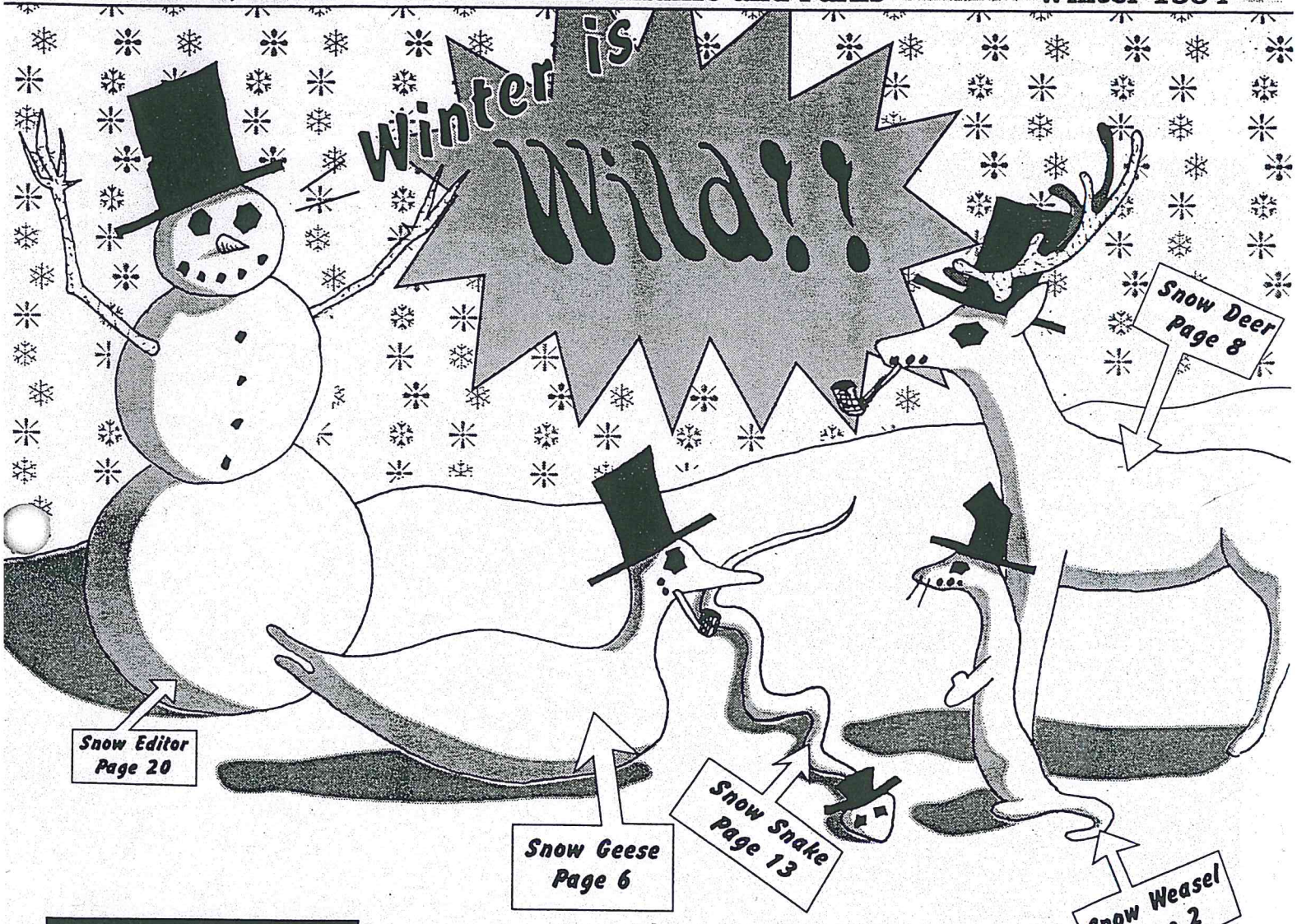
On T.R.A.C.K.S.

Teaching Resource Activities and Conservation to Kansas Students

Vol. 5, No. 2 Kansas Wildlife and Parks Winter 1994



Inside ...

In our March Issue: Geology and Wildlife!

SPECIES SPOTLIGHT: The Least Weasel

Family: **Mustelidae**
Scientific Name: ***Mustela nivalis***

When it comes to surviving the winter months, it is widely known that some animals actually change color to blend in with the white of winter's snow. Few animals in Kansas go to such trouble. After all, Kansas weather is rather unpredictable and lots of snow is not always guaranteed. This sounds reasonable except that the change in color is triggered automatically as the days become shorter.

The only two Kansas inhabitants that develop a white winter coat are members of the weasel family. The ***least weasel*** is the smallest of the two (the other is the long-tailed weasel). In fact, the mouse-sized least weasel is the smallest member of the order Carnivora, weighing in at 1.25 to 2 ounces and measuring 6 to 9.5 inches long (males are larger than females).

The least weasel is a mustelid, which means "mouse eater".

Because of its small size, it is rarely seen and appears to be limited to the northeast and north-central parts of Kansas. It was suspected to inhabit Kansas for many years, but the first positive identification did not occur until 1964 when an individual was found near Marysville. The least weasel prefers marshy areas, is least common in woodlands, and may inhabit meadows and grasslands.

It is built in typical weasel fashion: a long, slender body, short legs, short ears, and a very short tail. During summer months, the body is chocolate brown with a white belly. While the winter coloration is white, some individuals in Kansas and farther south keep the brown fur all year. It does not possess a black tip on its tail as other weasels do.

Being small presents its own obstacles for surviving the winter. A small body does not hold heat very well, so the least weasel (and other mustelids like the mink), have some of the warmest and most luxurious fur coats of all animals. Large amounts of food are required to fuel the highly active least weasel. It may need to eat anywhere from half to all of its body weight per day. It's a good thing they are primarily nocturnal ... they can't even sleep through the night without getting hungry. By the way, it would take you **two months** to eat your own weight in food!

So, what does this voracious eater like? Lucky for you and me, they like rodents; deer mice, harvest mice, and voles make up the bulk of their diet. This amounts to 1 to 1.5 mice per day. They will also eat moles and insects when encountered. Less frequently eaten are small ground-nesting birds such as sparrows. If you're like me, you're wondering:

How does such a small animal catch something as big as itself?

It's not easy. Fortuntately, a weasel's body is perfectly designed for entering runways and dens of small rodents. The least weasel can enter a hole less than one inch in diameter. After stalking through the home of its prey, there's the kill: the least weasel grasps its prey

at the back of the head and bites through the skull.

They make their homes in abandoned rodent burrows and make a nest from shredded grasses and leaves. They are solitary creatures, avoiding each other except during the breeding season. Females can produce two to three litters a year and may have four to five young per litter. Females are sexually mature at four months of age. This is necessary—the entire cycle of birth to death for the least weasel takes only one to two years.

Although many people do not value the importance of weasels, their feeding habits are beneficial to people. As a group, mustelids kill more rodents than any other group of predators. Without mustelids, it would be more difficult for people to control mice and rats. The truth is, these animals do far more good things for people than most of us know.

A Fond *Farewell...*

Mary Kay Crall has resigned to take an education position with the Olathe Fire Department. Her contributions to the Wildlife Education Service Sector and environmental education are many: editor of this newsletter, contributor to the development and revision of the educational resources available through the W.E.S., initiator of the Satellite Reference Center in the Wildlife and Parks Kansas City District Office, co-worker and presenter to the teachers and students in the Kansas City area, active participant and co-regional coordinator for Project WILD . . . one could go on and on.

Our loss will be the Olathe Fire Department's gain. We will miss Mary Kay as a colleague, but most of all as a caring friend who shared so much with us. We wish you the best in your new position. You will be missed, but never far from our thoughts. Take care!!

Mary Kay way back in 1985, just a couple of years after joining Kansas Wildlife and Parks.

Migrants, Hibernators, and Adaptations -- Oh My!

Kansas' winter winds don't just bring snow and freezing cold. Change is also in the air. Lifestyles that allow survival in warmer weather can lead to disaster in the winter.

Kansas wildlife must change behaviors to deal with the problems of winter. Food becomes less available, and what ***can*** be found may be concealed by a blanket of snow. Cold temperatures at the same time increase an animals' metabolic rate, increasing its demand for energy. The result can be an energy deficit, which makes it hard for an animal to stay healthy and defend itself. Hypothermia, frostbite, and starvation are all possible consequences of being unprepared for harsh winter conditions. Winter's changes may even reach far beyond its season. If an animal has a hard winter, it may not have enough energy in the spring for breeding or feeding young.

So how does Kansas wildlife adapt to survive winter? There are three basic responses:

✓ Avoid winter altogether by travelling.
✓ Stay and enter a sleep-like period of dormancy.
✓ Stay active and "tough it out" all winter.

The most obvious response to winter is to avoid it altogether: migrate south. Birds are most often associated with this behavior, but animals like bats and butterflies also migrate. Humans often begin to wistfully dream of migrating sometime around mid-winter, but seldom follow through.

Migrating would seem to be the easy way to deal with winter, but it is an event at least as stressful as staying in the north all winter. First, the migrants must be able to find their way south, and most animals return to the same wintering grounds each year. How the animals navigate is poorly understood, but most biologists believe that the stars, sun, and magnetic field of the earth are used in some combination.

Animals must also find suitable feeding areas along the way. Many long-distance migrants may need to store large quantities of fat in their bodies to prepare for their journey.

Some animals accomplish truly amazing feats of navigation. The arctic tern, a water bird, flies from its breeding range above the Arctic Circle to its wintering range just above the Antarctic Circle, a distance of 10,000 miles.

Perhaps even more amazing is the migration of the monarch butterflies, for none of the migrating individuals were alive during the last migration. Somehow, adult monarchs transfer the necessary travel information to their young genetically. Kansas monarchs winter in the mountains of central Mexico. Most mate there, and the males die soon after. Females lay their eggs on milkweeds on their way back north in the spring. Most of these old females will only get as far as northern Mexico and the southern U.S. before they die. Their eggs hatch into larvae, pupate, and continue the migration north about a month after hatching. The individuals in this next generation mate, lay eggs, and travel as far north as they can before dying. Generations of monarchs continue leapfrogging north until they reach their northern limit—Canada—around June. The following winter, the youngest monarchs head south to start the process all over again.

Another way to deal with winter is to sleep through it to conserve energy (another method much-dreamed-of by envious humans). Animals do this to different degrees. Some enter temporary sleep-like states—called "torpor"—during periods of extreme cold, but are active during some of the winter. During these periods of dormancy the animals drop their body temperatures and slow their breathing to conserving energy. When the weather warms, the animals wake up and

become active. This type of dormancy can be referred to as "incomplete hibernation". Reptiles, chipmunks, and some mice behave this way.

At the other extreme are the true hibernators; they stay dormant all winter regardless of outside conditions, and wake up only when spring arrives. In Kansas, ground squirrels and bats are the best examples of true hibernators.

It is interesting to note that like many animals, plants "hibernate" in the winter. Plants become inactive to survive winter's extreme cold, when water is locked in the soil and unavailable. This is the reason for one of autumn's most spectacular events—leaf fall.

Deciduous trees shut down the activity in their leaves to seal themselves off from winter. As the nights get longer and colder, a corky layer forms where each leaf joins its twig, preventing any water from entering the leaves. As the leaves die, the green photosynthetic material—chlorophyll—disintegrates; the red, yellow, and orange pigments in the leaves show through. The result is the bright colors of falling leaves.

Some animals neither hibernate nor migrate, but stay active all winter (something humans do, but grudgingly). These animals have evolved some behaviors that help them out.

One survival method is to store fat in the body for insulation and a source of energy. Most winter-active animals, such as deer, coyotes, and skunks, do this to some degree.

Other animals stay warm by huddling together. Honeybees are a good example ... during cold periods, the individuals in a honeybee colony will gather in a huge cluster. They raise the temperature in the cluster with their body heat, and use their bodies as insulation for the interior of the hive (they take turns moving in and out of the cluster).

In addition to storing fat in their bodies, some animals hide food to prepare for winter's shortages. This is called "caching". Tree squirrels are best known for this behavior. Squirrels are a common sight as they run hurriedly about in Fall, burying nuts in the ground. This food can be dug up for consumption later, if the squirrels can remember where they hid it. Beavers also cache food for winter. Some have been known to store as much as 145 pounds of woody material per beaver in the bottom of a pond.

Another way to survive is to find a nice, warm hiding place. Some insects have a unique way of accomplishing this—they force plants to build shelters for them! The process starts when an adult insect lays its egg on a plant. The egg hatches into a larva which burrows into the plant's tissue and secretes a substance which stimulates plant growth. The result is an abnormal, swollen structure grown by the plant around the larva. This structure is called a "gall". The insect is protected inside the gall from cold temperatures, and has a constantly growing food source for the winter. Galls come in many strange shapes, and can be found on leaves, twigs, stems, or roots of many kinds of plants. Over 2,000 species of insects in the United States produce galls.

Most of us think of winter as a dead time, to be suffered through until the first glimmers of spring. Wildlife in Kansas use some fascinating ways of dealing with the problem of winter weather. Life still occurs under winter's blanket of snow and cold. Maybe studying winter's dramatic changes will help you get through the season!

For more winter adaptations, see this issue's ***Species Spotlight!***

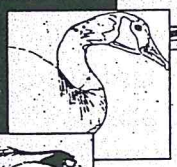
Winter Brings Wildlife

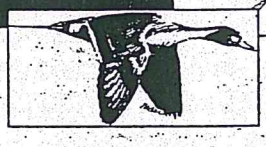
Every year it's the same, and that's what makes it so exciting ... the cycle of migration repeats itself in winter and spring, with a rainbow of wildlife traveling north and south through the Great Plains. That makes Kansas the Grand Central Station for ducks, geese, a variety of shorebirds, and other travelers.

Here's a sample of the wildlife tourists passing through Kansas about now. The map below shows a few of the animals, their origins, and their destinations. Use the map at right to find some good public places for viewing the yearly odyssey ...

Sandhill cranes travel from the arctic to the gulf in large numbers.

A large variety of water birds —geese, ducks, shorebirds, and others—make a long journey from Alaska and the Arctic to the Gulf of Mexica and beyond.



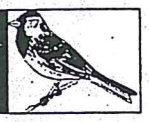


Kansas is part of the southern range of the silver-haired bat.

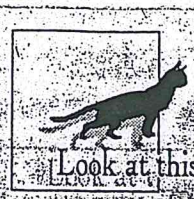
The ruby-throated hummingbird moves from the eastern U.S. to Panama in winter.

White pelicans wing their way from south central Canada to the gulf coast.

Monarch butterflies journey from Canada to Mexico and back over several generations.



Many birds in the US travel far south to winter. The eastern kingbird goes to Peru!



Want to incorporate a wildlife viewing plan into your environmental curriculum? Get your hands on a copy of ***Watching Kansas Wildlife: A Guide to 101 Sites*** *by Bob Gress and George Potts. (1993. University of Kansas Press. ISBN 0-7006-0594-0.)*

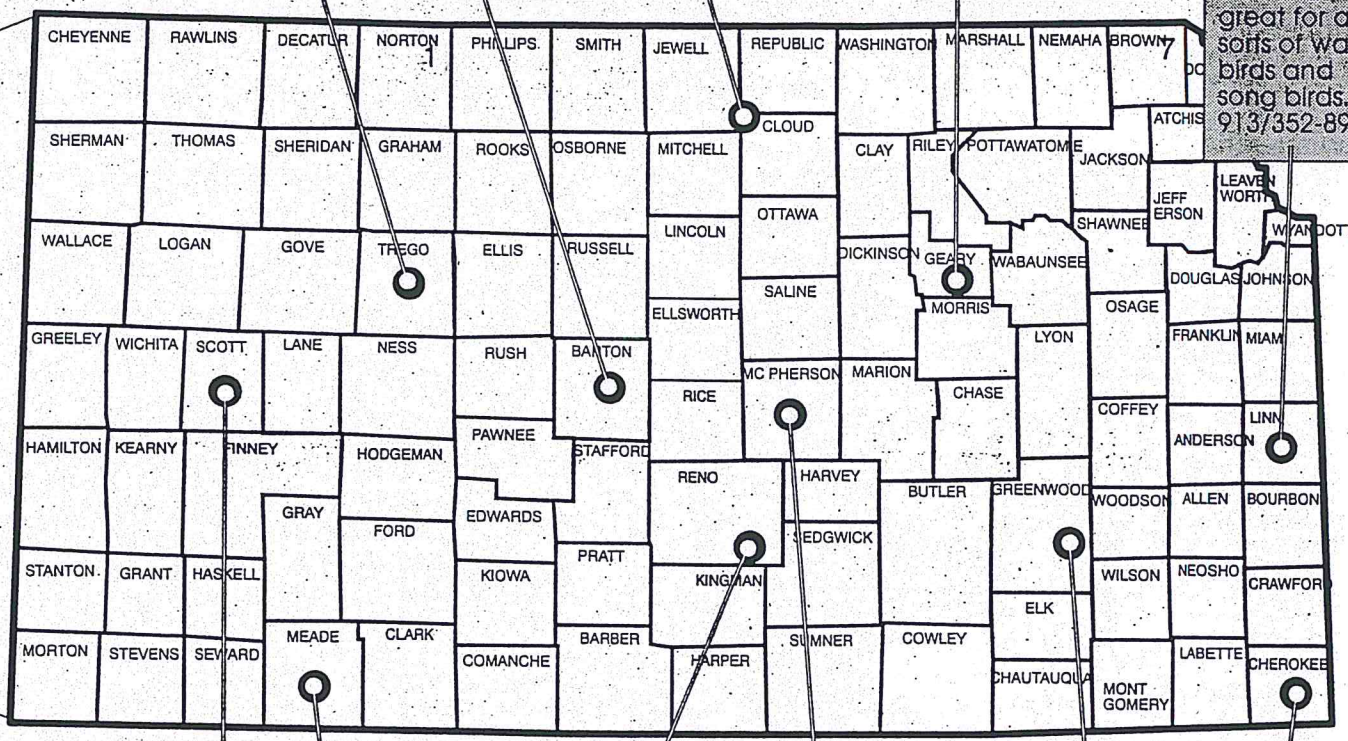
Cedar Bluff State Park and Wildlife Area. Woodlands, canyons, and prairie. 913/726-3212.

Cheyenne Bottoms Wildlife Area. Wetlands of choice for migrating birds. 316/793-7730.

Jamestown Wildlife Area. Group of shallow marshes good for attracting variety of ducks. 913/439-6243.

Milford State Park and Wildlife Area. Large area especially good for bald eagles (also has a staffed nature center!) 913/238-3014.

Marais des Cygnes Wildlife Area. Woodlands and wetlands, great for all sorts of water birds and song birds. 913/352-8941.



Scott State Park. A western Kansas jewel, canyons and woodlands offer refuge to ducks, geese, and songbirds. 316/872-2061.

Cheney State Park and Wildlife Area. Look to the habitats on the north end for good pelican viewing! 316/542-3664.

Meade State Park. Like Scott, this is an oasis for woodland and water bird migrants alike. 316/873-2572.

Maxwell Wildlife Area. With mixed grass prairie and woodland trails, expect a nice variety of migrating songbirds. 316/628-4592.

Toronto/Fall River Area. A diverse range of habitats for seeing migratory species. Call for info on viewing blinds. 316/637-2213.

Mined Land Wildlife Area. In addition to migrating waterfowl, look for osprey and the occasional bald eagle. 316/231-3173.

This is a small sample of the public areas managed by the Department of Wildlife and Parks. Many of these public lands collect information on migratory birds every couple of weeks, so you can get information on the species passing through either from the local newspaper or by calling the public lands office direct. Do yourself and your students a favor ... bundle up, contact a park or wildlife area, and take the trip. There's no substitute for the real thing!

Wildlife, Winter, and Habitat

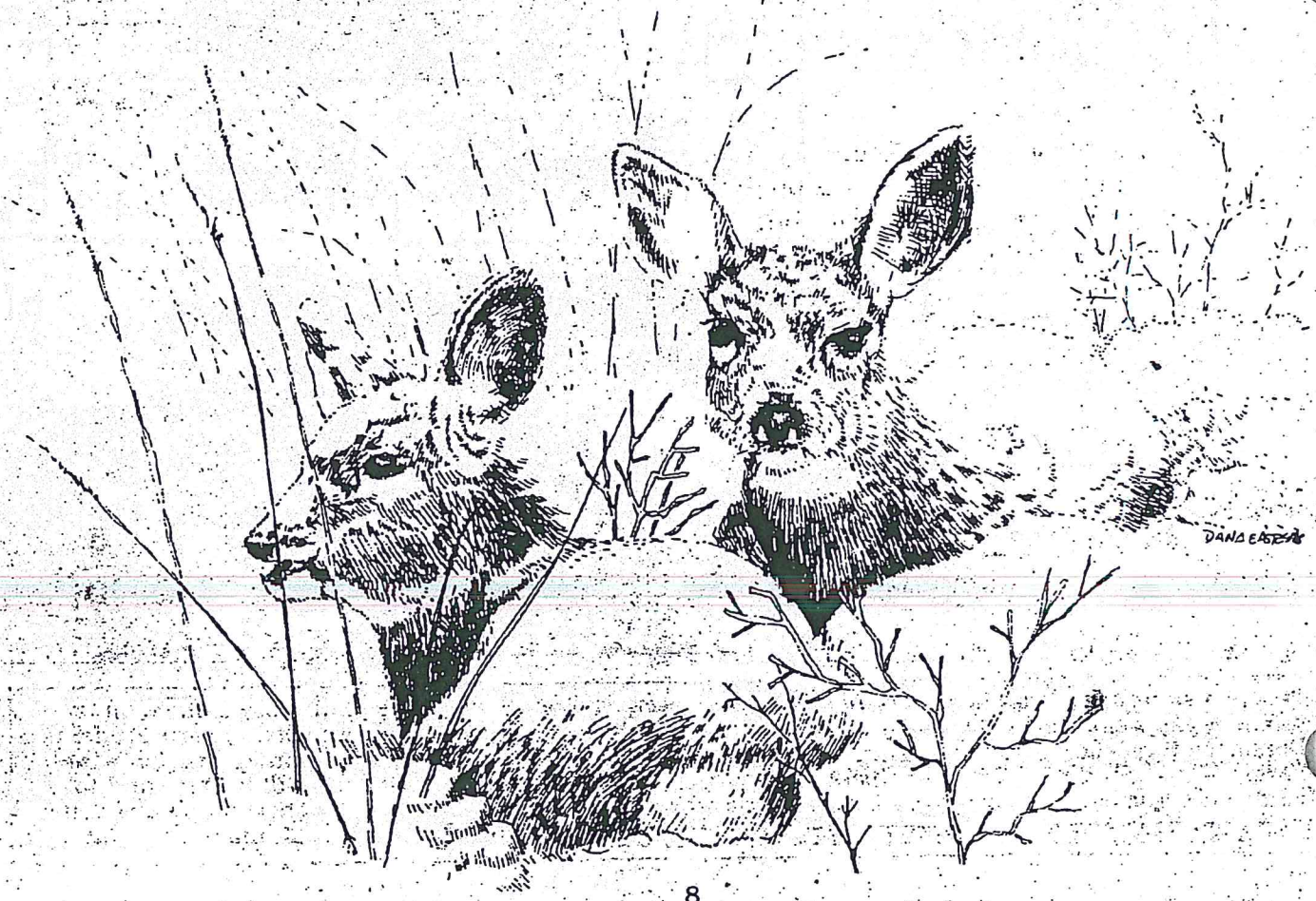
The hot chocolate tastes extra good tonight. Winter is outside in all its glory; snowing heavy, whipping up strong winds, causing the temperature to plunge below freezing. Ever wonder what effect winter has on wildlife in Kansas?

A variety of factors determine how animals survive harsh winter weather: the length of the winter season, the daily temperature and wind chill factor, the amount of snow cover, and the number of days the land surface is covered with snow.

Habitat—the area where an animal lives— is of critical importance to the survival of wildlife during winter. It must provide three essential components: food, water, and shelter. Because habitat requirements for wildlife vary from season to season, what may have been a good place for quail to brood in spring may not be the best habitat for winter ... the lush vegetation may now be matted down by snow, and the food supply is often of lesser quality or not availab The lack of proper cover also makes animals more susceptible to predators.

Winter causes animals to increase their energy intake so as to maintain body temperatures. All of this winter stress may also activate diseases, such as rabies, and can cause females to bear fewer young and devote less time to raising the young.

Larger wildlife species in Kansas—deer, antelope, turkey—and other true prairie inhabitants like prairie chickens, suffer little winter stress or mortality. They paw or scratch through snow to expose food, or switch to more accessible food sources. They use snow in such a way to protect and insulate them from the wind and cold (prairie chickens burrow into the snow in the event of a big blizzard).



Songbirds, small game birds, and fish are more likely to be adversely affected by snow and ice storms and long periods of cold and windy weather. Enormous die offs of songbirds and other small wildlife have occurred in Kansas when ice storms and heavy snows cover food sources for prolonged periods. Fortunately, these catastrophic winter kills are rare in Kansas.

Fish can also be affected by harsh winters. A dangerous situation can develop when ponds and small impoundments become ice-covered and are topped with a snow layer. This situation prevents adequate sunlight from penetrating the water. Over a long period of time, underwater plants die and stop producing oxygen. The oxygen supply is gradually used up by fish and decomposing plants. Soon fish begin to die from the lack of oxygen. Shad are very prone to winter-kill, followed by game fish like bass, crappie, and walleye. Catfish and carp are least susceptible.

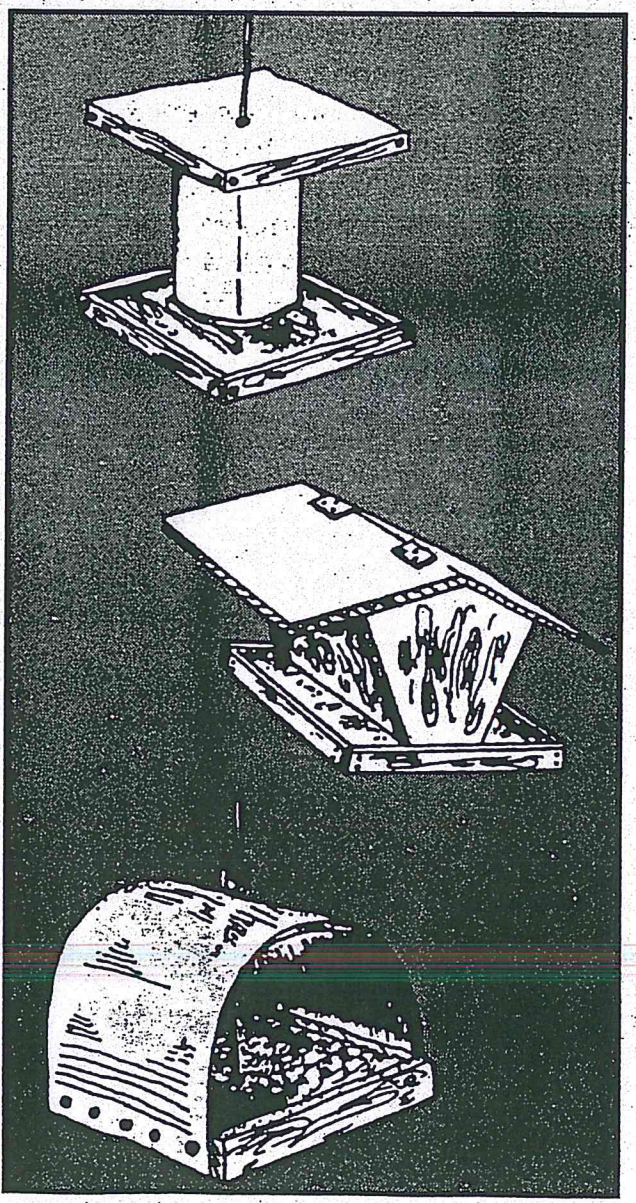
Habitat and its components (food, water, and shelter) are critical in determining how certain wildlife will survive winter. The following are suggestions for supplementing and improving habitat during the winter months.

Maintaining a Bird Feeder: In recent years, more and more people have discovered enjoyment in feeding birds. Ironically, as public interest grows, more and more habitat for birds is being lost. This situation makes it even more important for individuals to supplement food for birds during the winter months. Remember, once you start feeding the birds, you must continue to do so until the natural foods, such as insects, fruit, and grains, become available again.

Open Water Sources: Birds and small mammals may have a hard time finding ice-free water. Precipitation often falls as snow, sleet, or ice during winter ... an unusable form of water for most wildlife. Stress occurs when birds are required to travel greater distances to obtain usable water. A water supply near your birdfeeder would be a well-used addition.

Shelter Plots: All wildlife require areas where they can protect themselves from wind, rain, snow, and natural enemies. Winter shelter can be improved by planting more native trees, shrubs, and evergreens, providing brush piles and thickets, and leaving the remains of one's garden over winter.

Landowners can leave a few row of crops, such as milo and soybeans, standing throughout the winter months. Cover can also be provided by leaving heavy grass or other plant growth in field corners, or by planting nonproductive areas to shrubbery—plum, fragrant sumac, autumn olive, or evergreens. Good winter habitat should be thick and brushy to offer protection from the elements.



Every Groundhog Has Its Day ...

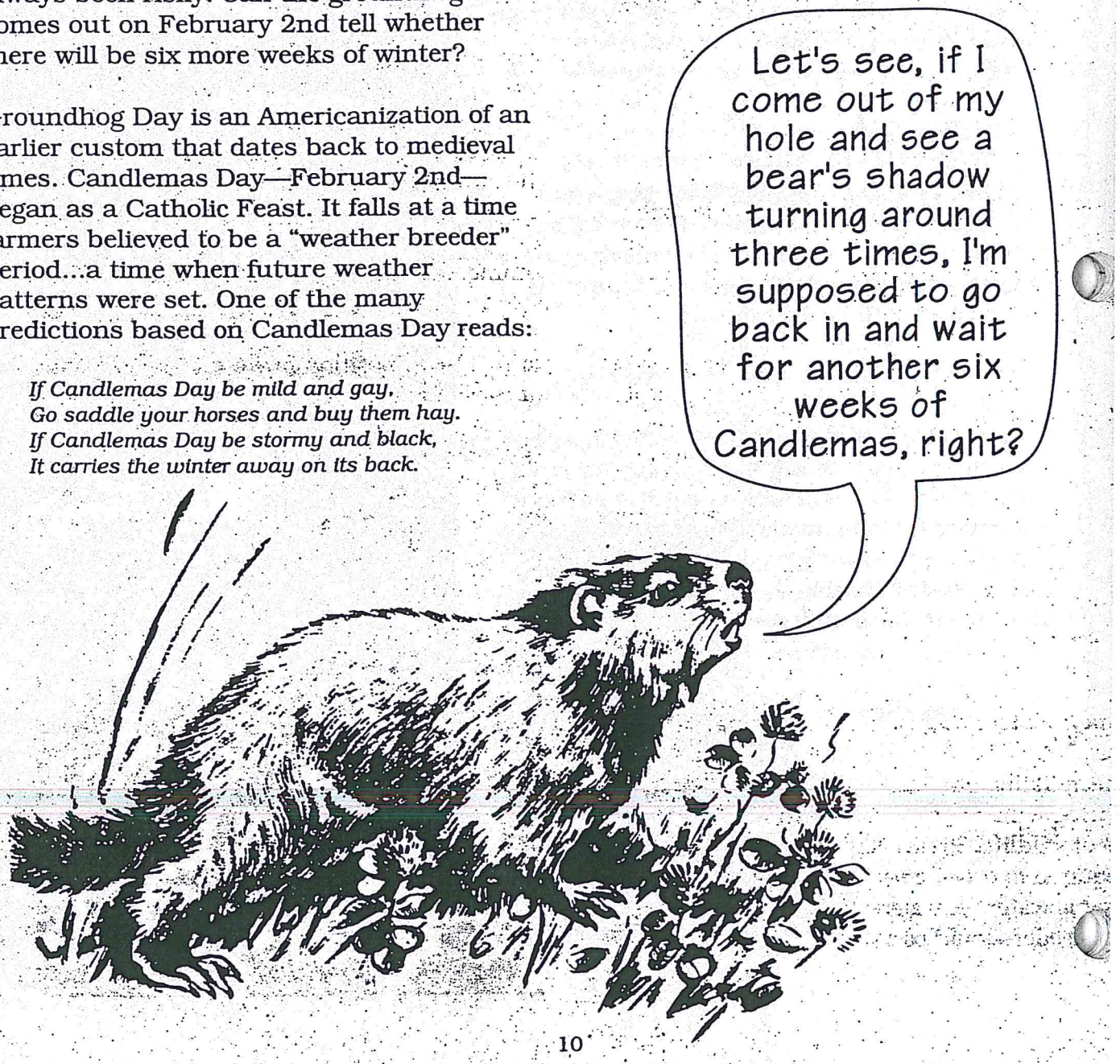
People have been trying to predict the weather for a very long time, with the earliest records dating back 6,000 years. This is not suprising ... predicting the weather could have been one of the first ways humans tried made sense of their existence and observe cause-and-effect relationships between the elements and the environment. Short-term or 24-hour weather predictions can be surpisingly accurate when one is weather-wise, but predicting the severity of the seasons has always been risky. Can the groundhog that comes out on February 2nd tell whether there will be six more weeks of winter?

Groundhog Day is an Americanization of an earlier custom that dates back to medieval times. Candlemas Day—February 2nd—began as a Catholic Feast. It falls at a time farmers believed to be a "weather breeder" period...a time when future weather patterns were set. One of the many predictions based on Candlemas Day reads:

If Candlemas Day be mild and gay,
Go saddle your horses and buy them hay.
If Candlemas Day be stormy and black,
It carries the winter away on its back.

In Germany, they believed if a woodchuck comes out on Candlemas Day and sees his shadow, he returns to his hole and waits for another four to six weeks of winter. In France, a bear replaces the groundhog, and it turns in place three times before returning to its den. Germans settling in Pennsylvania brought the custom along for the ride.

For more information, see the book Weather Wisdom by Albert Lee.



Ice And Snow And A HO - HO - HO

Ice and snow are normally included in one's thoughts about winter. We all have had experiences with both ... some pleasant like building snowmen, sledding, skiing, and ice skating, others not so agreeable (losing control of your car, falling on icy pavement, and shoveling the driveway after a blizzard).

As stated in the article ***Wildlife, Winter and Habitat*** (page 8), the same is true with wildlife. Winter with its snow and ice can influence the survival rate of wildlife. It can increase the amount of energy needed by wildlife (creating stress), reduce the availability of shelter, and affect their reproduction and susceptibility to diseases.

But winter also provides some real benefits for wildlife. A lot of snow during winter will increase the amount of moisture available in the spring, which will increase the amount of summer cover and food available to wildlife and their young.

Some wildlife needs heavy snow cover to assist them in surviving the winter months; a prairie chicken actually burrows into the snow to escape the wind and blowing snow in a major storm. The ruffed grouse, a cousin of the prairie chicken, must have a deep, soft and persistent layer of snow to survive the winter. They also burrow in the snow, which keeps them warm and protects them from predators. Without these conditions, they are forced to seek shelter in clumps of trees and shrubs. Under these conditions, grouse lose weight and suffer heavy mortality due to predation.

Raptors, like owls, hawks, and falcons, find the animals they prey upon easier to see and catch against a white background.

Ice is nothing more than water in a solid state. Besides having a solid state, water has some other strange properties. It is heaviest at a temperature of 39.2° F and is lightest at its freezing point. This creates several very beneficial aspects for fish in winter. In impoundments over six feet deep, the water on the bottom will seldom be below 39.2° F. When ponds and lakes freeze over, the warmest water will always be on the bottom. That is why ponds and lakes do not freeze from the bottom up.

As cooler temperatures occur, the surface water cools to the same temperature as the bottom, making the water more uniform in temperature and oxygen content. Colder water can also contain more dissolved oxygen than warmer water. Fish can now live throughout the lake, although in winter fish usually concentrate in large, tight bunches under the ice.

The number of fish which die off in winter can equal or exceed the summer numbers. This could create a problem because many of the summer scavengers (turtles and crawdads) are now dormant. But dead organisms do not decay as readily in cold water, so little oxygen is used for the decomposition process. This leaves more for the living organisms.

As with many situations in nature, liabilities can be transformed into an asset. So it is with ice and snow.

Let it Snow, Let It Snow, Let It Snow

I've always liked the song, "Let It Snow" because I prefer my winters to be full of this white, ephemeral stuff. But, I realize not everyone shares my sentiments. What exactly is snow, anyway?

Snow is just one form of precipitation and all forms of precipitation begin with clouds. A cloud is actually a mass of tiny water droplets and ice crystals suspended above the earth by air currents. Warm air laden with water vapor (picked up near the earth's surface) rises and begins to cool the farther up it travels. As this cooling takes place, the water vapor is changed from a gas to a liquid or solid and becomes water droplets or ice crystals.

Cloud temperatures range from 75° F to -40° F. To create snow, temperatures in the cloud must be on the cold side (otherwise, we end up with rain). Ideal temperatures for snowflake formation range between 10° F and -4° F. Water vapor in the clouds is constantly bumping into everything and when it comes into contact with a microscopic particle of dust or ash or soil, it crystallizes around the particle to form a tiny ice crystal. More water vapor continues to bump into this ice crystal and soon it grows into a small, flat, six-sided snowflake. All snowflakes have six sides, however, each snowflake is unique! The shape and size of a snowflake is dependent upon the temperature and amount of moisture in the air. Once a snowflake reaches a certain size, it becomes too heavy and begins to fall. Only when both the air the snowflake travel through and the ground upon which it rests are cold enough, does it stay around as snow. If the air is too warm, it melts on its way down. If the ground is too warm, it melts when it touches the earth.

Sleet and hail are other forms of precipitation sometimes seen in winter. Sleet occurs when air higher in the atmosphere is warmer than the air below it. So, water droplets fall through the warm air as rain but cool quickly as they come into contact with the cold air near the ground. When they strike the cold air, they freeze and become tiny ice beads (usually 1/8" or less).

There are several forms of hail—soft hail, small hail, and true hail. Soft hail is a white, snowlike pellet 1/4" in diameter. It occurs at temperatures above the ground's freezing point and appears before or with snow. Just as its name implies, it is soft and usually falls apart as it bounces on the ground.

Small hail is soft hail with a thin layer of ice around it. Small hail occurs at temperatures above freezing and often falls with rain. Like soft hail, it is easily crushed and leaves no permanent damage.

True hail is the form of precipitation that can leave devestating effects. True hail is actually a hard pellet of ice and can be from 1/4" to 5" in diameter. It is formed in the extremely cold air of a thunderstorm. Hailstones usually start out as frozen raindrops. The frozen raindrops bump into other supercooled water droplets. The supercooled water spreads over the surface of the frozen raindrop and quickly freezes into a layer of ice. This process continues until the hail grows so large the air currents cannot keep it aloft. The stronger the air current, the longer the hail stays up, and so the larger it becomes.

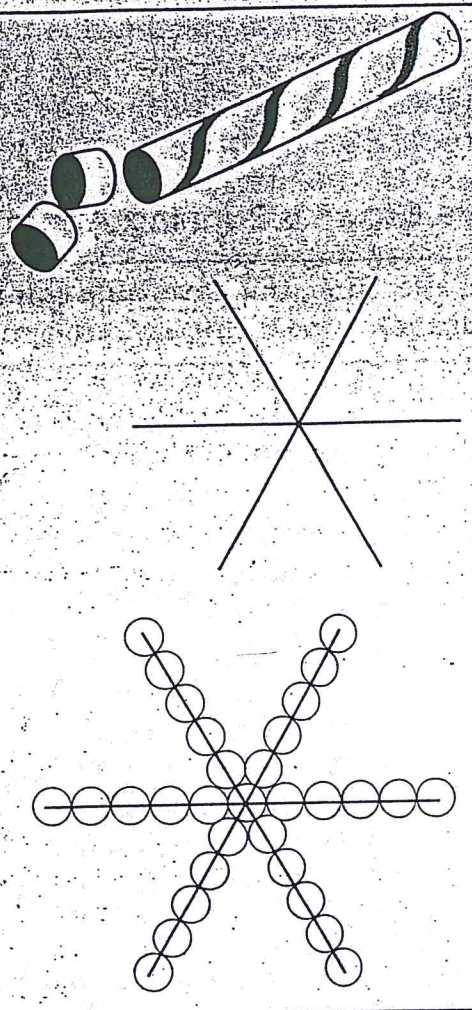
Maybe you don't share my love of snow, but the gift of moisture—in whatever form—is a precious thing on which all life depends!

How about this?

The largest hailstone on record fell in September of 1970 in none other than Coffeyville, Kansas. This monster hailstone weighed 1.67 pounds and measured 17 1/2 inches around. Does that make it "basketball size" hail?

Artificial Snow Flakes

You can make your own snowflakes using a piece of foil, a box of straws, scissors, and glue. Begin by cutting the straws into pieces about 1/4" in length (try to make each piece the same size). Cut up at least eight straws per snowflake. Next, draw three intersecting lines about 5" long on the piece of foil. You should now have six equally spaced points on the foil. Glue the sides of the straws together in whatever design you wish using the six lines on the foils as a guide (remember—no two snowflakes are the same!). The thick, white craft glue labelled "tacky" works best for this activity. Allow the flakes to dry overnight. When ready to hang, you may wish to gently slip a table knife between the flake and the foil, or you may leave the foil attached. Either way, you have winter snowflakes to decorate any way you like.



Idea from the book Young Naturalist, by Ilo Hiller. Published by Texas A&M University Press, 1984.

SSS ... Come Here

Have you ever seen a snake in winter? Chances are slim. Snakes, like other reptiles, hibernate during the cold winter months...but snow snakes are always out!

A snow snake is a decorated stick thrown onto an icy or smooth, snowy surface. The Iroquois people carved a groove in the ice and threw snow snakes competitively. On a good surface (like a frozen lake), it was reported to travel a mile! A snow snake begins as a stick about the size of a broom handle. The stick can be straight and tapered, or curved slightly. A spiral groove is carved around the length of the snake to add to its movement on ice. Throwing snow snakes was a favorite winter pasttime of the Iroquois and some western tribes. Why not give it a try?

The Wild Exchange

The Triple Crown is Running Again

Based on the numerous favorable comments and requests to repeat this unique opportunity to attend Project Learning Tree, Project WILD, and Project Aquatic in one workshop, we will again be offering the Triple Crown Workshop in 1994. For three days (July 18, 19, and 20) the three best environmental workshops available will be held at Fort Hays State University.

Block the time out now on your calendar. I can almost guarantee we will be blessed with better weather than in 1993. Can the 500 year floods reappear so soon??? Watch for more information on registration, fee charges, and times in the Spring issue of ON T.R.A.C.K.S.

Mushrooming Numbers

The total number of Project WILD workshops and their participants is growing like mushrooms across the nation and Kansas. The figures recently received from the national office indicate 24,500 workshops with over 450,000 participants have been given since 1983. In Kansas, over the last 2 1/2 years, 98 workshops serving 1,886 participants have been provided.

A special **"Thanks!!!"** to the many individuals who contributed and participated in the success of the program.

Rare and Endangered Species Cards

Series one of the Rare and Endangered Species card set is now available. These beautiful, full-colored photographs are printed on recycled card stock in a "baseball card" format and are protected with a high-gloss laminated finish. The back of each card contains accurate information on each species.

A portion of the proceeds from the sale of these cards is donated to help fund future Project WILD and WREEC programs. The cost is $2.35 per set (20 cards). Write to:

Collectible Imagery
210 Silver SW
Albuquerque, NM 87102

WILD in Russia

Al Mitchell, a trained WILD facilitator from Wabasso, Florida, recently returned from Russia where he conducted a WILD workshop for 25 educators. This could be the first step in encouraging the Russian Education Department to sponsor Project WILD.

The goal of Project WILD is to assist learners of any age in developing awareness, knowledge, skills, and commitment to result in informed decisions, responsible behavior, and constructive actions concerning wildlife and the environment upon which all life depends.

Environmental Quality Index

The 25th annual Environmental Quality Index found 1992 to be, overall, another difficult year for the environment. In all categories except one—soil, which was ranked in the middle—conditions registered on the worse side of the scale. Forests, air, wildlife, energy, water, and the quality of life are inferior in their degree of excellence compared to 1991.

Name Association

We often use animal names to describe the behavior of individuals. For example, we say someone is as busy as a bee, lazy as a dog, stubborn as a mule, wise as an owl, skittish as a horse, proud as a peacock, grumpy as a bear, slow as a snail, nervous as a cat, dumb as an ox, sly as a fox, sneaky as a snake, crazy as a loon, and noisy as a jay. I wonder how animals would use the names of people in their everyday language?

A Social Issue and Concern: The Environment

The role of education for its participants includes mental development, the passage of traditions and social values, and the means to achieve a better way of life for the individual, our families, and communities.

But will there be an opportunity for future generations to achieve and acquire a better existence for mankind? Are we, as educators, fostering an environmentally-enlightened individual; one who can accept the necessary behavior changes to enhance the safety of our earthly needs? Are we addressing social attitudes that are not environmentally sound and do not enhance the quality of our essential natural resources such as air, water, and soil?

Nurturing an environmental ethic is more than reusing grocery sacks and sorting our trash. Personal and social action on behalf of the Earth requires value systems influenced by sound environmental concepts. Everyone, especially our children, needs to become more knowledgeable of their bio-physical-cultural environment and its associated problems. We need to increase our sensitivity and understanding of how human behavior can affect the ability of our environment to provide the necessary natural resources to maintain and enhance the quality of all life on earth.

The care, development, and wise usage of our natural resources has been entrusted to the people of Kansas; both as individuals and as a society. The manner in which the responsibility of this trust is recognized and accepted will depend largely upon society's ability to develop an enlightened citizenry with sound environmental attitudes. The most important ingredient for success in this endeavor will be the educator's commitment, enthusiasm and willingness to educate and motivate children to a better understanding and appreciation of their natural environment. The Department of Wildlife and Parks supports the need for a comprehensive education program. Together we can nurture a sound environmental attitude which will provide the guidelines for effective and lasting solutions to the problems facing our wildlife and environment.

"It is inconceivable to me that an ethical relation to land can exist without love, respect and admiration for land, and a high regard for its value."

-Aldo Leopold, A Sand County Almanac

Freebies!

Groundwater and Land Use in the Water Cycle is a well illustrated and informative poster for individuals interested in doing a unit on the water cycle. For free single copies, write to:

Bureau of Water Resources Management
Department of Natural Resources
Box 7921
Madison, WI 53707

Two posters, one for elementary and another for middle schools, titled Water: The Resource That Gets Used and Used and Used and Used for Everything are available from the U.S. Geological Survey Books and Open Files Reports Section, P.O. Box 25425, Denver CO 80225-0425.

Earth Notes, a new quarterly newsletter for elementary educators, is full of interesting and fun environmental education ideas and activities. To be placed on the mailing list, contact Lois Haig, U.S. Environmental Protection Agency, 401 M. St., SW (A-107), Washington, D.C., 20460 or call (202) 260-4484.

An excellent activity guide for teachers dealing with wetlands has been created through the Federal Junior Duck Stamp Program. Request a free copy of the guide from the U.S. Fish and Wildlife Service, 1849 C Street NW, Washington, D.C. 20240 or call (202) 208-4545.

Two more resources, The President's Environmental Youth Awards and Environmental Education Materials for Teachers and Young People (Grades K-12) are available from the EPA, Public Information Center, (PM-211B), 401 M Street SW, Washington, D.C. 20460.

MRC Education/Networking Committee, P.O. Box 80729, Lincoln NE 68501 has a Directory of Resources: An Educator's Guide to Solid Waste Management Education available for no charge.

Audubon Adventures, an environmental education program which includes a newspaper, Leader's Guide, and activities for grades 3-6, is available from the National Audubon society, Education Office, Route 4 Box 171, Sharon, CT 06069 or call (203) 364-0520.

The Woodsy Owl Environmental Education Leader's Kits can be obtained by writing the U.S. Department of Agriculture, Forest Service, Woodsy Owl Campaign, P.O. Box 1963, Washington, D.C. 20013.

Free posters entitled, Water Works, Pollution Smarts, and You and Water, with six lessons about water, are available from the U.S. Forest Service, P.O. Box 2750, Asheville, NC 28802 or call (704) 257-4202.

Attention Educators

The U.S. Fish & Wildlife Service and the National Fish and Wildlife Foundation are sponsoring the **Federal Junior Duck Stamp Design Contest**, a part of the Federal Junior Duck Stamp and Conservation Program created to educate young people about wetlands and waterfowl conservation. The contest is open to students K-12. Winning designs from each state contest will be exhibited in various places where interest is expressed, and the First Place winners from each state will be submitted to a national contest. The first, second, and third place winners of the national competition, their parents, and their teachers will receive a free three-day educational field trip to Washington, D.C. To find out more about the contest and the rules of entry, please contact: Junior Duck Stamp Manager, Federal Junior Duck Stamp Program, U.S. Fish and Wildlife Service, 1849 C Street, NW, Suite 2058, Washington, D.C., 20240. Don't delay, entry deadline is **March 15!**

Kansas Fossil Kit Available

This 52-specimen collection includes examples of all the major phyla of the plant and animal kingdoms, and algae from the Protista kingdom. The majority of these are found in Kansas, but the collection does include a few examples of organisms not commonly found in the state. Among the items included in the fossil set are imprints of fossil leaves, a shark tooth, fish vertebra, a small piece of mammoth tusk, petrified wood, algae, and numerous invertebrate animals including a trilobite tail, brachiopods, mollusks, coral, and bryozoans. The collection comes identified and with materials that describe the organisms and the process that causes them to become fossilized. Price $20.00 plus $2.50 shipping. Make checks payable to Science and Mathematics Education Center. Send your order to Science and Mathematics Education Center, Box 4050, Emporia State University, Emporia, KS 66801 From the Kansas Science Teacher.

Wildlife Trade Education Kit

The World Wildlife Fund has put together a kit that demonstrates the effect trade has on wildlife, shows how laws are broken, and offers solutions to the consumer who wants to avoid contributing to this problem. The illegal and excessive trade of wildlife endangers many species —pushing some to the brink of extinction.

This kit includes: an 80-slide show and script entitled "Wildlife Trade: The Poacher, the Law, and the Consumer"; an educator's guide; a fact sheet on live parrots, primates, elephant ivory, rhino products, and other heavily-traded wildlife species; two full- color posters; a brochure; and a bumper sticker. Cost: $45.00 plus $2.00 shipping. Send order to World Wildlife Fund, P.O. Box 4866, Hampden Post Office, Baltimore, MD 21211, 301/338-6951.

Earth Materials Kit Available

The ESU Earth Science Department has assembled sets of earth materials for sale to teachers. There are 36 specimens in each set: 9 minerals, 9 igneous rocks, 10 sedimentary rocks, and 8 metamorphic rocks. Included also are petrified wood and dinosaur bone. Price: $20.00 plus $2.50 shipping. Make checks payable to: Science and Mathematics Education Center. Mail to Science and Mathematics Education Center, Box 4050, Emporia State University, Emporia, KS 66801. From the Kansas Science Teacher.

WOW: The Wonders of Wetlands

At last there is a complete guide to wetlands learning activities for students in grades K-12! This guide contains more than 40 classroom and outdoor lessons—160 pages of exciting activities and project ideas for hours of fun and learning. Cost: $12.00 (1-4 copies), $10.00 (5 to 19 copies) $8.00 (20 or more copies). Orders less than $25 must be prepaid. Mail orders to : WOW!, Environmental Concern Inc., P.O. Box P, St. Michaels, MD 21663.

Nature Educator of the Year Awards

The Roger Tory Peterson Institute of Natural History is accepting entries for its fourth annual Nature Educator of the Year Awards. The awards are designed to recognize people whose work directly promotes the cause of nature education of children. Three awards will be made in 1994: one to a public or private school teacher in any grade K-12, one to a person working through a community-based organization such as a zoo, nature center, or museum, and one to a person whose work affects the nature education of children on a national basis. Each award consists of a $1,000 cash stipend plus an all-expense paid trip to receive the award from the trustees of the Institute. Entry deadline is **March 31, 1994**. For more information, write to: Nature Educator of the Year Awards, Roger Tory Peterson Institute, Jamestown, NY 14701-9620 or call (716) 665-2473.

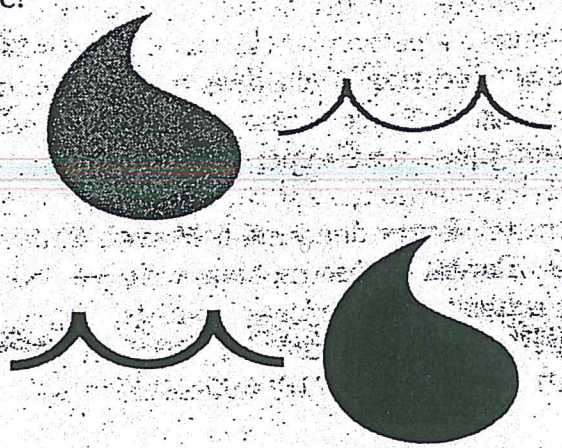
Wildlife Reference Center Changes

Two video tapes will no longer be available from the Wildlife Reference Center in Pratt. The VHS tapes **How Animals Talk** (#VT-249), and **Fresh Water Animals** (#VT-251) have been removed from the inventory. Those of you who have a copy of the Center's ordering catalog should grab a big black marker and cross those items off. Need a catalog? Call 316/672-5911 and ask for Roland Stein, the Wildlife Education Service coordinator.

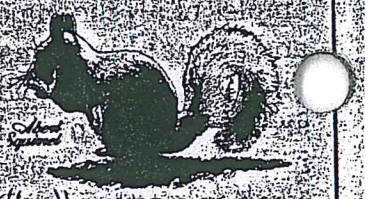
Stream Teams, Kansas Style

What's a Stream Team? Do we get uniforms and travel to exotic locales and compete against other stream teams? The next issue of ***On T.R.A.C.K.S.*** will answer all your questions, but here's a sneek peek provided by the project coordinator, Larry Zuckerman:

"Wake up, Kansans! The Kansas Wildlife Federation's Pure Water for Kansas program is here and rarin' to go. Now is the time to ask yourself—'What role will I play ... will I be a Stream Team coordinator, a trainer, or just a concerned citizen?' Watch for details, schedules, and training bulletins in the next issue!"



Did You Know???



The yellow lens in a gray squirrel's eye allows it better sight in bright light (like the blinding glare off newly fallen snow!)

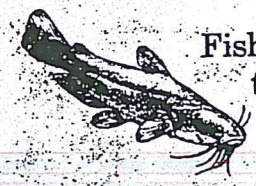
Black bears are the smallest members of the bear family. Females weigh around 200 lbs. and a male can exceed 450 lbs.

The short-eared owl will inhabit Kansas statewide from mid-October to mid-April. They have migrated southward to escape the snowy conditions that conceal mice in the northlands.

A wood stork can snap shut its beak in 1/40 of a second, one of the fastest reflex actions known.

The total number of California condors in the wild stands at seven.

Americans dump 16 tons of sewage into their waters every minute of each day.



Fish species most often contaminated are carp, suckers, and catfish.

Of all the animals that have ever lived on earth, 99 percent are now extinct, many due to natural causes!

What's Happening?

January 22, 1994	Project WILD Workshop. Marion Elementary School. For information call Deb Hiebert at 913/257-3551.
March 5-8, 1994	National Association for Interpretation Region 6 Workshop. Holiday Inn, Lenexa. Join naturalists, historians, educators, and administrators sharing new ideas relating to cultural, historical, and environmental education. For more information, contact Pat Silovsky at 913/238-LEAF.
March 16, 1994	Kansas Wildlife Heritage Month. "Agricultural Lands: Sharing the Bounty." Rotunda of the Capitol, Topeka. For more information, contact Lori Hall 913/826-7335.
April 14 & 15, 1994	Earth Day 1994. Topeka Zoo. "Hands-on" learning experiences will be provided for third through sixth grade students. For information, call Janet Neff, KS Dept. of Health and Environment, 913/ 296-1226.
April 17-23, 1994	National Wildlife Week. Theme: "Let's Clean Up Our Act--Pollution Solutions."
April 21, 1994	Project Learning Tree Workshop. Lake Shawnee. For information, contact Pat Silovsky at 913/238-LEAF.
April 22-24, 1994	Kansas Association of Teachers of Science (KATS) KAMP. Rock Springs Ranch (near Junction City). For information, contact Donna Bogner, 316/662-5584.

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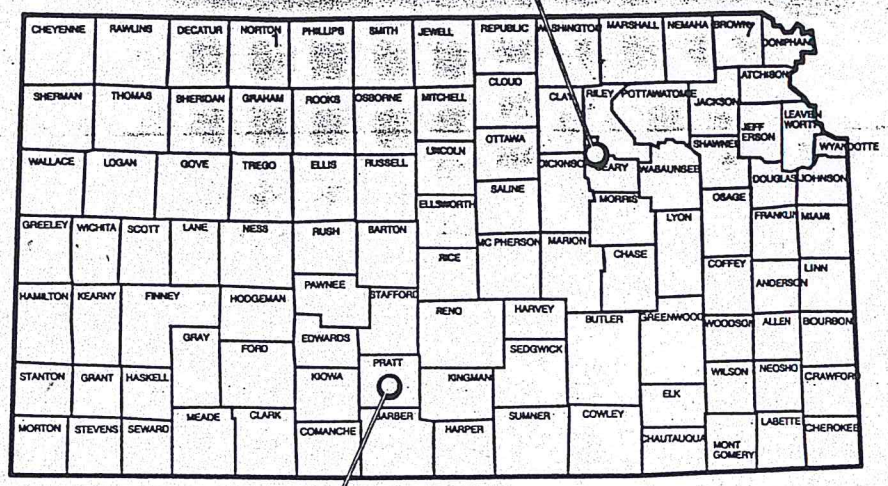

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