cliff Long
Wichita



Mike Blair photo

The Arkansas River offers some 150 miles of canoeable water in Kansas. Classified as one of Kansas' three navigable rivers, the Ark is a public waterway which is legally floatable within the confines of its banks.

From Raymond (35 miles northwest of Hutchinson) to the Oklahoma border southeast of Arkansas City, a distance of some 150 miles, the Ark drops 671 feet (average gradient: 4.6 feet per mile). This drop creates a river speed faster than several popular rivers in Missouri. The Ark makes a constant easy current just right for the novice, and a pleasure to lazy paddlers. The Ark is a typical prairie river with low banks, shallow sand bottom, and braided channels weaving around a series of sandbars and islands.

The section from Raymond to Hutchinson is narrow and twisty. Timber along the banks gives some protection from the wind. The river above Hutchinson is floatable through the winter months and during wet periods. At normal flow, the water is clear and clean (but not clean enough to drink safely).

Below Hutchinson, the river begins to widen. Turns are gradual and the water quality declines. Below Mulvane, the river widens further and the channels deepen.

Shallows are present the entire 150 miles. The channels are elusive and the paddler must learn to read the water to avoid grounding in deceptively shallow stretches of river. Go light and you can slip over the shallows or push over the lips of underwater sandbars. Sometimes you will encounter several narrow channels and, often, the main channel is along the bank. On the lower sections, you can follow boils of current which mark the main channel.

Wildlife abounds along the river. The low banks provide good views into adjacent brush and timber. Floods along the relatively broad, flat river corridor have kept homes and croplands from encroaching on the core of terrestrial habitat along most of the river's length.

Beaver signs are present along the river's entire course. Beaver dams are encountered in the upper section. Deer are commonly observed during the winter months when foliage has disappeared. During the winter, especially after ponds and lakes freeze over, flocks of mallards and teal will greet your arrival around virtually every bend. Canada geese are common sights either on the river or overhead. Herons and kingfishers are numerous year-round, due to the shallow water channels so important to these fish eaters. Bald eagles are commonly seen during the winter, usually perched in the large cottonwoods or along the edges of sand flats eating fish. Osprey and golden eagles are being seen more often along the river now, and in some areas muskrat and mink can be sighted while quietly paddling.

There is some unsightly riprap and trash which has been dumped over the years. In some places, junked cars have been laid to rest along the Ark's banks.

Since the Arkansas River is classified as navigable, it is a public river. The water surface, streambed, and adjacent banks to the average annual high water line are in public ownership and available for recreation. Canoeists and other river users, however, must remember to have landowner permission if they are crossing private land to put in or take out. However, public accesses are plentiful enough so that access should not be a problem.

A good way to get acquainted with the Ark, as well as the other rivers of Kansas, is through the Kansas Canoe Association. KCA members annually conduct a series of floats throughout the Midwest region. For information, contact: Kansas Canoe Association, Box 2885, Wichita, KS 67201.

The Arkansas River is a rich and diverse resource. From its headwaters in Colorado to its mouth on the Mississippi 1,450 miles downstream, it offers a variety of recreational experiences. The 150-mile stretch in central and south-central Kansas is no exception. See you on the river!

Guide to the Arkansas River

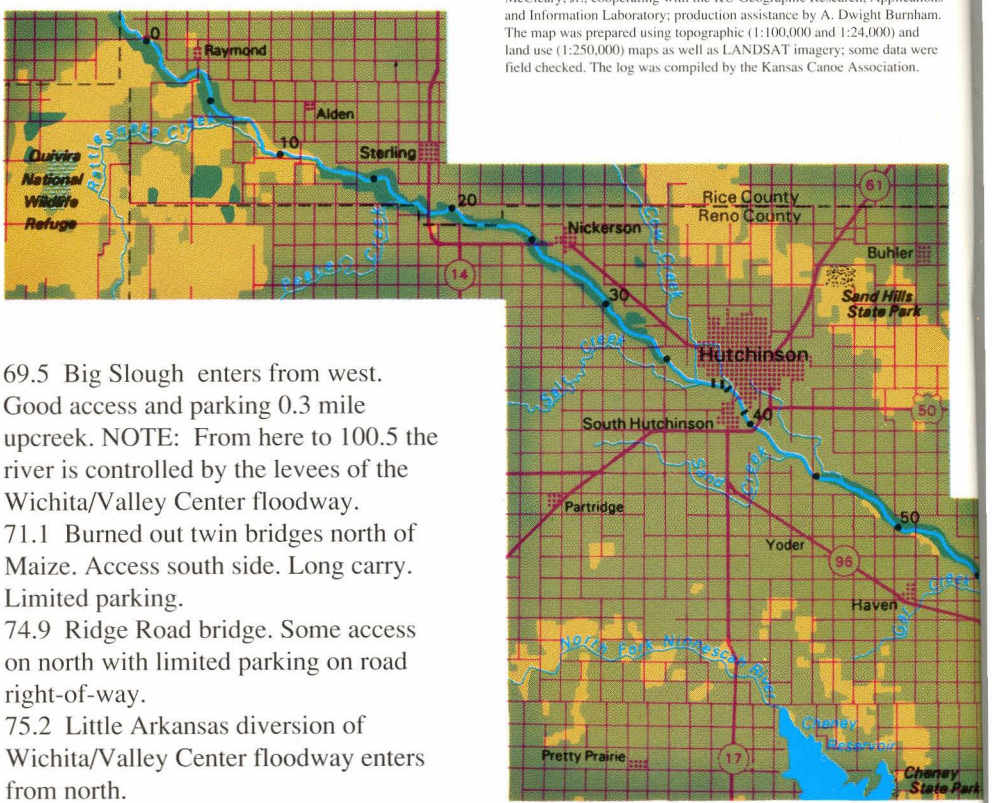
0.0 Parking area and put-in two miles west of Raymond. There is an active dragline below this access.
1.2 A pipeline crosses the river and may need to be portaged in low water.
3.2 South Raymond bridge. Access and parking southwest side.

6.5 View between Raymond and Alden.

7.8 Bridge west of Alden. Access and parking northeast.
11.3 Bridge south of Alden. Access and parking southwest side.
14.3 Bridge. Access and parking southeast side.
18.8 Bridge south of Sterling. Access and parking northeast side.
25.1 Bridge west of Nickerson. Access northeast side.
27.0 Bridge south of Nickerson. Access and parking northeast side.
34.8 Fourth Street bridge west of Hutchinson. Access and parking northeast.
37.2 Railroad bridges. CAUTION: Old bridge pilings remain.
50.9 Haven Road bridge. Access south side. Limited parking.

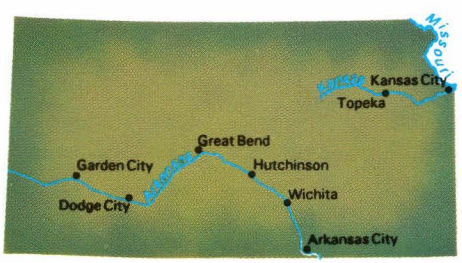
50.9 View downriver from Haven Bridge.

54.7 Bridge. Watch for hot fence wire at bridge and a mile downstream; there is a warning painted on the bridge.
58.4 Mount Hope bridge. Access and limited parking southeast side.
68.0 Bentley-Colwich bridge. Access south side. Limited parking.



69.5 Big Slough enters from west. Good access and parking 0.3 mile upcreek. NOTE: From here to 100.5 the river is controlled by the levees of the Wichita/Valley Center floodway.
71.1 Burned out twin bridges north of Maize. Access south side. Long carry. Limited parking.
74.9 Ridge Road bridge. Some access on north with limited parking on road right-of-way.
75.2 Little Arkansas diversion of Wichita/Valley Center floodway enters from north.
81.8 Another Little Arkansas floodway diversion enters from northeast.
82.2 Portage! Spillway structure lets river out of floodway. Take out southwest side. Long carry over levee and under I-235 to good parking area on west accessible from 21st Street. Possible to relaunch below structure and float to a take out closer to the parking lot. The outlet area from the spillway is a favorite play for local whitewater boaters and has a great variety of Class ratings (I to VI), depending on river flow. It is possible to paddle up to play and return to the same access to take out.

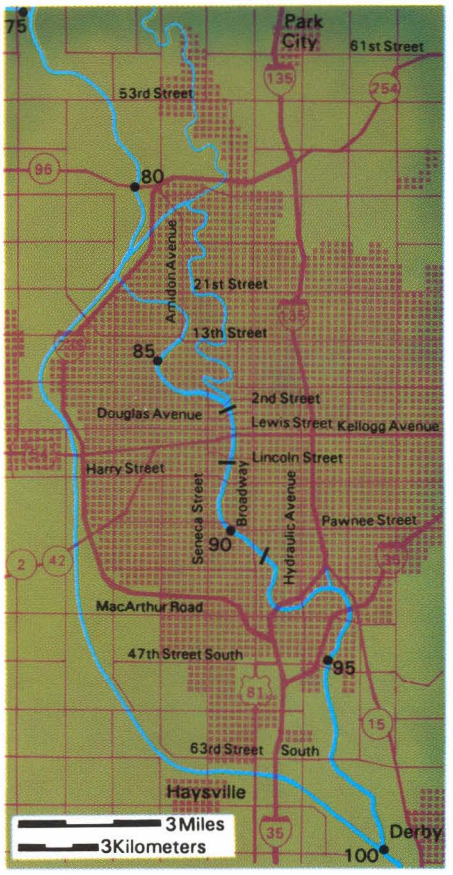
The Arkansas, Missouri, and Kansas rivers are public property up to their respective normal high water lines. Landowner permission is required before crossing private property to gain access to these three rivers. Unless otherwise posted, all other streams in Kansas are under private ownership of adjoining landowners.



The map and sketches were prepared by the University of Kansas Map Associates: Neil Allen, David Halliday, John Trickett, and George F. McCleary, Jr., cooperating with the KU Geographic Research, Applications and Information Laboratory; production assistance by A. Dwight Burnham. The map was prepared using topographic (1:100,000 and 1:24,000) and land use (1:250,000) maps as well as LANDSAT imagery; some data were field checked. The log was compiled by the Kansas Canoe Association.

82.5 Portage! Dam under 21st Street. CAUTION: Don't let high water fool you into thinking you can run this. It has killed!
82.6 Access below 21st Street dam. Carry down bike path southwest side. Parking area across street to northwest.
83.8 Amidon Avenue bridge.
84.4 13th Street bridge. City park along eastern/northern bank.
86.0 Cow Town on north. Parking and access.
86.5 Seneca Street bridge.
86.6 View (*opposite page, upper right*) across and downriver of Wichita skyline.
86.7 Little Arkansas River enters from north. Keeper of the Plains statue at confluence. Slack water from here to Lincoln Street. Limited parking on slab adjacent to MacLean Boulevard with access opposite Keeper of the Plains.
87.1 Second Street bridge.
87.2 Railroad bridge.
87.3 Douglas Avenue bridge.
87.6 Lewis Street bridge.
87.7 Highway 54 (Kellogg Avenue) bridge.
88.2 Portage! Dam under Lincoln Street. West side is best. Public parking south of Lincoln Street provided by Department of Wildlife & Parks.

88.3 Railroad bridge.
88.7 Harry Street bridge. CAUTION: Old bridge pilings and rebar can be a hazard in this vicinity.
89.3 Sewer pipe through river bed.
89.7 Pawnee Street bridge.
90.3 Herman Hill Park along north side. Good parking but long walk to access.
90.4 Highway 81/Broadway bridge.
90.8 Railroad bridge.
92.0 I-135 bridges.
92.6 Hydraulic Street bridge.
92.7 CAUTION: At times there is a low water crossing of broken concrete located here for vehicle access to the south side of the river.



93.4 Canal (East Fork of Chisholm Creek) enters northeast side.
94.0 Kansas Turnpike (I-35) bridge.
94.2 MacArthur Road bridge.
95.3 47th Street bridge.
97.3 63rd Street bridge. Access southeast side. Long carry.

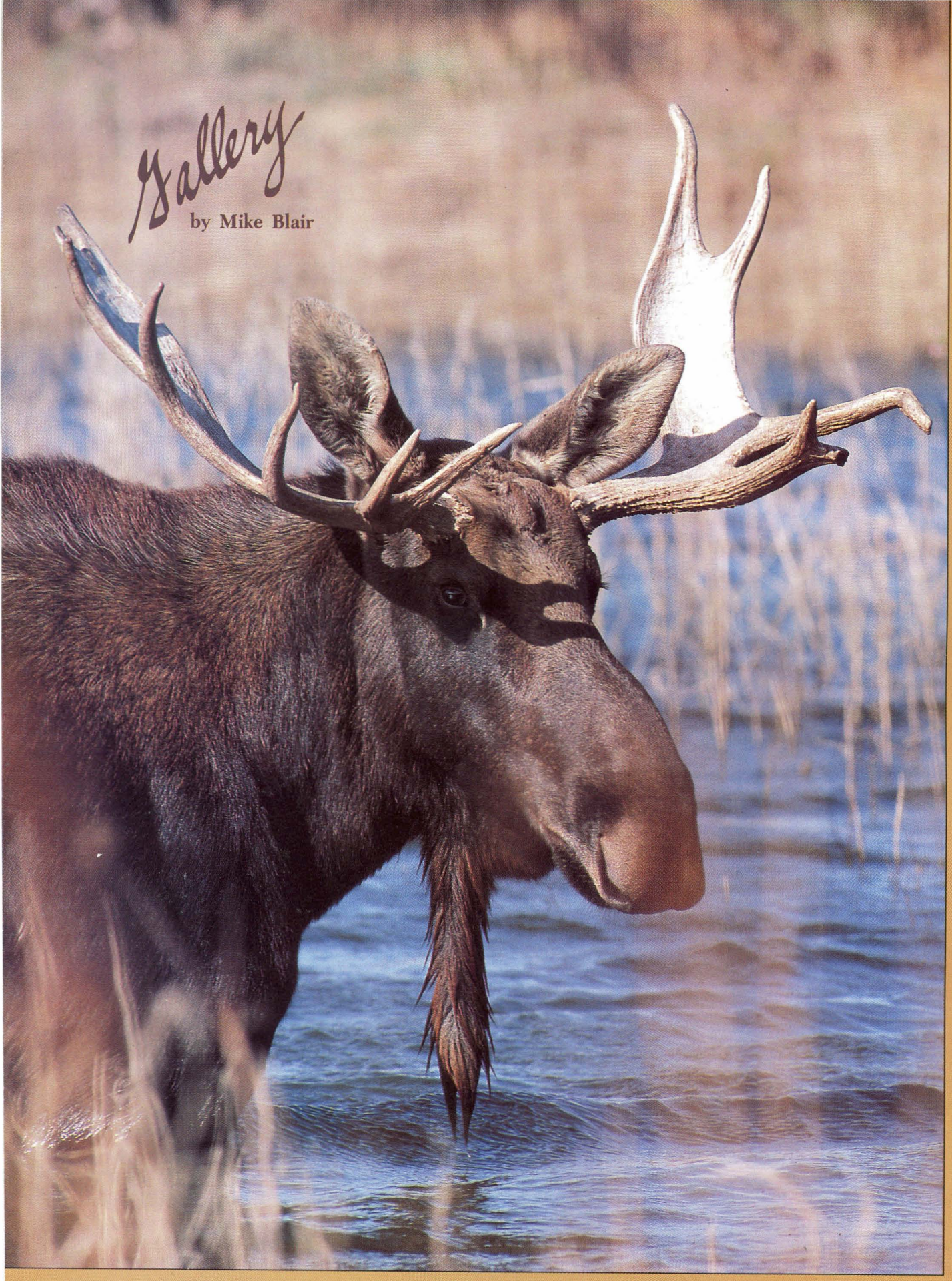
99.8 Wichita/Valley Center floodway (Cowskin Creek) enters west side.
100.5 Bridge west of Derby. Fair access east side. This is the end of theWichita/ Valley Center floodway.
106.1 Highway 53 bridge west of Mulvane. Access southeast of bridge. Long carry.
107.8 Railroad bridge.
108.5 Bridge south of Mulvane (closed to vehicular traffic.)
113.4 A few natural riffles over flat rock bottom.
115.0 Highway 55 bridge between Belle Plaine and Udall.
119.6 Several islands and old bridge pilings.
120.9 Ninnescah River enters west side. Access 1.2 miles up the Ninnescah from county road at bridge.
121.4 Old rock dam (Oxford dam) mill race on west side. Stay on the west side of the river (river right).
124.9 Oxford City Park northwest of Highway 160 bridge. Access and parking with boat ramp. Potable water in park. Stores within walking distance.

125.0 Downriver toward Highway 160.

132.7 Bridge. Access northwest side. Limited parking.
141.0 Bridge east of Geuda Springs. Access southeast side. Limited parking.
146.3 Bridge west of Arkansas City. Access southeast side.
146.9 Highway 166 bridge west of Arkansas City. Access southeast side.
151.9 Walnut River enters from the north. (Excellent access at Walnut Park, 2.0 miles up the Walnut northwest of Highway 166 bridge.)
158.2 Grouse Creek enters east side. Good access and parking developed by Department of Wildlife & Parks.
158.6 Oklahoma border.

Gallery

by Mike Blair

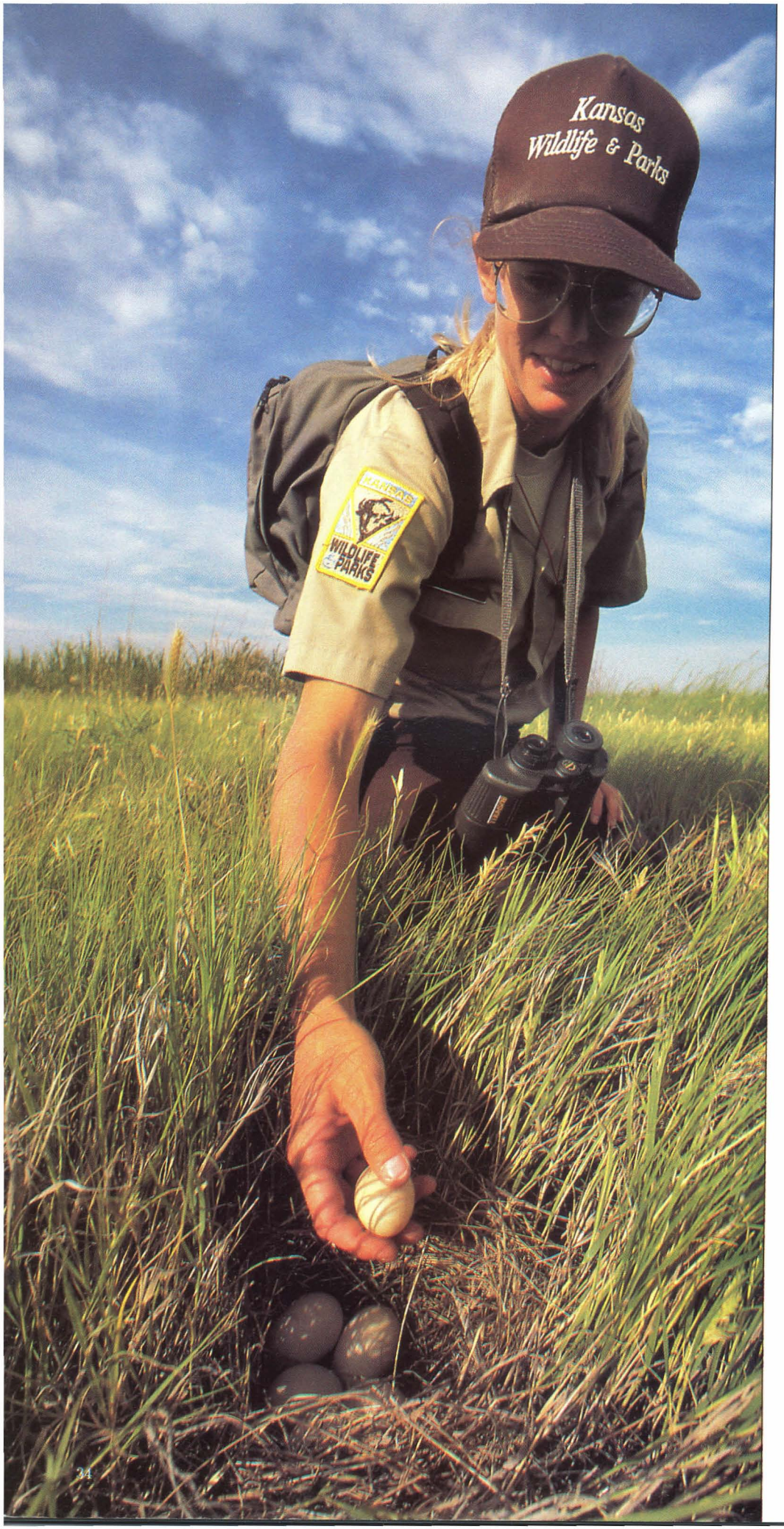


400 mm f/9.5 @ 1/125

400mm f/6.7 @ 1/250

400mm f/8 @ 1/125

As unusual as it must seem, Kansas was actually home for a wayward moose in 1987. Inexplicably, the young bull left its natural habitat in Montana and travelled down the Missouri River into Nebraska. It was reported to have sparred with an ornamental windmill in that state. It stayed in northern Kansas near Kirwin National Wildlife Refuge throughout the spring and summer, then caught the travelling bug again. Just after these photos were taken north of Kinsley, the moose was residing near Elkhart and thrilling hundreds of onlookers. It came to an end when well-meaning individuals decided the animal needed help and captured, treated and transported it to another state.



Duck Nest Research

by Helen Hands
wildlife biologist, Cheyenne Bottoms

photos by Mike Blair

To allow managers to develop management plans that promote favorable duck nesting conditions, a study has started at Cheyenne Bottoms that monitors nesting species, success and nesting habitat preference.

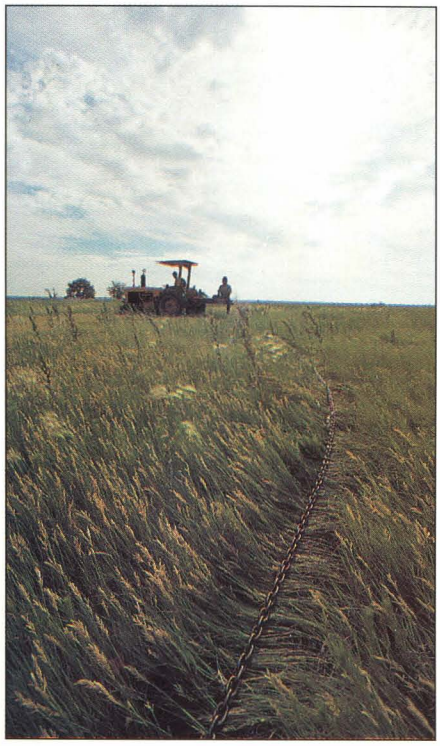
Cheyenne Bottoms has long been recognized as an important wetland for migratory shorebirds, waterfowl and other birds. However, few regard the Bottoms as an important nesting area for ducks. Although Cheyenne Bottoms does not produce as many ducks per acre as the prairie pothole region in Canada and the northern U.S., it is probably the most important duck nesting marsh in Kansas.

However, the number of ducklings produced each year in the prairie pothole region has declined since 1955, primarily due to loss of wetlands and adjacent grasslands and a long-term drought. More than 50 percent of the wetlands in the prairie pothole region have been lost since

settlement, largely due to agricultural development. As duck production in the prairie pothole region decreases and continental duck populations decline, it becomes increasingly important to maximize duck production in all suitable habitats. Thus, we decided to study the nesting habitat and success of ducks at Cheyenne Bottoms to determine if existing management activities need refinement. Although duck nesting was studied at Cheyenne Bottoms from 1963 to 1970, we initiated our study to more intensively evaluate the effects of habitat on duck nesting and to determine if nesting density and productivity have changed in 20 years.

Our study began last April with surveys of breeding pairs and vegetation density in the study area and continued through August. When ducks arrive at the Bottoms, they usually have already formed pair bonds. If they remain on the Bottoms to nest, nesting usually will begin in mid- to late April. Duck nests are well concealed in vegetation and are fairly difficult to find. In general, dabbling ducks, such as mallards and blue-winged teal, nest in grassland areas near wetlands and diving ducks, such as redheads and ruddy ducks, nest in marshes. We decided to search for nests only in the more upland, grassy areas of Cheyenne Bottoms because too much time would be required to adequately search both upland and marsh areas. Also, because the wetter portions of the Bottoms historically have been studied and managed more intensively than the uplands, we wanted to learn more about the uplands. We searched for nests in May, June, and July by dragging a 200-foot-long piece of 1/4-inch chain between two tractors. The chain caused hens to flush, but did not harm the hen or her eggs. When a hen flushed, we stopped immediately and usually found the nest with little trouble. At the nest, we recorded the species, number of eggs, incubation stage, vegetation density, and species of plants found within 3 feet of the nest. Each nest was marked with two sticks so we could find it again. Nests were rechecked soon after the anticipated hatching date to determine their fate.

We searched for duck nests in 360 acres in May and 480 acres in June and July. A total of 133 nests were found during these searches. The most common nesting species was the blue-winged teal (88 nests) followed by the mallard (20), shoveler (18), and gadwall (7). Considering that we searched for nests in less than one-fifth of the available grassland habitat, there were an estimated 780 dabbling duck nests on the Bottoms in 1990. During the previous study of duck nesting on the Bottoms, nest searches were conducted only in June. The techniques of the previous study were most similar to ours between 1967 and 1970. In June 1990, we estimated that there were 530 dabbling duck nests on the Bottoms. This compares to an estimated 440 nests in 1967, 450 in 1968, 390 in 1969, and 230 in 1970. Because of the variability in the estimated numbers of nests on the Bottoms during the previous study, more study is needed before we can realistically compare duck nesting now and that of 20 years ago.



A dragged chain flushes hen ducks from nests without damage and allows researchers to locate and examine the nests.

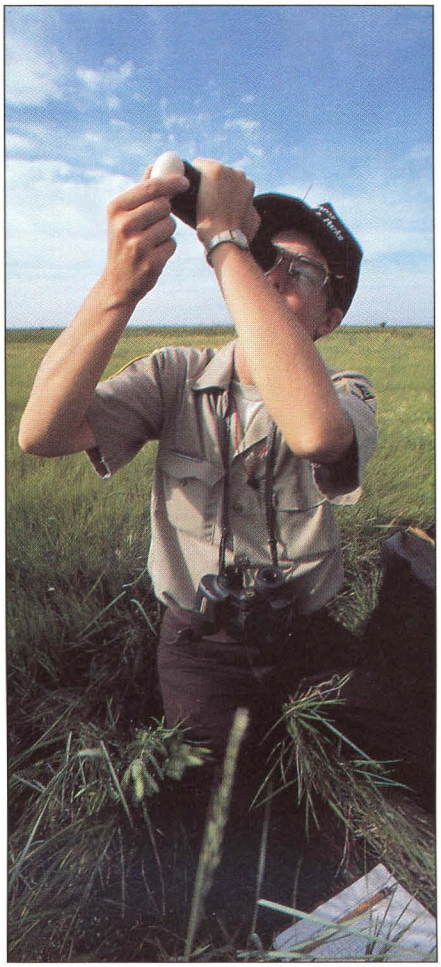
When a hen flushes, researchers visually mark the area and immediately go to the vicinity and try to locate the nest. Vegetation around the nest is noted for each species to find differences in preference.

Blue-winged teal and shovelers started nesting earlier than mallards and gadwalls with the first teal and shoveler nests being found in May. The first mallard and gadwall nests were found in June. When the hen begins laying eggs, her nest consists of little more than a scrape. As laying continues, she adds down from her breast and grass to the nest. Ducks usually lay one egg per day until the clutch is complete. Clutches of blue-winged teal, shoveler, mallard, and gadwall averaged nine to 12 eggs.

Vegetation density and kinds of plants at the nest site differed among species. Mallards nested in the densest cover followed by gadwall, blue-winged teal, and shovelers. Saltgrass was frequently found within 3 feet of the nests of all four species. In addition, foxtail barley and wheatgrass were commonly found around teal and mallard nests.

The hen begins to incubate her clutch after the last egg is laid and continues for 21 to 30 days, depending on the species. All eggs that develop normally hatch on the same day. When we checked nests after their anticipated hatching date, we usually could determine the fate of the nest from the condition of the nest bowl and the eggs. We could conclude that the eggs had hatched if the nest bowl was undisturbed, the eggshells remained in the bowl, and the shell membrane was detached from the eggshell. Typically a mat of down covered a successful nest as if the hen had left the nest only for a short time to feed. Failed nests, conversely, appeared much different. Unbroken eggs remaining in a nest after the anticipated hatching date generally indicated that the hen had abandoned the nest. If the nest bowl was disturbed and broken eggshells or eggs with small holes chewed out of the sides or ends were found, the nest probably was destroyed by a coyote, skunk, raccoon, or mink. Sometimes, no traces of the eggs were found which indicated that perhaps a snake may have eaten them.

Some or all eggs hatched in 63 (48 percent) of the nests we monitored in 1990. However, the percent of nests in which at least one egg hatched varied among species: 30 percent for mallard, 45 percent for blue-winged teal, 67 percent for shovelers, and 71 percent for gadwalls. Nesting success estimated in the previous study at Cheyenne Bottoms was 54 percent in 1967, 53 percent in 1968, and 59 percent in 1969. Again, more study is needed to determine if nesting success now is actually lower than it was 20 years ago. Nevertheless, nesting success at the Bottoms is much higher than in many parts of the prairie pothole region where only about 10 percent to 15 percent of nests are successful each year. Fortunately, a hen can lay a replacement clutch, or even two, if the nest is lost early in the nesting season.



The author "candles" a duck egg to determine how far into incubation it is. Nests were marked so that biologists could return after hatching and determine their fates.

Helen Hands photo

Researchers studied the condition of the nest and egg shells to determine whether or not the eggs hatched. This nest was destroyed by a predator.

After hatching, the hen broods the ducklings until they dry. Then the hen leads them on their often long walk, sometimes up to a mile or more, to water. At Cheyenne Bottoms, what happens to the hen and her brood after hatching is a mystery. The distance between the grassy nesting areas and water was usually at least one-quarter of a mile and sometimes up to one-half of a mile. Furthermore, broods usually have to walk through very dense, tall vegetation such as cattail, bulrush, and firebush. Thus, perhaps less than one-quarter of the broods at Cheyenne Bottoms may reach water. In the future, we would like to determine how many broods survive to fledging and at what stage most mortality occurs by attaching a radio transmitter to the hen and following the brood's movements.

We plan to continue searching for duck nests for at least four more years. During this time, we will burn or graze portions of our 480-acre study area to determine if these management treatments affect the density of nests and the percent of nests in which at least one egg hatches. We burned one 40-acre plot in April 1990. No nests were found in May when grass cover was very sparse. In June, 4 nests were found, of which three hatched and one was abandoned. More data of this kind will help us refine our management techniques, if necessary, to produce more ducks.

The Stocking Controversy

by Randy Rodgers
wildlife research biologist
Hays

photos by Mike Blair

Hotly debated for years, the subject of stocking pen-reared pheasants and quail to supplement wild populations is an emotional issue. Scientific studies, however, leave little doubt about the ineffectiveness of such practice.

In the years I've worked as a wildlife biologist in Kansas, I've found few other issues as patently frustrating as the subject of stocking pen-reared game birds. In the face of a lengthy list of scientific studies which, to the last one, provide evidence against supplemental stocking, many well-meaning people continue to advocate pen-reared birds as the answer to diminished wild pheasant populations.

There are many reasons why this controversy continues, even though the facts are clear. Let's look at some of them.

Communication between professionals and the public has, at times, broken down due to the use of imprecise terminology and incomplete explanations. In the category of terminology, take the example of simply defining stocking. *Supplemental* stocking, the primary issue at hand here, is the release of stock into habitats where an established population of the same species already occurs.

This is often done under the pretense of speeding the recovery of a low population. Contrast that with *initial* stocking which is the introduction of a species into habitats where it is not currently present. Most such releases in recent years have been made to restore a species to a portion of its historic range and, generally, involved trapping wild stock and moving them directly to the restoration area. Too often, nonprofessionals don't distinguish these very different forms of stocking which leads to their incorrect perception that biologists are sending mixed signals.

Misunderstanding also results when research is incompletely explained. I have heard biologists make flat statements like "pen-reared pheasants don't survive in the wild." Such a statement may be interpreted by some as meaning none survive. Game breeders bristle at this because they know that some do survive. For their part, game breeders also stretch the truth. Casual observation of a few pen-reared individuals that survive hardly justifies many game breeders' conclusion that most or even many survive.

The proverbial "apples and oranges" situation also frequently muddies the water. People sometimes see no distinction between supplemental stocking of hatchery-raised fish (commonly practiced by biologists) and stocking pen-reared pheasants (widely opposed by biologists). Learned behavior stemming from early life experience is very influential in the development of survival skills in birds. In contrast, fish rely more heavily on genetically encoded instinct. Consequently, artificial rearing produces very different outcomes with fish such as walleye as compared to pheasants.

The supplemental stocking controversy also, of course, derives heavily from the desire of game breeders with vested interests to see, hear and say nothing which might mean fewer customers. It is understandable that some game breeders are anxious to discredit statements by biologists on this subject.

Finally, it must be pointed out that state wildlife agencies aren't without sin either. Proceeding with good intentions, and little else, state game farms flourished in the first few decades after pheasants were widely introduced in this country. But by the late 1930s and 1940s, red flags were being raised over the propriety of supplemental stocking. Armed with ever mounting evidence, biologists succeeded in closing down many state game farms in the 1960s and 1970s by publicizing their knowledge.

The most common method of supplemental stocking is to release pen-reared birds when they are 8-12 weeks old in mid-summer. Research projects that tracked such birds have shown that few survive longer than a month.

But agencies continued to send mixed signals. In Kansas, for example, the state pheasant farm was closed in the early 1960s and the quail farm followed about 10 years later. Nevertheless, the state continued to purchase quail and distribute them to landowners for yet another decade. Biologists were publicly rallying against supplemental stocking while wardens, operating under the guise of "good public relations," were passing out birds, effectively sending the opposite message. That so-called good PR proved incredibly shortsighted as it left a legacy of public confusion over supplemental stocking. Some states perpetuate this confusion, even today, by operating pheasant farms. Admittedly, these are mainly for the purpose of put and take shooting, but the signal perceived by some of the public is that supplemental stocking is beneficial.

With all the misunderstanding and misinformation, it shouldn't be too surprising that the controversy continues. But let's examine the results of the extensive scientific research available on stocking pen-reared birds. Keep in mind that the specific examples we'll look at are backed up by a stack of studies too thick to even begin to cover.

Perhaps the most common form of supplemental stocking has been to raise pheasant to the age of 8-12 weeks and release them in mid-summer. One of the more illustrative studies that dealt with such stocking was done in Minnesota using radio telemetry. Those researchers found that more than 40 percent of their pen-reared juveniles were dead within five days of release. After four weeks, more than 75 percent were dead . . . and this, remember, occurred in the summer when cover conditions were best.

A somewhat different study done in Pennsylvania compared the survival of pen-reared adult males to that of wild adult cocks released in spring. Again, radio transmitters allowed researchers to track the birds and determine their fates. It took 10 days for 40 percent of these pen-reared adults to die, and more than 80 percent were dead within 50 days of release. Contrast those figures with the performance of the wild birds. After 10 days, only 10 percent

were lost and after 50 days, there were three times the number of wild/released birds than pen-reared birds alive.

So, how are the pen-reared birds dying? Basically, they get hammered by predators. In the Minnesota study, 91 percent of the losses were attributed to predators, starvation took two percent, farm machinery two percent, and cause the of death on the remaining five percent was undetermined.

The figures were remarkably similar in the Pennsylvania study, but those researchers took their study a step further. They discovered that a large proportion of the released pen-reared birds exhibited no response when approached. That's a very dangerous behavior when a predator is involved. The no response behavior was virtually unseen among wild birds. Even after a week of learning opportunity and, it must be noted, culling of the dumbest by predators, an astonishing one-third of the remaining pen-reared birds still exhibited no response when approached.

Now that we know predators waste no time taking advantage of this pen-reared banquet and that the birds are vulnerable because of defective behavior, lets dig deeper. What is the root cause of the pen-reared birds' maladaptive behavior?

One seemingly apparent answer might be genetics. There is little question that game farm stock has historically been selected for ease of handling and maximum egg production, not survival skills. However, a radio telemetry study done in Oregon in the early 1980s addressed the genetics issue. Spring releases of adult pen-reared pheasants from eight different genetic backgrounds were examined. The researchers found no difference in survival rates between the various stocks and, not surprisingly, survival was poor.

If genetics plays little or no role, then the source of the poor survival skills observed in pen-reared birds must be rooted in learning. Indeed, behavioral biologists have long known that young animals go through critical learning phases very early in life. If important learning opportunities, or stimuli, are unavailable during these early periods, animals find it difficult to develop appropriate behaviors, even if they experience these same learning opportunities later in life. Thus, pen-reared pheasants, deprived at the critical time of their chance to learn how to avoid predation, become the equivalent of sheep waiting for slaughter when they're released. A very few may survive, but most become predator chow.

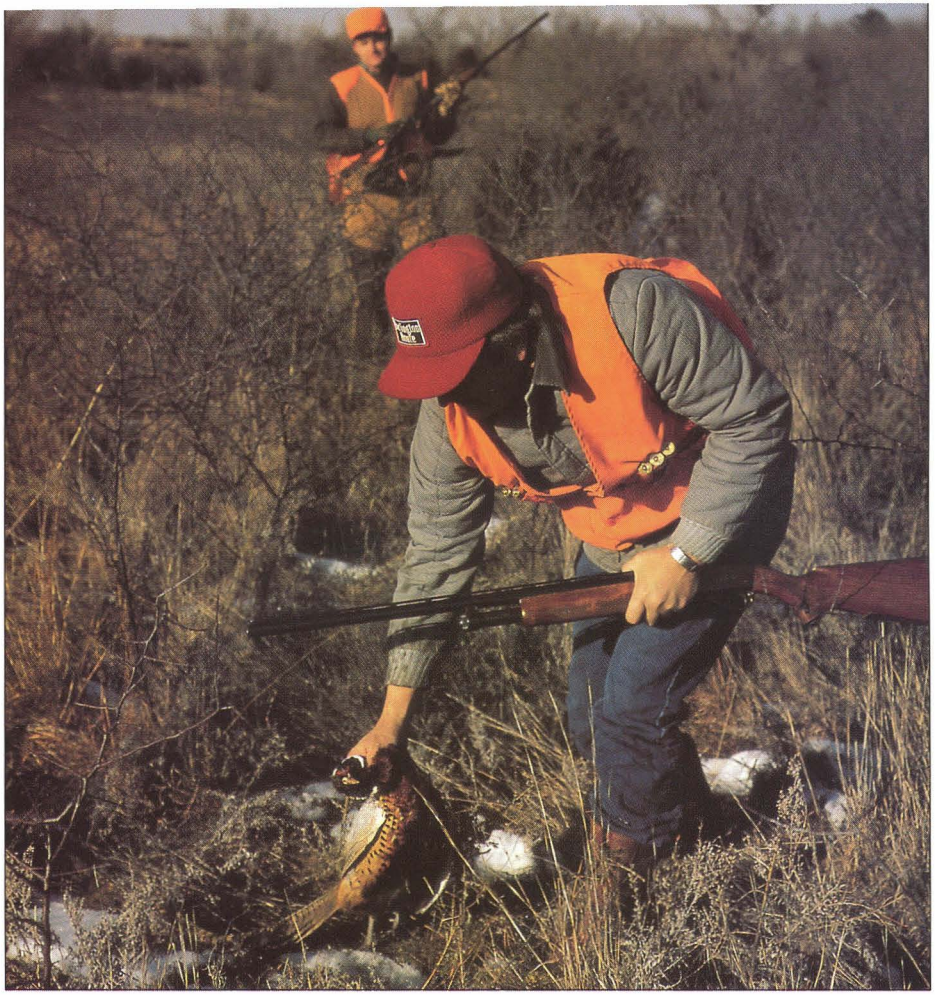
And what of the lucky survivors? Do they then go on to become productive members in the pheasant community? The best study I've seen on this subject was done in England. There, scientists compared the breeding abilities of wild cocks and hens to those of pen-reared birds that survived for nine months in the wild. They found that virtually all wild cocks were able to establish a territory and collect a harem, but only 57 percent of the surviving pen-reared cocks could do the same. In addition, the harems of wild males, on average, contained twice as many hens as the harems of pen-reared males. Combining those factors, the researchers estimated that wild cocks were three times better breeders than surviving pen-reared birds.

The more important questions, of course, relate to hens. In the same study, they found no difference in the number of nesting attempts or in hatching success between wild and pen-reared hens. That's interesting because these traits must be passed on genetically. After all, when these behaviors are occurring, the chick is only an embryo. But chicks are able to learn successful survival behavior from their mothers and therein lies the difference. Predators killed proportionally three times more pen-reared hens with chicks than wild hens with chicks. Apparently, the hen's survival skills are intensely important when chicks are present. Without those sharply honed skills, remaining pen-reared hens were only one-fourth as successful in raising their young as wild hens.

Studies where birds were released in spring as breeding stock have repeatedly shown dismal production. In an Oregon study, only 17 young were produced by 335 game-farm hens released in early spring. Other research has sometimes yielded modestly better results, perhaps 25 or 30 young per 100 hens released. Many well-meaning folks have tried to avoid the problems of stocking pen-reared juveniles by stocking adult breeders in the spring. Little did they realize that they had chosen an even worse alternative.

The picture gets even more grim when you consider the economics of a spring breeder release. Some simple mental gymnastics, based on what we already know, tell the story. Let's start with a spring release of 100 pen-reared hens costing about $10 each, an investment of $1,000. From that, we might optimistically expect 30 young to be produced, only

Releasing adult birds in the spring in an attempt to bolster breeding populations is even less successful. The few that don't end up as predator food are poor breeders and nesters.



A pen-reared bird that actually ends up in a hunter's bag is very expensive.

half of which are males. If we again optimistically assume that one-half of those males survive until the hunting season and that perhaps, here in Kansas, 30 percent or 40 percent are harvested . . . well, you get the picture. Any way you slice it, a rooster produced this way that actually ends up in the hunter's bag is astronomically expensive. It's too bad that such birds couldn't easily be marked. I suspect that advocates of such stocking would disappear real quick if they had to pay the true cost of bagging those birds.

The costs go down with other forms of supplemental stocking. In nine different studies that evaluated summer releases of 8- to 12-week-old juveniles, an average of nine percent ultimately showed up in the hunter's bag. Considering the high mortality, sex ratio, and harvest potential, the cost per bird harvested using this method likely falls in the $40-$50 range.

The cheapest way to put a pen-reared bird in the hunter's bag, short of euthanizing it and handing it over, is to raise the birds to adults and stock them shortly before they are hunted. Depending on how soon the birds are hunted after release, the intensity of hunting pressure and a few other factors, the cost per bird bagged may be less than $9 or $10, but can easily range up to $25-$30.

There remain several other points which fall outside the realm of well established fact, but should still be mentioned. Some are grounded in scientific reasoning but haven't been researched and some are highly speculative.

In the former category, consider disease transmission. It is well established that by concentrating animals, the opportunity for disease to spread is greatly enhanced. Game farms, by virtue of the fact that they create such concentrations, are centainly disease reservoirs. Pheasants that are healthy in captivity, thanks to medication and ample food, may become vectors for disease once they're released to mingle with wild birds. Such transmission is well documented in species that readily concentrate in the wild, such as waterfowl and turkeys. The situation is less clear with pheasants, but the potential should not be ignored.

A similar concern was advanced in 1947 at the North American Wildlife Conference. It was contended that the release of pen-reared birds may stimulate predation that, as the pen-reared banquet diminishes, spills over and increases predation on wild birds. Again, there there have been no studies of this relative to pheasants. But it is well known that predators, having found an abundant or easy to take species, tend to focus on that species, developing what is known in biology as a *search image*.

Consider also that there are knowledgeable people in Wisconsin who are wondering if their history of massive game-farm pheasant releases has somehow contributed to the decline of that state's wild pheasant population. They speculate that, despite poor survival, enough pen-reared birds may have survived over the years to genetically water down the wild stock. It's an intriguing idea, but it may also represent a proverbial "grasping at loose straws" when control of the real issue, land use, has been beyond their reach.

Possibly more important than any of the topics covered is what pen-reared stocking means to us. What is the human element? How does a ready acceptance of pen-reared game reflect on hunters and hunting?

In writing about hunting and fishing quality, C.H.D. Clark once equated the skills needed to participate in a put-and-take shoot to those of an executioner. To closely paraphrase his words . . . There is more pride in using the opportunities, even if limited, that are afforded by well managed land than can be had by luxuriating in a put and take barnyard.

Aldo Leopold, the founder and conscience of wildlife management, almost 60 years ago wrote: "The enjoyment of wildlife is inverse to its artificiality." We must not allow misplaced interest in stocking to divert our attention and resources away from the real need of restoring habitat. I believe we hunters, and hunting itself, are diminished in direct proportion to the degree that we accept cosmetics rather than fight for real conservation.

The Fisherman Is A Dreamer

text and photos by Mark Shoup
associate editor

Catching big flatheads is nothing new to Jerry Griffin, but last spring he caught a whiskered giant weighing more than a state record that had stood for 24 years.

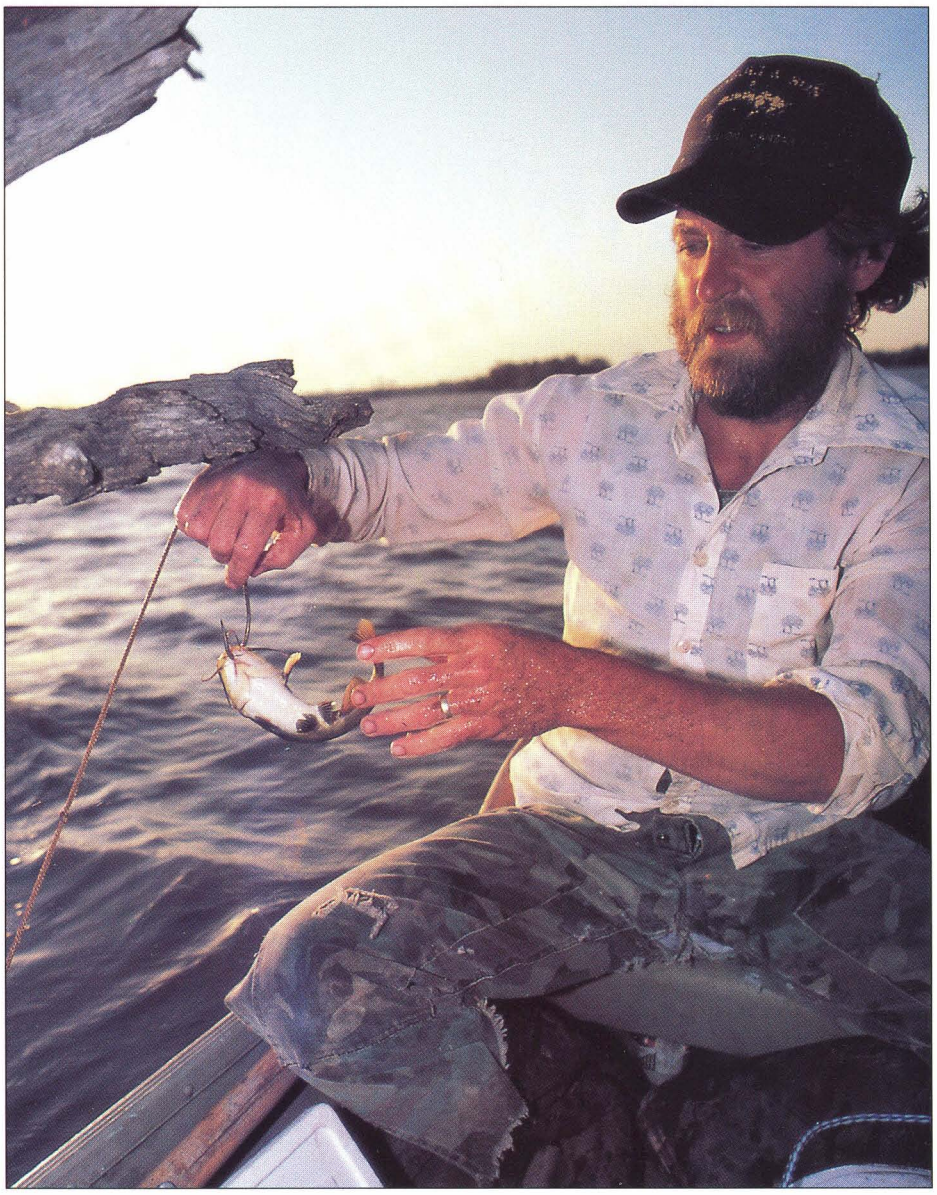
On Aug. 24, 1966, Jerry Griffin was 9 years old. He was most likely fishing for bullheads, which was his favorite pastime, not far from his hometown of Wellsville. One hundred and fifty miles south, on the Neosho River near St. Paul, 50-year-old Ray Wiechert was baiting setlines. For Wiechert, flathead fishing had been and would be a lifelong passion. This night, however, would be the most special of his fishing life.

As Griffin slept, perhaps landing a 4-pound bullhead in his dreams, Wiechert fought the biggest catch of his life. After a 20-minute battle, he pulled an 86-pound, 3-ounce flathead into his boat. The huge fish was a new state record, one that would last for 24 years — until April 26, 1990, when a young man from Wellsville, no less dedicated to this sport, would haul in an 87-pound, 8-ounce monster from Pomona Reservoir.

Times have changed dramatically in the 24 years since Wiechert's record catch. Dams have altered many Kansas streams, flooding them for days, then leaving long periods of low water. Banks have been washed out, and the streams are muddier. As a

Mike Blair photo

The flathead catfish is one of the largest fish swimming Kansas waters. Common in streams and rivers, it has also adapted to reservoirs. The current state record, set last spring, weighed 87 pounds, 8 ounces.



Current record holder Jerry Griffin baits a setline with a bullhead. Griffin uses large bait for big flatheads and prefers 12-0 hooks and 600-pound test line for his limblines. His secret is the strip of rubber inner tube that attaches the line to the limb.

result, some say the flathead fishing in Kansas streams is nothing compared to what it used to be. The reservoirs have, however, added a new dimension to flathead habitat. Rich with forage, they provide excellent growth potential for flatheads. In addition, the fish don't have to fight currents, so they are fatter than their lean stream cousins.

I'm an avid setline fisherman, so I was naturally intrigued when I heard of the new state record flathead. Last June, I travelled to Pomona Reservoir to fish with the new record holder.

It was noon Saturday when Randy Firestone, a friend of Griffin's who had been helping him set lines, met me at the local bait shop and led me to the Griffin campsite. Griffin and his father had been camped there since Wednesday. Griffin greeted me with a warm handshake and a gentle smile that reflected his easy-going nature.

He noted that although the water was rough, they had been having some fair luck. This was, at best, an understatement. They had a gunny sack full of 4- to 8-pound channel cats, and a nylon cord attached to a submerged tree 20 yards from shore held a 50-pound flathead. The week before, Griffin had caught an 83-pounder. My hopes for an exciting weekend were high. The lines were already set. We would rebait them that night and check them again in the morning. First, however, I wanted to know more about Griffin's fishing techniques and how he became involved in this unusual, sometimes gruelling pastime.

Griffin graduated from high school in 1974 and immediately enlisted in the Army. After initial training, he was sent to Germany, where he was stationed for three years. He married a German girl, learned the language and worked in that country for three years. In 1980, he returned to the U.S. with his family.

Surprisingly, it was during his stay in Germany that Griffin's interest in flathead fishing was piqued. His father sent a picture of a 58-pound flathead he had caught in Pomona Reservoir. It was 1978, and Griffin had never fished for big catfish.

"That was the first time I said, 'That's what I want to do,'" Griffin recalls. The same year, he returned to Kansas on leave and caught a 46-pounder while fishing with his dad. Griffin was, so to speak, hooked.

"When I came back from Germany in 1980, I started fishing with my brother, David," says Griffin. He worked in an Ottawa truck factory, but in his spare time he was on the lake with David. "I didn't know anything. I just helped him and learned. After about three years, I started fishing by myself because I wanted one of those Master Angler Awards." The awards would come, indeed. To date, he has 25 Master Angler Awards, all for flatheads caught on limblines or trotlines. (It takes a 50-pound flathead to earn the award using these techniques.)

Although his brother was his teacher, their fishing relationship soon developed into one of friendly competition. The competition reached a high point with Griffin's record catch last year, but in previous years, the rivalry may have been even more exciting. He explained the nature of this competition, which may have been the driving force behind the record catch.

"My brother and I have had this thing going on over the years to see who could catch the biggest flathead," Griffin explains. "He's always

seemed to out-do me somehow."

"In 1985," he continues, "I caught one over 50 pounds every weekend of April. On May 1, I caught a 71-pounder. I thought I had him beat. Then he comes out and stays for the whole first week of June and catches one 80-pounder, three 60-pounders and a 50-pounder — all in one week. I've been chasing that 80-pounder ever since. Last year (1989) he caught a 72- pounder, three 60-pounders and a 50-pounder, but this year, I've caught five or six, and he hasn't yet caught one over 50 pounds."

Did Griffin's state record catch discourage his brother? Griffin doesn't think so. "I figured one of us would get the record eventually. I got it first, but he may beat that next year."

April 26, 1990, was a calm day, perfect fishing weather. Firestone had helped Griffin set lines the previous evening. Because they both had to work that day, it had been nearly 24 hours since the lines had been checked. They put Griffin's small boat with 2-horsepower motor into the water about 6 p.m.

Most of the baits were gone, but Firestone recalls that Griffin had a feeling they would catch a good one. "When we got close to one set, the limb was under water, and Jerry said, 'We got a big one!' "

As Griffin pulled on the line, Firestone held the boat steady. The big fish jerked once and flipped toward Firestone's end of the boat, then succumbed to Griffin's pull. He simply grabbed the fish's lower lip and pulled it on board.

"I didn't think it was that big then because it slid into the boat so easy," Griffin notes. However, the line was badly worn, and the fish was apparently played out from fighting.

With the big fish aboard, the two headed back to shore, picked up the boat, loaded it on the trailer and headed back to Ottawa, where Firestone lives. They still didn't know how special their cargo was.

"I just thought it was another big flathead," says Griffin. "We showed it at a couple of places in town and sat around talking for about 30 minutes. I never thought anything about it being a state record until I tried to lift it out of the boat to show some kids, and I couldn't hardly lift it. Then I said, 'Oh, boy. We'd better get him home to weigh him.'" They drove 12 miles to Griffin's house in Wellsville and weighed the fish. It tipped the scales at well over 87 pounds, so he called local conservation officer Johnny Ray. Ray said to meet him at Stinson's Meat Processing in Ottawa, where the fish could be weighed on certified scales.

Griffin estimates that it was more than three hours between the time he caught the fish and the time it was officially weighed at 87 pounds, 8 ounces. The fish now stands as the largest ever caught in Kansas waters.

How does one catch so many impressive fish? Determination is the key, says Griffin.

"You have to go all out," he says. "I fish about every other weekend in April, May and June. I change baits that even look slightly weak, and I sharpen my hooks every time they're used. I also make sure my rubber bands aren't cracked."

The "rubber bands" he refers to are one of the keys to his success. They are the anchor between limb

Griffin and fishing partner Randy Firestone hold part of a night's catch. The 50-pound flathead is small by Griffin's standards. The channel cat, however, weighed 18 pounds.

and line and the element in Griffin's fishing rig that most likely catches and keeps fish on the line. Without them, the fish can bend hooks and break line. Griffin cuts his two-inch-wide rubber bands from tractor-trailer truck inner tubes. Most important, he notes, is to get a straight, clean cut, leaving no ragged edges that can tear or break. He uses two of these rubber bands per line.

Attached to the rubber bands is 6 to 8 feet of 600-pound test braided nylon line with a 6-ounce weight attached 6 inches from the hook. Griffin uses 12-0 hooks on limblines. The weights keep the bait down, especially in windy weather. His 150-foot trotlines are tied from one submerged tree to another, with three heavy window weights evenly spaced on the line. He uses 8-0 hooks on trotlines, and swivels on each drop.

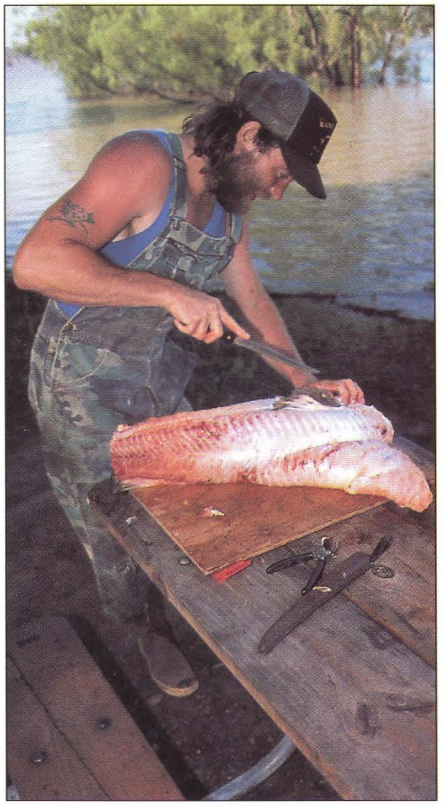
Large shiners, bluegill, carp, goldfish and bullheads are the primary baits used. The record fish was caught on a 10-inch golden shiner.

According to Griffin, the best places to fish are creek channels in reservoir coves. His lines are all attached to partially-submerged trees in 6 to 8 feet of water, where the big fish come to feed.

I was particularly curious about how Griffin was able to handle such large fish. The story of the record fish's landing sounded too easy. He admitted that it had been easier than most. The landing technique involves sticking your hand in the fish's mouth and grabbing the lower lip, which is serrated and razor sharp. You pull the line up with one hand until its mouth surfaces, then you grab it, lean back hard and slide it into the boat.

"I've cut my hands bad many times," Griffin comments casually. Flatheads often land easily, but problems occur when the fish fights hard after being grabbed. "If he twists on you, and you have to let go, you're going to get cut when you let go. It's that or get your arm broke." A little hide off the hands and fingers is nothing to a seasoned flathead fisherman.

Many people ask what Griffin does with all these fish, believing the myth that big flatheads are not good to eat. He has an easy answer — he eats them. "They taste just like any other fish, you just got to know what



Griffin disagrees with those who say big flatheads aren't tasty. His cleaning method includes trimming all fat and streaks of red meat. Remaining white meat is delicious.

you're doing when you clean them." Griffin notes two simple tricks to cleaning big fish: 1) fillet both sides, then be sure to remove all fat; 2) remove all streaks of red meat. The remaining white meat will be some of the best tasting fish you can eat.

All this information about Griffin's introduction to flathead fishing and his fishing and cleaning techniques was intriguing, but as evening approached, I began to get itchy. I was ready to set lines. Just before dark, Griffin, Firestone, Griffin's 12-year-old daughter and I took a boat ride and rebaited lines. The water was calm, and the sky was its most brilliant pink. As we motored back to camp, I imagined lines tugging in morning light.

Next day, we hit the water just after dawn. Eight limblines and one trotline had been set. Most of the bait on the limblines remained untouched, but the trotline catch was fantastic — at least by my standards — although no flatheads had been hooked. Griffin pulled in six channel cats from the trotline — five of them were 4- to 8-pounds and one was an 18-pound monster, the biggest channel I had ever seen caught. I was not disappointed, and I got a taste of the big flathead experience when we picked up the 50-pounder they had caught earlier. When we beached at camp, there was nearly 100 pounds of fish in the boat.

Fishing for the big ones is a passion for Griffin. But it's his second love, next to his beautiful wife, Maggie, and his two daughters, Patricia and Carrie. The short time I spent with him made that fact clear. Shortly after I arrived at the Griffin camp, Griffin talked about his two passions in subtle but telling ways.

"Maggie is really understanding," he admits. "She doesn't like to camp, but she's coming out this weekend because it's my birthday. When she asked what I wanted for my birthday, I said, 'I want you to come camping with me.' "

His daughters, however, have both been involved with Griffin's "hobby." Patricia goes out in the boat often, and Carrie was with him when he caught a 71-pounder in 1985. She was only five at the time. When spending time at the lake, both daughters seem to enjoy an easy relationship with their outdoorsman father.

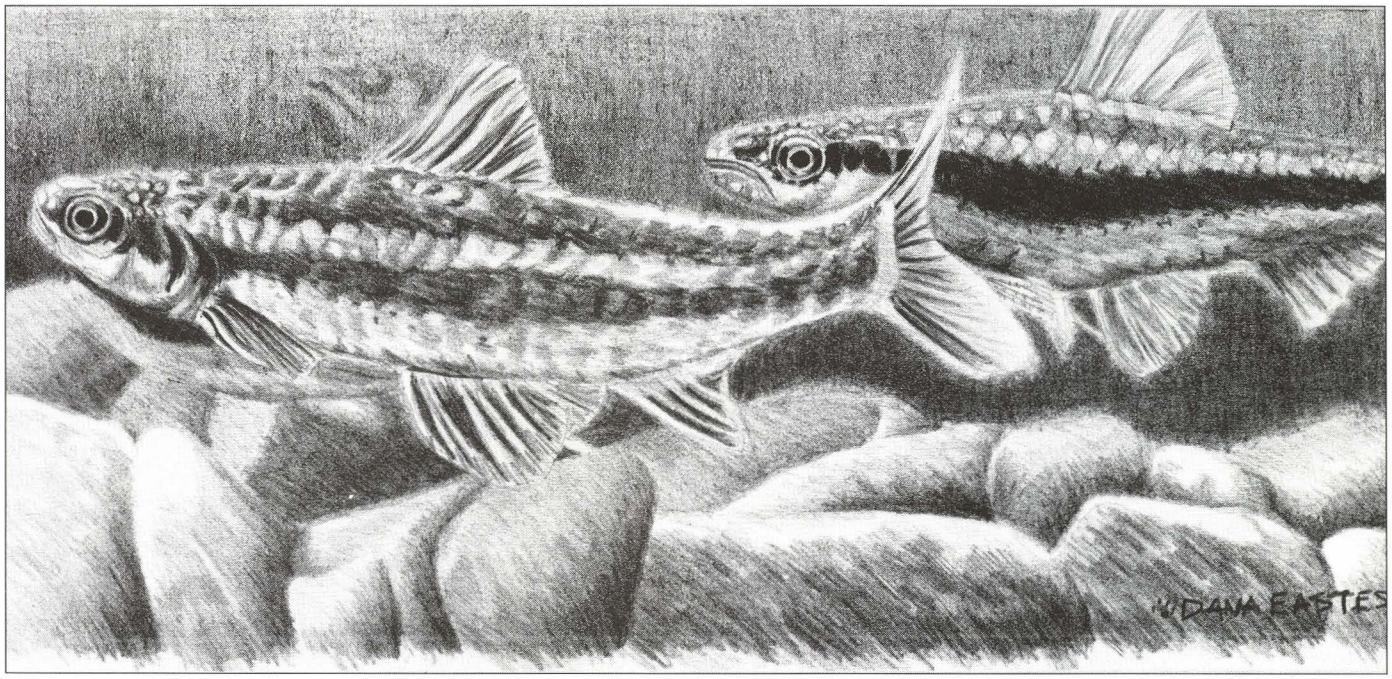
There's a new state record flathead in the books now, but Griffin doesn't figure it to last as long as the old one. As Kansas reservoirs age, the big flatheads grow. There are a lot of fishermen after a bigger one. Griffin's not resting on his laurels. "My next one's going to be a 102-pounder," he predicts, only half joking. "I think there's a few in this lake that will top 100 pounds."

There is one particular fishermen that he may want to keep his eye on. Shortly after he caught the new record, Griffin received a call from Ray Wiechert, offering congratulations. They have talked several times since then and made plans to fish together this spring. Still, one comment Ray made during that first amiable conversation sticks in Griffin's mind. "I reckon nobody will break your record for a long time, either," Ray said, "less'n I do." If you're a fisherman, you're never too old to dream.

HIGH GROUND

by Larry Zuckerman

Kansas' Newest Cardinal



Dana Eastes illustration

Is it a ruby-feathered bird at the backyard feeder? Or a scarlet wild flower in Flint Hill prairies? Or maybe a shortstop from St. Louis? No, Kansas' newest cardinal is a fish; the cardinal shiner, *Notropis cardinalis*. Dr. Richard Mayden discovered this new minnow (Family Cyprinidae) as part of his Ph. D. research at the University of Kansas on the cardinal shiner and its two sister species, the duskystripe shiner and the bleeding shiner. The Kansas Department of Wildlife and Parks' Nongame Research Program helped fund the work with money donated through Chickadee Checkoff.

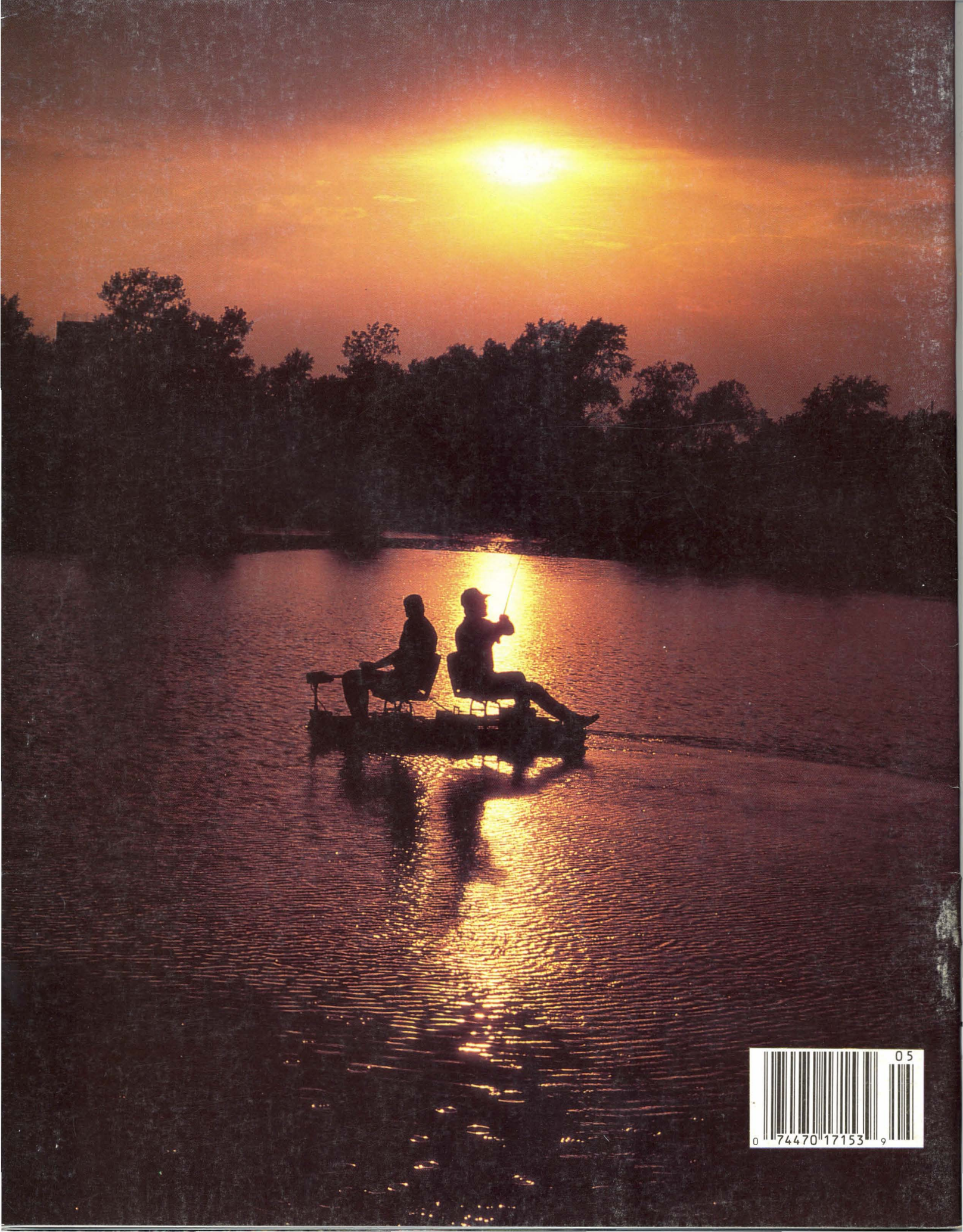
Most of this world's habitat for cardinal shiners is in Kansas. The cardinal shiner is found in the headwaters of the Neosho River Basin in Chase, Greenwood and Lyon counties and in the Spring River in Cherokee County. Populations are also known from the lower Arkansas drainage of Oklahoma, Missouri and Arkansas. The cardinal shiner was reported from the Red River drainage in the Ouachita highlands of Oklahoma but has apparently gone locally extinct.

Cardinal shiners are common inhabitants of gravel-bottomed, clear and cool streams, or moderate to small rivers with permanent flow. Typically cardinal shiners are associated with current in riffles and runs, but also are found in pools with current. Cardinal shiners spawn in the spring, with males displaying brilliant red face, body sides and fins and a blue snout. They could rival the fanciest tropical freshwater fish. Females are not as colorful.

Cardinal shiners lay their eggs in small pit-like depressions dug by the males on clean, gravelly riffles. They may even spawn over the gravel nest of hornyhead chubs or in the spawning pits of central stonerollers. Cardinal shiners don't get much bigger than 5 inches and have a lifespan of approximately three years. They are primarily insect eaters, feeding on aquatic insets as well as terrestrial insects such as ants that might fall in the water.

There is some concern for the conservation of this newly described species. Isolated populations in the Flint Hills of Kansas and the Arkansas River in northeastern Oklahoma represent remnants of a more widespread distribution. Monitoring in Kansas may be important as indicated by the recent extirpation of cardinal shiners in the Ouachita Highlands and the continued destruction of Flint Hills streams.

To the cardinal shiner, our 139th recognized fish species, we say, "Welcome to Kansas."



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