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Editorial

Whose Wildlife?

20,000-acre chunk of high desert near Rawlins, Wyoming is known as the Red Rim. It's primarily undeveloped land and home to a couple thousand pronghorns. Now some folks want to turn the Red Rim upside down to access a large coal deposit. One of those so inclined is Taylor Lawrence, who owns a big piece of the Red Rim.

The problem, of course, is that the local pronghorns can't eat coal, and they won't survive a massive mining operation. The Red Rim is "critical" pronghorn habitat, according to the Wyoming Game and Fish Department. Private conservation groups have petitioned the state agency to fight development of the Red Rim. They've also asked the Bureau of Land Management to resist mining or mineral leasing attempts on land it owns in the area.

Because federal and private landholdings checker the Red Rim in seemingly random fashion, the implementation of any large-scale management plan for the area is difficult. Mining companies would need the blessings of all concerned parties before they could begin economical operations. So far, the BLM has been reluctant to lease its mineral rights on Red Rim ground.

Lawrence, a landowner with substantial holdings nationwide, initially expressed his displeasure with the BLM's policy by erecting a fence around his property to exclude pronghorns. He has since lowered part of that fence to facilitate pronghorn migrations. Now, though, Lawrence has indicated that he may plow his ground and plant it to crested wheatgrass for cattle forage. Crested wheat is of no use to pronghorns. Conservationists are insisting that the BLM cancel Lawrence's federal grazing permit if the grass is planted.

What is the solution? First, let's back up and redefine the problem. Ostensibly it's a simple one, compounded only by the logistical headaches of subdivided property. Surely a landowner can do as he wills with his own holdings. If the wildlife resource is in jeopardy, the state fish and game agency is required to protect it — to negotiate, if need be, a management plan with the landowner and with federal biologists.

But what if the landowner doesn't cooperate? He may control the trespass rights and land development on his property, but he doesn't own the animals. They belong to the people of the state. On the Red Rim, pronghorns are being used as bargaining chips by a private party to bend federal policy to his benefit. They are borrowed chips. Ought not the people of Wyoming call them back? Can they?

Oddly enough, no, they can't. They can lobby legislators, flood WG&F offices with protests and carry their case to the BLM. But the future of pronghorns on the Red Rim still depends in large part on the land management decisions of one man. That's the way our system works.

Private land in some parts of the world is controlled entirely by the landowner. He can sell the resident wildlife, make it into biltong, carpet his living room with it, or try to preserve it all. None of these approaches augurs well for the wildlife. Landowners who are really serious about maintaining a healthy, balanced ecosystem hire biologists for that purpose. Many shrewd businessmen have found it more profitable to raise wildlife than gouge the land for minerals or leech its wealth through costly and erosive farming schemes.

Here biologists are employed by the state, and our collective conscience has historically determined our effectiveness in managing wildlife. We've turned a blind eye to the bulldozing of a hedgerow by a family farmer (don't most farmers have families?) while raising self-righteous hell over the rape of wildlands by "big business" (little business apparently doesn't count).

The biggest threat to wildlife today is competition for the land base supporting it. That competition will get keener as land economics become more important. Federal and state biologists will fight increasingly difficult battles with politically powerful groups that champion the extraction of coal or oil or timber or wheat and undercut moves to protect unique or critical habitat types. Landowners like Lawrence are now making their voices heard. That's not because they're obnoxious or vindictive or born with the urge to despoil natural treasures. They simply look at things differently than some of us and we've been too complacent to study their philosophy — a philosophy that is strong because it is widely shared.

Wildlife concerns will be dealt severe losses by other interests if conservationists do not concede that all natural resources have a dollar value and can be treated legitimately as private assets by landowners. Legally they are not. But the regulations that prohibit a farmer from shooting a deer out of season are powerless to prevent the destruction of deer habitat on his land.

Many people who own or control rural property base all their management decisions on profitability alone. We must learn to talk their language. It does no good to demand that they relinquish development plans or nurture wildlife habitat in the public interest. They own the land. And for years they've been manipulating wildlife while operating farms, ranches, mines and logging companies. They've paved over populations and scooped, sawed and sucked the land bare of sustenance for wild creatures.

We can make our conscience known, but to be effective crusaders we must also offer something tangible to those whom we'd convert. They are not wrong. Their values are simply different. Maybe that's not the way we'd like things to be. But that is the way they are. To discuss wildlife conservation without coming to grips with land control makes for idle gossip indeed.





Should We Market Our Wildlife?

This isn't the 19th century. Maybe we should consider what commercial harvests can do <u>for</u> our wild creatures.

Lloyd Fox

vast shortgrass prairie spreads before me. As I watch, a sow grizzly bear with two cubs ambles down a slope, and a pack of wolves play in the spring sunshine. Bison cloak the distant hills. A prairie dog town hums with activity. Burrowing owls flutter like butterflies traveling from one mound to the next. A black-footed ferret slithers from view down the entrance of a prairie dog hole.

Reality suddenly erases these images. It is the 20th century again. Postrailroad. After the settling of the West. Beyond the day of the market hunter. I feel cheated. Did market gunners rob me of all that I'd imagined? Examination of the prairie dog burrows reveals that a massive eradication program has taken place. Gone are these rodents and most of the associated wildlife in their ecosystem. They've been lost not because market hunters over-shot them but because prairie dogs lacked a monetary value in a world obsessed with dollars. Could dollars for dogs have meant survival?

Market hunting conjures up tales of waste and carnage. It is easy to stir the hearts of concerned wildlife enthusiasts by waving the bloodly shirts of the market hunters or holding up the weapon used in killing thousands of this or that species. The target of our venom becomes some stereotyped social outcast who made a living by selling our wildlife for profit. Socrates wrote, "There are trades in which it is impossible for a man to be virtuous." Perhaps market hunting falls in this category. But it is easier for us to deal with symptoms than it is to understand basic causes. It is easy to conclude that marketing wildlife is wrong and that anybody who supports the concept must be a heartless individual with no conservation ethic. It is easy to further conclude that by stopping commerce in a species we will automatically save that species from extinction.

By throttling market hunting in the 1890s, American conservationists expressed their desire for a guaranteed wildlife resource. Game laws were passed and game protectors were hired. Massive land use changes also occurred in the east, southeast and lake states. Second growth forests developed on much of the countryside. Large acreages of marginal farmland reverted from cropland to grasslands, brushy areas and woodlands, all valuable permanent wildlife habitat. White-tailed deer, wild turkey and pronghorn populations sprouted from dangerously low levels. Some people credit such recovery to the end of commerce in wildlife. In many cases this was true. But concurrent with the publicized recovery of deer and other game species which were banned from the market place was a quiet growth of furbearer populations that continued to be commercially exploited.

Unregulated market hunting with little or no professional wildlife management has caused disaster - here and elsewhere. Commerce, however, can provide security for certain wildlife populations. Some species are successfully managed by protective regulation alone — especially small, unattractive creatures with very limited distributions like the snail darter. Other species are so esthetically pleasing that their continued management is assured. Most of our songbirds fall into this category. Game like the whitetail deer and Canada goose have sufficient recreational value that their future is secure. But some wildlife, like furbearers, benefit from commercial exploitation which generates a clientel with a vested interest in its welfare.

We live in an affluent country rich in natural resources. Often we can afford the luxury of managing a wildlife population for a specific purpose. But if this leads us to believe that a species should have no other value it may result in inadequate or incomplete conservation. Commercial value need not be the sole reason we manage a species; however, it should not automatically be overlooked because market killing was at one time detrimental. Before dealing with commercialization of wildlife we must first define conservation. In 1978 members of 50 nations of the International Union of Conservation of Nature and Natural Resources prepared a document called "A World Conservation Strategy." They recognized that management of living natural resources is a major issue — a much larger one, in fact, than some preservationists (those who think only in terms of extinction of species) realize. To face this challenge conservation was defined in terms of using resources for man's benefit.

The goal of a conservation ethic is to develop a symbiotic relationship between man and wildlife. We must face the fact that man exploits wildlife even when he does not intentionally kill individuals. When we modify habitats for crops, cities or other human needs we often deprive wildlife of food and shelter. A symbiotic relationship with wildlife not only includes sustained use by man of the wildlife resource but provides for retention of suitable wildlife habitats. In this symbiotic relationship man derives food, clothing, recreation and esthetic benefits from wildlife. Wildlife is accorded permanent suitable habitat in which to perpetuate itself.

Norman Myers, noted author and expert on African wildlife, summed up 20 years of observations of African conservation and strongly urged the commercialization of wildlife. He stated, "In emergent Africa you either use wildlife or lose it. If it pays its own way, some of it will survive." His comments predictably drew criticism from preservationists. In a postscript to his "Farewell to Africa" article in International Wildlife he responded with an analogy. "As a conservation strategy, I view sustainable cropping the way Winston Churchill viewed democracy: It is a pretty poor option until we consider the alternative.

There are intelligent, sincere people who have questioned the market motive for managing wildlife. For example, Wayne King of the New York Zoological Society and Director of the Florida State Museum once said, "Whenever there is a market for an expensive wildlife product somebody will figure out a way to exploit it, legally or otherwise. The more animals they kill the more money they make." This is a flaw in community ownership of property, the tragedy of the commons that occurs when a resource is available to everybody but nobody is accountable for its future.

Man has a history of over-exploiting wildlife in the market place. Therefore, safeguards and incentives for conservation must be incorporated into a marketing system. After evaluating a commercial conservation program for capybara harvest on a ranch in Venzuela, Dr. King applauded the system. "As long as the capybara harvest is paying the operating expenses of ranches like El Frio, ranch owners will not alter the habitat that supports them. Not only the capybara, but a whole ecosystem might have been lost or altered if this new use of a one-time pest species had not emerged."

Commercialization of wildlife has succeeded in a number of locations and with a variety of species. Unregulated exploitation of crocodiles for leather has been identified as a serious worldwide problem. While many nations have chosen to end the legal trade in skins (preservation), a few governments have taken bold steps both to save the crocs and revitalize the trade (conservation). Papua, New Guinea, for example, created a program that gave local people a vested interest in protecting the reptiles.

he program started with research into the population dynamics of crocodiles. Biologists found that if they could protect the breeding animals and utilize individuals most apt to be lost to natural mortality crocs could sustain an annual cropping. To protect the breeding population the New Guinea government banned the sale of any skin with a belly width of more than 20 inches. Juvenile crocs have a very high natural mortality — in some populations as high as 80 percent. Crocodile farms were allowed to obtain wild hatchlings for their stock. After three years of feeding in captivity the farm crocodiles reached optimum commercial size with a 10- to 20-inch belly width. The farm animals were then slaughtered. The flesh was eaten by the farmer, sold for food or fed to the remainder of the crocs. The skins, worth \$70 to \$140 apiece, were preserved and readied for market.

The program produced interesting social effects among the natives. Poaching crocodiles is no longer socially acceptable in New Guinea. The merits of crocodile farming are understood and recognized as beneficial to the local people. Individuals that harm wild crocodiles are now ostracized in their communities.

Kangaroos are more appealing animals to most folks than crocodiles, but even these brown-eyed cuddlies can become a serious nuisance to livestock producers in Australia. Commercial shooters are normally employed to handle this situation. When kangaroos become a nuisance the farmer contacts the state ranger, who inspects the area and issues a culling quota. A state-licensed shooter is then contacted by the farmer and given authorization for a specific harvest. The shooter kills the animals and processes them for meat and leather. The result? A five million-dollar annual industry with benefits to farmers and commercial shooters, plus desirable products from a renewable natural resource.

Commercialization of wildlife does not always progress smoothly. Peru's vicuna program appears to have all the ingredients for success, but internal bickering may eventually destroy this project. Twenty years ago the vicuna, a llama-like animal and one of South America's four species of native camels, was on the brink of extinction. The value of its skin on the world black market was so high (\$600 per kilo of wool) and the population was so low (3,000 animals) that most conservationists were writing this species off. A bold conservation plan was developed. Reserves were established and armed guards were hired to control poachers. Local sheep herders were led to believe they would eventually share in the profits of this experiment. The task was not easy. Some of the guards gave their lives protecting the vicunas from poachers, but the vicunas prospered. Today over 49,000 vicunas exist. But even with this remarkable recovery the future is not bright. Guards are underpaid and local people are still waiting for some financial benefit. As the morale of the locals deteriorates arguments rage between officials as to whether to continue preserving vicunas or start a cropping program.

As is the case with kangaroos, wildlife can sometimes outcompete traditional livestock. But this isn't necessarily bad. Noted wildlife ecologist Raymond Dasmann demonstrated in 1959 that it was possible to make more money by managing the native veld in Rhodesia for wild game than it would be to eliminate the wild animals and substitute cattle. New Zealand's red deer farming is another excellent example of the competitive value of wildlife. Until the 1970's the red deer (a European counterpart to the North American elk or wapiti) was considered a major pest in New Zealand. The government employed a small army of shooters, but the herd stayed out of control. Today there are 2,000 deer farms in New Zealand with more than 180,000 animals. As the director of the New Zealand Forest Service states, "Deer are now absolutely under control." The reason: economics. The red deer went from the status of pest to that

of profitable asset. The species had some strong economic chips to play. Red deer have an excellent feed conversion ratio — better than cattle and twice as good as sheep. They also produce delicious meat, excellent leather and antlers of considerable value. Today's market value of red deer antlers in velvet is about \$40 per pound. That calculates out to approximately \$120 per stag per year.

urrently most wildlife in Kansas is managed by three groups. Native wildlife belongs to the people of the state, but most animals exist on private property. Landowners thus control access to the areas inhabitated by wildlife. The Kansas Fish and Game Commission is a professional agency set up to manage the state's wildlife in the best interests of the creatures, landowners and general public. Commission funding is almost entirely through the sale of hunting and fishing licenses.

Economics can enter this system in many ways. For example, state agencies can entice landowners to produce wildlife habitat through various land use practices, including cost share programs. Another way that money is involved is through user fees — wildlife enthusiasts paying landowners directly for trespass rights. This can vary from simple trespass permission for bird watching to a big game hunting lease.

For years Europeans have opened their markets to native wildlife. Once an animal is harvested it becomes the property of the taker to use in any manner deemed beneficial. Often the meat finds its way into local markets. Poaching for the market is not socially condoned. Because wildlife has a value to the landowners or lessees, poaching in Europe is equivalent to cattle rustling in Kansas. On the other hand, poaching in parts of the United States is all too often viewed like cheating on income tax: It is you against the bureaucrats — good luck!

Tradition is unquestionably an important component in the commercial use of wildlife. The balance between wise use and overuse of a wildlife resource is often acquired through painful lessons that fill our thoughts with stereotypes and hastily-drawn conclusions. Still, damning an institution without assessing its potential is unwise. Commercialization of wildlife can work to the benefit of marketed species — not only in New Guinea, Australia or East Africa, but here. There are numerous possibilities, but we must be willing to change our attitudes.

For example, Kansas' Flint Hills are one of the finest grassland areas for elk in North America. No habitat improvements are needed. A New Zealand red deer farmer would drool at the prospects of game farming in the Flint Hills. But Flint Hill ranchers can't yet realize an economic benefit from elk. They must have sufficient safeguards to protect their crops and they must be assured markets for elk products like meat, hides, antlers and recreational hunting. A system might be developed which would allow these things, but we would need to change some of our thinking. Do we wish to see herds of elk grazing in the Flint Hills or are we content to look back with distaste at the evils of market hunting?

The sun is sinking beyond the vacant prairie dog town. The shortgrass prairie remains here, but on the horizon I see irrigated croplands. The big dog towns cannot come back. Still, in this grass rodents compete with cattle for forage. Could it be profitable to manage prairie dogs for meat and hides? Now we simply tax the landowner to pay for poisoning the rodents.

The quiet of this prairie is deafening. When I imagine the alternative to commercial exploitation, market hunting remains an option to be considered in earnest. $\hfill \Box$



Mary Kay Spanbauer

Sometimes it takes a crisis to get people concerned about an issue. The development of fish culture in Kansas is a case in point. Fish propagation and stocking developed in response to a disastrous decline in fish populations. Some fish species disappeared permanently during the wave of settlement that occurred from 1850 to 1900. The range of other species was greatly reduced.

Conversion of prairie to cropland and extraction of water from streams were probably the two major reasons for the decline in fish numbers during the end of the 19th century. Once prairie sod was turned to cropland, the runoff began to carry with it more mud and silt. Removal of water from streams and springs for use in crop irrigation, livestock watering and household use compounded the problem.

The demise of fish populations occurred so quickly that it prompted an immediate call for action. Kansas and other states began to investigate the causes of fish depletion and to look for ways to reverse the alarming trend. The obvious answer was to restock depleted waters. So began years of experiments which have refined the science of fish culture in Kansas.

Fish culture originated in China thousands of years ago and soon found its way to Mediterranean and European countries. Stocking fish did not become a common practice in the United States until the first Fish Commissioner was appointed in 1871. His job was to investigate the depletion of food fish and suggest methods to restore the supply.

In 1877, the Kansas legislature appointed the state's first Fish Commissioner -D. B. Long of Ellsworth. Long believed Kansas streams could be made as productive as the fertile lands through which they flowed. He also felt he could improve on the varieties of fish in Kansas waters and promptly investigated those considered good food fish.

The first species to be officially stocked in Kansas was the American shad. But the introduction of this anadromous fish into the central plains was subject to speculation. Many thought the shad would have to travel too far on inland spawning runs from the ocean. U. S. Fish Commissioner S. F. Baird, however, felt the absence of dams on the Missouri River and its tributaries was conducive to this migratory species. He noted that shad stocked in the

BUILDING A FISHERY



The photos on these two pages illustrate what can accrue from sensible stocking efforts. Much trial and error over a century of fish culture has produced a stocking program that provides top-notch recreation for over 250,000 Kansas anglers.

southern part of the Mississippi River had been found as far north as St. Paul, Minnesota.

Long's first attempt to stock shad in Kansas was poorly orchestrated. The agent accompanying the shipment deposited the entire load of 100,000 shad into the Kansas River at Topeka. Kansas did not receive its share of shad in 1878, due to a federal shortage. In 1879, though, 160,000 were distributed in streams throughout the eastern part of the state. Stockings of shad continued until 1885, when 600,000 fish were released into the Blue, Smoky Hill and Republican rivers. A nother anadromous species stocked by Long was the salmon. "The vigorous strength and energy of the California salmon during its west coast migration," Long opined, "furnish evidence that they can reach the headwaters of our Kansas streams from the Gulf of Mexico." But the first stocking of salmon met with roughly the same measure of success as the initial experience with American shad. Long received 100,000 California salmon eggs from the Deputy U.S. Fish Commissioner. They were shipped in a refrigerated rail car via Chicago to Long in Ellsworth. He reported that the eggs



were in good condition after their nineday trek; less than five percent were dead.

Long had constructed a mini-hatchery consisting of handmade hatching boxes which he submerged in a nearby river. Placing the eggs in the hatching boxes, he laboriously tended the eggs for the next two weeks. The river rose unexpectedly, however, and eggs and hatching boxes were whisked downstream by flood waters.

Long remained optimistic. "Many no doubt made food for other fish, but I have hopes that others escaped and will in time return as full-grown salmon." Salmon were released during most of Long's six years as Fish Commissioner. He was convinced they would be successful and asked Kansas residents to report sightings of salmon. He received a few letters confirming the presence of small salmon in the streams, but ultimately Long abandoned his dream of salmon in Kansas streams.

Along with his attempts to introduce salmon, Long had also contracted with a company in Iowa for 100.000 lake trout and 10,000 brook trout. The trout arrived in Atchison in 1880 in very poor condition. Many were dead. Those that survived were distributed throughout the state along the various rail lines. But trout fared no better than salmon or shad. The last stockings of lake and brook trout were made in 1881 and 1883. Long's travails with fish species that wouldn't take had created in him a monumental need to succeed. Finally he did. He introduced a fish that took to Kansas waters as if it had always belonged here.

Carp made the grade.

A favored food fish in Europe and Asia, the carp was brought to the United States in 1876. Long heartily endorsed it as just the ticket for ponds. He predicted that, properly managed, carp would provide the foundation for a major new food-producing industry in Kansas. He encouraged pond stocking, as carp were readily available from the U.S. Fish

paid only for the shipping container and the express rail charges from the Kansas distribution point.

photo

Brehm

Jene

W. S. Giles, who succeeded Long in 1882, was also a staunch supporter of the carp. He envisioned hundreds of carpproducing ponds in every county in the state. By 1895, however, the first "anticarp" rumblings were being felt. O. E. Sadler, Fish Commissioner in 1896, had this to say about the carp: "This fish has been greatly over-rated. It is undesirable as a food fish and, although introduced as a vegetarian, there is questionable proof as to its destructive habits in devouring both the spawn and fry of better fish."

Commissioner at no cost. Applicants

any felt that distribution of carp should be discontinued. Others carried the sentiment a step further, urging the wholesale eradication of carp. In 1904, Fish Commissioner D. W. Travis recommended that a law be enacted giving wardens the power to destroy carp. But eradicating carp populations would have been an impossible task, even with legislative approval. Fortunately, early fish culturists chose to learn from past mistakes rather than ignore the need for fish propogation and stocking in Kansas. The carp's fall from favor taught them to cultivate more realistic dreams.

Giles believed the natural history and habits of fish must be taken into consid-



eration for fish stocking to be successful. Although he would have liked to continue the stocking of salmon and trout initiated by Long, he felt it would be futile due to their cool water requirements. Giles turned his attentions to species that were better adapted to Kansas waters.

This new philosophy met with a new challenge. Native fish were not easily obtained. Few were available from the U.S. Fish Commissioner. Giles made an agreement with the Illinois State Fish Commissioner to obtain a mixture of native fish from the Mississippi River to plant in Kansas waters. In 1883 he got 310,000 fish, a combination of nine species of "fine food and game" fish, alestablish a state fish hatchery, providing the land for the facility could be obtained free of charge. Pratt County offered twelve acres for the building of the state's first fish hatchery. By 1904, the first two-and-a-half acre pond was stocked with crappie and black bass. By 1906, additional ponds, buildings and a permanent water source had increased production of black bass, crappie and rock bass. The hatchery essentially solved the problem of obtaining a reliable supply of fish. In place of that problem a new one surfaced: logistics.

The problem of distributing the fish produced at the hatchery was growing as rapidly as the demands. In the 1800s, fish were transported by rail. Kansas' drawn wagons. Once loaded, the car was picked up by the next scheduled train and transported to various areas in the state.

It was necessary to pull the allwooden *Angler I* at the rear of the train to alleviate the strain imposed by the heavier steel coaches. On one occasion the conductor of the *Katy Flyer* hooked *Angler 1* in the middle of the train to make a quicker run. The crew spent many anxious moments hoping the old wooden car wouldn't pull in half.

Rail transport of live fish presented its own problems. Delays or missed connections could mean disaster for the entire shipment of fish. There were many cases when fish had to be dumped



though it is not documented what species were included.

Later, Sadler espoused Giles' view regarding distribution of native species, calling the introduction of foreign species dangerous and generally unsuitable. His success, however, was hampered by the same obstacle Giles had faced. Neighboring states with good stocks of native fish weren't inclined to let them go. It was evident that a permanent solution was needed to help restore the fishery and stock new waters in Kansas. The answer was a hatchery.

Every Fish Commissioner since D. B. Long had advocated and requested a state fish hatchery. Each time it was recommended, though, the appropriation was denied. Finally, twenty-five years after Long voiced that first appeal, the legislature accepted the idea. On March 13, 1903, authority was given to the Fish Warden (the name had been changed from Fish Commissioner to Fish Warden in 1899) to locate a site and fish stocking program relied on the cooperation and good nature of the rail conductors not only to carry but often to distribute the fish into Kansas waters. To increase stocking mobility and phase out the use of commercial rail cars, it was recommended in 1888 that the state purchase a fish car. Fish would soon have their own vehicle.

The car — Angler 1 — was purchased in 1906 at a cost of \$7,298.98. It carried fourteen tanks, each capable of holding 1200 fish. Angler 1 also had a kitchen and living quarters for the crew and was housed in a renovated barn near the hatchery. Fish were brought to Angler 1 by horsein the nearest available water. Another problem was that most trains only stopped in major towns. This necessitated frequent transfers and required some applicants in rural areas to drive fifty or more miles to receive their allotment. To further aggravate the situation, many railroads discontinued routes in the late 1920s.

But the highway traffic that out-competed smaller rail lines ultimately provided the solution for fish transport. Experiments with hauling fish by motor trucks began in the mid-1920s. At first the range was limited to within 50 miles of the hatchery, but improvements soon enabled safe trips up to 175 miles. There were many advantages in the use of motor transportation to haul fish. Trucks had more maneuverability and were not dependent on a set schedule. There weren't as many transfers, which meant trips by truck lost fewer fish due to handling stress. The major advantage of truck transportation was lower cost. Angler 1 could carry four times more fish than a truck, but the fish car cost more than five times as much to operate. In 1927 the department purchased a REO Speed Wagon to haul fish. This truck had 40 10-gallon cans, which allowed the safe transport of 4,000 fingerlings.

As the dependability of trucks increased, the need for *Angler 1* declined. By 1927 it was used exclusively for long hauls. In 1929 it was sold for scrap and junked. By 1930 three one-and-a-half-ton trucks, which carried 80 fish cans each, were in use for transporting fish. In 1936 a Therma Live-Fish Transport was purchased. This truck could haul up to 50,000 fish. ernment to build ponds on their property for water conservation, and a significant new fishery was created by the construction of state lakes.

In the past, every effort had been made to stock lakes, private ponds and streams. With demand for fish threatening to outstrip supplies, it soon became apparent that stocking priorities needed to be made. In 1932 the first stocking policy was written by warden J. B. Doze. First priority was assigned to public waters. Next came private waters for original stocking only. If any surplus existed, it was available for private ponds.



orld War II brought economic prosperity to the U.S. People had more free time and were beginning to view fishing more for the sport and relaxation it offered than as a food source. A significant change during this time was the advent of reservoirs. Built primarily for flood control and water supply, the reservoir was "big water" and would also accommodate new fish species.

One species introduced into reservoirs was the white bass. While white

Kansas Fish and Game photo



The state fish hatchery in 1910 was located on a dirt road. Now the building houses the Fish and Game Commission museum. Across the way a new administration building joins the director's residence — which has since changed little in appearance. Angler I was a wooden rail car that transported the first hatchery-produced fish to points of distribution around Kansas.

Advances in technology allowed the hatchery at Pratt to keep pace. Its 112 ponds were producing upwards of a half-million fish annually by the mid-1920s. The demand for fish and acres of fishable waters were also increasing. Farmers were encouraged by the govbass were native in some Kansas streams, their distribution was limited. They were stocked in Fall River Reservoir in 1950 — primarily to increase fishing opportunity and to assist in keeping rough fish populations under control. Probably the most popular fish to be stocked in Kansas reservoirs was the walleye. In 1954 the first walleye eggs were brought from Minnesota. The fry were hatched and then stocked in Fall River, Kanopolis and Cedar Bluff reservoirs and Clark State Fishing Lake. In 1956 nearly 30,000 eggs were collected at Fall River and hatched at the Pratt hatchery. Soon Kansas was collecting and hatching walleye eggs and releasing millions of fry back into Kansas reservoirs.

Another fish brought to Kansas reservoirs was the striped bass, an anadromous and very popular game fish on the East Coast. It probably would have remained a marine fish had not large numbers been accidentally trapped during construction of a dam in South Carolina. The fish survived and reproduced, and by 1960 an estimated half-million stripers had been taken from the two reservoirs formed by the dam. Stripers were introduced into Kansas in the 1960s and have since been stocked in a number of reservoirs in the state.

In the early 1950s rearing ponds were constructed at several state fishing lakes. These were built primarily to raise channel catfish fry to stocking size. By then four species were being stocked regularly: largemouth bass, bluegill, channel catfish and crappie. Crappie were dropped from the list when it was found they rapidly over-populated small ponds.

In recent years Kansas has gained even more fishable waters. The completion of many new reservoirs and smaller impoundments has put a strain on existing hatcheries. Qualifying ponds are still stocked at no charge. Urban fisheries programs in Kansas City and Wichita have increased fishing opportunities in these areas. The present demand exceeds the amount of fish produced. The three hatcheries in the state (at Pratt, Meade and Farlington), along with numerous rearing ponds, fall short of supplying the needed fish.

The new \$4.5 million-dollar hatchery at Milford Reservoir, completed in 1984, will help. Funded through the threedollar punch on fishing licenses, this new state-of-the art hatchery will be a tremendous boost to Kansas' fish stocking program and will mean increased fishing opportunity for the people of Kansas starting in 1985.

What began as a single-handed attempt to move fish from one place to another has evolved in one century into an elaborate and sophisticated process. The methods for stocking fish may have changed, but the goals are still the same. More fish. Better fishing. And more hours of enjoyment for Kansas anglers.

Fish Stocking: Another View

Jim Beam

round the turn of the century, a deluge of patent medicines hit the market, each supposed to cure everything from gout to lovesickness. A cure-all of a different nature had its origin in Kansas about the same time. It was fish stocking. Though we have since learned to be skeptical of preposterous medical claims, many fishermen still believe the supplemental stocking of fish is a cure-all for a decline in fishing success. It isn't.

The supplemental stocking of fish into waters that already contain fish is an "iffy" undertaking. Those existing fish create many problems not encountered when stocking is done in new or renovated waters. Predation and competition for food or living space can scuttle a supplemental fish stocking attempt.

To understand the effects of resident populations on fish stocking, we must know a little about those resident fish. All fish populations can be divided into two basic categories: stable and unstable. Each presents unique problems to stocked fish trying to carve their own niche in the ecosystem.

STABLE FISH POPULATIONS

Fishermen can count on bodies of water with stable fish populations to produce about the same sizes and numbers of fish year after year. Stable populations are directly related to stable environmental conditions such as water levels and turbidity. Small lakes and ponds are more apt to have these conditions than are larger lakes or water courses.

Typically, stable fish populations are very near the carrying capacity of the body of water they inhabit. Consider, for example, a one-acre pond with a fish carrying capacity of 300 pounds per acre. A stable fish population would support approximately that poundage of fish year after year. The weight of fish harvested by anglers and that lost to natural mortality are replaced each year through natural reproduction and by growth of the remaining fish. When this condition exists in a lake or pond containing a well-balanced mix of predator and prey fish, angling success is generally good.

Sometimes, though, the popularity of a particular fish species results in its overharvest; or predation may limit its reproductive success. In such cases, it may be necessary to supplementally stock a fish large enough to escape predation in order to maintain that species' population at a level that will meet angler demand. During 1984, for instance, the Fish and Game Commission stocked over 260,000 channel cats 8 to 12 inches in length to meet the immediate demand of Kansas anglers. These fish were also big enough to escape predators; attrition was low.

Although this type of stocking has proven very successful with channel catfish, it's harder to stock predatory fish of similar size. Channel catfish are relatively easy to raise to a length of 8 to 12 inches by feeding them artificially. Predatory fish, however, do not adapt as well to artificial diets, and raising natural prey requires so much hatchery space that it makes the entire operation unfeasible. In addition, cannibalism can take a heavy toll of predators in the hatchery.

Still, the rearing of predatory fish on artificial diets has been researched a great deal in recent years and may soon make the supplemental stocking of 6- to 10-inch predators routine.

Some Kansas waters hold populations of fish that are stable, but out of balance. Typically, these populations contain species that are undesirable to anglers — perhaps rough fish or stunted sport or panfish. Imbalance does not mean that population structure changes radically year to year. In fact, most such populations change very little over time. Stunting may increase, though, and the undesirable species may grow as a percentage of the population. When fishermen become disenchanted with their angling success the clamor to stock more fish begins.

Problems associated with stocking fish into an out-of-balance population are similar to those encountered with the balanced system. There are no available nutrients or space for the stocked fish. The majority of fish comprising an unbalanced population are too small to be accepted by the angler but too large to be utilized as prey by an introduced predator. Indeed, stocking could put the ecosystem under further stress. Total *renovation* of the fish population is much more cost effective and restores good fishing faster than repeated stocking attempts.

In summary, the stocking of fish into a stable fish population has only limited application. Indiscriminant stockings rarely meet with success.

UNSTABLE FISH POPULATIONS

Unstable fish populations characteristically show a great deal of variation year to year and can exhibit significant change during the course of a single year. These population shifts are usually associated with major environmental changes, occurring most commonly in the state's reservoirs. Angling success varies widely, with the demand to stock more fish increasing during lean years. In most cases, the poundage of fish in an unstable fish population is below the carrying capacity of the reservoir. Though there may be a good balance between sport and non-sport fish, there are usually enough nutrients and space available for more individuals in the population.

But the problems that limit natural reproduction and recruitment of fish in our reservoirs can also limit stocking success. When major floodwater releases dump fish downstream, they do not discriminate between stocked and naturally-produced fish. The same holds true when water turbidity restricts the production of plankton necessary for survival. About the only time supplemental stockings have a positive impact on natural populations is when lack of suitable spawning habitat or low densities of brood fish depress reproduction. If other survival criteria are met, stocked fish can then become successfully established.

Biologists have also been able to increase the survival of stocked fish by manipulating environmental conditions in our reservoirs. Water level management — which allows reservoir levels to rise during the spring spawning season and be held at that level until the fish become established — creates space for population expansion and increases protective cover and nutrient availability. But these factors are the same ones necessary for successful natural reproduction. When they are present, natural reproduction may be great enough to eliminate the need for stocking.

Though the sheer size of some Kansas reservoirs has made impractical the stocking of larger fish in sufficient numbers to have an impact on the fishery, improved culture techniques and new hatchery facilities should remedy that problem in the future. By being able to raise and hold increased quantities of larger sport fish, the new facilities will provide fish that are able to compete in an unstable ecosystem — in numbers that will have a noticeable immediate impact on the fishery.

Supplemental stocking of fish still has limited application. Mother Nature controls the makeup of our fish populations; fisheries biologists can only devise ways to circumvent the natural order in an effort to improve fishing. Supplemental stocking is a management tool to be used with discretion. It cannot produce healthy populations of fish or sustain them. It is merely a biological band-aid, useful at times, but far from being the cure-all it is so often considered.

Shelterbelts Save More Than Soil

Seven inches isn't much. That's about the thickness of the letters "A" through "D" in the Oxford English Dictionary. It's the length of a keeper bluegill, or the growth of a cottonwood twig the first two weeks of May. It's also the average depth of topsoil for all the world's food producing lands.

Kansas is blessed with prime farmlands having deeper soils than many regions of the earth. Even so, its topsoils average only 12 inches thick. Below these are soil horizons of poor fertility and tilth. Topsoil is the key to productivity.

Soil is not an inexhaustible commodity. Much time is required to weather mellow soil from parent rock. The soil which grows Kansas' crops today is roughly 20,000 years old, and another full inch of topsoil won't be formed for at least 500 years. Damage to the soil surface quickly takes a toll.

One hundred fifty years ago, when Kansas was still an unnamed expanse of tallgrass prairie, nature made its own provisions to protect the soil surface. A variety of natural plants clothed the land, resisting the forces of erosion. But the plow that opened most of the state to farming made the soil vulnerable to loss by prairie wind and water.

In the 1930s wind erosion in Kansas and neighboring states was at its worst. Decades of land conversion had exposed vast areas of open soil, leaving them unprotected. A major drought throughout the Midwest parched the land and set up conditions for the infamous dust storms which characterized the era. The government stepped in to initiate one of the most successful conservation programs in history.

Under the authority of the Works Project Administration (WPA), crews of tree planters established hundreds of millions of trees in field shelterbelts throughout the Great Plains. From 1935 through 1942 more than 3,500 miles of windbreaks were planted and cultivated in Kansas — nearly 40 million trees!

As the dust storms faded into history, though, attitudes regarding field shelterbelts began to change. Many plantings were too wide and occupied too much farm ground; the trees sapped moisture and nutrients from adjacent crops, resulting in poor yields; unwanted trees invaded nearby pastures or stood in the way of irrigation systems.

As time passed, the disadvantages of old windbreaks led to more and more



removals without replacement, increasing the wind erosion problem in Kansas. In 1984, the average acre of Kansas cropland lost a layer of topsoil the thickness of a quarter. This represents a loss of seven tons per acre by wind and water erosion, or an inch of topsoil every 15 years.

Before trying to prevent wind erosion, though, it is important to understand what takes place when soil blows. Damage depends on soil type (loams, sandy loams and loamy sands are most susceptible), as well as the amount of moisture and crop residues present; but transportation always takes place in one or more of the following ways:

First, medium-size particles bounce along the surface in a process called saltation. Because of their weight, they seldom jump higher than 12 inches but are responsible for the bulk of soil damage. As they skip across the soil, they spin, reaching speeds of up to 1,000 revolutions per second. The combination of forward and downward movement, coupled with spinning energy, dislodges new soil particles with every bounce. The damage accumulates progressively across the field.

Particles too large to be lifted vertically tumble across the soil surface. This type of damage is known as "creep" and also dislodges new soil particles. Though creep does not directly result in soil leaving a field, it exposes smaller particles to the lifting effect of the wind, contributing to indirect loss.

The final type of wind erosion is the kind most commonly noticed: suspension. Small soil particles dislodged by saltation and creep are carried high into the air and often blown great distances. Dust storms have been known to load the atmosphere with 1,600 tons of soil per cubic mile of air. One severe storm (February, 1937) in the Oklahoma Panhandle deposited dust on Iowa snow fields more than 500 miles away. Samples showed that deposits contained three times as much humus as the best soil remaining in the area of damage a significant loss to productivity as well as soil volume.

Dust storms of this magnitude require unprotected soil, high winds and dry conditions. On a lesser scale, though, suspended dust is common in Kansas during windy weather. Even the milddest dust storms can cause losses of 15 tons per acre per year.

What can be done to protect our valuable soil from the force of wind? Well, it turns out that Granddad was right: Tree and shrub windbreaks are still the best means of tempering wind and protecting the soil from erosion. But recent research has shown that more effective designs are available to help combat the problem.

Today the wide windbreak is out. It is now known that 10- and 20-row shelterbelts gobble much of their own zone of protection. One to three well-designed rows of trees provide equally good protection when spaced at proper intervals. Today's windbreaks are trimmer.

The traditional hip-roof design has been replaced. Years ago it was thought that the best wind protection was obtained by placing short trees on the outside rows and tall trees in the center. This stairstep effect was thought to lift the wind better than other designs, when it actually caused it to bounce back into the field a relatively short distance away. Today's designs are based on wind tunnel tests and produce a rectangular profile, with trees in all rows approximately the same height. Some things haven't changed. A dense windbreak which allows no air underneath is still effective in protecting soil. Trees like cedar and arborvitae provide good density and tend to form snowdrifts on their leeward sides which help to water the trees. These species are also relatively non-competitive with adjacent crops.

The importance of tree height to wind protection is as obvious today as it was fifty years ago. Soil is protected for a distance of 20 times the height of the windbreak, so cedar trees 30 feet tall provide 600 feet of erosion control. This knowledge is important in planning windbreak intervals.

Finally, research has shown that strips of narrow plantings on regular intervals provide the ultimate combination of field protection for land invested. Though this system has yet to see widespread use, it is receiving serious attention by windbreak planners.

According to the new design system, large plantings are no longer made along field edges. Instead, one-or tworow windbreaks are established, usually 660 feet apart. The rows are positioned east-west and left open at the ends. This provides wind protection from prevailing north or south winds. Previously, multi-row plantings along field borders protected only a portion of their fields from erosion loss.

Using one-row plantings, five percent of a field is occupied by trees, but research has shown that increased yields from protected crops pay for the land investment many times over. And it does so in addition to protecting the soil, a long-range benefit.

Looking at economics, field windbreaks offer a substantial increase in net incomes over unprotected fields. From the standpoint of conservation, the past five years in Kansas showed an average production loss of \$16.20 per acre due to loss of topsoil alone. In addition, nearly 100,000 acres of crops were destroyed

Improved crop yields through retention of topsoil and moisture is a primary benefit of tree belts. But the habitat provided by dense field borders is vital to the survival of resident wildlife, too.



annually during that period by wind erosion, at estimated losses of \$150 per acre. Emergency tillage was required annually on 104,460 acres, at an assessed cost of \$1.15 per acre. For the farmer with adequate windbreak protection, these costs became savings.

At the Windbreak and Crop Study Site in Meade, Nebraska, research is conducted on a series of 40-acre fields protected by two-row windbreaks spaced 435 feet apart. Wind, soil and moisture conditions are typical of those in central and western Kansas. Windbreaks were planted in 1964 and occupy more than six percent of the available cropping area. Economic impact of the windbreaks on wheat production has been under continuous study since that time. Findings indicate the windbreaks had an early effect on wheat production, increasing yields to the point that all establishment costs of the trees were paid back in 13 years. After that, pure profit increase on the continuous wheat has averaged 15 percent higher than on unprotected fields. Similar studies have 3







The "edge" effect of shelterbelts is of greater value to most wildlife than are expansive timber tracts. Sunlight penetrates to the center of brush strips, promoting the development of understory vegetation that provides thermal cover, security and forage for many creatures. Upland birds, deer, rabbits and other game concentrate in tree belts, making them hunting hotspots.

shown yield increases on soybeans and corn in the 20 percent range.

From these statistics, it's easy to see that a well-designed windbreak system is an important asset to Kansas farmers. It saves the soil necessary to grow the crops, and it increases crop yields by reducing moisture stress and limiting sandblast damage to tender seedlings. These are benefits that can be measured in dollars. Tree rows also provide wind-



break protection for livestock on winter wheat pasture, saving roughly eight percent of the energy required to keep them warm in exposed areas under average winter conditions. This increases efficiency of maintenance or gain. Windbreaks add beauty and variety to the landscape and reduce the impact of blowing dust around work and living areas. More importantly, they provide crucial habitat for Kansas wildlife.

Particularly in central and western Kansas, windbreaks provide the bulk of woody cover. Tree and shrub species most often used in plantings produce excellent wildlife food, too. If a pond or water source is available nearby, the habitat triangle is complete. Significantly, windbreaks provide a great deal of "edge" effect. This is good because succulent growth and increased mast stimulated by sunlight on outside rows provide food easily reached by wildlife. Also important is the tendency for wildlife movements to take place along the transitions between short and tall vegetation. Edge provides this transition.

There are few easy answers to modern soil problems. But the simple practice of planting trees can have a marked impact on soil loss. It's a proven method, requiring a surprisingly small investment in time and money compared to the long term benefits. Designed to meet local requirements, windbreaks can profitably save the soil while benefiting crops and providing crucial wildlife habitat. Windbreaks don't cost; they pay.

the

center section

Edited by Rob Manes



ABOUT DEER PERMITS

Editor:

I noticed that Kansas is one of the few states, if not the only state, that has no out-of-state license for deer hunting during the archery season. Why has this continued, since there seems to be many deer due to good luck and good management?

> James R. Hunter Johnson City, TN

Dear Mr. Hunter:

You are correct that Kansas deer numbers have been growing, and the state offers some of the finest trophy hunting found anywhere. Still, with the current number of deer permit applicants, many firearms hunters are turned away each year. Until the Kansas Fish and Game Commission determines that all residents have a reasonable opportunity to hunt deer annually, there is little chance of nonresident permits being offered. Manes

Editor:

I wish to commend the Kansas Fish and Game Commission . . . I was quite pleased to read about handguns being approved for antelope and deer. It was also good news that the Kansas elk herd is doing well.

However, I am quite disturbed to find out that you are considering the issuance of two deer tags to archery hunters. I feel this is quite unfair. One should be able to obtain a firearms permit each and every year before anyone should be able to take two deer.

> Fred G. Showman Sabetha, KS

Dear Mr. Showman:

Archers have inquired to Kansas Fish and Game about the possibility of receiving two permits for future seasons, but no action has been taken on the matter. You can be sure that the Commission will not issue deer or any other permits. without first considering the best interests of the Kansas wildlife resource and all of the state's sportsmen. Manes

KEEP IT UP

Editor:

I work for the Oklahoma Department of Wildlife as a game ranger, and was privileged to work with (Kansas) game protectors Dennis Knuth and Gene McCauley on the case mentioned in your March/April (Law) article, "Civic Duty." This was in reference to the two subjects who killed three deer in Kansas and one in Oklahoma. I was present at the (interviews) of the subjects, and I must say Dennis and Gene are professionals - they did a fine job.

We have worked several cases together, and I want to thank these two men for their help. I hope that in the years to come we can work together as well as we have in the last few years.

> Fred Sanford Oklahoma Game Ranger Nowata, OK

Editor:

I have received only one copy of KAN-SAS WILDLIFE, but I must drop a note to your organization. I showed it to my son-inlaw and my granddaughter. They agreed that it is good to see conservation being pushed. (My granddaughter) thought it would be good if this magazine was put in junior high and high schools.

Keep up the good work.

Mary Ann Tucker Wichita, KS

Dear Mrs. Tucker:

We too feel that KANSAS WILDLIFE is a valuable educational tool, which can help Kansas school children learn about the wildlife of their state. Certain portions of the magazine are specifically designed for education. We hope the use of KANSAS WILDLIFE in classrooms and school libraries will continue to increase. Perhaps a subscription to the magazine would be an appropriate gift for you to present to a local school library. Manes

Editor:

I just received your letter stating that I have overlooked my renewal. Last year, I was fortunate enough to receive a year's subscription from a good friend for my birthday. He should have known that anyone worth his salt, especially a native Kansan, would already be subscribing to such a fine magazine. I received double issues for the year, one of which I took to work for my friends to read and enjoy.

I just recently renewed for another three years. I do appreciate your letter and your concern. Keep up the good work.

> J.P. Lafoe Wichita, KS

TRYING TO HELP

Editor:

One group of people is directly responsible for all of the enjoyment I've had while hunting and fishing - private landowners. Without their kindness in letting me gain access to their land and even taking the time to show me around, none of my hunting and fishing would have been possible.

I'm sure other sportsmen feel gratitude to our farmers as well. Farmers are having a pretty tough time of it right now, and many small farms are facing bankruptcy. There are various reasons for this situation, but the bottom line is that many farms are in financial trouble.

Would it be possible to set up a fund called, for example, "Hunters and Fishermen for Farmers", to which sportsmen could make monetary donations? The money could be forwarded to (legislators) who are fighting for farm relief and other help for farmers. I'm willing to bet that there are many sportsmen who would donate to a fund that may help our farming friends.

> Rob Sherffius, Jr. Wichita, KS

GOOD QUESTION

Editor:

Why doesn't someone stop all the trotline fishing in the reservoirs in our state? It's almost impossible to catch fish on a rod and reel anymore. We go up the Delaware river in the summer, and can hardly get through (the trotlines). Some people almost live there, and they run lines morning and evening. We buy licenses, bait, we use up gas on the weekends, and go home empty-handed.

> Tony Harski Lansing, KS

Dear Mr. Harski:

The use of trotlines is legal in most Kansas reservoirs and streams. They may not be used on state fishing lakes and some community lakes. Setlines also may not be used within 150 yards of any dam or the mouth of any stream. They must be run at least once every 24 hours and tagged securely with the angler's name and address, unless they are used in private impoundments. Each setline fisherman may use, in addition to two rod-and-reel rigs, one trotline with not more than 25 hooks or eight banklines with no more than two hooks each.

Research and angler surveys show that there is little conflict between the fish harvest by setline anglers and the harvest of rod-and-reel anglers. In Kansas' larger rivers, flathead catfish are the main catch on trotlines and banklines. This species is not a major portion of rodand-reel anglers' creels. *Manes*

Editor:

Reading KANSAS WILDLIFE is like being there. I have just read the whole January/February issue . . . most of all I like "What Deer Eat — and Why."

Do you think it matters how old you are

to have a gun, if you have passed the Hunter Safety Course . . . I am 12.

> Brian S. Weaver Altamont, KS

Dear Mr. Weaver:

Under Kansas law, anyone who has passed the Kansas Hunter Safety Course, or another approved course, may hunt small game in the state. Even after passing the course, youngsters must be sixteen before hunting big game with firearms in Kansas. No one born on or after July 1, 1957 may hunt in the state without first passing such a course.

This law is designed to maintain safety in the field among hunters, but it does not provide for safe handling of firearms in all situations. Even after passing the Hunter Safety Course, children should receive careful adult supervision when handling firearms in the field or elsewhere. Once a youngster is certified as a safe hunter, his guardian must decide when he is ready to go afield alone with a gun. Manes

HYPOTHESIS

Editor:

In the last issue of KANSAS WILDLIFE, you had a piece about trophy patterns in Kansas deer. I read another article that stated studies had shown antler development was affected by the (weather during) the winter and spring (prior to fawning). A year with good moisture and a relatively mild late winter allows the does to be in better shape and the buck fawns to grow and develope bigger antlers than those born under less favorable conditions. That could answer part of the question.

> Don Loyd Pittsburg, KS

WHAT'S GOING ON?

Editor:

The poachers in Chautauqua County what are you going to charge those men (for hunting without permits, out of season, wanton waste, and transporting deer across the Oklahoma line)? If these men are stupid enough to hunt this way, then they surely expect to pay fines if they are caught. I don't think they should get off with anything less than a \$1,500 fine per deer. You are going to have to put some teeth into the laws of this state . . . You ought to revoke their hunting rights and give them stiff jail sentences. It is very seldom that you get enough fines from anyone who poaches game in this state . . .

Every month you publish cases in KAN-SAS WILDLIFE where poaching has taken place, yet you get meager fines and they can afford to do it again.

> Robert M. Vaughan Wichita, KS

Dear Mr. Vaughan:

We appreciate your concern about seeing justice done to those who violate wildlife laws; but the Kansas Fish and Game Commission can only enforce those laws. It is the duty of the state's court system to impose fines and jail sentences upon those found guilty of wildlife-related crimes. Even the power of the courts is restricted by limits on fines and jail sentences established by the Kansas Legislature.

Persons such as yourself, who desire stiffer penalties for wildlife violations, should make local judges, county attorneys, and legislative representatives aware of the concern over this matter. *Manes*

Editor:

I can't believe what I read, "... and a baked quail dinner." Your note, "Q.U. Flying High", immediately changed my feelings on Quail Unlimited. The numbers of quail in our county are down. I was hoping the organization was to help the quail reach the populations of several years ago.

> Debra A. Connell Marysville, KS

Dear Ms. Connell:

I assure you Quail Unlimited has the best interest of Kansas' quail populations at heart. The organization is made up of conservation-minded sportsmen who give their time and money for the development of upland bird habitat in Kansas and other states. It is, after all, a lack of habitat — not eating a few birds - that has contributed so greatly to the decline in quail numbers. Q.U. funds recently awarded to the Kansas Fish and Game Commission for upland bird management will be of great value to future quail production. Besides, the birds eaten at the Q.U. banquet were pen-raised. Manes

THE LAW

THEY CATCH 'EM

Nearly 3,300 people were convicted of violating wildlife laws in Kansas last year, and they paid \$241,800 in fines and court costs. The most common violation was fishing without a license (852), followed by operating a boat without sufficient life jackets (446) and hunting without a license (326). Of the 3,449 people arrested, 94.7 percent were convicted, a fact which points out the expert capabilities of Kansas game protectors.

Other common violations included 130 convictions for hunting or possessing deer illegally and an equal number for hunting migratory birds with unplugged guns. The most common violation on state fishing lake areas was driving a vehicle in a restricted area. The most common furbearer violation was trapping without a proper license.

The 1984 figures for wildlife-related convictions were about the same as those for the previous year. Unfortunately for the sportsmen of Kansas, none of the fine moneys resulting from wildlife violations are diverted back to the Kansas Fish and Game Commission. Instead these funds, generated through the work of officers who are paid with license dollars, are sent back to the State General Fund, where they don't benefit Kansas wildlife resources. *Manes*

HUP, TWO, THREE

Something told Kansas Highway Patrolman Rich Shivers that the driver of the pickup was in no condition to be behind the wheel. When he stopped the vehicle near Abilene, two Fort Riley Soldiers were inside, and they had a hen pheasant with them.

Shivers notified Game Protector Steve Stackhouse of the apparent wildlife violation and said he was taking the soldiers to the sheriff's office. There, Stackhouse interviewed the men separately, and they both admitted the passenger in the pickup shot the hen pheasant with a Marlin lever-action .30-30 rifle. That constituted two violations — but there was more. The soldier had shot the bird while it sat on the ground, it was well after the season's end, and he had no hunting license. The way G.P. Stackhouse saw it, that made it five violations.

Dickinson County Judge James Davis

agreed and fined the passenger \$50 for hunting pheasants during closed season, \$50 for possessing a hen pheasant, \$50 for taking a pheasant with an illegal firearm, \$50 for hunting without a license, and \$150 for shooting the bird on the ground. Judge Davis topped off the fines with \$25 court costs.

Finally, the culprit was ordered to surrender his .30.30 to the Kansas Fish and Game Commission to be sold at auction, and sentenced to work under the supervision of Fish and Game staff on four weekends — or spend 30 days in jail. *Manes*

IT'S IN THE MAIL

One Thursday in November, a Garden City man was driving home from Liberal. While still in Seward County, he spotted a small mule deer buck just off the road. He stopped and shot the deer with a rifle, loaded it in the car, and went on to Garden City.

At his home he dressed the deer and packaged the meat. Then he put the head and hide in a plastic garbage bag and drove southwest of town, where he threw it in a roadside ditch.

Three days later, a resident of the area phoned the Garden City Law Enforcement Center to report finding the remains of the animal. Game Protector Dennis Sharp was on assignment elsewhere, so Finney County Deputy Robert L. Hahn responded.

At the scene, Hahn recovered two pieces of mail bearing the same name and address. Hahn rightly suspected the mail would lead to a culprit.

The next day, Hahn and Game Protector Sharp went to the suspect's house. Faced with the evidence, the man confessed. The packaged deer meat was recovered from a freezer in the house, and the suspect was cited for illegal possession of a deer.

He pleaded guilty to the charge, and the Finney County district magistrate ordered him to pay \$250 and \$25 court costs. A ten-day jail sentence was changed to one year's probation. *Dennis Sharp*

PATIENCE PAYS

One of the greatest challenges facing a wildlife law enforcement officer is to be in the

right place at the right time. Sometimes that requires long, tedious waits for a violator to return to the scene of a crime.

Last year, Kingman County Game Protector Jack Dunbar spent the day after Thanksgiving waiting — the entire day. Dunbar's first call of the morning was from a rancher who lived south of Kingman. He said a bowhunter found a freshly killed deer near the house, and it appeared to have been shot with a rifle.

Dunbar theorized that someone had shot the deer from a vehicle on the road and then sped away. He believed they would return to get the deer later. So he hid himself under a nearby bridge, and the rancher's son joined him.

Midday came and the poacher hadn't returned, but the rancher brought lunch to their bridge hideout. Kingman County Sheriff's Officer Jan Smith joined in the wait, situated down the road, out of sight, ready to give chase if needed.

Meanwhile, the Wichita man who shot the deer had gone home to enlist the help of his brother in loading the animal in his pickup truck.

It was nearly 7:00 p.m. when Dunbar decided it was time to give up. Then, just as he was about to leave, he saw headlights approaching. He and the rancher's son took cover again, watching as the pickup drove slowly by without stopping. Something had spooked the poacher, but he appeared again and stopped. From under the bridge, the rancher's son watched as two men loaded the deer in the truck.

As soon as the tailgate was closed, he signaled Dunbar and Smith who were hidden just down the road. They moved in and caught the poacher red-handed. A Kingman County judge fined the men \$500 each. *Manes*

HE'S CLEAN

A woman called Southeast Regional Law Enforcement Supervisor Charlie Ward to report that a man she knew had an illegal deer stashed in his freezer. Ward and Game Protector Jim Hollis went to interview the suspect at work, and he immediately began to talk; but the officers quickly interrupted to read him his rights. Then the suspect explained that the animal was legally taken by a friend who worked at the same place. It was confirmed that the suspect's friend had taken the deer and he did have a permit.

Ward asked why anyone would make such a false report.

The former suspect explained that the caller was probably his ex-girl friend, just trying to make his life miserable. *Manes*

from Dr. Bill Layher, Kansas Fish and Game Commission, (316) 672-5911. Bill Layher

ISSUES

A DEAD ISSUE

Center-pivot irrigation has proven its power. It can turn arid unproductive soils into lush cropfields, it can make unprofitable farming operations into big money-makers, and it can kill a river.

So what does one do with a dead river? Why, farm it of course, or pump oil from it. That's what happened in southwest Kansas along the Arkansas River. Two brothers who farm near Garden City found the timber along that once pristine stream was dying because irrigation had pulled the underground water below the reach of the tree roots. Once the trees were dead, they were removed, and the stream bed was farmed. Oil was found under the dry stream bed, and the brothers claimed it as though it was on their own land.

The Kansas Fish and Game Commission says the bed of the Arkansas River is state property, whether it is dry or covered with water, and Judge Jay Don Reynolds of Dodge City agreed with the Commission. Judge Reynolds cited an act of the federal government, which made the Arkansas and two other navigable streams in the state (the Kansas and the Missouri) state property in 1861. He ruled that since the property was once given to the state, it could not be given away.

So why does Kansas Fish and Game concern itself with a dry stretch of river bed?

The Commission sees the 22,000 acres included in the now dry river as an important stronghold for wildlife. In a part of the state where ditch-to-ditch farming has eliminated much of the permanent cover, unfarmable areas, such as stream beds, may constitute a major portion of the remaining cover. In addition, the lands in question may provide significant income through mineral resources. The Commission feels that these too belong to the State of Kansas. *Manes*

DOLLAR WISE ?

Reagan Administration proposals to reduce the federal deficit could leave a number of departments which are responsible for fish and wildlife programs operating on shoe-string budgets in 1986. Little money is expected to be available for national park and refuge land acquisition, and there are indications that the Soil Conservation Service — celebrating its golden anniversary this year — could be all but eliminated. This move seems unwise, considering the economic returns provided by proper management of the nation's natural resources. A study conducted by the Department of Interior and the Department of Commerce in 1980 showed that wildlife-related recreation pumps 41 billion dollars into the U.S. economy each year. *National Wildlife Federation*

WATER, WILDLIFE

The Kansas Water Office (KWO) is developing a section of the State Water Plan which deals with fish, wildlife, and recreation. The new section results from many citizens' comments at public meetings and hearings held across the state to receive input for the draft State Water Plan.

KWO requested that the Kansas Fish and Game Commission prepare background papers documenting water problems related to fish and wildlife resources in the state. There are five such papers: 1) Wetland Resources and Their Relationships to Wildlife In Kansas; 2) Stream Fisheries Resources In Kansas; 3) Riparian Resources and Their Relationships In Kansas; 4) Environmental Coordination Related to Fish and Wildlife Resources In Kansas; and 5) Reservoir Fish and Wildlife Resources In Kansas. These papers are available to the public upon written request to the Kansas Fish and Game Commission's Environmental Services Section at the agency headquarters in Pratt.

KWO will also receive input for the plan from other state and federal agencies. Once the draft is completed, it will be presented to the KWO for review, modification, and approval this summer. Public meetings will be held in August to receive further input.

It is most important, especially for those who are interested in the future of Kansas wildlife resources, that concerns about the plan are expressed at the public meetings. The future of birdwatching, wildlife photography, hunting, trapping, and fishing is dependent on the water available to support habitat for fish and wildlife.

Current information about the State Water Plan's fish and wildlife section may be obtained

LONG-TERM LOAN

Seven years ago, an effort was begun to expand the money available through the Dingell-Johnson legislation (D-J), which provides funding to improve sport fishing throughout the country. After much work on the part of interested anglers, tackle manufacturers, and others, D-J expansion became a reality. Now the U.S. Office of Management and Budget (OMB) wants to negate all those efforts.

In July of 1984, Congress passed and President Reagan signed the D-J expansion into law, providing about \$900,000 to Kansas for expanding fisheries programs. The legislation clearly states the purpose of these funds and how they are to be allocated. Now OMB, by way of the President's 1986 budget, proposes to divert the funds for use in paying off the national deficit.

Let's see — the national deficit is something over two hundred billion dollars — but let's say it's an even two hundred billion; and the new D-J monies total nationwide about 68 million annually, which equals .034 percent of the national deficit. That means if the national deficit doesn't increase, and all the new D-J monies went toward paying it off, by the end of calendar year 4926 A.D., the nation would be even.

Somehow, I just don't think it will work.

In Kansas, we intend to fund 19 new projects the first year, including increased reservoir access, special fisheries investigations, an Aquatic Resources Education Program, aquatic habitat improvements, and hatchery improvements. If the folks at OMB have their way, none of this will happen.

The crime is that this is your money. You paid when you bought that new trolling motor, dip net, tackle box, and when you filled your boat with gas. The D-J legislation made it possible for you to pay to improve your own fishing through an excise tax on fishing equipment and a marine fuels tax. People who don't fish don't pay!

The Kansas Fish and Game Commission views this manuever by OMB as a violation of national law and a serious breach of public trust. The choice is yours — do you want to spend the next 2,941 years trying to pay off the national deficit, or do you want to see money that you are already paying put to use in 1986 to improve fishing in Kansas and the rest of the nation? Let your national legislator know how you feel. *Chief of Fisheries, Mike Theurer*



PUZZLED BIRDWORDS

ACROSS

- 1. Another name for birds that spend time near the water's edge.
- 2. A structure built from wood for birds to nest in.
- 3. Birds, like other animals, use their eyes to_____.
- 4. When the chick inside is ready, it will _____from its egg.
- 5. Most birds use their wings to_____.
- 6. An instrument used by people to watch birds and other wildlife closely.
- A kind of bird found in Kansas. There are two species of this bird Mississippi_____and swallow-tailed____
- 8. Another name for a soaring hawk with broad rounded wings and a broad fanned tail.
- Some birds of prey, such as hawks and owls, eat____, and are nature's traps.
- 10. The place birds incubate their eggs is called a_____.

DOWN

- 1. How a bird communicates.
- 6. Another name for a bird bill.
- 11. What a bird lays.
- 12. A red-breasted bird we often see in towns.
- 13. A young bird, not old enough to leave the nest, is called a_____.
- Birds eat seeds, insects, worms, mice, fish, or other plants and animals for their______
- 15. The state bird of Kansas is the western _____.
- 16. A bird's body is covered with_
- 17. A bird of prey is called a_____
- 18. A large enclosure in which birds are kept.
- 19. The American naturalist who is famous for his paintings of birds.
- 20. To shed feathers.
- 21. A nocturnal bird noted for its ability to turn its head 270 degrees.



Answers: Across 1)shorebird, 2)box, 3)see, 4)hatch, 5)fly, 6)binoculars, 7)kite, 8)buteo, 9)mice, 10)nest. Down 1)sings, 6)beak, 11)egg, 12)robin, 13)nestling, 14)food, 15)meadowlark, 16)feathers, 17)raptor, 18)aviary, 19)Audubon, 20)molt, 21)owl.

THE MALLARD PATROL

Color the mallard duck family by following the key below. The male, or drake, has bright colored feathers to attract a mate. The drab feathers of hens and chicks make them difficult for predators to see.

- 1 : brown
- 2 : white
- 3 : orange
- 4 : blue
- 5 : green
- 6 : black 7 : purple
- 8 : yellow
- 9 : tan or beige



ABOUT BIRDS

You may have been told that you eat "like a bird" because you didn't eat very much; but some birds eat half their weight in food each day and baby birds eat more than their weight in one day. So, if someone tells you that you eat like a bird, you must have a really big appetite.



In late winter, when the days slowly grow longer, we begin to hear birds singing. You might think it's a sign of good weather. Actually it is the long days, with more hours of sunlight that cause the birds to sing.





You may find a young bird that has fallen from its nest. And you might think that once you touched it, its mother will never return. That isn't true.

Carefully replace the bird in its nest. If you can't find the nest, make one of grass near where you found it, and keep cats and dogs away from it.



If you've ever been called a "bird brain", you probably were insulted. You could take it as a compliment, because birds have large brains for their small bodies.

HUNTING

GOODBYE LEAD

Recent comments submitted by a number of state agencies, private organizations, and individuals to the U.S. Fish and Wildlife Service (FWS) show growing support for banning lead shot. Nearly half of those submitting comments recommended implementing a state, flyway-wide, or nation-wide ban on lead shot for waterfowl hunting. FWS now recommends that non-toxic steel shot should be used in zones or "hot spots" where significant numbers of waterfowl, eagles, and other birds are dying from lead-shot poisoning.

Meanwhile, several states are implementing their own statewide steel-shot requirements for hunting waterfowl. Nebraska recently approved the first state-wide lead shot ban, which goes into effect next year. Iowa, New Jersey, New Mexico, and Kansas are following suit. Wyoming has gone a step further, proposing that all shotgun hunters use steel shot, starting in 1986. National Wildlife Federation

A GOOD YEAR

The success of 1984 Kansas deer hunters was the highest in the 20-year history of the season. The harvest was increased last year to stem growth in the state's deer population, and the season provided more than 340,000 days of recreation for Kansans.

More than 19,400 of the 28,500 firearms hunters harvested deer, for a succes rate above 68 percent. The highest rate of success for firearms hunters was in the western end of the state, where more than 80 percent bagged deer.

Of the total number of deer taken by firearms hunters, 17,583 were whitetails, and 1,850 were mule deer. The area with the highest mule deer harvest was Rawlins County, with 141. Chautauqua County had the most hunters (753), as well as the highest whitetail deer harvest (597). The average firearms deer hunter spent three and one-half days in the field.

The average archery deer hunter spent almost eighteen and one-half days afield. Of the 13,281 bowhunters who tried to harvest deer, 4,167 succeeded, yielding a success rate of 31.38 percent. That compares to just over 27 percent in 1983.

Butler County hosted the most archery deer

hunters, with 437; but Ness County had the top success rate at 60 percent. The highest whitetail deer harvest by archers was in Butler County, where 120 whitetails and no mule deer were taken. The top area for mule deer bagged by bowhunters was Sheridan County, with 42. *Manes*

DUCK COUNT

The news isn't good — the number of ducks counted in the 1985 Kansas Mid-Winter Duck Survey was the lowest in more than ten years, 65 percent below the 30-year average. The number of mallards recorded in the survey was the lowest since the count was initiated in 1956.

Biologists say the main reason is lack of habitat. The most severe problem is in the northern U.S. and Canada, where upland nesting cover and prairie pothole breeding grounds are being destroyed to make way for agriculture and development. A recent drought in the region has also contributed to the lack of wetland brood habitat. Despite multi-million dollar efforts of state, federal, and private conservation organizations, the destruction of habitat continues to outpace programs to acquire and develop nesting grounds.



The Kansas mid-winter duck count peaked at 1,025,000 eight years ago. Mallard numbers in the state reached their highest levels that same year, but waterfowl specialists say the increases were the result of a coincidental set of circumstances — harsh weather in northern states and plentiful surface water in Kansas. The impressive number of ducks in the state that year was no signal that conditions were improving for waterfowl.

Waterfowl surveys in other Central Flyway states show similar declines. During the 1984-85 flyway-wide survey, mallards were 41 percent fewer than the previous ten-year average. *Manes*

RESPONSIBILITY

This year's Kansas winners in the Marlin Firearms Company Hunter Safety Essay Contest were Chris Schnurbusch in the Junior Division and Gayle Ann Sullard in the Senior Division. Each winner received a \$50 gift certificate from L.L. Bean Inc. and a merit award from Marlin.

The volunteer hunter safety instructors who taught the winners also received gift certificates, and were presented with certificates of recognition from Hunter Safety Coordinator George Schlecty. Schnurbusch's instructor was Charles Rice of Neodesha, whose son won the senior national essay contest last year. Sullard's instructor was Bob Harrington of Paola.

Program Coordinator Schlecty says he hopes participation in the Marlin Hunter Safety Essay Contest will continue to increase. He is optimistic about the chances for a national winner from Kansas next year. *Manes*

SURVIVORS

Two hunters, Richard Dailey, 35 and Steven McCoy, 27 were suffering from hypothermia, a lowering of body temperature that can result in death. They were trapped on the bitter cold, windswept peak of Cuddy Mountain, Idaho on the night of November 10, 1983.

Shaking uncontrollably, their minds and bodies numbed with cold, both men were prepared to die. Then they decided to shoot their mounts, slit the horse's bellies, remove the internal organs, and crawl inside for warmth. The plan worked, and Dailey and McCoy escaped the frozen mountain top with their lives.

The two men have been given the Northern Cross Survivor Award, which is presented annually to the person or persons who display outstanding courage and resourcefulness in order to survive under adverse environmental conditions. Selections for recipients are made by the Northern Cross Society of Topeka, Kansas. The award is intended to serve as an inspiration and a tribute to the memory of those whose similar circumstances proved less fortunate. *Dennis A. Baranski*

FISHING

BIOREPLACEMENT

One problem of reservoir fisheries is that nonsport fish, such as carp and bigmouth and smallmouth buffalo, often increase in number as the impoundment ages. A body of water can support only a finite number of fish (actually pounds of fish per unit of water), so increasing rough fish populations compete for space with desirable fish.

To help control this problem, the Kansas Fish and Game Commission contracts with a commercial fishing business to remove rough fish from certain reservoirs. Marketable Fisheries Investigator Jim Stephen says the nets used are designed to catch only large nonsport fish, so desirable fish are not taken. As numbers of rough fish decrease, sport fish populations increase to fill the available space — a phenomenon called "bioreplacement." While this does not work in every reservoir, it does promise improvements in fishing at several of Kansas' larger lakes.

During 1984, Kansas' licensed commercial fishing operation harvested more than 156,000 pounds of rough fish from Tuttle Creek, Pomona , John Redmond, and Glen Elder reservoirs. Bigmouth and smallmouth buffalo made up about 120,000 pounds of the total, and common carp totaled 28,500 pounds. Other rough fish in the harvest included drum, river carpsucker, and gar.

In addition to the direct benefit to the reservoir fisheries involved, almost \$20,000 was paid to Fish and Game through a percent-of-the-catch agreement with the commercial fishing company. That money will be used to manage and improve the fisheries resources of Kansas. *Manes*

LATE SPRING WALLEYE

In late spring, when walleye are still in shallow water, they are most easily caught. The best method is to use a boat to drift or troll until you catch the first walleye. It is important to mark the spot with an anchored float and make note of the depth at which the fish took your bait. For this reason, an electronic depth finder can be helpful in walleye fishing. The information it can give you about bottom contour is also valuable. During the rest of the day, you should look for walleye near similar submerged structure and at the same depth.

An effective technique to use after you have located a school of walleye is to aim your boat into the wind and anchor it so it will drift back over the spot where you found the fish. The rope lets your boat swing slowly back and forth, and the rocking motion of the craft gives your bait the proper up-and-down motion. A longer anchor rope works better for this than a short one.

Since walleye usually feed near the bottom, you should keep your bait down. Lower it until it touches the bottom, and then reel it up about a foot. This method permits you to handle the allowed two poles easily.

Worms and minnows are two of the best baits for walleye. Minnows seem to work better in the early season. In mid-summer, a worm and a jig head bouncing off the bottom is the favored bait.

When a walleye first takes the bait, it will pull your rod tip down. Briefly allow the fish to swim freely with the bait in its mouth. Then set the hook with a short snap of the rod. Walleye have very hard mouths, which makes setting the hook more difficult, but use caution not to jerk with enough force to break your line.

Before you go walleye fishing, make sure your line is good, your hooks are sharp, and you have the right bait. The only thing more important is just going. *Paul Miller*

IT'S A LIVING

"Are you going fishin' again? Why don't you get a job and be somebody?"

Perhaps some nagging guardian spoke those words to Roland Martin, Rick Clunn, Larry Nixon, Ken Cook, or Bo Dowden. If they did, they are probably silent now.

The quintet is made up of the top five alltime money winners on the Bass Anglers Sportsman Society tournament circuit, and their winnings total nearly one million dollars.

Martin, the number one man, has pocketed about \$270,000 in his career. Almost \$50,000 of that has been claimed during the 1984-85 season. Being number one in money hasn't made Martin the all-around top dog in fishing though.

Larry Williams, a Lakeview, Ohio resident

who isn't even in the top 30 money winners, is in the lead for most total pounds of fish taken in the three 1984-85 tournaments held prior to this writing. He has landed more than 83 pounds of bass.

Larry Nixon, third in money rankings, is second in total pounds of fish. Roland Martin has the third largest total creel for the year, Bo Dowden ranks number five in both fish and money, and Ken Cook, the number-two money winner is tenth in total pounds.

The "Super B.A.S.S. IV" fishing tournament, held in early April, will offer more than \$400,000 in awards and monies. The winner will leave \$105,500 richer, taking the biggest purse in B.A.S.S. history. *Manes*

PERCH RECORD

The world record yellow perch was taken in Bordentown, New Jersey, weighing four pounds, three ounces. Experts say it isn't likely that one even half that size will be caught in this century.

When was the record set? May of 1865. National Fresh Water Fishing Hall of Fame

FISH FUNDS

During 1984, 283,265 people purchased licenses to fish in Kansas. The money that resulted from those sales totals more than three million dollars, all of which goes to management of the state's fisheries resources. Of the total number of license buyers, 22,155 were nonresidents.

In a 1983 comparison, Kansas ranked 32 in fishing license sales among all states. California was number one, with 635,530 license buyers paying nearly four million dollars. Bringing up the rear was Hawaii, with 8,495 license holders spending \$27,738.

Across the United States, 42.1 million people aged 16 years and older fished in 1980. They spent an estimated \$17.3 billion in pursuit of the pastime, but less than seven percent of that amount went for licenses and permits. *Manes*

WISDOM

Nature never did betray the heart that loved her . . .

William Wordsworth

NATURE

COURTING DEER

As part of their mating ritual, male whitetail deer use their hooves and antlers to dig shallow depressions in the ground called scrapes. A scrape is usually located near the base of a tree, where both bucks and does can stand on their hind legs and bite (not eat) overhead twigs. Bucks also brush their antlers on the high branches, and some experts say deer leave scent from glands near their eyes on the twigs.

One buck can have several scrapes, which it visits as often as two or three times daily to stir up fresh soil and spray the area with urine. Does also mark the scrapes with urine. Scrapes and the trails that connect them serve as loose territorial boundaries. The scent of doe urine at each one may give bucks some indication of how many females in the area are ready to mate. The peak of the mating, or rutting, season for Kansas whitetail deer generally runs from late September to late November. *Manes*

FOR THE BIRDS

Where you place birdseed for wild birds can be just as important as what you place in the feeder. Cardinals, for instance, seem to prefer a tabletop on which to eat sunflower seeds in the shell, while morning doves fancy eating sunflower seeds off the ground. *National Wildlife*

BLUEBIRD BOOST

Don Yockey of Onega has constructed more than 300 bird nesting boxes for the Kansas Nongame Program. Most are bluebird nest boxes and have been used to establish bluebird nest box trails in Chase, Coffey, Franklin, Geary, and Osage counties.

Mr. Yockey's nest boxes are well used by bluebirds. Records show that six consecutive boxes along the Franklin County route had nests in them last summer. In addition to bluebird nest boxes, Mr. Yockey also provided many nest structures for great-crested flycatchers, kestrels, and woodpeckers. Other species that benefit from these man-made nesting sites include the house wren, Bewick's wren, tufted titmouse, black-capped chickadee, and the unwelcome house sparrow.

Our thanks to Mr. Yockey. Marvin Schwilling

COMPASS PLANT

The compass plant gets its name from the way the leaves usually point in the north-south direction, so that it escapes the strong midday sun. Kansas School Naturalist

UGLY

One of the ugliest creatures in Kansas is the Dobson fly larve, called a hellgrammite. It has eleven body segments, three fitted with legs on each side, and the rest with protruding feathery gills. The hellgrammite has a set of powerful





pinchers on the front of its over-sized head. Found in rocky riffles in streams, the Dobson fly larve is a favorite bait among fishermen.

When the hellgrammite matures, it becomes a large insect, measuring about four and onehalf inches across it lacy wings. Still it's no beauty. Males have huge mandibles and females have smaller ones. They can be seen in summer along streams in eastern Kansas. *Manes*

SPECIES RECOVERING

Forty-six more native and foreign animals and plants were added to the List of Endangered and Threatened Species during 1984. With these additions, the list now stands at 828, of which 331 species are found in the United States. The total includes 297 mammals, 220 birds, 99 reptiles, 85 plants, 62 fishes, 24 clams, 16 amphibians, 12 insects, 9 snails, and 4 crustaceans. In addition to the new listings, 54 other species were proposed in 1984 for listing as endangered or threatened.

This year brought good news for several species that appear headed toward recovery. The Arctic peregrine falcon and the Utah prairie dog were moved from "endangered" to "threatened" listings. The tiny snail darter, a southern Appalachian member of the perch family that sparked the most celebrated court test of the Endangered Species Act, was likewise reclassified to "threatened." Other species on their way to a more secure future include the southeastern population of brown pelicans and the Florida population of the American alligator.

The Endangered Species Act entered its second decade in 1984. It is considered the world's foremost law protecting species faced with extinction. Among its major features are penalties for harming endangered animals, obligations placed on Federal agencies to protect endangered species, and the listing of threatened and endangered species eligible for protection under the act.

Listing is only the first step toward bringing a species back from the brink of extinction. Using goals established in recovery plans, biologists, conservation organizations, and state and federal natural resource managers attempt to improve a species' status through research, habitat protection, increased law enforcement, improved land management practices, captive breeding, relocations, and establishment of experimental populations. There are now 164 approved recovery plans for endangered and threatened species — an increase of 54 plans over the previous year.

"Endangered" means that a species is in danger of extinction throughout all or a large portion of its range. "Threatened" means that a species is likely to become endangered. U.S.F.W.S.

NOTES

WATER PRIMER

An understanding of water issues and the existing laws governing Kansas water resources is necessary in order to make wise and responsible decisions for the future. To help Kansans make such decisions, the Kansas Rural Center has compiled a report on water issues in the state. The publication provides readers with an overview of policies and research relating to water resources.

The report, *Water In Kansas: A Primer*, uses the most recent data available from a broad range of sources. Because it is not written by a government agency, institution, or special interest group, the primer offers a unique perspective. It questions the assumptions of present water use policy and its impact on water resources, as well as the structure of agriculture, communities, and the environment. Copies are available for five dollars each, plus one dollar for postage, from the Kansas Rural Center, Box 133, Whiting, KS 66552. KRC

CLUB HONOR

The Ford County Sportsman's Club of Dodge City, Kansas has been selected by the National Wildlife Federation to receive the 1984 President's Award for exceptional achievement. The club was among 25 state NWF affiliates selected for involvement in wildlife-related matters.

Among other projects, the Ford County Sportsman's Club annually sponsors hunter and furharvester education classes. It also cosponsors National Hunting and Fishing Day events with the Kansas Fish and Game Commission, and has provided manpower and materials for construction of fishing facilities and planting wildlife habitat. The organization was selected by the Kansas Wildlife Federation for similar honors on the state level. *Manes*

T-SHIRT TIME

You can make a donation to wildlife and get a T-shirt in return. The Kansas Fish and Game Commission's WILDTRUST program is offering the half-cotton, half-polyester shirts for minimum donations of \$5.50 for children's sizes and \$6.50 for adult sizes. A postage and handling fee of one dollar is required for each shirt ordered, and checks should be made payable to WILDTRUST. The money will be used to purchase films and tapes for the freeloan Wildlife Reference Center located at the Kansas Fish and Game headquarters in Pratt.

The T-shirts bear a striking illustration of a greater prairie chicken set against a stylistic Kansas sunrise, and bold letters across the front read "It's Wild in Kansas." They are available from regional offices of the Kansas Fish and Game Commission or from the agency headquarters. Joyce Harmon Depenbusch

MAN OF THE YEAR

Former EPA Administrator William D. Ruckelshaus has been named the 1984 Conservationist of the Year by the National Wildlife Federation. "When EPA was an institution on the verge of collapse, Mr. Ruckelshaus returned to Washington to put the agency back on course, even though it meant a tremendous personal and financial sacrifice," said Jay D. Hair, Executive Vice President of the National Wildlife Federation. "Under extraordinary circumstances, he accomplished a record that enhances the quality of our environment for the benefit of all forms of life — both now and for the future."

Ruckelshaus restored the EPA budget to a level 53 percent higher than in 1983, increased enforcement actions against industrial polluters, and imposed mandatory controls for removing the pesticide EDB from the food chain. *NWF*

ANTI BROCHURE

One of the most dangerous and misunderstood threats to outdoor sports and wildlife management, the anti-hunting movement, is examined in a new brochure offered by the The Wildlife Conservation Fund of America (WCFA).

"Who are the anti-hunters? — A close look" examines the philosophies and activities of the modern anti-hunting movement. Additionally, it lists the functions and priority issues of the major anti-hunting organizations.

The brochure is Volume III of the WCFA's Sportsmen's Defense Series. Volume I of the

Series, "Lobbying," and Volume II, "Lawyer's Primer," offer counsel for sportsmen and their lawyers on defeating local government actions to ban outdoor sports.

Sportsmen concerned about the anti-hunting movement are urged to obtain a copy of the brochure from The Wildlife Conservation Fund of America, 50 W. Broad St., Columbus, OH 43215. The WCFA asks a \$.50 donation for each brochure ordered, to cover handling costs.

Copies of Volume I, "Lobbying" and Volume II, "Lawyer's Primer" are also available. WCFA asks a \$1.00 donation to offset printing and handling costs for each booklet ordered. *Rick Story*

NATURE STUDY

The Kansas Museum of Natural History will again offer its "Summer Workshops for Young People" in 1985. Last year, more than 600 five- to thirteen-year-olds participated in the 40 week-long sessions offered. Several new classes are planned, and many experienced instructors will be teaching this summer's sessions.

Scholarships for the Summer Workshops are awarded to students in local schools who are interested in natural history and have financial need. The scholarships are available through the generosity of individuals, businesses, and service organizations. Contributions are welcome. More information about the Summer Workshop and the scholarship program is available from the Public Education Office at the Kansas University Museum of Natural History, (913) 864-4173. David Lassiter

BACK TO NATURE

College robs many students of the free time they might have spent hunting, fishing, or just enjoying nature. Crowded schedules can leave even the most dedicated outdoorsmen without opportunities to keep in touch with the natural world around them.

When graduation comes, such a student will likely be ready to explore the outdoors with renewed enthusiasm, and a great way to start is with KANSAS WILDLIFE Magazine. It provides a direct link with the natural resources of the state, giving information about when, where, and how to enjoy the wildlife of Kansas. KANSAS WILDLIFE Magazine boasts some of the finest writing and photography found in any magazine of its kind — and for six dollars a year, it's one of the best graduation gift bargains around. *Manes*





prothonotary warbler

When was the last time you saw a paruline? O.K., how about a warbler? Everybody who pays any attention to wildlife has, on occasion seen these small, perching, mainly insectivorous birds, many of which are brightly hued and only some of which actually warble (sing). Warblers are members of the subfamily Parulinae and the family Embirizidae. They are, in less technical parlance, "New World" or "American Wood" warblers, distinguished biologically from the Old World warblers Sylviidae).

Warblers migrate to Kansas in the spring. Many nest here. Of those that do, the male bird arrives before the female and stakes out a territory. When the females appear, courtship is brief, and nesting begins almost immediately.

Nests are almost always built by the female. Some species are ground nesters, while others prefer dense undergrowth and yet others tree-top sites. Three to seven eggs are laid. These are white or off-white, usually with brown, black or purple speckling. Incubation is short — rarely longer than two weeks. The young remain in the nest another ten days or so. Normally both parents feed them. $\hfill \square$





Brehm photo





Ron Spomer photo





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Kansas Wildlife



Oliver Gasswint

n recent years hunters and anglers in this state have spent about \$200,000,000 annually in pursuit of their sport. Of this, license fees amount to just over three percent, a figure that has remained relatively constant for the past 30 years. The \$200,000,000 figure, by the way, does not include expenditures by unlicensed anglers and hunters; and spending by non-consumptive users is judged to exceed this. All told, Kansas outdoor enthusiasts may spend 400 to 500 million dollars per year!

But this is not the whole picture. Economists say we must use a "respending multiplier" to estimate the full effect. This multiplier reflects the amount of new business spending that results from these dollars. A fraction over three, it shows that the total economic impact of outdoor recreation in this state is more than a billion dollars.

What is the source of all the money that creates this bonanza? It comes mainly from the costs for transportation, food, lodging, equipment and other goods and services purchased by sportsmen. The amount spent on licenses and permits provides \$7,200,000 annual income to the Kansas Fish and Game Commission. To this is added boating registration fees, Wildtrust gifts, non-game check-off monies, other miscellaneous income and over \$2,500,000 federal aid funds.

Although federal aid is only 25% of KF&G's total income, it supports most of the programs that produce the fish, birds and other game desired by sportsmen. After the agency funds its general administrative costs, those for law enforcement and most of our information and education work, some \$5,000,000 is left for fisheries and game management. Federal aid accounts for half of these monies. Without federal assistance, KF&G could not provide the lands, facilities and other services that most outdoors people have come to expect.

There are a number of federal grant programs but the most significant are PR and DJ. PR is the Pittman-Robertson Federal Aid in Wildlife Restoration Act

Wildlife Dollars: how they come and where they go

Miller illustration

Mike

passed in 1937. DJ is the Dingell-Johnson Federal Aid in Fisheries Restoration Act passed in 1950. Under the provisions of these acts, sportsmen pay excise taxes on sporting arms, ammunition, archery equipment, rods, reels, lures and other sport fishing gear. In turn the federal government, through the U.S. Fish and Wildlife Service, apportions these tax revenues back to the states for fisheries and wildlife restoration work.

Over the years Kansas has received \$26,000,000 in PR funds. The first apportionment in 1939 was for a mere \$16,909.67. This has grown to \$2,000,000 annually in the past three years. In the last 35 years Kansas has received \$7,000,000 in DJ funds. The first apportionment under DJ in 1952 was for \$49,714.99. We now receive \$500,000 annually. With the passage of the 1984 Wallop-Breaux Act, DJ funds may double or even triple in 1986!

Approved activities qualify for the reimbursement of three PR or DJ dollars for each four dollars of work accomplished. In 1984 over \$3,500,000 in fish and wildlife restoration work was costshared using PR/DJ assistance. Some activities don't qualify — among them law enforcement. Too, most of the work accomplished by the Information and Education Division must be done with "state" dollars. The Director's office, commissioner's expenses, legislative matters and general administrative costs don't qualify. Put-and-take stocking of fish and game are not approved activities.

rior to 1962, essentially all PR/DJ funds were used to construct state fishing lakes and waterfowl management areas. From 1950 to the mid 60s KF&G purchased 2,013 acres of land and built 12 lakes totaling 1,017 surface acres. Since that time it has purchased lands, conducted surveys and research, developed terrestrial and aquatic habitats, maintained lakes and wildlife management areas and built roads, ramps, parking lots and other access facilities. In addition it has developed a hunter education program, reestablished certain game, fish and non-game populations within the state and provided technical services to landowners and local units of government for development of game habitat and lake management.

Kansas was late in conducting game and fish surveys and research. Today it is recognized for its excellent programs in small game, big game, non-game, furbearer and warm water fisheries.



Game research and surveys were instrumental in fostering the liberal hunting seasons we enjoy today. KF&G is now operating under a planning system recognized nationally. As a result, other state fish and game agencies look to Kansas for assistance in developing their planning programs.

Let's look a little more closely at some of the wildlife programs undertaken in the Sunflower State. As early as 1957 KF&G recognized the potential for a developing deer population. Field surveys identified the location and probable numbers of deer and the growth potential for these populations. Biologists formulated a management program. As a result, the first Kansas deer hunting season since the turn of the century was held in 1965. In 1983 this resource provided over 310,400 days of huting recreation and a harvest of 17,556 animals. That's a lot of recreation and venison stew! 111

In the early 60s, research indicated a potential for the reestablishment of antelope and wild turkey. Antelope introduced from Wyoming, Montana, Nebraska and Colorado have now established pronghorn populations in several counties. In 1983 the northwest herd provided 917 days of hunting recreation and a harvest of 339 antelope.

One of the state's greatest successes has been the wild turkey. Starting with 125 birds from Texas and 36 from Oklahoma, KF&G has established the Rio Grande subspecies in most of the available range in Kansas. By acquiring Eastern wild turkeys from Missouri, it is rapidly restocking suitable habitat in eastern Kansas. The growth of turkey populations has made it possible for Kansans to enjoy 17,225 days of hunting recreation with a harvest of 1,954 birds in 1983.

Another effort that has great potential is a program to reestablish breeding populations of the giant Canada goose. In 1983 alone 645 goslings were released in prime ranch pond habitat in the Flint Hills of eastern Kansas. Similar reintroduction programs are aimed at other game and non-game birds and mammals that were once part of the state's fauna — including the mountain plover, swallow-tailed kite, eastern chipmunk, river otter, ruffed grouse and sharptailed grouse.

Fish, too, have fared well. Northern pike, walleye, white bass, striped bass and wipers (white bass-striped bass hybrids) have all been introduced or reintroduced.

Frequent fish population inventories indicate the need for maintenance stocking and rehabilitation of lakes that no longer have manageable sport fish resources. Surveys determine angler success and preferences. Where fisheries problems have been identified, research is done to find solutions to these problems.

Black bass length limits have been imposed and studied on several lakes and reservoirs to determine whether or not such management will improve sport fish populations and angler success. Threadfin shad have been stocked in selected waters to determine whether this forage fish will improving fishing for black bass, crappie, bluegill, walleye and other fish.

Ver the years Pittman-Robertson monies have been used to purchase 51,238 acres of land for public hunting benefits. On these lands KF&G has developed 16,695 surface acres of water — primarily marshes for waterfowl. These waters provide secondary benefits for fish life, furbearers and non-game species. Without federal grant funds the agency could not have developed another 270,000 acres of lands and waters licensed on federal reservoir projects.

By planting native grass, shrubs, trees and cereal grains for food and cover, KF&G has created excellent small game, big game and waterfowl management areas. Use surveys indicate that over 10 percent of all hunting in Kansas takes place on state-managed lands. This is particularly impressive in light of the fact that these public lands make up less than one-half of one percent of the total land areas in the state!

KF&G provides technical services to others in order to minimize environmental impacts and to protect and enhance our wildlife resources. These services include the Wildlife Habitat Improvement Program (WHIP), the Community Lake Improvement Program (CLAP) and the Environmental Services project. Through WHIP. agency experts help landowners plan for the development of wildlife habitat on private lands. Over 2,200 landowners have placed more than a million acres under development plans. In most counties the lands under such plans total less than 10,000 acres. But in three counties (Phillips, Norton and Brown), acreages total 51,311, 67,139 and 84,403 respectively!

There are 124 ponds and lakes totaling nearly 10,000 surface acres under CLAP. These are public waters owned and managed by cities, counties and



townships. KF&G biologists make fish population surveys, prepare management plans and help local governments manage their fisheries resources.

The Environmental Services project provides for review of construction projects proposed by other agencies. Biologists review proposed agricultural and water resources legislation and assistance programs in an effort to eliminate or modify those things that might adversely affect our fish and wildlife resources. Of particular concern in these environmental reviews are impacts on threatened and endangered species and their habitats.

Other KF&G services include the investigation of fish kills and water pollution incidents, provision of technical assistance to pond owners and the alleviation of animal depredation problems. A big project is the state hunter education program, in effect since 1974. Since that time 185,000 youths have completed the course, and about 15,000 new students are certified each year. This program is being reviewed to include greater emphasis on hunter ethics, essential for improving hunterlandowner relations. Although supported with PR funds, the Kansas program could not have succeeded without the assistance of volunteer instructors. These volunteer services are worth over \$100,000 a year.

Yes, fish and wildlife management does contribute to the Kansas economy and to the natural beauty of our state. Many of the most successful programs have been made possible by the nearly 50 years of Pittman-Robertson and 35 years of Dingell-Johnson federal grant assistance. The excise taxes that make these grants possible - and the state license fees that form the core of KF&G funding - are all derived from license buyers. No state general tax revenues are available to support the Kansas Fish and Game Commission. The maintenance and further development of our fish and wildlife resources depend upon continued support by the state's anglers and hunters.

All citizens of Kansas can be proud of what sportsmen have made possible. Because, whether we participate in field sports or not, we all benefit. The wren's home is furnished by sportsmen, as is the chipmunk's and the badger's and the avocet's. Sportfish and game animals may be the object of the license buyer, but he also supports other wildlife and helps protect natural areas from the bulldozer blade and chain saw.

Good wildlife management is expensive, but it returns to the state a substantial dividend in both dollars and environmental quality. It is worth supporting.

The Prairie Falcon

text and photos by Mike Blair

ith the coming of really warm weather birds of all kinds become more visible in Kansas. Nesting is the order of the hour, and even rare species are evident by virtue of their activity. One bird you'll see with *decreasing* regularity, though, is the prairie falcon. It is a winter resident in Kansas and heads north during the spring.

Prairie falcons are crow-size birds, larger and less brightly colored than the kestrels which commonly reside in Kansas. Because of their markings and size, they are sometimes mistaken for hawks. In flight their slender pointed wings and rapid wingstrokes distinguish them from the heavier raptors. Prairie falcons are usually brown, though they may be gray, even ivory. The face is marked with prominent white eyebrows and cheeks, broken by dark brown crescents below the eyes. The beak is blue-gray, short and hooked. The eyes are nearly black.

Among the fastest and most skilled flyers of the bird kingdom, prairie falcons are efficient hunters. Unlike peregrine falcons, which live in mountainous areas and subsist chiefly on birds, prairie falcons frequent open grasslands and foothills. Prey as large as ducks, pheasants, prairie dogs and jackrabbits fall to mature falcons. But due to their accessibility and abundance, meadowlarks and smaller rodents are more common in the diet.

These raptors often hunt close to the ground, flying swiftly in search of prey. At other times they soar to great heights. The following account by Dawson describes a high-altitude attack: "The bird makes little fuss over the capture of small game. It simply materializes out of the empty blue and picks up a gopher as quietly as you would pluck a flower. The thunderbolt, launched from the height of half a mile, has been checked every few hundred feet by a slight opening of the wings, that the falcon might gauge the caliber and the intent of the victim; and the final plunge, therefore, has the speed and accuracy of fate. In the case of larger game the quarry is knocked headlong by a crashing blow, after which the assailant turns to try conclusions as to weight. But the falcon prefers always to snatch, and when small game is abundant, the bird is less likely to disturb rabbits or poultry."

Prairie falcons nest exclusively in rocky cliffs or dirt banks where their enemies cannot reach them. Nests are usually located so they are inaccessible from below and above, often 20 feet or more from both ground and rim. Five eggs are commonly laid on a layer of rock, bone or gravel. The young stay with their parents for some time after learning to fly.





The Stream Ecosystem

drop of rain falls on the grasscovered soil. The addition of more drops develops a fine ribbon of water down the stem of each plant. Humic materials in the soil absorb much of the moisture until the ground becomes saturated. Some waters may percolate through the ground, replenishing aquifers and sustaining spring activity.

The excess is destined to form small rivulets, gradually becoming larger as they join. As these rivulets enter intermittent streams, small pools are replenished with a fresh supply of water, which gives new life to the microorganisms, native fishes, and amphibians living there. But the water's journey is far from over. The small streams meld into larger drainages which then combine to form perennial streams. As the water moves down each channel, the volume being carried constantly grows.

Flow is not without inhibition. Friction occurs between stream banks and the substrate of the stream bed. Energy is dissipated in the erosion of stream banks and bottoms. Depending on hydrologic and geologic factors like soil type, rock hardness, gradient and a number of other variables, the stream may become deeply entrenched, or shallow and wider.

Sediment settles out of the water column as flows subside or as the stream flattens out in its descent to the ocean. Deltas may form as the river slows upon reaching large bodies of waters.

Some sediment periodically covers rocky or gravelly pool bottoms, but high flows in the spring cleanse and scour these bottoms, exposing the rock crevices needed by many fishes to spawn, insect larvae to perpetuate, and organisms to escape the short-lived torrents.

Turbidity increases during high stream flow, but subsides quickly. Native prairie vegetation prevents large quantities of soil from washing into the stream courses. The clear water of a clean stream allows penetration of the sun's rays. Phytoplankton (microscopic plants) and larger rooted vascular plants capture this energy through photosynthesis, molding inorganic materials

Sloughing of bared stream banks is evident here as accelerating water churns its muddy way downstream. Soil loss at streamside and flooding at channel junctures have brought headaches to farmers and destroyed more cropland then was salvaged from between the bends of natural waterways. Gouging straight, deep cuts in the earth is one way of getting water from point to point at a faster clip while freeing idle acres for crops. But the subsequent damage wasn't in the blueprint on the Black Vermillion, where scars won't quickly heal.

such as phosphates and nitrates into a living complex of proteins and carbohydrates, subsequently providing food sources to aquatic herbivores (planteaters), which in turn pass their stored energy and nutrients to carnivores (flesh-eaters).

The food web is highly complex and rarely as direct a chain as most people think. This dynamic system ensures that if a link is eliminated, the system will still operate. When the system becomes so reduced as to become a single chain, the removal of any component will make it inoperable.

Too much sunlight can throw the system out of balance or change its components. Tree-lined banks prevent the water from overheating. In addition, stability of the stream bank is ensured by the myriad of tree roots holding its soil in place. Roots provide hiding and foraging places for fish, allowing them to rest and preventing the energy drain of a constant battle against swift currents.

The trees themselves provide nesting habitat for birds and satisfy life requirements for raccoons, opposums, deer, turkeys and countless other wildlife. Tree belts afford cover for movement of animals to new areas and help prevent isolation, ensuring the genetic variation so important to natural selection.

A meandering stream channel obviously is longer than a straight line from



its headwaters to its confluence with another stream. The stream's capacity to hold water is much greater because of natural convolutions. Many streams also develop "ox-bows" or small basins near their courses. These hold excess water, reducing flood risks. Specific life forms have developed to utilize these basins.

When the stream does flood after a heavy rainfall, organic material is deposited in the lower flood plain, enriching soils and providing the nutrients for lush foliage to develop. Much of our highly productive farm land is formed in this manner.

A stream is amazingly complex. That is obvious. But man often intervenes in the workings of a stream before determining the effects of his actions. As an environmental investigator, I've repeatedly seen the results of large-scale gravel dredging, dam building, sewage effluents, industrial pollution, and dewatering. Last spring I received an investigative report from the U.S. Army Corps of Engineers concerning what I thought was a minor river channel change on the Black Vermillion River. Before the investigation was over, I was to see still another way that we can inadvertently "kill" a river.



Natural stream confluences are always formed at gentle angles. Not so human-engineered junctions! Turbulence at this sight is eating away the soil tons at a time. The increased velocity of water barreling down a straight channel aggravates the situation and produces severe downstream flooding during spring runoff.

The Case of the Black Vermillion

The Black Vermillion River has its beginning in Nemaha and Marshall Counties. The North Fork arises northwest of Axtell and flows southeast in Nemaha County before it turns to the south for several miles and then cuts southeast toward Vliets. Just above Vliets, the North Fork is joined by the South Fork, which begins southeast of Centralia. At the confluence of these two small streams, the main channel of the Black Vermillion is born. The river then meanders to the southwest, passing around Frankfort and eventually joining the Big Blue River just above Tuttle Creek Reservoir.

The confluence of the two forks is where the Corps investigative report directed my attention. Just after the rivers join, the stream swings to the north in a large arc. At least, it did at one time. When I investigated, I found the landowner had bulldozed the riparian vegetation, filling the creek channels and covering the trees with a layer of dirt. He had then planted a crop. A new channel was cut in a perfectly straight line, the banks nearly vertical. The two forks now met head on, and I could see the erosive results of the large whirlpool that had formed at high flows some days before. The Black Vermillion, previously a slow-moving, sluggish stream throughout its descent, raced through the new channel. The shortened stream dropped precipitously, the water quickly gaining in velocity as it moved downstream.

I was to visit the site on several future occasions. Each time the stream appeared different. On my next visit the river had breached the channel plug (the fill). Pushing its way through, it had eaten the soil from among the other fill debris. Exposed was the graveyard of numerous cottonwoods, elms and hackberry trees. Water inundated the old creekbed and flowed through the new one. What had been part of a crop field was now an inaccessible island several acres in size.

Shortly afterward, I received two more reports of similar dredging and filling activities downstream. New channels had been cut through crop fields, sealing about two miles of the original meandering stream. The trees along these stretches had not been touched, but plugs (earthen dams) had been placed where the original stream crossed the new channel. The work had been done about three years before I looked at it. The new channel was a disaster. Though the new channel cuts were 12 to 20 feet deep and well over 100 feet across, no piles of excavated soil were evident. Looking closer, I discovered that the top of the new stream was eight to ten feet below the bottom of the old stream bed. Obviously, when the channel was made it wasn't so large.

Surprisingly, the new channels were cut across crop fields. I've seen many small channel changes around the state, and usually the action is performed to gain more crop ground, enhance access to a field or for some similar reason. But these changes were splitting crop fields asunder, with no reason for the rerouting apparent.

Why They Do It

n a statement submitted to the Corps of Engineers, one landowner described the rationale he used to undertake channel work on his property. We have no corroboration of his statement, but it does explain how one man addressed his flooding problems.



A straightened channel acts as a sluiceway for water that once was directed and controlled by a meandering streambed. It's not nice to fool Mother Nature.

"I would like to inform you of the work that has been done in the Black Vermillion Valley. In the early 1960's, the Upper Black Vermillion Watershed Joint District No. 37 was formed for the purpose of controlling flooding on the Black Vermillion River. The plan was drawn up by the Soil Conservation Service and consisted of approximately 150 detention dams and channel improvement on 16 miles of the Black Vermillion upstream from Frankfort, KS. This plan was presented to the landowners who voted to accept the plan. A board of directors was elected to carry out the plan. In the late 1960s farm owners whose land lay above the end of the channel improvement started to straighten the stream on the land. In 1977, we found out that the Soil Conservation Service changed the specifications for the channel improvement and determined that the new channel would have to be rip-rapped, thus tripling the cost and changing the cost-benefit ratio so as to make the channel prohibitive. The landowners in the flood plain were shocked that our government, who had promised to carry out the work that was planned, could do such a thing. Our U.S. Senators and Representatives were contacted and asked to help reinstate the original plan, but to no avail. The Soil

Conservation Service and board of directors of the watershed told the flood plain landowners they would have to do their own channel work. There were no guidelines set up for the landowners to follow that I knew of. The flood plain landowners were paying a special assessment for flood protection besides a two-mill tax levy. We paid the special assessment, which had been added to the tax roles for those who didn't pay a lump sum at the beginning, until 1981. The special assessment was started in 1972.

The farm owners in the flood plain had no other alternative but to do the channel work themselves. The common practice was to cut a new channel that would



Much of the cat and dragline work done on the Black Vermillion was of poor quality. "There were no guidelines set up for the landowners to follow ...'

eliminate a bend in the stream and bulldoze a crossing to get across the old stream bed to farm the land that had been isolated. The practice of clearing timber was also carried on in order to get more land under cultivation. The farm economy is so bad that clearing this land is more economical than going even deeper in debt purchasing other land.

I did no different than any other landowner in the area. I did not know that I was doing anything wrong until after the work had been done. I did not fill the old channel. I did clear some ground adjacent to the old channel in hopes of farming it. We have such a problem with the spread of trees away from the stream and if nothing was done, the trees would take over. In 1982 my land was flooded so often that I was unable to plant approximately 350 acres to a crop. The water accumulates in this area and cannot get away unless there is channel development.

I hope you can see the problem the landowners in the flood plain have, and hope you will allow me to farm the land as intended."

It should be noted the reasons behind dropping the proposed channel work from the watershed district's plan were not entirely due to changes in specifications by the Soil Conservation Service (SCS). In 1969, Congress passed the National Environmental Policy Act, requiring all federally funded projects to be examined for their potential impacts on the natural environment. Subsequent rules, regulations, and policies were implemented by all federal agencies, including the Soil Conservation Service, to bring their operations into compliance with the law of the land. Channel work such as that proposed on the Black Vermillion had been documented to be one of the most environmentally degrading construction activities that could be undertaken. Further, the decision to include rip-rap on the channel was not arbitrary. Because the channel would pass through highly erodible soils, rip-rapping would have been the only way to control erosion on the channel banks. The serious erosion now being experienced on the Black Vermillion substantiates the Soil Conservation Service's decision. By including the rip-rap, the cost of the project then exceeded any benefits received, so the channel work was dropped from the plan-a sound decision both economically and environmentally. Unfortunately, despite the problems with chanstraightening, the work has nel proceeded.

Irreversible Damage

t apparently started as small projects in the upper portion of the two river forks. Individuals channelized portions of the stream and soon saw that water moved quickly off their fields, preventing flooding. Word of their success passed downstream. Downstream landowners, however, became flooded more frequently and to a greater extent than before. So they, too, made "chan-nel improvements." Down each watershed, the work progressed. Now the North Fork is about 70% channelized, the South Fork about 40%.

Below the confluence of the two tributaries, farm land is being flooded even when relatively small rains occur, despite the fact that some fifty watershed structures have been built in the Black Vermillion basin. Another 43 remain to be constructed. Even though these structures aid in controlling runoff, flooding now is more severe than ever. The channelization effects of moving water quicker downstream have more than offset the benefits of the impoundments. The lower watershed is now hit by fast-moving flood waters. The river channel cannot hold the waters once detained by ox-bows which slowly released the water.

The new channels were developed using poor hydrologic design. Banks are straight up and down, impairing animal movement across the stream. High waters saturate the banks, and as the water level drops, it pulls tons of dirt into the new channel. The next high water flushes the dirt down the stream. It becomes deposited at road crossings, in some cases elevating the road five to eight feet above the bridge. Most of the dirt has nowhere to go except downstream. No bends exist to slow the water, so the silt is carried all the way to the Big Blue River. As that stream slows upon entering Tuttle Creek Reservoir, the silt is dropped.

The stream banks are sloughing off and the shortened stream reach has a greater drop in its bed. The bottom is continually degrading. The Black Vermillion's two forks, once meandering streams, are now straight ditches which are rapidly becoming wider and deeper. Except for isolated spots, trees cannot establish root systems quickly enough to



rookie land developer.

stabilize the banks. How long will the process continue? Until something is done about it. Stream restoration will cost in the millions.

What has been lost because of the straightened channel? We can only speculate because pre-project conditions were not well documented. We do know a few things, though. The fish and wildlife that require trees and brush along the streams are gone in many sections. Travel corridors for wildlife dispersion are not there. The stream exhibits temporary high velocities, preventing the establishment of stable fish populations or communities. The uniform channel affords no habitat for fish spawning, invertebrate production, or furbearer foraging. Roads crossing some river points are no longer passable. Crops rarely can be raised in many

Regulation

ll-planned stream projects adversely affect a number of resources, including fish, wildlife and water. But the control of stream modifications has not been given to any one agency or even an organized group of agencies. In Kansas the Division of Water Resources, under the State Board of Agriculture, controls water rights appropriations and issues permits for all stream drainage alterations. An individual, by state law, is required to secure a permit from that agency to perform such work. However, the law does not delineate fines, restorative action, or any other penalty for non-compliance. Thus, the Division of Water Resources has no real enforcement capabilities to ensure that projects



Left alone, streams will eventually revert to their natural undulating paths. But this will take time. In the interim, soil erosion, flooding, and the loss of riparian vegetation drain not only the farmer's pocket, but our state-owned natural resource base. It is ironic that such hard work as rechanneling a stream produces no permanent benefit, tragic that its cost is so high to all of us.

fields lower in the basin because of flooding. Even in areas where trees were not cleared, frequent flooding prevents high wildlife production.

Water quality in the stream is severely affected. High turbidity limits aquatic plant production even though large quantities of fertilizers surely accompany the soil washed into the stream. Tuttle Creek Reservoir is being filled with sediment from the upper reaches of the Black Vermillion. With the soil, too, come chemical herbicides and pesticides. Much of the atrazine now being detected in Tuttle Creek may well be coming from the Black Vermillion Basin. are developed within sound engineering or hydrologic guidelines.

The Kansas Department of Health and Environment requires water quality certification of similar projects. Historically, the agency has halted such projects only if state water quality standards would be violated. These standards do not address sedimentation or secondary environmental effects such as temperature increases due to tree canopy removal, loss of nutrient uptake by riparian vegetation, or changes in primary productivity if channels are widened.

No state law addresses the general impacts of stream alteration on fish and wildlife resources—though if a project potentially affects habitat of threatened or endangered species, the Kansas Fish and Game Commission can act to lessen those impacts, and project sponsors must obtain a channelization permit from the Commission.

If a project occurs on a stream which possesses a flow of at least five cubic feet per second 80 percent of the time, an individual must get a permit from the U.S. Army Corps of Engineers to proceed. Before issuing such a permit, the Corps is required to check on whether other state permits have been issued. The problem in Kansas is that most streams are not covered. The Corps issues nationwide general permits which cover most activities in smaller streams and negate the need for individual project review. Before nationwide permits are issued in a state, water quality approval is obtained from the state agency responsible. So on small streams in Kansas, the Kansas Department of Health and Environment permit is already issued, the Corps permit is not required, Division of Water Resources cannot enforce its own statutory authority, and the Kansas Fish and Game Commission can do nothing unless threatened or endangered species occur on site.

Currently, the State is developing a water plan. The responsibility for writing that plan lies with the Kansas Water Office. Perhaps future safeguards will prevent a repeat of the Black Vermillion incident. Unfortunately, it is not the only stream in the State currently affected by channel modification. The Upper Chikaskia, the Neosho River, Four Mile Creek and the Wolf River have all felt the bulldozer blade. It might be too late to save some streams, but we still have time to prevent others from experiencing similar fates. And we can work to correct our mistakes. Many states are now planting buffer strips of vegetation along streams denuded in the past. Not all damage done is irreparable.

The complexity of a stream ecosystem is still not recognized by many people. Its importance to our environment-indeed, to ourselves-is grasped by few. The natural flow of streams must be nurtured wherever possible and radical alterations of banks or beds undertaken only when absolutely necessary and with a bank restoration program ready to implement. A state stream protection plan will take time and money to formulate and enforce. But water courses like the Black Vermillion are expensive lessons in natural resource stewardship. A plan, a consideration for our streams is vital to the productivity of our farm lands and the well-being of animal and human life on the plains.



to the faded ink.

Not that scope rings are the only things I lose. I lose lots. Right now I'm looking for a set of three very mediocre

ook, it couldn't walk away on

its own. You must have put it

"That, my little melon, is logical. It is

"You're wrong. It isn't there now."

Sometimes logic can make someone

as unpleasant to be around as can a case

of whooping cough. Truth and logic, you

see, are only distant relations. But too

many people use the words interchan-

one more time. The missing scope ring

was here, in this box, last October. I saw

it. I fondled it. It was real. I put it back

in the box with this other Tilden ring'

- I paused to display the item, keeping

a firm grip on it so it wouldn't disappear

'Tilden rings.' " I pointed triumphantly

me. Something you forgot. I never go in

your box. Neither does your daughter.

Had a burglar been at work, the last item

in this house he would have taken

would have been a Tilden scope ring."

line now. The climax. The big surprise.

Well, there isn't any. I still don't know

where that ring is. If you do I'd appre-

ciate hearing from you. Failing any such

perception, you might drop me a line if

you have a rear, low, one-inch Tilden

You're probably waiting for a punch

- "and immediately labeled the box

'There's something you're not telling

'All right," I said, "I'll go through this

geably. My wife is one.

also untrue. I didn't put it anywhere. It's

been in this box since horses lost their

somewhere.'

toes.

transparencies that someone left with me. If they were mine, I'd probably toss them. I hope I didn't. The person didn't leave them with me to toss.

... with Stub Snagbark®

off trail

There are a few things, of course, that I've never lost. Old hunting socks, to name one. Old hunting socks cannot be misplaced or lost. Especially the ones with holes in them. If the holes are two toes wide, the only sane thing to do is burn them or stick them in a can of car wax. You don't bury old socks. Some dog will dig them up, and sooner or later they'll wind up in your dresser drawer. Socks with holes only one toe wide, by the way, should either be mended or cut with scissors so that they're two-toe socks and can subsequently be burned.

Another thing that I've never lost is my automobile. Oh, one night in Oregon I spent several hours wandering around the timbered north face of a mountain looking for it. But I really didn't worry much about not finding the old pickup. It was too temperamental to stay lost for long and would, as always, turn up quickly after I found the road I'd parked it on. It did.

Big boxes full of stuff rarely get lost, and as long as you don't compartmentalize the stuff, it won't either. But woe to the poor beggar who thinks organization will solve the problem of lost lures, arrowheads, shellholders, scope caps, mount screws, ferrules, and other trinkets. As soon as a separate drawer is set aside for a specific item, things start disappearing. The first recourse is to go back to the big box. Naturally your lost bauble isn't there. You moved it. To a place it would never get lost.

Parceling out the contents of the big

box has other drawbacks, too. You may lose the smaller containers themselves. I have a parts chest at home that's missing one drawer. I don't know which drawer it is yet, except that it didn't hold scope rings. One of these days, though, I'll wind up missing something that went in that drawer, and suddenly I'll remember all sorts of other things that were stored with the lost item. If you keep everything in one big box, you may lose individual pieces on occasion, but you won't be caught minus a whole category of items.

Papers and anything that can be written on are prime candidates for loss. Sometimes papers even get lost before you write anything on them. That's when you should be thankful something important isn't missing. Oddly, papers without anything on them eventually turn up. Printing of any sort — such as is found on hunting licenses, car registrations, birth certificates, checkbooks and coupons for your favorite breakfast cereal — virtually guarantees that lost papers will stay lost.

Some people say papers stay lost easily because they're small. But some things that stay lost aren't small. The Dutchman Mine, for example. Though most of us will never have the chance to lose a gold mine, it's comforting to know that someone once did. Not that losing your only chartreuse bass lure the night before season is inconsequential.

Car keys are lost by people all the time. I haven't lost very many, partly because I hate to walk from anywhere worth driving to. I take very good care of my car keys. I even lock them in a special cage each night. I use a combination lock, by the way, with the combination etched on the crisper drawer in my refrigerator. That way I can't possibly lose the key to my lock to my key or misplace the paper with my combination on it the way some people do. A lot of lost car keys are actually gobbled by ignition switches. These keys aren't really lost. They're visible, just inaccessible. I'd give anything if my Tilden scope ring were visible now. I'd find some way to get at it.

cover photo: yellow warblers by Gene Brehm

You must teach your children that the ground beneath their feet is the ashes of our grandfathers. So that they will respect the land, tell your children that the earth is rich with the lives of our kin. Teach your children what we have taught our children — that the earth is our mother. Whatever befalls the earth, befalls the sons of the earth. If men spit upon the ground, they spit upon themselves.

— Chief Seattle

