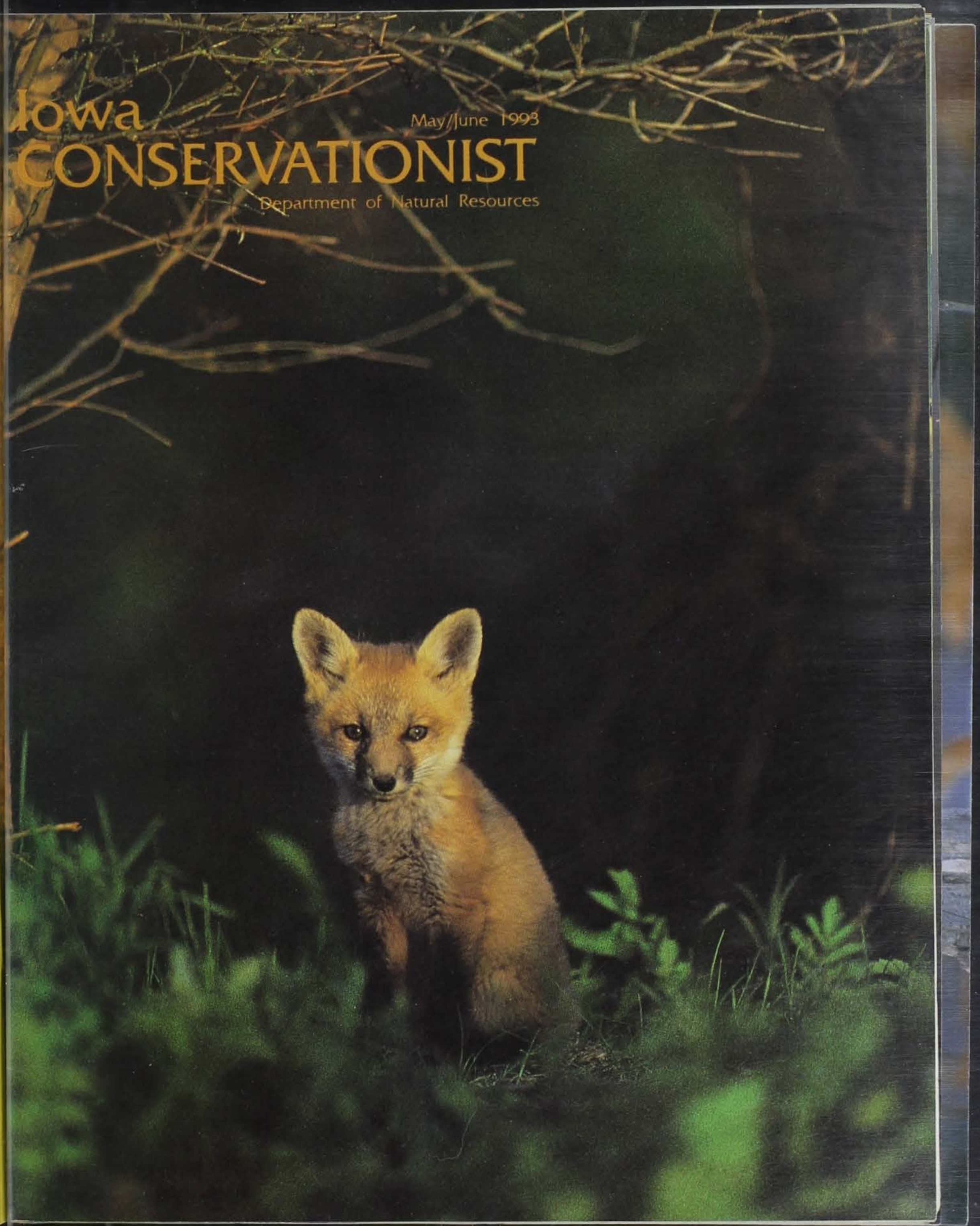
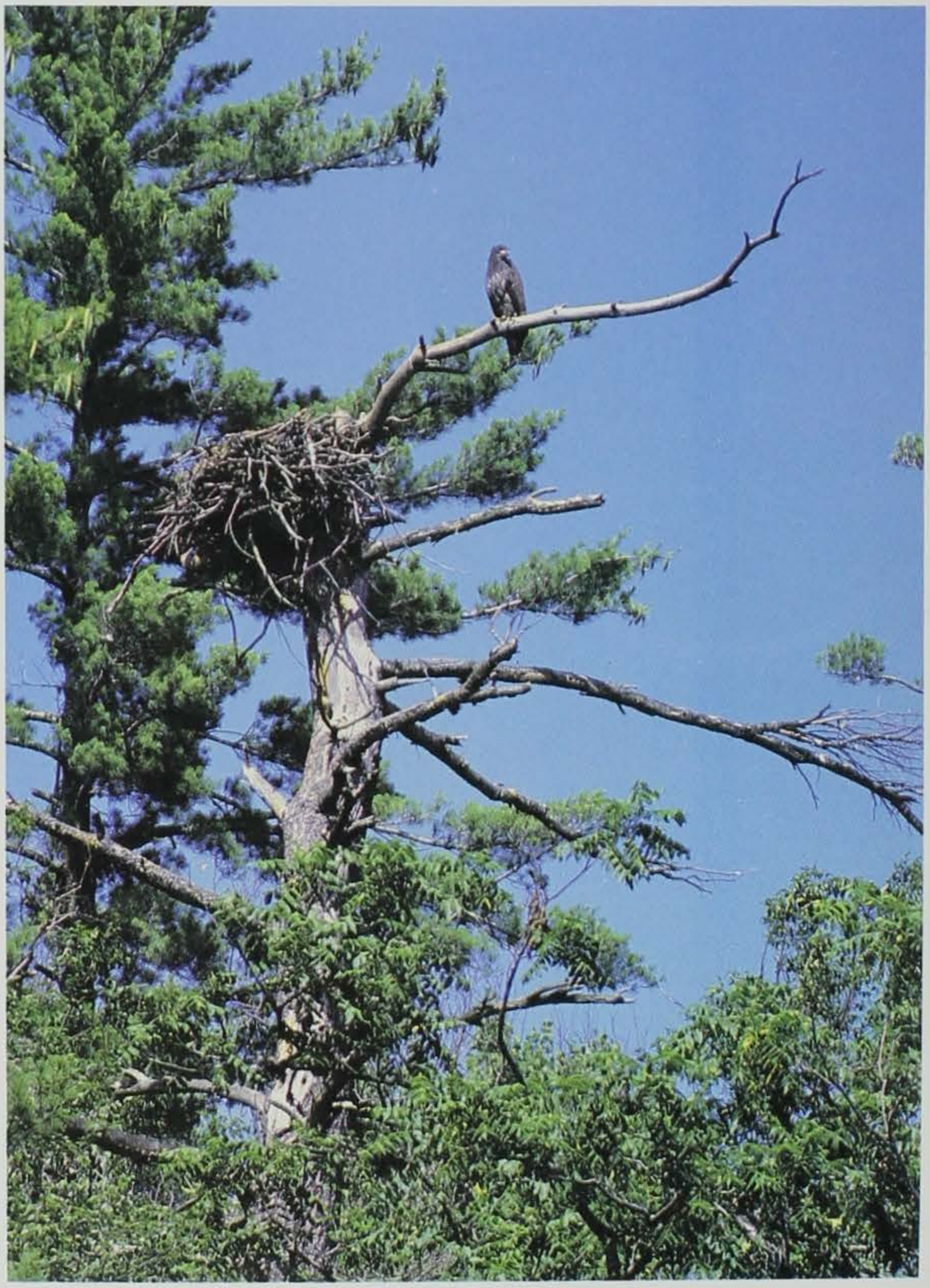
# Iowa CONSERVATIONIST

May/June 1993

Department of Natural Resources





# CONTENTS

**Iowa CONSERVATIONIST**

**May/June 1993**
**Volume 52, Number 3**



**SPECIAL PHONE NUMBERS**
DNR Central Office, (515) 281-5145
Emergency Spill Response, (515) 281-8694
Telecommunications Device for the Deaf, (515) 242-5967
Turn-In-Poachers (TIP), (800) 532-2020
Waste Reduction and Recycling, (800) 367-1025

*Iowa Conservationist* (ISSN 0021-0471) is published bimonthly by the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034. Second class postage paid in Des Moines, Iowa, and additional mailing offices. **Subscription rates: $9.97 for one year, $14.97 for two years and $19.97 for three years. Prices subject to change without notice.** Include mailing label for renewals and address changes. POSTMASTER: Send changes to the *Iowa Conservationist*, Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.



page 12

page 25

## FEATURES



## DEPARTMENTS

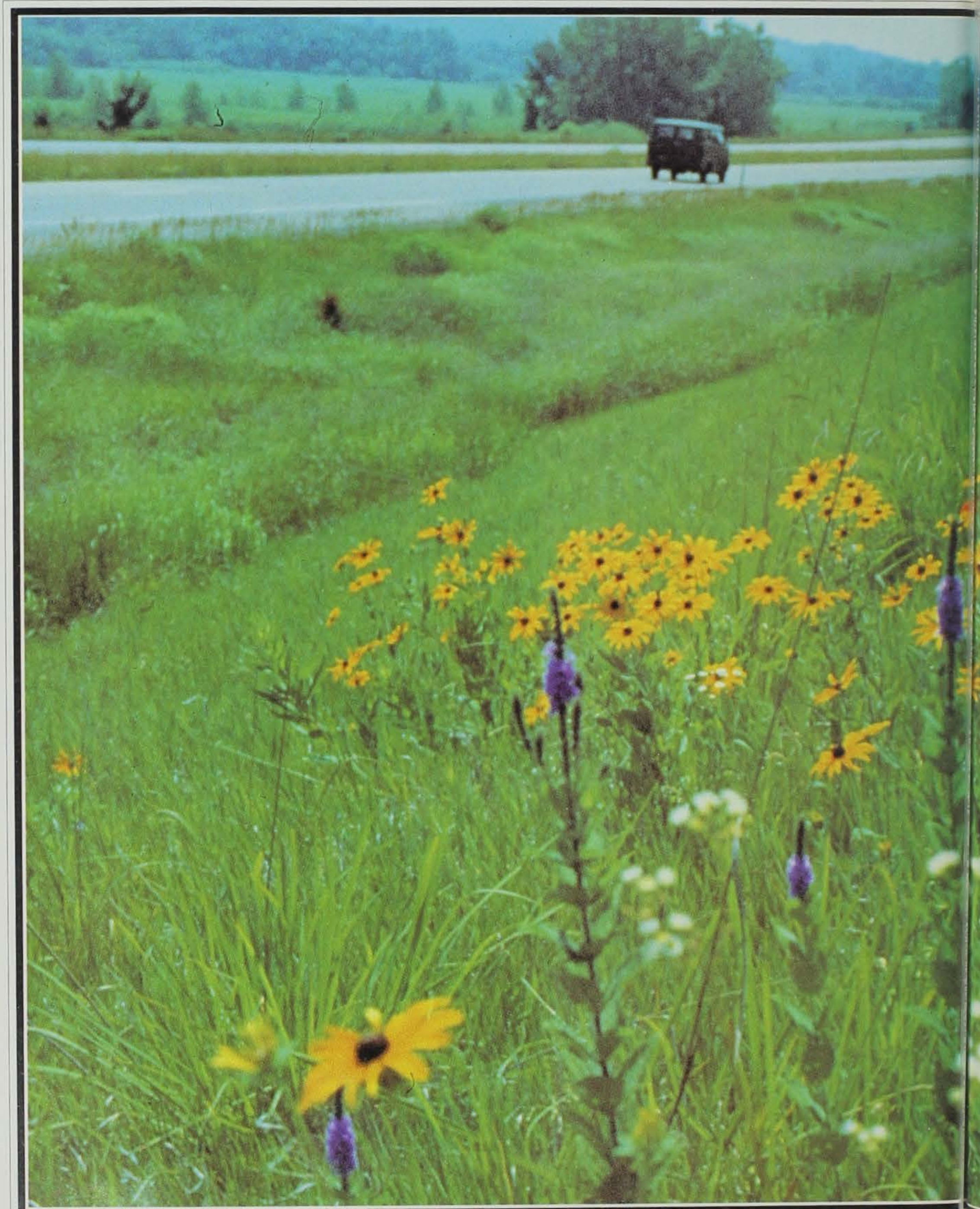


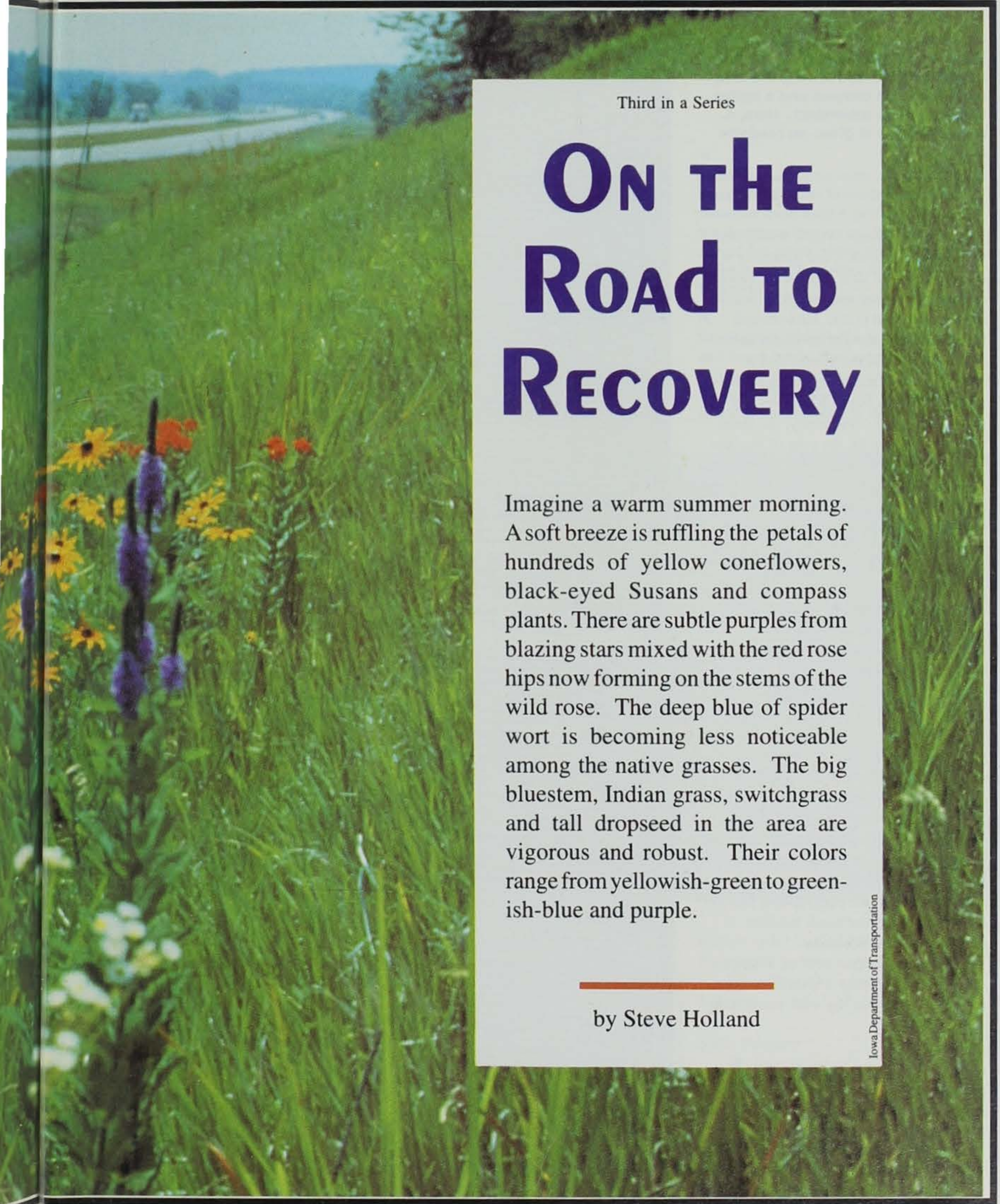
Printed on Recycled Paper

PRINTED WITH SOY INK

## COVERS

**Front** -- Red fox pup by Roger A. Hill.
**Back** -- "Morning of Discovery," by J.D. Speltz of Armstrong, Iowa. This limited edition print of the Lewis and Clark Expedition is available for $30 by calling Lewis and Clark State Park 712-423-2829. Proceeds from the print will be used to offset costs of the Lewis and Clark Festival and keelboat replica.
**Inside Front** -- Bald eagle by Barb Schoenherr.
**Inside Back** -- Dragonfly by Roger A. Hill.





Third in a Series

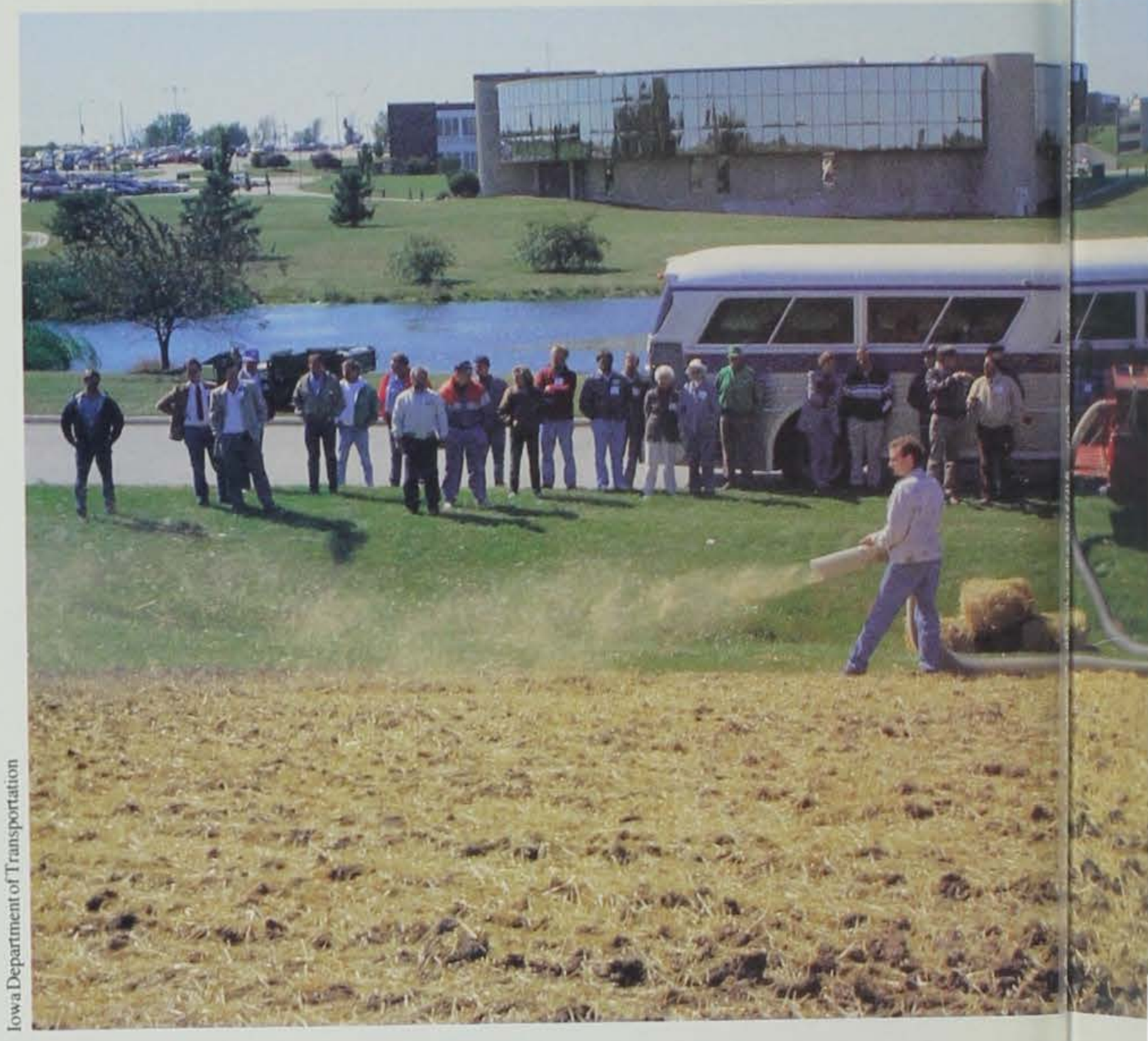
# On the Road to Recovery

Imagine a warm summer morning. A soft breeze is ruffling the petals of hundreds of yellow coneflowers, black-eyed Susans and compass plants. There are subtle purples from blazing stars mixed with the red rose hips now forming on the stems of the wild rose. The deep blue of spider wort is becoming less noticeable among the native grasses. The big bluestem, Indian grass, switchgrass and tall dropseed in the area are vigorous and robust. Their colors range from yellowish-green to greenish-blue and purple.

by Steve Holland

Iowa Department of Transportation

▶
**Hawkeye Technical Institute in Waterloo received an LRTF grant to establish roadside native grass and wildflowers on campus and a native tree and shrub arboretum. Here, a demonstration is given on roadside seeding.**



Iowa Department of Transportation

These grasses, with a beauty and strength of their own, are gleaming with the last drops of dew, their seed heads becoming evident and uniquely beautiful in shape and color. Red-winged blackbirds, meadowlarks, dickscissles, sparrows, pheasants, grouse and a myriad of butterflies, moths and other colorful insects busy themselves with their daily tasks. Suddently, the quiet beauty is broken by the roar of engines and the sound of tires on the pavement. A semitrailer carries its goods to a new destination. Cars, trucks and vans carry their occupants and cargos to work or vacation throughout the country.

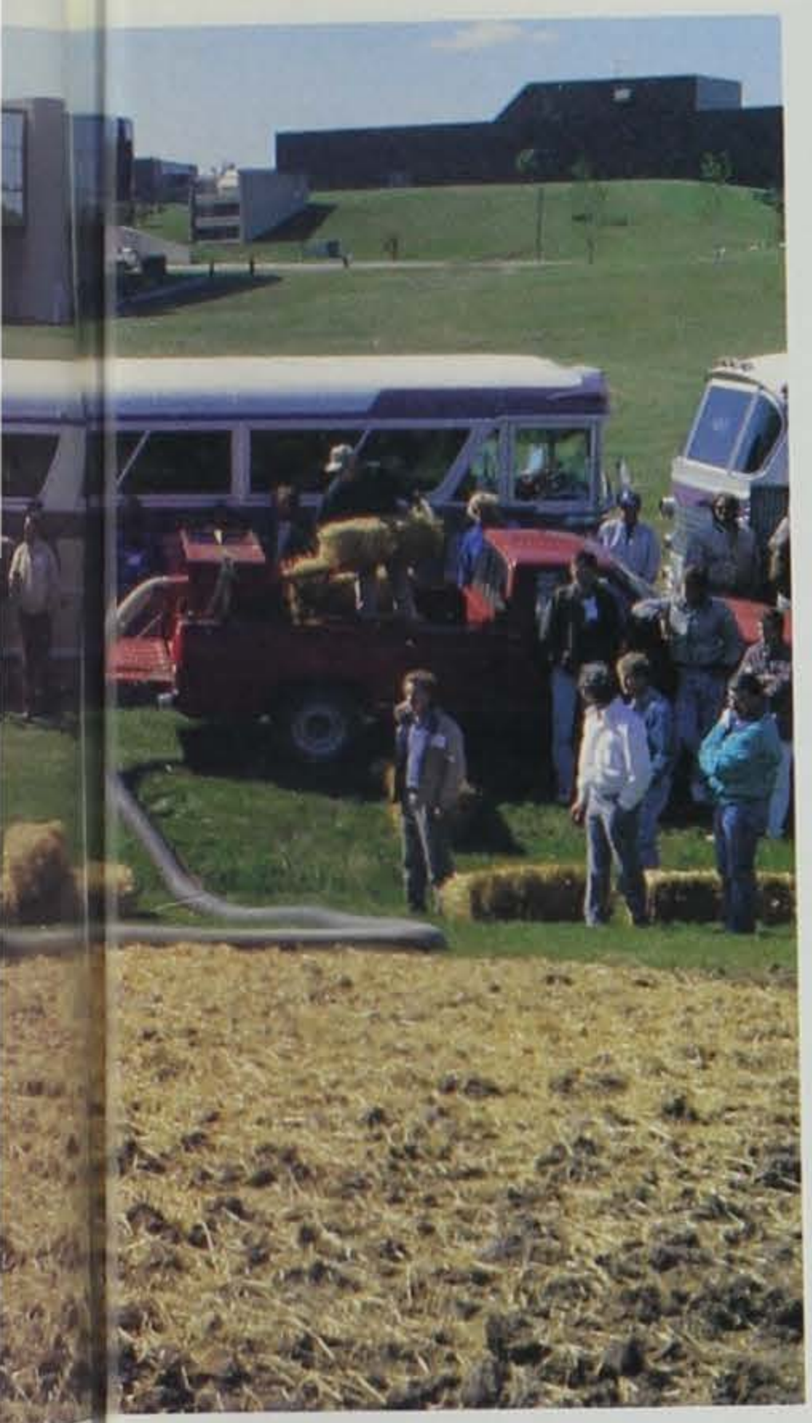
This scene has become more common along Iowa roadsides due to efforts of many people actively involved with roadside vegetation management and Resource Enhancement and Protection funding.

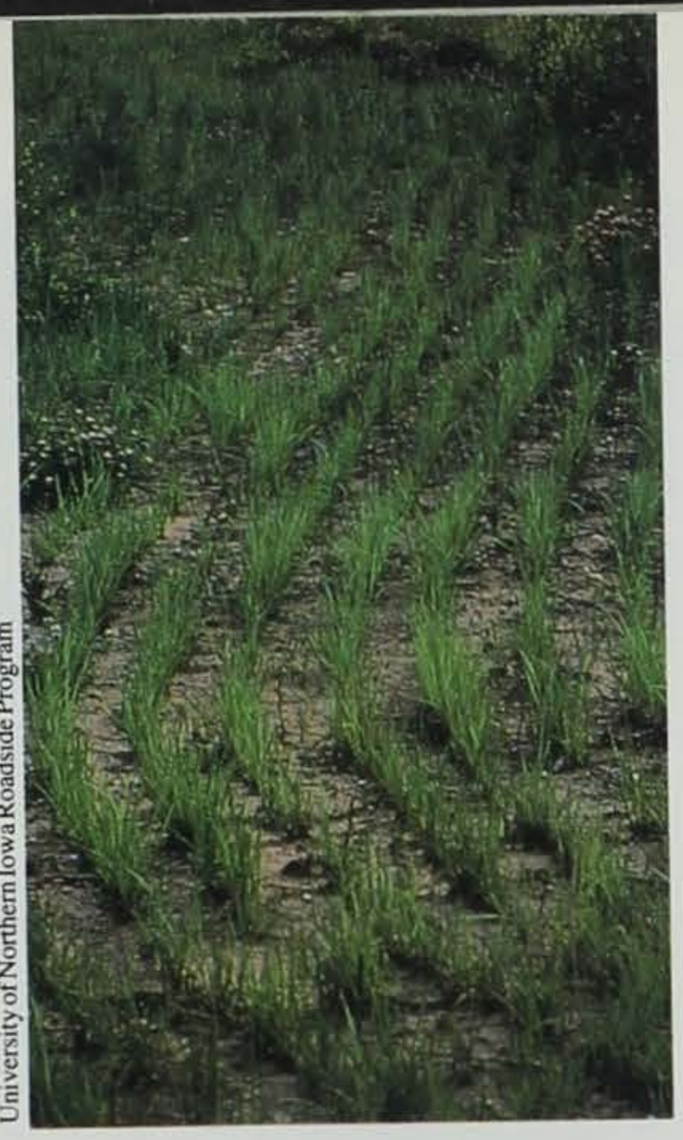
REAP funds have given new priority to roadside vegetation management. Because of the training, information and materials that the fund is able to provide, results are becoming evident. There are more flowers and native grasses along Iowa's roadways. People are beginning to understand the importance of converting more than 600,000 acres of ditches into viable resources for water purification, erosion control, weed prevention, wildlife habitat and beautification.

The Iowa Department of Transportation and University of Northern Iowa have programs dealing with integrated

University of Northern Iowa Roadside Program

▶
**In a spot-spraying program, herbicides are delivered by backpack sprayers or specially designed mobile units that allow excellent control over the amount and direction of herbicide applications.**

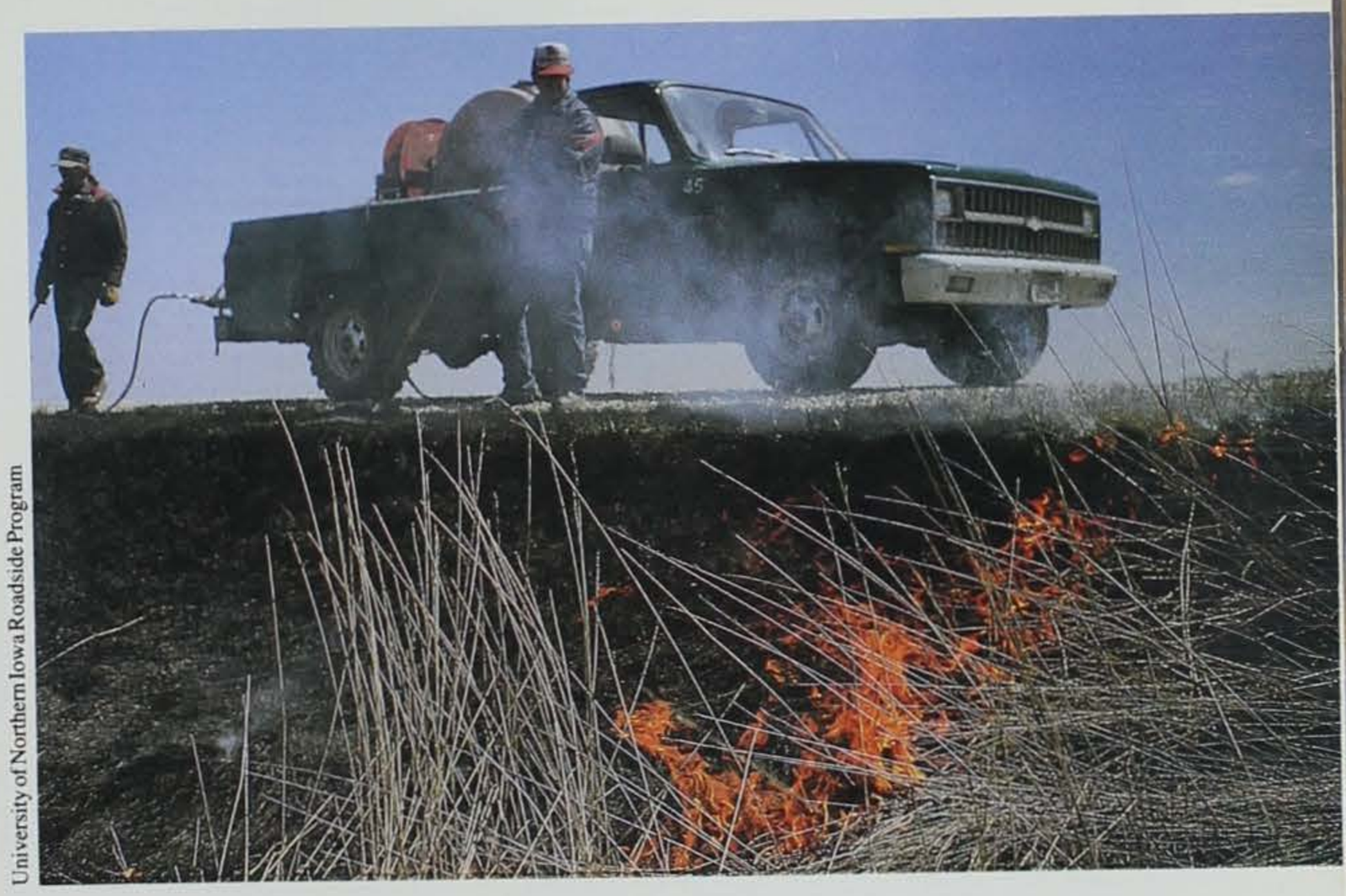




University of Northern Iowa Roadside Program

◀
**Roadside managers select a few prairie species best suited to use in roadsides based on their habitat preferences and the functions they serve. This may be a mix of five or six native grasses and as many as 5 to 30 or more forbes and legumes.**

▼
**Burning roadsides helps control weeds and brush but is done primarily to invigorate prairie species where already present. These plants are fire-adapted. Burning tips the scale in their favor.**



University of Northern Iowa Roadside Program

University of Northern Iowa Roadside Program

▲
**A native grass drill produces the best results when working with the light, fluffy seeds of prairie grasses.**

roadside vegetation management. The DOT and UNI work closely to provide information, education, research, training and public awareness of vegetation management for roadsides.

The Living Roadway Trust Fund (LRTF) receives three percent of REAP funds. This money is used for DOT, county and city roadside vegetation management projects. The LRTF is administered by the DOT. Since June 1989 more than 230 projects across the state have been funded and are in various stages of completion. These projects range from basic native plantings in roadsides to research on best plant choices and their influence on wildlife habitat. They also include gateway plantings for communities of all sizes, as well as training and education for roadside managers and the general public.

Specific projects include the following:

**State Projects**

■ *Production of native ecotypes.* This project is funded in cooperation with the University of Northern Iowa and the National Plant Introduction Center at Elsberry, Missouri, under the direction of Dr. Daryl Smith, professor of biology at UNI. This project is in its

third year of harvesting, processing and increasing native Iowa seed -- providing Iowa growers/producers a truly native source of seed. Once the volume of seed has been increased to marketable quantities, it will then be available for use in roadsides and other prairie restorations throughout the state.

■ *Gateway seminars.* In November 1992 the LRTF, in cooperation with the Iowa Natural Heritage Foundation's Trees Forever program, sponsored six gateway seminars around the state. These seminars provided information on projects by *Trees Forever*, LRTF and DOT. They also provided roadside planting guidelines and general funding information to explain planting procedures for rights of way as well as other sources of funding and volunteer groups to accomplish plantings. Similar seminars are

## County Roadsides

Iowa's roadside program is being watched closely by many states including California, Texas, Oregon, Pennsylvania, Minnesota and Wisconsin. Most of these states are already practicing some form of right of way enhancement along their own interstates. So what is special about Iowa's integrated roadside vegetation management program that merits national attention? Simply put it is participation at the county level and the fact that our improvements in roadside vegetation management go beyond wildflower plantings.

All of these states are recognizing, as Iowa has, that land is a finite resource we cannot afford to abuse or neglect. Roadsides, which make up more than 600,000 acres in Iowa, are now seen as a significant resource to be managed for maximum benefit. This includes groundwater protection, soil conservation, prairie restoration and wildlife habitat. Because county roadsides make up 80 percent of the 600,000-acre total, it is more important that they are included in the program.

Iowa's integrated roadside vegetation management program centers on the belief that native prairie grasses are the vegetative cover best suited to roadsides, and management efforts should be focused on establishing this hardiest of vegetation as a means of long-term weed prevention. After all, these are the plants best adapted to our climate, possessing extensive root systems that out-compete weeds and control soil erosion through our long hot summers when traditional plantings of bluegrass and smooth brome get stressed and go dormant. This is a very proactive approach compared to the decades-old management practices of broadcast spraying and mowing which attacked only the symptoms, stressed the entire plant community and formed a self-perpetuating cycle that always left room for new weeds.

Wisconsin has also learned the importance of providing financial support to encourage county involvement and hopes to implement legislation similar to Iowa's creating the Living Roadway Trust Fund (LRTF). Funded by REAP and administered on a grant basis by the Iowa DOT, the LRTF provides money for the special equipment and seed vital to a successful roadside program. Without this money most Iowa counties would have trouble getting their programs off the ground.

The LRTF also provides money for counties to conduct windshield surveys

Iowa Department of Transportation

▲
**Native plants left in roadside as a result of training programs that explain the benefits that can be achieved by reducing mowing and pinpointing noxious weed spraying.**


▲
**Counties fully implementing integrated roadside vegetation management with a designated roadside manager on staff (1).**
**Counties that have adopted integrated roadside vegetation management in principle but have not yet hired a roadside manager (2).**

**Many other Iowa counties have stopped broadcast-spraying their roadsides, have purchased a native grass drill and are burning some roadsides.**

of their existing roadside vegetation. Establishing this data base containing the locations of weed patches, brush problems, erosive sites and existing prairie vegetation enables roadside managers to prioritize their activities and measure their success.

The integrated roadside vegetation management legislation provided for establishment of the Roadside Office at the University of Northern Iowa as a source of focus and momentum for the program. Located in the biology department, the office serves as a clearinghouse of information for counties in the program, helps new counties get started and has carried out several demonstration and education projects funded by grants from the Living Roadway Trust Fund.

How does roadside vegetation management get its start in a new county? Rising concerns about groundwater contamination combined with increasingly difficult budget situations motivate county supervisors to find alternatives to paying contractors $70,000 a year to bombard the county's roadsides with chemicals. It makes much more sense to spend this money on a roadside program hiring a roadside manager who will do positive things with roadsides and perform the many services a county must provide to rural residents. These include serving as weed commissioner, carrying out a responsible spot-spray weed-control program, seeding bare areas with natives, removing trees and brush from the rights of way, burning roadsides to improve prairie where it exists, providing educational programs for the public and often serving as the local prairie expert.

Beautifying the right of way and reducing maintenance costs were once considered mutually exclusive goals. As goals for the integrated roadside vegetation management program, they are certainly long-term. But they are real. For the present, we can say we are headed in the right direction, being responsible to the needs of rural residents and developing sustainable management techniques along the way.

*--Kirk Henderson, roadside specialist for the County Roadside Assistance Office at the University of Northern Iowa.*

▶

**Gaining acceptance for integrated roadside vegetation management involves changing public perception of what makes an attractive roadside. More and more people see beauty in the variety of heights and colors of a prairie roadside prefering it to the old "country club" lawn look.**

Roger A. Hill

planned for the future.

■ *Publications and videos.* The LRTF sponsored the printing of the following:

*Integrated Roadside Vegetation Management Technical Manual*, produced by The County Roadside Assistance Office, Department of Biology, University of Northern Iowa.

*Distribution Maps of Iowa Prairie Plants*, by Dr. Paul A. Christiansen, Cornell College, Mt. Vernon, Iowa.

*Discover Iowa's Flowering Plants and Grasses*, a brochure developed by the Iowa Department of Transportation.

*Proceedings of the 12th North American Prairie Conference*, held at the University of Northern Iowa in the summer of 1990.

The LRTF also sponsored the production of the following videos: "Going Native," "Management Techniques, May 1992," "IRVM, A Low-Maintenance Approach to Roadside Management," and several IRVM public service announcements for TV.

■ *Rights of way plantings.* The LRTF has sponsored plantings at more than 30 DOT shop locations around the state using native grasses, wildflowers, trees and shrubs. These plantings will demonstrate establishment, management and identification of native plants, and serve as wildlife habitat and beautification. Wildflower plantings have been completed at several rest areas along I-80, I-35 and I-29.

The LRTF has recently begun a program of assisting schools in planting small prairies, native trees and shrubs in rights of way immediately adjacent to schools and on to public school property. At this time, only those schools on state roadways are included. However, schools located along county roads and city streets may make application by September 30, 1993, for funds from the Living Roadway Trust. These plantings are to be used as outdoor classrooms to gain knowledge and acceptance for native vegetation, as well as enhancing rights of way and reducing long-term maintenance needs.

■ *Equipment.* LRTF has provided funding to purchase native grass drills for rights of way. They are now available in each district of the DOT. When used correctly, these drills improve establishment percentages of prairie plants.

**City Projects**

■ *Gateway plantings.* Funding for these plantings include native wildflower and grass establishment, plus native and/or hardy introduced species of trees and shrubs, mulch and first-year maintenance. Future maintenance (a minimum of five years) is provided by groups receiving funding for the project. Smaller communities are beginning to realize the possibilities for economic growth by improving the entryway to their communities. Plantings of wildflowers, native grasses, trees and shrubs can enhance the appearance of the community significantly, helping to attract businesses and/or new families.

**County Projects**

■ *Seed purchases.* These funds are used to purchase native grass and wildflower seed for planting along county roads. These plantings help increase public awareness and acceptance of native plants for erosion control, weed prevention and beautification.

■ *Inventories.* These funds are used to survey roadsides in an effort to identify native prairie areas, weedy areas, disturbed or bare ground areas, erosion sites and hazard or problem tree areas. The purpose of these inventories is to help roadside programs become more efficient and effective in their vegetation management. Knowing what is in the roadside can greatly reduce travel time and wasted efforts. Inventories can prevent unnecessary control of plants that are beneficial and ensure the correct method of control for specific problems when they arrive. Another benefit of inventories is the evaluation of control or establishment techniques for future years. By completing follow-up surveys, roadside managers can better evaluate if they are achieving intended goals or are using the best methods.

**Equipment.** These funds have been used to purchase seeding equipment such as native grass drills to handle fluffy seeds; cultipackers for firming soil; mulching equipment to hold soil and seed in place on steep slopes that occur in most ditches; fire fighting equipment for roadside burns; and seed harvesting equipment to assist in overall cost reduction and supply.

REAP funds have given new priority to roadside vegetation management . . . People are beginning to understand the importance of converting more than 600,000 acres of ditches into viable resources for water purification, erosion control, weed prevention, wildlife habitat and beautification.

The application deadline for 1993-94 funding from the LRTF is September 30. To receive application forms and information on qualifications contact Steve Holland at the address below.

Any questions you might have regarding integrated roadside vegetation management or the Living Roadway Trust Fund can be directed to: Steve Holland, Iowa Department of Transportation, Office of Local Systems, 800 Lincolnway, Ames, Iowa 50010, (515) 239-1768 or Kirk Henderson, County Roadside Assistance Office, 1256 McCollum Science Hall, University of Northern Iowa, Cedar Falls, Iowa 50614, (319) 273-2813.

*Steve Holland is the roadside coordinator for the Iowa Department of Transportation in Ames.*

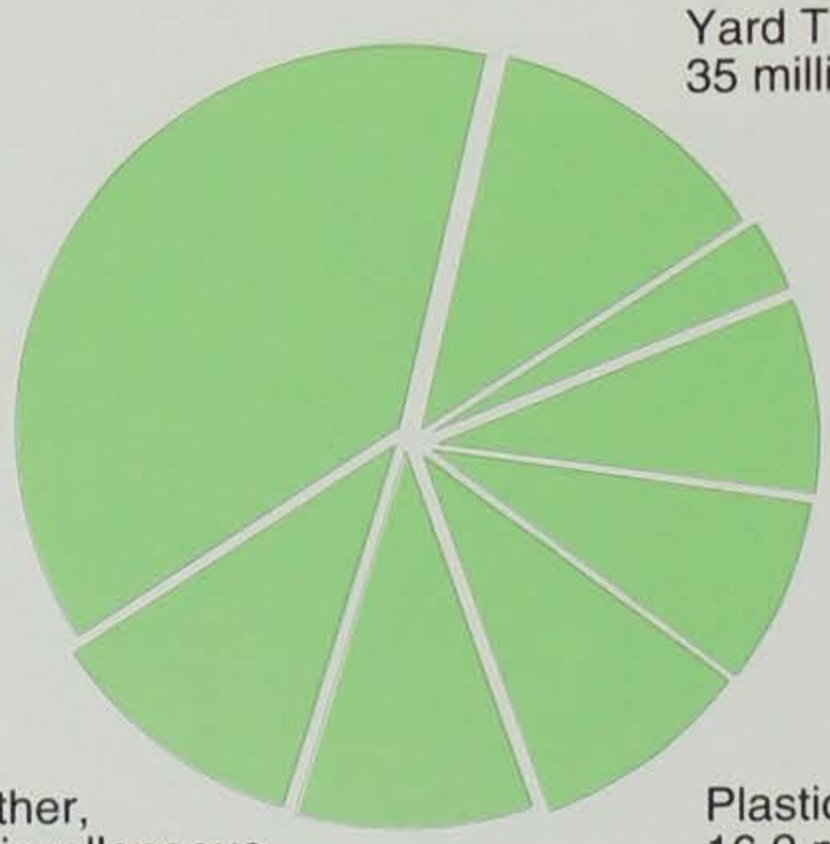
# RECYCLING MUNICIPAL SOLID WASTE:

## Facts and Figures

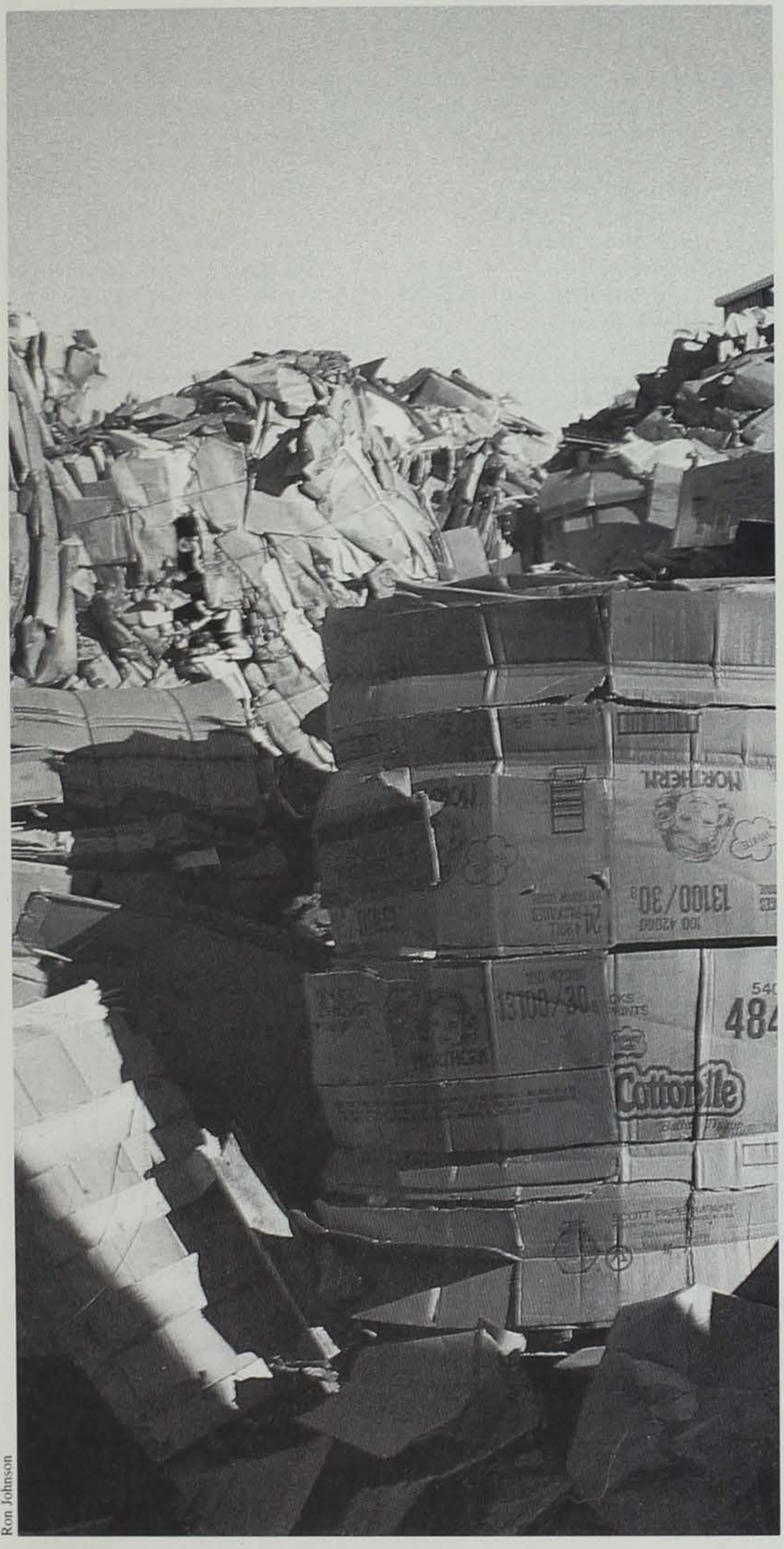
In the United States, we generate approximately 195 million tons of municipal solid waste (MSW) annually -- an average of 4.3 pounds per person per day. To safely and effectively manage all of this trash, communities across the nation are using "integrated waste management systems," which combine source reduction, recycling, combustion and landfilling to manage waste. Recycling, including composting, is a key component of many integrated waste management systems. The Environmental Protection Agency has challenged the nation to reduce and recycle at least 25 percent of MSW (in 1990, the nation's overall recycling rate was just over 17 percent). Many communities have far exceeded the national goal. The following are nine of the primary components of the MSW stream, along with their generation rate, the percentage of the MSW stream they comprise and their recovery rate. Although rates specific for Iowa are unavailable at this time, current information regarding Iowa's waste reduction efforts are given as well.

### Nationwide Materials Generated in Municipal Solid Waste by Weight, 1990

**Total Weight = 195.7 Million Tons**




Ron Johnson




Ron Johnson

## Paper and Paperboard

**Generation:** Nearly 73.3 million tons of paper and paperboard waste are generated annually.

**Percent:** Paper and paperboard constitute the largest portion of the MSW stream, representing 37.5 percent.

**Recovery:** Paper has an overall recycling rate of 28.6 percent. About 48 percent of corrugated boxes, 42.5 percent of newspapers, 10.3 percent of office papers are currently recycled.

**Iowa:** Paper and paperboard products account for the largest share of the solid waste stream in Iowa, often comprising 40 percent or more of the total. There is currently a strong demand for newspapers for animal bedding, while newspaper publishers are trying to use more recycled newsprint in their papers. The new demand for magazines in some parts of the state is due to the development of new deinking technologies that need the clay content of the glossy pages.

At times, market supply for some recovered paper products, such as newsprint, has exceeded the capacity of mills to use the materials. Markets for recycled paper products, however, are generally stable and expanding as more mills build new deinking facilities to process waste paper and as the demand for recycled paper products grows.

---

*With the exception of the Iowa information, this article is reprinted from an* EPA Environmental Fact Sheet *by the same title.*

## Yard Trimmings

**Generation:** Thirty-five million tons of yard trimmings (including grass, leaves, and tree and brush trimmings) are generated annually.

**Percent:** Yard trimmings make up 17.9 percent of the MSW stream.

**Recovery:** Each year, 12 percent of the yard trimmings produced are composed.

**Iowa:** Disposal of yard waste in Iowa landfills was banned January 1, 1991. Many counties and municipalities have composting operations that have become popular with residents who drop off their "compostibles" and take home the valuable by-product. Many others find it convenient and economical to compost materials in their own back-yards.

Yard trimmings can be transformed into compost for home owners, farmers, public agencies, landscapers and nurseries. Grass clippings can be beneficial when left on the lawn.

Ron Johnson

## Glass

**Generation:** Approximately 13.2 million tons of glass waste are generated annually. Food and beverage containers make up more than 90 percent of this amount; the remaining 10 percent comes form products like cookware and glass ware, home furnishings and plate glass.

**Percent:** Glass constitutes 6.7 percent of the MSW stream.

**Recovery:** About 22 percent of all glass beverage containers are recycled. Glass has an overall recovery rate of 19.9 percent.

**Iowa:** Iowa recovers 35 million pounds of glass each year from its deposit program alone.

Glass manufacturers typically use 30 percent crushed glass (known as "cullet") along with raw materials to make new glass. Cullet can also be used as an aggregate in road building.

Ron Johnson

## Plastics

**Generation:** More than 16 million tons of plastic waste are generated annually.

**Percent:** Plastics comprise 8.3 percent of the total MSW stream.

**Recovery:** About 2.2 percent of all plastics are currently recycled, with plastic soda bottles being the most commonly recycled product (more than 31.5 percent are recovered).

**Iowa:** Of the many types of plastic resins that exist, six resins account for about two-thirds of all plastic sales. Most recycling programs in Iowa are focusing only on polyethylene terephthalate (PET, No.1) and high-density polyethylene (HDPE, No.2), which are the most prevelant types of plastics used.

Plastics' share of the waste stream is growing by weight and volume. Most plastics that end up in the waste stream are from packaging and containers. Plastics recycling has increased dramatically over the past two years. Products made from recycled plastic include drainage pipes, toys, carpet, filler for pillows and sleeping bags and cassette casings. While accounting for only about eight percent of the MSW stream by weight, plastics make up more than 20 percent by volume.

## Aluminum

**Generation:** A total of 2.7 million tons of aluminum waste are generated annually. Aluminum containers and packaging, such as soft drink and beer cans, contribute 1.9 million tons.

**Percent:** Aluminum makes up 1.4 percent of the total MSW generated annually.

**Recovery:** Fifty-four percent of all aluminum containers and packaging are recycled. The overall recycling rate of aluminum is 38.1 percent.

**Iowa:** Aluminum beverage containers are subject to Iowa's beverage container deposit law which was enacted in 1979. Due to the deposit law, all beverage containers, including aluminum cans, have a 95 percent redemption rate, so nearly all redeemed aluminum cans are recycled for re-manufacturing. Aluminum cans are the most valuable recyclable in the waste stream.

The markets for scrap aluminum are strong. Aluminum has a high market value, and aluminum cans supply a large percentage of the income for many municipal recycling programs. Almost all the aluminum collected is used to make new cans.

## Steel

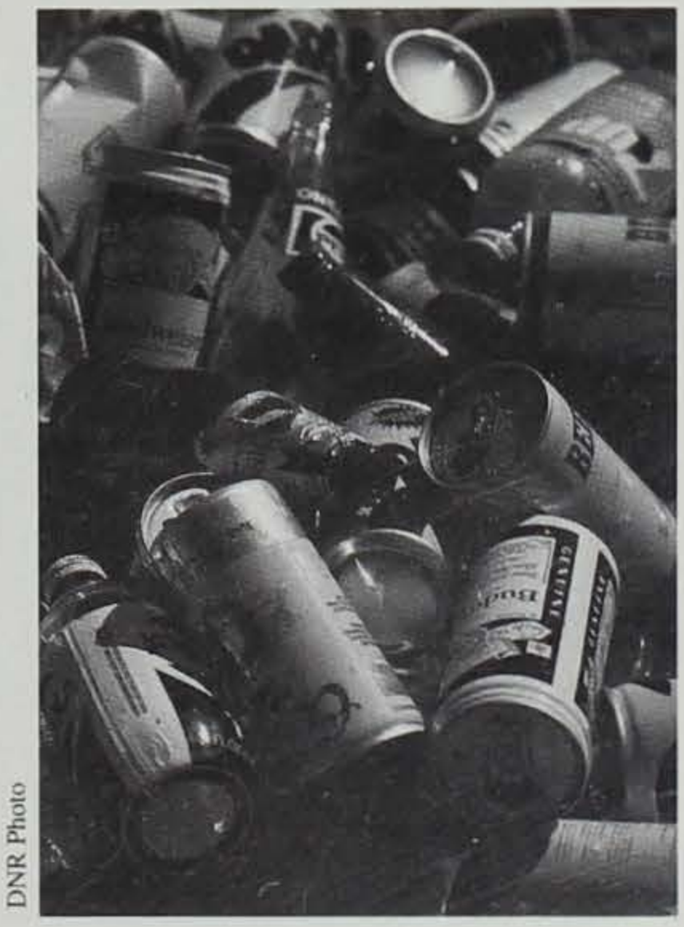
**Generation:** About 12.3 million tons of steel waste are generated annually.

**Percent:** Steel constitutes 6.3 percent of the MSW stream.

**Recovery:** Overall, about 15.4 percent of steel in MSW is recycled. More than 22 percent of steel cans are recycled. Much greater amounts of steel are recovered; however, these steel products (e.g. junked cars, steel girders) are usually not considered MSW.

**Iowa:** Ferrous metals are abundant in Iowa's waste stream, usually in the form of steel cans or "white goods," namely refrigerators, stoves, hot water heaters and other appliances. Steel cans represent only six percent of all steel used, but they are a common material for community recycling programs in Iowa, and their recycling rate is growing.

Demand for steel scrap is growing as steelmakers are using more steel scrap to produce new steel products and less scrap is being produced within the steel making process. Some steel foundries are also beginning to use steel cans as a source of new raw materials.

DNR Photo

## Used Oil

**Generation:** More than 1.3 billion gallons of used oil are generated yearly.

**Percent:** Used oil makes up less than one percent of the MSW stream.

**Recovery:** Sixty-seven percent of all used oil is recovered (900 million gallons). Only 10 percent of the amount generated by people who change their own motor oil is returned to collection programs.

**Iowa:** Used oil was banned from landfills July 1, 1990. Retailers are required to either accept used oil from customers or post notice of locations where it is accepted for recycling. Waste oil is collected at many retail sites around the state and then picked up by waste oil companies for processing it into industrial boiler fuel or recycling it back into motor oil.

If disposed of improperly (i.e., poured down sewage drains), used oil can contaminate soil, groundwater and surface water. Many state and local governments are taking steps to ensure the safe and effective management of used oil. In some communities, used motor oil is collected at service stations, corporate of municipal collection sites, or at the curbside.

## Automotive Batteries

**Generation:** About 1.5 million tons of used automotive (lead-acid) batteries are generated annually. In addition, many of the 2.5 billion household batteries purchased each year are discarded into the MSW stream.

**Percent:** Batteries constitute less than one percent of the MSW stream.

**Recovery:** About 96 percent of automotive batteries are recycled each year.

**Iowa:** Lead-acid batteries were banned from landfills July 1, 1990, and retailers are required to accept used lead-acid batteries as an exchange when a customer purchases a new battery at the point of sale. The exchange and landfill ban provisions in Iowa have effectively removed auto batteries from disposal and into recycling.

Although automotive batteries constitute a small portion of the MSW stream, they contain metals that may be a concern when disposed of in landfills and combustors. All there components of automotive batteries are recyclable -- the lead, the acid and the plastic casing. Retailers often accept used automotive batteries that manufacturers recycle into new batteries.

## Tires

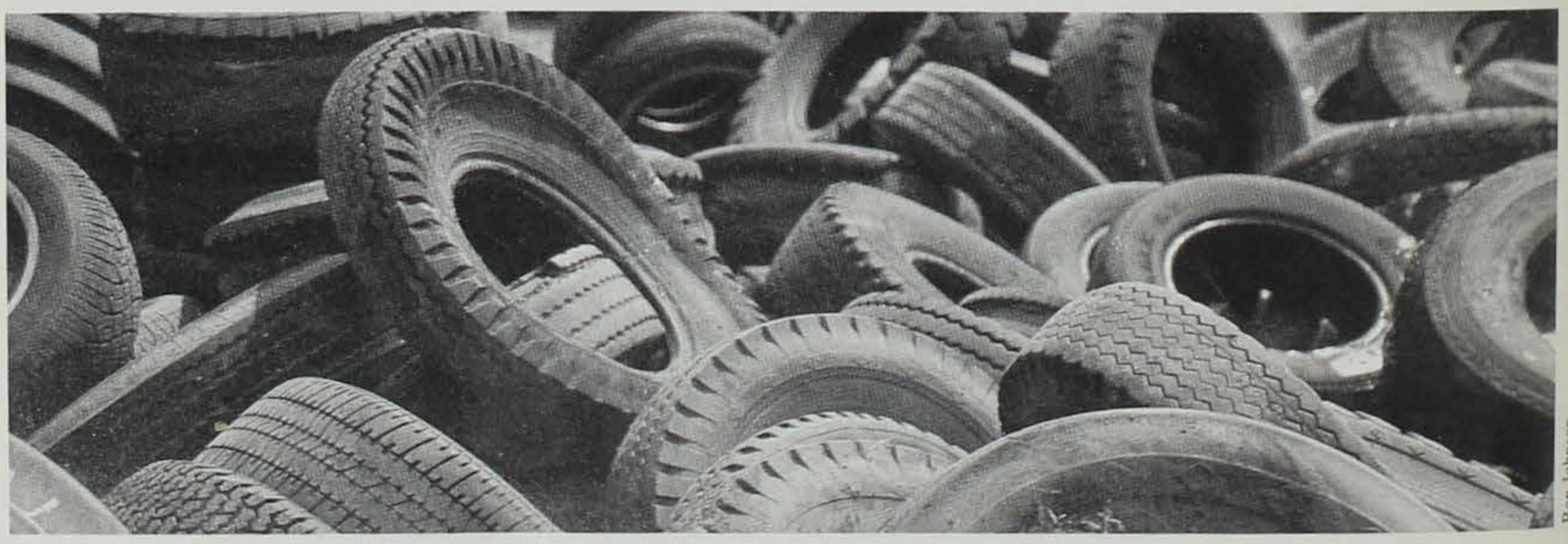
**Generation:** Approximately 1.6 million tons of rubber tires (or 240 million scrap tires -- about one tire per person) are generated annually.

**Percent:** Tires make up about 1.8 percent of the MSW stream.

**Recovery:** Annually, 11.6 percent of scrap tires are recycled.

**Iowa:** Whole tires are banned from landfill disposal in Iowa, and landfilled tire pieces must be no longer than 18 inches on any side. Iowa produces waste tires at the rate of about one tire per person annually or 2.7 million. Because of their number and problems associated with their storage and disposal, tires are a difficult problem. It typically costs $1 or more per tire for disposal. About 10 percent of the tires in Iowa are retreaded.

Scrap used tires are difficult to dispose of in landfills and waste combustors. An estimated two to three billion are currently stockpiled. These stockpiles can provide convenient habitats for rodents, serve as breeding grounds for mosquitoes and pose fire hazards. Of the scrap tires that are used, most are burned for energy. Scrap tires are also used for rubberized asphalt paving, molded rubber products and athletic surfaces.



Ron Johnson

*Meriwether Lewis and William Clark in Iowa? Where?*

*Several places along the Missouri River between July 18 and August 21, 1804.*

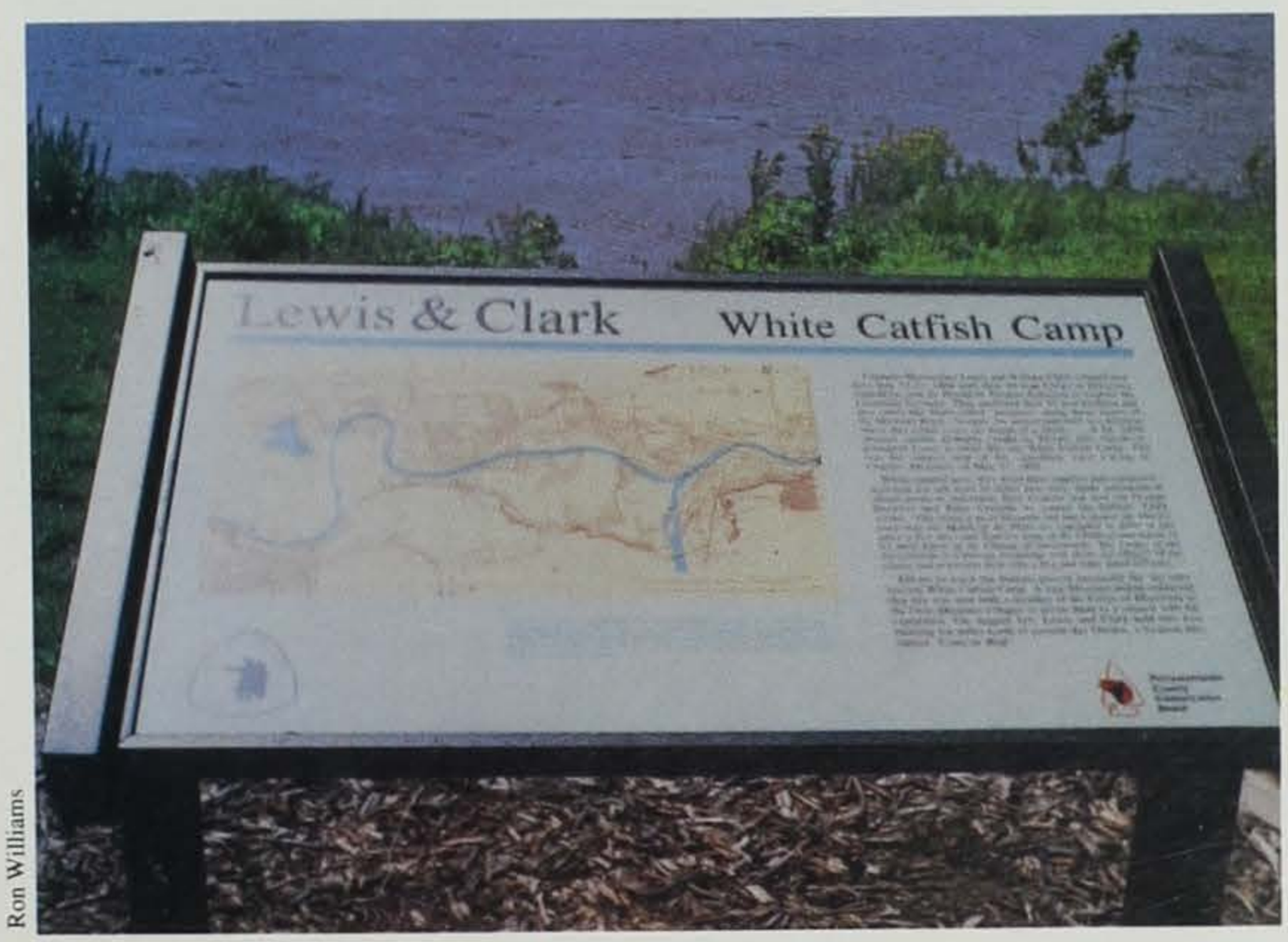
# On the Trail of Lewis & Clark

by Ron Williams

July 18 through August 21 is the time period it took Lewis and Clark and their three-boat expedition to travel the present-day Iowa portion of the Missouri River, from the southwest corner of Iowa to Sioux City. It took them 34 days to traverse this distance of approximately 150 land miles. We could travel the same distance today on Interstate 29 in three hours. In 1804 the Missouri River wound back and forth across the flood plain a distance of 313 miles for this same route. Today the flood plain seems very flat, except for the old river channels that criss-cross the interstate repeatedly, indicating the old Missouri River meandered. Some of these old river channels were actually the main channel of the Missouri River in 1804 when the explorers Meriwether Lewis and William Clark and their expedition of men and boats travelled upriver exploring the newly acquired Louisiana Purchase and seeking their all-water passage to the Pacific Ocean.

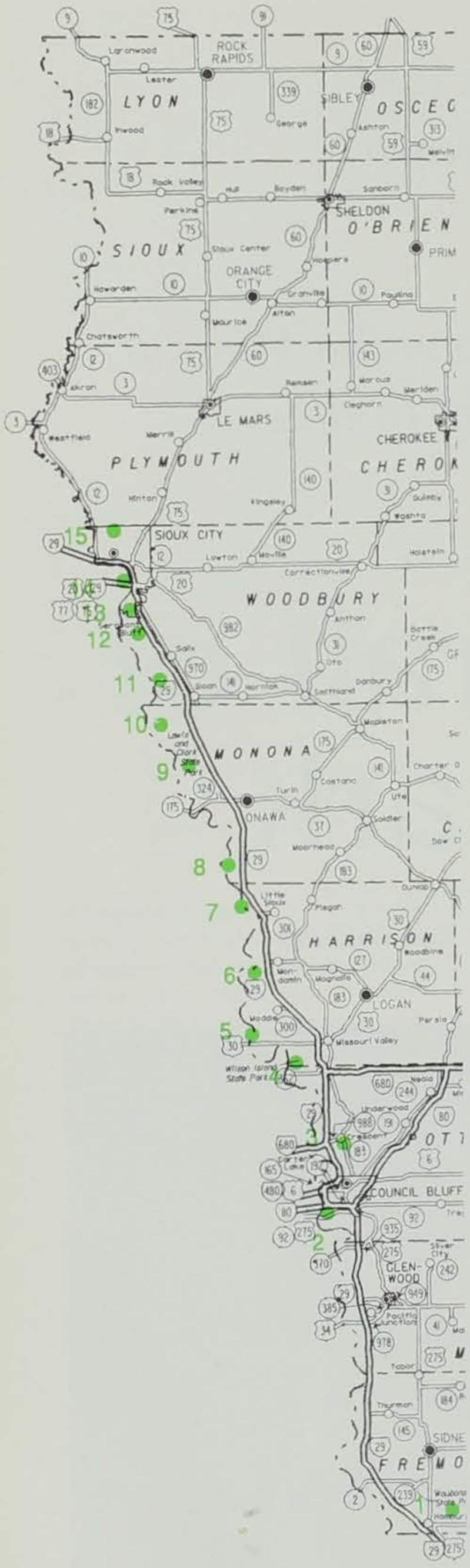
To aid in the study of this well-known expedition, the Iowa DNR and several local managing authorities are cooperating with the National Park Service and other states along the Lewis and Clark Trail by selecting various public sites and installing interpretive signage for public study.

In 1982 the National Park Service established the Lewis and Clark National Historic Trail as a part of their




Ron Williams

**Example of Lewis and Clark Historic Trail markers to be used to interpret points along the trail.**




National Scenic and Recreational Trails System. This trail is not a contiguous trail for hiking or multiple use. It consists of a number of sites and segments that relate to the Lewis and Clark Expedition.

On the morning of July 19, 1804, the expedition set out early after a breakfast of "roasted ribs of deer and a little coffee." Clark set out on shore after an elk and pursued it up into the hills. He records, "after ascending and passing through a narrow strip of woodland, came suddenly into an open and boundless prairie. This prospect so sudden and entertaining that I forgot the object of my pursuit and turned my attention to the variety which presented themselves to my view."

This quote from Clark's original journals, along with a map of Lewis and Clark's route in the area, will be interpreted by sign at:

**1. Waubonsie State Park** overlook near Hamburg, Iowa.

Other sites certified in Iowa that will also be interpreted by site specific signage include:

**2. Long's Landing County Park** (White Catfish Camp, July 22 to 27, 1804) south of Council Bluffs, Iowa, and managed by the Pottawattamie County Conservation Board.

**3. Lewis and Clark Monument Park** (July 28, 1804) north of Council Bluffs and managed by the Council Bluffs Parks Department.

**4. Wilson Island State Recreation Area** (July 29 to August 3, 1804) near Missouri Valley, Iowa, and managed by the Iowa DNR.

**5. DeSoto National Wildlife Refuge** (August 4, 1804), also near Missouri Valley and managed by the U.S. Fish and Wildlife Service.

**6. Remington Access** (August 5, 1804) west of Mondamin, Iowa, and managed by the Harrison County Conservation Board.

**7. Little Sioux Delta Access** (August 7 and 8, 1804) west of Little Sioux, Iowa, and also managed by the Harrison County Conservation Board.

On the morning of August 8, they passed the mouth of the "River de Cueoux" which the Sioux Indians called "ea-Neah Wau-de-pon" or Stone River and which interpreter Durion said passed through a large lake "Lac d-Spirit" or Spirit Lake, approximately "15 leagues upriver." They passed a long island they named "pelican island"


▲
**The Lewis and Clark National Historic Trail follows the route of these historic pioneers from "Camp Wood" near St. Louis, Missouri to the mouth of the Columbia River and the Pacific Ocean.**

from the large numbers of these birds which were feeding on and around it. One was shot and the men found that the bill of this bird would hold five gallons of water.

**8. Huff-Warner Access** (August 8, 1804) southwest of Blencoe, Iowa, and managed by the Monona County Conservation Board.

**9. Lewis and Clark State Park** (August 13 to 19, 1804) west of Onawa, Iowa, and managed by the Iowa DNR.

**10. Lighthouse Marina Restaurant and Campground** (August 10 and 11, 1804) west of Whiting, Iowa, and managed privately.

**11. Snyder Bend County Park** (August 13 to 19, 1804) southwest of Salix, Iowa, and managed by the Woodbury County Conservation Board.

August 18 was Capt. Lewis' 30th birthday. On the evening of August 19, Sgt. Charles Floyd "was taken violently bad with the [bilious colic] and is

dangerously ill." Floyd died the next day and was buried atop a bluff below the mouth of Floyd's River on August 20.

**12. Sgt. Floyd Monument** (August 20, 1804) south of Sioux City, Iowa, and managed by the Sioux City Parks and Recreation Department.

**13. Sioux City Riverfront Trail** (August 20, 1804) in Sioux City, managed by the City of Sioux City.

**14. Sgt. Floyd Welcome Center** (August 20 and 21, 1804) in Sioux City, managed by the Sioux City Convention and Visitors Bureau.

**15. Stone State Park's Elk Point Overlook** (August 21, 1804) northwest of Sioux City and managed by the DNR.

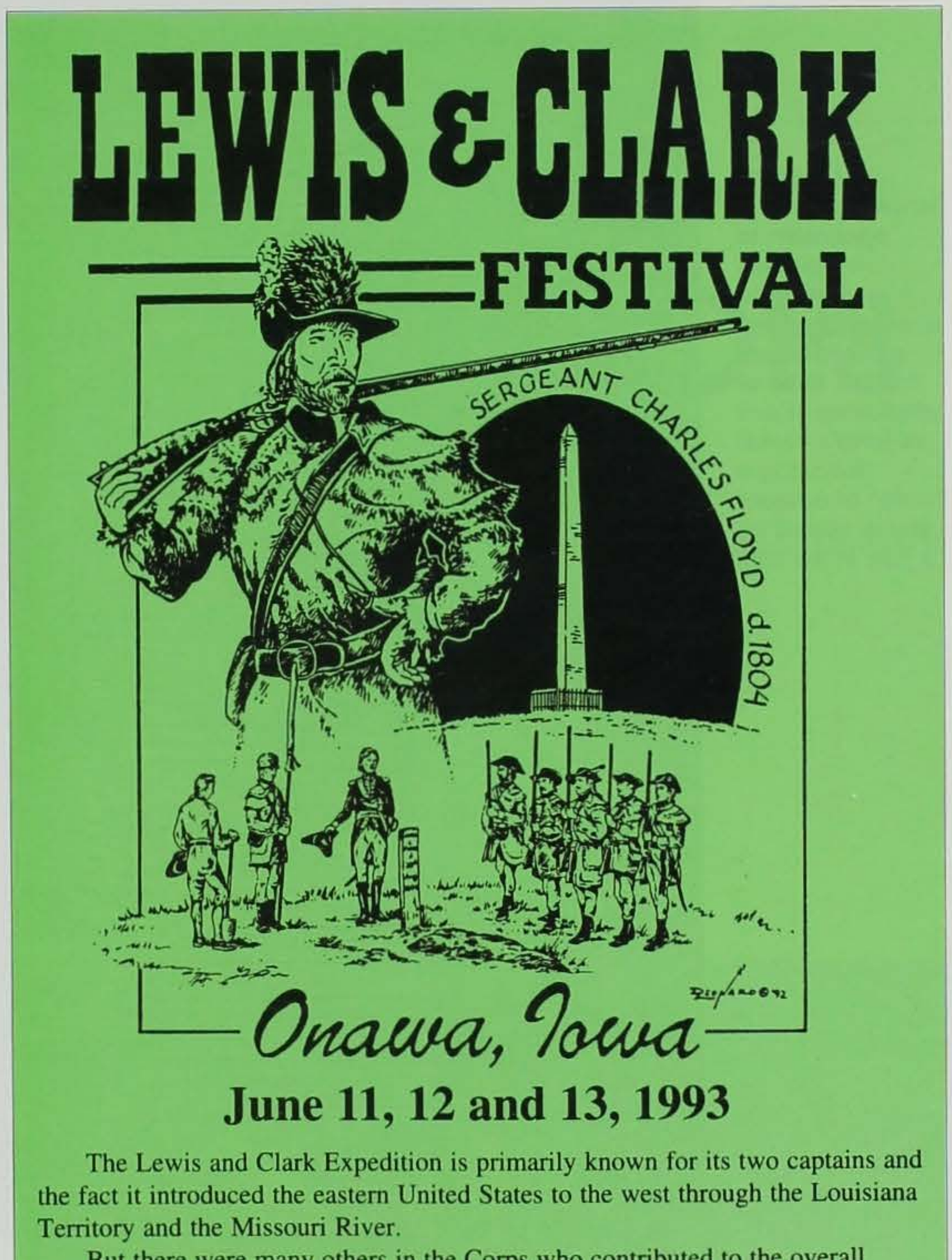
All of these sites will eventually have interpretive signs that give a brief glimpse of what Lewis and Clark observed as they passed through each particular area. Long's Landing County Park has already received and installed their site-specific sign and the other sites will follow when funding becomes available. Due to present budget limitations, private funding sources are being sought for the cost of developing and making each of these signs. Each individual management authority will be responsible for installation and maintenance of their particular sign.

Some sites such as Council Bluff's Lewis and Clark Monument, and the upstairs museum at the Sgt. Floyd Welcome Center in Sioux City already offer some interpretation in various forms. The additional sites will cover more completely Lewis and Clark's exploration in Iowa, and will support the overall National Historic Trail from Wood River, Illinois, to the mouth of the Columbia River on the Pacific Coast. Several of the other states have already completed their portions and Iowa is now adding to this trail.

The addition of these sites to the Lewis and Clark National Historic Trail will greatly aid the interpretation of this significant expedition along Iowa's western border.

---

*Ron Williams is the park ranger at Lewis and Clark State Park located near Onawa.*



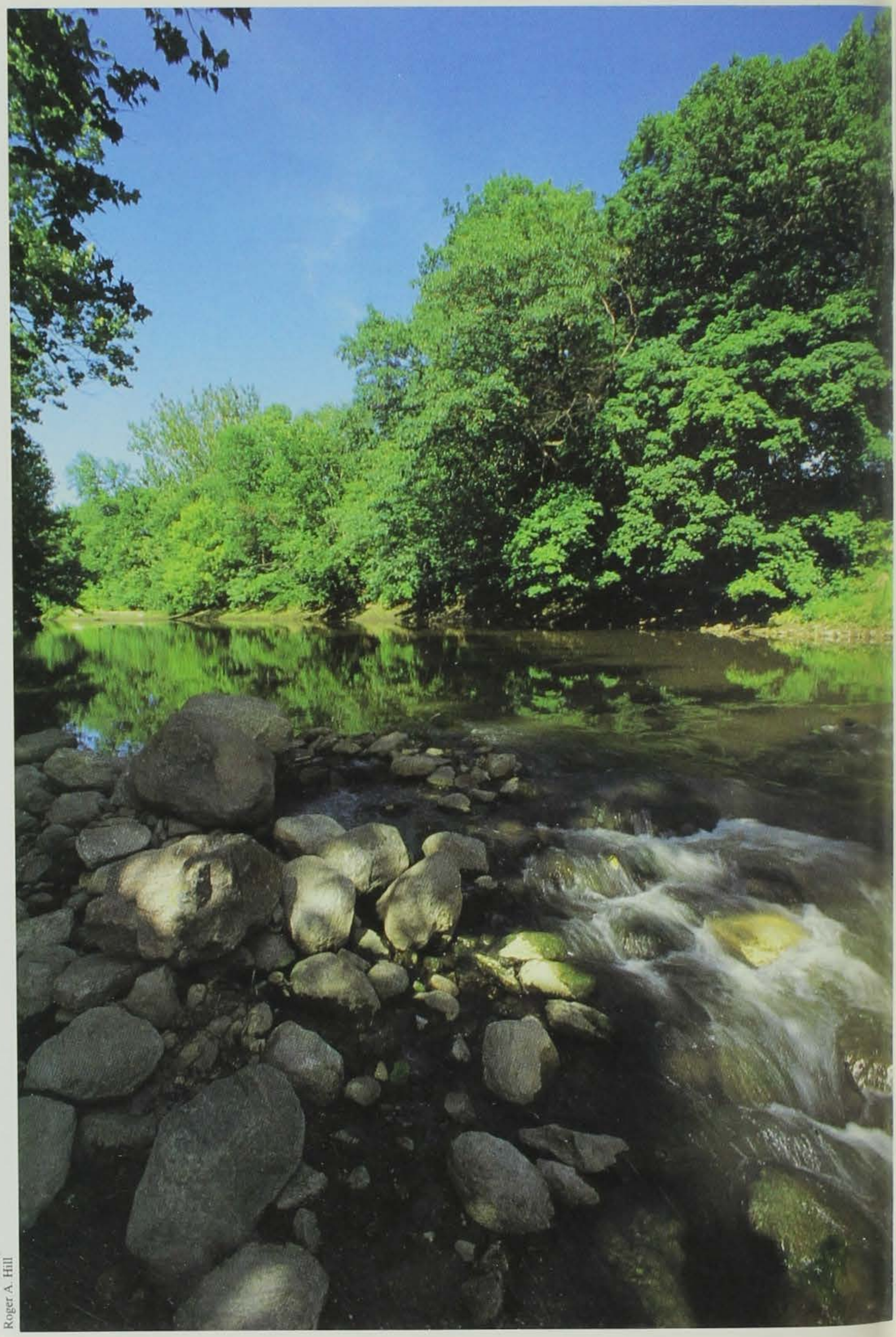

The Lewis and Clark Expedition is primarily known for its two captains and the fact it introduced the eastern United States to the west through the Louisiana Territory and the Missouri River.

But there were many others in the Corps who contributed to the overall success of this expedition. This was a military expedition with approximately 50 enlisted men and civilian boatmen when they left St. Louis in May 1804. They were separated into three details, each led by a sergeant who the two captains selected because of their leadership abilities. Sergeants Pryor, Ordway and Floyd were well respected by the captains and were invaluable in training, directing and disciplining the rest of the volunteers who were selected for the trip.

Sgt. Floyd is well remembered to historians because he was the only member of the expedition who died during the trip. He died on August 20 near present-day Sioux City of "bilious colic" caused by a ruptured appendix and apparently was somewhat ill when they passed the Lewis and Clark State Park area.

The Onawa, Lewis and Clark Festival honors Sgt. Floyd as its central theme in 1993. The festival is held each year at Lewis and Clark State Park, two miles west of Onawa's I-29 Interchange.

**Much of the following story is applicable to wilderness camping, but whether planning a backpacking trip out West or picnicking in one of Iowa's parks, following a "code" of outdoor ethics should be a part of the trip.**



Roger A. Hill

Using the Right Outdoor Equipment Helps Recreationists Tread More Lightly

# Low-Impact Goes High-Tech

by Michael Hodgson

To suggest we must leave no trace when traveling wild trails is an admirable goal but unfortunately one that cannot be backed up by deed. It is impossible to go anywhere outdoors without having some kind of impact. The best we can hope for is to pass through the woods, deserts and mountain peaks as a gentle breeze, lightly stirring the dust and treetops but leaving no permanent scar on the landscape.

Recreationists' misuse of our natural resources has, throughout the decades, left us with a legacy of eroded hillsides, scarred trees, polluted waters, trash-strewn meadows, trampled vegetation, blackened and charred rocks, and immeasurable disruption of wildlife. All of us who use the outdoors, whether on foot or by wheel, carrying a gun, fishing rod or hiking staff, stand to lose a lot if we continue these damaging practices.

Fortunately, outdoor outfitters, industries and consumers have discovered and developed ways to help all who visit the backcountry minimize or even eliminate their impacts.

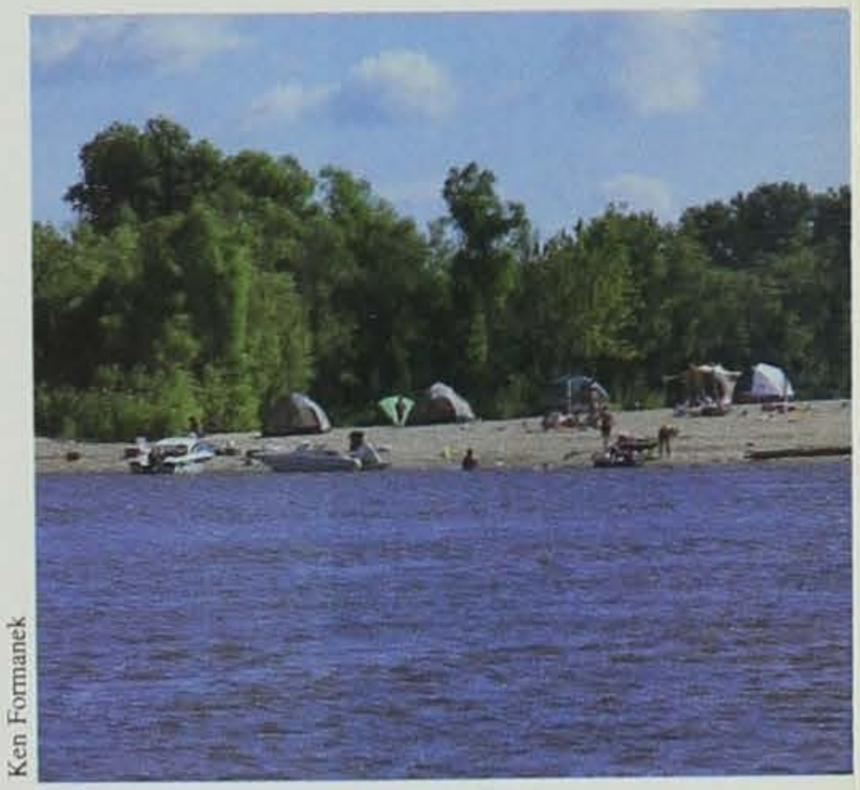
Many developments throughout the years have been technologically oriented tools that help promote the wilderness ethic. This is not to say that because we use stoves, fire pans and low-profile treads on our boots we can gloat that we are having no impact on the environment, because it must be recognized that through the very manufacture of these products there is an environmental consequence. Still, any step toward natural resource protection is a step in the right direction.

## Packing for Low Impact

The goal of low-impact outdoor use is to select gear and tools that will meet comfort and survival needs without harming or altering the environment. Here are a few suggestions about what to pack.

**Cooking**

For those intoxicated with the thrill of outdoor adventure, the fire has long served as an after-dark elixir, warmly coaxing forward camaraderie, tall tales and quiet reflections. But campfires have a dark side, more subtle than scarring forest fires caused by careless fire builders. Charred fire rings, rocks smudged black from use, scattered coals evident from half-hearted attempts at a wilderness ethic, broken or cut trees and branches, and half-burned logs too large for consumption and left strewn around an abandoned camp are a few of the more obvious impacts. Above all, the most detrimental and long-term



Ken Formanek

▲
**Although Iowa does not have the vast wilderness areas of the West, the "wild" areas we do have demand the same respect from visitors.**

. . . because we use stoves, fire pans and low-profile treads on our boots we can [not] gloat that we are having no impact on the environment, . . . through the very manufacture of these products there is an environmental consequence. Still, any step toward natural resource protection is a step in the right direction.

▲ ▲ ▲ ▲

impact of camp fires is the depletion of wood and other flammable materials vital to an area's ecological balance.

Camp stoves neatly solve this problem. Backpacking or two-burner camp stoves burn efficiently using either white gas or butane. Camp lanterns, either candle or gas powered, provide the necessary evening illumination for cooking and social interaction, although it must be said that many outdoor travelers prefer the glow of stars and an early night in the sleeping bag.

**Cleaning**

Water bags and shower attachments have done much to minimize water impacts. A 2.5-gallon water bag allows campers to fill up once then step away from fragile stream or lake banks. This is important because frequent trip to and from camp to the water's edge break down banks.

Add a shower hose attachment, and rinsing off soap is accomplished easily outside the minimum 200-foot distance requirement from the nearest waterbody. Some water bags even have a black side and a temperature gauge attached so a warm, solar-heated shower can be enjoyed.

No-water soaps are a recent development, tested during Operation Desert Storm and personally used by me on several river trips. They seem promising. Simply squeeze a small amount of the lotion into your hand, lather up and rub briskly into skin or hair. Once adequately massaged in, towel dry. No-water soaps tend to gum up the towel on an extended trip but for short excursions work admirably well.

**Waste Disposal**

The "zipper seal" bag a minimum impact tool? You bet! It's great for packing your food during a trip in, then for sealing garbage during the trip out.

River runners have long used a setup involving a large ammunition box, garbage bags and lime (the dry, white powder, not the fruit) to pack out human waste. This system can help minimize what would be an unacceptable accumulation of this waste, which can be detrimental to a river's health. A few back country users have begun using sealed plastic boxes and zipper seal bags to pack out waste in places such as deserts, canyons, rock-climbing areas and frozen terrain that is heavily traveled.

*Note:* Although water filtration is not in and of itself a specific tool to minimize impact on the wilderness, it is a tool used to minimize consequences of ingesting bacteria such as *Giardia lamblia*, which can cause intestinal illness during a wilderness outing.

Why do we need filters in the first place? Although there is some debate as to the initial source of *Giardia*, it generally is acknowledged that it is spread as a result of poor sanitation practices by, you guessed it, us humans.

**Accommodations**

Today's tents seem to be far more waterproof and better designed and constructed than their single-walled predecessors. A good tent design adequately sheds wind and heavy rain without the need for trenching. Trenching, needed and inspired because of the lean-to or tent constructions that left water pooling around slumbering campers, is a thing of the past and has no place in our back country areas.

What does a sleeping pad have to do with minimizing impact? Plenty. Pine boughs and leaf beds are out; closed-cell foam padding, or the increasingly popular self-inflating mattresses, are in.

Although relatively few people have explored the hammock as a minimum impact alternative, I can attest that it works marvelously well.

Hammocks are light, packable, versatile and comfortable and when coupled with a rain tarp, offer a sleeping arrangement that will allow you to camp anywhere there are trees. Although there is no earthy impact from a tent, you do have to be careful of abrading the bark, nothing several wraps around the trunk with a securing line won't solve.

**Apparel**

Certain types of deep lug-soled boots worn over the course of several miles, can displace pounds of dirt. The resulting chewed and chopped earth is susceptible to erosion during the first heavy rain. Place hundreds of boots on the same route, and one easily can imagine the potentially devastating effect.

Enter the low-profile treads common on light- and medium-weight boots in recent years. The specially designed treads easily release dirt and mud, prevent accumulation underfoot and in most instances leave very little trace of a boot's passing.

After a brief hiatus into the 1980s' world of visually arresting colors in outdoor apparel, manufacturers now are promoting a style and color scheme that is more natural and easier on the eye than neon and other bright clothing accents. Still, the trend is not to return to khaki and olive drab. Instead, manufacturers are designing clothing with an emphasis on rich color tones that are pleasing to the eye while remaining true to the natural world by blending instead of clashing. Of course, clashing is what you seek if you are traveling through the backcountry during hunting season, and blaze orange always has been and always will be readily available.

It's refreshing to see the outdoor industry striving to improve itself and take a leadership role in mitigating its impacts, both immediate and associated on the environment. With the formation of the Outdoor Industry Conservation Alliance a number of years ago, the industry took an aggressive and forward-thinking stance by advocating equipment design aligned with sound environmental thinking. The alliance also donates significant funds to promote grassroots conservation efforts.

Another industry organization, the Outdoor Recreation Coalition of America, recently has taken a leadership role by promoting and helping underwrite the Green Levels Project, which is developing a plan for solid waste reduction by the outdoor industry.

As more and more consumers demand environmental responsibility from equipment suppliers, it is clear that future products and packaging will reflect designs that meet those requests. Fortunately, for the most part, the outdoor industry and those associated with it recognize that as the wilderness goes, so goes the industry.

## What Not To Take

Certain equipment choices are not conducive to minimizing impact on the outdoors and should be left at home.

*Toiletries:* Cosmetics, hair spray, styling gels, mascara, shaving cream -- I have seen them all at one time or another in the wilds. Leave them at home. Let your beard grow, your hair blow in the wind and your skin return to au natural. Besides anything you put on eventually drips off and finds its way into the groundwater.

*Shovels:* What are your digging for? A small trowel for digging waste cat holes is all that is needed.

*Mallets:* If you can't push the tent stakes in by hand, it wasn't meant to be. Find softer ground.

*Radios, TVs, Walkie-Talkies:* come on. You are in the wilderness to leave behind your need for an overload of information. Unless you are working as a member of a search and rescue team or trail crew, the walkie-talkie isn't needed.

*Cigarettes:* I have seen enough cigarette butts littering the trails in the last two years to last me a lifetime. If you have to smoke, pack out the butts! Better yet, leave the cigarettes at home, and eliminate both a fire hazard and a barrier to your appreciation of sweeter air.

*Hand or Wire Saws:* use a stove! If you must build a fire, you should be using only downed timber small enough to break by hand, so the saw is unnecessary.

-- MH

---

*Michael Hodgson is an award-winning free-lance journalist and book author who writes as an outdoor columnist for the San Jose, California.* Mercury News. *He also is technical editor for* Outdoor Retailer *magazine and a contributing editor for* Backpacker *magazine. His most recent book is titled the* Basic Essentials of Minimizing Impact on the Wilderness *and is published by ICS Books. Contact 1-800-541-7323 for more information.*

Reprinted from *Outdoor Ethics*, Volume 11, No. 4, a quarterly publication of the Izaak Walton League.

# Take Advantage of Iowa's Good Nature

The solid waste problem affects Iowans at home, at work and at play. The problem doesn't go away during recreation activities -- in fact, it actually can increase.

The cans, bottles, wrappers, food waste and other items we dispose of add up. Iowa's state parks host more than 10 million visitations annually. The result is hundreds of tons of waste to dispose. This takes energy, requires the use of landfills, and includes many items that could be recycled.

Recognizing that waste disposal is no picnic, the Department of Natural Resources is initiating a simple carry-in, carry-out policy for picnic and other "day use" areas at all state parks and recreation areas. Everything you carry in you must also carry out.

Kathy Stangl

Except for campgrounds, lodges, cabins, group camps and beach concessions, waste bins are no longer available. Please pack your disposables to return home with you.

**Reduce wasteful habits by:**

▲ planning recreation and camping activities;

▲ purchasing reusable products; and

▲ avoiding disposables and individually wrapped items.

**Reuse resources by:**

▲ selecting durable rather than disposable dishes, glasses and cups;

▲ using washable cloth napkins, table cloths and towels;

▲ placing food waste in a separate bag or container for home composting;

▲ borrowing or renting items you use in-frequently;

▲ refilling liquid fuel stoves and lanterns; and

▲ storing leftover foods in reusable jars and dishes.

**Recycle:**

▲ glass jars, plastics, metal cans and newspapers.

Some Iowa state parks have recycling programs. When you visit a "recycling" park, please dispose of recyclable items such as glass, cans and plastics at the designated recycling points conveniently located for your use. Through recycling, we can all help to conserve resources and avoid waste.

**At the Campsite**

If disposable dishes, cups and glasses cannot be avoided, bring paper products which burn cleanly. Do not burn plastics or polystyrene (Styrofoam), glass, batteries or any metal. Carry these items out and recycle them at home or at the nearest recycling facility.

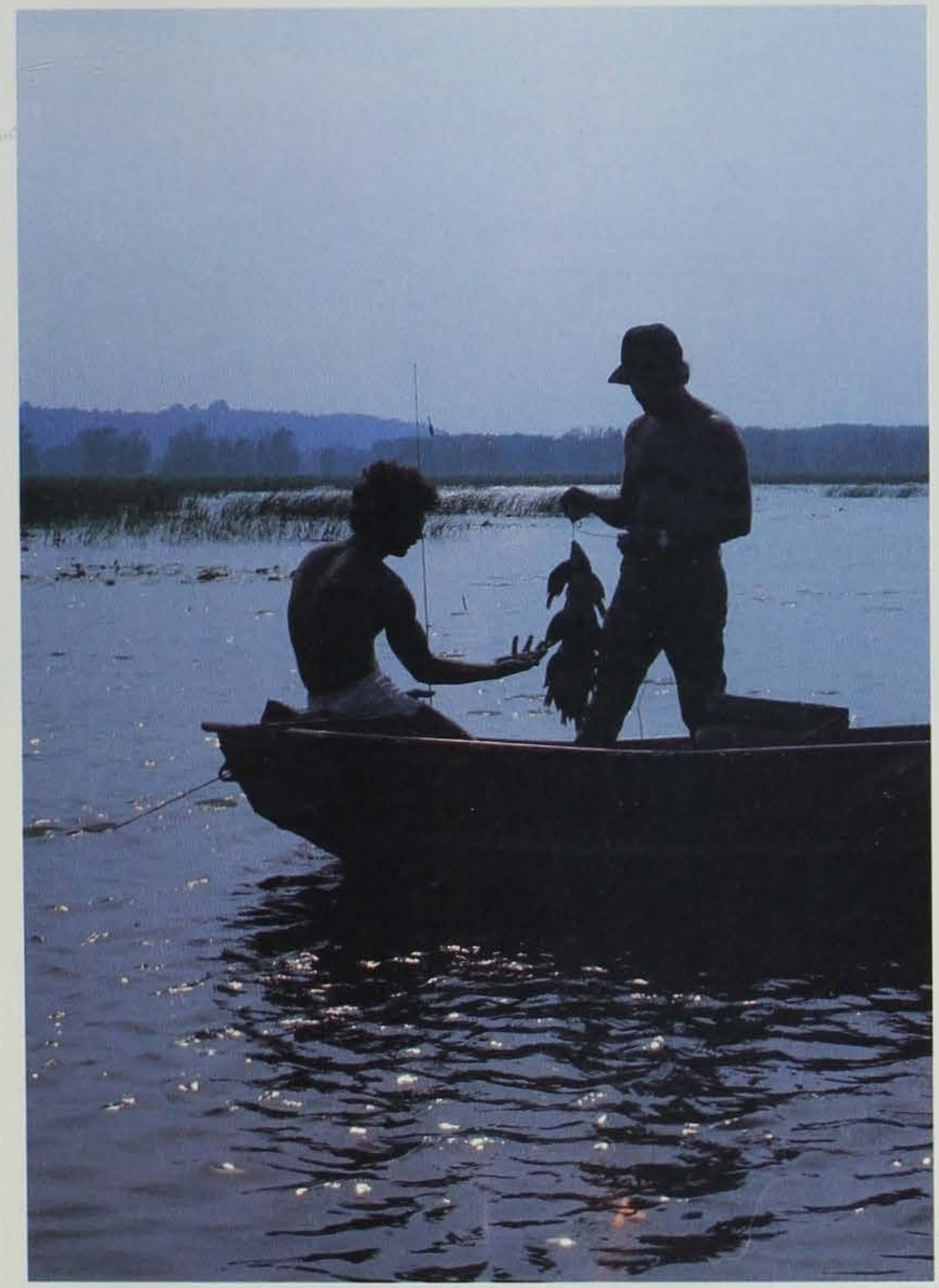
When planning recreational events this year, remember to carry-in, carry-out and recycle. We can fight the solid waste problem if we all do our part!

**Reduce**

**Recycle** **Reuse**

by Russ Gent

# A New Perspective On The Mississippi



Ron Johnson

Bert had lived on the river for 60 odd years and I jumped at the chance when he offered to show me his "hotspots." "Yeah," he said, "I caught a five-pound bass over there where that maple sapling is growing. Twenty years ago that used to be one of the best fishing holes on the river." He pointed out several of his "has been" hotspots but later that day we got around to sampling some of his current favorites.

As the saying goes, there are two things you can always count on, death and taxes. Perhaps we should add to this list that change is inevitable. The world around us is constantly changing.

Ron Johnson

▲ **By collecting long-term data on water quality, sedimentation rates, fish populations and plant communities, river managers hope to maintain the unique and diverse resources of the Mississippi.**

. . . river environments are in constant flux, slowly shifting sediment from one place to another . . . Many of these riverine changes are not evident on a daily or monthly basis but when we look over a period of years or decades . . . gross changes become evident.

Some changes can be rather dramatic such as the changing seasons. Others can be quite subtle such as the changes in geologic features which would go unnoticed to most of us without the science of geology. Between these two extremes there is a myriad of forces at work.

Within this gray zone, river environments are in constant flux, slowly shifting sediment from one place to another. Along with these physical changes, plants and animals respond to the changing habitat and try to keep up with the delicate natural balance. In fact river environments never achieve a state of balance and are constantly changing. Many of these riverine changes are not evident on a daily or monthly basis but when we look over a period of years or decades, as through Bert's eyes, gross changes become evident.

It is difficult for river managers to track all the changing topography on the Mississippi River; much less all the hydraulic, physical, biological and human factors influencing these changes. The Environmental Management Program was conceived and implemented to document the evolution of the Upper Mississippi River and to answer the major questions plaquing river managers. Initially approved by

Russ Gent

## Long-Term Resource Monitoring Area


◀ **Looking downstream at Pool 13 of the Mississippi River** (far left)**.**

**The Army Corps of Engineers is the principal administrator of the Environmental Management Program. Individual states collect data at six field stations. The U.S. Fish and Wildlife Service in turn analyzes the data at the Environmental Management Technical Center at Onalaska, Wisconsin.**

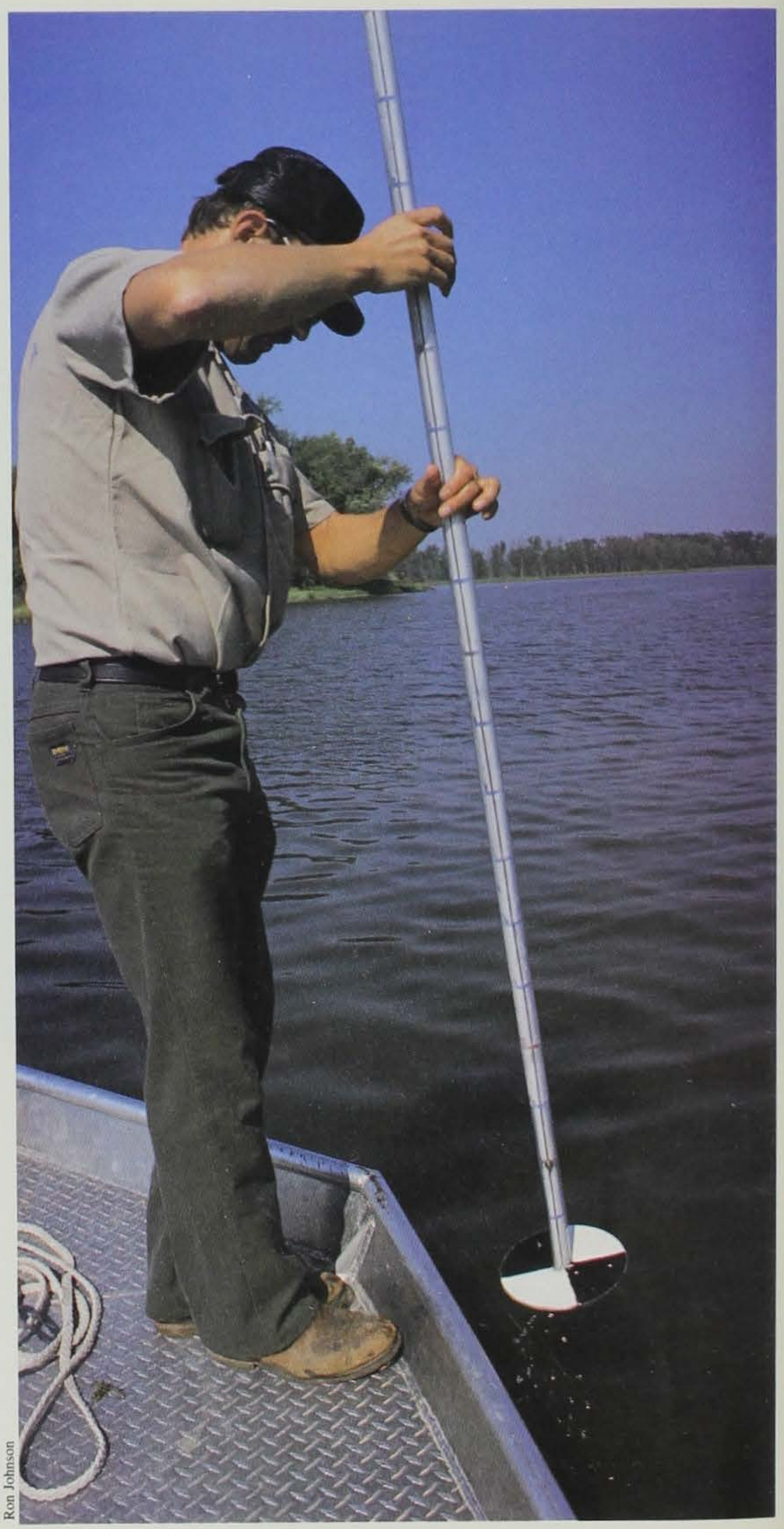
the U.S. Congress in 1986, the Environmental Management Program (EMP) was authorized for 10 years to gather detailed, system-wide information on the Mississippi River environment as we know it today, track the habitat changes as they occur, address specific problems, and restore lost habitat in strategic locations.

To address this monumental task, a multi-agency task force was used involving the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the states of Minnesota, Wisconsin, Iowa, Illinois and Missouri. This list includes the agencies who play a major role in managing the Upper Mississippi River System. With all agencies involved, a system-wide understanding of the Upper Mississippi is possible in addressing the major problems identified, namely sedimentation of the backwater habitats, fluctuating water levels, and a projected increase in commercial shipping.

The Army Corps of Engineers is the principal administrator of the EMP and manages the habitat restoration projects. Management of the data collection and analysis is the responsibility of the U.S. Fish and Wildlife Service located at Onalaska, Wisconsin. The individual states are responsible for data collection at six field stations stretching from river mile 30 at Cape Girardeau, Missouri, to river mile 797 at Red Wing, Minnesota, and including the LaGrange Pool on the Illinois River. Each field station collects detailed information on water quality (biological limiting factors such as dissolved oxygen, temperature, turbidity, current velocity, etc.), sedimentation rates, fish populations and plant communities.

Each field station is strategically located to assist the different habitat groups, or river reaches, on the Mississippi River so the data can be integrated on a system-wide basis. Along with standardization of methods between all field stations, this allows a unique opportunity to draw direct comparisons between different river reaches. When these relationships become a reality, river managers will have a proverbial crystal ball and will not have to guess what impacts a given project will have on the river ecosystem.

To draw this information together and analyze the similarities and differences between the river reaches, the U.S. Fish and Wildlife Service has assembled an impressive Computerized River Information Center. State of the art knowledge is being used to construct a Geographic Information System (GIS) to integrate the diverse information gathered by the Long-Term Resource Monitoring Program. In short, a GIS



Ron Johnson

**Water quality measurements are taken throughout the year. Researchers use equipment such as the Secchi disc to check water turbidity -- just one aspect of water quality.**

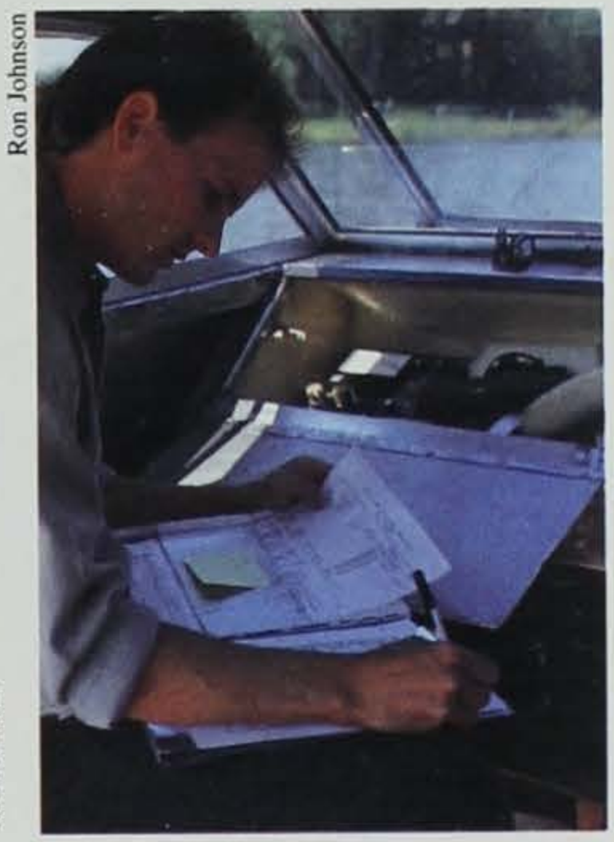
will have the ability to pinpoint the locations an amount of critical habitat such as waterfowl nesting sites, fish spawning areas, bass over-wintering areas and others. Updating this information system will also allow managers to track and quantify habitat changes as they occur.

Knowing the amount and location of critical habitat on the Upper Mississippi River will be a great asset. Being able to use that information and rejuvenate degraded areas to revitalize their usefulness, adds a whole new dimension. The habitat rehabilitation and enhancement projects do just that. In areas where critical habitat is limited or a productive area has lost its viability, money is now available under the Environmental Management Program to "move dirt" and restore essential habitat that has been lost during the last few decades.

Many projects have been proposed by all states bordering the Upper Mississippi but one of the first to win approval was the Brown's Lake rehabilitation project. Here, important overwintering habitat for panfish and bass was rejuvenated to restore adequate dissolved oxygen levels and allow access for fish movement within the area.

In addition to the Brown's Lake project, Big Timber, a backwater lake located south of Muscatine on Pool 17, was improved in much the same way. Bussey Lake near Guttenberg, is undergoing a similar renovation that

Ron Johnson



Ron Johnson

will not only improve the lake but create attractive waterfowl habitat.

Other major problems on the Upper Mississippi are also being studied. Research is being funded by the EMP to address specific problems such as the impacts of barge traffic on fish in the navigation channel, drafting new contour maps of the Upper Mississippi, and determining the rate of sedimentation in backwater habitats and how it can be reduced.

Thanks to the effort of countless individuals who have made the Environmental Management Program possible, the river is still changing and for the better. All too often when humans interfere with the natural scheme, nature loses. But when humans work with nature, everyone gains. It was very satisfying to see the grin on Bert's weathered face as he watched the dredge eat away at the maple sapling and restore his old bass hole. Maybe he'll show us a few more of his old "hotspots."

---

*Russ Gent is a fisheries biologist at Bellevue.*

Russ Gent

▲

**Determining vegetation baseline data in a shallow Mississippi River backwater habitat** (top left) **and collecting water quality inforamation** (top right) **are just part of the long-term resource monitoring done for the Environmental Management Program.**

**One of Bert's "fishing hotspots" is restored through a habitat rehabilitation and enhancement project at Brown's Lake on Pool 13 near Green Island.**

by Pat Schlarbaum

# THE EAGLES HAVE LANDED

*"There's a cottonwood tree with a nest of sticks half as big as the cab on my pickup truck. Come and take a look at it,"* exclaimed the caller. Reports such as these have been increasing in Iowa since 1979, when the first successful Iowa bald eagle nest occurred this century. In 1992 there were 19 bald eagle territories, 12 nests that were successful, and 22 young produced along Iowa rivers, with more than 1,000 nesting pairs in states to our north. For an endangered species, this is an amazing recovery few believed possible 20 years ago. Realizing the requirement to maintain the privacy of these nesting bald eagle pairs, a challenge was created: how to share the excitement of these rebounding birds and not spoil it by scaring them away.

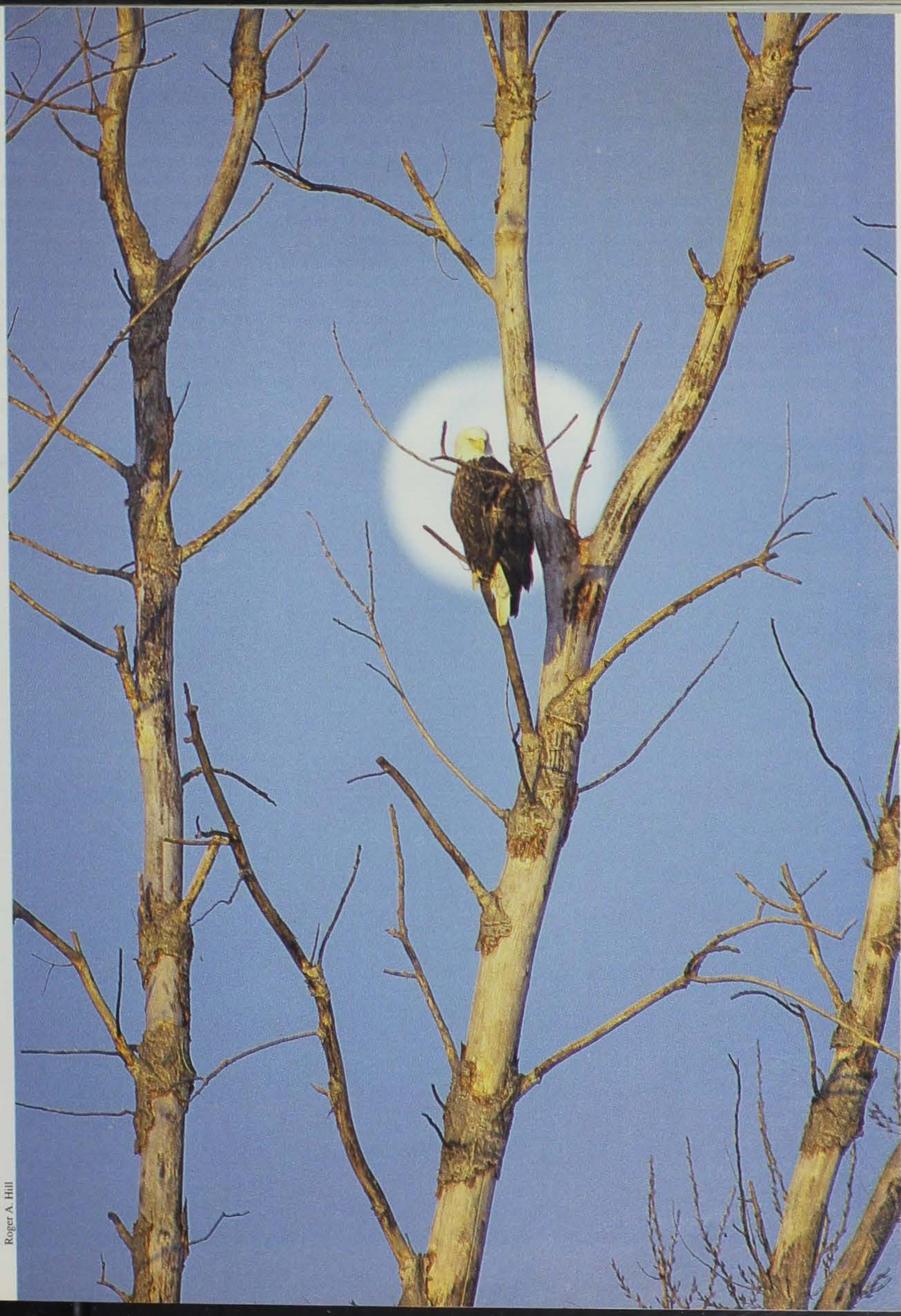
As a result of this responsibility, a replica of a bald eagle nest was created in 1988 by the Iowa Nongame Program of the Department of Natural Resources. The nest has been used extensively for Bald Eagle Appreciation Days events throughout the Midwest to aid in explaining the nesting ecology of the bald eagle. Actual eagle nest sticks were salvaged from a blown-down nest and included in the construction of the replica. What follows is a nesting chronology of bald eagles from the time the adults leave the over-wintering area to the fledging of their young. Some of the information was condensed from a pictorial book, *A Season with Eagles,* by Dr. Scott Nielsen, who photographed a nesting eagle pair in Wisconsin. Nesting is more common there, but the basic life cycle stages apply to Iowa eagles as well. As our national symbol, bald

Ronald Eckstein

▶
**(Right) Bald eaglets.**

▶
**(Far right) As early as mid-winter, bald eagles return to their northern home in preparation of another nesting season.**

Roger A. Hill



Roger A. Hill

eagles nest exclusively in North America and are not found anywhere else in the world.

## NESTING

As early as mid-winter, the bald eagle pair returns to its northern home in preparation of another nesting season. They have spent the past few months fishing unfrozen waters further south. Spring thaw is still weeks away, but the eagles will scavenge remains of deer and other mammals that did not survive winter. And, where available, eagles will fish open water areas. The pair's home range will include 10 to 15 square miles of wooded terrain, rivers and lakes. Only a few locations in the region will be ideal for a nest.

The nest site or eyrie will be, in most cases, an older, dominant tree with strong support branches. Quite often the nest tree was overlooked by turn-of-the-century loggers that selected straighter trees with less branching. The tree will be isolated, near water, and included in a territory of one square mile. The pair will defend the territory against any nesting competitors, such as other bald eagles and predators, such as egg-stealing squirrels, crows or gulls.

Both sexes are compulsive nest builders, and will construct a new nest from scratch or add to an existing nest each year. Working for a few hours each morning and evening, a nest can be constructed in about a week. Sticks and dead branches from nearby trees are the most common nest materials. Some branches can be six to seven feet in length. Cattails, grasses and mosses are used to fill in the gaps between the branches, creating a platform that may be six feet wide and eight feet deep and weigh a ton. This is a substantial feat, even for a 10- to 14-pound bird with a wingspan of seven feet.

The nest is generally secured near

the trunk in stout branches about 90 percent up in the tree, providing a clear view of the surroundings. Open flight paths to and from the nest are essential. The top 10 percent of the tree will offer some privacy to the eagles from harassing gulls and crows. Also, necessary shade for the brooding female and young will be provided.

In late winter, eagles tend to their nest, do their courting and mating, and prepare for egg laying. These daily activities and feeding take only a few hours. The remainder of the time is spent perched at the eyrie, scanning the area. (The eagles face opposite directions and are afforded a 360-degree view of their territory.) Any strange sound will prompt them to determine the source. Upon visual scrutiny, if the disturbance (for example, human activity) warrants, the pair will fly from the nest. Permanent abandonment of the nest site can occur at this time, if the eagles' privacy is threatened. Again, *no human activity* can be tolerated within one-quarter mile of eagle nest sites, during the late winter/early spring season.

## EGG LAYING

When the eagle pair is assured its

▼

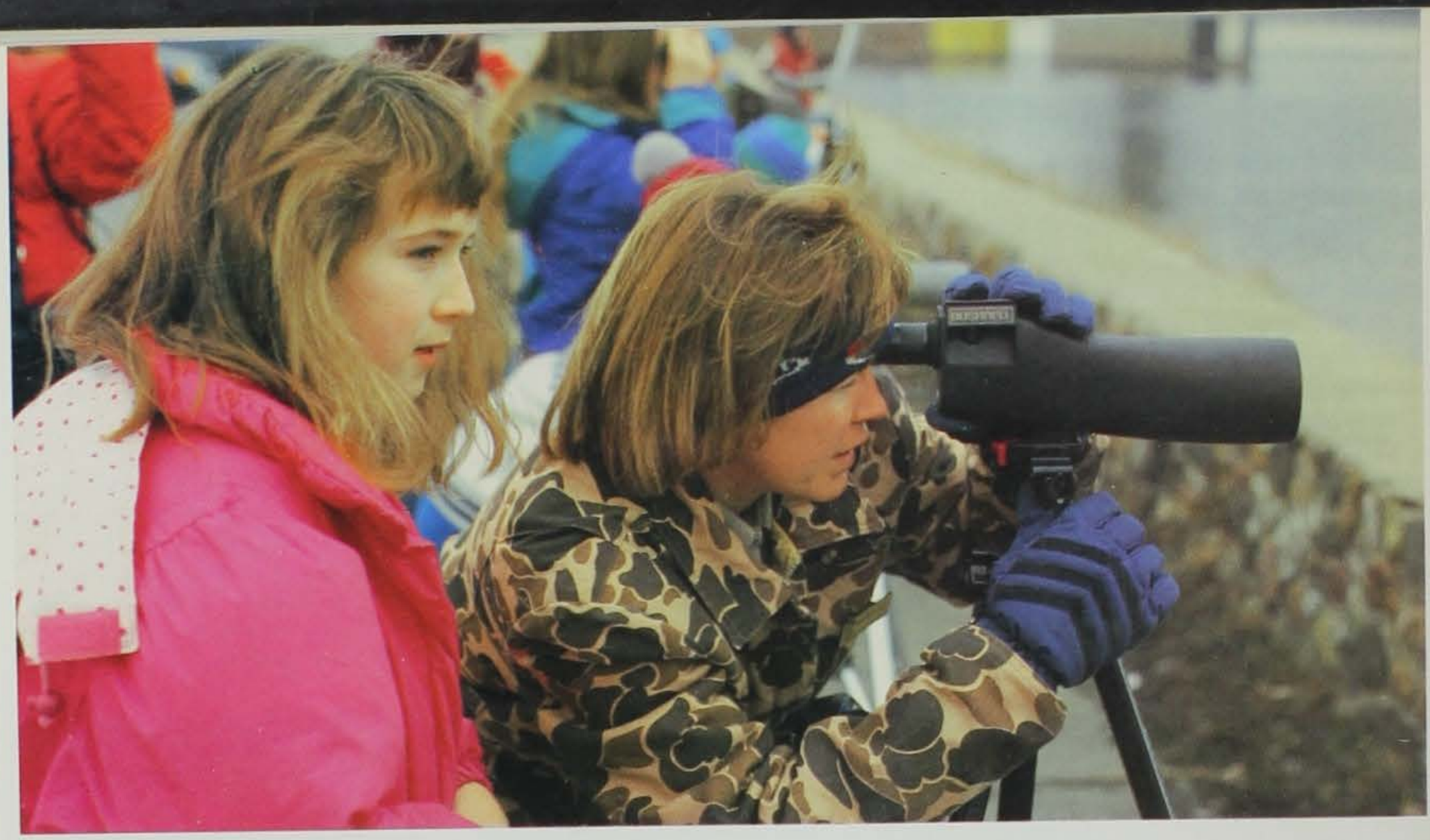
**Generally, after the 10th week, the young eagles fledge or take their first flight. This first flight is usually awkward, at best, and occasionally disastrous. Nearly 70 percent of all raptors, including eagles, do not survive their first year.**

Barb Schoenherr

Barb Schoenherr

◀

**The eagle nest is secured approximately 90 percent up the tree near the trunk, providing a clear view of the surroundings.**



Ron Johnson

▲
**Bald Eagle Appreciation Days are held throughout the Midwest to provide a rare opportunity to see the eagles up close and to learn more about them.**

Ron Johnson

▶
**A replica of a bald eagle nest was created as an educational display to discuss the nesting ecology of the bald eagle.**

nesting territory is secure, mating will begin. The male will mount the female, flapping his wings to maintain balance. When his tail has worked under the female's, sperm is deposited and mating occurs. This sequence generally happens at the nest site.

According to noted ornithologist, Dr. Nielsen, "An old folk tale says eagles mate in mid-air, but the weight of the birds and the necessity for cloacal touching makes this impossible, although it is a romantic thought."

After mating, the female enters a lethargic period, staying at the nest site, and the male brings her food once or twice a day. The male continues to feed his mate through the time the eggs are laid. Eagles lay two or three eggs at four-day intervals. Once eggs are laid and incubation begins, the male will relieve the female on the nest. He generally incubates for a few hours at midday, while the female leaves to

bathe, preen and feed herself.

The first egg hatches after 35 days of incubation, and each succeeding egg hatches at four-day intervals. Twenty-four hours or more may pass from the time the egg shell is first pierced until the eaglet finally wiggles free. The male spends more time at the eyrie after the eggs hatch, and brings pine sprigs to the nest site, possibly to act as camouflage or shade for the young. The female feeds the young (called eyas or eaglets) saliva-rich morsels of fish, every hour or two and resumes brooding. This is a very critical stage of eagle development, and chances of desertion are quite high until the eaglets are more than two weeks of age.

## YOUNG

Eaglets' eyes open after one week and young "imprint" on the first movement they see, usually the adult eagles. The eaglet learns to recognize its species and learns to recognize itself as an eagle. While imprinting is occurring in the young, "bonding" is occurring in the adult eagles. By feeding the young, parents form a stronger attachment to the eaglets and the nest. Only after bonding has occurred will parents be unlikely to abandon the nest site should disturbance occur.

By three weeks of age, traditionally Memorial Day weekend, the majority of eaglets are banded by biologists of the U.S. Fish and Wildlife Service (USFWS). Blood samples are taken to check for harmful poisons, lead and mercury. The eaglets, having been fed every three to four hours, have grown to five pounds and stand about 12 inches high. Their feet are nearly full-sized, so USFWS bands do not slip off their legs.

The fifth week of development is distinctive and is called the "ramage" stage. Their down has been replaced by feathers for protection from the sun and weather. The eaglets can tear food apart and feed themselves, and consequently can be relocated to reintroduction projects around the nation. These management practices have bolstered areas of low eagle populations.

At seven weeks of age, the young experience a solitary nest life. Parents visit with food once a day, but perch nearby so as not to draw attention to young in the nest. The young have attained the full fledging weight of 10 to14 pounds, but feathers are still developing.

After eight weeks, young are wing exercising and are referred to as "wingers." It is at this stage young occasionally fall from the nest. Therefore, no banding of young occurs after the eighth week.

Young are perching in the branches of the nest tree at nine weeks of development, and are called "branchers." The eaglets improve the grip in their talons as they flap about the branches of the nest tree. A strong grip will become crucial when they have to grasp their own food.

Generally, after the Fourth of July and the 10th week, the young eagles fledge or take their first flight. Several days before fledging, parents do not bring food to the nest, rather, they perch nearby with food to entice the young to fly. Their first flight is awkward, at best ,and occasionally disastrous. Nearly 70 percent of all raptors, including eagles, do not survive their first year. Young eagles stay near the nest site for a few more weeks (up to five), where they continue to be fed by the adults and develop stronger flight muscles. By late summer, immature eagles are flying well outside the nest territory and learning to hunt and forage their own food. They will likely leave their parents' home range in September, traveling irregularly and unpredictably.

For the next four to five years, the immature eagles are on their own, until sexual maturity is reached. With their white heads and tails replacing the darker coloration of the immature eagles, bald eagles will seek a mate and suitable nesting territory. Eagles mate for life. However, if one of the pair perishes, the other will generally attract another to the territory. In a sense, bald eagles "mate" to the territory.

## HABITAT

As with many species, loss of suitable habitat is by far the biggest problem eagles have to deal with. For bald eagles, suitable habitat means large trees for nests, in areas free of disturbance, especially during the early part of nesting. Protection from predators, and room for roosting are also required. Suitable habitat means an adequate supply of food, mainly fish, which in turn means access to water.

During the winter, eagles congregate in areas where food and night roosts are available. Eagles are opportunistic feeders and concentrate on major river systems below dams and power plants, or at other areas where open water allows them to feed on fish and waterfowl. Upland fields with improperly disposed livestock carcasses will draw eagles away from major river systems.

As the bald eagle population increases, wintering and night roosting areas free of disturbance and development have become essential. Nearly a thousand bald eagles resided in Iowa in 1993 and protection of their overwintering sites is imperative if the bald eagle population is to truly thrive. During extremely cold weather, bald eagles are under pressure to consume enough food and expend as little energy as possible to maintain body heat. Causing eagles to fly by approaching too closely is unethical and bad for the birds. While observing eagles in the wild, use a spotting scope or binoculars and keep well away from their perching sites. Stay in a vehicle when possible or stand behind a stationary structure when viewing eagles. Keep on the opposite side of the river or lake to allow them a peaceful refuge. For eagles to return to nesting areas in the best condition possible, we must insure their overwinter stay here is also a healthy one.

Even if you're not fortunate enough to view an eagle's nest in the wild, much can be enjoyed and appreciated concerning our national symbol. Bald Eagle Days events held around the state each year provide a rare opportunity to see these majestic birds up close and learn more about them. The replica eagle nest provides a unique educational display in Iowa's ongoing effort to present quality programs about its nongame wildlife.

---

*Pat Schlarbaum is a nongame wildlife technician for the department at Boone.*

[redacted]

by J. Edward Brown

# IMPLIED CONSENT

**1. What is implied consent and how does it function?** Implied consent provisions for boats should be like those for automobiles. As a result of your privilege to use public waters, you agree to be subject to testing. If you refuse to test, you lose the privilege to operate a motorboat or sailboat. This penalty would not affect a person's ability to operate another recreational vehicle or motor vehicle since there are no ties to provisions regulating the operation of these vehicles. Finally, although you can still be prosecuted for operating while intoxicated based on other evidence gained by testing through implied consent, the likelihood of conviction is much less.

**2. Can you impose the implied consent requirement without having a license to operate?** Definitely yes. Although some have maintained there must be a license to revoke for the process to be effective, in most implied consent states no license is required to operate a boat. The penalty is the loss for one year of the privilege to operate watercraft. Some states impose fines in addition to the loss of use. One state imposes a 90-day suspension for an OWI conviction and a year suspension if you refuse to be tested as a further incentive to test. It should be noted that for motor vehicles operators, hundreds of motorists are arrested for operating while intoxicated after their license is lost. The courts can still impose sanctions against such violations.

**3. What states contiguous to Iowa have boating implied consent laws?** Minnesota, Wisconsin, Illinois and Nebraska.

**4. Has the implied consent law in those states resulted in aggressive enforcement?** No. The state administrators have indicated no problem with over-enforcement. Operators tested are most often stopped for other violations including operating a boat without lights or operating too fast in a no-wake zone or too close to other boats, or other unsafe practices. Concern expressed that seasonal help might make arrests or require testing under the bill are addressed by authorizing only full-time peace officers to require testing.

**5. What is the main impact of adopting implied consent legislation?** To clearly draw the line between having fun on the water and creating a condition where excessive drinking causes harm to others. Nebraska officials, for example, indicated that a primary benefit of their law was the publicity that it generated. People become much more aware of the dangers of OWI and the need to use restraint or provide for a designated operator.

**6. Is operating while intoxicated that much of a problem?** Yes. Between 1983 and 1992, 88 persons have died and 294 persons have been injured in boating accidents in Iowa. A number of these are alcohol-related. Without testing, however, we cannot know the total. Also, when intoxicated boaters start drive home, they become drunk drivers -- a condition that Iowans have been intolerant of for years.

**7. Will this law prevent the consumption of alcohol?** No. Only the operator is subject to testing. An open container of alcoholic beverage in your boat is not a violation. This proposed legislation will not change that.

**8. Will a "recreational" OWI affect my driver's license?** No, there is no connection to the driver's license. On the other hand, statistics from other states indicate that 50 to 75 percent of those found OWI on the water have a prior history of OWI in motor vehicles. For those concerned about the prospect that the bill infringes on the right to avoid self-incrimination, the *only* penalty is the loss of use of the right to operate as previously noted. There is no fine or taking of property that would further compel compliance.

**9. How will a person under suspension be detected, since there is no license to suspend?** Exactly as with motor vehicles -- by sight recognition. The number of motorists caught driving without a license clearly shows that revocation does not keep people off the road. Boats and boat operators are less numerous and easier to recognize.

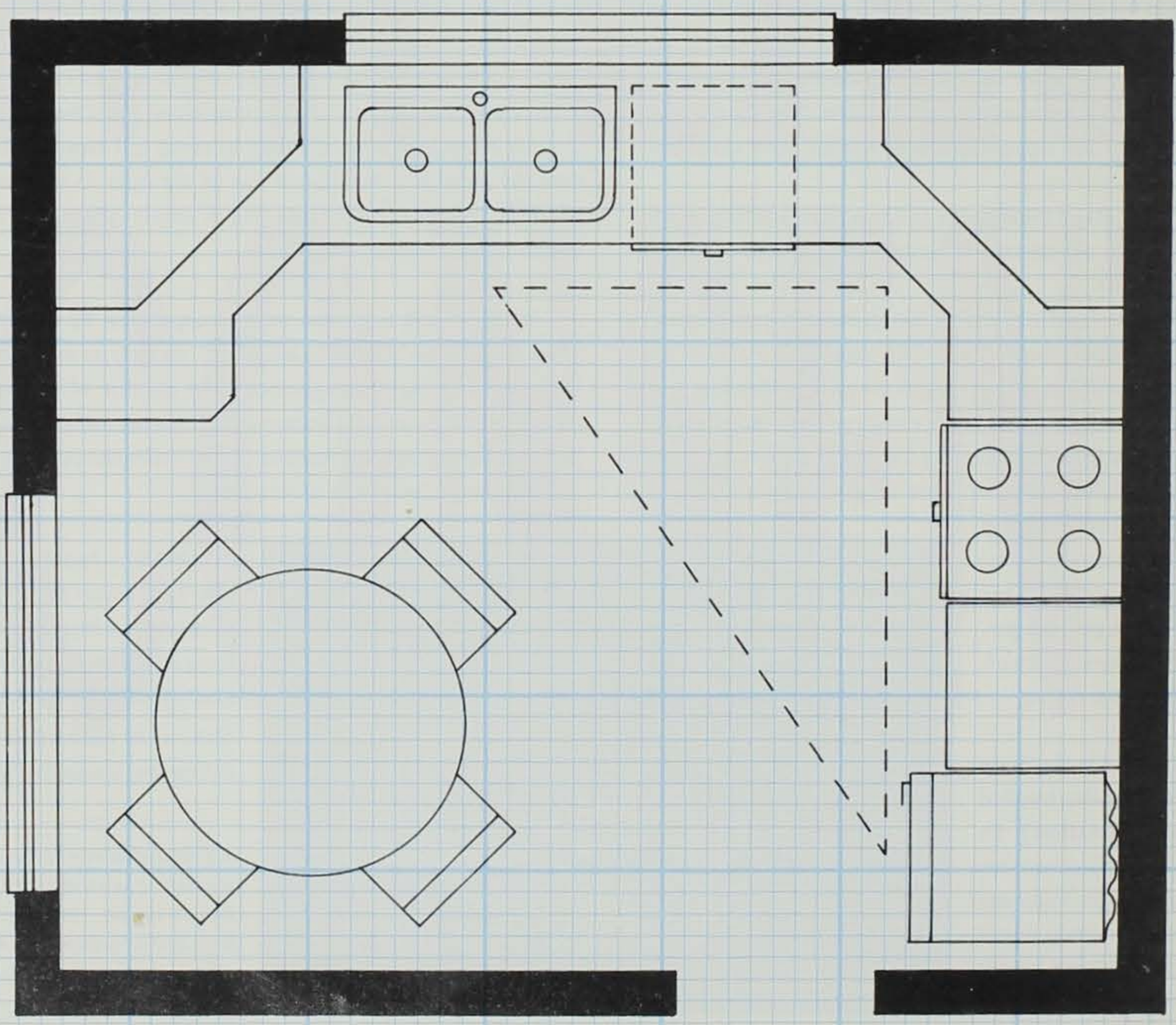
*NOTE: Implied Consent Legislation For Boats (House File 230) passed the Iowa House of Representatives during the 1993 session. It is expected to go before the Senate in 1994.*

---

*J. Edward Brown is the state waters coordinator and serves as the department's legislative liaison on various conservation-related issues.*

# REMODELING WITH THE EARTH IN MIND

by Julie Kjolhede



*6:30 p.m. After serving a healthy dinner to their family, kitchen clean-up begins as John scrapes food scraps into a blender next to the sink, while at the same time reminding his daughter, Ella, to gather the cloth napkins for the hamper. At the sink, Mary is peeling labels from vegetable cans before rinsing and drying both the cans and an olive jar as her son, Mark, retrieves a utility/recycling collection cart from behind a bi-fold door. Rinsing complete, Mark grabs a towel and begins drying the recyclable materials and placing them onto the cart.*

*Back from the hamper, Ella transfers leftover baked salmon into an empty, reusable container as Tabby, the family's pet cat performs a series of figure-eights around her ankles. Thinking someone should appreciate it, Ella sneaks a glance towards her dad, who's busy mixing the pureed food scraps into a plastic tub to be composted, and slips a generous serving of salmon into Tabby's dish.*

*The indoor food composting started, recyclables stored, leftovers refrigerated and cat fed, the family prepares to host a neighborhood "Earthwise" meeting. Tonight's topic: Home Remodeling With the Earth In Mind.*

---

"Waste not, want not." These words of wisdom, spoken by generations of Iowans are fast becoming the emerging aspect of our 90s lifestyles. Decisions determining how we heat and cool our homes, wash and dry our clothes, cook our food, clean our living spaces, and dispose of our wastes — all impact our homes, our health and our environment. Therefore, the job of healing the earth doesn't begin with the distant experts or the polluting companies on the coasts. The job of healing the earth begins with the actions each of us takes within our own home.

While you may not be willing or able to improve all of your home's functions at once, a few simple and gradual changes to your home — and your lifestyle — can start you moving in an Earthwise direction. And what better place to begin, than the hub of daily life: The kitchen.

Today's kitchen is often wasteful of valuable resources. And the most wasteful of our resources are the throwaways: cans, bottles, paper and plastic packaging, cardboard and newspapers, and food wastes that find their way into our trash and into our garbage disposals. And what about garbage disposals? Much like landfilled wastes, food wastes deposited into garbage disposals don't "go away," they just go somewhere else! And "somewhere else" is likely to be an already burdened municipal sewage system or an overloaded septic tank. Think about indoor composting instead. It's simple, resourceful and 90s smart (see sidebar on page 40).

In order to "waste not," planning a kitchen space that is appropriate in size, shape and location to its intended functions is a priority. One intended function of the 90s kitchen is to include recycling as a practice. If you're designing a full-scale kitchen remodeling effort, plan for maximum recycling as you would plan for any other "built-in" feature. One solution for adding recycling space to your

## FACTS TO KNOW AND TELL

One in every six trucks in the United States is a garbage truck.

Americans throw away enough aluminum every three months to rebuild our entire commercial air fleet.

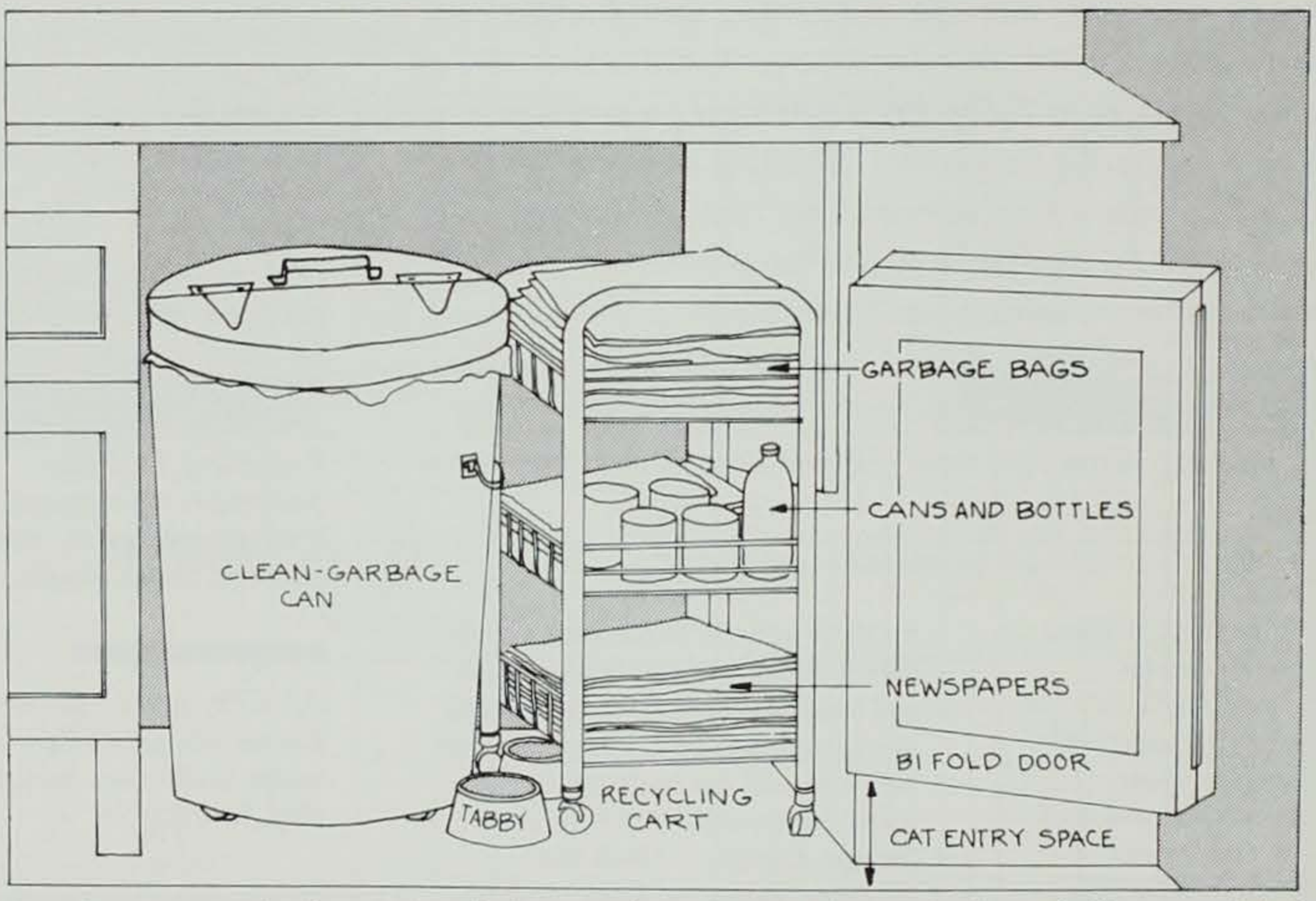
One day's junk mail could produce enough energy to heat a quarter of a million homes.

Recycling a single aluminum can saves enough energy to run a TV set for three hours.

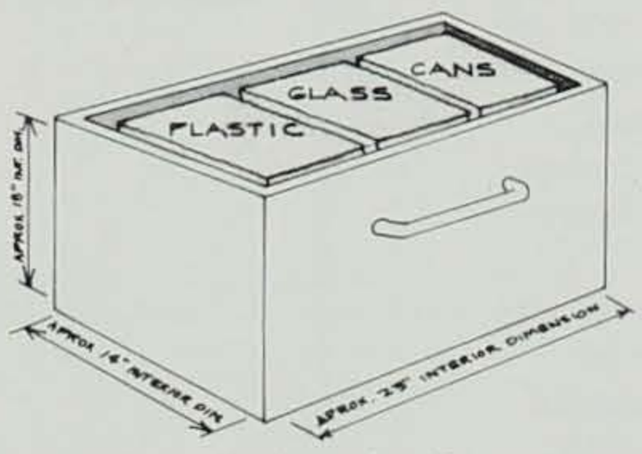
An EPA study showed it takes householders a little more than two minutes a day to recycle.

# RECYCLING KITCHEN WASTES

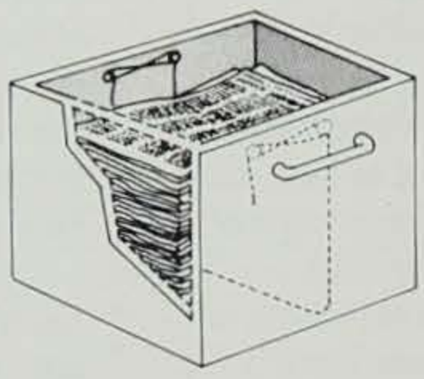
Rearrange a space in or near the kitchen for convenient collection of recyclables. Whether you have available space for recycling collection in an existing drawer, shelf or on a utility cart, or you're preparing to remodel and can't decide if recycling is worth building into your improvement plans, consider this: today's resources are tomorrow's future . . . and do you really want to throw that away? Re-think the way you live . . . Respond with the earth in mind.




*The large garbage can on wheels minimizes "taking out the garbage." The cart facilitates holding materials for reuse and recycling. The space below the door permits pet access to food when door is closed.*




*Designed to hold standard brown paper bags.*



*Note: Twine holder makes bundling easier.*

present kitchen design may be detailing the inside of an existing cabinet with pull out shelves or converting a cabinet to a drawer. Check with local carpenters and building supply stores for storage ideas. You don't have to spend your fortunes to collect recyclables. Consider that a simple review and reallocation of space, in addition to a recycling bin or cart may be enough to meet your present needs.

The key to incorporating recycling as a daily routine is keeping related activities together, and out of traffic areas.

◆ Locate the recycling bin or cart near the use site(s). For example, for indoor food waste composting, place both your blender or food processor near the "mix center" (food preparation area). For most kitchens, this area will be near the sink where rinsing and drying of recyclable containers will also occur.

◆ Allow enough collection space for each recyclable material collected in your community.

◆ Design the recycling space to be attractive, convenient to use, and easy to clean and maintain.

If you're concerned about attracting pests from the temporary storage of recyclables in or near your kitchen, remember that plastic bottles, cans, jars and other recyclable containers should be as clean for recycling as the dishes you return to your cupboards for reuse.

So, if you're in the market for a new kitchen, or considering updating your present kitchen, take a few minutes to rethink the way you live. Recall that decisions you make about your home often represent an extension of your lifestyle. Respond to every remodeling consideration with the Earth in mind. Because the real hub of our daily lives is Planet Earth. Waste not!

---

*Julie Kjolhede is a planner with the department's Waste Management Assistance Division in Des Moines.*

## RESOURCES AND REFERENCES

*Healthy Houses*, Clint Wood and Debra Lynn Dadd (Guarantee Press, 4720 Montgomery Lane, Suite 1010, Bethesda, MD 20814)

*The Natural House Book*, David Pearson, (Simon and Schuster/Fireside, Simon and Schuster Building, Rockefeller Center, 1230 Avenue of the Americas, New York, NY 10020)

The Smart Kitchen, David Goldbeck (Ceres Press, Department IC, P.O. Box 87, Woodstock, NY 12498; Phone: 914/679-5573; $15.95 plus $2.00 shipping

*Utility Bills Update No. 355* (lists addresses and phone numbers of 70 manufacturers of "earth-friendly" products and descriptions of their products. Send $1.50 and a self-addressed business-size envelope to: James T. Dulley, Des Moines Register, 6906 Royalgreen Drive, Cincinnati, Ohio 45244.)

*Your Home, Your Health, and Well Being*, David Rosseau, W.J. Rea M.D., and Jean Enwright (Hartley and Marks, Vancouver, BC, 1988)

## HOW TO COMPOST INDOORS

Making compost indoors is like making it outdoors except on a smaller scale. Indoor composting can be done in large plastic jugs with the tops cut off, or in any short, fat waterproof container.

Wastes should be chopped or pureed in the blender or food processor, or you can use only foods that are already quite small, such as coffee grounds, tea leaves, vegetable parings, and such. The wastes should be layered with soil (make sure it is not sterilized), and after the first few days stir it daily. Small amounts of grass clippings or hay held in a plastic bag can also be mixed in. It is the mixing and stirring that will kill off any odor-causing bacteria. Keep moist but not soggy, and do not add garbage to a container that is already in the process of composting; start a new one.

The decomposition should take about two weeks, yielding fertilizer or humus for houseplants, window box, greenhouse, or an unusual gift for a plant-loving friend.

*Reprinted with permission from* The Smart Kitchen, *David Goldbeck, Ceres Press, 1989.*

*See page 42 for information on composting garden and yard wastes.*

## IDEAS?

If you have common-sense, practical ideas on reducing kitchen wastes, and allocating recycling space in your kitchen, we'd like to hear from you. Write: Julie Kjolhede, Waste Management Assistance Division, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

# Why Waste Yard Waste?

Although composting is a relatively new concept for many Iowans, the practice has been around for centuries. In fact, more than 2,000 years ago Romans used compost to improve soil quality. Today, you can use compost to improve the quality of your lawn, garden or landscape. And, at the same time you will help reduce the volume of organic yard waste sent to the landfill.

Composting is a natural process of breaking down organic materials into a useful, soil-like product that poses no threat to the environment. There are a large number of plant materials around the yard and garden that can be used in the compost pile (see listing below). For composting to work, you must use the right ingredients. You can stray from the basic recipe, but be careful. If a pile is too dry, decomposition will slow down. If there's not enough air, odors will be created. If there's not a proper mix of browns and greens, the process will become unbalanced and inefficient. For trouble-free and odorless composting, four components are required -- organics, air, water and macro/microorganisms.

**Organics (Organic Waste).** Organic waste includes both food and yard waste. A good mix of carbon-based organics such as leaves (browns) and nitrogen-based organics such as grass clippings (greens) is essential to the process.

**Air.** The second component needed for efficient composting is fresh, oxygen-rich air. Not much air is needed, but without it, the decomposing process becomes very slow and unpleasant odors are created.

**Water.** Enough water is needed to promote decomposition, but not so much that it drowns the process. Here's a simple way to judge moisture content. Squeeze a handful of material. At the proper moisture content, only a few drops of water will be squeezed out.

**Micro/macroorganisms.** In less technical terms, what we're talking about are bacteria, fungi, bugs and worms. These organisms are the workhorses of the composting process. They consume and digest organics forming humus from which plants can gather nutrients.

No special procedures need to be followed to prepare compost. An out-of-the-way area that can be screened from view is preferable. It should be convenient and accessible to water. Partial shade will tend to retard drying, but will lower temperatures of the composting material, therefore slowing decomposition in spring and fall.

**What Items Can Be Composted?**

A variety of organics can be composted at home, including yard waste.

**Leaves**
**Prunings**
**Grass Clippings**
**Flowers/Weeds**
**Ash (small quantities)**
**Pet Hair**
**Garden Wastes**
**Vacuum Sweepings**
**Sawdust**
**Paper Towels**

You can also compost certain food wastes.

**Bread**
**Pastas**
**Grains**
**Vegetable Wastes**
**Coffee Grounds/Tea Bags**
**Fruit Wastes**

**What Items Should Not Be Composted at Home?**

The following items are not recommended for inclusion in a home composting project.

**Red Meat**
**Fish**
**Dairy Products**
**Bones**
**Poultry**
**Eucalyptus Plants**
**Rose Bushes**

Meat and dairy products are not generally recommended for composting because of the potential pest and health risks they create. In addition to attracting animals to the compost pile, they may carry pathoens, such as salmonella, which might not be destroyed in the composting process. Also, rose bushes and eucalyptus plants will change the pH level of compost, which might destroy the macro and microorganisms.

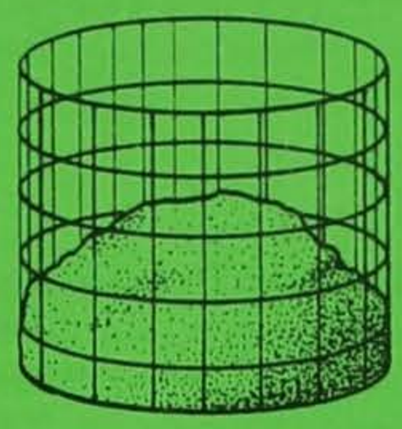
**What about Additives or Activators?**

Several commercial compost additives are available, which can help begin the process or speed it up. There are nitrogen additives for heavy carbon-based projects (leaves and no grass), and there are carbon additives for nitrogen-based projects (grass and no leaves). While these additives may be beneficial, make sure you need them before buying. The following non-commercial products will add nitrogen to your compost project.

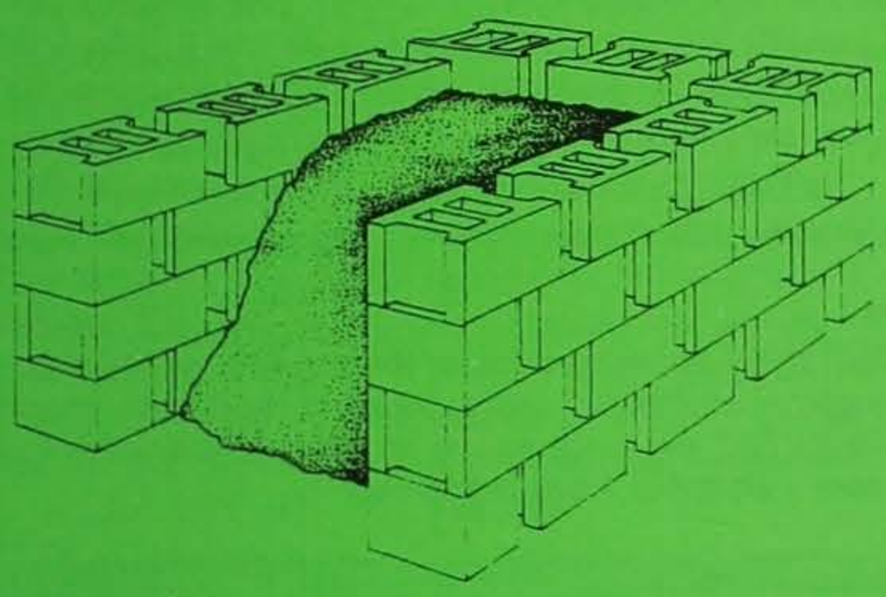
**Alfalfa Meal**
**Blood Meal**
**Bone Meal**
**Compost (half finished)**
**Cottonseed Meal**
**Fish Meal**
**Hoof Meal**
**Horn Meal**
**Leather Dust**
**Manure (well rotted)***
**Rich Top Soil**

*Check local ordinances before using manure.

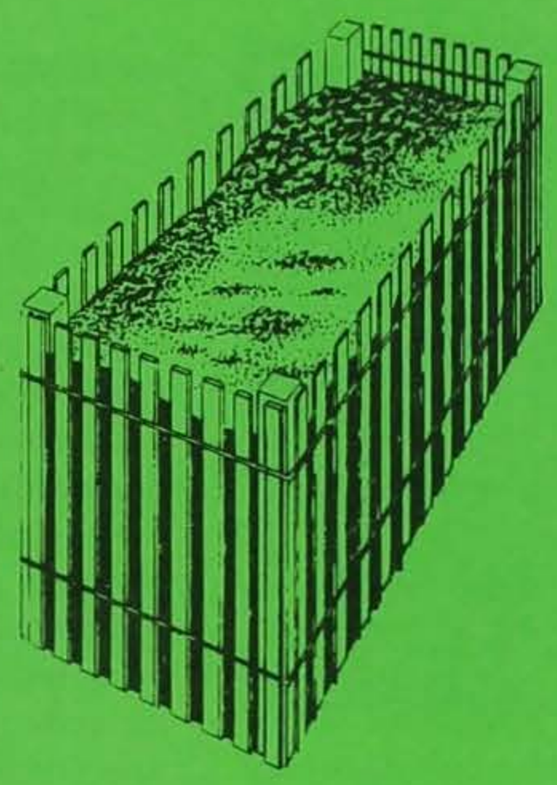
**Compost Bins**



Woven wire bin



Block or brick bin



Snow fence bin

To hasten decomposition, heat is naturally generated during the composting process. The temperatures often reach 150 to 170 degrees. If the pile is not kept sufficiently moist, the materials may get too hot, and the action of fungi will cause it to become *firefanged*. The resulting product appears to have been burned, is lightweight and is of no value for compost.

A compost bin can be as big or small as your needs require. It can be easily constructed of chicken wire stapled to wooden stakes. Hooks on one end hold the cylinder together (see illustrations above for other types of compost bins). There are many advantages to compost bins. They are inexpensive, aesthetically pleasing and keep out pests. They can easily be set up, taken down and moved to another location. More elaborate bins, of varying size and shape, can be made or purchased. Composting bin kits are available at most hardware or lumber stores and in a variety of catalogs and range in cost from a few dollars to more than $100. While expensive bins may be more pleasing to the eye, they rarely do a better job of producing compost than the more simple and inexpensive methods.

A well-constructed compost pile will have the following ideal composition:

▲ 50 percent dry, carbon-based organic waste, such as leaves;

▲ 40 percent wet, organic waste, such as grass and weeds; and

▲ 10 percent soil or previously composted material.

Best results can be obtained by putting the compost in layers. Each six- to eight-inch layer of plant material should be topped with a one- or two-inch layer of good garden loam or barnyard manure plus several shovels full of coarse sand. A top dressing of commercial fertilizer should be added to each layer. Because of the remarkable ability of soil or humus to absorb odors, there will be no disagreeable odor around a compost pile that contains layers of sand.

Compost is ready to use when it is dark brown, crumbly and earthy-smelling. You can pick it up, and it will crumble and sift through your fingers. Let the finished compost stabilize for a few extra days and then you may sift it through a 1/2-inch screen to produce a finer, less lumpy product. To work the compost into your soil, turn your soil, apply one- to three-inch layers of compost and work it in well. You may add up to one pound (a heaping double handful) per square foot.

Compost's characteristics make it ideal for use around flowers, vegetables, shrubbery and trees during the growing season. Also use compost when digging a new garden as an organic supplement. Lastly, compost makes an ideal potting soil for indoor or boxed plants.

---

*This article contains excerpts from* Mulching and Composting at Home *and* Why Waste Yard Waste *(published by the Des Moines Metropolitan Area Solid Waste Agency, 521 E. Locust St., Des Moines, Iowa 50309, (515) 244-0021) and* Composting: A Guide for Composting Your Yard Waste in a Holding Bin *(published by the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034, 1-800-367-1025).*

# CONSERVATION UPDATE

## May Is American Wetlands Month -- Enjoy, Educate and Appreciate

by Kathryn Stangl,
information specialist

Swamps, bogs, marshes, sloughs, oxbows, potholes and just plain "wet spots" are all part of Iowa's wetlands. Wetlands are areas that are saturated with water part or all of the year. These unique and valuable ecosystems are increasingly appreciated for the diversity they help foster. May is American Wetlands Month and a perfect time for enjoyment in, education about and appreciation of, wetlands. Wetlands provide habitat for game and nongame wildlife, improve water quality, reduce soil erosion, reduce potential for flooding, provide groundwater recharge and provide recreational and educational opportunities for Iowans.

The U.S. had an estimated 221 million acres of wetlands during colonial times. Today only about 104 million acres remain. Where have all the wetlands gone? Most of the wetland loss is attributed to draining and filling for conversion to agricultural production and the remainder has disappeared due to development of towns, cities, industries and roads. Iowa has been greatly affected by wetland conversion. The state originally had two to four million acres of wetlands but today only about 50,000 acres remain -- a loss of more than 98 percent.

Why should Iowans preserve and restore wetlands? Wetlands mitigate flood and storm damage by temporarily storing and then slowly releasing stormwaters and improve water quality by controlling erosion. They trap runoff containing nutrients, pollution, sediment and wastes and then filter the water and provide groundwater recharge. At the same time wetlands are some of the most biologically diverse regions on earth. The large variety of vegetation they support provides food, water, migration stopovers, breeding and nesting grounds, and winter cover for many kinds of wildlife for some or all of their lifecycles.

How can individuals or organizations celebrate Wetlands Month? The list is as long and varied as are wetlands themselves.

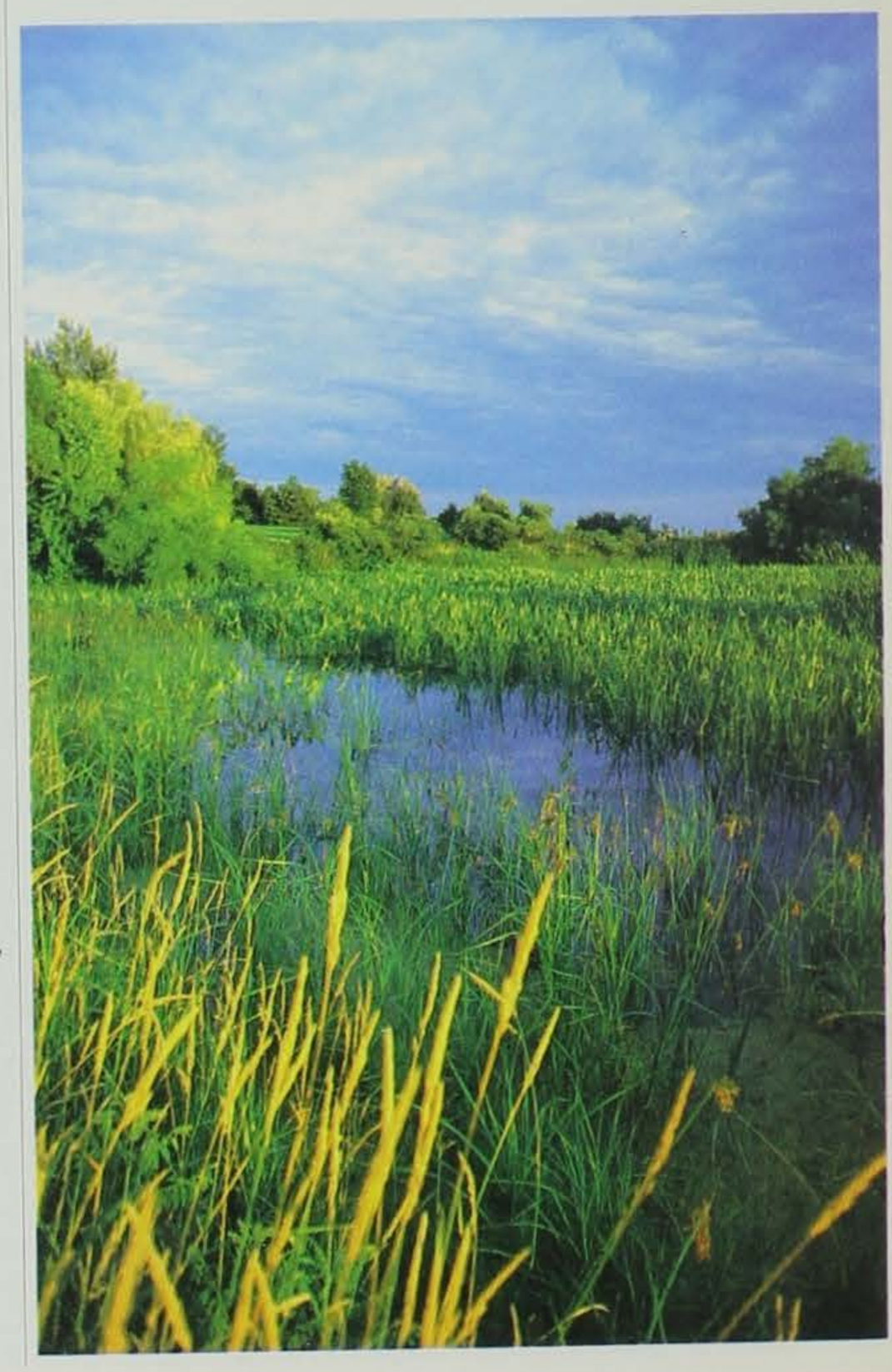
● Start by reading and learning about wetlands in your area. How do they contribute to the community? What part do they play in local history. During settlement did they provide food from fishing and hunting or furs from trapping? Did they provide timber for cooperage, posts or firewood needs? Are they part of environmental protection like the wetland sewage processing plants? Are local wetlands home to any endangered, protected or rare plants or animals?

● Establish a "wetland enjoyment spot," with a bench where someone can rest and observe life in the wetland or a sign telling individuals what to watch for. Take a canoe, boating or wading trip through your local wetland. Bring your nature notebook to record what you observe.

● Organize a field trip to a local wetland. Take photographs of the wetland, showing the animals, waterfowl and other wildlife that frequent it and the diversity of plants that grow there. Feature these photos in an exhibition and share the importance and beauty of the area with those who are not familiar with it.

▼

**Join the thousands of other Iowans who as hunters, anglers, wildlife watchers, trappers, botanists, canoeists, hikers and just plain nature lovers appreciate the riches Iowa's wetlands have preserved.**



Roger A. Hill

● Work with local schools to promote wetland awareness programs. Some of these programs could feature art, literature or music that refers to wetlands. Or, develop an economic benefits lesson that points out the local income derived from wetland-oriented recreationists. Biology, botany or environmental/ ecology lessons could highlight the local wetland and its seasonal changes.

● Talk to state and local officials about landowner incentives for protecting and preserving wetlands. Wetland loss still occurs in Iowa but this trend is being reversed because of federal and state initiatives such as --

The *North American Waterfowl Management Plan* (NAWMP) is an innovative international partnership to save waterfowl. The plan targets critical waterfowl breeding, staging and wintering areas in both the U.S. and Canada. Iowa's role in the NAWMP is through the *Prairie Pothole Joint Venture*. The PPJV seeks the restoration of more than 10,000 wetland basins in the upper Midwest. Iowa's PPJV goal is to protect and enhance 2,000 acres per year of wetlands and adjacent uplands. In Iowa 13,500 acres of habitat have been protected and an additional 3,500 acres of wetlands on private and public land have been restored since 1988.

The *Wetland Easement Program* lets landowners take wetlands to the bank, by compensating them in return for a perpetual easement. The U.S. Fish and Wildlife Service will make a lump sum payment to landowners that agree to protect and restore wetlands covered by the easement. For more information on Iowa's PPJV or the Wetland Easement Program, contact one of the DNR's wildlife biologists.

The *Wetlands Reserve Program* (WRP) is a voluntary program offering landowners a chance to receive payments for restoring and protecting wetlands on their property, while allowing them to retire marginal cropland. Like the Conservation Reserve Program, WRP pays farmers for safeguarding certain defined land -- in this case, the restoring and protecting of wetlands. More than 5,000 acres were accepted into WRP during the 1992 pilot program, providing Iowa's landowners with $5 million to protect wetlands. For more information on the WRP, contact: Jim Ayen at the Soil Conservation Service, (515)284-4370.

Take some time during Wetlands Month to enjoy the beauty wetlands offer. Experience the many aesthetic qualities and economic benefits a wetland possesses that add to our quality of life. Share these benefits with others. Get your feet wet.

## Wetlands Interpretive Center Opens In Palo Alto County

The Palo Alto County Conservation Board has announced the opening of the Lost Island Prairie Wetland Nature Center located 3-1/2 miles north of Ruthven. Situated along the shore of northwest Iowa's Lost Island Lake, at Hudson Park, the wetland center is Iowa's newest, and perhaps most unique, environmental education facility.

"At this point, the center represents the only educational facility in the Midwest that is geared entirely towards the interpretation of prairie wetlands," says conservation board director, Steve Pitt. The nature center will include a library, small gift shop, meeting area and exhibit room. The exhibit room contains a dramatic wetland diorama complete with basking turtles, stalking herons and cut-a-way view of a muskrat lodge. "This exhibit was created by Spencer taxidermist, Lance Christensen, and is one of the most impressive and realistic to be found anywhere," said Pitt.

"We view the Wetland Center as a regional outreach," said Pitt. The facility is located in the heart of Iowa's prairie pothole country and lies in the middle of an interconnected network of more than 60 wetland basins that include Smith's Slough, Lost Island Marsh, Dewey's Pasture, Barringer Slough and Bluewing Marsh. The entire complex encompasses more than 5,000 acres of public marsh and grassy uplands.

Our overriding goal is to teach people about Iowa's wetland heritage," said Pitt. "By telling both sides of a very complex story, we hope to help people of all ages to better appreciate our natural prairie lakes and marshes and the intricate ecosystems they support.

"Our aim is for the Wetlands Center to serve as a jumping off point for a broader educational experi-

Lowell Washburn

▲ **Taxidermist Lance Christensen works on a display showing a cut-a-way view of a muskrat lodge at the Palo Alto Wetland Nature Center.**

# CONSERVATION UPDATE

ence," says Palo Alto County naturalist Miriam Patton. "We want the diorama and other indoor displays to spark an interest that will make people want to explore further," she added.

The DNR is currently cooperating with nature center staff in creating a 2.5 mile series of wetland hiking trails. Part of the trail network will use an already-existing dike system that will serve as "earthen boardwalks" to take hikers over and through wetland habitats where all sorts of marsh life can be viewed first-hand.

"Iowa's natural wetlands have so much to offer, and we want to make the public aware of these benefits," said Patton. "This facility is a very tangible way for us to serve beyond county and even state borders."

Construction for the Lost Island Prairie Wetland Nature Center was made possible by a REAP grant of $198,000. Additional funding was provided by the U.S. Fish and Wildlife Service and numerous private donations. The facility will be open to the public from 9 a.m. to 4 p.m., Wednesday through Friday, and from 1 to 4 p.m. Saturday and Sunday. An official ribbon cutting and grand opening celebration is scheduled for Saturday, July 10 at 1 p.m.

Lowell Washburn

▲
**A portion of the sale of each copy of "Mallard Pirouette," a new bronze sculpture by Barbara Nelson will go directly to the wetland nature center. For more information on the sculptures contact the Palo Alto County Conservation Board at (712)837-4866.**

## Agricultural Stewardship In Iowa

Drake University Agricultural Law Center and the Iowa Natural Heritage Foundation cosponsored a one-day symposium on the future of agricultural stewardship in Iowa to mark the 50th anniversary of a famous Iowa Supreme Court decision, Benschoter versus Hakes. While the court's landmark ruling upheld the constitutionality of the Iowa law that requires a landlord to notify a tenant in advance of terminating a farm lease, the decision remains important today because the court made several findings concerning the value of agriculture to the state and the importance of protecting soil resources. The case has been cited frequently in opinions concerning soil conservation, environmental protection, land-use planning and regulating agricultural practices such as stream straightening.

The symposium focused on how the courts and the legislature have used laws in the last 50 years to create and implement "a duty of agricultural stewardship." A panel of farmers shared their attitudes towards stewardship and the role of regulations on agriculture, and agriculture law specialists discussed the future of stewardship legislation.

Society is becoming increasingly concerned about the impact of modern agriculture on the environment and may be contemplating additional regulatory and legal controls on agricultural practices. According to Professor Neil D. Hamilton, director of the Agricultural Law Center at Drake University Law School, the laws must regulate the individuals and society, not the individuals' use of the land.

Hamilton, a leading expert on the role of law in shaping agriculture, spoke on the use of penalties versus incentives in promoting agricultural stewardship, and suggested that Iowans first make themselves aware of the "where to place the blame" problem. "The farm community resents the idea that they are an uncaring group sacrificing the environment to gain productivity," said Hamilton. "The environmentalist believes that a cut in productivity is worth the environmental protection. The potential role of the soil and water conservation districts as a regulatory entity is to promote the stewardship duties," he added.

"Success lies in education and cost-share programs and in our commitment to the voluntary programs," said Hamilton. "As the farming population decreases, farmers may need to be certified and educated or paid to learn to be stewards of the land. This puts the cost on the public, who will benefit from the responsibilities, and has better success than trying to force landowners to comply."

John Miller, farmer and a member of the State Soil Conservation Board said that people can always find reasons for resisting the sustainable agriculture practices. "Peer pressure is enormous," Miller said. "We have been lead by public policy to decrease our diversity. The challenge is to learn and research our diversity limitations."

Ron Rosmann, farmer and a past president of Practical Farmers of Iowa, said the sustainable agriculture definition must include "people" in the equation. "It's an ongoing process of looking at the whole system," he said. "At PFI, there is a group of 28 farmers

who are cutting back on herbicides and nitrogen and farming more and more grass for rotational grazing. Our motto is -- *We reserve the right to change our minds.*"

Tom Franzten, farmer and current president of PFI, said the most important change in the last 10 years has been ridge-till. "It's an innovative improvement that has had a lot of advantages and no problems," he commented. "I'm still looking for an innovation for livestock management. You need goals first and then management follows."

Miller closed the farmer's discussion session by saying, "You should live as though you'll die tomorrow, and you should farm as though you'll farm forever."

Paul Johnson of Decorah, former state representative and author of many Iowa environmental protection laws, including the Iowa Groundwater Protection Act, said the Legislature has started to integrate the protection of water and soil resources. "The next generation needs laws and rights," Said Johnson. "We have concurred nature, now we need to concur stewardship. Herbert Hoover, H.J. Wallace, Ding Darling and Aldo Leopold all started the care of the land," Johnson reminisced. "But I'm worried that we're taking a break right now. In order for a change to take place, we need to get everyone talking about it, then as a state, we'll survive. We will make it," he added.

Jerry Schnepf, from the Iowa Natural Heritage Foundation summed up the conference by noting Iowa's 150th anniversary is approaching. "It's a time to reflect on where we've been and how far we've come," Schnepf said. "Have we made any progress?"

For more information about issues covered at the syposium, *What Farmers Need to Know About Environmental Law, the Iowa Edition*, explains how state and federal environmental laws and regulations apply to farmers. The 190-page volume is written for non-lawyers in an easy-to-follow question-and-answer format. Send a check for $20 payable to Drake University to: Environmental Law Book, Drake University Agricultural Law Center, Des Moines, IA 50311-4505.

**STAY ON TOP.**
**BOAT SMART.**

**National Safe Boating Week June 6-12**

## Free Fishing Days June 11, 12 and 13

Take a friend fishing and celebrate *Free Fishing Days* this June. June 11, 12 and 13 are *Free Fishing Days* for all Iowa residents. Any Iowa resident may fish and possess fish without a license during these days. In addition a trout stamp is not needed to possess trout during free fishing days. All other fishing regulations must be obeyed.

Copies of the *1993 Iowa Fishing Regulations* are available at DNR offices, county recorder offices and most retail outlets where fishing licenses are sold.

Two regulation changes are of special note this year. There is a new catch and release area for bass. All bass caught from the Cedar River, Mitchell County, extending downstream from below the Otranto Dam as posted to the bridge on county road T26 south of St. Ansgar, must be released alive.

Jennifer Lancaster-Woodley

There is also a new definition of artificial lure. Artificial lures are defined as lures that do not contain or have applied to them any natural or human-made substances designed to attract fish by the sense of taste or smell.

▼
**Gary Wagner of Burlington has been named the 1992 Iowa Wildlife Farmer of the Year by the DNR. Each year, a farmer who has made significant contributions to wildlife conservation is selected by nominees chosen from across the state by the DNR's wildlife bureau.**

Ken Formanek

# CONSERVATION UPDATE



## Upcoming NRC, EPC and Preserves Board Meetings

The dates and locations have been set for the following meetings of the Natural Resource Commission, Environmental Protection Commission and the Preserves Advisory Board 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, contact the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

**Natural Resource Commission:**
--June 3, Hampton

**Environmental Protection Commission:**
--May17, Des Moines
--June 21, Des Moines
--July 19, Des Moines

**State Preserves Advisory Board:**
--June 8, Fayette County

## New Booklet on Iowa Birds Available

*A Teachers Activity Booklet About . . . Iowa Birds*, an 84-page spiral-bound book is now available from the Iowa Ornithologists Union in cooperation with the Iowa Conservation Education Council. The booklet can be purchased by sending $4 plus $2 shipping and handling to: Iowa Ornithologists Union, c/o Linda Zaletal, 715 West St., Colo, IA 50056.

## Radon Levels in State Water Supplies

Levels of radon above the Environmental Protection Agency's proposed standard for radon, have been found in some public water samples that rely on Iowa's groundwater. The DNR working with University Hygienic Laboratory and local water supplies has completed a study of water supplies that use groundwater as their sole water source.

The study was done to see how many towns across the state would exceed the proposed EPA standard for radon and to begin to estimate what the cost would be to treat Iowa public water supplies and bring them into compliance if the proposed standard is adopted. The estimated costs of treatment to reach a certain standard are one of the criteria used when the EPA establishes a standard for water supplies.

The EPA expects to establish the standard for radon by October 1993. When the standard is finalized, each town will have to conduct tests over the next few years to determine if the water supply truly exceeds the standard. Even if a town's water tested above the proposed standard in the current study, there is no health danger incurred by drinking or using the water between now and the establishment of the final standard.

Investigations indicate that Iowa water supplies using both shallow and deep geologic formations as a water source may exceed the proposed EPA radon standard for public water.

The EPA has proposed a radon standard of 300 pCi/L (less than one trillionth of a gram of radon per liter). Some water treatment industry representatives have suggested the EPA set the level at 1000 pCi/L. Ingestion of drinking water and breathing vapors from waters with higher concentrations of radon can increase the risk of cancer.

Water samples, that have been processed through a treatment system, indicated lesser radon levels than raw samples. Out of the 153 samples tested, only 43 of the finished water samples exceeded the proposed standard. However, 79 -- just over half -- of the raw water samples exceeded the proposed standard. The study found no connection between well depth and the concentration of radon in the raw water samples. Just under half of the water supplies in the study use shallow groundwater sources. All concentrations above 700 pCi/L were found in the northwestern part of the state.

The study indicates that one-quarter of Iowa's groundwater supplies that use a single hydrogeologic source are likely to exceed the proposed radon standard. While aeration treatment is effective to remove radon, it is expensive. Using EPA projections, it could cost Iowa systems $16 million to install treatment. For the average small Iowa water system the cost increase per household could be $10 to $12 monthly.

In the sample of 153 water supplies the 10 that exceeded 700 pCi/L were Bridgewater, Calamus, Early, Galva, George, Hartford, Holmes, St. Ansgar, Truesdale and Wiota.

The 33 public water supplies that exceeded 300 pCi/L were Akron, Alvord, Arion, Boyden, Bristow, Castana, Cleghorn, Delhi, Emerson, Forest City, Guttenberg, Hancock, Kingsley, Lansing, Latimer, Lawton, Leland, Linn Grove, Lone Rock, Madrid, Manning, Moville, New Albin, Pilot Mound, Pleasantville, Rake, Ricketts, Riverton, Smithland, Swan, Van Meter, Westgate and What Cheer.

If you have questions about radon levels in your drinking water, call Michael Anderson at (515)281-6599.

# CLASSROOM CORNER

by Don Sievers

## *The Cure*

The following activity was developed for the *Trees for Teens* program provided by the Iowa DNR and Peoples Natural Gas. *Trees for Teens* encourages teen involvement in tree planting programs and stresses career opportunities in natural resources and related fields. Special thanks to Harold Woodruff, a pharmacist from Jefferson for his assistance on this exercise.

## Background:

Did you know that one of the most effective mosquito repellents comes from a plant growing in some of the best mosquito habitat or that a possible treatment for equatorial malaria comes from a plant that grows only in temperate regions? The recent announcement that a cure for certain types of cancer may be provided by compounds found in a species of yew tree has raised peoples' awareness of another important role natural resources play in our everyday lives. Many of the medicines in use today are derived directly from native plant and animal resources.

While most people do not perceive a relationship between trees and the person in a white coat providing prescription drugs at the pharmacy, a very important relationship does exist. Pharmacognosy is the science of drugs which specifically deals with the characteristics of drugs developed from plant and animal resources. The following activity provides a glimpse into one of the many careers which is directly related to forestry resources. The "results" the class should come up with are shown (upside down) below in the "manila envelope."

**Results:**

**(1)** Gymnosperm leaves are the needles of the white pine (*Pinus strodus*).

**(2)** The soil is the type of soil where white pines grow.

**(3)** *Tuberculous Lymphadenitis* is a swelling of the lymph glands.

**(4)** The brownish colored powder is from the inner bark of white pine which has been used in cough medicines, as an expectorant and to reduce swollen tissues.

**(5)** The Iowa road map will tell you where the substance is found and where the research team was headed.

**(6)** The research team is in White Pine Hollow State Forest Preserve. They are happily collecting gum and tar, and are waiting to collect buds in early spring and inner bark during the growing season.

**(7)** Congratulations, your task is completed. Sorry, but you are no longer needed. Your team's positions with the company have been terminated.

## Age:

Grades 5-12

## Objective:

Students will be able to apply critical thinking skills to:

**1)** identify an unknown substance, and

**2)** identify the location where the substance may be found in Iowa.

## Method:

Students will use their skills of analysis, application, discussion, evaluation, identification, mapping, problem solving and research to identify a substance used in treating *Tuberculous Lymphadenitis* and determine where this substance may be found in Iowa.

## Materials:

Road map of Iowa; tree identification book; Webster's Third New International Dictionary, Unabridged; medicinal plants book.

## Resource Materials:


Krochmal, Arnold, and Connie Krochmal, 1978. *A Guide to the Medicinal Plants of the United States.* Quadrangle/The New York Times Book Co., Inc. New York, 259pp.

Brockman, Frank, C. 1968. *Trees of North America.* Golden Press. New York, 280pp.

CLASSROOM CORNER

## Extensions:

These exercises are all career-related extensions.

**1**. Describe the ways environmental factors influence the culture and economies of peoples of the world.

**2.** List recommendations for solving the problems of overcrowding and overuse of public areas.

**3.** List the ways in which consumer decisions have far-reaching economic, social and environmental implications.

Jerry D. Leonard

*Don Sievers is a training officer at the department's Conservation Education Center in Guthrie County.*

## Procedure:

1. Provide the following situation to the students. Explain that their task is to use their knowledge of English, math, science and social studies to develop a hypothesis as to what substance is used in "the cure" and then to identify where this substance can be found in Iowa.

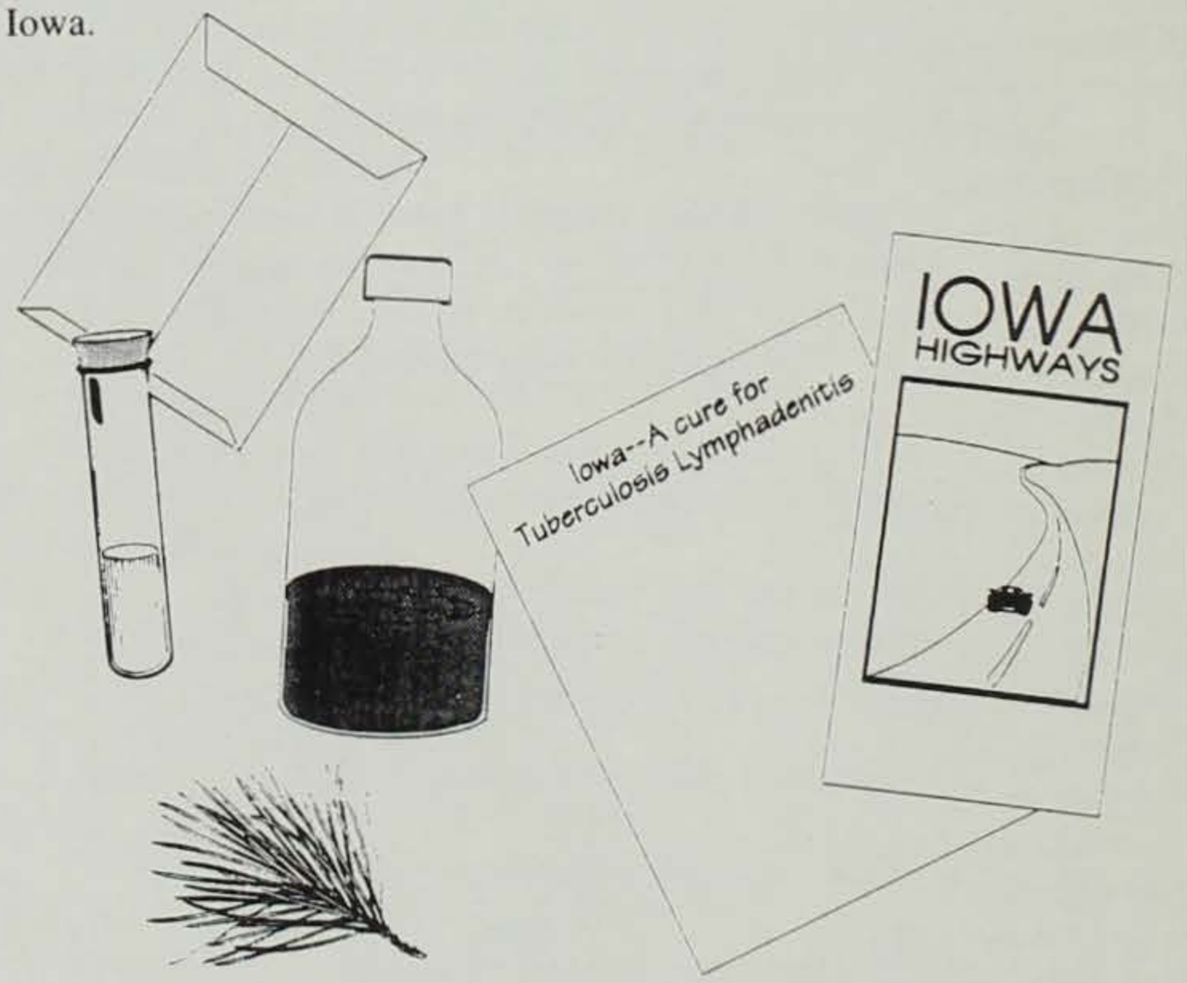
### The Cure

Congratulations, you have just been hired as the leader of a research team for a major pharmaceutical company. The research department has a reputation of being very creative and has discovered many new valuable chemical compounds. Your predecessor was an extremely intelligent scientist who had led the research staff for more than 20 years. Because of the research team's habit of walking around reciting chemical formulas ("$6CO_2 + 6H_2O \xrightarrow{\text{Sunlight}} = C_6H_{12}O_6 + 6O_2$ ; $6CO_2 + 6H_2O \xrightarrow{\text{Sunlight}} = C_6H_{12}O_6 + 6O_2$ ") other members of the staff referred to the leader as the "mad scientist."

In January of 1993, the research department was last seen entering the *Temperate Deciduous Forests of North America* in search of a new chemical compound. No contact from the team has been received by the "outside world." The company has given up hope of finding the lost research team and has decided to hire you as the leader of their new research staff.

On your first day of work you open your desk drawer to find a manila envelope with the following contents: 1) An Iowa road map; 2) a bottle of sandy loam soil; 3) a stoppered test tube with 5.08 centimeters of a brownish colored powder; 4) a twig with gymnosperm leaves which are attached in groups of five, are flexible, are three to five inches long, and have a fine white line on two surfaces of each leaf and 5) a piece of paper with the words "Iowa - A cure for *Tuberculous Lymphadenitis*" written on it.

After you hire your research team you assign them their first task of identifying the substance used for treating *Tuberculous Lymphadenitis* and locating where the substance can be found in Iowa.

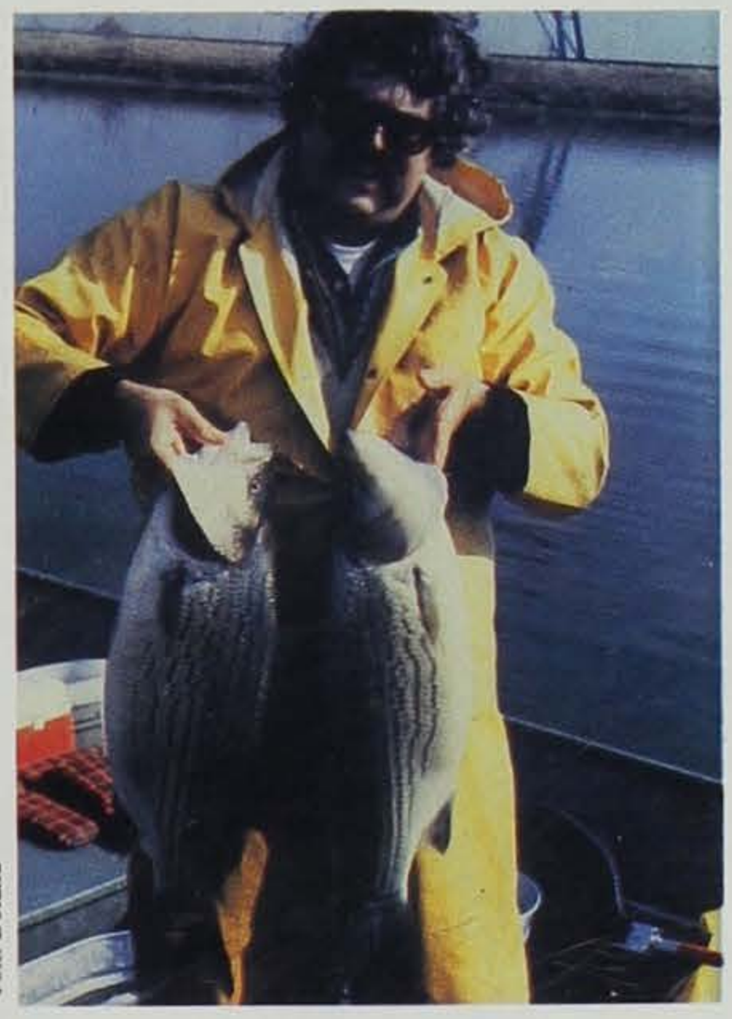


# MISSISSIPPI Wipers

by Tom McCarthy

As part of a mitigation agreement between the Iowa Department of Natural Resources, Illinois Department of Conservation and Commonwealth Edison for fish losses due to open-cycle cooling of the Quad Cities Nuclear Power Plant near Cordova, Illinois, a cross between white bass and striped bass have been reared in an abandoned 60-acre cooling canal that surrounds the plant. Nearly 611,000 of these three- to five-inch hybrid striped bass, better known as wipers, have been stocked in Pool 14 of the Upper Mississippi River from 1984 to 1992. This stocking program is one of the first major efforts by any group or agency to stock fish in the Mississippi and must be thoroughly evaluated. During the initial years of the project, it was determined that electrofishing and seining were relatively ineffective in collecting hybrids. In 1986, a DNR creel survey in Pool 14 determined that only 26 percent of the anglers questioned were aware of the project. Accordingly, wiper posters and postage-paid cards were put up in bait shops up and down the river from Pool 13 to Pool 19. The goals were to inform anglers of the project, to determine angler harvest, and to find out seasonal habitat preferences and movements of the wiper.

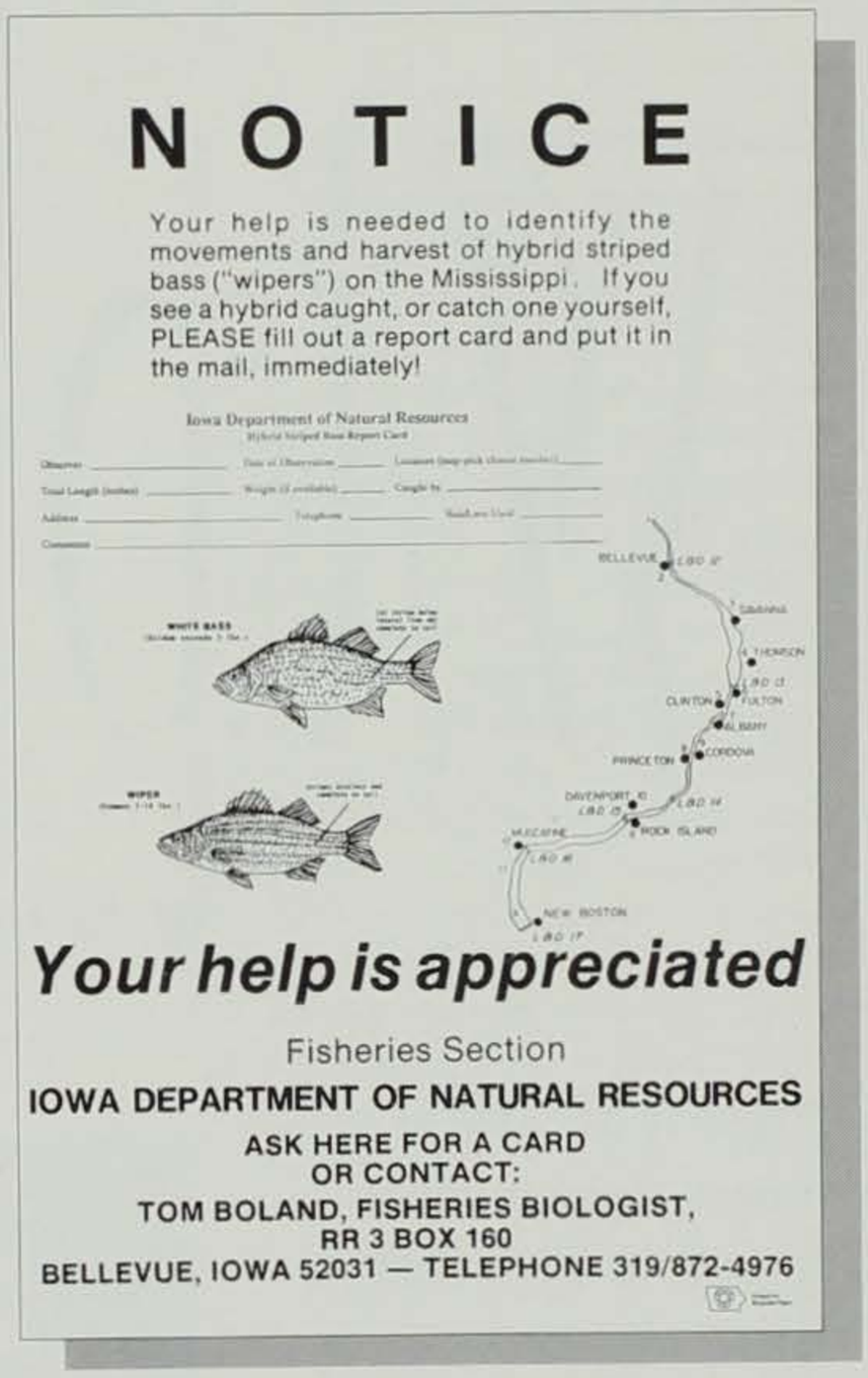
Thanks to anglers who returned the postcards, research biologists were able to partially achieve their goals, and also discovered quite a lot about the lures, tackle and fishing methods used to catch these newly introduced fish.



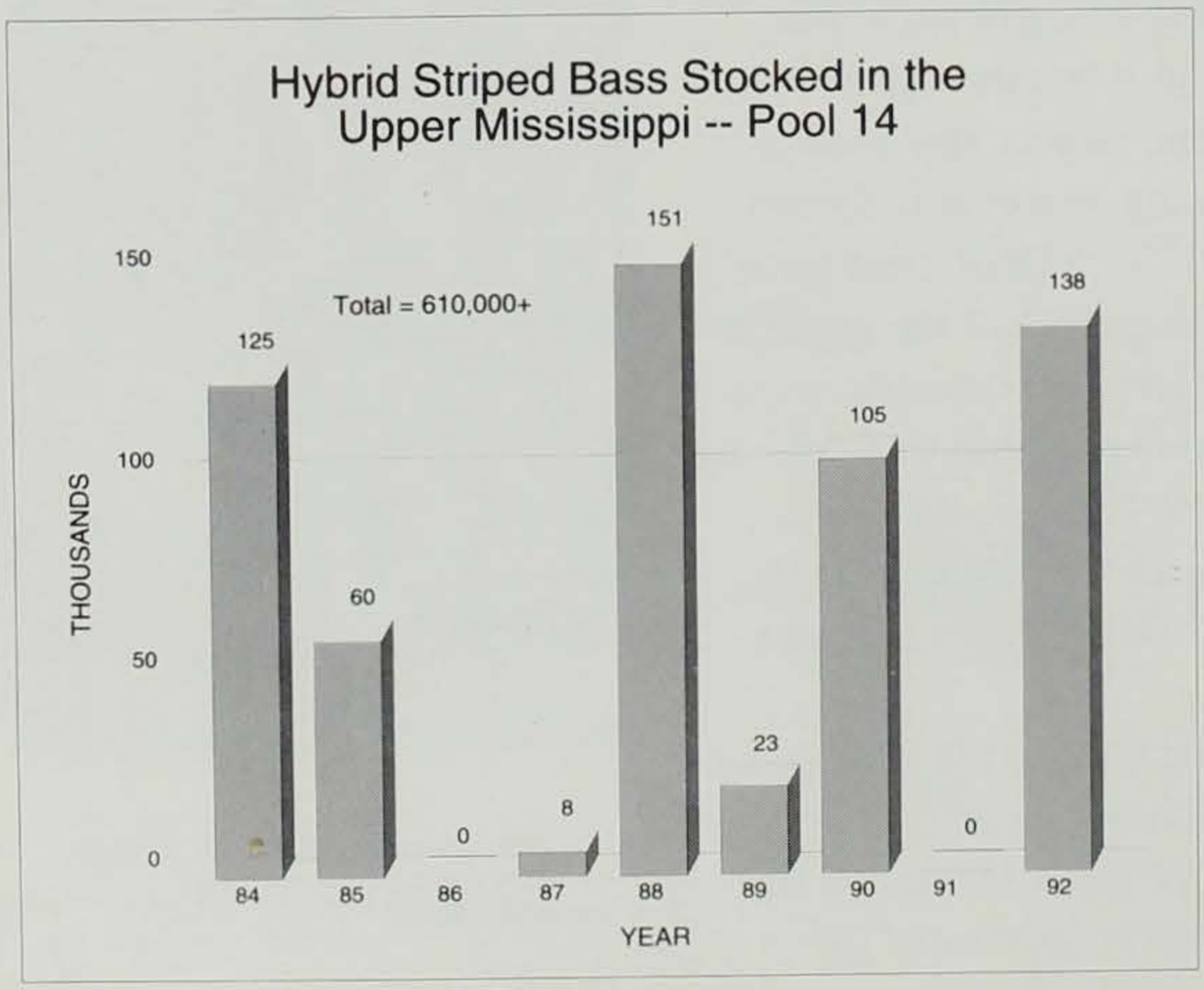
Tom Boland

▲ **Four- and five-year-old wipers grow to more than eight pounds in the Mississippi River.**

▶ **Wiper posters and the accompanying postage-paid reply cards are located in many bait shops and sporting goods stores. along Pools 13 to 19 of the Mississippi.**




▼ **More than 610,000 three- to five-inch hybrids have been stocked in Pool 14 since 1984.**




## Lures

Anglers fishing for walleye, white or black bass, probably already have an assortment of lures which will at times catch wipers. Anglers caught almost one half of the fish on maribou jigs, twister tails and shad bodies. Lighter colors like white, silver and yellow seem to work the best. Jigs tipped with live minnows or leaches were also effective. More than one quarter of the hybrids were caught on crankbaits. The top-producing crankbaits were imitations of shad, minnows or crawfish. In line spinners and spinner baits took a fair number of wipers. Finally, natural baits such as minnows, crawfish, worms and even cutbaits were used to catch a few hungry wipers.

## Tackle

A Pool 14 angler had a medium-weight spinning reel's drag burned out by a six-pound wiper that was eventually brought in by hand. Another angler who fishes specifically for wipers hooked a fish he believed was a wiper near a submerged rock pile. This fish took out 150 yards of line, trashing the reel and breaking the fishing pole in the process. Most of the wipers caught weighed from three to six pounds and averaged four pounds. Commercial fishers report catching and releasing many more hybrids than anglers, and almost 10 percent of their fish weighed more than 10 pounds! Maybe the reason the largest wiper reported by an angler was only 10 pounds 6 ounces is that the typical river walleye or bass angler relies on tackle too light to bring in a really big wiper. In this day when anglers are using lighter line and gear to get a better feel for structure and fish strikes, it may be wise to use at least a 12-pound test line and medium to heavy fishing rods if fishing for hybrids.

## Angling Methods

Most of the wipers were caught by walleye, white and black bass anglers. The best three habitat areas for wipers,

# WIPER IDENTIFICATION

**Several characteristics can help anglers distinguish the native white bass from wipers.**

Body Marking **The white bass' stripes are faint and only the lateral line extends to the tail. The stripes on a wiper are much darker and several extend to the tail.**

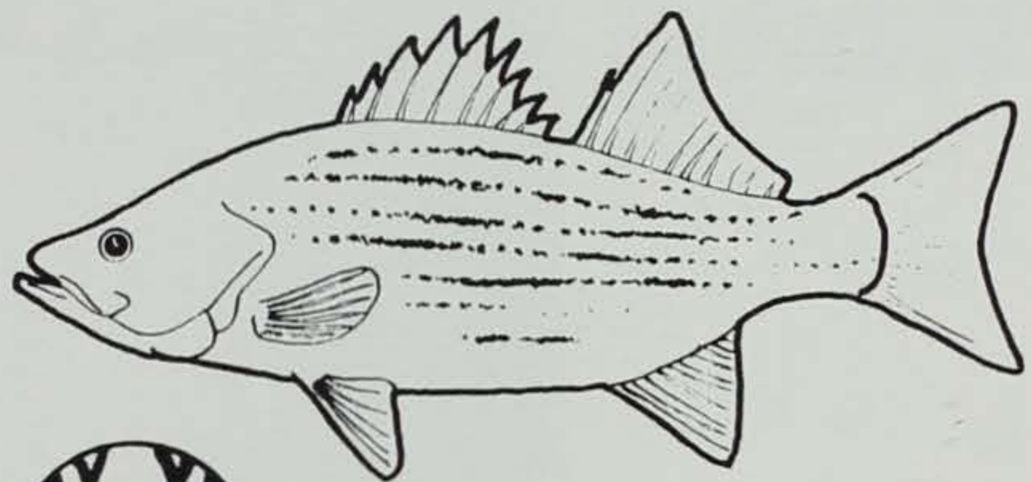
Shape **The shape also differs between the two fish. White bass seem to have a deeper body and a pronounced hump behind the head. Wipers have a racy streamlined torpedo shape.**

Tongue **Both the white bass and wiper mouths are well equipped for eating. The tooth patch configuration on the center of the tongue differs between the two. White bass usually have just one tooth patch on the center of the tongue. Wipers on the other hand have two parallel tooth patches on the tongue.**

Size **The easiest way to tell the two apart is by size. White bass are very common in the one-half- to two-pound range. Only the very rare individual gets up to three pounds. The state record for white bass is 3 pounds 14 ounces and was caught in West Okoboji. Wipers in the river grow fast and can weigh up to eight pounds in just four years. Most of the wipers caught range from two to six pounds, and average four pounds. The largest Mississippi River wiper to date was a 10-pound, 6-ouncer caught near Davenport, Iowa. Commercial fishers have reported catching huge wipers, including one weighing 18 pounds in Pool 18.**

## White Bass

(Rarely exceeds three pounds)



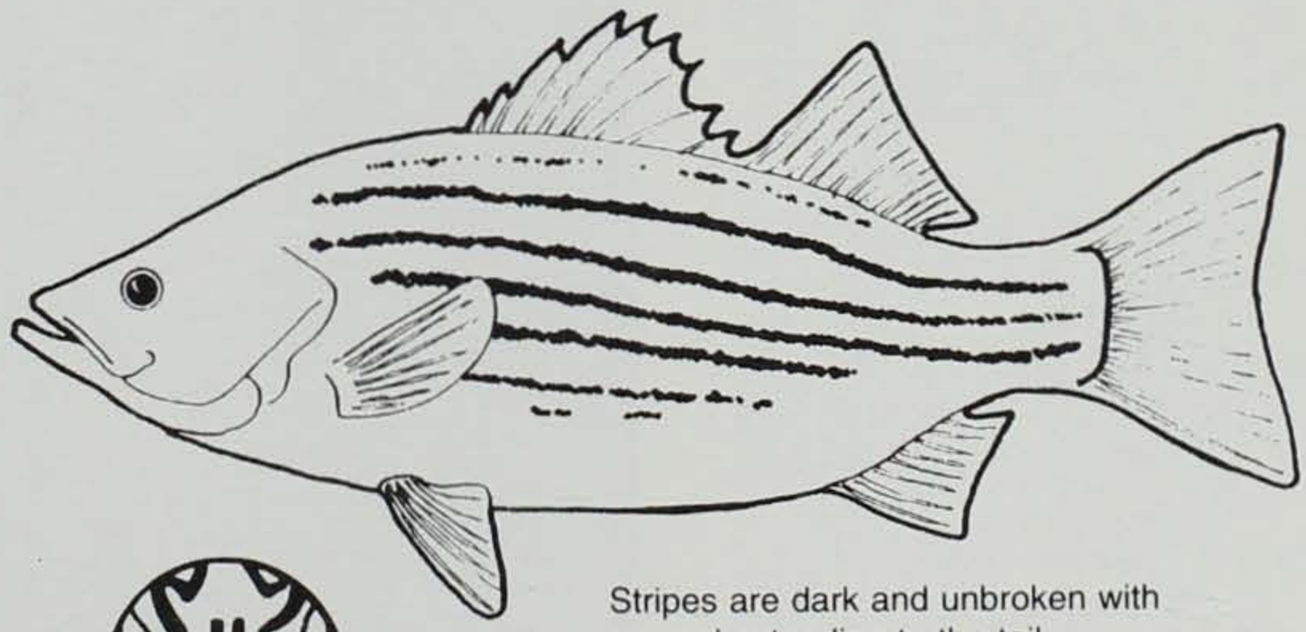
Stripes are faint with only one extending to tail.

Back of tongue has one heart-shaped tooth patch.

**Iowa Record:** 3 lbs. 14 oz.
(West Okoboji Lake)
**World Record:** 5 lbs. 9 oz.
(Colorado River, Texas)

## Wiper

(Rarely exceeds 20 pounds)



Stripes are dark and unbroken with several extending to the tail.

Back of tongue has two close tooth patches with a fine space between them.

**Iowa Record:** 15 lbs. 6 oz.
(Des Moines River)
**World Record:** 22 lbs. 6 oz.
(Savannah River, Georgia)

▶ **The wiper program on the Mississippi River continues to be a success, due in no small part to the cooperation of anglers reporting their catches.**

DNR Photo

ranked in order of importance are, main channel borders (39 percent), tailwaters (31 percent) and backwaters and side channels (10 percent each).

Tailwater fishing begins in April and continues into July, but the peak is in May and June. Hybrid bass seem to follow the native white bass in their upstream spawning runs. There have even been reports of a few wipers carrying eggs. Studies from other states have shown that most hybrids will not produce viable young. Wipers are big movers and have been caught below Lock and Dam 11 at Dubuque through Lock and Dam 19 at Keokuk, but the best tailwaters to fish for wipers are below lock and dam numbers 13, 15 and 17. Although the tailwaters of Lock and Dam 17 at New Boston, Illinois, have not produced many wipers as 13 or 15, it may be a sleeper spot because commercial fishers report catching almost one half of their wipers in Pool 18.

The genus name of the striped bass, *Saxatilis*, is Latin for "dwelling among rocks," and it is no surprise that wipers

◀
**Notice the difference in the boldness of the stripes between the wiper (top), white bass (middle left), yellow bass (middle right) and striped bass (bottom).**

Roger A. Hill

like areas with lots of rock. Anglers cast jigs and other lures from shore or boat into rip-rapped areas next to the roller gates. An occasional wiper is caught along with good numbers of white bass. Along the walls of the lock chambers or immediately downstream of the roller gates are other good places to cast for wipers. Sometimes schools of white bass and wipers can be seen near the surface of the water chasing forage fish. A tandem rig of 1/16-ounce jigs retrieved quickly through a school of fish often yields two fish per cast. Hybrids have been caught in the spring in tributaries of the Mississippi such as Spencer Creek by LeClaire and the Rock River below Davenport.

Rocky wing dams are the primary main channel border habitat fished. The upstream face of these structures can be fished by casting or trolling crankbaits, jigs or three-ways rigged with natural bait or artificial lures. Fishing wing dams is especially effective during periods of low water flow during early summer or fall. Trolling the deeper portions of dams in Pool 14 has yielded some nice catches of hybrids.

Largemouth bass and crappie anglers report catching some wipers by casting spinner baits, jigs and crankbaits in the backwaters. Still fishing with minnows has produced a few wipers.

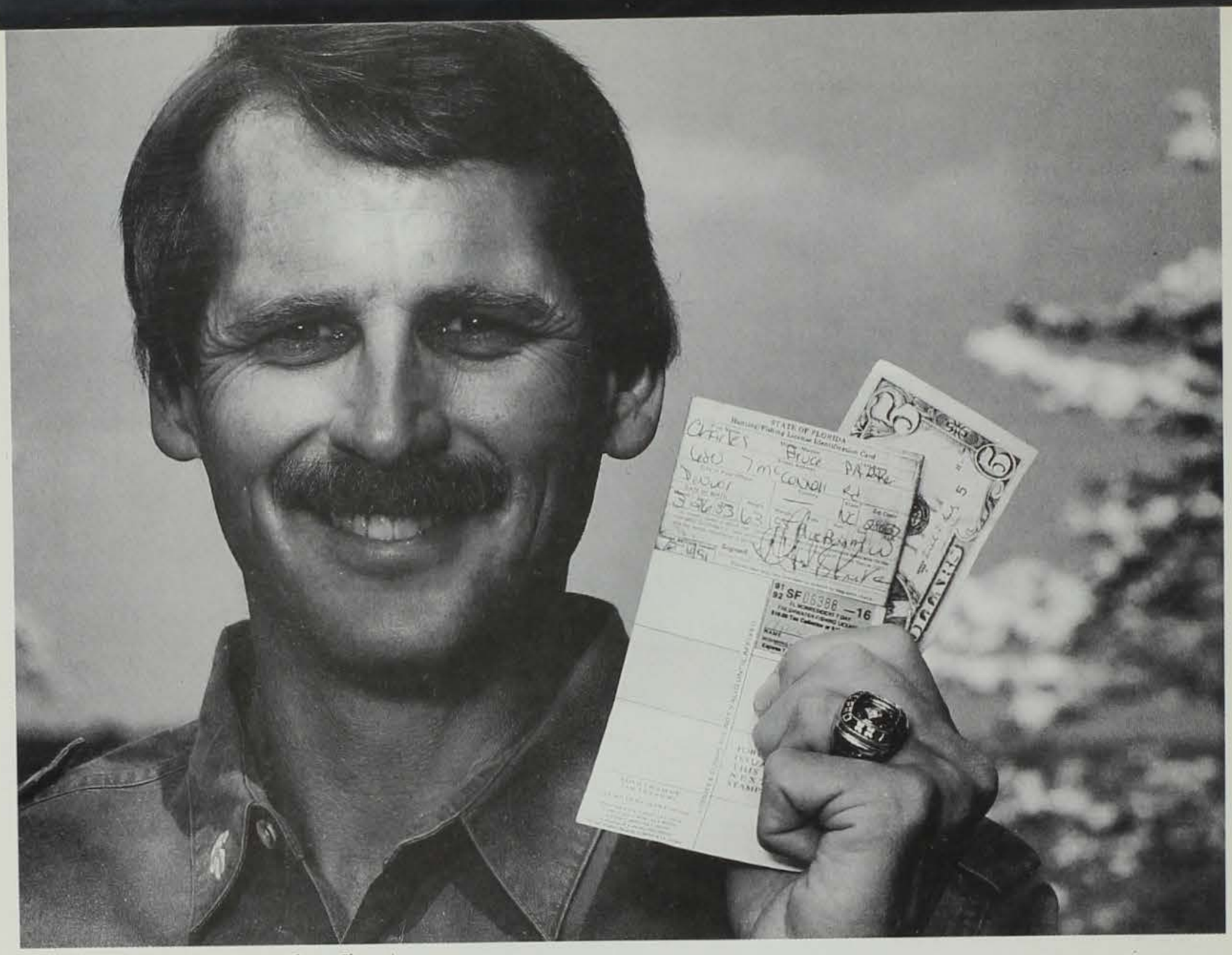
Side channels with current flow can contain closing dams, spillways and other current breaks that hold many fish including wipers. Anglers trolling line spinners, crankbaits and jigs through the LeClaire canal off the main channel in Pool 14 have harvested a good number of wipers.

Although large numbers of wipers are not being caught, there is considerable interest among anglers to catch this hard-fighting fish. Thanks to the efforts of anglers who sent in postage-paid postcards, fisheries biologists have been able to partially evaluate the wiper stocking program. There are still many anglers who do not know about wipers. For example, 36 wipers were reported during local big fish contests in 1991 and 1992, but only four of the fish were reported on postcards. Possibly the novelty of this introduction has worn off and anglers are simply not reporting catches. Because other collection methods have been relatively ineffective, biologists are dependent now as much as ever upon anglers to supply them with wiper catch data to continue to evaluate the stocking.

If you catch a wiper or see one caught, please send in a postage-paid card found in many local bait shops or contact DNR fisheries personnel at the Bellevue Fisheries Station, 24143 Hwy 52, Bellevue, Iowa, 52031 or call 319-872-4976. also, if possible, take a good picture of the fish. If the fish is destined for the dinner table, a frozen head and skin would be helpful for DNR verification of the catch. Thanks for your help and good luck catching the elusive wiper!

---

*Tom McCarthy is a fisheries technician at Bellevue.*



Hank Parker, two-time BASS Master's Classic Champion

# "Get Into Fishing This Season And Catch A $5.00 License Rebate From Berkley."

**During The Month Of June Get $5.00 Back From Berkley When You Buy Your Fishing License And Two Spools Of Trilene® Or TriMax.®**

Been thinking about the fun and excitement of fishing but just haven't gotten started yet? Let Berkley help you get going with this great $5.00 fishing license rebate offer. Just send us a copy of your license (purchased in June, 1993) and UPC codes from two spools of super strong Berkley Trilene or high performance Berkley TriMax, America's #1 selling fishing lines. We'll send you $5.00!

Call it an extra incentive to get you back into the enjoyment of fishing. Buy your fishing license along with some Trilene or TriMax line and send for your $5.00 rebate today. And start hauling in the big ones tomorrow!


MADE USA IN THE

**Berkley®**

*Dedicated to the Future of Fishing.℠*

**$5.00 Fishing License Rebate**

Please send my $5 License Rebate. I'm enclosing: 1) a photocopy of my fishing license, 2) the UPC codes and dated cash register receipt from the purchase of two spools of Berkley TriMax or Trilene fishing line. (All spools, except the 110-yard Pony Spools qualify.)

Name _____

Address _____

City _____

State _____ Zip _____

Send to: Berkley $5 License Rebate
P.O. Box 7665
Young America, MN 55573-7665

Allow 8 weeks for delivery. Limit of two per household or address. Offer void where taxed, restricted or prohibited. ALL PURCHASES MUST BE MADE IN JUNE 1993. This offer cannot be combined with any other Berkley offer. Good in USA only. Effective 6/1/93-6/30/93.



*Recycle used line with Berkley.*

# History of Geological Investigations

by Jean C. Prior

The search for mineral wealth in the Upper Mississippi Valley first brought Iowa to geological notice and resulted in one of the country's most remarkable volumes of geological reconnaissance, David Dale Owen's "Report of a Geological Survey of Wisconsin, Iowa and Minnesota" in 1852. This effort was followed by two short-term -- but important -- forerunners of the present survey that were directed by James Hall of New York and Charles A. White, M.D. Their reconnaissance work, published in 1858 and 1870, contained the state's first regional correlations of rock strata here with those in the eastern United States and Europe. These early volumes established a preliminary framework for the more comprehensive geological studies which were to follow.

Beginning in 1892, when the present Geological Survey was established, Samuel Calvin and his colleagues began to examine Iowa's geology county by county. Their readable accounts reflect the prevailing broad approach to natural science, as they are supplemented with information on prairie and forest flora, meteorological records and archaeological remains. Calvin, Thomas Macbride and Bohumil Shimek, three of Iowa's most influential and inspiring scientists, were equally at home in several fields of natural history. The tradition of service and science which they established remains an important theme of the survey's present and future operations.

Iowa has long been recognized as one of the important areas in the world for the study and interpretation of glacial deposits. As F.A. Wilder, G.F. Kay and A.C. Trowbridge followed Calvin as state geologist, they continued to emphasize examination of the state's glacial record. Questions related to glacial drifts, gravels, buried soils, peats, and loess deposits were inseparable from economic geology in Iowa -- and today are inseparable from environmental assessments. The adaptability of Iowa's terrain and soils to agriculture, and the importance of agriculture to Iowa's economy and as a factor in today's environmental issues warrant a strong and continuing commitment to research of Iowa's Quaternary-age glacial deposits.

Calvin Collection, University of Iowa

**▶ Samuel Calvin, state geologist from 1892 to 1904 and 1906 to 1911, examines a large glacial boulder in Buchanan County.**

Reprinted from *Iowa Geology 1992, Centennial Edition, 1892-1992.*

---

*Jean C. Prior is a geologist for the DNR in Iowa City and is editor of* Iowa Geology.

## SAMUEL CALVIN, PIONEERING GEOLOGIST

by Brian J. Witzke

Samuel Calvin's legacy of accomplishments has influenced generations of Iowa geologists. Even today, he is regarded as Iowa's premier geologist among the many scientists to have worked in our fine state. Born in Scotland in 1840, Calvin's family moved to eastern Iowa in 1854. His talents in science, teaching and administration led him to service as a school teacher in Quasqueton, an instructor of mathematics at Lenox College in Hopkinton, a school principal in Dubuque and Delaware County superintendent. He also enlisted as a volunteer in an Iowa regiment during the Civil War.

Calvin was appointed state geologist for the fledging Iowa Geological Survey in 1892. It was under his able leadership that the newly commissioned survey undertook detailed county-by-county studies of the bedrock and surficial geology and evaluated their water and mineral resources. These reports remain an indispensable source of geologic information to this day. Calvin was also an active field geologist whose astute powers of geologic observation were widely respected. He personally wrote 12 of the survey's detailed county reports, as well as dozens of other articles on natural resources, bedrock stratigraphy, paleontology and Pleistocene geology.

His depth of scientific knowledge made him eminently qualified to be chairman of natural history at the University of Iowa, a position he assumed in 1874. This department subsequently expanded into the departments of geology, botany and zoology under his guidance. Calvin also served as editor of the *American Geologist*, president of the Geological Society of America and the Iowa Academy of Science, and served on federal panels related to fuels and conservation of natural resources.

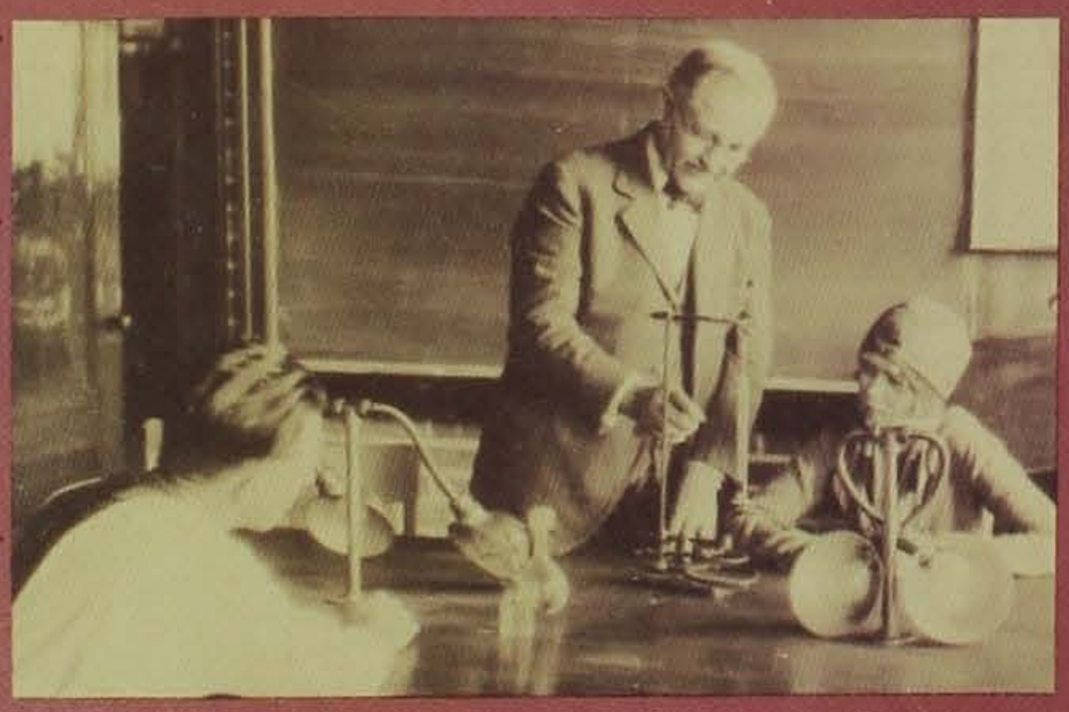
Calvin was recognized by the Iowa Academy of Science (1911) for having given shape, proportion and character to the work of the Geological Survey and for having effectively combined its scientific and economic aspects. His colleagues found in his example of service to the state, to education, and to science "the purest inspiration for future effort and devotion."

## THE LEGACY OF THOMAS MACBRIDE AND BOHUMIL SHIMEK

by E. Arthur Bettis III and Debby Z. Baker

Interdisciplinary studies are an integral part of our approach to earth science study. Collaborative work among scientists with diverse interests and training often leads to new perspectives on old issues and innovative solutions to problems. For example, Iowa's effort to reduce the impact of non-point source groundwater contamination is exemplary of the interdisciplinary approach, with specialties ranging from agronomy to sociology contributing to the identification of key issues and solution of problems.

Modern interdisciplinary natural science studies in Iowa have their roots in the late 1800s and early 1900s. Especially important is the legacy of Thomas Macbride and his student Bohumil Shimek, two prominent members of the University of Iowa faculty and special assistants of the Iowa Geological Survey. The two were widely recognized for their contributions to botany and geology, contributions resulting from an ability to incorporate knowledge from diverse fields in the interpretation of the landscape. Macbride mapped glacial geology in north-central Iowa, and published articles on plant geography, paleobotany and fungi. Shimek

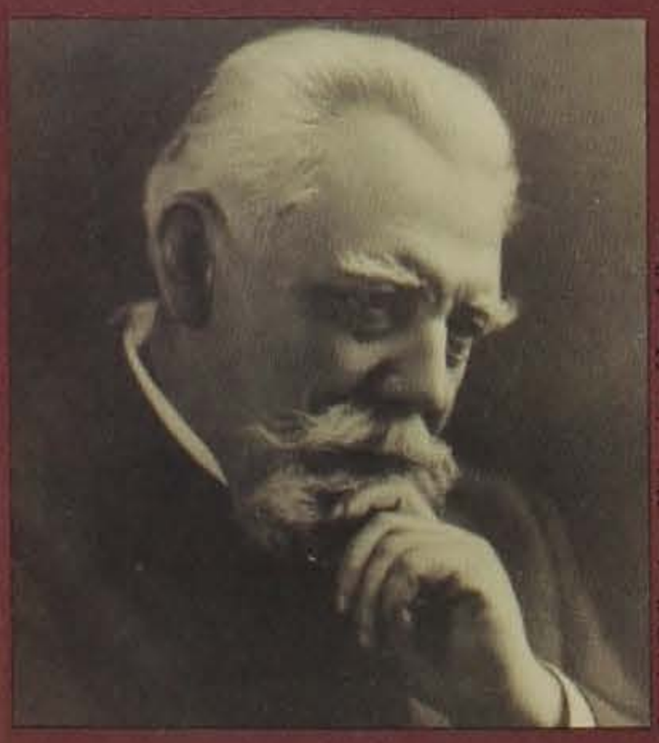


Special Collections, University of Iowa Library

**Bohumil Shimek, known for his work on Iowa's loess deposits, works with plant ecology students (circa 1925).**


Calvin Collection, University of Iowa

◄ **George F. Kay, state geologist from 1911 to 1934, ponders his plight after a June 1924 windstorm during field work in Lucas County.**



Special Collections, University of Iowa Library

◄ **Thomas Macbride, who mapped the glacial geology of 17 counties, also served as president of the University of Iowa from 1914 to 1916.**

exhibited a similar breadth, mapping two counties in the loess hills of western Iowa, elucidating the origin of loess (by recognizing the habitat of its fossil snails), and publishing classic works on loess, glacial deposits and molluscs, Iowa's plant geography, and the antiquity of humans in the upper Midwest.

Natural scientists in Iowa took note of the great loss in natural areas that occurred late in the 19th century, and in 1901 a group was organized to establish state parks and protect forest songbirds and wildflowers. This was the Iowa Park and Forestry Organization, the precursor of today's DNR, and Thomas Macbride was the organization's first president.

Shimek and Macbride believed that education, whether formal instruction in classrooms, sitting in the back of buckboards discussing landscapes and specimens with students on field trips, or addressing citizen groups in small communities, could solve most of society's problems. An informed populace was the purpose of science, and as teachers Macbride and Shimek were unsurpassed. This drive to educate reached fruition in 1909 when, through the efforts of Calvin, Macbride, Shimek and others, the Lakeside Laboratory was established on the shore of Iowa's deepest lake amid the prairies, marshes and potholes of Dickinson County -- a place where natural history could be studied, touched, smelled and experienced as a multidisciplinary entity.

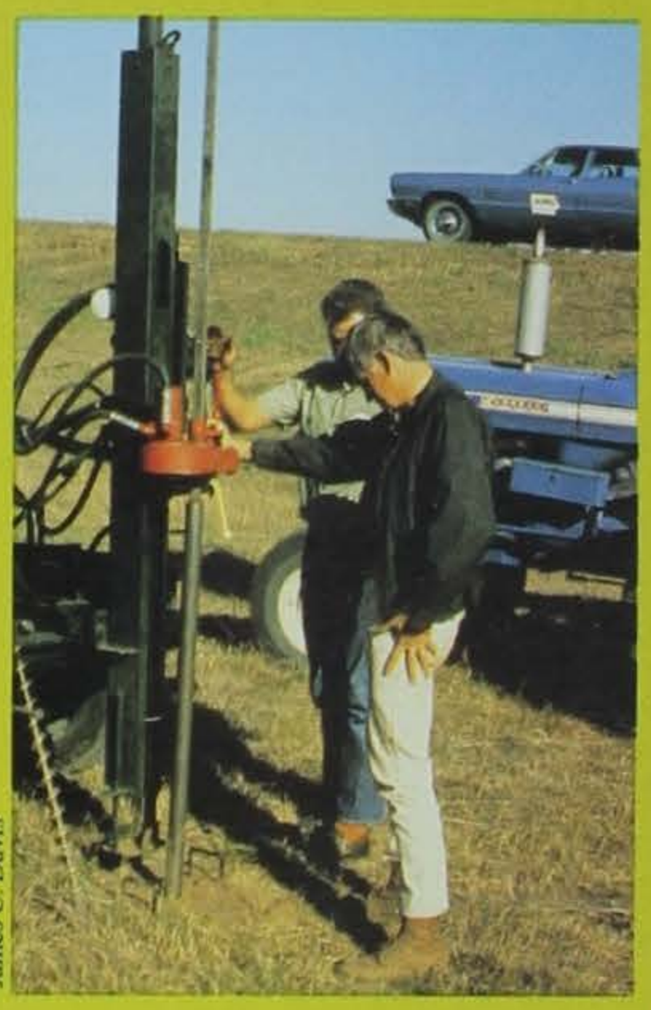
Macbride and Shimek provided us with a record of Iowa's native landscape and a vision of the conservation ethic necessary to preserve what little remains of that native condition. They left a body of knowledge upon which generations will continue to build. Their spirit of wonder and respect for the landscape, and their casting aside of disciplinary boundaries in nature's study are the foundation upon which our understanding of Iowa's natural history stands.

## UNDERSTANDING THE SOIL WE LIVE ON by Timothy J. Kemmis

There is a remarkable variety of surficial earth materials ("soils") in Iowa. For more than 100 years, survey geologists working to understand the distribution and characteristics of these materials have also made significant scientific contributions.

Materials accumulated during glacial activity comprise much of the state's surficial deposits. C.A. White (1860s) recognized ridges that were significant to later regional mapping of continental glacial deposits; W.J. McGee (1880s) recognized that the "Ice Age" was really composed of several ice ages separated by mild periods when soils formed; and Calvin, Shimek, Bain, Udden and Norton helped to establish the classic sequence of glacial and interglacial stages recognized worldwide. After Shimek established the wind-blown origin of loess, predictable variations in its properties could be applied to erosion potential, slope stability and rates of groundwater infiltration. Studying buried soils in southern Iowa, Kay demonstrated that they were products of weathering rather than deposition. In the 1960s Ruhe's identification of erosion surfaces provided a means for understanding how subsurface conditions can change with landscape position. Continuing scientific contributions of survey geologists include improved understanding of Iowa's oldest glacial deposits, of the alluvial sequence in river valleys, and of Des Moines Lobe glacial advances.

As we enter the 21st century, intensive land use, especially by agricultural production and urban expansion, make it imperative that land-use decisions be based on understanding Iowa's surficial deposits. Our need is for detailed county maps that portray not only the type, sequence and properties of these surficial deposits, but their suitability and vulnerability for various uses. Our challenge is to have the foresight to fund such mapping.



James C. Davis

▲ **Samuel J. Tuthill, state geologist from 1969 to 1975, drills into surficial deposits in Fremont County.**

Calvin Collection, University of Iowa

▲ **Arthur C. Trowbridge, state geologist from 1934 to 1947, took these geology students to a Johnson County quarry in 1912 to study Devonian limestones.**

# IOWA'S BEDROCK GEOLOGIC MAPS

by Brian J. Witzke

A bedrock geologic map portrays the geographic distribution of various rock units present at the bedrock surface. It shows what kind of rocks, grouped according to their geologic age and stratigraphic position, would be encountered if all overlying "soil" materials were removed. This distribution of rock units results from the interplay between the three-dimensional structure of tilted and domed rock layers and the configuration of the eroded surface which cuts across them. The earliest geologic maps were prepared from visual reconnaissance of bedrock exposures. Information about areas where the bedrock is buried has become possible as water wells are drilled across the state, and the accuracy of our geologic maps has shown progressive improvement.

Regional and statewide geologic maps were produced by Owen (1844, 1852), Hall (1858), White (1870), Calvin (1893, 1894, 1897, 1898, 1900, 1904, 1905, 1907), Kay (1912, 1914, 1922), Trowbridge (1937) and Hershey (1969). County geologic maps were also printed in the survey's *Annual Report* series between 1895 and 1941. Although the 1969 map is the most current, new revisions are ready to publish.

Production of a 1990s bedrock geologic map will be facilitated by recent improvements in bedrock topographic mapping, geologic structure maps, locations of bedrock exposures, resolution of bedrock units, completion of 7.5-foot topographic maps, and a computer-based geographic information system. A revised bedrock geologic map of Iowa will be an invaluable tool for natural resource planning, industrial minerals assessment, groundwater systems evaluation and environmental protection.

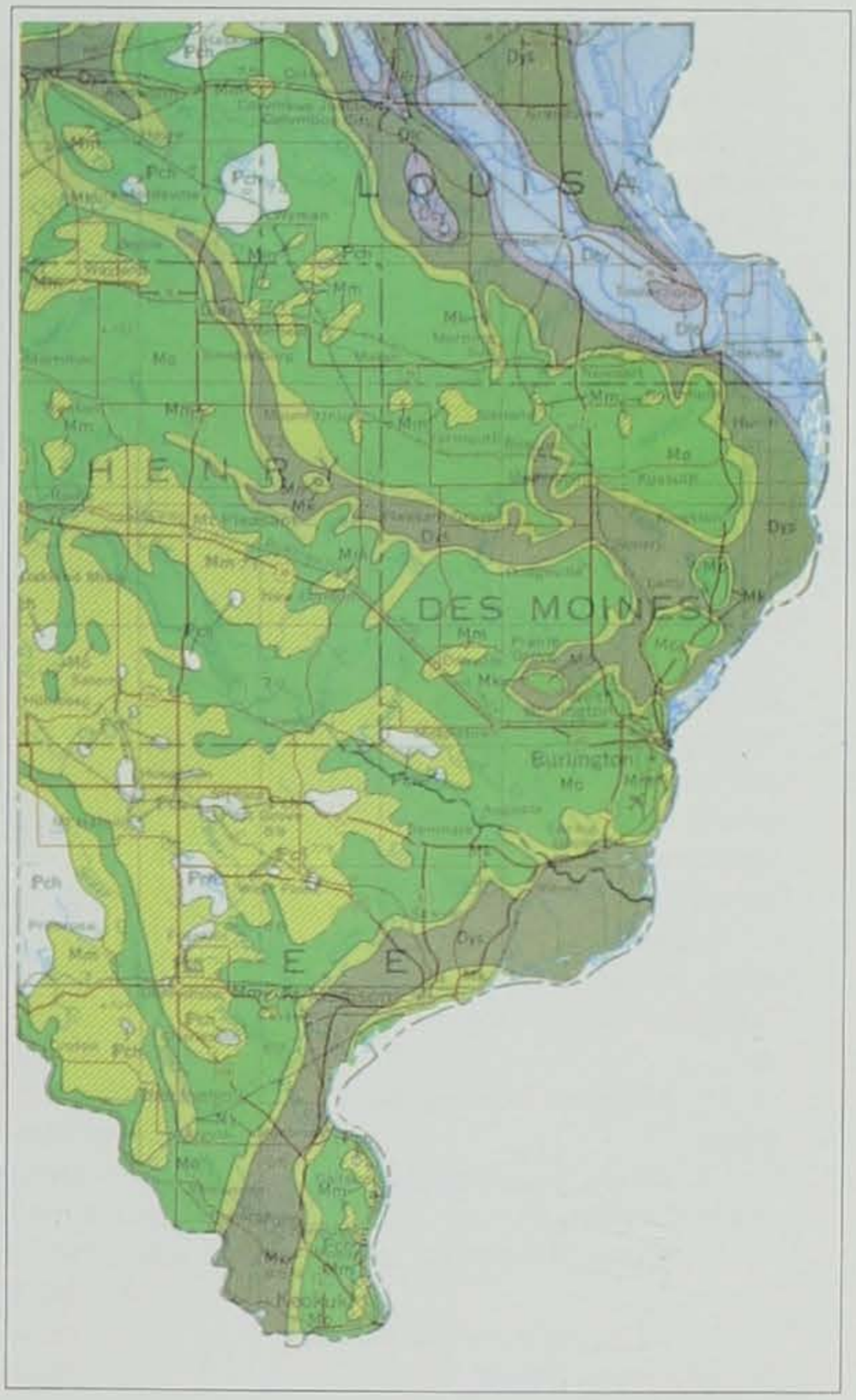

**Bedrock Geology of Southeast Iowa**

**1892 Map**

- Upper Carboniferous
- Lower Carboniferous
- Devonian

***Current Map***

- *Pennsylvanian*
  - Pch — *Cherokee Group*
- *Mississippian*
  - Mm — *Meramec Series*
  - Mo — *Osage Series*
  - Mk — *Kinderhook Series*
- *Devonian*
  - Dys — *Yellow Spring Group*
  - Dlc — *Lime Creek Formation*
  - Dcv — *Cedar Valley Group*



# WARDEN'S DIARY

by Chuck Humeston

## Tribulations of a Boater "Wannabe"

Some years ago, I thought I wanted to get a boat, but not just any boat -- a fast boat -- lots of horsepower -- I'd be a blur across the water. I wanted to be a *boater*. Then I became a conservation officer.

I've got to be honest and tell you enforcing laws for "pleasure boating," is not always a pleasurable experience. I like my job, it's simply that navigation enforcement usually brings up more confrontations with unhappy persons than other facets of this job.

I've found I can encounter a hunter or angler who is breaking the law, give them a ticket, and there will be no problem. Usually the person knows the law has been broken and expects the consequences. This often doesn't seem to be the case with boating laws.

I've tried to analyze this phenomenon, and the only thing I can come up with is it is similar to when I was a park ranger, dealing with laws relating to people's recreation, and recreation is perceived as strictly a private matter. (In this case the "recreation" relates to how fast a person can travel across the water!)

It seems to me boating laws are made, for the most part, to prevent the boater from getting into a boat and:

1. killing or drowning the boater;
2. killing or drowning the boater's passenger;
3. killing or drowning another boater;
4. killing or drowning another boater's passenger; or
5. destroying property.

Yet trying to get people to slow down or to use safety equipment is sometimes like getting the motorist to put on a seatbelt, or the motorcyclist to put on a helmet. Many persons resent the officer's attempt to interfere with the individual's perceived constitutional right to maim themselves.

Sometimes people can be very verbal in expressing their offense at an officer's audacious intrusion into their attempt at self-injury. Sad but true, most conservation officers will tell you they have taken more verbal (and sometimes physical) abuse during navigation enforcement than in any other aspect of law enforcement.

One night, Gary Biederman and I were working on Lost Island Lake, and came across a young boy in a canoe. There was no life jacket and no adults in sight. We directed him to shore, and, knowing his being alone was a little dangerous, we looked up his parents. Gary began issuing Dad a citation for allowing the boy to operate the canoe without the life jacket. Dad became unglued! Gary, who was being called things which made *me* cringe, began issuing a citation for a registration violation. Dad waded into the water, pounded on the side of our boat and demanded to see our safety equipment. We motored away with Dad still screaming in the distance.

Many times, early in my career, if I felt the need for up-close and personal self-abuse, I would head for West Okoboji. Once, Gary Owen and I motored up to a boat with light problems on the water in front of the amusement park. During the process of talking with the operator, the passenger stumbled to the side of the boat and announced he was going to "kick our a____." Recognizing the effects of alcohol, we suggested possibly the person would enjoy the Dickinson County jail. The operator, seeing his friend's mouth continuing to move and recognizing our resolve, successfully quieted his friend.

Now you may suggest, "Chuck, perhaps it's your approach?" Hey! I've considered that. On Clear Lake one blistering Fourth of July, I handed a citation for a violation to an operator and asked for his signature. He proceeded to read the citation over and over and ask question after question as to why he should sign it. I answered each question, and I explained the alternative to signing was to go to jail. He signed the citation.

My partner, Randy Schnoebelen, ventured the suggestion that perhaps I talked too much. Okay, I decided, I'll watch how this should be done. Shortly after dark we came across a boat with no lights. My fellow officer tried a less wordy approach. Randy simply informed the operator he was going to be cited for no lights. The gentleman was instantly furious. He told us what he thought of the citation and of us. So much for Randy's approach suggestion.

Even receiving a citation is sometimes not a deterrent. Faced with a person "in his face," Steve Schutte continued to write more tickets as the person continued his verbal attacks. Finally, Steve asked, "Just how many of these can you afford?" The man answered, "Probably more than you can write." Sigh . . .

We keep going out there. We try to let the words roll off our backs. Harangue us if you will but remember -- maybe down the road what we do will cause you to check your behavior or equipment. Then, just maybe, we've prevented you from becoming another tragic statistic. And, that makes us smile, even if you have turned into a red-faced, fuming cartoon character who bears a striking resemblance to someone who is always ranting at a certain, "rascally rabbit."