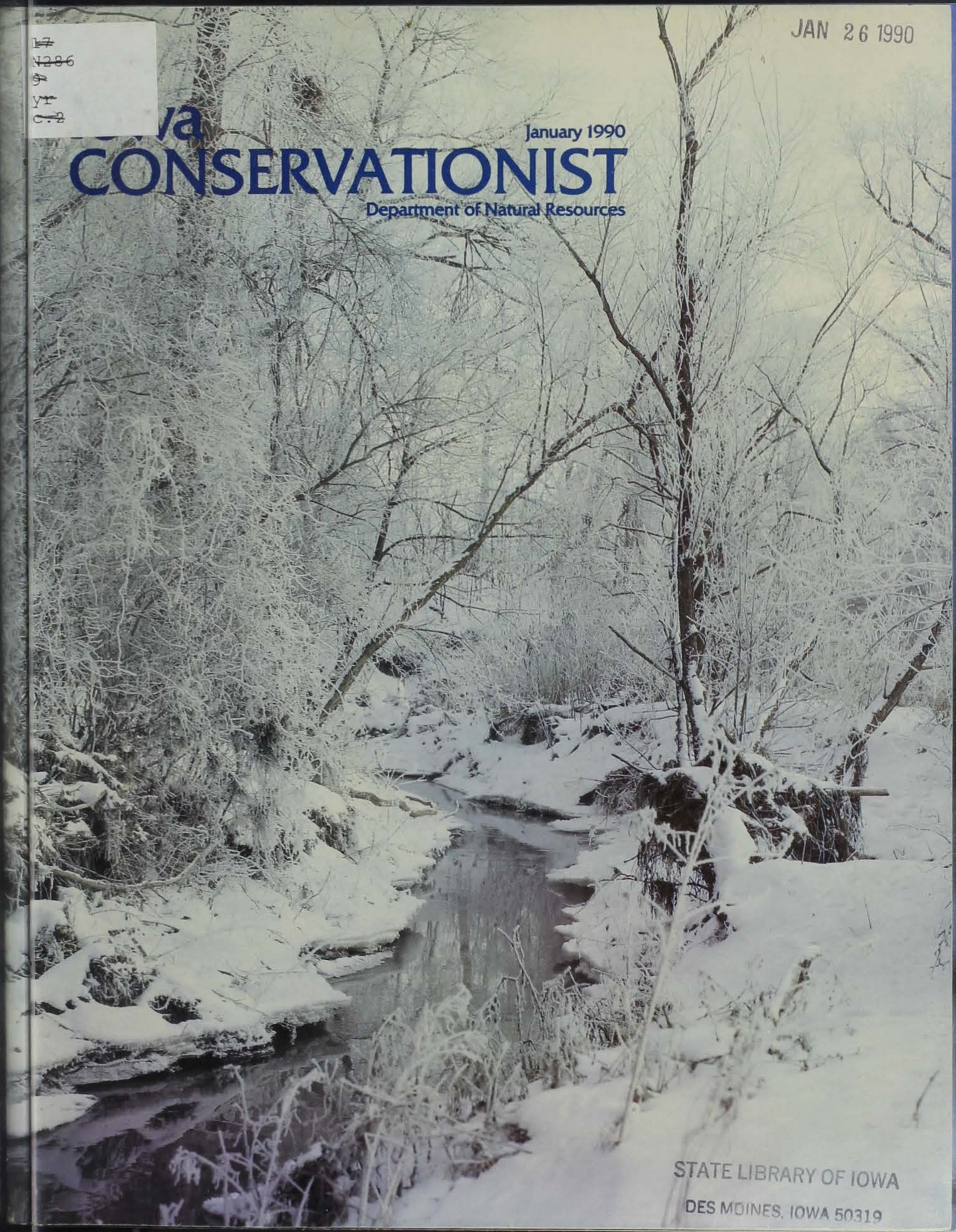
January 1990

Iowa CONSERVATIONIST

Department of Natural Resources



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SPECIAL PHONE NUMBERS

DNR Central Office	1-515/281-5145
Emergency Spill Response	1-515/281-8694
Telecommunications Device for the Deaf	1-515/242-5967
Groundwater Hotline	1-800/532-1114
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COVER: Front -- Winter scenic. Photo by Ron Johnson. Back -- Pheasant tracks. Photo by Bruce Morrison.

The Environment In The 1990s
First In A Series

It's In The Bag

Paper or Plastic Grocery Sack Is One Better Than The Other?

The proof that we have become a throwaway society is evident in the fact that as a nation, we discard more than 160 billion tons of solid waste each year. This was the equivalent of 3.58 pounds per person each day in 1986 (and is expected to reach almost 4 pounds by the year 2000).

Every year we throw away 16 billion diapers, 2 billion razors and blades, and mountains of household hazardous wastes and non-food products such as detergents and cosmetics that may be partially left inside discarded containers. We also discard tons of paper and plastic sacks used to haul these products home from the local supermarket.

What we discard is, more often than not, hauled to local landfills. Experts predict that if we continue with our current disposal habits, landfills in more than one-half of all U.S. cities will be filled to capacity within the next 10 years. How do we help reduce the huge volume of solid waste going to our landfills? What are the environmental and economic impacts of making these reductions?

Beginning this month, we will take a look at the ways we "throwaway" and consider alternatives as we head into the 1990s. First up: the paper versus plastic grocery sack debate.

Marketing experts of both the paper and plastic industries are quick to point out the environmental and economic pluses of their products to environmentallyconscious consumers. But, is one better than the other? Which can be recycled easier? Is degradability a solution, and if so, which degrades faster?

Article by Tammra K. Pavlicek
Photos by Ron Johnson

Each year more than 160 billion tons of solid waste is discarded in the U.S. This figure includes 16 billion diapers, 2 billion razors and blades and mountains of household hazardous wastes and non-food products. We also discard tons of paper and plastic grocery sacks used to haul these products home from the local supermarket.

Paper

The paper industry in the United States began as a recycling industry in 1690 at the Rittenhouse Mill near Philadelphia, Pennsylvania, where paper was made from rags.

For the next 170 years (through 1860), the U.S. paper industry relied exclusively on recycled fiber derived from cotton and linen rags and on waste paper that had been made from these textile fibers. Economic growth led to greater demand for paper and eventually to raw material shortages. To meet this increasing demand, techniques were developed to use wood fiber to make paper.

By 1904, 60 percent of the total fibrous material consumed for papermaking in the U. S. was wood pulp, 8 percent was waste paper and 22 percent was rags and other miscellaneous fibers, making a total of 40 percent from recycled materials. During the 1930s, the use of waste paper began to decline as more mills using wood pulp were built. Waste paper, however, continued to serve as an important supplemental source of fiber.

While rags were phased out as new technologies

developed, some industrial cotton clippings from ginning and textile plants are still being recycled to produce cotton fiber papers.

The familiar brown paper bags used in grocery stores are made from strong "kraft" paper which must meet demanding specifications for strength. Because of these stringent specifications, kraft paper is produced from high-grade fibers, keeping the use of "post-consumer" waste paper in manufacturing the kraft papers to a minimum. "Post-consumer" products are items which have been used by consumers.

While little post-consumer material is currently being used in the production of these bags, once produced and used, they can then be recycled into various other paper products. However, the recyclability of paper, including sacks, can be a complicated procedure.

Paper recycling is receiving a lot of attention, in part due to the fact that the amount of waste paper collected has increased from 12.5 million tons in 1970 to more than 22 million tons in 1986. However, all discarded waste paper cannot be recycled. In some cases separation and collection are not economical. Paper that comes in contact with food waste becomes contaminated with odor and bacteria and does not lend itself to recycling. The major contributors of waste paper, such as old newspapers and old corrugated containers, can be recycled again and again. However, there is some loss of fiber each time they are recycled. Some waste paper is used to make products that are not recyclable because they are combined with other materials, such as plastic coatings and aluminum foil laminations and tissue, which are frequently disposed of in sewer systems.

What is the degradability of paper in a landfill? While paper manufacturers are quick to point out that paper degrades relatively quickly, just how quickly is questionable. Landfill excavations in Arizona showed that newspapers, for example, which constitute up to 10 percent of landfill volume, can still be read easily after 10 years of landfill burial.

Plastic

The 1940s were the "Golden Age" for plastics as World War II spawned dozens of new uses — from nylon parachutes to acrylic bomber nose cones. It wasn't long before numerous types of plastic appeared in various forms at the supermarket. Low-density polyethylene (LDPE), which is used for supermarket grocery bags, was first introduced to American consumers during the war. By the 1960s it replaced cellophane as the favorite food wrap, and today, more LDPE is used in packaging than any other plastic. Besides its use in grocery sacks, LDPE is also used for supermarket produce bags and bread bags.

Plastic grocery sacks are produced using petroleum and natural gas, non-renewable resources. Many of the chemicals used in the production and processing of plastics are highly toxic. Benzene, for example, an established human carcinogen implicated in leukemia cases, is used as a solvent in the production of LDPE.

However, of all the plastics, polyethylene has the least environmental impact. It is competitive with paper for many uses. Most thin plastics, including bags and baggies, are made of polyethylene or similar compounds. Most cheap-looking, translucent plastics, such

Plastic grocery bags (shown here with "kraft" paper bags) are made from low-density polyethylene (LDPE). LDPE was first introduced to Americans during World War II and today is used in more packaging than any other plastic. According to environmental experts, of all plastics, polyethylene is the least damaging to the environment. However, whether or not these plastic bags are less damaging than paper ones is a highly debated topic.

as beverage cups, are also made of polyethylene.

Because evidence continues to emerge proving the landfill is not conducive to the degradation of any material, the plastic grocery sack can be promoted as a means of waste reduction as it is one-sixth the size and weight of paper. Currently, paper accounts for 37 percent of landfill waste by weight, as compared to 7 percent for plastics. However, plastics may account for as much as 30 percent of landfill waste by volume. One plus for the plastic bag -- they cost the grocer less than the paper sack.

What about degradable plastic?

Experts agree that all plastics, in their own right, are degradable. The question now is — "How much degradation occurs and what phase of degradation is desired?" While both photodegradation (exposure to the sun) and biodegradation (exposure to chemicals) may assist, to some degree, with the litter problem, it is not the answer in a landfill. Nevertheless, consumer pressure is mounting towards degradable packaging. Numerous supermarket chains, as well as various department and specialty stores, have begun using degradable bags.

The addition of cornstarch into polyethylene bags allows them to degrade relatively quickly — some experts estimate these bags will degrade within six months to two years, as compared to 300 years for non-degradable bags. However, this concept is new, and researchers suggest additional studies be conducted before the widespread use of cornstarch-derived bags is allowed. Questions remain as to the validity of how quickly these bags will break down and, to what degree. Also, adding cornstarch to the bags has caused them to weaken, leaving room for product improvement.

One thing is certain — research indicating these bags are a viable option means an economic boon for Iowa's corn industry.

Because old plastic is difficult to recycle — it must be sorted according to type, or resin — virgin resins must be used to make new bags. In the dozen or so years since the last energy crisis, consumers seem to have forgotten that petroleum and natural gas, the raw materials of plastics, are limited resources that will run out some day. So one question remains — "Is it feasible to use non-renewable resources for products destined to be trashed by consumers in a matter of minutes?"

Paper or Plastic?

In conclusion, is one bag better than the other? Currently, environmental experts with the Iowa Department of Natural Resources agree that there are no right or wrong answers for choosing a paper or plastic bag. That decision must be made by each consumer, taking into consideration the various environmental and economical aspects of each. However, is there another option for choosing a paper or plastic bag? Consider the alternatives listed on the following page.

Next month:
Food and product packaging -- too much of a good thing?

Which bag do most Iowans choose? According to a poll conducted last summer by the Des Moines Register, paper bags are selected more often (56 percent) than plastic ones (33 percent). Consumers cited concern for the environment as one of the main reasons for choosing the paper bag instead of the plastic bag.

Alternatives
To Paper and Plastic Bags

◆ Instead of using either paper or plastic bags, consider using your own tote. Various fishnet or canvas bags work well, and, like the plastic bags, have convenient handles for carrying.

◆ Consider using a metal pull cart. These can be purchased for about $25-60 and will last indefinitely.

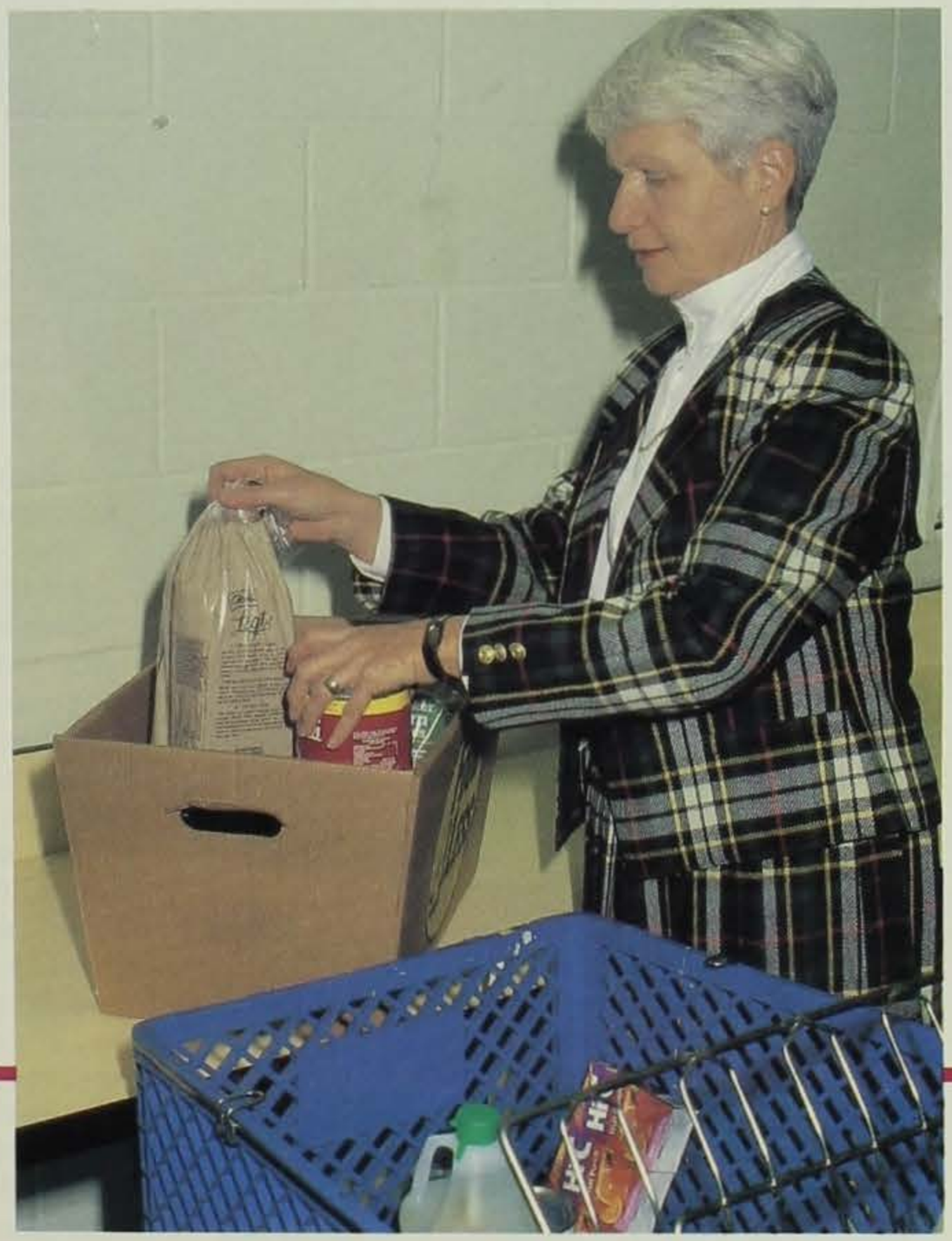
◆ Various supermarket chains have large cardboards boxes available for purchase. These boxes, which sell for about 60 cents each, can be used again and again for transporting groceries from store to home. They are also handy for various uses at home such as storing and moving items.

◆ If you choose paper or plastic bags, reuse them the next time you go to the supermarket. Or, give the bags to local Goodwill or D.A.V. stores or to churches for bizarres.

◆ Use paper bags for wrapping packages that are to be mailed.

◆ Collect bags and give them to your local recycling outlet.

Do you have unique uses for your paper and plastic bags? We would like to hear from you. Write: Iowa Conservationist, *Wallace State Office Building, Des Moines, Iowa 50319-0034.*



The use of cardboard carriers is just one method of transporting groceries from the local supermarket to home. These boxes have convenient carrying handles and can be used for other household tasks as well. These boxes can be purchased from various supermarkets for about 60 cents each.

Size Limits

They Take Cooperation

Article by Kay R. Hill
Photo by Ron Johnson

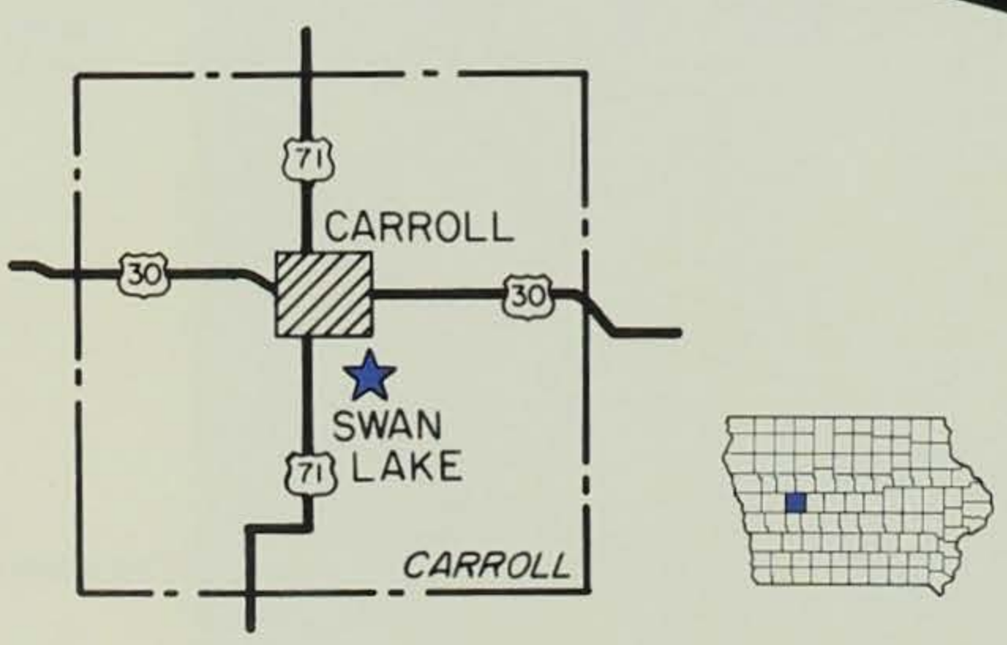
Fish size limits have been used as a fish management tool for at least 20 years and are used mostly on predator species. Angler acceptance of size limits ranges from poor to good, because some anglers do not understand the objectives of size limits, while others think this tool is a placebo for poor fishing.

There are several types of length or size limits used. The most common is a minimum length limit where all fish caught, smaller than the length established, must be returned to the water and only those fish larger than the size limit can be kept.

Another type of size limit is the slot length limit. This size limit uses a protected size range, such as 12 to 15 inches, where all fish smaller than 12 inches and all fish larger than 15 inches may be kept, but those in between must be returned to the water. The third type, just the opposite of the slot length limit, is a window length limit where all fish in the desired ranged, such as 11 to 14 inches, may be kept but all others released.

The main objective of a bass minimum length limit is to control harvest of the stock-sized bass so sufficient bass are left to provide enough predation on bluegill, or forage fish, to prevent stunting of the bluegill population. The size limit would also theoretically insure sufficient numbers of stock-sized bass for adequate reproduction, because most bass rarely reproduce until their third or fourth year of life, which corresponds to about 12-15 inches in length.

Bass size limits are needed in heavily fished Iowa lakes because bass recruitment into the stock size is not sufficient to keep up with angler harvest. For example, in 1953 anglers caught 90 percent of the bass out of Rock Creek Lake, in



Jasper County, during a three-day weekend.

Size limits on largemouth bass have been used in Iowa since 1971 when a 14-inch minimum length limit was initiated at Big Creek in Polk County. Vaughn Paragamian, a fisheries research biologist with the Iowa Department of Natural Resources, evaluated the effect of the size limit from 1971 to 1976 and found the stocked bass were protected for about three years but beyond that point little effect was found on the bass population. He also determined angler compliance with the size ranged from 62 percent to 71 percent.

Minimum length limits in Iowa have not achieved the desired results because most anglers fail to comply with the size limits. A research project was initiated in 1987 on Swan Lake in Carroll County to find out if a 16-inch minimum length limit on bass could result in a high catch rate of bass and panfish after two years of fishing. Swan Lake was recently dredged and restocked with bass, bluegill, channel catfish and crappie. An intensive public education program in addition to a creel clerk were deemed necessary to insure high compliance with the size limit. The creel clerk numbered and measured each fish caught, collected fishing trip data, and reported people with sublegal bass to a park ranger who would issue a citation.

Creel data showed Swan Lake anglers demonstrated outstanding compliance with the size limit. Angler compliance was 99 percent in 1987, and 98 percent in both 1988 and 1989. Although fishing pressure has remained high at Swan Lake, the catch rate of bass has remained about six times higher than the average catch rate of bass on other lakes which have had creel surveys. Angling pressure was 295 angler hours per acre in 1987, 314 in 1988 and 340 in 1989. To put this into perspective, Swan Lake received about three times the fishing pressure per acre as Big Creek Lake. From June through August 1989, anglers bought 4,800 dozen night crawlers at the Swan Lake concession. If these crawlers

Smallmouth Bass Protection

It Pays Off

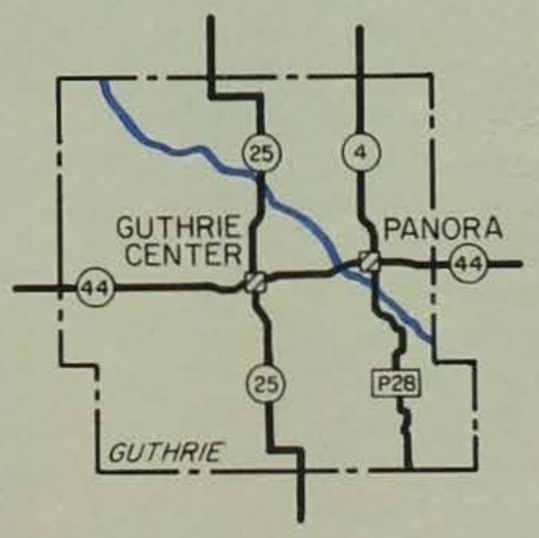
Article by Tom Putnam
Photos by Ron Johnson

As the blade of my paddle butted up against a large, glacially worn boulder, I knew the canoe was about to enter yet another stretch of prime smallmouth bass-holding habitat. Quietly, setting the paddle aside, I retrieved my rod from the canoe floor and made my first cast. The crawdad-shaped crankbait plunged below the water, and the surface immediately exploded as a three-pound smallmouth inhaled the lure. I quickly set the hook. Not long ago, a chance to fight a bass of this quality was a rare occurrence indeed. Things had changed for the better on the Old Middle 'Coon.

The Middle Raccoon River in Guthrie County, below Panora, has traditionally been one of the better smallmouth bass streams in Iowa. This tradition, although short in years, began in the late 1960s with the construction of the Lake Panorama Dam. Since that time the water quality has improved considerably below Panora. The exposed boulder outcroppings, riffles, cobble bars and the deeper-water holes associated with them, have encouraged a proliferation of smallmouth bass.

With this expanding smallmouth population, however, came an increase in fishing pressure, especially in the stretch of stream located nearest to town. Hooking a big fish became a much less common occurrence. Even the numbers of smaller fish caught and released declined noticeably. Angler overharvest had hurt the population.

To combat this declining trend in population numbers and quality, a catch-and-release regulation was enacted on the most impacted portion of the Middle Raccoon River in 1985. This one-and-three-quarter-mile stretch extended from the Lennon Mills Dam at Panora to the bridge on Highway P-28 south of



town. The regulation made it mandatory to release unharmed to the water all black bass, regardless of size.

A five-year project was initiated that same year to determine the impact of this regulation on the smallmouth bass in that stretch. Annual fish surveys were taken in the target area, and the data was compared to that collected in an unregulated area downstream. The results were not surprising.

During the first three years of the project, comparisons between the two zones showed little change. The formerly overfished zone, now under a catch-and-release restriction, responded slowly during this period. In fact, over this period, the now restricted area, Zone 1, still produced only half the number of quality-sized fish (12 inches or larger) than the unrestricted Zone 2.

However, after three years, conditions changed drastically in the adult fish population. In 1988, the observed ratio of keeper-sized bass was 2.5 to 1, indicating 2.5 times more quality smallmouth in the protected zone compared to the unregulated zone. An even more dramatic change was seen in 1989 when the survey revealed four times more quality-sized bass in Zone 1 compared to Zone 2.

Two important conclusions can be drawn from this study coupled with other field observations. The first is that protection had a markedly positive influence on the numbers of large-sized smallmouth in the protected zone. Without catch-and-release, this easily accessible stretch would have continued to produce only mediocre angling.

A second conclusion is that the decline in numbers in bass in Zone 2 was brought about by a lack of protection in that area and a corresponding increase in fishing pressure. Many who fish smallmouth bass in the Middle Raccoon River are catch-and-release addicts, preferring to let even a nice fish live to be caught another day. Other anglers prefer to "take something home." The reduction in the bass population in Zone 2 caused by the latter was evidence that protection does have a place in a fragile fishery resource such as this.

Due to the positive results of this study, further changes in the regulation below Panora are anticipated. The catch-and-release zone will remain the same for the 1990 fishing season, extending from the Lennon Mills Dam at Panora to the P-28 bridge south of town. It will be recommended that in 1991 the catch-and-release area be extended to the Redfield Dam. This will lengthen the protected zone to about 15 stream miles. Also recommended will be an exception that one trophy-sized fish may be retained by the angler in the creel.

The smallmouth bass fishery on the Middle Raccoon is a unique resource in central Iowa, one that is deserving of our protection. Now we have the opportunity to enjoy smallmouth fishing at its best and still protect the resource for future trips and future anglers. We know that the smallmouth bass catch-and-release regulation is working and the smallmouth fishery deserves this consideration from us.

Tom Putnam is a fisheries management biololgist for the department's fisheries section in Boone.

were used at Swan Lake, which undoubtedly they were, anglers contributed 57,600 night crawlers to the food chain in Swan Lake.

There were 11,270 bass large enough to be caught in Swan Lake during 1987 and anglers caught 8,141, but kept only 102. In 1988 the bass population was an estimated 12,700 and anglers caught 10,817 bass, but kept only 330, while in 1989, anglers caught 1.6 times the total bass population. This data shows how few bass would be left if the anglers did not understand and comply with the bass size limit.

Size limits are not needed in every lake, but on heavily fished lakes like Swan, a good bass fishery could not exist without the size limit. Bluegill anglers are catching fish at a rate of 1.3 fish per hour and channel catfish anglers are fishing about 10 hours for every catfish caught. These catch rates are much better than in other lakes with creel survey data. Without the excellent size limit compliance, Swan Lake anglers would have a lot longer time between bites and not nearly as much fishing pleasure.

Kay R.Hill is a fisheries research biologist for the department's fisheries section in Lewis.

Creel clerk at Swan Lake checks angler for size limit compliance.

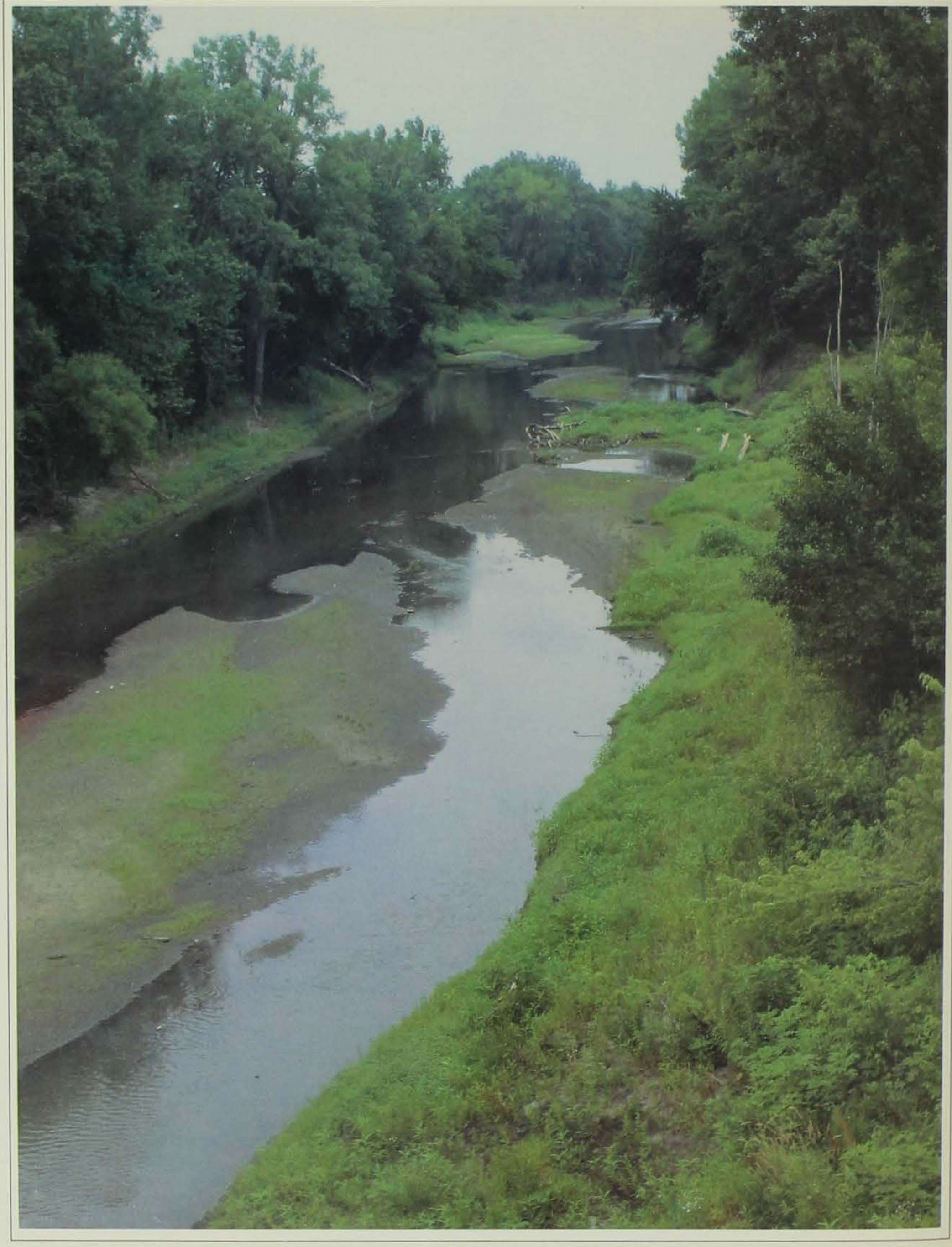
Drought Prevention?

Maybe not. But recent droughts have emphasized the importance of state and local programs to conserve water supplies and prevent the effects of drought.

The Department of Natural Resources is the agency of the state, charged with the responsibility and vested with the powers to study, control and regulate the use of water. It has been state law for more than 30 years that all water existing within the state is public wealth. Actually that law was passed in 1957 as a result of the 1956 drought. The intent was to give the state the tools to regulate water use to ensure that the water resources of the state are allocated to the most beneficial use; waste of the resources is avoided; degradation of its quality is prevented; the scarcity, if and when one exists, is shared; resource availability is studied and when appropriate, new water sources are developed; and water resources data relevant to the state of Iowa is gathered and shared.

The Legislature decided, because water is such a critical natural resource, it is proper for its control to be under a public agency. Briefly, water rights allocation, the protected flow program, the water conservation program and the priority allocation program are the tools the DNR uses to manage water resources.

Article by Victor I. Okereke
Photos by Ron Johnson



Water Rights Allocation: By law, a permit is required before anyone can withdraw more than 25,000 gallons of water a day from any source or combination of sources in Iowa. Any amount below that limit can be withdrawn by anyone without a permit, provided they have legal access. That condition, pretty much excludes most homesteads, individual farmers (except irrigators) and many small towns from the water use permit requirement. Small towns and even some businesses that qualify as public water supply systems may be required to obtain other permits from the state. Consequently, a significant portion of the water used in Iowa is not governed by a permit. This discussion will focus only on those users that must obtain permits.

Last year, the state allocated about 2.5 trillion gallons of water for all uses. Allocations of 2.2 trillion gallons (88 percent) went to industrial users, 190 billion gallons (7.4 percent) went to public water suppliers, 100 billion gallons (4.2 percent) were for irrigation and 10 billion gallons (0.4 percent) were for recreation purposes. However, the significance of the allocation depends on whether the use consumes the water or returns it to a water source. For example, electric power plants use the major share of the water allocated by the state but almost all of it is non-consumptive or is available for re-use by downstream users. Other types of uses like irrigation are 100 percent consumptive since the water evaporates, is used in plant growth or percolates into the ground and so is not available for "immediate" reuse. Of the total amount of water allocated last year, about 80 percent was derived from surface water sources (rivers, creeks, farm ponds and lakes) while 20 percent was derived from groundwater.

Protected Flow Program: This program allows the state to set minimum flow rates in Iowa streams and rivers. When the stream flow falls below that minimum, state law requires a ban of all consumptive withdrawals in excess of 25,000 gallons per day, from the affected stream, lake and other source. Non-consumptive withdrawals are still allowed, even when a stream is under protected flow.

Why this program? The protected flow program is designed to protect water for human and livestock consumption, water for waste dilution and groundwater recharge, and the overall protection of the environment and wildlife. In a way, it is designed to allocate water to the most beneficial uses during times of scarcity. The program does not hurt business. In fact it does the opposite, since it helps them prepare in advance for the onset of a drought. That is particularly important since droughts occur quite often in Iowa. The state has been in a drought during five of the last 14 years. Hence, the knowledge that its water source may be affected in the event of a drought encourages the regulated community to seek alternative sources.

Last year, the state allocated 100 billion gallons of water for irrigation purposes.

Water Conservation: Most people think of water conservation only in times of water shortage and only in terms of reduced usage. Water conservation is most effective when it is practiced regularly with or without any water shortages. And it should not involve any reduction in the standard of living. It is also most effective when it is devised and implemented locally. Water conservation plans and the enabling ordinance should be in place long before they are needed.

In fact, existing state law requires all regulated users of water to develop and file with the DNR for approval, day-to-day water conservation plans. Unfortunately, many in the regulated community do not take water conservation seriously until serious supply shortages are imminent. The old adage that "a penny saved is a penny earned" applies

South River, 1989 (left)

Agricultural losses from drought can be devastating. Often overlooked, however, are the losses to wildlife, which are equally as devastating -- particullarly to those whose breeding activities take place around water.

equally to water use. It is definitely cheaper to improve the water supply picture by conservation than through the development of new sources. When the costs of new or larger treatment plants to handle the increased volume along with the attendant wastewater problems are factored into the equation, the value of water conservation looks even better. On a per capita basis, the Europeans use much less water than we do in the United States. Yet their standard of living is not any less than ours.

Priority Allocation Program: This program is designed to re-allocate the available water resources in a region where extreme water availability problems exist. The program is based on a legislative, predetermined, nine-item priority classification in which water used for human consumption has the highest priority. Water conveyed out of Iowa for use in other states has the least priority. The program has a number of triggering mechanisms including a water-related state of emergency declaration by the governor, a finding by the DNR or federal agency that a water emergency has occurred or is imminent, and a petition by 25 people in the affected area. Once one of these trigger mechanisms has occurred, the DNR must review the situation to determine if the priority allocation program is warranted.

Before the DNR can implement the priority allocation program in any part of the state, all water users in the area must first implement their approved emergency water conservation plans. And those plans must be shown to have been inadequate to deal with the water emergency. So, priority allocation is wisely tied to the water conservation program.

The 1988 and 1989 droughts are now history, and whether a drought will continue into 1990 and thereafter is unknown. The experience of the drought and its effects may linger for a long time. Who can forget the almost daily news bulletins of dried-up wells, of communities that "suddenly" ran out of water? Who can forget all those national guard trucks that were hauling water to thirsty cities in southern Iowa? Or the dramatic delivery of Des Moines water to Lamoni, some 80 miles away. Remember the cities Elk Horn, Diagonal, Lenox, Deep River, Delta, Grand River, to name just a few.

Droughts are bad but we can gain valuable experience from them. What we learned from the recent drought is that most water systems can, and should, be protected from the effects of drought long before they come along. Besides, it is often cheaper to do than the alternative. The cost to provide emergency supplies can, in some cases, be higher than what would be needed to provide a "permanent" solution. What that permanent solution may be would depend on the particulars of the case. The solutions would vary from drilling new wells through construction of new surface water reservoirs, to hooking up to rural water.

Is the loss of water really sudden? Not at all. It is known that severe droughts tend to develop over a long period. An area may be experiencing reduced precipitation, yet it would be several weeks or months before stream flow levels are seriously affected. In the case of wells, the effects of a drought may not be felt for a year or longer. There are many state and local mechanisms for dealing with a drought. Each community must devise its own drought-response program, based on local circumstances. The time to do that is now.

Victor I. Okereke is an environmental engineer for the department's surface and groundwater protection bureau in Des Moines.

Water Allocation In Iowa By Year and Type Of Use*

Year	PWS *(bgy)*	IRR *(bgy)*	IND *(bgy)*
1960	20.1	24.4	5.0
1965	50.0	26.1	25.2
1970	75.3	32.6	51.2
1975	100.2	42.4	69.0
1980	130.4	101.0	70.2
1985	134.4	102.0	616.0
1988	186.1	102.6	2117.8
1989**	187.9	104.7	2220.2

*Excluding Recreation Use

**As of the End of August 1989

PWS = Public Water Supply
IRR = Irrigation
IND = Industrial
bgy = Billion Gallons/Year

Note: Large increases in allocation after 1985 were due to changes in the law that required the regulation of the previously non-regulated users, such as power plants and other users along the Missouri and Mississippi rivers and many of the smaller public water suppliers. It does not reflect a dramatic increase in water use in Iowa.

A WINTER FIELD TRIP

Article by
Don Sievers

Photos by
Tanya Smith

I remember leaning against the warm radiator while looking out the window of Mrs. Robinson's classroom, staring at the fox squirrel sunning itself on the limb of a giant elm across the street from our school. The squirrel did not seem to be doing anything, just sitting. I wondered why it always chose that one branch to sit on, and why it had its tail curved up over its head. It looked as if the squirrel was using its tail for a blanket.

The ground was covered with snow and the tracks of what looked like a thousand kids who had left the school buses and explored every inch of the playground. The first graders had left a wagon wheel design where they had played fox and goose.

Although my body was captured in the classroom, my mind was exploring the outdoors. "Wouldn't it be great if we could have class outside in winter?" I thought.

Now, we do! Thousands of school kids and their teachers are rediscovering the outdoors in winter and its importance as a classroom. One of these outdoor classrooms is nestled in the oak-hickory woods and prairie remnants of Springbrook State Park. Throughout the year teachers bring their students to the Conservation Education Center for environmental education programs. The facilities include dormitory space for 104 overnight guests, indoor classrooms and 800 acres of state park to explore. A private concessionaire provides meal service for our hungry visitors. With bedding and meal services furnished, teachers find they have more time to spend studying with their classes. Staff are available to assist in planning schedules and presenting educational programs.

One teacher who has rediscovered the outdoors in winter is Joe Toot from Nevada Middle School in Milford. Joe finds the facilities are more available in winter. "Most field trips are either in the spring or fall. I like to give the kids an opportunity to experience a different time of year. If you live in Iowa, experiencing winter is definitely a part of your life." Let's follow along on his sixth-grade field trip to the education center.

Following an hour and a half bus ride it is off to the dorm to stow the gear, make beds and tour the site that will be "home" for the

"I've got one!" someone yells from the other half of the group. "It's my first time fishing. I want to take it home to show my grandpa!"

next two days. First on the agenda is an observation hike to look for animals and animal signs. Students learn how to increase their observation skills by exploring the different habitats along the trails. It is a time to become aware of the natural world and to appreciate the things we see. Next, it is indoors for an introduction to ice fishing by one of the staff.

After the introduction it is off to the lake to study water quality and try ice fishing. Winter is nice because it provides a 12-inch thick boardwalk across the water. "Hurry, drill a hole in the ice and let's measure the dissolved oxygen, temperature and Ph of the water," comments a student. "That's funny, why is it warmer at the bottom of the lake?"

"I've got one!" someone yells from the other half of the group. "It's my first time fishing. I want to take it home to show my grandpa." That is another nice thing about winter, you do not have to worry about keeping your fish fresh -- nature has provided a refrigerator. Aquatic ecosystems are fun to study in winter. The students are busy taking notes of their water testing results. Later they will have to describe the meaning of their results as well as the causes and effects of too little dissolved oxygen.

Back into the classroom to warm up and study the habits of Iowa's furbearers. Have you ever noticed that semi-aquatic furbearers have dark-colored fur, while those living in land habitats have fur with a variety of colors? Can you think of an advantage for animals to be colored this way?

Time to write in log books, go on a hike to see deer or watch a winter sunset. Daylight does not last long, and we want to catch as much of it as we can.

After dinner its back to the classroom to see a video about snakes. Tomorrow everyone gets a chance to hold the live ones. Astronomy and tracking animals in the dark are also on the evening agenda, followed by hot chocolate and popcorn before lights out.

"Hurry and shower, pack your bags and load them on the bus before breakfast," shouts Mr. Toot. "Is it time to get up already?" moans a late sleeper from the corner bunk.

After breakfast everyone works on their log books and the state bird search activity. A collection of prints representing the

Building survival shelters is a great cooperative learning activity. It gives students . . . a chance to . . . learn about the basic requirements for all life -- food, water and shelter.

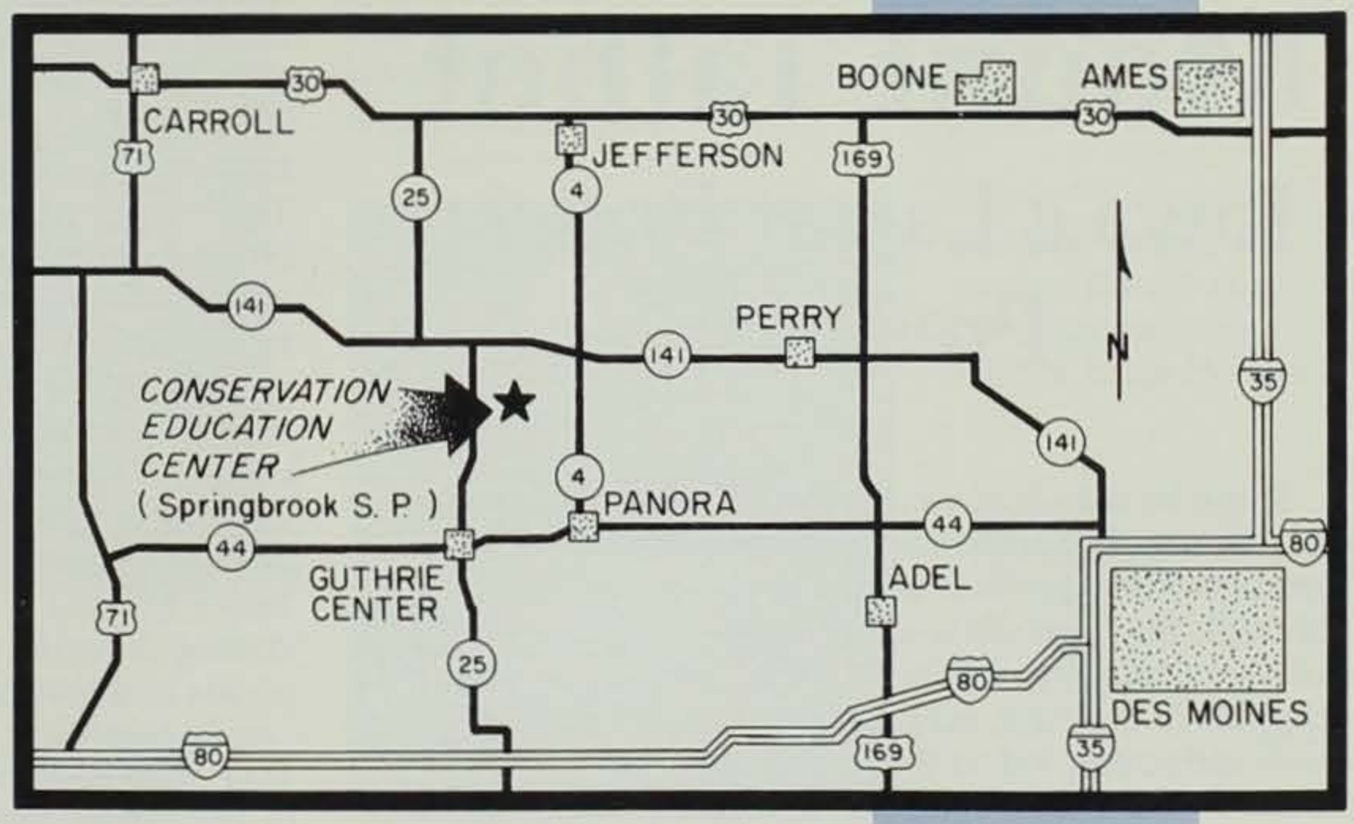
state birds from all 50 states line the walls of the dining hall.

Next it is off to cross-country ski and to learn about winter survival. Cross-country skiing is a great way to enjoy nature. However, having six-foot long feet for the first time in your life is a challenging experience. The most awkward part can be learning to stand up. And yes, everyone falls down -- that is part of learning how to ski.

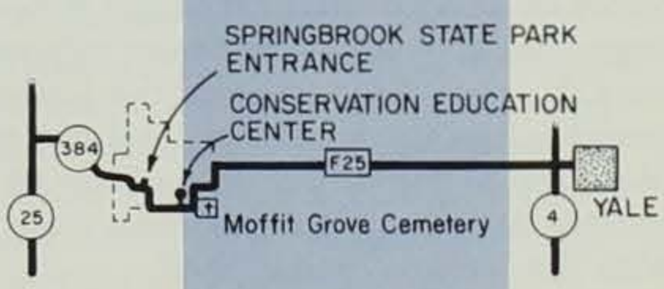
Building survival shelters is a great cooperative learning activity. It gives students who might not normally work together, a chance to cooperate in accomplishing a task and helps them learn about the basic requirements for all life -- food, water and shelter.

After lunch is an opportunity to hold a live snake. They are really smooth and dry. You can feel their muscles move when they crawl on your arm. If you handle the snake correctly, you will receive an "Honorary Herpetologist's Certificate." The kids usually do not hesitate to handle a snake, but it is sometimes hard to convince a mom or dad to hold them. They usually settle for a quick touch and it is passed on to the next future herpetologist.

It does not seem possible that we could have gone through two days, but we have. Back at school the kids will share their experiences with other classes and excite brothers, sisters and friends about what they can expect on their field trip to the education center.



Most groups plan one night overnight and arrange their arrival and departure times around the availability of buses. If you would like to plan a field trip for your class, call the education center at (515)747-8383 to check available dates. The education staff will assist you in planning environmental activities for your students.



Don Sievers is an educator at the Springbrook Conservation Education Center.

Iowa's newest state preserve was created on September 14, 1989, when Governor Terry Branstad dedicated 90 acres of mixed prairie and oak woodland in the northern part of Stone State Park as the "Mount Talbot State Preserve." Closely associated with the new preserve's rich natural history of prairie, savanna, and rare species of plants and animals is an equally interesting human history. Official dedication of the preserve insures its future as an unimpaired natural area, but an understanding of its past also contributes to its value. This value was greatly enhanced when Sioux City historian Neil F. Guernsey wrote "The History of Stone State Park and Vicinity" in 1936 for the National Park Service, which was then assisting the state of Iowa with the development of Stone Park. Much of the following story is based upon Guernsey's original report.

Mount Talbot

Iowa's Latest Prairie Preserve

It can be said the story began in 1803 when that enormous and controversial land acquisition called the Louisiana Purchase was added to the United States. Although the immediate effect of this purchase on the ecology of this vast wilderness was minimal, it initiated a chapter of ecologic, economic and social change which ultimately led to the opportunity to establish the Mount Talbot State Preserve. In 1930, a large part of what was to be western Iowa was ceded to the United States by several tribes of native American Indians. An important ecologic effect of the removal of Indian influence dramatically decreased the number of fires which swept across the landscape, maintaining the dominance of prairie and savanna. The effects of fires, set by Indians for a variety of benefits, were removed along with the Indian lifestyle itself.

In 1846, Iowa became a state. This sped the settlement of western Iowa and, by 1849, the first homesteaders had established claims in the area around Sioux City. Sioux City was founded scarcely a decade after statehood and soon began to export the products of the agricultural community around it. Wildfires and roving herds of buffalo were incompatible with the new agricultural economy and were eliminated during this era. In fact, one of the last wild buffalo in Iowa was reportedly killed in the vicinity of Stone State Park in 1868, just a little more than 20 years after statehood. Without the influence of wildfire and grazing, the natural landscape around Sioux City began changing from prairie and savanna to dense, scrubby woods.

In 1885, a Sioux City businessman named Daniel Talbot acquired much of the hilly land northwest of Sioux City by purchasing numerous unused land awards called "scrips" from Civil War veterans. A high grassy ridge of the new Talbot farm, assembled from these small holdings, eventually became known as "Mount Talbot." Fortunately, Mr. Talbot was a naturalist with a special interest in birds and consequently appreciated the need for protection of natural habitat. However, Mr. Talbot also introduced livestock which grazed the woodlands and prairies on his farm. In one respect, grazing by domestic livestock may have resembled the ecological effects of buffalo grazing by retarding the growth of woody plants, but heavy grazing may also have damaged native prairie plants and favored exotic weeds. A special breed of "mule-foot" hog which Talbot developed and released may have been instrumental in destroying populations of the native prairie rattlesnake, *Crotalus viridis*, a species now officially listed as endangered in Iowa.

In 1912, Sioux City acquired the Talbot farm from the family of Thomas Jefferson Stone, who had acquired the land when Talbot lost his estate to bankruptcy. Thus, "Stone Park" came into existence and has remained in public ownership for more than 75 years. During the city's ownership, the park provided recreation for the residents of Sioux City, who appreciated the deep shade cast by mature forests which had developed during decades of fire protection.

In 1935, Stone Park was acquired by the state of Iowa and developed by the Civilian Conservation Corps. Many of the roads, trails and buildings in the park today were constructed during this time. Protection from fire and grazing was enforced in an effort to conserve the forest resources of the new park. A concern for conservation of the original prairies and savannas, which required some measure of burning or grazing, had not yet developed in the American conservation movement.

by John Pearson and John Fleckenstein

During the 1970s, new land was added to the north side of the park, including the Mount Talbot area. It was also during the 1970s that conservationists finally began to realize the importance of restoring fire in prairie management. It was about this time prescribed

John Pearson

burning was first carried out on Cayler Prairie and Hayden Prairie here in Iowa. In the 1980s, a series of prairie inventories conducted by the Nature Conservancy and the Department of Natural Resources identified Stone State Park as one of the most important sites in Iowa for conservation of Loess Hills prairie. In particular, the Mount Talbot site was consistently cited as a top-ranking example.

Prescribed fire was introduced to the Mount Talbot prairie in the spring of 1989 and will be used regularly in the future to restore the prairie and savanna qualities of the original vegetation. In celebration of "Prairie Heritage Week," September 1989, Governor Branstad dedicated the Mount Talbot area as Iowa's 83rd state preserve, thereby insuring that its unique resources would be preserved in their natural condition.

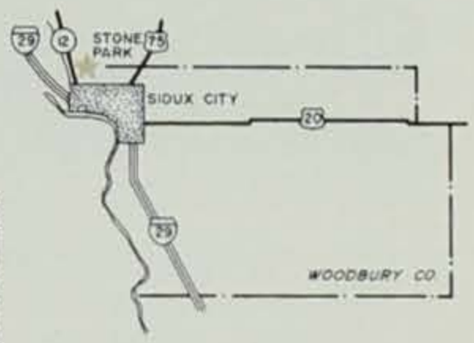
The Mount Talbot State Preserve is both similar to and different from other state preserves. Of the 82 other state preserves, 30 contain prairie of some kind, but only two of them contain the spectacular "Loess Hills" type of prairie (they are the Five Ridge Prairie and the Turin Loess Hills state preserves). Together, these three preserves contain more than 200 species of native plants.

However, the Loess Hills landform in Iowa contain more than 500 species of native plants, so the task of representing the entire natural flora of the Loess Hills in the state preserve system is not yet finished.

Nongame wildfire has been a target in the selection and design of many Iowa preserves, but it was especially important in the Mt. Talbot preserve due to the discovery here of a very rich butterfly fauna. More than 40 species have been documented on the preserve to date by Sioux City naturalist Tom Orwig and others. Included in this total are two species on the official state list of "threatened" animals — the dusted skipper, *Atrytonopsis hianna*, and the Olympia white, *Euchloe olympia*. Beyond their colorful appeal, butterflies represent a large group of small sedentary organisms which are sensitive to fires used for management purposes. The management plant for the Mt. Talbot Preserve addresses this concern by leaving large areas of prairie unburned at any one time. This is one of the first preserves to have its butterfly fauna thoroughly inventoried and their needs specifically addressed in its management plan.

Ken Formanek

In early spring, the pasque flower is a common sight on Talbot State Preserve.



The Mount Talbot preserve is entirely within the boundaries of Stone State Park. Although more than 40 other preserves have been established on state-owned lands, only three are contained within a state park or recreation area (Pilot Knob State Park, Palisades-Kepler State Park, and Brushy Creek State Recreation Area). This newest preserve will easily fit into Stone Park's long-standing tradition of protecting a large natural complex of prairie and woodland. Preserve status will help insure that the Mount Talbot area will continue to be a fine natural area long into the future.

John Pearson is an environmental specialist for the department's preserves and ecological services bureau in Des Moines.

John Fleckenstein is an environmental specialist for the department's preserves and ecological services bureau in Des Moines.

CONSERVATION UPDATE

Record Volume of Hazardous Waste Collected During Toxic Cleanup Days

More than 1,200 drums of household hazardous waste were collected from Iowans during Toxic Cleanup Days this fall, the largest volume ever collected in Iowa since cleanup days began in 1986.

TAMMRA K. PAVLICEK

Thousands of gallons of oil, paint and other household hazardous waste were collected during toxic cleanup days last fall. Aerosol cans, containing paint, pesticides, lubricants and hair spray, will be incinerated at EPA-permitted hazardous waste disposal sites.

The Polk County event, held Sept. 30, was one of the largest first-time cleanup days ever conducted in the U.S., according to Robert Ribbens, environmental specialist for the Iowa Department of Natural Resources. Polk County residents brought in nearly 500 drums worth of hazardous waste along with 4,900 gallons of oil, 600 gallons of usable paint and 812 car batteries.

Toxic Cleanup Days were conducted on Oct. 7 at Spencer and Council Bluffs. Clay County residents brought in household hazardous waste totaling 125 drums along with 565 gallons of oil and 178 car batteries. Pottawattamie County residents brought in 122 drums worth of waste along with 1,200 gallons of oil, 400 gallons of usable paint and 400 car batteries.

Iowa City and Davenport conducted cleanup days on Oct. 14. Residents from Johnson County brought in 158 drums worth of waste, along with 800 gallons of oil, 400 gallons of usable paint and 105 car batteries. Scott County residents brought in 111 drums worth of waste, along with 800 gallons of oil, 465 gallons of usable paint and 192 car batteries.

Toxic Cleanup Days were conducted on Oct. 21 in Oelwein and Charles City. Fayette County residents brought in 124 drums worth of household hazardous waste along with 1,075 gallons of oil, 255 gallons of usable paint and 126 car batteries. Residents from Floyd County brought in 134 drums worth of waste along with 600 gallons of oil, 50 gallons of usable paint and 120 car batteries.

"We were very pleased with the turnout at this fall's Toxic Cleanup Days," said Ribbens. "One of our goals is to educate the public on what products are considered household hazardous waste and to provide the public an opportunity to properly dispose of these wastes."

The hazardous material collected from these events were sent to GSX Services of Greenbriar, Tennessee, for disposal. Iowa currently has no permitted hazardous waste disposal site.

The DNR conducts the cleanup days to collect quantities of less than 220 pounds or 25 gallons per person of hazardous waste from households and farms. Through cleanup days, residents are able to dispose of toxic waste in a proper manner rather than by common disposal methods such as spreading on the ground, flushing down sanitary and storm sewers, sending to sanitary landfills with regular household refuse, and long-term storage.

Streambank Stabilization Booklet Now Available

"Save Our Streambanks: A Survey of Methods" is a new, 21-page booklet that discusses how citizens can stop soil erosion on streambanks — an increasingly serious water quality problem in areas facing heavy development and human activity. High sediment levels in streams kill fish and aquatic vegetation, suffocate spawning beds, and carry heavy metals and pesticides from agricultural areas into fragile aquatic ecosystems.

Produced by the Save Our Streams (SOS) program of the Izaak Walton League of America, the booklet costs $1. "This booklet was written for any individual concerned about the health of local streams and streambanks," said Karen Firehock, national SOS coordinator. "It basically outlines simple methods in great detail so anyone can decrease soil erosion and save fish and their habitat."

To order the booklet or learn more about the SOS program, contact the Izaak Walton League of America, Save Our Streams, 1401 Wilson Blvd., Level B, Arlington, VA 22209; (703)528-1818.

DNR Wins "Take Pride In America" Award

The Iowa Department of Natural Resources received a national award in October from the U.S. Department of Interior, National Park Service, for the "Iowa Open Spaces Protection Plan." The Take Pride in America award is for "outstanding commitment to the stewardship of America's public lands and natural and cultural resources," said Arnie Sohn, planning bureau chief of the DNR.

The open spaces plan identifies the remaining high-quality natural open spaces in Iowa and provides recommendations for their protection. The Resource Enhancement and Protection ACT (REAP), passed by the 1989 General Assembly, includes specific reference to the Open Spaces Protection Plan and its goals as targets for REAP programs.

Larry Wilson, director of the DNR, accepted the award on behalf of Governor Branstad and the state of Iowa at an awards ceremony held Oct. 15 in Albuquerque, New Mexico.

Ice Fishing Shelter Laws

Ice anglers are reminded of the laws regarding ice shelters on state-owned land or waters.

Ice fishing shelters left on the ice overnight must have the owner's name, street address and city in four-inch or larger block letters on all sides in a color contrasting to the background. This owner information will act as a permit.

All fishing shelters left on the ice after sunset must have amber reflectors attached to all sides of the structure. Also, the structure must not be locked while in use.

Shelters must be removed from all state-owned waters on or before ice melt or by Feb. 20, whichever comes first.

Iowa Trophy Deer Records

Deer hunters who successfully bagged a deer with trophy-sized deer antlers are encouraged to enter the rack in Iowa's annual big game records registry. Award certificates and patches will be issued to eligible entries which meet minimum standards set by the Iowa Department of Natural Resources. A list of deer taken and measured each year will be printed in the *Iowa Conservationist* magazine.

In order to qualify for an award, however, a rack must be measured and scored by an official scorer for the Boone and Crockett (firearms) or Pope and Young (archery) clubs, or by a wildlife biologist, conservation officer or other individual certified by the DNR. The scoring system used for Iowa records is identical to that used by the Boone and Crockett or Pope and Young clubs.

Award certificates will be presented in four classes. The classes, with minimum scores for each, are:

Shotgun-Muzzleloader
Typical -- 150 Points
Non-typical -- 170 Points
Archery
Typical -- 135 Points
Non-typical -- 155 Points

RON JOHNSON

Hunters who bag a deer with trophy-sized antlers are encouraged to enter the rack in Iowa's annual big game records registry.

Deer hunters possessing trophy racks which have not been officially measured may contact the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034, (515)281-5145.

Because of shrinkage in varying degrees, racks taken during the recent hunting season cannot be measured for at least 60 days in order for the antlers to dry out properly.

Upcoming NRC and EPC Meetings

The dates and locations have been set for the following meetings of the Natural Resource Commission and the Environmental Protection Commission of the Iowa Department of Natural Resources.

Agendas for these meetings are set approximately 10 days prior to the scheduled date of the meeting.

For additional information, write or call the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034, (515)281-5384.

Natural Resource Commission:
-- Feb. 1, Des Moines
-- March 1, Keokuk
Environmental Protection Commission:
-- Feb. 19-20, Des Moines
-- March 19-20, Des Moines

Spring 1989 Wild Turkey Harvest Decreased Slightly From 1988

Iowa wild turkey hunters, for the first time in several years, did not see a record harvest this last spring. Wild turkey gun harvest for spring 1989 was estimated at 6,699 birds, down five percent from 1988, according to DeWaine Jackson, forest game research biologist for the Iowa Department of Natural Resources.

A four-season format, with a quota of 4,420 licenses available during the first three seasons and an unlimited license quota for the fourth season, resulted in 21,938 shotgun licenses issued — a 21 percent increase over spring 1988. An additional 1,353 archery-only licenses were issued, a 12 percent increase over 1988. Archery harvest declined eight percent and totaled 97 turkeys.

"I expected another record harvest," said Jackson "because we issued several thousand more license than last year, we had excellent turkey populations, and this was the first year the entire state was open to spring turkey hunting. Apparently, the spring weather conditions were not conducive to hunting nor to the breeding activity of the turkeys. The inclement weather, combined with a high non-use of license by hunters — nearly 24 percent of the licenses issued were never used — lowered the harvest this year."

Shotgun hunters that used their licenses did not have excellent success with more than 38 percent harvesting a turkey. "Iowa turkey hunters have one of the highest harvest success rates in the Midwest," said Jackson. "Iowa's small tracts of timber and high turkey densities allow hunters to quickly locate and call-in gobblers."

George Raes of Welton was recently named the "Outstanding Hunter Safety Instructor" by the Iowa Wildlife Federation. Raes has been teaching hunter education courses for more than 20 years. George Hulsey, National Wildlife Federation Midwest vice-chairperson, presented the award to Raes in October.

National Wildlife Federation Directory Now Available

The National Wildlife Federation has released its *1990 Conservation Directory*, a listing of organizations, agencies and officials concerned with natural resources.

This year's directory contains the names of more than 12,000 individuals and 1,900 organizations in the United States and 111 other countries. Federal and state officials, committees and agencies, in addition to hundreds of citizens' groups, are listed.

The directory can be ordered by writing *1990 Conservation Directory*, National Wildlife Federation, 1400-16th St., NW, Washington, DC 20036. The cost is $18 per book plus $3.50 for shipping charges per order.

REAP Newsletter Available

A newsletter on the activities and projects implemented through Iowa's Resource Enhancement and Protection Act is available to the public free of charge. The newsletter is published bimonthly. To subscribe, send name and address to Tammra K. Pavlicek, editor, REAP Newsletter, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

Donations

Hy-Vee Food Store Boone	Watermelons valued at $52 for special event at Ledges State Park.
Don Ross Boone	Concrete blocks valued at $50 for park maintenance at Ledges State Park.
Hill Top Greenhouse, Ltd. Ogden	Flowers and pots valued at $220 for Ledges State Park
Lowe-Berry Garden Boone	Plants and shrubs valued at $100 for Ledges State Park.
Joe Boesen Greenhouse Boone	Flowers valued at $100 for Ledges State Park.
Buffalo Park Settlers Anamosa	$100 for footbridge construction at Wapsipinicon State Park.
Noon Kiwanis Club Algona	Materials and labor valued at $1,272 for re-roofing of "Old Settlers" cabin at A. A. Call State Park.
Iowa Industrial Products, Inc. Cedar Falls	Bolts valued at $120 for playground equipment construction at George Wyth State Park.
Model Meat Market Stanton	Deer processing valued at $65.
Dick Paul Taxidermy Red Oak	Deer antler mounting valued at $115.
Laura and Frank Lucas Las Vegas, Nevada	$200
Wood Magazine Des Moines	The use of copyrighted bird house material.
Marilyn Holcomb Martelle	$75
Field Stone Cabinetry, Inc. Northwood	$100
Darrell Arntzen Dundee	Fuel storage canister valued at $60 for Backbone State Park.
John Rohde Monona	Cement blocks valued at $75 for Volga State Recreation Area.
Dave Wheeler Granger	210 pounds of suet valued at $105 for bird feeding at Ledges State Park.
Don Schmitt Boone	Shelled corn valued at $130 for wildlife feeding at Ledges State Park.
Bill Medland Creston	Photocopier valued at $200 for George Wyth State Park.
Cedar Valley Lakes Waterloo	One-car garage valued at $1,500 for equipment storage at George Wyth State Park.
Jim Scheffler Des Moines	35mm camera and three lenses valued at $150 for interpretive and planning activities of the DNR..
F. L. Diggs Hamburg	Oil painting of Chief Waubonsie for Waubonsie State Park.
Arnold Jun Nebraska City, Nebraska	12 bird houses for Waubonsie State Park.
Suzanne Perry Bellevue	Entertainment valued at $120 for special event at Waubonsie State Park.
Rick and Linda Froehlich Omaha, Nebraska	Silver earrings and sash valued at $50 and demonstration of weaving for special event at Waubonsie State Park.
Bob Nelson Orient	Six trees valued at $200 for Pammel State Park.
Barb Reichtsmeier Cedar Falls	$1000 for playground equipment at George Wyth State Park.
Marge Dahl Cedar Falls	$1000 for benches and picnic tables at George Wyth State Park.
Kenny Kramer LaPorte City	Use of roto tiller valued at $60 for George Wyth State Park.
Five Seasons Mobile Home Court Waterloo	Bird house construction material valued at $490 for George Wyth State Park.
Charles Hermann Muscatine	Use of tractor and post-hole digger valued at $100 for sign installation at Wildcat Den State Park.
Judy Vanhecke Maquoketa	Printing of 6000 brochures valued at $210 for Maquoketa Caves State Park.
Leonard Tallman Guthrie Center	Labor and use of truck and tractor valued at $4000 for park maintenance at Springbrook State Park.
Indianola Building Center Indianola	Use of metal cutting band saw valued at $335 for Lake Ahquabi State Park.
Edna Pansegrau Gladbrook	$125 for benches for fishing jetties at Union Grove Lake
Ventura High School Shop Classes Ventura	Construction of an information kiosk at McIntosh Woods State Park
Kay Hill Cedar Rapids	8 truck rims valued at $200 for fireplace construction at Wapsipinicon State Park
Bernet Construction Marion	Cement forms and materials valued at $325 for rest room renovation at Wapsipinicon State Park

Classroom Corner

by Robert P. Rye

The issue of hazardous waste has been the topic of discussion several times in classes. One discussion addressed household hazardous wastes such as paint cans only half full, insect and plant chemicals, shoe polish, automotive oils, hair spray and nail polish remover. One way to eliminate household hazardous waste is to buy only the amount you need. Another way is to find alternatives to these hazardous products.

Below are examples of household hazardous materials. Try matching these products with safer alternatives.

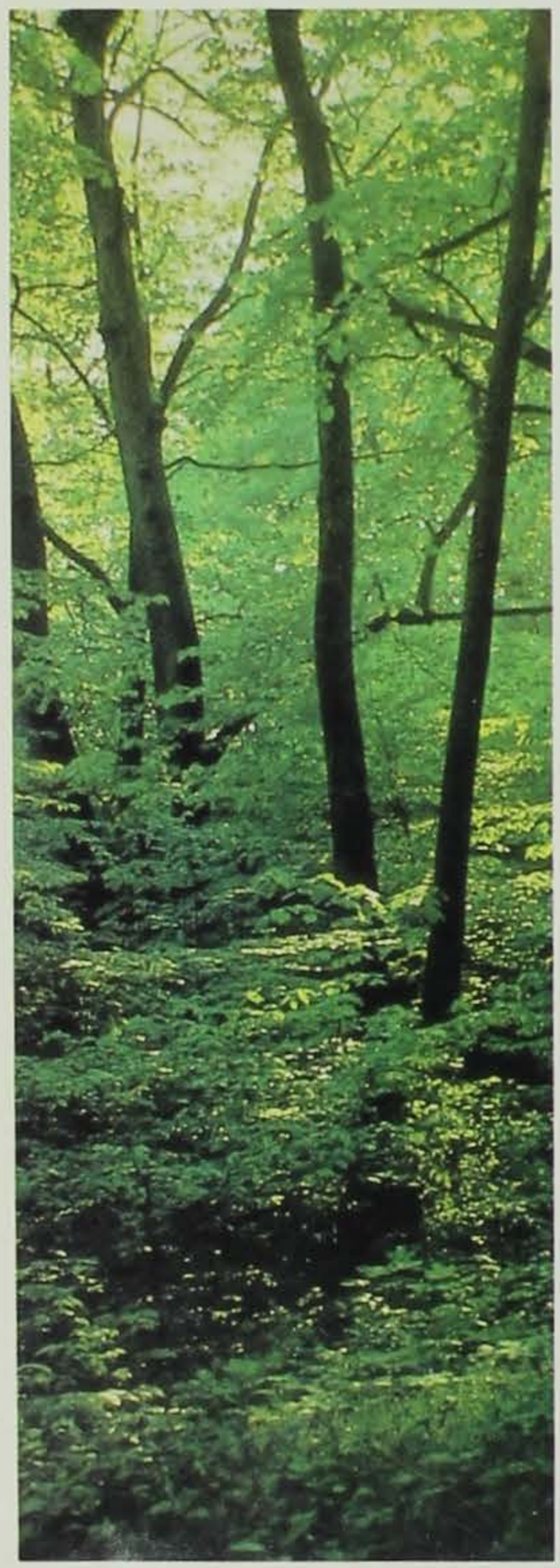
Household Hazardous Materials	Alternatives
1. Flea Collars	a. Soak in boiling water with baking soda
2. Abrasive Cleaners	b. 1/2 cup Borax in 1 gallon of water
3. Furniture Polish	c. Dry cornstarch
4. Disinfectant	d. 1 part lemon juice, 2 parts vegetable oil
5. Ant Killer	e. Cedar chips
6. Silver Polish	f. Vinegar, salt and water mix for surfaces
7. Rug Cleaner	g. 1/2 lemon dipped in Borax
8. Mothballs	h. Mix bar soap and water
9. Ammonia-based Chemicals	i. Brewer's yeast in pet's diet
10. Houseplant insecticides	j. Chili powder at entry.

Answers:

1. i 2. g 3. d 4. b 5. j 6. a 7. c 8. e 9. f 10. h

COUNTY CONSERVATION BOARD FEATURE

The Understated Understory by Bonnie Callan



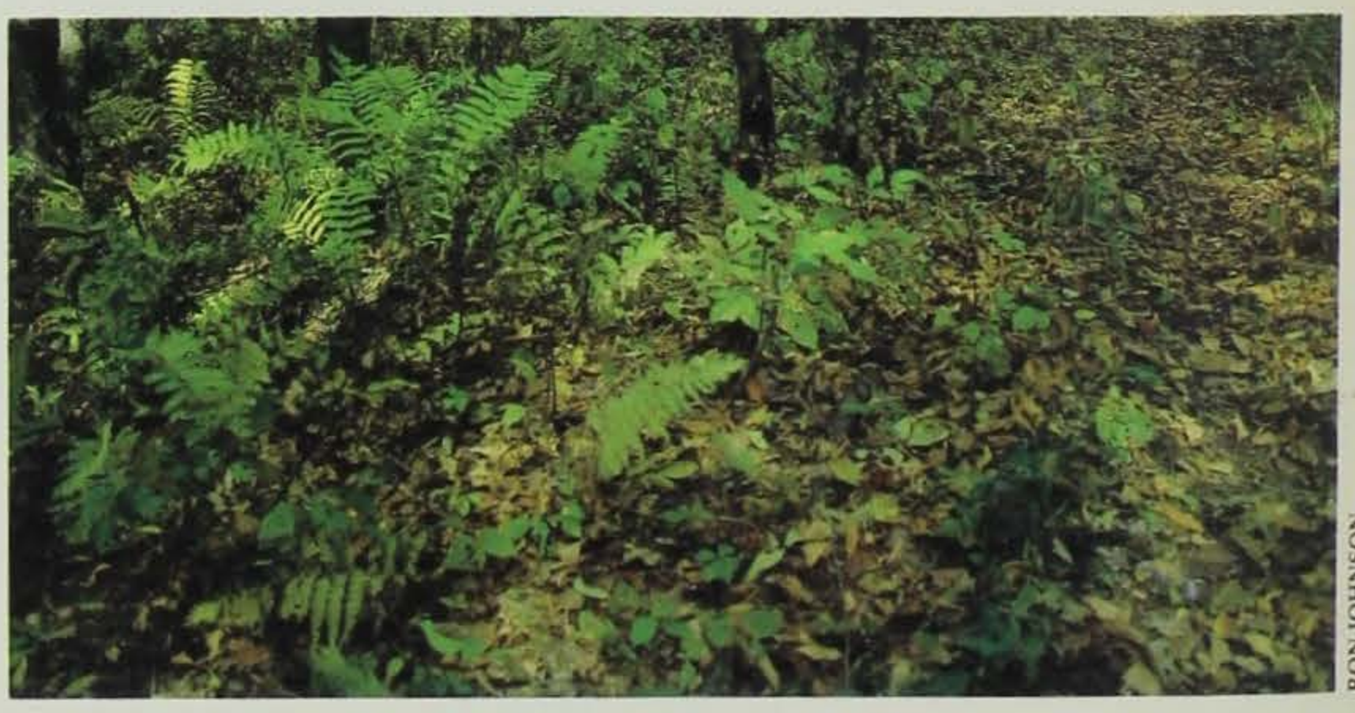
JIM ZOHRER

The old saying, "You can't see the forest for the trees," seems to be true. All that most people see when they look at a forest is the trees; but between the treetops and the forest floor lies a diverse layer of small trees, shrubs and vines — the understory.

This layer is where many of the forest's stories are told. Here insects chew and birds flit; 'possums waddle and squirrels walk tightropes. This is the active crossroads of the forest world. Most people think of birds in the treetops and some species do look for seeds and insects in the canopy; but the forest's upper limit is a world of extremes — scalded by sun, pelted by rain, wind whipped and open to the watching eyes of hawks circling above. Down below, in the understory protected by the tangles of shrubs and vines, birds nest in relative safety, away from tempest-tossed branches and preying eyes.

A study of nesting birds in one forest showed that more than half of the nests were lower than six feet above the ground and only a few were found above 35 feet in the canopy. Here, too, the birds find the abundant food of summer. Leaf-eating caterpillars, pupae hidden in bark crevices and web-spinning spiders all become dinner for young nestlings.

The trees and shrubs also provide food. Prickly gooseberries and raspberries provide summer's first course, gathered by people as well as by animals. Then wild cherries, their sour flesh and hard pit succumb to squirrels and high-climbing chipmunks as well as birds. And fall's bounty arrives with berries -- red high bush cran-



RON JOHNSON

RON JOHNSON

"In winter, the understory provides the food and shelter necessary for survival. Safe in a thicket, deer find shelter from winter's deep snow and browse tender twigs and bark."

berries, white poison ivy berries, and the blue berries of Virginia creeper; relished by migrating birds as well as year-round residents. From the understory, too, come hazelnuts hidden in their leafy husks, these sweet nuts are eaten by squirrels, chipmunks, raccoons, deer, woodpeckers and wild turkeys.

Even in winter the understory provides the food and shelter necessary for survival. Safe in a thicket, deer find shelter from winter's deep snow and browse tender twigs and bark. Some shrubs, like coralberry hold their fruit through the winter providing a food source held above the snow and utilized even by the northward migrating birds of spring.

So, a forest is more than just trees. A woodland cleared of all its undergrowth, by humans who think it is more attractive or by the over-grazing of livestock, becomes a poorer place, lacking the rich diversity of the understory.

Bonnie Callan is a naturalist with the Polk County Conservation Board.

CALENDAR

JANUARY 20 AND 21
Bald Eagle Days. Keokuk will be hosting its sixth annual Bald Eagle Days. Indoor programs and displays will be at the Keosippi Mall on Main Street in Keokuk. Displays and indoor programs, as well as outdoor observation areas, will be available. For more information, contact the Iowa Nongame Program, Iowa Department of Natural Resources, Wildlife Research Station, Route 1, Ledges Road, Boone, Iowa 50036, (515)432-2823.

JANUARY 28
Winter Fishery and Fun Festival. Pleasant Creek State Recreation Area is the site for this winter event, featuring an ice fishing tournament with prizes for species and size. Ice skating, sledding, demonstrations and classes will be part of the festival. For more information, contact Pleasant Creek State Recreation Area, Drawer C, Palo, Iowa 52324, (319)436-7716.

FEBRUARY 3 AND 4
Bald Eagle Days. The Quad Cities will hold their Bald Eagle Days at the Milan Community Center. Displays and indoor programs, as well as outdoor observation areas, will be available. For more information, contact the Nongame Program, Iowa Department of Natural Resources, Wildlife Research Station, Route 1, Ledges Road, Boone, Iowa 50036, (515)432-2823.

FEBRUARY 10
Winterfest 90. McIntosh Woods State Park is the location for a festival of winter activities such as snowmobiling, cross-country skiing, showshoe races, ice fishing tournament and ice sculpture contest. For more information, contact McIntosh Woods State Park, Ventura, Iowa 50482, (515)829-3847.

Designed by Gaye Wiekierak

JANUARY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Protect your loved ones. Store toxics in a safe place and dispose of them properly.	**2** While shopping today, pick up a "Home Sweet Hazards" brochure from any retailer who sells household hazardous materials.		**4** Clean closets — try cedar chips, lavendar or mint instead of toxic mothballs.	**5** Still cleaning those closets? Donate clothes you no longer need, instead of throwing them away.	**6** When shopping today, be aware of over-packaged products. Can alternatives be bought?
7 Enjoy the outdoors. Check twice for any litter. Plastic beverage can rings can trap birds and fish.	**8** Change oil in car — call your local service station to find a place to recycle used oil.	**9** Clean basement -- call the Groundwater Protection Hotline at **1-800-532-1114** for ways to properly dispose of hazardous materials.	**10** Get rid of pet odor in car or house by placing pure vanilla on a cotton ball in a saucer. Place the saucer where odor exists.	**11** Buy groceries -- reuse your own sacks at the store.		
14 Use pump sprays instead of aerosols whenever you can.		**17** Don't forget to wear proper gloves and other protective clothing when using toxic materials. Provide lots of ventilation.	**18** Teach children how to read labels on toxic materials.	**19** Plan your summer garden. Plan to plant marigolds. They repel many vegetable pests and will help you avoid chemicals.	**20** Still planning that garden? Planting garlic between strawberry rows and next to roses and fruit trees can prevent fungus diseases and the use of chemical fungicides.	
21 Pour a kettle of boiling water down the drain weekly to melt fat that may be building up in the drain. This will help prevent the use of toxic drain chemicals.		**24** Find out what your city or county is doing to reduce or recycle waste. Any ideas? Let them know -- get involved!	**25** Check antifreeze -- keep it away from pets. They like the sweet taste, but it is highly toxic.	**26** Clean bathroom -- try using sachet or potpourri instead of chemical air fresheners.	**27** Plan for summer composting — call the Groundwater Protection Hotline at **1-800-532-1114** for a free composting brochure.	
28 Check your children's art supplies. Are they non-toxic?	**29** Monday morning -- time for coffee. Bring your own cup to work, instead of using disposables. Encourage co-workers to do the same.	**30** Clean kitchen sink -- try using baking soda or lemon and salt instead of cleanser.	**31** Silver polish is a household hazardous waste. Try applying a baking soda and water paste to silver. Rub, rinse and polish dry with a soft cloth.	**Think Globally -- Act Locally** **"Earth Day 20" is April 22, 1990.**		

WARDEN'S DIARY

The Art of Snowmobile Riding by Chuck Humeston

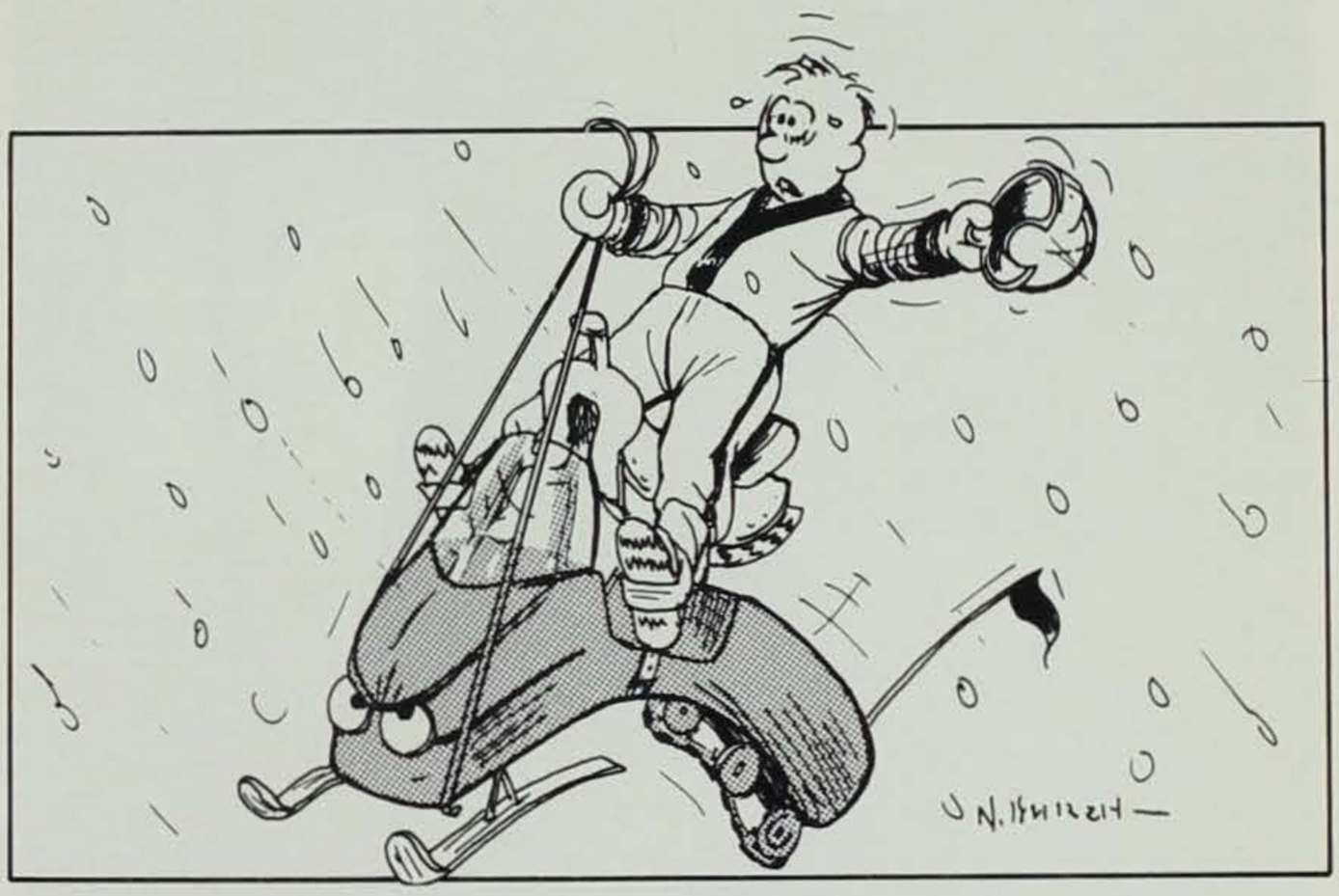


Illustration by Newton Burch

One item of equipment most conservation officers are issued is a snowmobile.

Now you may think, "Well, that would be nice. That would be a lot of fun." Wrong! Other people seem to have better fortune with the snowmobile than I have. It all started a long time ago.

My first assignment was in northwest Iowa -- snow country, ice, snowmobiles. I was just completing training and was in Spirit Lake receiving equipment. Mike Ashby (who is now my supervisor but at the time was the officer assigned to the lakes area) stated it was time to learn how to ride a snowmobile. I thought, "This is great!"

We went to a storage building and inside were some new Kawasaki 440 Intruders (snowmobiles even have fast names!). I thought, "This is great! Which one is mine?" Mike took me to the back of the room. There, dust-covered and used, sat a Scorpion. It didn't look fast. It just looked . . . well . . . intimidating. It sort of said, "Ride me if you can." Mike said, "This one is yours." Suddenly, things did not seem so great.

I asked where my snowmobile suit was. "I have one here to loan you," was the answer. I suited up, sat on the Scorpion, and I turned the key -- nothing. "You might have to use the pull-start, Chuck." I grabbed the handle and pulled and pulled and pulled and finally collapsed. After a great length of time, a cloud of blue smoke and odd noises, it started. Mike showed me the throttle, the lights, the brakes and the kill switch. "Be careful," he said. "It's top heavy and tips over really easy." This definitely was not great any more!

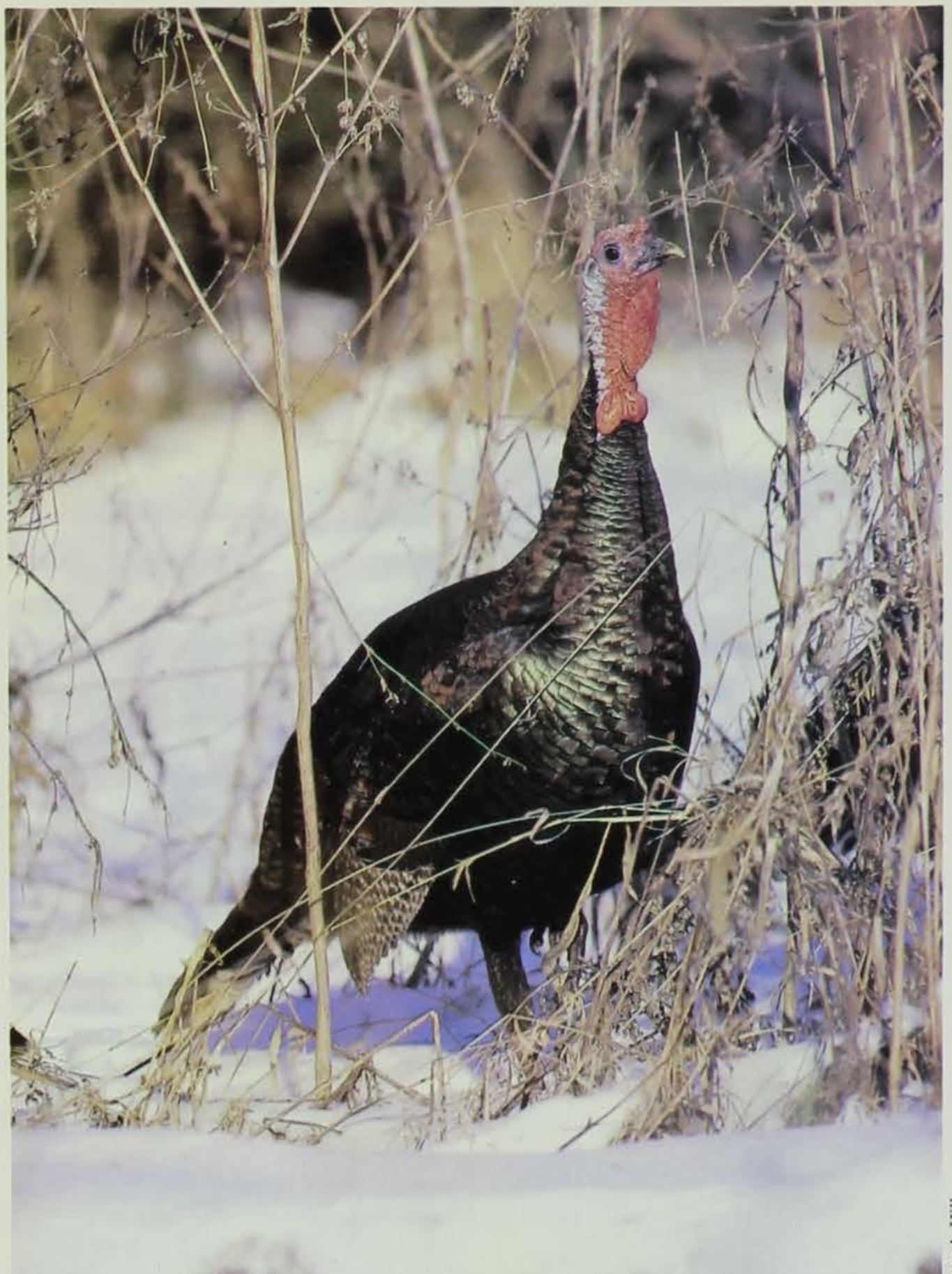
We rode out onto West Okoboji. This sled felt like it would tip over at any moment. I had a death-grip on the handlebars as I slowly squeezed the throttle. We went down into the road ditch and I promptly tipped over. Mike was very sympathetic -- he laughed until he shook!

Well, the wind was blowing snow into a ground blizzard. I could see the orange flag on the back of Mike's sled and that was all. I didn't know which direction was which, and that included up and down. I thought, "I'll just stay on his tail."

Mike knew one speed -- wide open. With my face frozen in fear and my hands frozen and white-knuckled, I opened up that Scorpion. That orange flag was suddenly the focus of my life. We toured West Okoboji (even though I couldn't see it). We checked a few anglers that appeared out of the snow then went out back to the road ditch. I promptly tipped over. Mike did not see it. I hurried to right the sled. I was stuck in loose snow. I thought, "If I push on the sled, and give it some throttle, the sled will ride itself out of this before Mike sees me." I pushed on the sled and opened the throttle. The Scorpion immediately shot out of the snow, onto the road shoulder, and slid across the highway into the ditch on the other side with me falling face-first into the snow as it went out from underneath me. I sat digging snow out of my helmet wondering if there was some other line of work I could get into.

Mike noticed I was gone and rode back to me. "What happened? Why is your sled over there?" he asked. He was not much help pushing my sled out of the ditch as he was laughing too hard.

That Scorpion went to the state sale the next summer. I got my Kawasaki 440 Intruder. I spent a lot of winters on it, and I learned a little more. I learned how hard it is to pull-start a snowmobile while the kill-switch is engaged. I learned about throwing drive belts 10 miles from town in -10°F weather. I learned to strap snowshoes to my sled. I learned about bouncing on a sled all day long and feeling 5'5" at the end of the day instead of 6'. I learned how great it is to be on river patrol and to round a bend to find nothing but open water. That's the great thing about learning to ride. You can only learn by doing.



Roger A. Hill

trading turkeys bartering birds

a benefit to all

by Richard Bishop

On a clear, quiet April morning just after first light, if you venture into Iowa's woodlands you will likely hear a sound that was silenced for more than 60 years. It is the gobble of the wild turkey that rings across the ridges and the valleys in a *gobble, gobble, obble, obble*. Our symbol of Thanksgiving, and if Ben Franklin had his way, our national bird rather than the bald eagle, has returned to Iowa's oak-hickory forests.

Turkeys became extinct in Iowa just after the turn of the century primarily due to timber loss and unregulated hunting. During the late 50s and early 60s many conservationists dreamed of bringing the wild turkey back to Iowa's oak-hickory forests. At that time, it was thought that turkeys needed 10,000 acres of unbroken timber habitat to survive. Even if habitat was not the main factor, how would Iowa obtain any turkeys to release? Many trial and error studies showed that release of pen-reared or semi-domesticated turkeys did not work. The birds simply did not survive or ended up pecking around in someone's farm yard.

The only way Iowa was going to lay their hands on any wild turkeys was to find a state that had wild birds and wanted a species of fish or wildlife that Iowa had in abundance. Hence, a return to the old true barter system. In 1959, commissioners of the Iowa Conservation Commission agreed to trade walleye fry to Texas for 46 turkeys of the Rio Grande sub-species. These birds evolved in open brushland-chaparral of southwest Texas. This sub-species was not adapted to northern hardwood forests with higher precipitation. Nonetheless, the trade was made and Iowa released 46 wild turkeys into northeast Iowa. Northeast Iowa was the closest resemblance to 10,000 acres of forest land that Iowa had but probably was the furthest idea of quality habitat to release a bird from south Texas. Some of the birds from this stocking survived and prospered for a

short time, then numbers dropped to only an occasional sighting.

It was the eastern sub-species of wild turkey that originally inhabited Iowa. In the late 50s and early 60s, Missouri had been very successful in trapping and transplanting the eastern wild turkey and their populations were growing rapidly.

It seemed Iowa's only hope to reestablish wild turkeys was to obtain wild-trapped eastern turkeys and release them into southern Iowa despite the large unbroken tracts of timber. Biologists thought these birds might be able to adapt to Iowa conditions—Missouri turkeys were doing well. Missouri was interested in obtaining offspring from pheasants that had successfully adapted to southern Iowa to stock in the more agricultural areas of northern Missouri. Missouri was also interested in stocking ruffed grouse into areas that historically supported grouse. This common need brought Iowa and Missouri into a wildlife trade of 35 wild-trapped turkeys for 53 ruffed grouse from northeast Iowa and 200 pheasants from southern Iowa. Iowa's highly successful turkey program was on its way with stocking in Shimek and Stephens state forests from 1965-68. The turkeys rapidly expanded their numbers and gradually spread into adjacent habitat. Biologists, getting a pleasant taste of success, were anxious to move faster. Trapping birds and transplanting them into other timber sites in Iowa was started, but the process was a slow process because of the limited number of birds. However, Missouri wanted to obtain additional pheasants for a mass stocking. So, to speed up Iowa's turkey stocking program and to meet Missouri's pheasant program plans, a new swap was arranged.

In 1974 Iowa and Missouri entered into a multi-year agreement that would send 9,000 young pheasants produced from wild-trapped adults and raised at the state game farm to Missouri in exchange for 465 Missouri wild-trapped turkeys. These birds were targeted for release at a number of sites across Iowa. This was Iowa's last trade for turkeys. The program, greatly enhanced from the 465 turkeys from Missouri, shortened the time for many Iowans to see, hear and hunt the bird. (We also traded smallmouth bass fry to North Dakota for 20 turkeys of the Merriams sub-species and Nebraska gave us 15 Merriams turkeys. It was originally thought the Merriams would adapt better to the more open woodlands of western Iowa's Loess Hills, but in the end, the eastern sub-species was the bird that adapted best to western Iowa forest land.)

Iowa's first spring gobbler season opened in May 1974. Three hundred permits were issued and 102 gobblers were harvested. In 1988, 18,133 spring permits were issued and Iowa hunters harvested 7,059 gobblers plus 4,278 birds in the fall.

So went Iowa's first major wildlife swap. The saga of Iowa's wild turkey program is mostly history.

Since the mid 70s the Iowa DNR has attempted other wildlife trades. A trade of 300 pheasants to Oklahoma for 10 pair of bobcats was attempted in the 70s, but due to pressure from livestock raisers, Iowa had to turn down the bobcats even though the pheasants had already been sent to Oklahoma. In Iowa the bobcat is listed

Cannon-netting is the method most often used in trapping turkeys -- small rockets launch a large net over turkeys at the bait site. However, trapping turkeys is not always easy. Many times, after the smoke from the cannon net clears, the wildlife biologist comes up empty-handed.

Ron Johnson

Ron Johnson

Ron Johnson

as an endangered species and would make an attractive addition to Iowa's wildlife. They are not known to cause much damage to calves, lambs or pigs. They do, however, like free ranging chickens, ducks, and other poultry, but since Iowa has so little poultry ranging free, biologists still feel all the aspects of this trade would be beneficial.

Iowa's successful reintroduction of the wild turkey sparked other states to do the same. As Iowa's wild turkey populations flourished, so did the opportunity to initiate some additional wildlife trades. Instead of trading for turkeys Iowa started trading turkeys, along with pheasants, for prairie chickens, ruffed grouse and river otters.

Lowell Washburn

Prairie Chicken

All states adjacent to Iowa have at least a remnant population of prairie chickens. Iowa completely lost its prairie chickens with the disappearance of native grassland. In 1980-82, 52 turkeys were traded to Kansas for 102 prairie chickens. The birds were released in western Iowa's Loess Hills. This venture did not prove successful, maybe due to the quantity and quality of grassland in the Loess Hills. With the advent of the 1985 farm bill and the Conservation Reserve Program (CRP), which resulted in 1.6 million acres of crop ground being seeded to grass or trees, another attempt was made to reintroduce prairie chickens. This time it was Ringgold County where extensive acres of CRP-produced grassland. In 1986, Iowa traded Michigan 113 turkeys for 200 prairie chickens and 30 ruffed grouse. Michigan arranged for the capture and delivery of prairie chickens from Kansas. In 1987, Iowa offered Michigan more turkeys for prairie chickens. Iowa received an additional 124 prairie chickens captured off the booming grounds for 124 wild turkeys.

At this time, reproduction of Iowa's prairie chickens has been documented and the birds have established two spring booming sites. Biologists are guardedly optimistic, and only time will tell if this project will be successful.

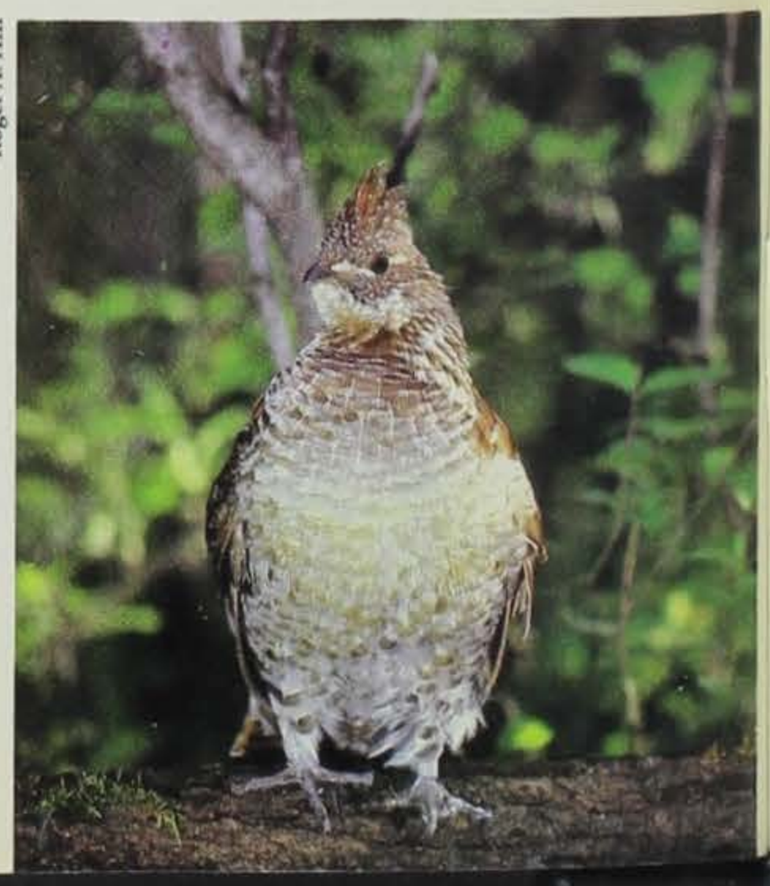
Ruffed Grouse

Iowa has had a huntable population of ruffed grouse in a portion of northeast Iowa (Allamakee, Winneshiek, Fayette and Clayton counties) for some time, but it was decided to try to expand their range. In the early 70s, grouse were captured in northeast Iowa and moved to Shimek State Forest in Lee and Van Buren counties. This first stocking is considered somewhat successful—birds have survived in specific habitats.

Biologists decided to stock more grouse in south-central Iowa, but due to the difficulty and expense of capturing ruffed grouse in northeast Iowa, it was cheaper to capture and trade turkeys and pheasants to other states for grouse. From 1986-1988 Iowa traded Indiana 95 turkeys for 235 ruffed grouse, and Wisconsin 390 pheasants for 350 ruffed grouse and $4,000. Also, 30 ruffed grouse were received from Michigan as part of the prairie chicken trade.

Ruffed grouse were stocked at the 1,835-acre Sand Creek Wildlife Area in Decatur County, Boone Forks Wildlife Area (2,100 acres) in Webster and Hamilton counties, and into portions of Stephens State Forest near Lucas and northeast of Chariton.

The success of these releases is being evaluated. Reproduction has been documented and biologists are continuing surveys of springtime drumming males. Hopefully, a population of ruffed grouse will be established and expand to the point of opening a limited hunting season some time in the future. In the meantime, springtime mushroom hunters, turkey hunters, campers, hikers, and others will have the opportunity to hear or flush this log thumper on a walk through the woods.



Roger A. Hill

River Otters

Another of Iowa's interesting wildlife barters was a trade of turkeys to Kentucky for river otters they purchased from Louisiana. Kentucky arranged to buy otters captured by Louisiana trappers and in turn used these otters to obtain turkeys from Missouri and Iowa. River otters still exist along the upper Mississippi River and the lower portions of rivers that empty into the upper Mississippi, but they have long been extinct from interior Iowa waterways. The otter, an important and valuable furbearing animal, is also an exciting animal to watch. If otters return to our inland rivers and streams, it will be a big plus for all wildlife enthusiasts.

Ron Johnson

Otters were released at the following sites:

- 1985 Red Rock - Marion County, 16 otters
- 1986 Boone Forks - Webster-Hamilton counties, 20 otters
- Raccoon River - Guthrie County, 20 otters
- Otter Creek Wildlife Area - Tama County, 20 otters
- 1987 Rathbun Reservoir-Lucas-Appanoose counties, 20 otters
- Little Sioux River (near the corners of Buena Vista, Clay and Cherokee counties), 20 otters
- 1988 Nodaway River - Cass and Montgomery counties, 20 otters
- Wapsipinicon River - Bremer County, 20 otters
- Wapsipinicon River - Linn - Jones County, 20 otters
- 1989 Cedar River - Mitchell County, 8 otters

The otter program received broad support from trappers, hunters, school children, the news media and the general public. It was a good example of varied interests working together to accomplish a common goal.

Otters have been observed at all the release sites and a number of young animals have been documented. The project is off to a good start and biologists are optimistic that viable otter populations will be established in these areas.

The idea of trading wildlife between states often receives a raised eyebrow until the idea is fully thought out. It happens to be the only way some wildlife populations, extirpated from a given state, can ever be returned to their native habitat. Without cooperation between state wildlife agencies, many people in the United States would be denied a unique experience. The opportunity to trade wildlife has opened the doors for many species to be returned to habitat now capable of supporting them. The main difference today is regulations are in place to protect these reintroduced animals. The general public is much more concerned and local people normally join wildlife biologists in helping protect and nurture these transplants. Across the country, there are numerous examples of successful trade—giant Canada geese, otters, prairie chickens, bighorn sheep, antelope, elk and turkeys, of course, are some examples of native wildlife reintroductions.

How do wildlife agencies decide the number of animals to be traded? This is a favorite question and there is not a pat answer, but the most common factors are how plentiful the species and how difficult to capture. Cost of capture is often decided for both species and then a single equal cost formula determines the number to be traded. In some cases, states are so eager to obtain a given species they will make the trade very advantageous to the state with whom they are trying to do business. These basic dealings have been quite agreeable and few difficulties have arisen.

The opportunity for Iowa to reestablish the wild turkey was truly significant. It has provided recreational pursuits for thousands of turkey hunters, increased the value of timberland and economically benefited many businesses. Iowa owes Missouri for cooperating in the initial birds for release. Thanks to the ring-necked pheasant, introduced to the state years ago, Iowa had a desired commodity to trade with Missouri. Iowa Department of Natural Resources' biologists are hopeful that trades for prairie chickens, ruffed grouse and river otters will also prove very beneficial to the Iowa public.

Yes, the trading of wildlife has indeed been a benefit to Iowans.

Richard Bishop is chief of the department's wildlife bureau in Des Moines.