

Iowa
CONSERVATIONIST

January/February 1993

Department of Natural Resources



Larry Zach © 1993



Iowa
CON

Janua
Volum

STAFF

Ross Ha
Julie Spa
Tammra
Kathryn
Lowell W
Larry Po
Ken For

NATUR

Barbara
Marian K
Mark Do
Richard
(Mrs.) M
Douglas
Richard

ENVIR

COMM

Richard
Clark A.
Nancy Lee
Verlon B
William E
Rozanne
Charlotte
Margaret
Gary C. P

DIRECT

Larry J.

DEPUTY

Don Paul

DIVISIO

Stan Kuh
Larry Be
Allan Sto
Allen Far
William F
Michael C
Teresa D.

SPECIA

DNR Cent
Emergency
Telecomm
(515) 24-
Turn-In-P
Waste Res

Iowa C

Monthly

Wallace St

0034. Sec

additional

year. Inc

changes.

Conservat

Wallace State

0034

Under Ti

of the Ret

Act of 197

1972, fede

basis of rac

believe tha

program, a

desire furth

Departmen

Building, 9

0034 or the

Washingto

CONTENTS

FEB 15 1993

Iowa CONSERVATIONIST

January/February 1993
Volume 52, Number 1

STAFF

Ross Harrison, Bureau Chief
Julie Sparks, Editor
Tammra K. Pavlicek, Managing Editor
Kathryn Stangl, Assistant Editor
Lowell Washburn, Writer/Photographer
Larry Pool, Graphic Artist
Ken Formanek, Photographer

NATURAL RESOURCE COMMISSION

Barbara Nelson, Chairperson, Ruthven
Marian Kieffer, Vice-Chairperson, Bellevue
Mark Doll, Secretary, Council Bluffs
Richard Garrels, Mount Pleasant
(Mrs.) Marion J. Patterson, Cedar Rapids
Douglas R. Smalley, Des Moines
Richard C. Young, Waterloo

ENVIRONMENTAL PROTECTION COMMISSION

Richard Hartsuck, Chairperson, Des Moines
Clark A. Yeager, Vice-Chairperson, Ottumwa
Nancy Lee A. Siebenmann, Secretary, Cedar Rapids
Verlon Britt, Elgin
William Ehm, Creston
Rozanne King, Mondamin
Charlotte Mohr, Eldridge
Margaret M. Prahl, Sioux City
Gary C. Priebe, Algona

DIRECTOR

Larry J. Wilson

DEPUTY DIRECTOR

Don Paulin

DIVISION ADMINISTRATORS

Stan Kuhn, Administrative Services
Larry Bean, Energy and Geological Resources
Allan Stokes, Environmental Protection
Allen Farris, Fish and Wildlife
William Farris, Forests and Forestry
Michael Carrier, Parks, Recreation and Preserves
Teresa D. Hay, Waste Management Assistance

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 rate: \$6 for one year.** 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.

Under Title VI of the 1964 Civil Rights Act, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975 and Title IX of the Education Amendments of 1972, federal regulations prohibit discrimination on the basis of race, color, national origin, sex or handicap. If you believe that you have been discriminated against in any program, activity, or facility as described above, or if you desire further information, please write to: Director, Iowa Department of Natural Resources, Wallace State Office Building, 900 E. Grand Ave., Des Moines, Iowa 50319-0034 or the Equal Employment Opportunity Commission, Washington, D. C. 20240.



page 16



page 33



page 56

FEATURES

- 4 **WET AND WILD** by Lisa Hemaseth
- 10 **NONGAME NEEDS YOUR HELP**
- 12 **COOL CATS** by Lannie Miller
- 16 **ALL SYSTEMS GO** by Kevin Szcodronski
- 24 **IOWA'S HISTORY RECORDED IN STONE** by Raymond R. Anderson
- 27 **ENERGETIC WINNERS** by Patricia S. Cale
- 33 **IOWA'S STATE PRESERVES SYSTEM** by John Fleckenstein
- 51 **HOW TO CUT DOWN ON EVERYONE'S LITTER . . . EVEN THE CAT'S**
- 56 **SOLID SOLUTIONS FOR WASTE DISPOSAL** by Tom Anderson

SPECIAL INSERT

Attracting Backyard Wildlife

DEPARTMENTS

- | | | | |
|----|-------------------------|----|---------------------|
| 42 | Iowa's Outdoor Cookbook | 44 | Conservation Update |
| 49 | Classroom Corner | 62 | Warden's Diary |

COVERS

Front -- "Winter Pair -- Cardinals" by Larry Zach. For information on this or other prints by Larry Zach, contact White Oak Publishing, 901 SE Trilein, Ankeny, Iowa 50021, (515) 964-1570.

Back -- Pasque flower by Ken Formanek.

Inside Front -- Trumpeter swan by Ken Formanek.

Inside Back -- Cross-country skiing. DNR Photo.

CONTENTS



is so
but a
own

ago,
comp
with
squa
acres
west
name
regio
arriv
comp
char
bison
crane
loon,
godw
the t
speci
the s

nativ
settle
who
lands
"para
natur
crane
laugh
tural
grazi
bean
settle
inclu
and
exter
for t
area.
com
the t
settle
has b
nativ

fauna
decre
phibi
gray

by Lisa Hemaseth



WET and WILD



To have cranes as playmates is something difficult to imagine, but at one time it happened in our own backyards.

Approximately 12,000 years ago, glacier ice fields produced a complex of prairie interspersed with wetlands covering 300,000 square miles including 7.6 million acres in north-central and north-western Iowa. This area was named the "prairie pothole region." Before European settlers arrived in Iowa, the prairie marsh complex attracted a multitude of charismatic animals such as the bison, elk, river otter, whooping crane, sandhill crane, common loon, long-billed curlew, marbled godwit and trumpeter swan. By the turn of the century, all of these species had been extirpated from the state.

The disappearance of the native fauna coincided with the settlement of ambitious pioneers who set to work changing the landscape to fit their definition of "paradise." What once was a natural paradise for dancing cranes, roaming buffalo and laughing loons became an agricultural paradise for growing corn, grazing cows and raising soybeans. Unfortunately, the white settlers' definition of paradise included plowing under the prairie and draining the wetlands to the extent that little habitat was left for the natural residents of the area. While the production of corn and soybeans has put food on the table for many of Iowa's settlers and their descendants, it has been at the expense of Iowa's native fauna.

The decline of prairie pothole fauna continues to the present with decreasing populations of amphibians and reptiles, such as the gray treefrog, chorus frog and

"In the early day(s) as many as one hundred cranes would occasionally be seen in a flock. On one occasion about 20 alighted near the home of Rufus Greene, and his little daughter about six years old went out and played among them a considerable time, many of their heads being higher than hers."

Pocahontas County,
1904

Blanding's turtle. The bird community also continues to suffer. In the late 1980s, the U.S. Fish and Wildlife Service included the American bittern, least bittern, black tern and northern harrier on their list of "Migratory Nongame Birds of Management Concern in the U.S."

By 1980, only 26,470 acres of natural wetlands still existed in the state of Iowa. To date, Iowa has drained more than 95 percent of its natural wetlands and plowed under more than 99 percent of its prairie. Remnants of north-central and northwestern Iowa's vast prairie marsh complex can only be inferred from counting drainage inlets or flooded basins in fields after a heavy spring rain. With the natural landscape severely altered, hope for recovering many of Iowa's lost and disappearing prairie pothole fauna seemed futile.



Bruce Morrison

▲ Marsh marigolds

◀ With rare exception, sandhill cranes are no longer found in Iowa.

▶ Duckweed plants adhere to the feet and feathers of wetland birds to help revegetate restored marsh habitats.

▼ Studies have shown that birds and aquatic insects colonize restored wetlands within the first year of restoration. Many migrating shorebirds are attracted to the mud flats of these areas for resting and feeding.



Bruce Morrison

With the institution of the North American Waterfowl Management Plan (NAWMP) and the Conservation Reserve Program (CRP) in the mid-1980s hope was given to Iowa's disappearing wetland wildlife. The NAWMP is an international effort to reverse the decline of wetland acres and population declines of waterfowl. The plan is instituted by 34 regional committees which concentrate their efforts on restoring and acquiring land on a local scale. Iowa is a member of the Prairie Pothole Joint Venture (PPJV), the regional committee for the northern prairie states. With the help of federal, state and county agencies, conservation organizations, private businesses and concerned citizens the PPJV has protected, restored or enhanced more than 90,000 acres of wetlands throughout the prairie pothole region. The CRP, a provision of the 1985 Farm Bill, provides monetary incentives for farmers to take marginal agricultural land out of production and plant it with a suitable cover crop for

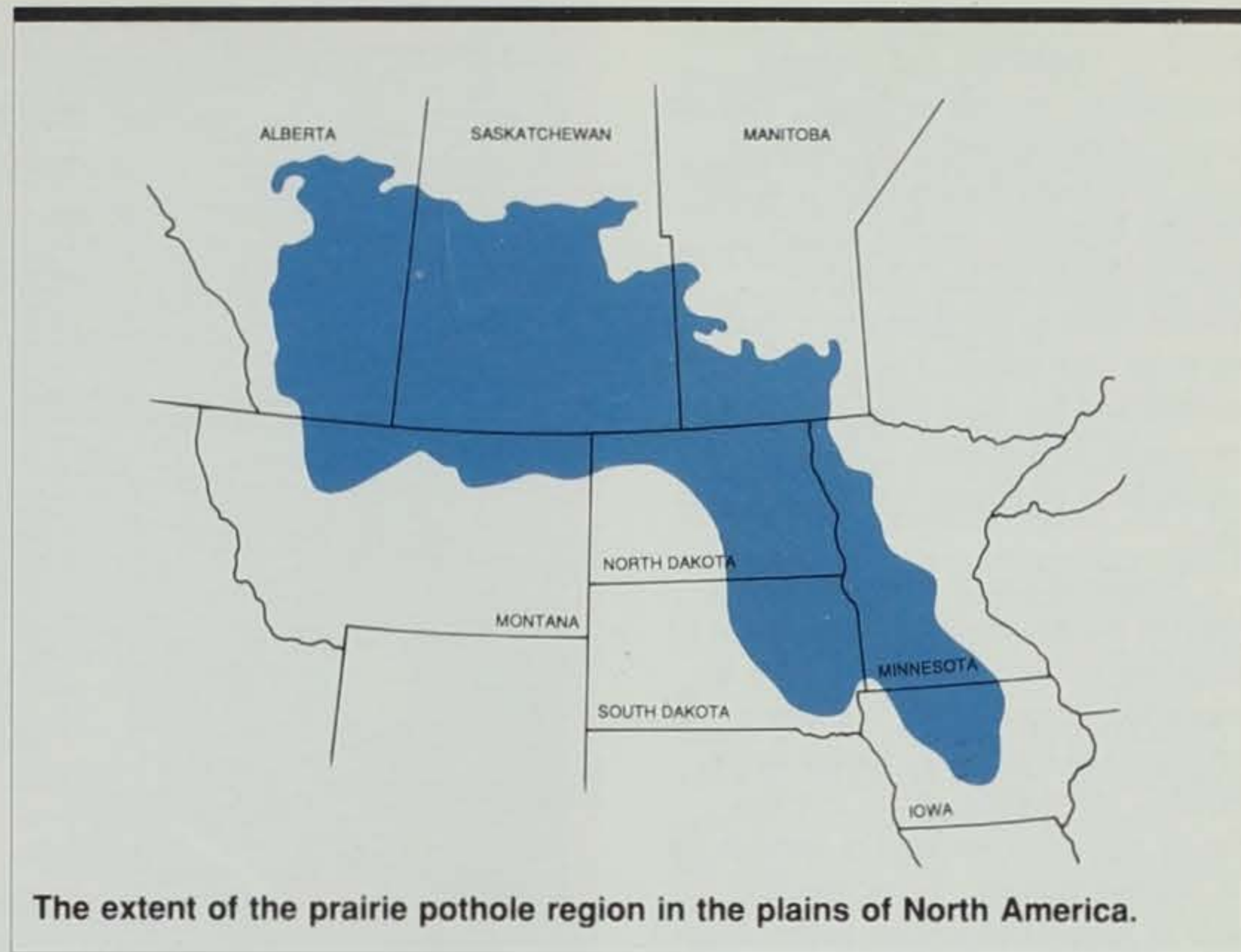
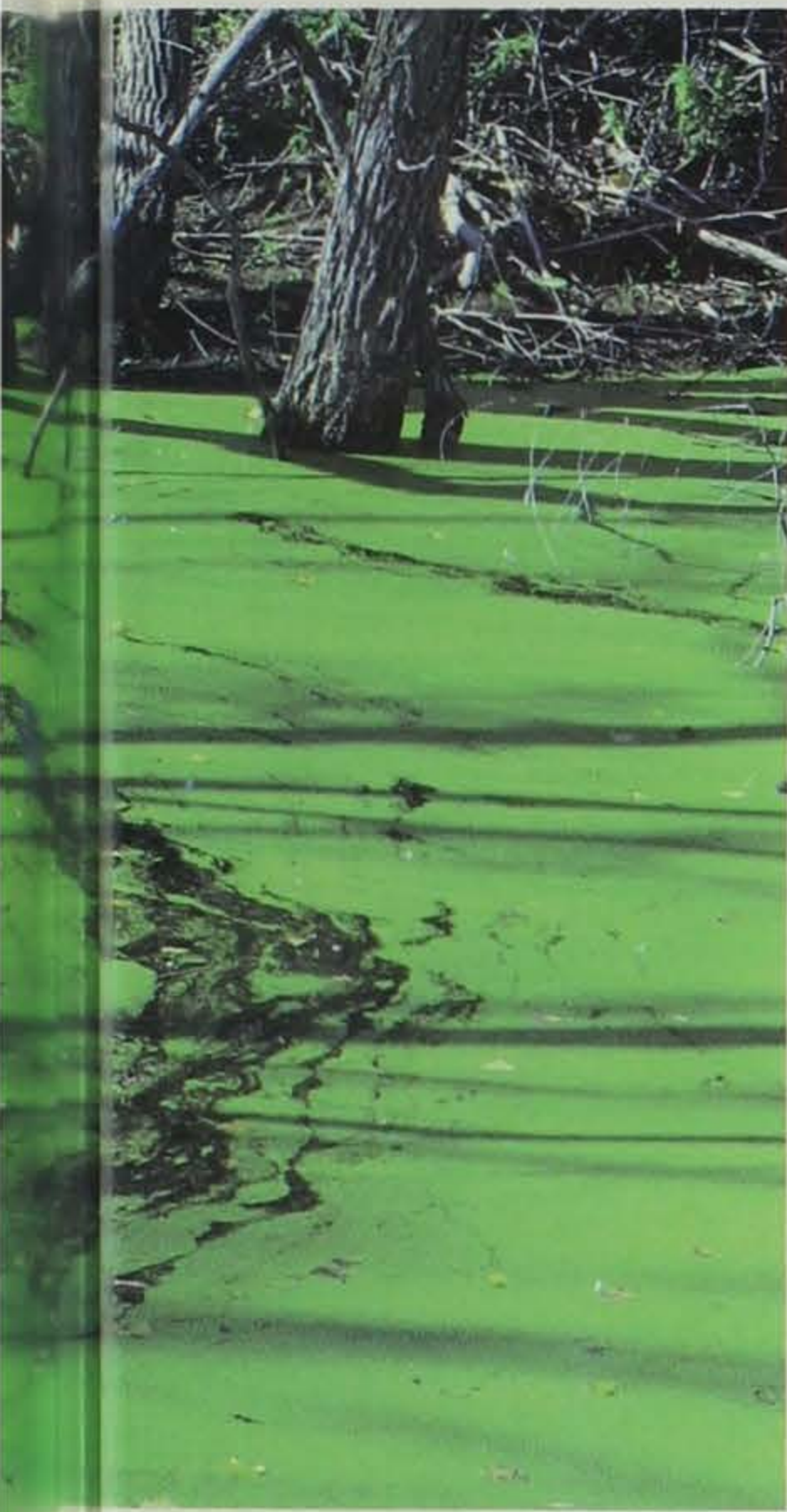
10 years. With water included on the list of suitable "cover crops," wildlife biologists and landowners throughout the prairie pothole region in the Midwest became busy with redefining the term "paradise" and began to restore the wetlands our ancestors once drained. The NAWMP and CRP have stimulated wetland restoration and

preservation in Iowa. To date, Iowa has restored 900 basins totaling more than 4,000 acres.

Wetland restoration is possible due, in part, to unique characteristics of the wetland seedbank. High densities of long-lived seeds in the soil enable the vegetation to respond quickly when the basin is reflooded. The seeds are



Roger A. Hill



essentially "waiting" for water to return to the drained basin so that they can germinate; however, seeds can only wait so long. Studies show that after a wetland has been drained for more than 20 years, very few wetland plant seeds remain in the soil. In Iowa, most of the wetlands were drained 50 or more years ago. With a depleted seedbank, how do restored wetlands in Iowa revegetate?

Wind and animal dispersal of seeds and plants helps restored wetlands revegetate. Some seeds, such as cattail, are light and are easily blown around. These seeds will quickly germinate wherever there is moist soil. Duckweed, pondweed and bladderwort plants disperse to restored wetlands by adhering to the feet and feathers of wetland birds. Finally, and probably most importantly, newly flooded basins often have remnant plant populations which are able to respond quickly to the moist soil conditions. These remnant populations are better known

to some people as weeds. Because many drained potholes still flood during heavy rains, the soil is moist enough to allow some wetland plant seeds to germinate. The result is river bulrush, spike rush and water smartweed growing in the corn or bean field. Once the wetland is restored and there is no corn, beans or herbicides to compete with, the remnant wetland plants quickly take over the site.

While the primary goal of wetland restoration has been to provide habitat for waterfowl, it has, nevertheless, provided habitat for many of Iowa's nongame wildlife. Studies conducted by South Dakota State University and Iowa State University show that birds and aquatic insects colonize restored wetlands within the first year of restoration. American coots and red-winged blackbirds are usually the first to be attracted to the newly flooded basins using the flooded upland grass as nesting material. Many migrating shorebirds are attracted to the mud flats of newly restored wetlands and use the new habitat for resting and feeding along their arduous journeys. After two or three years, as the marsh vegetation begins to develop, yellow-headed blackbirds, pied-billed grebes, black terns and marsh wrens will begin to nest in the restored wetland.



Lowell Washburn

▲ Female red-winged blackbird

Little information has been collected on amphibian and mammal responses to restored wetlands. Painted turtles, snapping turtles and leopard frogs have been documented at many restored wetlands, but the impact of these wetlands on less abundant species, such as the Blanding's turtle, is yet to be determined. Tracks of mink, raccoon and fox have been sighted at some restored wetlands. Muskrat houses have also been erected at a few sites.

Nongame use of wetlands varies with the habitat conditions present at a particular wetland. Wetlands vary in vegetation composition, vegetation structure and hydrology (water depth, duration of flooding, etc.). For this reason, not every wetland is suitable for all wetland species. Some species, such as pied-billed grebes, prefer deep-water wetlands in which they can build floating nests inaccessible to predators and find an abundance of frogs and fish to eat. On the other hand, American bitterns nest in shallow wetlands (water depths less than two feet) or in upland



Lowell Washburn

▲ Flowering arrowhead plant



Ron Johnson

Wetland Appreciation

Iowa has many types of wetlands (prairie potholes, backwater lakes of rivers, river bottomlands, ponds, fens, streams, oxbows and artificial lakes, ponds and reservoirs). Reading magazine articles about Iowa's wetlands may increase your knowledge of wetlands and donating money to conservation agencies that restore and preserve wetlands may help wetland wildlife, but a true appreciation of the natural world can only be attained through direct contact. So, get out your boots and binoculars and take a trip to the nearest wetland. If you are unaware of the locations of wetlands in your county, contact your county conservation board, the DNR or your local library. Once you have arrived at the wetland please take the following steps:

- ◆ Get out of your car.
- ◆ Walk to the wetland and proceed to wade into the water.
- ◆ Remember you have more senses than just sight. Please

feel free to listen for bird and frog songs, touch cattails and lily pads, and smell the flowers or a handful of marsh mud.

- ◆ Don't pick any flowers. Smelling and touching flowers is great, but please leave them for the next visitor to enjoy.
- ◆ Don't harass the wildlife. Let wild critters determine the distance between you and them.
- ◆ Experience the wetland during all four seasons. Wetlands are alive with wildlife all year long. In winter, look for tracks of mammals and birds in the snow and enjoy the silence of a winter day.
- ◆ Bring the kids! Building an appreciation of the natural world is a lifetime process.

Start exploring wetlands near your home today, and learn to appreciate the wildlife that share your part of the world.

-- LH

sites. These secretive birds prefer wet meadows or low prairies for nesting.

Wet meadows and low prairies are also known as temporary or ephemeral wetlands because they retain water for only short periods of time and are dry for the majority of the year. The plants in these habitats can only tolerate extremely short periods of flooding (a few days to a few weeks). Plants which can be found in these shallow wetlands include blue vervain, ironweed, cord grass, water hemlock, prairie phlox and yellow star grass, to name a few. These wetlands can be found in swales, flats, or on the rims of larger, deeper wetlands (see figure).

Because wet meadow and low prairie plants do not have seeds which remain viable in the soil for long periods of time or readily disperse, the addition of water to a wetland basin that has been drained for a long time is not going to produce plants associated with temporary or ephemeral wetlands. Due to the absence of wet meadow and low prairie wetland zones, restored wetlands have a difficult time attracting animals which typically breed in these habitats. For example, a study conducted by Philip Delphey and Dr.

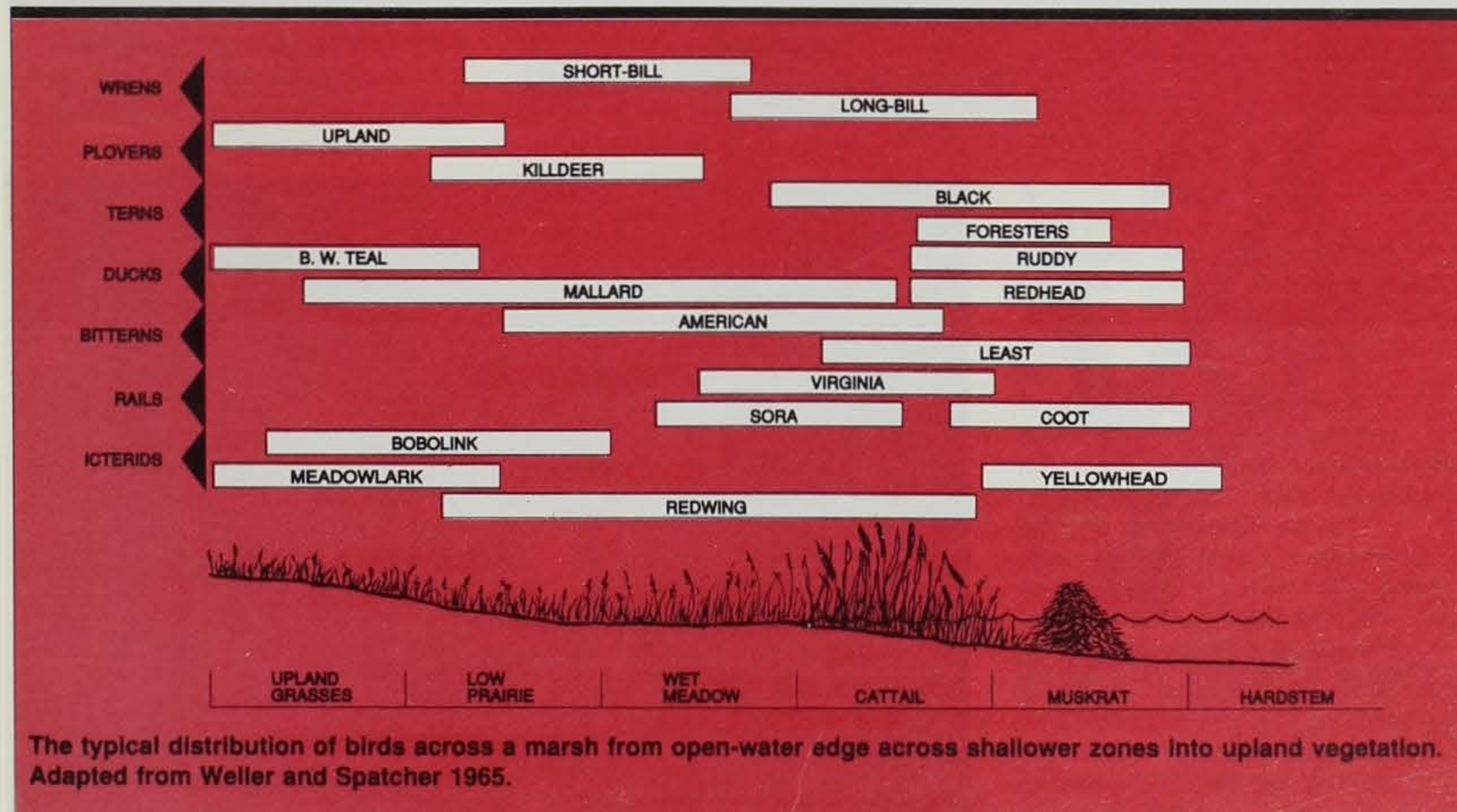
James J. Dinsmore of Iowa State University, has shown that common yellowthroats and swamp sparrows, birds which nest in wet meadows and low prairies, frequently breed in natural wetlands but avoid restored wetlands. Other birds which require wet meadows and low prairies for nesting include the bobolink, sora, Virginia rail and sedge wren (see figure). According to Susan Galatowitsch, a doctoral student at Iowa State University studying plant colonization of restored wetlands, active management in the form of planting seeds or transferring plants from a natural marsh to a restored wetland may be the only means in which to restore wet meadow and low prairie plant communities and the habitat needed by many wetland animals. Obviously, restoration of these plant communities is going to be labor intensive and costly.

While restored wetlands may not offer the habitat diversity seen in natural marshes, they have provided a home for many wetland species. Research conducted by Iowa State University professors and graduate students has provided valuable information on how birds, aquatic insects and plants

colonize restored wetlands. The Iowa Department of Natural Resources' (DNR) Nongame Program has supported research on restored wetlands with the intention of using this information to improve restoration techniques employed by Iowa landowners and the DNR's wildlife biologists.

In 1993, the Iowa DNR plans to restore, or acquire through land purchases, 500 acres of wetlands in Iowa's prairie pothole region. An additional 700 acres of wetlands will be restored by Iowa DNR biologists and landowners on private land. Research and management of Iowa's wetland fauna will be expanded in 1993 and 1994 by initiating studies on amphibian colonization of restored wetlands, erecting black tern nest site platforms, censusing for migrating shorebirds and censusing for breeding northern harriers. Through the efforts of ambitious landowners, biologists and wildlife enthusiasts throughout the state we are restoring a little slice of the natural paradise that we once took for granted.

Lisa Hemaseth is a nongame biologist for the department at Boone.



The typical distribution of birds across a marsh from open-water edge across shallower zones into upland vegetation. Adapted from Weller and Spatcher 1965.

◆◆◆◆

Nongame Needs Your Help

◆◆◆◆



Roger A. Hill

Contributions to the Chickadee Checkoff, which funds state programs for 80 percent of Iowa's wildlife, have hit an all-time low. As of October 1992, 92 percent of the state income tax forms had been processed, and the Chickadee Checkoff had only received \$157,819. Contributions to the checkoff have dropped nearly 30 percent in the last four years.

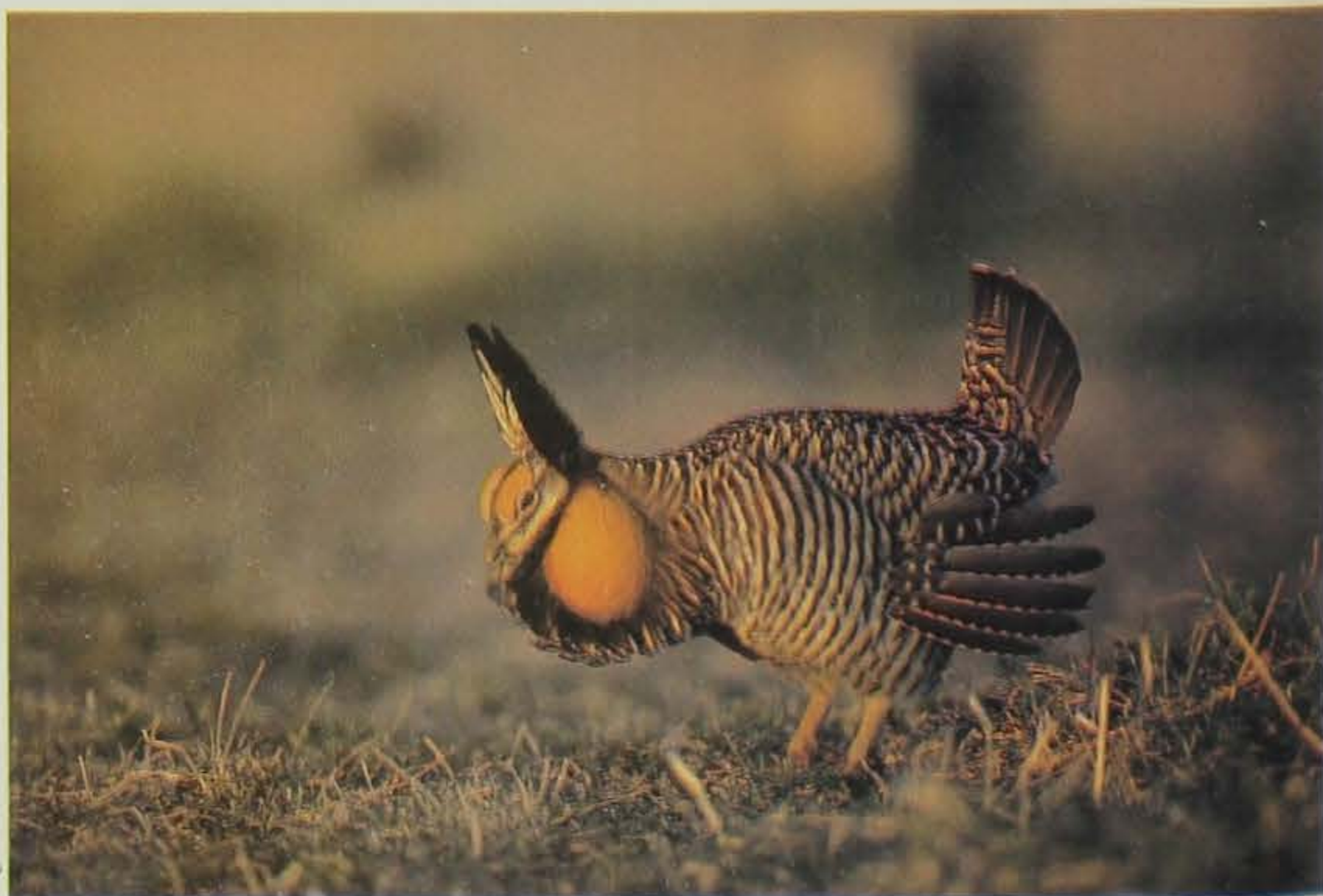
"At best, we might creep up to \$170,000 when the processing is through," says Laura Jackson, nongame biologist. "However, this still represents the lowest contribution ever to the Chickadee Checkoff."

The biggest sufferers will be the state's wildlife noted Jackson. The Nongame Program which is funded by the Chickadee Checkoff has spearheaded such projects as the river otter releases, peregrine falcon releases, and the first complete survey of Iowa's

▲
Leopard frog.
Nongame personnel research a variety of wildlife species, including frogs and prairie chickens.

▶
This year's nongame support certificate is a photo of a lesser prairie chicken taken by Roger A. Hill of Roland, Iowa. The image size on the certificate is 7 x 5". The certificate is available for \$5 each. Send a \$5 check or money order to the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

Roger A. Hill



breedin
conduc
amphib
assiste
endang
from b
tions a
to host
enjoye
per yea
that are
and lan
Th
contras
plus bu
progr
Minne
Missou
simply
nongan
Iowa, t
comes
Chicka
than 90



Birds of Two Worlds: Tropical Birds of the Midwest

Many of the colorful songbirds we enjoy in summer make their homes on two different continents. This year's nongame poster is illustrated by Catherine McClung, a wildlife artist from Dexter, Michigan. It depicts, in watercolor, 10 of our favorite songbirds, from the northern oriole and scarlet tanager to the ruby-throated hummingbird and the bobolink. Information and migration maps for each of the birds is featured on the back. The poster is being produced by Partners in Flight, an international group focusing their resources on solving the problems that face neotropical migrant birds, or birds that spend most of the year in the tropics of Central and South America and nest in North America. State and federal agencies in the Midwest have teamed up to produce the poster, an effort of the U.S. Fish and Wildlife Service, Mark Twain National Forest, Minnesota Department of Natural Resources, Missouri Department of Conservation and the Iowa Department of Natural Resources. Iowans can obtain the poster by contributing to the Chickadee Checkoff on their state income tax form, or by making a contribution of \$5 or more directly to the Nongame Program.

◀ Northern oriole, as it appears on the poster.

breeding birds. The program also conducts surveys on winter birds, amphibians, bald eagles, and has assisted research on threatened, endangered and other species ranging from bats to butterflies. The contributions also enable the Nongame Program to host wildlife watches that are enjoyed by more than 25,000 Iowans per year and to produce publications that are used by thousands of schools and landowners across the state.

The funding decline in Iowa contrasts starkly with the \$1 million plus budgets used to fund similar programs in surrounding states such as Minnesota, Wisconsin, Illinois and Missouri. Most other states do not rely simply on checkoffs for funding their nongame programs, noted Jackson. In Iowa, the only funding for the program comes from direct donations or the Chickadee Checkoff. Ironically, more than 90 percent of the people in the

state enjoy the types of wildlife recreation that the Nongame Program promotes. Yet only two percent of the people contribute to the program.

"It is a problem of awareness," says Jackson. "Many people enjoy wildlife, but don't realize that wildlife needs their support."

Hunted species are supported by license sales and excise taxes on equipment, which produce about \$12 million annually for wildlife management. Non-hunted species, which form the bulk of Iowa's wildlife, are supported only by the checkoff.

"Game and nongame animals alike benefit from management of Iowa's public lands," according to Richard Bishop, chief of the DNR's wildlife bureau, "but the small amount donated by nongame supporters doesn't begin to address the additional needs of the 400-plus nongame species which reside in Iowa."



Do your part by contributing to the Chickadee Checkoff this year on your state income tax form. You will find it on line 61 of the 1040 state income tax form -- the Fish and Wildlife Protection Fund.



Cool

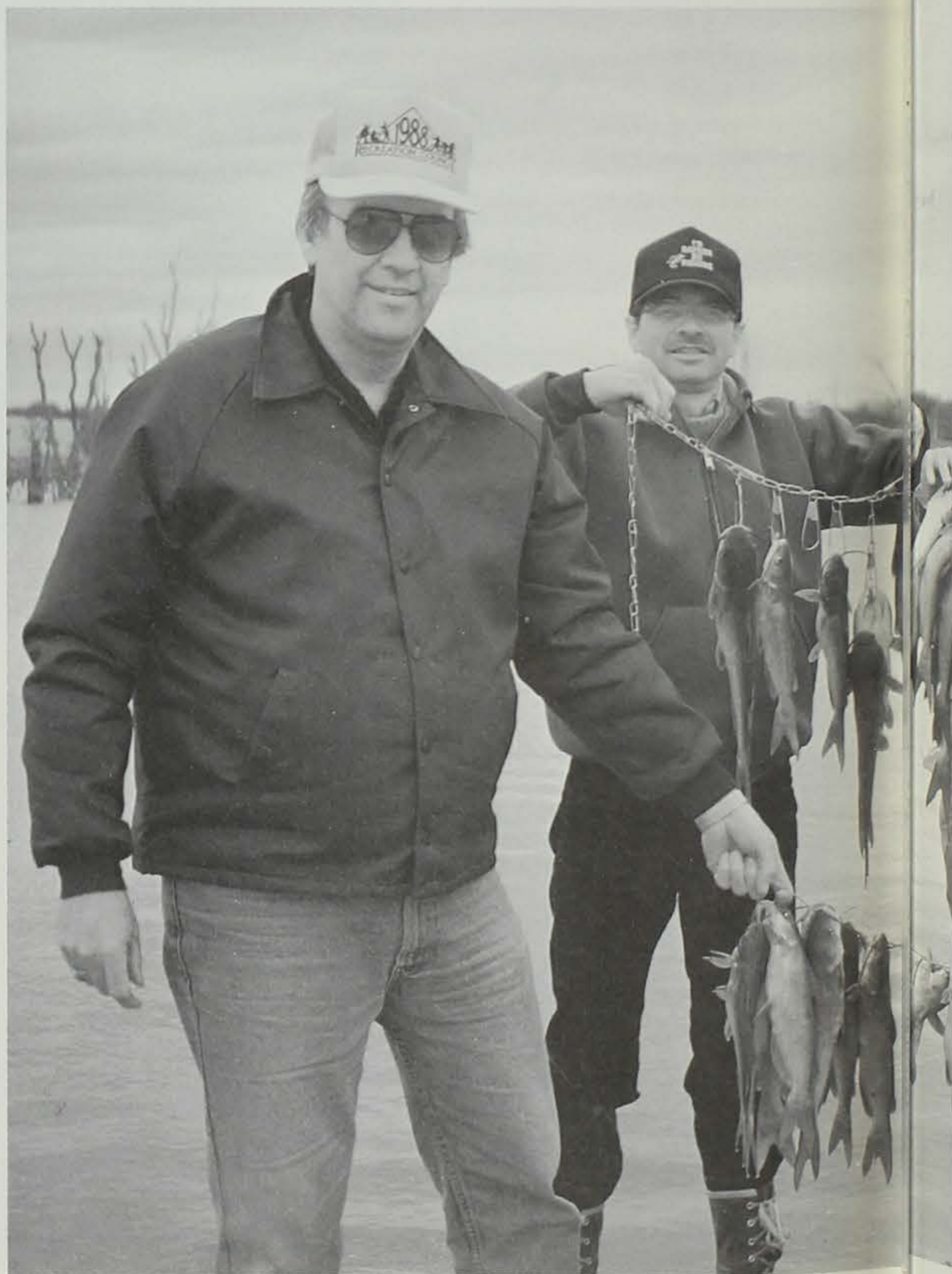
by Lannie Miller

Want to know a little fishing secret? One that is guaranteed to increase your catch of channel catfish? Try ice-out catfishing.

I don't mean sometime in May or June, I mean within a week or two of actual ice-out on your favorite lake. You say you've always heard that catfish only bite after the water temperature has reached 60°F. Well, don't believe it. This type of angling offers some of the year's best catfishing opportunities, yet relatively few people participate in it.

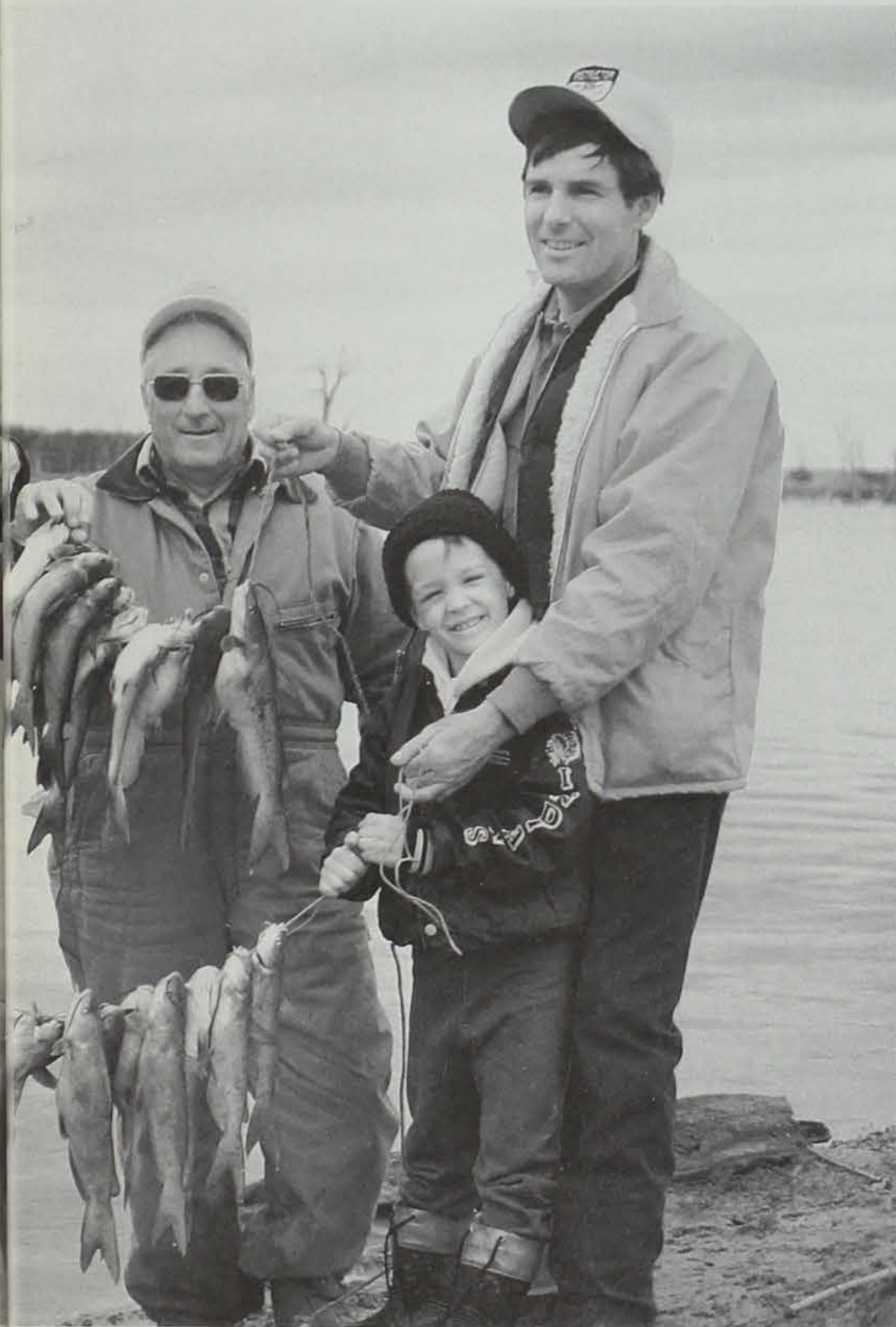
The winter months in Iowa are a time of stress for all living creatures, including fish. Thousands of fish die each year under the mantle of ice that covers our lakes and reservoirs. Because nothing goes to waste in nature, many of these dead fish either decompose or are eaten by other fish. Enter the catfish! Because the catfish is both a predator and a scavenger, ice-out signals the start of a feeding binge that has no equal the remainder of the year. Wave action and spring currents pile dead fish up in certain locations in the lake and catfish are quick to take advantage of this smorgasbord. This feeding frenzy will continue as long as the water remains cool and dead fish are present.

Let's take a look at the different types of lakes and how to fish them for early spring catfish. I've separated the lakes into three categories -- reservoirs, artificial lakes and natural lakes. I've asked two of the best catfish anglers I know to help me explain the



Cats

The Hottest Fishing of the Year



intricacies of this type of fishing. Don Bonneau is the fisheries research supervisor stationed in Des Moines. He fishes catfish on all types of lakes and streams, but is especially knowledgeable about ice-out catfishing in the large reservoirs of central and southern Iowa. Larry Gepner is a fisheries management technician stationed at Lewis. Gepner fishes the smaller artificial lakes in the southwest part of the state and consistently catches limits of catfish in the early spring.

Reservoirs

Location, bait and wind are three of the most important factors for any successful fishing trip, but they are especially important when angling for catfish in the early spring. According to Bonneau, the best locations are the shallow bays near the upper end of the reservoirs. Because of their shallow depth and dark color, these bays warm up much faster than the rest of the reservoir and catfish are attracted to these areas. "If a stream or river enters





these shallow bays, so much the better," says Bonneau. Because most of the water that Bonneau fishes is between one and four feet deep, wind can also be a real factor. "Wind piles lots of warm water into these bays," says Bonneau. "The catfish will start feeding in these areas as soon as the water temperature reaches 40 degrees, but they will start to disperse from

these bay areas when water temperature gets above 60 degrees."

"Most people don't realize how many fish, especially shad, die during the winter months," Bonneau says. "These, in turn, are eaten by catfish, so it's quite obvious that the best bait to use in early spring would be dead fish." Bonneau, like all good catfish anglers, has a favorite bait -- prepared shad sides. This bait can be purchased at most bait shops in southern Iowa. To humans, these prepared shad sides are one of the most awful smelling baits imagined, but catfish love them, especially during cold water periods. This bait will work in all lakes, even where shad are not present. If the cats aren't biting, Bonneau changes bait every 30 minutes as fresh bait gives off more scent.

"I like to use a long, stiff fishing rod, open-faced spinning reel and eight-to 10-pound test line," says Bonneau. "My terminal tackle consists of a light

slip sinker, small split shot to act as a sinker stop and a 2/0 or 3/0 baitholder hook. As soon as a fish picks up the bait and runs, I set the hook."

Several reservoirs consistently produce limits of catfish for Bonneau in the early spring. He rates Rathbun, Macbride and Saylorville as the best in the state.

Artificial Lakes

According to Larry Gepner, wind is the most important factor to consider when fishing artificial lakes. The stronger the wind velocity, the better. Gepner prefers south or southwest winds, because they usually signal warmer weather, thus increasing water temperatures. "Always fish the shore that the wind is blowing in to," says Gepner. He looks for shallow, turbid water created by wind action to fish on these lakes. If he doesn't get some action in an hour, he will move to a new location. Gepner usually begins his quest for catfish in mid-April when water temperatures reach 40 to 50 degrees.

Prepared shad sides are also Gepner's favorite early season catfish bait. According to Gepner, these shad sides can be frozen for future use, but once thawed should be kept in a tightly sealed container in a refrigerator that is not used for food.

Gepner's terminal tackle, which is very similar to Bonneau's, consists of 10-pound line, medium action rod, small slip sinker and a 2/0 hook. "You usually aren't bothered with little catfish using this bait and equipment," says Gepner. "Most of the catfish I catch in the early spring are between two and five pounds with an occasional fish 10 or 15 pounds." Gepner rates the following artificial lakes as some of the best in Iowa for early spring catfishing -- Mormon Trail, Greenfield, Littlefield, Nodaway and Anita.

Natural Lakes

In many of our state's natural lakes, early spring catfishing can be described in one word -- fantastic! Storm Lake, Black Hawk Lake and North Twin all have gizzard shad as their main forage base. Shad not only produce big, fast-





growing catfish, but also provide anglers with one of the best opportunities to catch ice-out cats. I can personally attest to the quality of catfishing in these three lakes. I have caught spring-time catfish when the surface water temperature near shore registered 36 degrees and shards of ice were still drifting on the waves. To be honest, catfish are less than aggressive at this temperature but they are feeding and can be caught in the right location with the right bait.

My favorite bait for early catfish has to be shad entrails. Although not as

smelly as the prepared shad sides, they still have a lot of odor and are relished as a delicacy by any catfish that smells them. Immediately after ice-out, large, dead gizzard shad can be found on the shorelines of lakes with a population of these fish. The entrails can be removed from them quite easily and cheaply. Several bait stores around these natural lake areas also sell them if you don't want to go to the trouble of getting them yourself. I use a small slip sinker and a 2/0 baitholder hook for this type of bait. As soon as a catfish picks up the bait and runs with it, I set the hook



hard. Most of the catfish I catch from these natural lakes will be between one and one-half and five pounds.

Because all of the natural lakes I've mentioned are shallow, wind plays an important role in early spring catfishing on these bodies of water. I always try to fish either directly into the wind or with the wind blowing perpendicular to the shore. These cross winds produce strong water currents, especially off points of land. These currents act as "in-lake rivers," bringing food items to the catfish waiting on the downwind side of these points. A smelly bait such as shad sides or entrails has a scent trail that catfish can smell for hundreds of feet.

It has always been surprising to me how few anglers fish for catfish in the early spring. While most anglers are pursuing walleyes, crappies and bluegills, the channel catfish are largely ignored. This spring, get a jar of smelly bait, warm clothes and a bucket to sit on and give ice-out catfishing a try. I know you'll be pleasantly surprised.

Lannie Miller is a fisheries biologist for the department at Black Hawk Lake.

First in a Series

All Systems Go

One hundred green lights came on in the room. Not a single red light was among them. It was all systems go for what was about to become landmark legislation in the State of Iowa. Three short years later it would be recognized as one of the nation's most responsive and progressive environmental programs in recent times. Its formal name is the Resource Enhancement and Protection program. Most people simply call it REAP.

Article by Kevin Szcodronski
Photos by Roger A. Hill



Those green lights came on in the House Chambers in Iowa's State Capitol on April 25, 1989, indicating that all 100 members of Iowa's House of Representatives voted "yea" for the REAP bill. No party lines were drawn. Democrats and Republicans alike were pleased with what they saw in the bill.

The bill then went to the Iowa Senate for its action. The Senate, after some refinements which are best classified as fine tuning, passed the bill on May 2, 1989, with a vote of 40 "yeas" and 6 "nays." While not unanimous, the Senate also soundly approved REAP. Because the Senate made some changes the bill then returned to the House for final approval. The red lights once again remained off as 91 green lights lit up when the House of Representatives adopted the refined bill.

The bill was now on its way to Governor Branstad's office for his consideration and signing into law. He signed it on May 27, 1989, and the REAP legislation became effective immediately on that day. REAP was given \$15 million for its first year of implementation -- \$8 million came from state lottery receipts and \$7 million came from state tax receipts.

The story of the REAP bill is somewhat unusual in three ways. First, it was enacted during the first legislative session in which it was introduced. Legislation of this magnitude typically takes two or more sessions to get passed. Second, provisions of REAP were immediately effective upon the Governor's signature. Laws are usually written to become effective at the beginning of a fiscal year, which would have been July 1, 1989, for REAP. However, lawmakers felt it was critical that REAP commence as soon as possible. Third, REAP was appropriated \$15 million upon its enactment. Bills that create new programs are often passed, but money is not provided to begin implementation. Money sometimes lags behind two or more years before programs can really take effect. REAP, on the other hand, was immediately allowed to begin providing benefits to the people of Iowa.

It was clear from the onset that REAP would need a variety of programs and beneficiaries to be successful.

REAP's success in getting this prompt attention did not come easily. A lot of time, effort and expertise went into designing and gaining support for the program. In fact, four years of work went into REAP before it was introduced in bill form. This advance work has paid off because after three years of implementation the REAP program remains solid as originally designed.

A sound foundation for REAP was established through the work of a special legislative study committee on recreation, tourism and leisure. This committee began working in 1985 and submitted its final recommendations in 1987. One of the recommendations was for the state to protect more of its open spaces. In response, the State Legislature directed the Department of Natural Resources to prepare an Iowa Open Space Protection Plan by July 1, 1988. The Legislature included in its directive an overall goal of having 10 percent of all land in the state under some form of public protection by the year 2000. While this is a very energetic goal and in some people's minds unachievable, it did set the stage for Iowa's growing support for open space protection. The DNR, with help from other agencies and interested private organizations, completed the plan and submitted it to the Governor and General Assembly in 1988. The plan called for doubling

protected open space by the year 2000 and a commitment to an active, on-going protection program in the years beyond 2000 aimed at achieving the 10 percent goal. Iowa had about 625,000 acres under public protection in 1988. Doubling that by the year 2000 means raising the acreage to about 1.25 million. That doubling constitutes about one-fifth of the overall 10 percent goal.

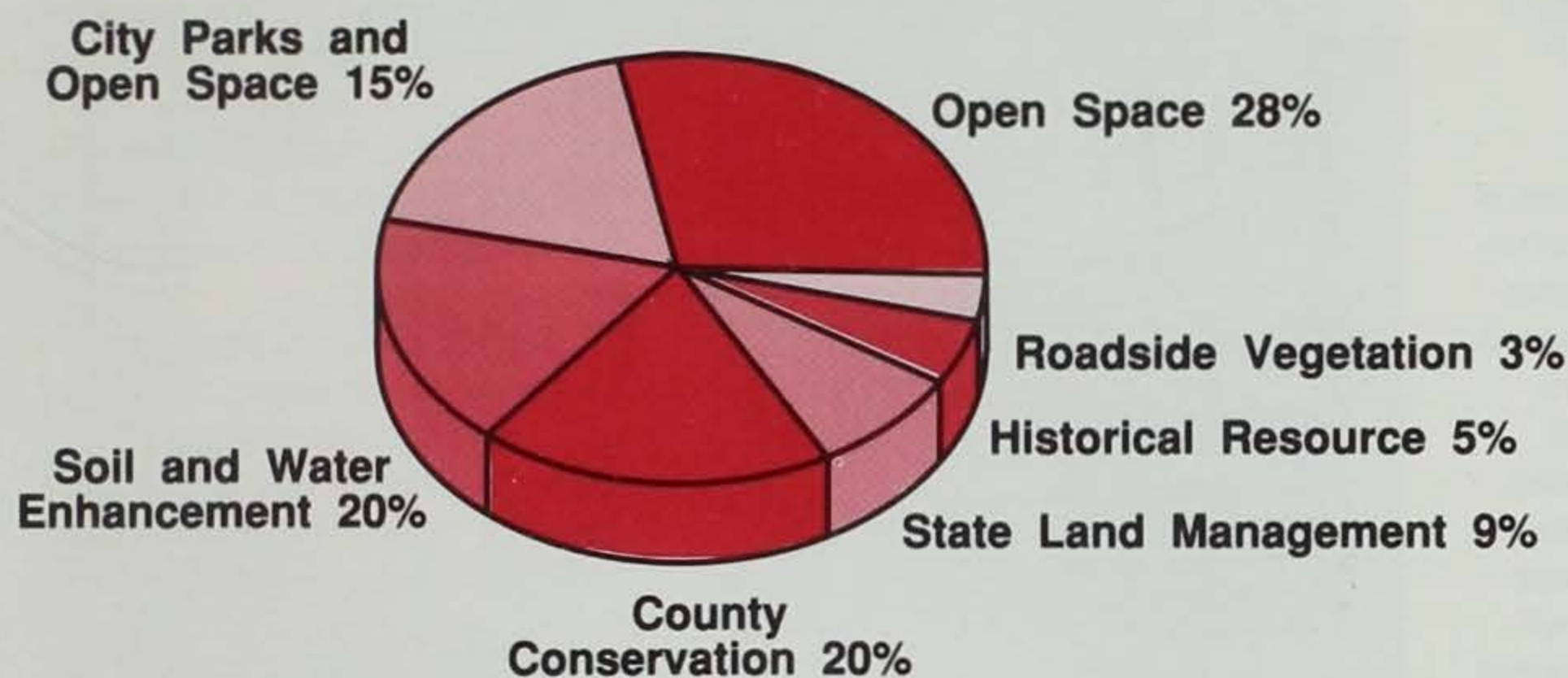
While this study was going on, a group that would eventually be called the "REAP Alliance" was forming. This group, made up of representatives from 26 private conservation-related organizations, worked with interested legislators to begin designing REAP. It was clear from the onset that REAP would need a variety of programs and beneficiaries to be successful. Cities, counties and private conservation organizations would have to join DNR efforts in accomplishing open space protection goals. Soil conservation elements would need to be incorporated since soil is our state's most precious resource. Introduction and management of native prairie grasses and wildflowers along streets, roads and highways could reduce maintenance costs while providing wildlife habitat and scenic areas. Preservation of the state's historical resources are important, so it too was included. Anyone and everyone involved in conservation knows how important education is to achieve long-term commitment by people to the well-being of natural and cultural resources. Therefore, a conservation education element was put into REAP. And, as the saying goes -- "last but not least" -- the creators of REAP felt that it was vital to provide plenty of opportunities for citizens and organizations throughout Iowa to be actively involved in the program.

REAP thus far has received the following appropriations:

1990 -- \$15 million
1991 -- \$25 million, cut to \$20 million
later in the fiscal year
1992 -- \$10.6 million
1993 -- \$9.4 million

This money has come from a com-

REAP Fund Allocation



First \$350,000 allocated for conservation education. One percent of the balance allocated to the DNR administration account.

◀ The chart at left shows the percentage for each of REAP's basic programs.

combination of lottery and state tax receipts. While the amount is significant and has allowed for many accomplishments, it is quite a bit lower than the \$30 million per year that was originally designed into REAP. Supporters of the program are looking forward to better economic times in Iowa government and to \$30 million a year becoming a viable commitment to REAP.

REAP funds are allocated based on percentages spelled out in the law. Five state agencies are involved in carrying out REAP programs: Department of Natural Resources (DNR); Department of Agriculture and Land Stewardship (DALSS); State Historical Society of Iowa, Department of Cultural Affairs (DCA); Department of Transportation (DOT); and Department of Education (DOE). The chart above shows the percentage and respective state agency for each of REAP's basic programs.

Because in-depth articles on REAP programs will be published in the *Iowa Conservationist* over the next two years, this article presents only brief descriptions of them.

Conservation Education -- The first \$350,000 of each annual appropriation goes for conservation education. Emphasis for this money is on

assistance to teachers and naturalists for continuing conservation education stipends and on grants for preparing conservation education materials. The Department of Education administers this program, with assistance from the Conservation Education Board. This Board is comprised of representatives from Department of Education, Department of Natural Resources, Iowa Association of County Conservation Boards, Iowa Association of Naturalists, and Iowa Conservation Education Council. Funds are distributed on a competitive grant basis.

DNR Administration -- After the \$350,000 conservation education allotment, one percent of the remaining funds are transferred to the DNR to help defray costs of REAP administration. The DNR is responsible for overall coordination of REAP, including managing the budget, carrying out the regional assemblies and congress, and producing the *REAP* newsletter.

Open Space (28 percent of REAP funds) -- This money is allocated to the DNR for state acquisition and development of lands and waters. The Natural Resource Commission has set a policy that half this money be directed to land acquisition and half

to facility developments.

One-tenth of this 28 percent is set aside to cost-share land acquisitions with private organizations. The cost-share arrangement entails 75 percent of the acquisition costs coming from REAP and the other 25 percent coming from private sources of money. This program provides an excellent opportunity for private conservation organizations to help the DNR achieve open space protection goals. The DNR owns and manages the property that is jointly purchased. A project review committee made up of three DNR administrators and three representatives of private conservation organizations select the projects.

One-twentieth of this 28 percent is available to the state's Protected Water Areas (PWA) program. This program is directed at acquiring land along designated rivers to maintain their scenic and natural qualities. Portions of the Boone, Little Sioux, Middle Raccoon, Upper Iowa, and Wapsipinicon rivers are currently designated "protected water areas."

The Open Space component has an important requirement that is very popular among local officials. Property taxes on land purchased with REAP Open Space funds continue to be paid. In other words, the property remains on the tax roles

and its acquisition by the state does not place financial burdens on local governments. The DNR pays these taxes with funds from the REAP Open Space account.

County Conservation (20 percent of REAP funds) -- This money is available to counties for land easements or acquisition, capital improvements, stabilization and protection of resources, repair and upgrading of facilities, environmental education, and equipment. Expenditures are not allowed for single or multipurpose athletic fields, baseball or softball diamonds, tennis courts, golf courses, and other organized sport facilities. Swimming pools and playground equipment are also ineligible.

Thirty percent of the county conservation account is allocated automatically and equally to all 99 counties. This money is provided to counties on a quarterly basis and can be used for any of the above stated purposes.

Another 30 percent of the county conservation account is allocated based on population. In other words, counties with larger populations receive more money than counties



One important aspect of REAP is the roadside vegetation management program. Under the program, native prairie species are planted along roadsides. These prairie plants choke out noxious and other unwanted weeds, eliminating the need for chemical spraying.

A lot of time, effort and expertise went into designing and gaining support for the [REAP] program.

with smaller populations. This money is also distributed quarterly, but there is an eligibility requirement. Counties are eligible to receive these funds if they are dedicating at least 22 cents per \$1,000 of the assessed value of taxable property in the county for

county conservation purposes. In other words, a county must be committing a specified tax levy amount from county tax dollars for conservation purposes in order to receive their per population REAP allocation. Ninety-THREE of Iowa's 99 counties currently are eligible under the 22-cent rule.

The remaining 40 percent of the county conservation account is available to counties on a statewide competitive basis. The 22-cent eligibility criteria also applies to these grants. Grants are 100 percent, so local match money is not required. Competition for these grants are extremely keen. The bulk of the grants thus far have been for acquisition of high-quality natural resource lands. The director of the DNR appoints county conservation board staff to help select the grant-winning projects.





◀ Black-eyed Susans, native to Iowa prairies.

REAP Program Receives National Environmental Award

Last September State Representative Dennis Black and I represented Iowa's Resource Enhancement and Protection Program (REAP) at the annual Renew America Awards ceremony. The awards were presented at the National War College at Fort Lesley J. McNair in Washington D.C. There was REAP along with 19 other programs from all over the United States receiving national recognition.

The Renew America Award is not an award the govern-



At left is the award that was presented to Iowa's REAP program at the Renew America Awards ceremony in Washington, D.C., last September. Kevin Szcodronski, REAP coordinator, and Dennis Black, State Representative, attended the ceremony and accepted the award on behalf of the State of Iowa. The award was given in the category of "Public Land and Open Space Protection."

REAP was one of only 20 programs nationwide that received an award from Renew America. The National Environmental Awards Council, who determines the award winners, is comprised of 28 organizations representing more than six million members nationwide.

Soil and Water Enhancement (20 percent of REAP funds) -- These funds are available to landowners for soil and water conservation and enhancement projects and practices. Project money is directed towards protecting the state's surface and groundwater resources from point and non-point sources of contamination. Practices money is directed towards reforestation, woodland protection and enhancement, wildlife habitat preservation and enhancement, protection of highly erodible soils, and water quality protection. Soil conservation districts designate high priority watersheds in which REAP funds can be expended. Districts may also designate animal waste management as a priority.

This portion of REAP is admini-

After three years of implementation the REAP program remains as solid as originally designed.

stered by the Division of Soil Conservation in the Department of Agriculture and Land Stewardship. Grant applications and information are available at any of Iowa's 100 soil

conservation district offices, normally located in county seats.

City Parks and Open Space (15 percent of REAP funds) -- This money is available to cities on a competitive grant basis. Three city size categories have been established to assure grants are distributed to all sizes of cities. The categories are cities with populations of less than 2,000, from 2,000 to 25,000 and greater than 25,000. Annual grant amount ceilings are also in effect based on size of cities to help assure that funds are distributed for projects located throughout the state.

These grants are also 100 percent, so local matching funds are not required. This grant program is also very competitive. Like the

ment bestows upon itself. And, everyone entered does not receive an award. About 140 applications were considered under the Public Lands and Open Space Protection category alone -- Iowa's REAP program came out on top. Examples of the 19 other categories are renewable energy, drinking water protection, transportation effi-

“ . . . [REAP] establishes Iowa as a national leader in the movement to retain our country's rich base of ecological resources . . . ”

*Tina Hobson,
Renew America*

ciency, forest protection and urban forestry, conservation of food and agricultural resources, and fish and wildlife protection. All in all, about 1,600 programs were considered.

The Renew America Awards

are determined by the National Environmental Awards Council, a group comprised of 28 organizations representing more than six million members nationwide. Each year, Renew America members act as the coordinators for the council, searching for the nation's most successful environmental programs. Organizations represented include American Farmland Trust, Defenders of Wildlife, Rodale Institute, Trout Unlimited, Zero Population Growth, The Nature Conservancy, The Garden Club of America and the Izaak Walton League.

"Iowa's Resource and Enhancement Program establishes Iowa as a national leader in the movement to retain our country's rich base of ecological resources," says Tina Hobson, executive director for Renew America. "This program sets a positive example for the rest of the nation to follow."

Renew America award winners were as diverse as their projects. The Surfrider Association in California was recognized for its victory in the largest Clean Water Act lawsuit in U.S. history. The

City of Los Angeles won for its asphalt paving recycling program. Another winner is restoring salmon habitat in northern California and its work attracted this fish species into spawning areas that it has not used since the previous century. A group called "Tree Musketeers" won for its innovative efforts in urban forestry and solid waste reduction. This group was organized by 13 environmentally concerned eight-year-olds.

And for everyone who remembers Woodstock, Richie Haven accepted the Rodale Environmental Achievement Award, the major Renew America award, on behalf of a group called "The Natural Guard." This organization empowers inner city school-aged youth by providing the tools, information and leadership to improve their local environment.

As I mentioned earlier, Iowa's REAP program was among only 20 winners in the nation proclaimed 1992 winners. It is a distinction all Iowans can be proud of.

--KS

county grants, funds are not available for single or multipurpose athletic fields, baseball or softball diamonds, tennis courts, golf courses and other organized sport facilities. Swimming pools and playground equipment are also ineligible. Park expansion and multi-purpose recreation developments are typical projects funded under this REAP program. The DNR administers the city grant program. City officials appointed by the Director of the DNR help select which projects receive funding.

State Land Management (nine percent of REAP funds) -- This money is available to DNR for development and management of state conservation lands. Project examples are trail renovation, shower and rest room replacement, repairs to lodges, shelters and cabins, and minor repair of dams, spillways, parking lots and beaches. This account serves as a substitute for the state park user permit receipts which were terminated by the State Legislature when REAP was enacted. While most of the funds have been directed to projects in state parks and recreation areas, they can also be used for improvements on state wildlife management areas and state forests.

Historical Resource Development Program (five percent of REAP funds) -- The State Historical Society in the Department of Cultural Affairs operates this program. Grants are available to private individuals and businesses, as well as to non-profit organizations and agencies of Certified Local Governments, a designation made by the National Park Service that requires certain historical-related programs and organizations.

Grants under this program support a wide variety of projects that fall under three basic categories: (1) historic preservation; (2) library and archives; and (3) museums. This program has proven to be very popular throughout Iowa

and truly demonstrates the diversity of REAP.

Roadside Vegetation (three percent of REAP funds) -- This money is available through the Department of Transportation for state, county and city management of roadside vegetation. The establishment of attractive gateways into cities is also becoming a popular use for this money. The overall concept of roadside vegetation management is to introduce native prairie species in the rights-of-way. These species have been shown to out-compete noxious and other unwanted weeds without the need for chemical spraying. Therefore, roadside maintenance costs are reduced through less spraying and mowing while at the same time providing cover for wildlife and scenic roadsides for travelers. Demonstration and research projects are typically funded under this program in an effort to learn and share new approaches to vegetation management. The purchase of specialized equipment and seed to carry out management practices is also a part of this program.

REAP public participation is organized into three tiers. First, all 99 counties are required to create a Resource Enhancement Committee. Representation on the county committees include board of supervisors, county conservation board, mayors of cities in the county, soil conservation districts, school district boards, farm organizations and conservation organizations. In other words, any organization sincerely interested in REAP and wishing to contribute towards its success can and should participate on their county Resource Enhancement Committee. Each committee is responsible for preparing a five-year county REAP plan with a one-year expenditure plan for submission to the DNR. They are also responsible for coordinating and exchanging information on REAP projects and proposals in the county. Second, multi-county meetings

called regional assemblies are periodically held in 17 locations throughout the state. These are open public meetings where all REAP programs and associated projects are presented. Also, opportunities for regional REAP projects are to be identified and participants may recommend changes in REAP policies, programs and funding. A round of 17 assemblies is held every other year during the months of February and March. Two rounds have been conducted thus far. They were typically well-attended and proved beneficial to both the general public and REAP.

Third, five delegates are elected at each of the 17 assemblies to serve on the statewide REAP Congress. This 85-member congress meets during the summer on even-numbered calendar years. The responsibility of the congress is to organize, discuss and make recommendations for approval by the Governor, General Assembly and Natural Resource Commission regarding issues concerning REAP. Congress recommendations are taken very seriously. Two congresses have been conducted to date and both entailed thorough discussion of all REAP components. The overriding sentiment of the 1990 Congress was to allow REAP to continue as designed since it was progressing very well in its early years and it was too early to consider significant changes. The 1992 Congress concluded much the same thing, but expressed the need to get the downward trend of appropriations reversed as soon as economic conditions improve. It also discussed at length the need to more actively promote the many benefits of REAP by showcasing its diverse and widespread projects.

Next issue: City Parks and Open Space Program.

Kevin Szcodronski is the REAP coordinator for the Department of Natural Resources.

IOWA'S HISTORY RECORDED IN STONE

Article and photos by Raymond R. Anderson

Located among the cornfields northwest of Coralville on the University of Iowa's Oakdale Campus, is one of the state's most unusual libraries. The Department of Natural Resources' geological survey bureau (GSB) Oakdale Research Facility houses the GSB Rock Library, a collection of rock samples that constitutes the primary resource for our understanding of Iowa's geology. The library includes rock samples from more than 33,000 sites around the state, most of which were collected during the drilling of water wells. Additionally, the library contains almost 400,000 feet of drill *core* (cylinders of rock drilled for research programs) and rock samples from quarries and natural exposures collected by staff geologists.

The water well samples are small chips of rocks that are washed out of a drill hole during rock-bit drilling, the most common drilling technique. These samples were provided by well drillers, who collect *cuttings* (chips of the rocks being drilled) at successive five-foot depth intervals, and place these cuttings in sample bags which are labeled to identify the well and sample depth. The drillers also prepare a logbook in which they note the rock intervals penetrated, casing used, depth of water and other pertinent information. Bureau personnel regularly visit well drillers to collect the samples and logbooks. When these samples arrive at the GSB Rock Library, the information from the drillers' logbooks is entered into a computer-

ized sample tracking system and the well is assigned a unique number called a *W-number*. Next, the well samples are prepared for microscopic study. Each sample bag is opened and a portion of the sample scooped out and washed to remove mud used in the drilling operation. The sample is then dried and placed in a coin envelope which is in turn placed inside of a larger envelope that contains some of the unwashed material from that interval. The envelopes are labeled with the W-number and depth interval, and when all samples from the well have been processed the samples are boxed and shelved for future study.

Selected sets of well samples are studied by staff geologists, with deep wells (in excess of 1,500 feet) and municipal water wells having the highest priority. Each sample is examined under a binocular microscope to identify the *lithologies* (rock types), proportions of each lithology, fossils, mineral grains and other characteristics of the sample. This information is recorded on a long strip of cardboard called a *strip log*. In addition to a written description of each sample, the strip log includes a graphic description which displays each lithology as a color and includes symbols for fossils and minerals. When all samples from a well have been studied the *stratigraphy* (the names of the various geologic units encountered during the drilling) is identified and indicated on the strip log. Finally, the strip log is completed by filling in





the *header*, information at the top of each strip log, including the well location, owner, driller, dates drilled and studied and other important information. Information from these strip logs is then entered into a computer database. The strip logs are archived in the geological survey bureau's main office in Iowa City where they are accessible to geologists and the general public.

To date, the GSB Rock Library has cutting samples from 30,770 wells, including more than 1.5 million samples representing more than 7.5 million feet (1,420 miles) of drilling. This sample-saving program is strictly voluntary; however, the samples are required for all permitted wells (wells that will produce in excess of 25,000 gallons of water per day, and oil, gas and mineral exploration wells).

In addition to the cutting samples, the library contains cores from more than 839 research wells, totaling more than 387,000 feet. These cores are drilled using a special drill bit that looks like a short length of pipe impregnated with diamonds on one end. These diamonds bore through



◀ Geologist studying cutting samples using a binocular microscope.

▼ The Geological Survey Bureau Rock Library in Oakdale.



▲ Geological technician preparing cutting samples for study. Study of these samples allows geologists to improve the understanding of the geology of Iowa -- knowledge necessary to locate the groundwater used by the citizens and industries in Iowa and to assess its quantity and quality. The samples also provides information to help evaluate and properly use the state's mineral resources, and encourage exploration for potential future resources such as oil or gas.

Boxes of drill core on file at the geological survey bureau Rock Library. The GSB Rock Library contains rock samples that have been collected and studied almost continuously since 1933.

the rock, cutting out a cylinder of rock which is recovered through the center of the hollow drill pipe. Many of the cores in the Library were drilled and donated by mineral research companies, gas companies who drilled cores to access and evaluate underground storage facilities, mine and quarry operators in Iowa, and consultants who collected the cores in the course of environmental studies. Additionally, many of the cores were drilled by staff of the geological survey bureau, who operated their own research drilling program from the early 1970s until late 1992. These cores are especially valuable for geologists, because the cores provide a virtually continuous look at rocks which normally lie deeply buried, some not exposed anywhere in Iowa. These cores range in size from more than four inches to about one inch in diameter, and provide researchers with material to test the rock for minerals, collect and identify fossils which are used in stratigraphic identification, test the rock's *porosity* (its ability to hold water, oil, or gas) and *permeability* (the ability of water, oil or gas to move through the rock), and its structural properties.

Information from the samples in the library is currently stored in several computer database files. *GEOSAM*, the geological sample tracking program, contains the header information for each W-number, each well's current status (studied or unstudied), and the physical location of the samples in the library. *GEOSAM* also links other databases which contain additional information for each W-number. The *GEO* program contains generalized information about the lithologic and stratigraphic information from all wells that have been studied (about 17,300). *GEO* is currently being updated to include all of the information that is presently recorded on strip logs. A series of other computer databases are also employed to provide easy access to such in-

formation as water quantity and quality. These computer databases are accessible to staff geologists and constitute a primary tool utilized by staff to respond to information requests and for research projects. These databases will soon be available to other state agencies and the public through the Iowa Department of Natural Resources' *Geographic Information System*.

The GSB Rock Library contains rock samples that have been collected and studied almost continuously since 1933. It would cost more than \$93 million to commercially drill and re-collect the cutting samples repositied in the library today. Preparation and study of these samples would cost an additional \$6.5 million. To drill the core samples in the rock library today would cost \$10.3 million, with an additional \$1.5 million required to prepare and study the cores. The total replacement value of the drill samples in the GSB Rock Library is about \$111.3 million, so practically speaking the library represents an irreplaceable resource for the citizens of Iowa.

The GSB Rock Library continues to grow. Recent changes in requirements for well drilling associated with the Iowa Groundwater Protection Act of 1987 have led to an increase in the number of well samples received at the library. In 1991 the library received 420 sets of well samples totaling a record 140,000 feet. Contributions of cores to the library has also increased in recent years. Study of these samples allows geologists to improve the understanding of the geology of Iowa --



knowledge necessary to locate the groundwater used by the citizens and industries in Iowa and to assess its quantity and quality. The samples also provide information to help evaluate and properly use the state's mineral resources, and encourage exploration for potential future resources such as oil or gas. Additionally, as government, industry and the general public become increasingly conscious of environmental concerns, the need for a detailed understanding of the state's geology will be of primary importance to preserve and even improve the quality of land, water and air in Iowa. Staff of the GSB Rock Library will continue to acquire, analyze and reposit rock data for Iowa, and will make this information available in as complete and easily accessible form as possible.

Raymond R. Anderson supervises the geological and mineral resources section of the DNR's geological survey bureau in Iowa City.

Energetic winners

by Patricia S. Cale

Geo Metro Ethanol Challenge

For the past two years, on the eve of the Ruan Greater Des Moines Grand Prix, a race of a different kind has taken place. The winners succeed not on speed, but on fuel efficiency. The Geo Metro Ethanol Challenge promotes efficient and safe driving as well as the use of a renewable fuel -- 10 percent ethanol-blended fuel.

Teams made up of high school students and local media and other celebrities drive Geo Metros provided by Central Iowa Chevy dealers. The winners are determined by the miles per gallon achieved over the 100-mile course.

Sponsors include Central Iowa Chevy/Geo dealers, the Chevrolet Geo Motor division, the Iowa Corn Promotion Board, the Ruan Greater Des Moines Grand Prix, Pizza Hut and Kum and Go stores.

Racing on 3 1/2 Gallons

At the start of the race, each team received three and one-half gallons of ethanol-blended fuel. It was up to them to stretch that fuel to the maximum over the course, while getting to each checkpoint in time. Teammates huddled over their maps and charts, plotting their strategies.

When it was time to line up for the start, the cars were pushed to the starting line to save fuel. Not until they were given the signal to go were any

engines started. Vince and Larry, the crash test dummies, gave the sendoff.

Any unnecessary fuel consumption had to be eliminated. That meant no air conditioning on a hot, muggy July day. Not only that, but windows were kept rolled up to avoid any extra drag.

Team Spirit

Each Geo Metro, sponsored by a Central Iowa Chevy Geo dealer, was assigned to a local high school or to a celebrity team. Teams tried to outdo each other in decorating their cars. Everyone had fun painting on school colors and mascots, slogans and crazy sayings. The DNR's car, driven by director Larry Wilson and energy administrator Larry Bean, proclaimed, "This is Larry and Larry. Darrell stayed home."

Results Not Surprising

Students from Ames High have won the Challenge two years in a row in a Metro sponsored by George Wright

Chevrolet. This year the team achieved an average 58.79 miles per gallon. Overall, the 41 teams averaged 49 miles per gallon.

The results are not surprising. The Geo Metro is rated as the most fuel-efficient car in its class.



Ken Formanek

Geo Metro Ethanol Challenge winners were determined by the miles per gallon achieved over a 100-mile course.

Last October, for the fourth year, the Iowa Department of Natural Resources presented the Iowa Energy Leadership Awards. The winners included leaders in energy efficiency and renewable energy resources.



Trees Forever photo

Trees Forever photo

▲ Financial support from Iowa Electric plus organizing and training from Trees Forever plus commitment from communities equal a successful tree-planting program.

▲ Trees not only beautify communities, but can help cool them off on hot summer days.

IE Branching Out Program

Starting in one small city, community tree-planting programs have "branched out" across the state, thanks to a program launched by Trees Forever and Iowa Electric Light and Power. In late 1989, a pilot project was started in Belmond, Iowa. That community's reaction was so positive the IE Branching Out program was created to plant trees statewide.

Making An Idea Grow

From an idea in two people's minds, with nourishment from a utility company and hard work by many volunteers, tree-planting has grown into a state-wide effort to turn Iowa communities green. The following shows the progress.

February 1989: Shannon Ramsay and David Krotz, volunteers with a shared interest in tree planting, found Trees Forever.

October 1989: Trees Forever becomes a program of the Iowa Natural Heritage Foundation.

November 1989: Iowa Electric Light and Power pledge \$5,000 to establish a community forestry pro-

gram in Belmond, Iowa.

January 1990: The Belmond community program is successfully established with an outstanding volunteer steering committee that completed a three-year focus plan.

May 1990: Responding to a new law requiring utilities to start tree-planting programs, Trees Forever and Iowa Electric are able to offer the Belmond project as the model for a utility-sponsored program.

July 1990: Trees Forever and Iowa Electric launch IE: Branching Out, a partnership program designed to provide grants to communities in the Iowa Electric service area.

October 1990: Iowa Electric increases its original \$100,000 per year commitment to \$225,000, for a five-year commitment of \$1,225,000. Iowa Southern becomes the second utility to sponsor a Trees Forever program with a \$100,000 annual budget.

December 1990: All seven investor-owned utilities join forces with Trees Forever.

By August 1992, Trees Forever has programs in 200 Iowa communities with 11 full-time staff people. The

volunteer force has grown to almost 6,000 strong. Funding is now being received from investor-owned utilities, municipal utilities, corporations, foundations and government agencies.

The Beauty of Trees

Iowa Electric's interest in a tree-planting program was to save energy and reduce peak electrical demand, thus offsetting the need for future power plants. Properly placed trees save energy by shading buildings from summer sun and sheltering them from winter wind.

Urban tree planting also provides other benefits such as soil stabilization, wildlife habitat and food and noise absorption. Tree leaves also filter pollutants such as carbon dioxide, and through evapotranspiration can actually help cool the air in the summer.

As important as these very concrete benefits are, the intangible contributions trees make to a community. Their spring blossoms, summer foliage and fall glory, even the starkness of their branches against a wintry sky, beautify our surroundings and raise our quality of life.

Elaborate engineering studies collect dust on the shelf unless there is a dedicated person in the trenches to continually adapt these studies to real world potential.

The City of Iowa City

Since 1978, Iowa City has employed an energy coordinator to save energy in both city facilities and throughout the community. Outreach and education efforts have included "energy fairs," compact fluorescent light bulb giveaways, energy videos on cable TV and poster contests.

During the past 10 years, the city has saved close to \$2 million in energy costs.

Coordinating Energy Use

Cities carry out many different functions, and often each department sets its own policies and makes its own decisions, especially on energy use. Iowa City is different. A city-wide perspective on energy use is gained by having an Energy Coordinator establish a conservation program.

The benefits of this approach are easy to see: \$2 million saved and a 43 percent drop in building energy consumption.

According to James Schoenfelder, Iowa City energy coordinator, the "key is continuing program management and analysis. Elaborate engineering studies collect dust on the shelf unless there is a dedicated person in the trenches to continually adapt these studies to real world potential."

Iowa City learned the hard way one year the importance of the energy coordinator position. In 1985, the \$16,000 position was left vacant. That year the city's energy bill jumped by \$77,000.

Passive Solar Animal Shelter

In addition to being the energy coordinator, Schoenfelder also serves as the city architect. Combining these two areas enabled him to design a new city animal shelter that incorporates both energy efficiency and passive solar features. The new shelter uses 57 percent less energy on a Btu per square foot basis than the former building.

The tiny old shelter was uninsulated concrete block. The new addition is airy and spacious, with skylights providing natural light. Large south-facing windows do double duty, offering both light and solar heat.

Passive solar is also used in a trombe wall along the old section of the building. The wall's outer layer of clear fiberglass transmits 90 percent of the sunlight. The inside, a concrete wall painted black, transmits the sun's heat to the interior of the building.

Designing an animal shelter offered unique challenges, Schoenfelder said. The floor, for example, needed to be kept warm for the animals. Schoenfelder put a heat storage system in the floor. For maximum efficiency, the warm air is recirculated for room heat.

Other efficiency measures include super-insulation in the addition, with R-50 roof insulation, and exterior insulation on the old section of the building.

Cities Can't Afford Inefficiency

In Iowa City, the energy conservation program funds itself through energy savings, with no new allocation of tax dollars as improvements continue to be made throughout the city's 13 buildings. Last year the effort saved \$295,000. According to Schoenfelder, any city government in Iowa that spends at least \$175,000 on energy bills in its buildings can't afford NOT to hire at least a part-time energy professional.



Patricia Cale

Energy innovations designed by Schoenfelder create a comfortable atmosphere for both shelter employees and the animals.

The new Iowa City animal shelter incorporates passive solar and energy efficiency for a 57 percent drop in energy used per square foot.



Patricia Cale

National Energy Consultants

This Cedar Rapids company was the first business in Iowa to provide comprehensive energy management services to businesses, churches, nonprofit facilities and homes.

Efficiency A Process

The philosophy behind National Energy Consultants is that "energy efficiency is a process, not a single action." That process is, according to Ole Munson, president, a continuous loop of identifying, prioritizing, implementing and monitoring cost-effective measures. "With energy efficiency, you have to keep moving forward. You can't stand still because it's too easy to go backward if you neglect it," he said.

The company, for which Munson's brother Gunnar serves as executive vice-president, uses broad-based methods that include a thorough analysis of a building's usage and energy bills. The resulting report includes suggestions for taking advantage of lower rates offered by utilities, specific energy-efficient equipment and advice on how to operate a facility more efficiently.

The energy efficiency "game plan" is tailored to the needs of the client and aims to maximize energy savings while minimizing the client's costs -- getting the maximum return on the energy investment. "We pride ourselves on the accuracy of projected savings," said Munson.

An Evolving Business

The Munson family started out in the electrical contracting business and moved into energy management when they saw a need after the 1970s oil crises. At that time, "there wasn't a book you could read or a school you could go to" to learn energy consulting, said Ole Munson. The company developed its own unique approach through working



Patricia Cale

◀ NEC doesn't sell one brand of light bulb, but helps clients pick the best from the wide array available.

▼ NEC helped cut utility bills in half at the Cedar Rapids Transport Center.

with clients, manufacturers and utility companies.

One of the ways the staff, such as Lars Lee (energy systems), Steve Powell (energy services) and John Ireland (marketing), stay current with rapidly changing technology is to use it in the National Energy Consultants building. "The guys have been experimenting lately with different types of motion sensors for lights. Half the time now when a light goes on or off I don't know what caused it," laughed Munson.

Energy technology is constantly changing, but "that's the fun of being in this business over the last 15 years," he said.

Committed Clients

According to Munson, luck plays a role in the business' success.



Patricia Cale

"We're lucky when we find a client that is truly committed to conserving our nation's resources and that is not afraid to implement an energy conservation measure even when it involves a new idea or a new technology."

National Energy Consultants was the guiding force behind the energy management efforts that won Iowa Energy Leadership Awards in previous years for the Indian Creek Nature Center and the Cedar Rapids Bus Department.

Waverly Light and Power

A small municipal utility, Waverly Light and Power is taking the lead on three fronts -- energy efficiency, renewable energy and tree-planting. Energy efficiency efforts include hiring a full-time energy advisor to work with customers, builders and contractors; addressing future energy needs with integrated resource planning; replacing all street lighting with efficient high-pressure sodium lamps; and working with local service organizations to promote compact fluorescent lighting.

Waverly Light and Power has operated three hydroelectric generators since 1923. A new effort in renewable energy involves studying the possibility of installing wind generators.

The utility has Iowa's largest municipal utility tree-planting program, developed with Trees Forever.

Seeking Efficiency

According to Glenn Cannon, the utility general manager, "A municipal utility should be a leader and seek efficiency. Why use energy if we don't need to?" As a result, Waverly Light and Power has put together a variety of energy efficiency programs, incentives and planning efforts.

Each type of customer is included in at least one of the programs. According to James Jebe, energy advisor, "If you're willing to invest the money, we're willing to spend the time to help you become efficient." Residential customers can take advantage of the Good Cents program, which offers savings on utility rates in exchange for making recommended improvements. Other efficiency incentives include appliance rebates and giveaways of compact fluorescents, water-saving showerheads and hot water heater blankets.

Commercial and industrial customers are receiving energy audits and a simple offer -- a rebate of \$100 per kilowatt hour saved, regardless of how it's saved. "We've already audited the 16 largest businesses, and now have 400 more to do," said Cannon.

Part of the efficiency effort involves planning for the future with an integrated resource planning process. "We're looking ahead 10 to 20 years, and then backing into what are our best options now. Our board is farsighted enough to see that if we spend money now we will forestall costs later," said Cannon. "Future power will be tight in Iowa, and our plan treats efficiency as a solid resource option. It shows what percentage of our power demand can be met by each program."

Wind and Water Power

Water power continues to contribute to the Waverly Light and Power's energy mix. Currently, the three hydro generators provide 1.7 percent of the community's energy needs. Although this may seem negligible, Cannon points out that it's enough to run all the street lights for the city.

"Future power will be tight in Iowa, and our plan treats efficiency as a solid resource option."

The utility is now trying to exploit another natural power source -- the wind. Preliminary studies indi-

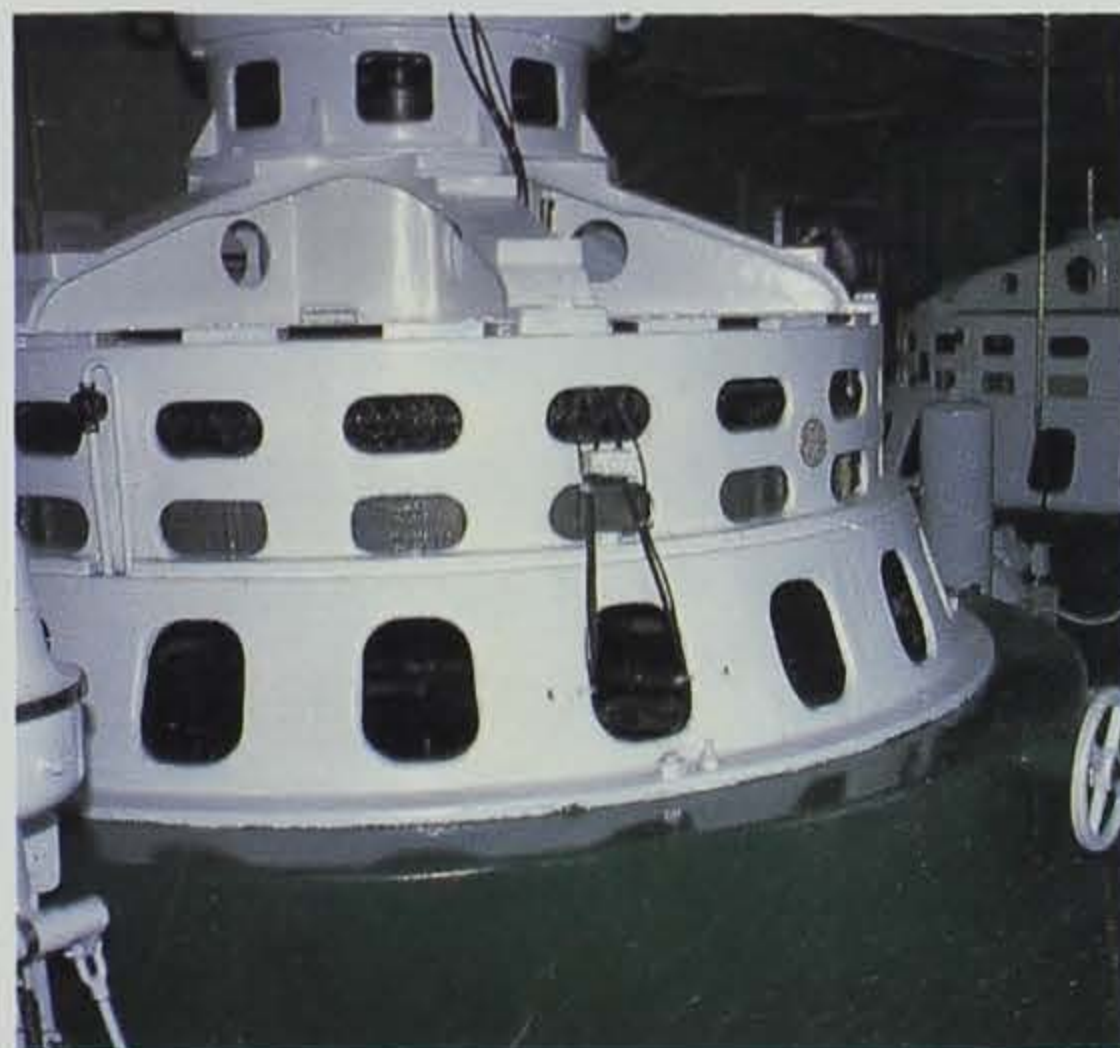
cate that Waverly may be able to cost effectively generate electricity with a wind turbine. The next steps are to gain funding, put in the turbine and then evaluate the actual cost per kilowatt hour. According to Cannon, if every municipal utility used wind, we could make a dent in Iowa's power needs.

Tree Planting

In 1991, Waverly Light and Power made a five-year, \$100,000-commitment to the Trees Forever program. On a per residential customer basis, that commitment is larger than any other utility in the state. After an initial tree survey of the community, Trees Forever organized citizen committees and developed a five-year plan for planting in city parks, at schools and around buildings.

On Top of What's Going On

Waverly Light and Power is a leader among Iowa utilities because it is looking to the future -- for energy efficiency solutions, for renewable energy options and for community betterment. "We want to be on top of what's going on to be able to serve our customers," Cannon said.



Patricia Cale

1920s-era hydro generators continue to supply enough electricity to light Waverly's streets.

Wood Crest Custom Homes

Developing energy-efficient, passive solar homes is a family affair for Wood Crest Custom Homes of Bettendorf. Members of the Prochaska family design and supervise the energy efficient construction of the homes, decorate and choose appliances with efficiency in mind, and market the homes.

The Efficiency is There

According to Joe Prochaska, president of the company, "We build in the most energy efficiency that is justified by the cost." Most features Prochaska incorporates pay for themselves in less than five years.

Clients don't always understand the need for some extra costs up front for efficiency. "If you spend \$500 on wallpaper, it will be noticed. But energy efficiency features aren't visibly noticeable," Prochaska said.

Even clients who initially balked at paying for efficiency learn quickly after moving in why Prochaska insists on it. Heating, cooling and lighting costs are kept to a minimum.

A recent project was a 3,600-foot custom ranch house that costs

less than \$250 per year to heat and requires only one watt per square foot for lighting. A 50-percent reduction in normal lighting costs was achieved by using compact fluorescents in the foyer, hall, den, kitchen and bedrooms.

Full-size fluorescent fixtures are used in the master and hall bathrooms, laundry room and walk-in closets. The lighting fixtures used for the powder room, garage exterior and backyard floodlights have motion sensors to come on only when needed.

The Prochaskas' houses are inexpensive to heat and cool because they are superinsulated, use double and triple glazed windows, incorporate passive solar design and use high efficiency systems and appliances.

A Family Affair

Wood Crest Custom Homes has been a family operation since 1974, started by Joe and Darlene Prochaska. Joe designs the homes and supervises construction. Darlene does the interior decorating, selecting efficient light fix-



Patricia Cale

Designing, building, decorating, selecting appliances -- the Prochaskas strive for energy efficiency, beauty and comfort.

tures, and as a licensed realtor, markets the homes. She's often even called in to do inside finish work when she's needed.

Their son David works on both building and selling the company's homes. "He keeps two sets of clothes, work clothes and suits. One minute he may be working on a house, and 15 minutes and a suit later, he's a realtor," said Prochaska.

Son-in-law Dwight Darland is superintendent of construction. "He can do everything in the house, whether it's carpentry, plumbing or whatever. So he understands the subcontractors' problems" and can help ensure energy efficiency, Prochaska said.

Spreading the Word

The Prochaskas don't keep their expertise to themselves. They have featured their homes in the Home Builders Association Parade of Homes and passed out literature on the energy efficient features. They also, with Iowa-Illinois Gas and Electric Company, hosted an open house for builders, architects, interior designers and lighting suppliers to see their energy efficiency systems.

Their motto is "We strive to do 100 things one percent better every day." Their commitment shows in the state of the art technologies and knowledge incorporated into the homes they build.

Patricia S. Cale is an energy information specialist for the DNR in Des Moines and coordinates the Energy Awards program.



Patricia Cale

ATTRACTING BACKYARD WILDLIFE



Cover photos: Scenic backyard by Ken Formanek. Robin nestlings by Bruce Morrison.

Ba
W
Pl
So
W
Ar
Cr
Ha
Li
Ni
Re
Ha
W
He
Ne
De
Fo
Re
Ot



Contents

Backyard Wildlife in Iowa	4
Wildlife Habitats	5
Planning For Wildlife Habitat	6
Some Common Iowa Birds and Their Preferred Habitats	8
What To Plant	9
American Cranberry Bush, Black Walnut, Cherries	9
Crabapple, Dogwood, Elderberry	10
Hackberry, Hawthorn, Kentucky Coffeetree	11
Lindens American Basswood, Mulberry, Nannyberry	12
Ninebark, Oaks, Raspberry	13
Red Cedar, Shadblow Serviceberry, Wild Plum	14
Habitat Tips For Rural Areas	15
Woodlands For Wildlife	16
Herbaceous Plants That Attract Butterflies and/or Hummingbirds	17
Nesting Box Plan Diagram	18
Demonstration Areas	19
For Assistance	20
Related Publications	21
Other Sources	22



Backyard Wildlife in Iowa

As human populations expand, more and more lands are altered to meet people's needs for homes, businesses, transportation and food. This expansion forces wildlife out of their former habitat, making it increasingly necessary to provide spaces where wildlife can live. Several measures can be taken to create wildlife habitat in urban and rural areas which will also provide direct benefits for the homeowner.

A row of conifers furnishes winter cover for wildlife and increases privacy around your home. Conifers can

also act as a windbreak which can decrease your winter heating bills by as much as 35 percent.

Hedges can supply nest sites and food sources for birds as well as a living fence for property borders.

Plantings for wildlife can provide you with summer shade, autumn color, spring flowers and year-round wildlife viewing opportunities.

This guide is designed to help you plan your yard to achieve these benefits.



Photos (clockwise from upper left): Fox squirrel by Roger A. Hill; house wren by Ken Formanek; cottontail rabbit by Roger A. Hill.

Wildlife Habitats

Wild birds and animals show preferences for certain areas or habitats. The scarlet tanager, for example, lives in mature forests whereas the meadowlark lives in grassy areas. The wildlife you attract will depend not only on the type of habitat in your yard, but also on the habitat in the surrounding area.

Wildlife have three basic requirements for survival that you should keep in mind when developing your backyard habitat: food, water and cover. Every species of wildlife has its own requirements, these often vary with age and season. Several types of food can easily be provided in a backyard habitat plan from fleshy fruits, such as berries and crabapples, to mast production, such as acorns, to forage and browse plants. Water is essential for wildlife and should be provided year-round if possible. Although wildlife prefers moving water, standing sources of water, ranging from birdbaths to small ponds, are acceptable. If using a source such as a birdbath, change the water regularly. Cover provides protection for breeding, nesting and hiding from enemies. Ideal cover involves dense vegetation, such as vines or shrubs, and larger conifers, such as spruce or red cedar.

Several types of habitats occur in Iowa. These habitats include wetlands, grasslands, old fields, shrub forests, the forest edge and the mature forests. When planning your yard, it is best to harmonize the result you hope to create with the dominant type of habitat in your area. Then you can eventually expect to see most or all of the wildlife species living within the surrounding habitat in your yard. For example, if your house is located in an area where big oak, hickory and other trees occur, it would be wise to plant some shade-tolerant shrubs and young oak, hickory or walnut trees in your yard. Eventually you will have woodpeckers, nut-hatches and other forest-dwelling birds, as well as chipmunks and squirrels. If you plant native prairie grasses in such an area, many of the forest species would avoid your yard, and the one grassy patch would be too small for many prairie animals to use. Try to make the transition from a manicured lawn to mature trees gradual. Plant some low shrubs, tall shrubs and small trees to create an edge zone. Many backyard wildlife species prefer these edge areas. Shrubs are particularly useful in edge plantings because they are intermediary zones between open grassland and mature forest. You can plant shrubs in most any situation to create an attractive area for wildlife.



Top photo: Eastern chipmunk by Doug Reeves; bottom photo: Cardinal by Ken Formanek.



Planning For Wildlife Habitat



It is important to plan your plantings, especially in a yard where space is limited. Be sure not to plant trees where they could interfere with powerlines or possibly harm buildings upon reaching maturity. If you have underground tiles, plant trees and shrubs far enough away so that extending roots do not damage the drainage system. In addition to these considerations, you can maximize the benefits to wildlife by having plants which blossom and fruit at different times to provide a continuous source of food. A wide variety of shrubs and trees create a multi-layered habitat, thereby providing for treetop, shrub and

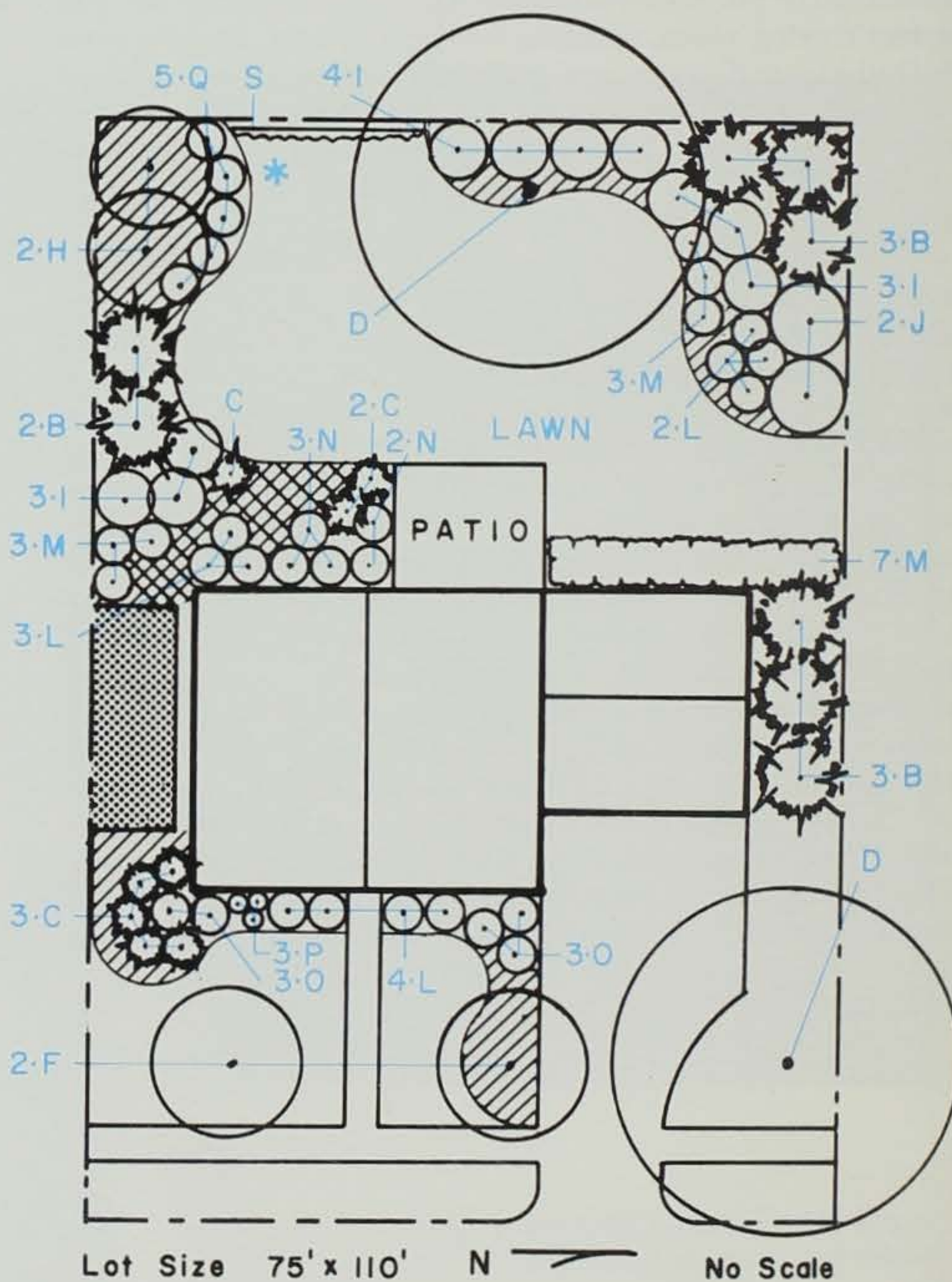
grass dwelling wildlife at the same time.

It is a good idea to sketch your plans on a sheet of paper. Draw the plants at the size they will reach at maturity. Often you will find that there is not as much room for the number of plants that you originally wanted. Planning can save you time and money that you might otherwise have spent on unnecessary plants. If you plan to develop your backyard over several years, sketching your ideas will help you to remember where you wanted to place future plants. The following are some suggested designs for planting in "typical" backyards.

KEY

- B - Fairview Juniper
- C - Japgarden Juniper
- D - Linden
- F - Crabapple
- H - Wild Plum
- I - American Cranberry Bush
- Ia - Arrowwood Viburnum
- J - Lilac
- K - Redtwig Dogwood
- L - Potentilla
- M - Dwarf Lilac
- N - Barberry
- O - Anthony Water Spirea
- P - Garden Currant
- S - Grape

-  Vegetable/Flower
-  Garden Daylilies
-  Various Ground Covers
-  Bird Bath



KEY

CONIFERS
 A - Fir
 Spruce
 Pine

COLUMNAR JUNIPERS
 B - Fairview
 Juniper (20' x 6')

LOW JUNIPERS
 C - Japgarden
 Juniper (1' x 6')

SHADE TREES
 D - Linden
 Oak
 Walnut*
 Hickory*
 Maple

FRUIT-BEARING TREES
 E - Serviceberry
 (Juneberry)
 F - Crabapple
 G - Domestic
 Fruit Tree
 H - Wild Plum

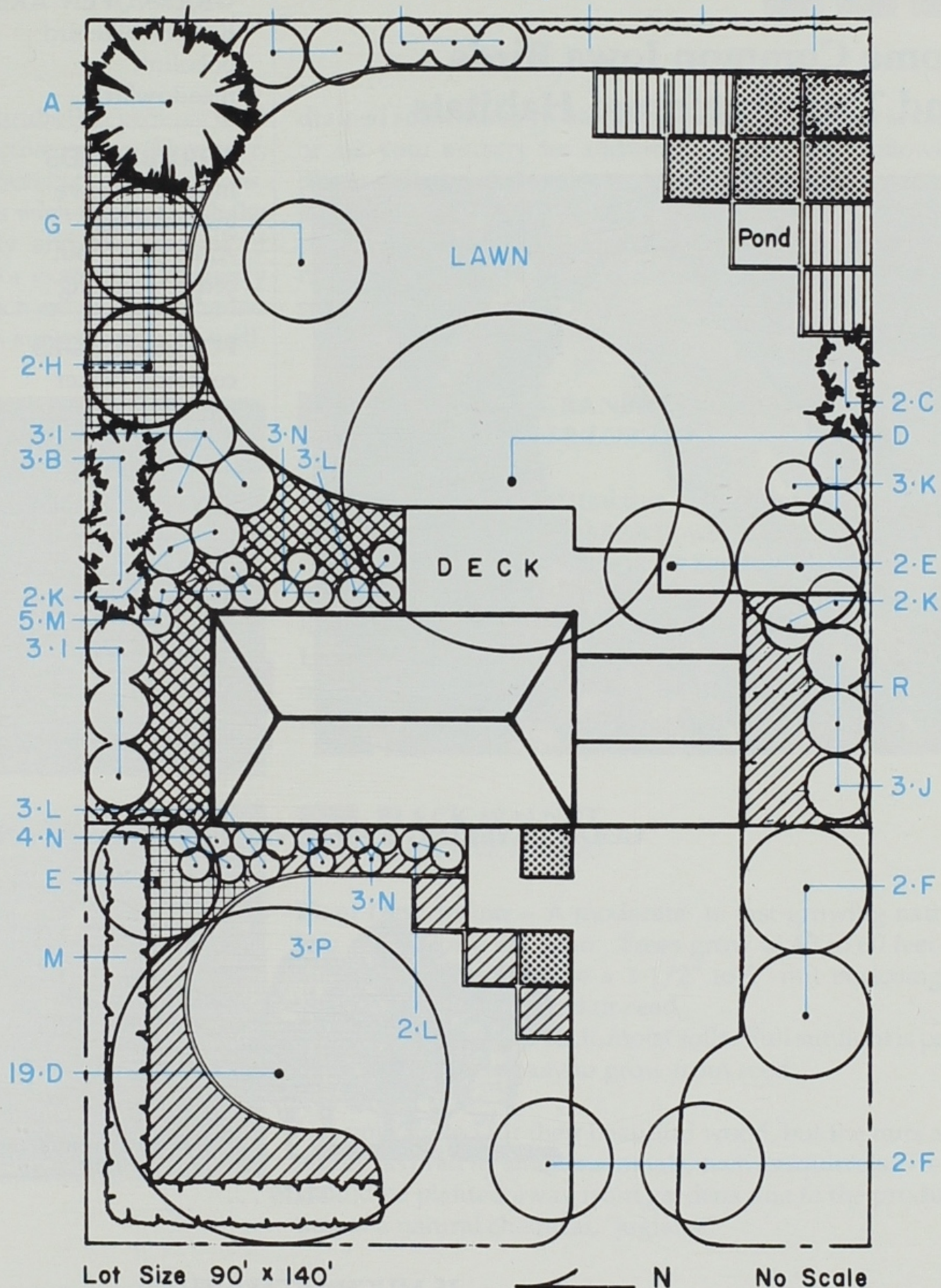
LARGE SHRUBS
 I - American
 Cranberry Bush
 J - Lilac
 Ninebark*
 Nanking Cherry

MEDIUM SHRUBS
 K - Dogwoods
 (Grey, Redwing
 or Yellowtwig)
 Arrowwood
 Viburnum
 Coralberry*

SMALL SHRUBS
 L - Potentilla
 M - Dwarf Lilac
 N - Barberry
 O - Sedum Spectabile
 P - Garden Currant
 Q - Dwarf Ninebark

VINES
 R - Virginia Creeper
 Limber Honeysuckle
 S - Grape
 Bittersweet

2-I 3-K Raspberries S Asparagus



GROUND COVERS
 Coloratus Winter Creeper, Ivy, Ground Vines, Violets

Daylilies
 Hosta and Ferns
 Perennial Flowers
 Vegetables and Annual Flowers

*May not be suitable for front yards



Some Common Iowa Birds and Their Preferred Habitats



GRASS/OPEN AREAS

Eastern bluebird	red-winged blackbird
bobolink	song sparrow
meadowlark	

SHRUBLANDS

mourning dove	northern cardinal
gray catbird	American goldfinch
American robin	chipping sparrow
cedar waxwing	

FOREST EDGES

common flicker	blue jay
red-headed woodpecker	Northern oriole
Eastern kingbird	indigo bunting

MATURE WOODLANDS

woodpeckers	black-capped chickadee
great-crested flycatcher	nuthatches



Cedar waxwing by Ken Formanek.

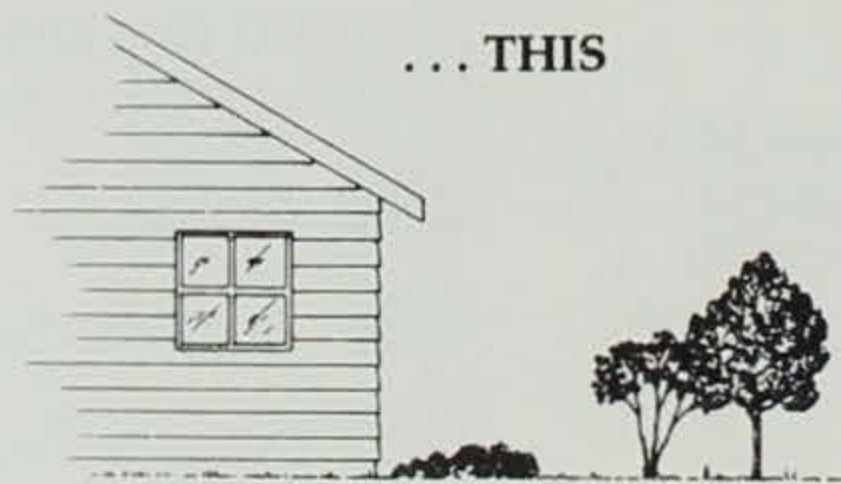
GOOD LAYERING AND DIVERSITY CREATES AN EDGE



THIS . . .

IS MUCH BETTER THAN. . .

. . . THIS



NO EDGE, LITTLE COVER FOR WILDLIFE

What To Plant

It is usually best to plant trees and shrubs that provide food in addition to nest sites and protective cover. However, remember that plants tend to grow best in certain locations. Therefore, match the vegetation you wish to plant with the soil type, soil mixture, soil acidity and the amount of sunlight available in your yard. For example, elderberry will do quite well in moist soils which are partially shaded or sunny, while hazelnut requires a sunny area with well-

drained soils. Refer to the site requirements in this booklet or ask your nursery for additional advice. The following plants will grow in a variety of conditions and are particularly good for wildlife. Furthermore, most fruit- and nut-producing plants (apples, cherries, plums, currants, walnuts and oaks) provide excellent wildlife food and nest sites.



AMERICAN CRANBERRY BUSH (*VIBURNUM TRILOBUM*)

Plant Description -- Attractive, tall, upright shrub (8'-12'); showy, flat clusters of whitish flowers; glossy, scarlet fruit clusters. Blooms May-June; fruit September-May.

Site Requirement -- Deep, moist, well-drained soil; sun to light shade.

Uses -- Provide cover for many birds and mammals. Fruit often remains until late winter and then provides an important food source.



BLACK WALNUT (*JUGLANS NIGRA*)

Plant Description -- A moderate- to fast-growing native tree with a long life span. Trees grow to 40 to 60 feet in height. Walnuts provide a 1-1/2" to 2" nut enclosing a sweet, oily, edible kernel or seed.

Site Requirements -- Rich, moist soils. Full sunlight is preferred. Extremely easy to grow from seed.

Uses

Not only prized for their beautiful wood, but the nuts are highly favored by small mammals, such as squirrels. Trees should be planted away from gardens due to the production of a natural chemical, "juglans."



CHERRIES (*PRUNUS SPP.*)

Plant Description -- Chokecherry (20'-30'), Pin cherry (15'-25') or Nanking cherry (8'). All native cherries with white flowers in spring and red-purple, edible fruit. Chokecherry and Nanking cherry can become multi-stemmed shrubs.

Site Requirement -- Well-drained soils. Pin cherry can tolerate some sandy soils, but no shade.

Uses -- Popular fruit for birds. Good plants for naturalizing background or cluster planting.

CRABAPPLE
(*MALUS SPP.*)

Plant Description -- Small to medium-size tree (10'-30'); flower is white to pink; fruits are red, purple, orange or yellow.

Site Requirement -- Sun to light shade; well-drained soil. Planted throughout the state.

Uses -- Flowers are showy and will occasionally attract hummingbirds. Fruit is used by both birds and mammals, and the dense foliage provides good nesting cover. Plant cultivars resistant to cedar-apple rust and fireblight.

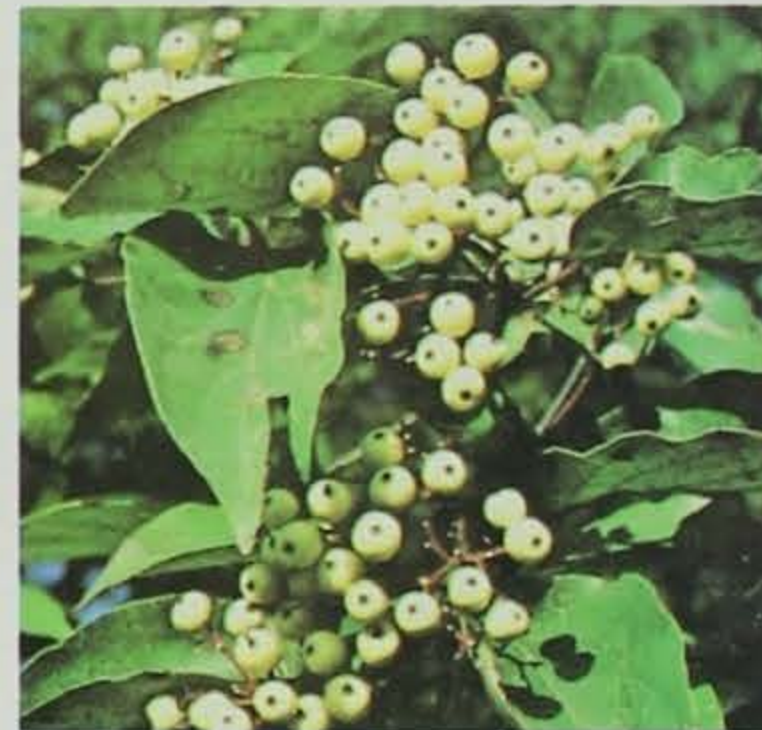


DOGWOOD
(*CORNUS SPP.*)

Plant Description -- Small- to moderate-sized shrub (5-8'). Leaves red to bronze in fall; small blooms whitish to yellowish, flat clusters or bunched; fruits bunched -- red, blue or white. Blooms April-June; fruit August-February.

Site Requirement -- Moist to well-drained soil; will tolerate moderately wet sites. Sun to shade, extremely adaptable. Planted throughout the state.

Uses -- Provides cover and food for birds and mammals. Plant in hedgerows for a screen and/or windbreak. Can also plant in small clusters. Moderately effective for erosion control. Outstanding humus builder. The pagoda dogwood is an attractive landscaping tree.



ELDERBERRY
(*SAMBUCUS SPP.*)

Plant Description -- Tall shrub (5'-8'); blooms in flat whitish clusters; red to purple-black fruits. Blooms May-July; fruit July-October.

Site Requirement -- Moist to well-drained soil; sun to shade. Planted throughout the state.

Uses -- Excellent cover and food for 29 species of birds and mammals.





HACKBERRY
(*CELTIS OCCIDENTALIS*)

Plant Description -- Slow to moderate growing native tree with rugged, dense wood and long life spans. Trees mature at 40 to 50 feet in height. Provide small berries during the late summer on a regular basis.

Site Requirements -- Trees are adaptable to tough urban conditions, including drought and alkaline soils. Tolerates shade and wet to dry sites.

Uses -- Provides food source for birds and small mammals on a regular basis, cavity nesting birds utilize trunks as tree ages.



HAWTHORN (*CRATAEGUS SPP.*)
WASHINGTON OR COCKSPUR

Plant Description -- Small tree (20'-30'); toothed leaves, white flowers; orange to red fruits, very persistent.

Site Requirement -- Deep, moist to dry soil; sun to shade. Tolerates city soot and grime well. Planted throughout the state.

Uses -- Very showy plant; used as food for birds. Stands browsing well. Plant cultivars resistant to cedar-apple rust. Some thornless cultivars available.



KENTUCKY COFFEETREE
(*GYMNOCLADUS DIOICUS*)

Plant Description -- Moderately growing native tree free of insect and disease problems. Coffeetrees reach 50 to 60 feet in height. Trees produce a thick, woody pod 4 to 6 inches in length with 3 to 9 seeds, often persisting on the tree throughout the winter.

Site Requirement -- Coffeetrees prefer rich, moist sites, but are able to grow on a variety of soils. Tree is relatively tolerant of drought and can grow in light shade.

Uses
Coffeetrees provide winter food source for small mammals and sites for nesting.

LINDENS (*TILIA AMERICANA*)
AMERICAN BASSWOOD

Plant Description -- Moderate to fast growing native tree with long life span. Lindens grow between 30 to 50 feet in height. These trees annually produce small edible seeds.

Site Requirements -- Lindens prefer moist well-drained sites, but are adaptable to a variety of urban sites. Trees can grow under shade but perform best in full sun or partial shade.

Uses -- Lindens produce edible seeds that persist throughout the winter for small birds and mammals. As the trees become large and age, they are a favorite of cavity nesting birds.



MULBERRY
(*MORUS RUBRA*)

Plant Description -- Small deciduous tree (25'-40'); Female trees produce heavy crop of purple, raspberry-like fruit. Blooms May-June; fruit June-July.

Site Requirement -- Adaptable; sun to light shade, moist to well-drained soil. Planted throughout the state.

Uses -- Excellent food source for birds. Fruit will leave purple stains so best planted in larger yards away from structures.



NANNYBERRY
(*VIBURNUM LENTAGO*)

Plant Description -- Usually a large shrub (15'-25'); multiplies by suckers. Fruit available August-September, persistent. Foliage is bright red.

Site Requirement -- Dry, well-drained or moist soils. Sun to shade. Will tolerate air pollution. Very hardy, adaptable to a wide range of conditions.

Uses -- Suckers will form thickets if allowed to. Good in hedgerows. Provides cover as well as food for many birds and mammals.





NINEBARK
(*PHYSOCARPUS OPULIFOLIUS*)

Plant Description -- Shrub of moderate size (5'-9'). Multi-stems, fine in texture.

Site Requirement -- Well-drained, moist soil; sun to shade. Adaptable in difficult situations.

Uses -- Seeds used by birds for food. Plant in several rows for wildlife cover. Shorter cultivars are available.



OAKS-- White, Red, Bur, Swamp White and English
(*QUERCUS SPP.*)

Plant Description -- Slow to moderate growing native trees with long life spans. Trees grow to maximum heights of 60 to 80 feet tall. Trees provide 1" to 2" acorns, with heavy crops occurring every 2 to 5 years.

Site Requirements -- Oaks prefer soils mildly acidic to neutral in pH. Oaks perform best on well-drained sites and full sunlight. Plant in the spring only.

Uses -- Popular trees for mast productions for birds and small to large mammals. A declining resource that needs to be increased in Iowa through plantings.



RASPBERRY
(*RUBUS SPP.*)

Plant Description -- Forms very dense thicket (3'-5').

Site Requirement -- Will grow in poor soil. Requires full sun. May be planted throughout the state.

Uses -- Excellent for cover and food for 50 species of birds and mammals. Used for erosion control.

RED CEDAR
(*JUNIPERUS VIRGINIANA*)

Plant Description -- Medium-sized conifer (40'). Foliage dense and pyramid-shaped. Becomes more open when older. Fruit dark blue, berrylike. Is alternative host to cedar-apple rust.

Site Requirement -- Hardy and capable of growing almost anywhere, including poor soils.

Uses -- Natural backgrounds and windbreaks. Excellent winter cover for wildlife and fruit provides food.



SHADBLOW SERVICEBERRY
(*AMELANCHIER CANADENSIS*)

Plant Description -- Normally multi-stemmed, gray trunk with upright or nodding branches (20'-30'). White showy flowers in early spring. Fruit purple, edible.

Site Requirement -- Well-drained, moist soils. Adaptable to sun or shade and acid or alkaline soils.

Uses -- Food and cover for wildlife. Nice as either small tree or screen. Good spring and fall color.



WILD PLUM
(*PRUNUS* SPP.)

Plant Description -- Forms thicket by spreading root suckers. Small tree to 15 feet. Thicket mainly used for cover. Fragrant pink and white flowers. Abundant purple or red-yellow fruit, available from July-October.

Site Requirement -- Moist to dry soils, sun to light shade; winter hardy. Planted throughout the state.

Uses -- Food source for a variety of wildlife. Thickets provide dense nesting cover.





Habitat Tips For Rural Areas

Shelterbelt and Wildlife Plantings

Plantings of trees and shrubs on Iowa farmlands creates tremendous opportunities for wildlife. Shelterbelt plantings around farmsteads often provide the only areas for winter cover, nesting sites and food. Plantings should be diverse combinations of 4 to 10 rows of deciduous, low-growing shrubs, deciduous trees and conifers. Remember to locate the closest row of the windbreak at least 100 feet from the buildings to prevent snow drifting problems.

Farms often have an odd corner too difficult to farm economically or a piece of land presently in the Conservation Reserve Program (CRP). These sites can easily be planted with a number of varieties of trees and shrubs to enhance wildlife habitat. Establish a minimum of six rows of conifers for winter cover. Plant 5 to 10 rows with deciduous trees and shrubs to supply food and nesting sites (approximately four acres).

Winter Cover

Evergreens or conifers such as red cedar, spruces and firs planted alone or in groups, are important to wildlife in winter. Conifers act as "Wildlife Hotels." They provide critical sheltered refuges to protect birds and mammals from harsh winter winds, snow and predators. Conifers also serve as summer nesting sites. The sap, needles, twigs, buds and seeds are eaten by wildlife. Conifers most adapted to Iowa conditions are Eastern red cedar, arborvitae, white spruce, Black Hills spruce, blue spruce, Norway spruce, concolor fir, Douglas fir, Eastern hemlock, white pine and Scotch pine.

Some people trim the bottom branches off of their conifers. This is unfortunate, since these lower branches are the most important area for many wildlife species. Trimming these branches also reduces the effectiveness of the conifers as windbreaks and noise barriers.

Prairie Restoration

Prairie restoration or recreation is an activity that is gaining popularity in Iowa. Farmers are planting native prairie grasses for set-aside lands. The Iowa Department of Natural Resources has planted switchgrass, big bluestem and Indian grass for wildlife cover on many wildlife management areas. As a landowner, you can become involved in the prairie movement by establishing native prairie plants in your yard, particularly if your yard is two acres or larger. However, even a small plot of native grasses in a generally open area will give you a taste of the prairies that once made Iowa part of the sea of grass.

Prairie plants provide you with summer color of coneflowers, subtle fall hues of brown and red, and the lacy beauty of frosted winter plants. Birds such as meadow-

larks, dickcissels, goldfinches and song sparrows will probably visit, then possibly nest in your prairie patch. During the winter a variety of juncos, sparrows and finches will use your prairie patch.

Historically, prairie plants lived in an environment where fire would frequently burn huge tracts of prairie. Consequently, prairie plants tend to lose their vigor if they are not occasionally burned or mowed and raked. This is because the accumulation of dead plant matter from previous years chokes out the growth of new plants. So to maintain your prairie, either burn it every four years (where legal and safe), or mow it, and remove the excess material.

Seeds of many native prairie plants are available from some nurseries. For further information, contact your local wildlife biologist, county conservation board or the prairie network.

Rural Wildlife Areas

Vary plant cover in fencerows, windbreaks and yards to create multi-layered habitat with maximum edge and a variety of food sources for wildlife.

Favor trees and shrubs with high wildlife value, especially seed-, berry- and fruit-producing species. Plants which hold their mast, berries or fruit through the winter and early spring, such as dogwood, bittersweet and crab-apple, supply wildlife with a food source throughout the critical winter period. Conifers provide an important source of winter cover for wildlife so should also be included in planting schemes.

Do not burn or destroy existing fencerows, woodlots or ditches because fire destroys humus, nests, food, cover and wildlife itself.

Delay mowing of grasslands until after July 15 to allow ground-nesting wildlife maximum nesting success. Avoid mowing road ditches.

Retain bottomland forests, wetlands, brushy fencerows, woodlots and highly erodible hillsides as valuable wildlife habitat. These areas provide wildlife with nesting or denning sites, travelways and stop over points during migration. Restore previously disturbed sites by planting trees, shrubs or permanent cover crops.

Fence woodlots and planted areas to prevent trampling, soil compaction and overgrazing of vegetation by livestock.

Establish living fencerows of trees, shrubs or vines around field boundaries to reduce soil erosion, retain soil moisture and provide food, cover and travel lanes for wildlife.

Establish or preserve brush piles for wildlife.

Leave standing food plots for wildlife and avoid fall plowing.



Woodlands For Wildlife

Iowa possesses two million acres of woodlands located on upland and bottomland sites too difficult to farm. Upland woodlands of oak-hickory contain a high diversity of plant material and are highly utilized by wildlife. Bottomland, or riparian areas, along streams and rivers provide valuable food sources, travelways and migration corridors.

Depending on the types of wildlife you wish to manage for, forest areas may be preserved in large units protected from livestock grazing, to enhance nesting or breeding. Large, old or even dead "snags" should be retained. A minimum of two to three snag trees per acre will enhance opportunities for Iowa's cavity nesting birds and mammals. In some cases timber harvesting can be used to provide browse and enhance natural forest regeneration. Brush piles of tree tops are extremely valuable to small wildlife for hiding cover. Seek the advice of the DNR's foresters or wildlife biologists to help develop a plan for your woodlot.



Woodlands offer prime wildlife habitat. Photo by Tom Rosburg.

Habitat Fragmentation

Fragmentation of blocks of forests or grasslands is becoming an increasing concern for a variety of bird species. Grassland species such as bobolinks, Henslow's sparrows and Northern harriers need large grasslands to successfully nest. Grasslands which are broken up by patches of shrublands invite more predators and nest parasites (such as cowbirds) to use the area. This diminishes the nesting success of the grassland species.

Likewise species such as scarlet tanagers, wood thrushes and many species of warblers require unbroken woodlands for successful nesting. These birds try to nest in the forest interior to avoid predation and parasitism by skunks, raccoons, blue jays and cowbirds which prefer the forest edge. To maximize nesting for interior nesting birds, try to retain large blocks of woodlands and grasslands. Square blocks of forest or grassland provide more interior nest sites than rectangular areas. Timber cuts along the edge of the woodland disrupts less interior-nesting sites than cuts in the center of the forest. Brushy invasions in large prairies or grasslands should be removed. Edge is ideal in residential areas, farmstands and already fragmented areas. However, edge should be reduced in areas which contain potentially unbroken grasslands or woodlands.

Other Woody Plants That Provide Food and Cover

Oak	Lilac	Viburnum
Hickory	Cherry	Greenbrier
Hazlenut	Alder	Barberry
Cedar	Sumac	Conifers
Hackberry	Grape	
Mulberry	Bittersweet	
Mountain Ash	Virginia Creeper	

Additional Ideas

■ Vines are often overlooked when planning wildlife plantings. However, bittersweet, grapes and Virginia creeper can furnish both food and cover for wildlife. Vines can be trained to grow on fences, trellises or arbors and can provide additional household or backyard privacy.

■ Flower beds or boxes can add other dimensions to your backyard by attracting butterflies, moths, bees and hummingbirds. Many flowers such as sunflowers, bachelor's buttons, zinnias, asters and daisies produce seeds that are eaten by birds. If you have a garden, you may want to plant a row of sunflowers for the birds, or leave a row of corn for wildlife. Netting can be used to protect plants if too much wildlife begins to enjoy your garden before you do.

■ If you have raspberry bushes, fruit or nut trees in your yard, you can also help wildlife by sharing some of the bounty. Leave some of the fruits or nuts in your yard or collect some extras and put them out for wildlife when snow covers the ground.

Herbaceous Plants That Attract Butterflies and/or Hummingbirds

Common Name	Botanical Name	Perennial	Annual	Height	Time of Bloom
Aster	Michaelmas	x		1'	June-July
Autumn Joy	Sedum spectabile	x		1-2'	Aug.-Sept.
Black-Eyed Susan	Rudbeckia	x		3'	July-Sept.
Blazing Star	Blazing Star	x		3'	Aug.-Sept.
Butterfly-bush	Buddleia	x		4'	Aug.
Chives	Allium schoenoprasum	x		1'	June-Aug.
Columbine	Aquilegia	x		2'	May
Cosmos	Cosmos	x		3'-4'	Aug.-Sept.
Daylily	Heerocallis	x		2 1/2'	June-Aug.
Gaillardia	Gaillardia	x	x	2'	July
Goldentuft Alyssum	Alyssum saxatile	x		1'	May
Hollyhock	Althea rosea	x		2'-5'	June-July
Impatiens	Impatiens		x	1'-2'	July-Sept.
Lavender (herb)	Lavandula officinalis	x		2'	June-Sept.
Lobelia	Lobelia		x	1/2'	Aug.-Sept.
Lupine	Lupinus	x		2'	May-June
Marigold	Tagetes erecta		x	1/2'-3'	July-Sept.
Morning Glory	Ipomea		x	Vine	July-Sept.
Ornamental Tobacco	Nicotiana		x	2'	Aug.-Sept.
Phlox	Phlox	x	x	1/2'-3'	May-Aug.
Purple Coneflower	Echinacea	x		2'-3'	July-Sept.
Sage (herb)	Salvia Officinalis	x		1 1/2'	July
Scarlet Salvia	Salvia splendens		x	2'	July-Sept.
Strawflower	Helichrysum		x	2'	Aug.-Sept.
Trumpet Vine	Campsis radicans		x	Vine	June-Aug.
Yarrow	Achillea	x		2'	June-Aug.

Helpful Hints

- Plan for continuous bloom.
- Arrange plants according to their height, flower color and time of bloom.
- Hummingbirds are attracted by red, orange and pink flower varieties.
- Older plant varieties usually provide more nectar than those highly hybridized.
- To avoid destroying butterfly larva, use chemical pest controls sparingly, if at all.
- Leave stems over winter to allow butterfly eggs and chrysalis to survive.



Black swallowtail by Eaton Cote.

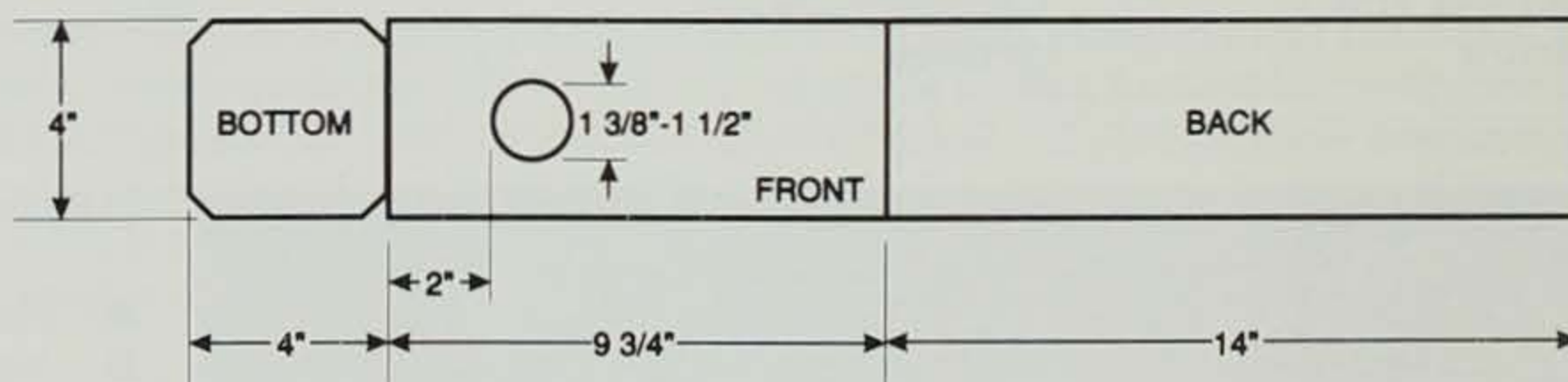
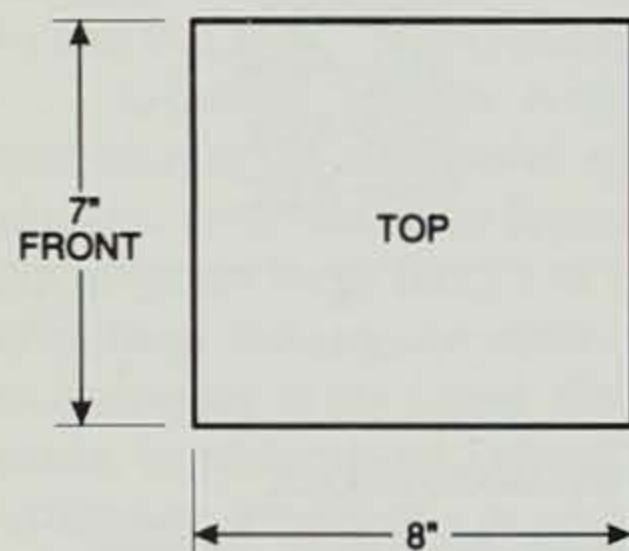
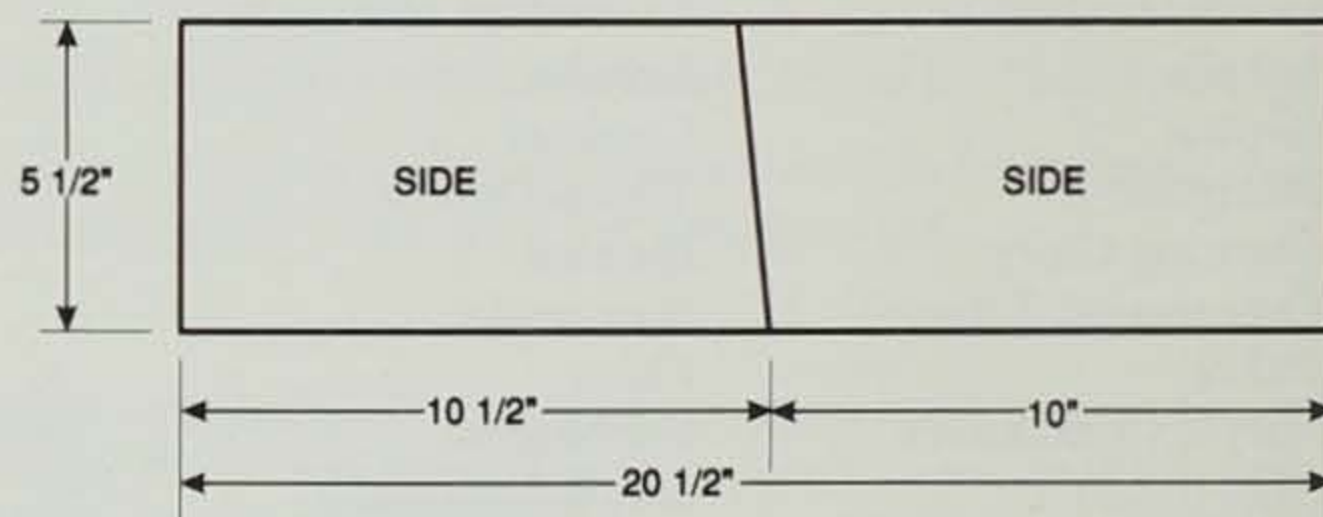
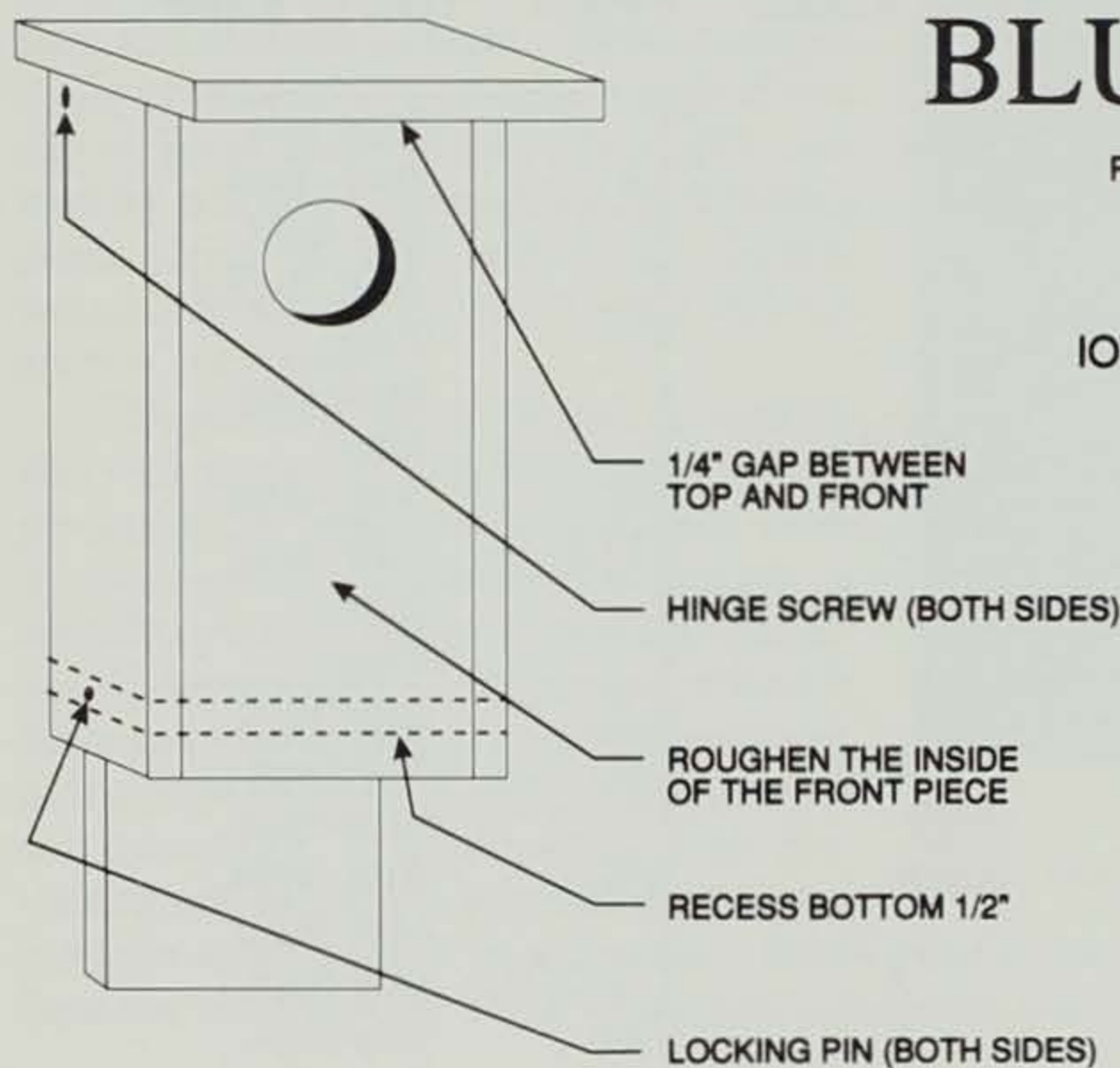


Nesting Box Plan Diagram

BLUEBIRD BOX

PLANS FOR 3/4" WOOD THICKNESS

COMPLIMENTS OF
IOWA'S NONGAME PROGRAM



Bluebird Nestbox Recommendations

1. Interior dimensions: 4" x 4" x 10" high
2. Bottom should be recessed 1/2" with cut corners to ensure dryness.
3. Galvanized screws or ring shank nails are preferred, blunting nails by striking the point with a hammer will minimize wood splitting.
4. Two-inch overhang on top and good steel post with metal flashing to discourage predation by cats, raccoons and snakes.
5. Place box in open field, away from brush and trees to discourage wren nesting.
6. Face box opening southerly, toward single tree or bush within 50 yards for fledglings' first flight.
7. Cedar is good to use for box, paint pine wood a light-colored earth tone.
8. House sparrows are not protected by law. Boxes placed away from buildings, feedlots or typical house sparrow haunts are best.

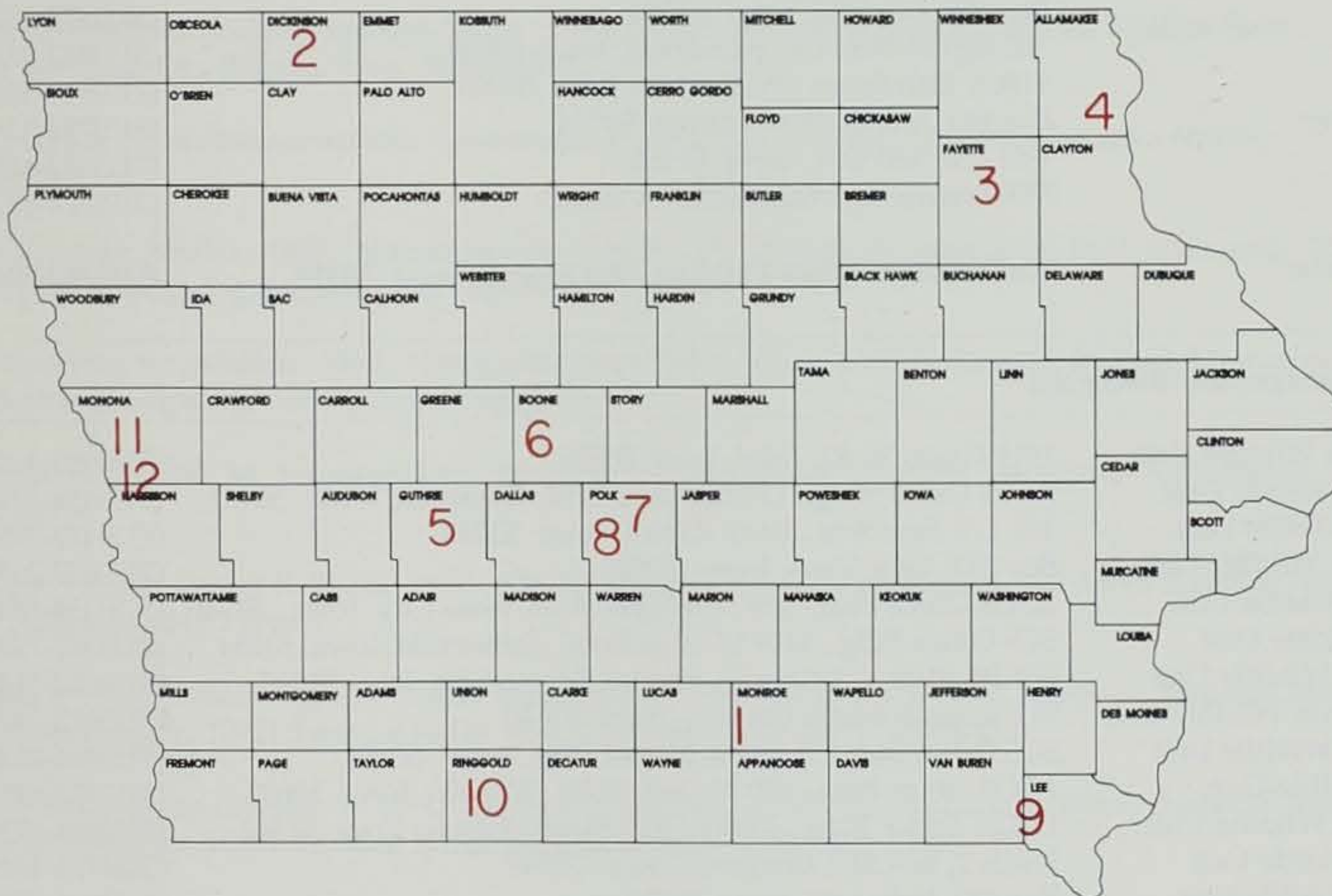
Demonstration Areas

The Iowa Department of Natural Resources' Forests and Forestry Division manages 35,000 acres of state forest areas to encourage wise use of woodlands. These areas exhibit excellent habitat, natural and planted, for many species of wildlife.

The Department of Natural Resources' wildlife bu-

reau maintains 231,380 acres of public wildlife management lands. These public areas demonstrate planting practices such as windbreaks and various plant species that benefit game and nongame animals.

Some good public areas to visit are:



1. Stephens State Forest, Lucas, Monroe, Davis, Appanoose and Jasper counties
2. Kettleston Hogback Wildlife Management Area, Dickinson County
3. Sweet Marsh Unit Headquarters, West Union
4. Yellow River State Forest, Allamakee County
5. Springbrook State Park, Guthrie County
6. Iowa Arboretum, Boone County
7. Big Creek Wildlife Management Area, Polk County
8. Saylorville Reservoir, Polk County
9. Shimek State Forest, Lee and Van Buren counties
10. Mt. Ayr, Ringgold County
11. Loess Hills Wildlife Management Area, Monona County
12. Loess Hills State Forest, Monona and Harrison counties

Many other wildlife management areas, state parks, state forests and county conservation boards have demonstration areas. For additional information on demonstration areas, call the agency nearest you.



For Assistance

District Foresters

Adel	1918 Greene Street, Adel, Iowa 50003	(515)993-4133
Anamosa	Box 46, Anamosa, Iowa 52205	(319)462-2768
Chariton	Route 5, Box 119AA, Chariton, Iowa 50049	(515)774-8733
Charles City	Box 4, Charles City, Iowa 50616	(515)228-6611
Creston	500 E. Taylor, Creston, Iowa 50801	(515)782-6761
Elkader	Box 662, Elkader, Iowa 52043	(319)245-1891
Fairfield	Box 568, Fairfield, Iowa 52556	(515)472-2370
Humboldt	102 Eighth Street S., Humboldt, Iowa 50548	(515)332-2761
LeMars	1100A 12th Street SW, LeMars, Iowa 51031	(712)546-5161
Marshalltown	Box 681, Marshalltown, Iowa 50158	(515)752-3352
Red Oak	Box 152, Red Oak, Iowa 51566	(712)623-4252
Wapello	515 Townsend, Wapello, Iowa 52653	(319)523-8319
Urban Forester	Wallace State Office Building, Des Moines, Iowa 50319	(515)242-5966

Wildlife Management Biologists

Bays Branch Wildlife Unit	1918 Green St. #2, Adel, Iowa 50003	(515)993-3911
Big Marsh Wildlife Unit	ASCS Office Bldg., 115 2nd Ave. NW, Hampton, Iowa 50441	(515)456-3730
Big Sioux Wildlife Unit	301 1/2 First Ave., Rock Rapids, Iowa 51246	(712)472-3751
Black Hawk Wildlife Unit	Box 815, Lake View, Iowa 51450	(712)657-2639
Coralville Wildlife Unit	ASCS Office Bldg., 438 Southgate Ave., Iowa City, Iowa 52240	(319)354-8343
Ingham Wildlife Unit	SCS Office Bldg., 2109 Murray Road, Estherville, Iowa 51334	(712)362-7222
Maquoketa Wildlife Unit	201 W. Platt, County Courthouse, Maquoketa, Iowa 52060	(319)652-3132
Missouri River Wildlife Unit	912 Seventh Street, Onawa, Iowa 51040	(712)423-2426
Mount Ayr Wildlife Unit	SCS Office Bldg., Route 3, Mount. Ayr, Iowa 50854	(515)464-2220
Odessa Wildlife Unit	ASCS Office Bldg., 220 N. 2nd Street, Wapello, Iowa 52633	(319)523-8319
Otter Creek Wildlife Unit	USDA Office Bldg., 203 W High Street, Toledo, Iowa 52342	(515)484-3752
Rathbun Wildlife Unit	Route 2, Box 310, Chariton, Iowa 50049	(515)774-4918
Red Rock Wildlife Unit	Box 423, Indianola, Iowa 50125	(515)961-0716
Rice Lake Wildlife Unit	SCS Office Bldg., Route 2, Box 241A, Northwood, Iowa 50459	(515)324-2431
Riverton Wildlife Unit	Box 490, Sidney, Iowa 51652	(712)374-3133
Ruthven Wildlife Unit	306 Eleventh Street, SW Plaza, Spencer, Iowa 51301	(712)262-9326
Saylorville Wildlife Unit	1327 Hwy 30, Boone, Iowa 50036	(515)432-2235
Sweet Marsh Wildlife Unit	Route 1, Box 103, West Union, Iowa 521175	(319)422-5832
Upper Iowa Wildlife Unit	ASCS Office Bldg., 911 S. Mill Street, Decorah, Iowa 52101	(319)382-4895
Wapello Wildlife Unit	USDA Bldg., 700 Farm Credit Dr., Ottumwa, Iowa 52501	(515)682-3552
Nongame Office	Wildlife Research Station, 1436 255th St., Boone, Iowa 50036	(515)432-2823



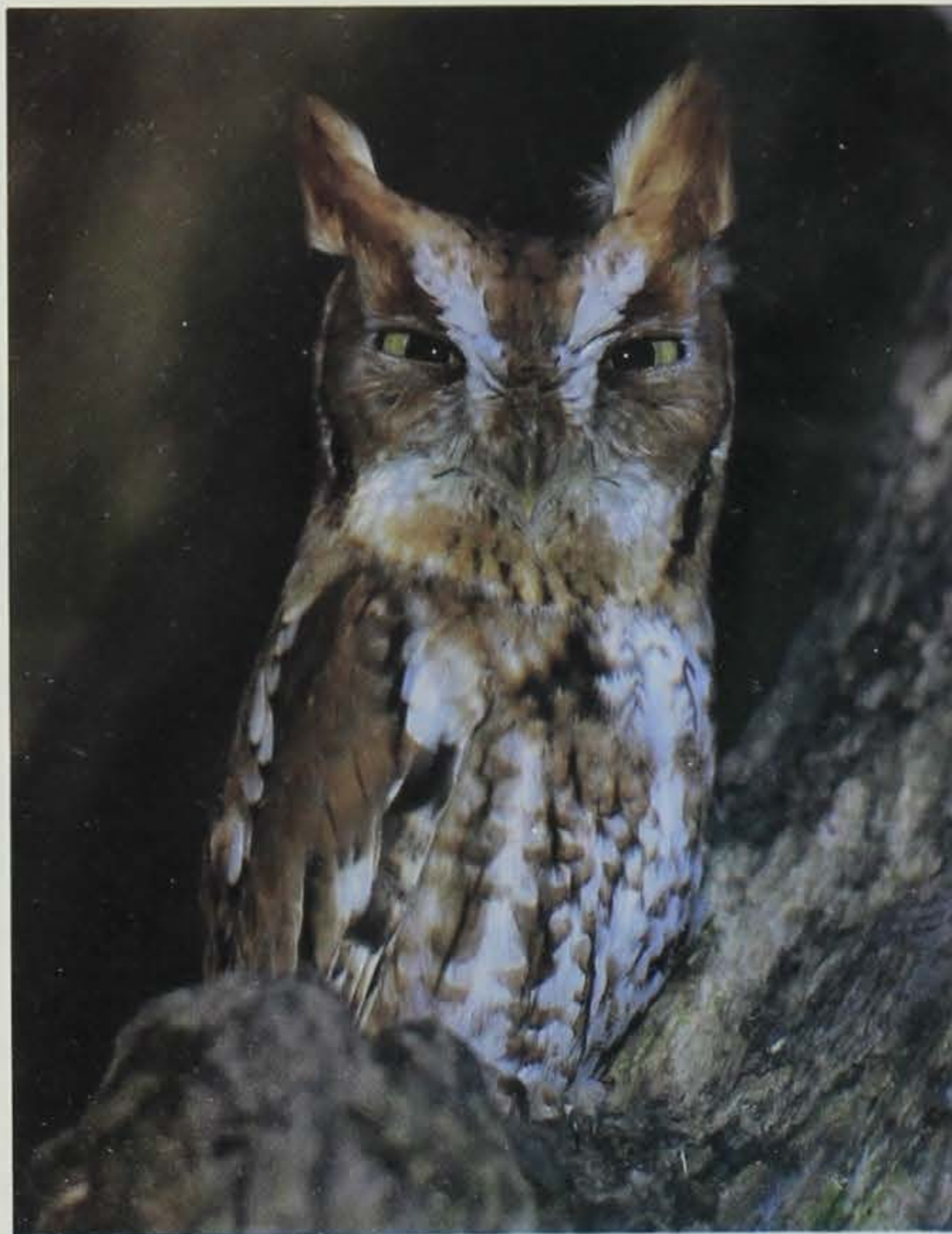
Related Publications

- *Invite Wildlife to Your Backyard*, write: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (Midwest Stock No. AL 68:982.) (20 cents)
- *American Wildlife and Plants*, by Martin Zim and Nelson; Dover publications. Write: National Wildlife Federation, 1421 Sixteenth Street NW, Washington, DC 20036.
- *How to Attract Birds*, by Burke, McKinley, Wood and Stockton; Ortho Books.
- *Landscape Plants for Iowa*, Iowa State University; Cooperative Extension Service, Ames, Iowa 50011. (\$3)
- *Prairie Establishment and Management*, write: Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.
- *Who's Who in Great Plains Songbirds*, University of Nebraska, 105 ABC, Lincoln, Nebraska 68583-0918. (\$3)
- *Landscaping for Wildlife*. 1988. Minnesota's Book Store, 117 University Avenue, St. Paul, Minnesota 55155. (\$9.95 plus \$2 shipping/handling per shipment)
- *Woodworking for Wildlife*. 1992. Minnesota's Book Store, 117 University Avenue, St. Paul, Minnesota 55155. (\$9.95 plus \$2 shipping/handling per shipment)
- *The Butterfly Garden*, M. Tekulksy. 1985. Harvard Common Press, Harvard, Maryland. Available at book stores.
- *Trees For Wildlife*, James R. Fazio. 1990. The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, Nebraska 68410. (Free)
- *A Guide to Urban Wildlife Management* by D. L. Leedy, T. M. Franklin and R. M. Maestro. National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, Maryland 21045. (\$3)
- *Wildlife Reserves and Corridors in the Urban Environment*, by L. W. Adams and L. E. Dove. National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, Maryland 21045. (\$7)
- *A Wildlife Plan for Small Properties*. National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, Maryland 21045. (\$1)
- *Brushpiles and Rockpiles: Small Habitats for Backyard Wildlife*. National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, Maryland 21045. (\$1)
- *Butterflies in Your Garden*. National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, Maryland 21045. (\$1)
- *Attracting Birds to Your Yard*, by Georgia Bryan and James Pease. Iowa State University Extension Service. Managing Iowa Habitats Series. Pm-1351d. (50 cents)
- *Grassed Waterways*, by Georgia Bryan and James Pease. Iowa State University Extension Service. Managing Iowa Habitat Series. Pm-1351c. (50 cents)
- *Wildlife Needs That Dead Tree*, by Jewel Bennett. Iowa State University Extension Service. Managing Iowa Habitat Series. Pm-135ab. (50 cents)



Other Sources

- Iowa Prairie Network, Joel Hanes, 5266 Lake View Dr., Clear Lake, Iowa 50428.
- Integrated Roadside Vegetation Management, Department of Biology, University of Northern Iowa, 1268 McCollum Science Hall, Cedar Falls, Iowa 50614.
- National Wildlife Federation, Backyard Wildlife Habitat Program, 8925 Leesburg Pike, Vienna, Virginia 22184-0001.
- National Institute for Urban Wildlife, Urban Sanctuary Program, 10921 Trotting Ridge Way, Columbia Maryland 21045.

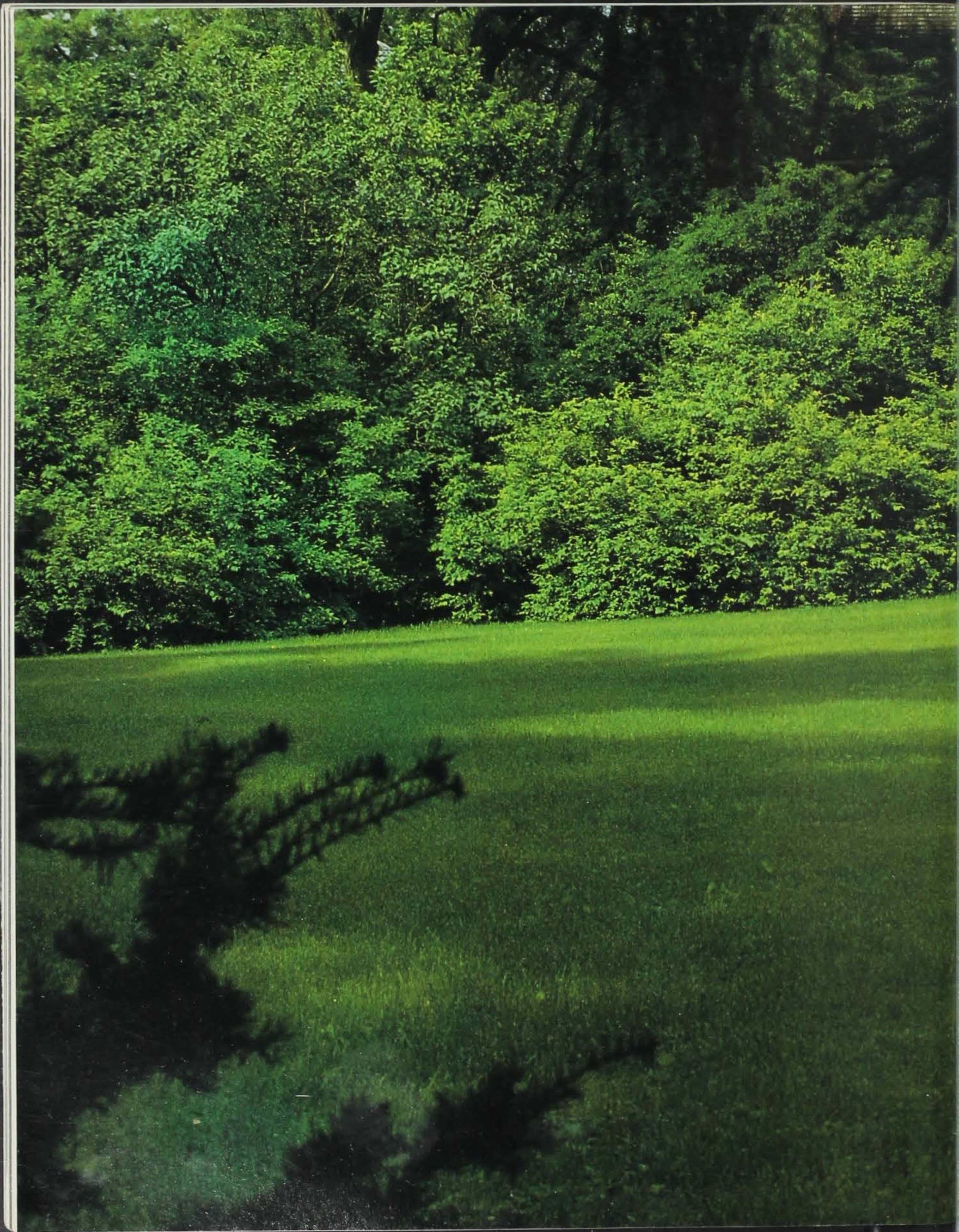


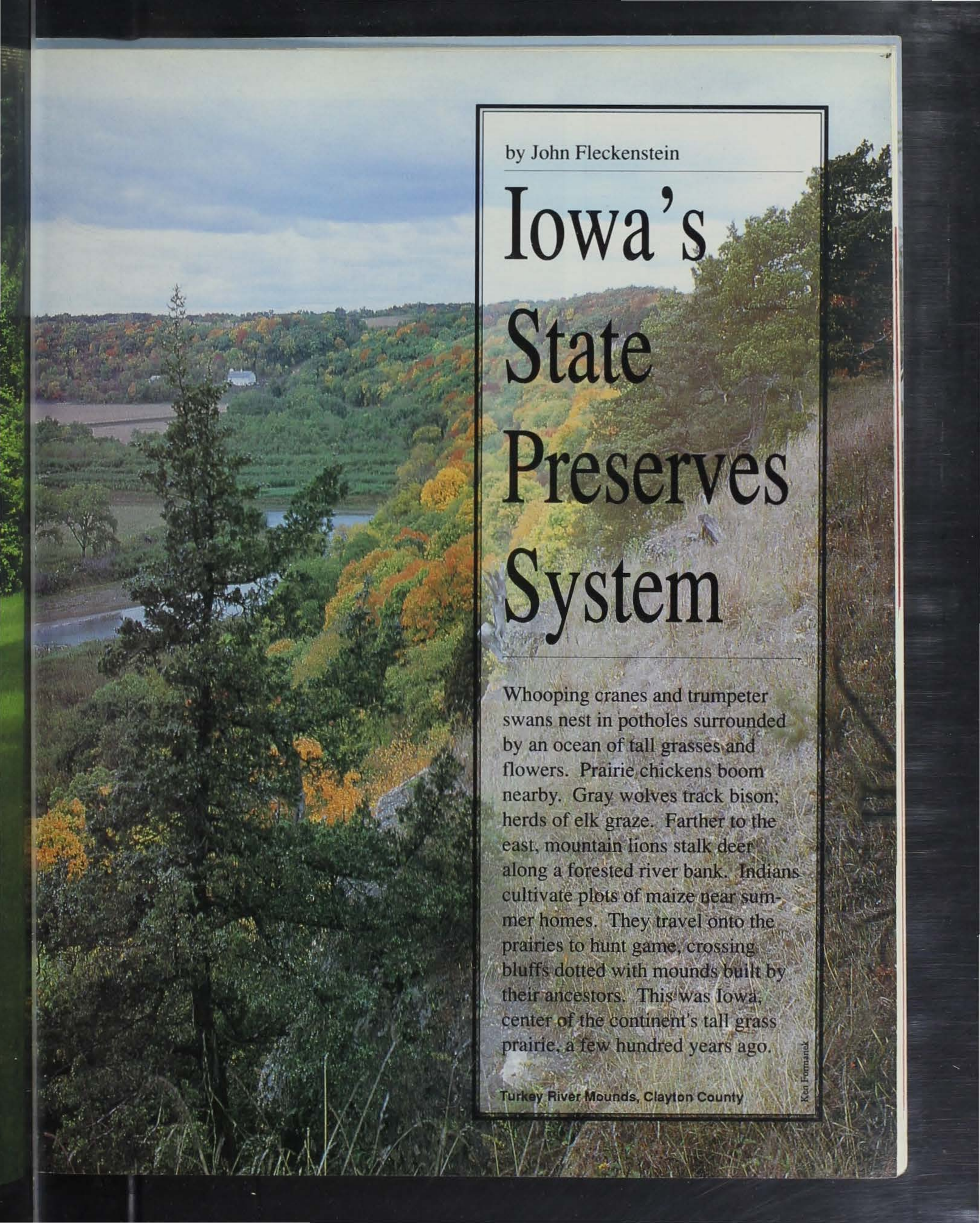
Screech owl by Roger A. Hill.

Under Title VI of the 1964 Civil Rights Act, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975 and Title IX of the Education Amendments of 1972, federal regulations prohibit discrimination on the basis of race, color, national origin, sex or handicap. If you believe that you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please write to: Director, Iowa Department of Natural Resources, Wallace State Office Building, 900 E. Grand Ave., Des Moines, Iowa 50319-0034 or the Equal Employment Opportunity Commission, Washington, D.C. 20240.

This publication was funded by the Iowa Wildlife Federation, the Iowa Department of Natural Resources' Nongame Program and through a grant from the Iowa Urban Community Forestry Council and the Iowa Department of Natural Resources' Forestry Division.







by John Fleckenstein

Iowa's State Preserves System

Whooping cranes and trumpeter swans nest in potholes surrounded by an ocean of tall grasses and flowers. Prairie chickens boom nearby. Gray wolves track bison; herds of elk graze. Farther to the east, mountain lions stalk deer along a forested river bank. Indians cultivate plots of maize near summer homes. They travel onto the prairies to hunt game, crossing bluffs dotted with mounds built by their ancestors. This was Iowa, center of the continent's tall grass prairie, a few hundred years ago.

Turkey River Mounds, Clayton County

Ken Formanek

L

ittle of this remains today -- less than a quarter of our woodlands, less than a tenth of one percent of our prairies. But here and there, between farmland and city, bits of Iowa's past remain

untrampled. Clusters of Indian mounds still dot the bluffs overlooking the Mississippi River. Ragged church walls, remnants left by early European settlers, crown a hilltop. Golden saxifrage blooms near caves cold enough to be coated with ice in mid-summer. Kettleholes, shaped when retreating glaciers abandoned an ice block, can still be found among the landscape. Lavender blossoms of pasque flowers mark the end of winter as they have for centuries. These blossoms yield to a summer of flora of more than 200 prairie species. Each of these irreplaceable lands and relics forms a part of a priceless heritage.

In 1965, the Iowa Legislature established a mechanism for protecting this heritage. Legislation created the Iowa State Preserves System to identify and preserve, for this and future generations, portions of our natural, prehistoric and historic heritage, and to maintain preserved lands as nearly as possible in their natural condition.

As of January 1993, 86 sites have been dedicated as preserves. These 86 preserves range in size from less than one acre to 845 acres, and incorporate a total area of about 8,900 acres.

▶
Pasque flower



Roger A. Hill

Types of Preserves

Five categories of preserves exist in Iowa. Many designated areas qualify for preserve status in more than one category.

GEOLOGY

The shape of Iowa's land surface is determined by three geological processes. Layers of bedrock formed by volcanic, metamorphic and sedimentary process underlie the entire state. Over most of the state, glaciers deposited and shaped a thick layer of overburden. The bedrock and glacial deposits have been shaped by erosion to give us the landscape we now see.

The oldest deposits date from the Precambrian Era which ended about 570 million years ago. These volcanic and metamorphic quartzite rocks appear at the surface in the northwest corner of the state. Sedimentary rock formed under marine sea and coastal conditions are conspicuous in northeast Iowa. Younger rocks appear in river valleys across the state. The surface deposits over most of Iowa originated more recently. Glaciers moved across the state several times during the last two

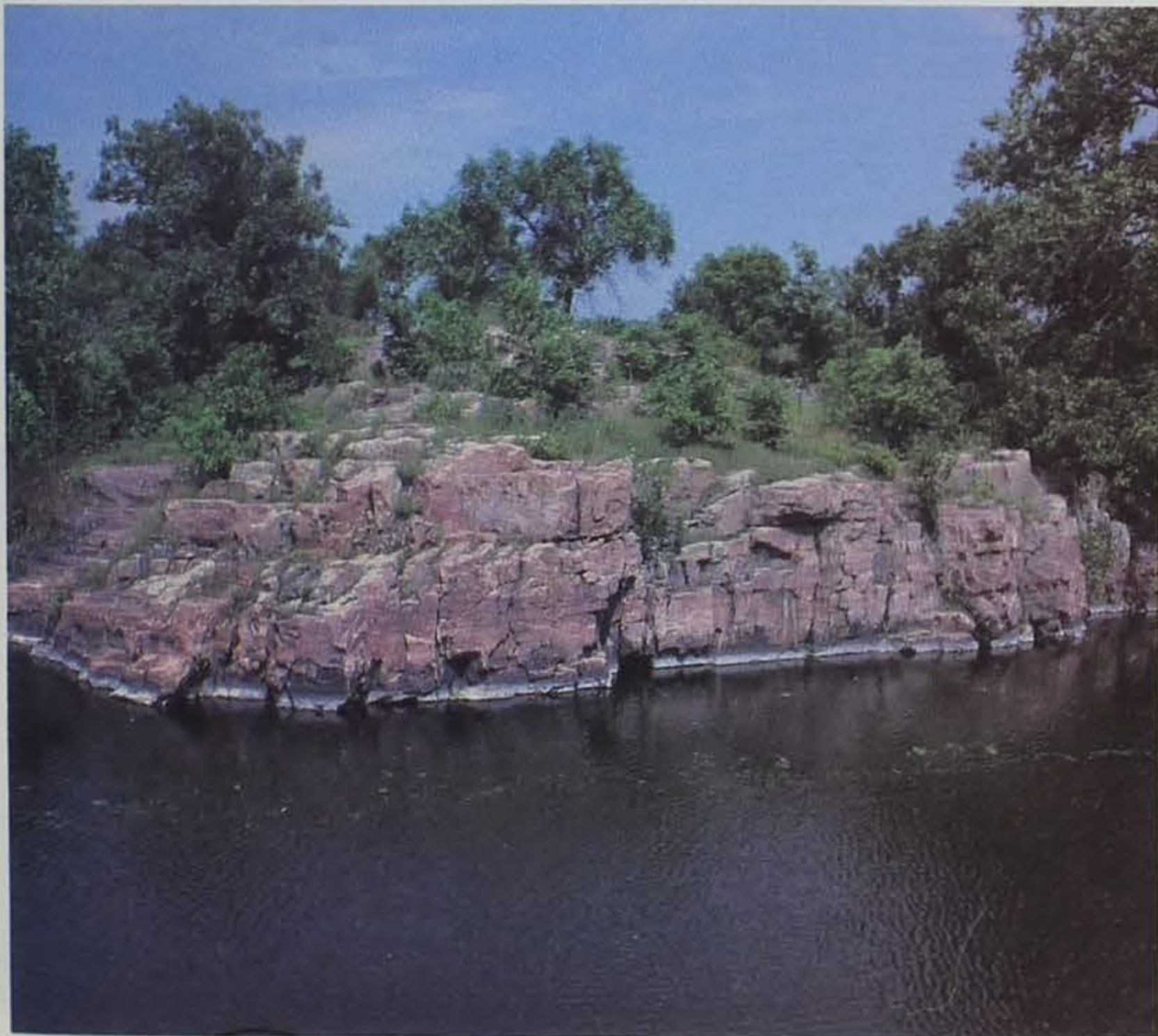
million years. They created landforms directly by moving large quantities of glacial till and indirectly by leaving till for wind and water to work. Glaciers departed northern Iowa about 12,000 years ago, so erosion has not had long to work in that region. In southern Iowa, glaciers have not been present for 500,000 years or more, and erosion has had a much longer time to modify the landscape.

Geological preserves illustrate this ancient past. Distinctive and rare deposits or features are included. For example, at Gitchie Manitou, Sioux quartzite 1.2 billion years old protrudes from the earth. These are the oldest outcrops in Iowa. Another geological preserve, the Old State Quarry Preserve, was mined in the 1840s for limestone used in the construction of our original state capitol in Iowa City. Later, blocks of this unusually hard limestone were transported to Des Moines for the foundation of our present-day capitol.

The landscape of Iowa can be divided into eight landform regions based on appearance and history. These are shown on the map on the following page.

“‘Preserve’ means an area of land or water formally dedicated . . . for maintenance as nearly as possible in its natural condition though it need not be completely primeval in character at the time of dedication or an area which has unusual flora, fauna, geological, archeological, scenic, or historical features of scientific or educational value.”

--Code of Iowa



Wayne Schennum

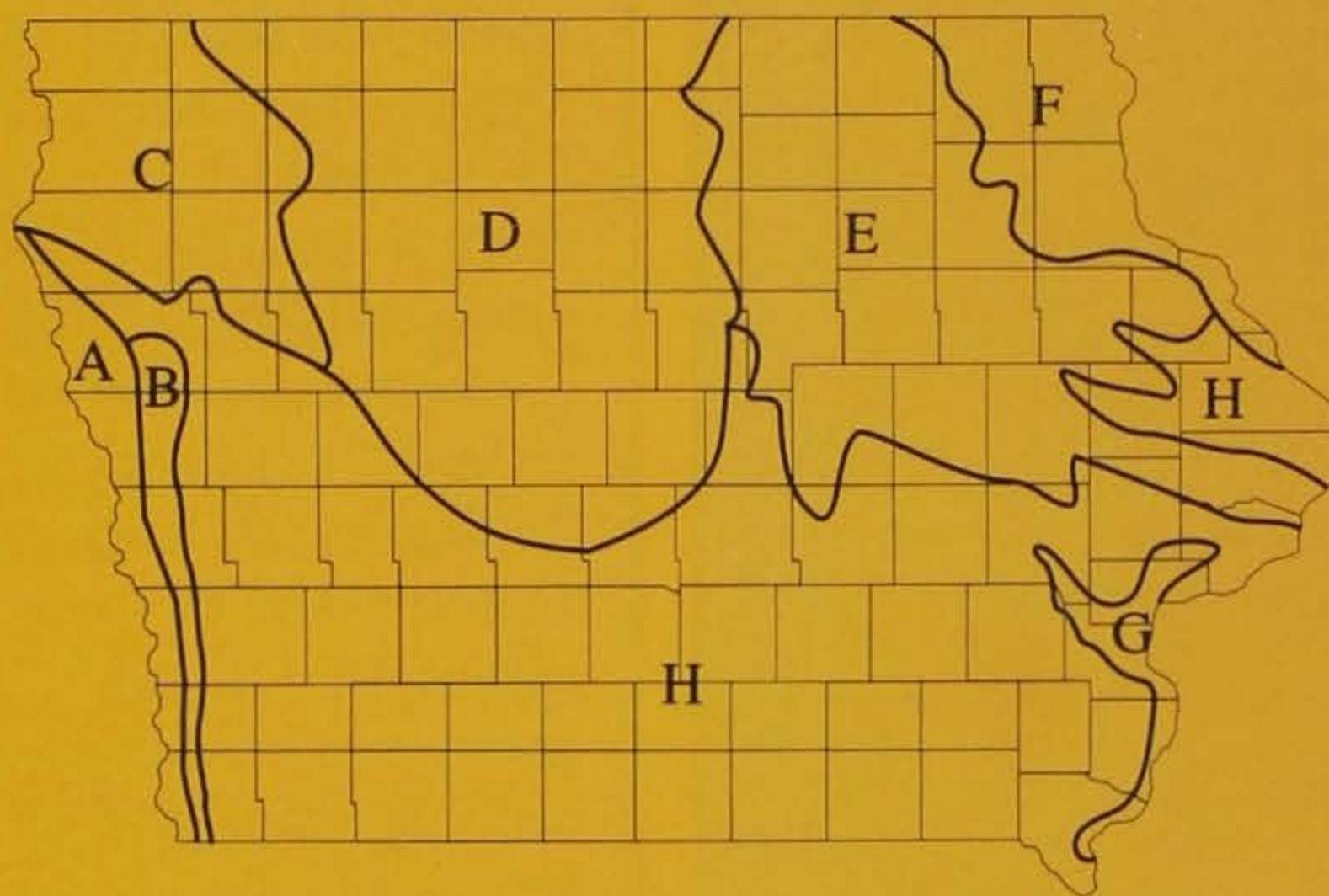


Ken Formanek

▲ Freda Haffner Kettlehole, Dickinson County

◀ Gitchie Manitou quartzite outcrop, Lyon County

Landforms of Iowa



- | | |
|----------------------------------|-------------------------------|
| A. Missouri River Alluvial Plain | E. Iowan Surface |
| B. Loess Hills | F. Paleozoic Plateau |
| C. Northwest Iowa Plains | G. Mississippi Alluvial Plain |
| D. Des Moines Lobe | H. Southern Iowa Drift Plain |

NATURAL COMMUNITIES

The natural communities of Iowa are often divided into three groups: woodland, wetland and prairie. Most sites do not fit neatly into one group. Woodland grades into prairie and wetland, prairie grades into wetland. A site may represent one of the major communities, or it may be intermediate.

About 2,000 species of plants and 600 species of vertebrate animals live in these communities. No single community supports all these species. The diversity of plants and animals found here is due to the diversity of natural communities. Since 1800 at least 60 plants and 33 animals have disappeared. At least 400 plants and 15 animals have been introduced.

Natural preserves demonstrate these outstanding biological features. Some are excellent examples of the prairies and forests that once dominated the state. Others hold plants and animals now rare in Iowa. Dry bluffs



Bruce Morrison

▲ Ladies' tresses

▶ Doolittle Prairie, Story County



Roger A. Hill

in the Five Ridge Prairie form one of the few suitable habitats for one of Iowa's endangered species -- the plains pocket mouse. Starr's Cave Preserve includes numerous types of ecosystems -- mature deciduous woodlands, caves and creek beds. This preserve also marks the northern terminus of many plants typical of the Ozark Plateau.

ARCHAEOLOGY

The first settlers arrived in Iowa about 12,000 years ago. Glaciers still lay across the central part of the state, and the rest of the state was covered with coniferous forest. The conifers retreated north with the glaciers and were replaced by deciduous woods, and eventually by prairie. Giant mammals such as mammoth and ground sloth were present.

Archaeological preserves give us a glimpse of the state's original inhabitants -- the Indians who roamed this land since at least 12,000 years B.C. The Indian Fish Trap, a 200-foot long rock funnel used for fishing the Iowa River, is an example. Another example is Wittrock Indian Village, this fortified village was occupied from 1100 A.D. until changing climate and hostile neighbors forced abandonment 300 years later.

HISTORY

Europeans first saw Iowa in 1673 when Marquette and Joliet traveled down the Mississippi River. By the early 1700s, fur trade had begun in Iowa. The United States obtained Iowa as part of the Louisiana Purchase in 1803.

Lewis and Clark were sent by President Jefferson to explore the Louisiana Purchase. They traveled up the Missouri River in 1804, meeting with the Oto and Missouri tribes and hunting in the Loess Hills. In 1809, Fort Madison was built, followed shortly by Fort Armstrong at Rock Island, Fort Crawford at Prairie du Chien, and Fort Atkinson. In 1833, eastern Iowa was opened for settlement, and by 1850, small settlements were scattered across the state. Early settlements were along rivers, especially in eastern Iowa. By 1870 railroads had spread across the



DNR Photo

state, and river transportation was no longer important.

The Mormon Trail through southern Iowa was an important route for settlers moving west. In 1844, the Mormons were driven from Navoo, Illinois. They established a trail across Iowa and began a migration which lasted until 1852. They cleared a trail, built bridges and established settlements and farms to support those traveling on west.

By the mid-1800s, most of Iowa's cities and towns were established. Farms covered the state, and the population patterns looked much like they do today.

Historical preserves include significant structures or objects associated with this early Euro-American occupation. Two such preserves are Fort Atkinson and Mt. Pisgah Preserve. Fort Atkinson was a federal military post built in the 1840s to protect Winnebagos from other Indian tribes. In and



Ken Formanek

▲ (top)
Indian Fish Trap, Iowa County

▲
Fish Farm Indian Mounds, Allamakee County

near Mt. Pisgah, a Mormon pioneer way station and cemetery, 800 people were buried in the mid-1800s.

BEAUTY

Scenic preserves are selected for their outstanding natural beauty. However, most scenic preserves are valued for scientific merits as well. For example, one of the most scenic areas in northeastern Iowa -- Bluffton Fir Stand Preserve -- is noted primarily for its northern plant associations. This balsam fir stand, the largest in Iowa, reaches from the banks of the Upper Iowa River to the summits of bluffs 150 feet above. Canadian yew, white pine and several other relics from glacial eras flourish here.

How is Land Entered into the Preserves System?

Preserves are established and overseen by the State Preserves Advisory Board. The board's seven members -- six appointed by the governor plus the director of the Department of Natural Resources (DNR), advises the DNR on acquisition, dedication, and management of state preserves.

Only carefully scrutinized lands are admitted to the State Preserves System. Each prospective area is visited to assess its scientific and educational qualities. All literature concerning the area is perused. Some sites are owned by individuals and private conservation organizations. Others are owned by cities

▼
Showy lady's slipper



DNR Photo

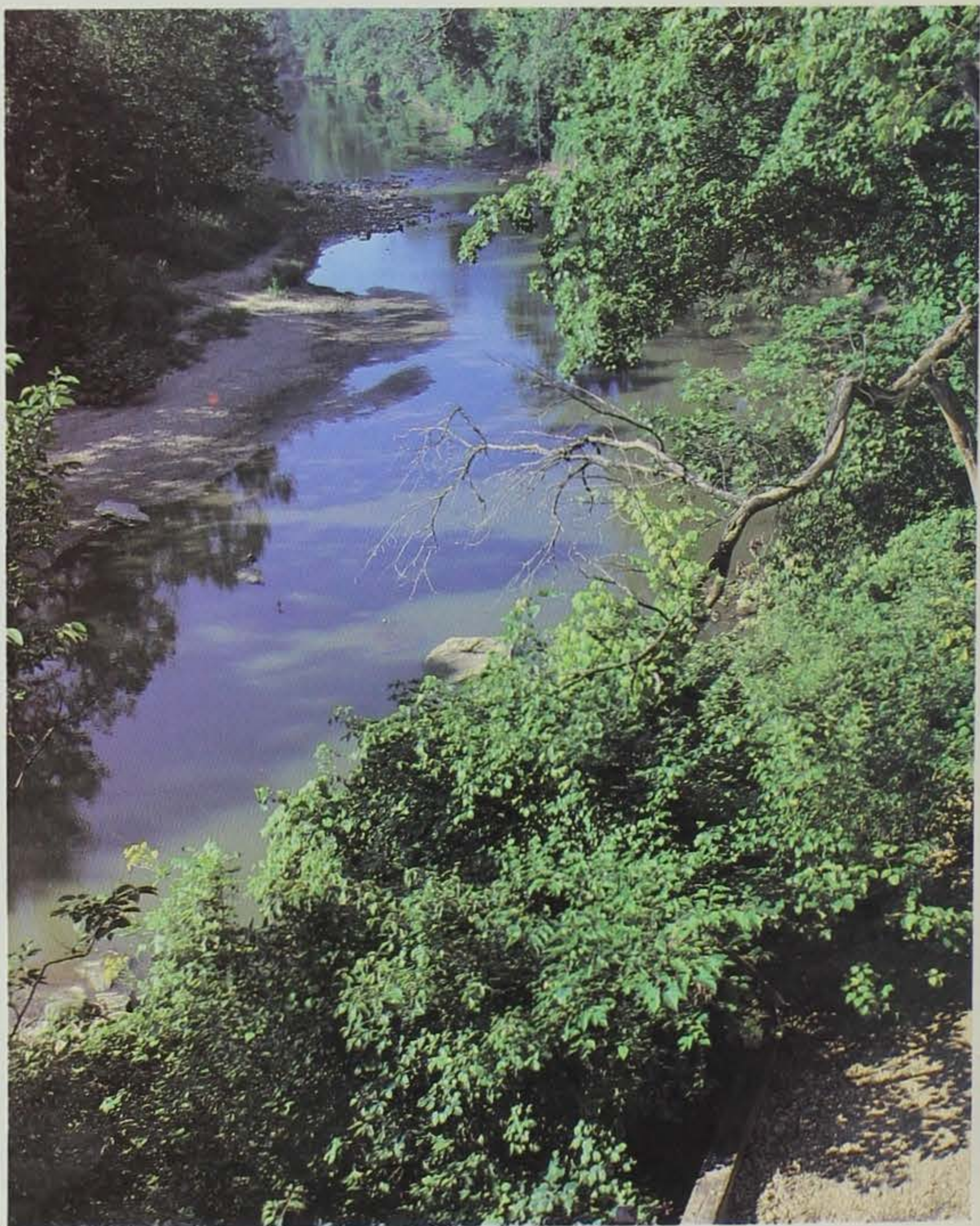


Randall Maas

▲
Golden saxifrage

▶
Starr's Cave, Des Moines County

Ron Johnson



Iowa's State Preserves



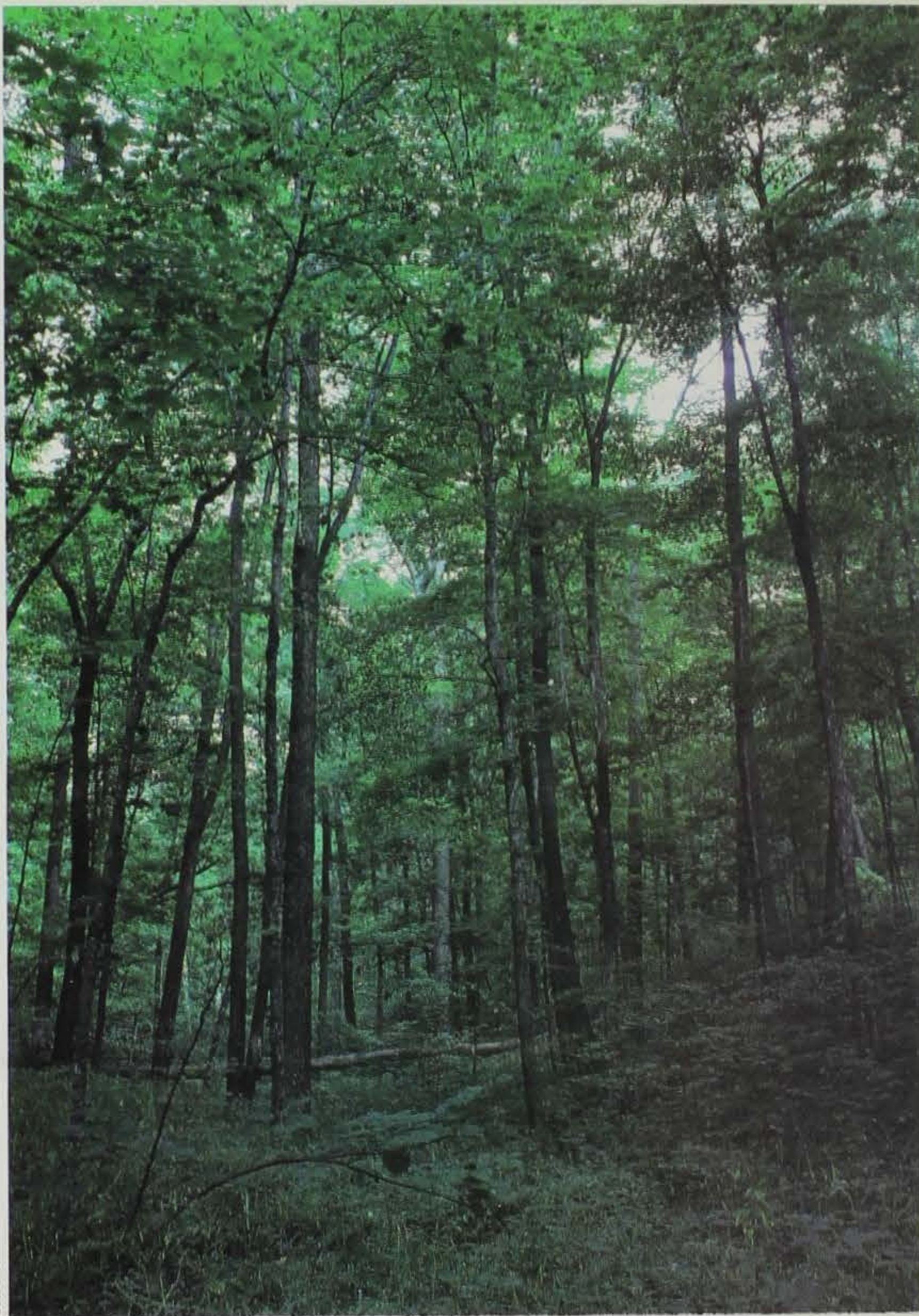
- | | | |
|---|--|---|
| 1. Anderson Prairie (200 acres) | 29. Gitchie Manitou (91 acres) | 58. Pecan Grove (17 acres) |
| 2. Behrens Ponds and Woodland (30 acres) | 30. Hanging Bog (16 acres) | 59. Pilot Grove Historical Preserve (7 acres) |
| 3. Berry Woods (42 acres) | 31. Hardin City Woodland (25 acres) | 60. Pilot Knob (369 acres) |
| 4. Bird Hill (1 acre) | 32. Hartley Fort (2 acres) | 61. Retz Memorial Woods (49 acres) |
| 5. Bixby State Preserve (183 acres) | 33. Hayden Prairie (239 acres) | 62. Roberts Creek (13 acres) |
| 6. Bluffton Fir Stand (94 acres) | 34. Hoffman Prairie (36 acres) | 63. Rock Creek Island (60 acres) |
| 7. Brush Creek Canyon (217 acres) | 35. Indian Bluffs Primitive Area (845 acres) | 64. Rock Island Botanical Preserve (17 acres) |
| 8. Brushy Creek (277 acres) | 36. Indian Fish Trap (1 acre) | 65. Roggman Boreal Slopes (20 acres) |
| 9. Cameron Woods (36 acres) | 37. Kalsow Prairie (160 acres) | 66. Rolling Thunder Prairie (123 acres) |
| 10. Casey's Paha (175 acres) | 38. Kish-ke-kosh Prairie (17 acres) | 67. Saint James Lutheran Church (1 acre) |
| 11. Catfish Creek (600 acres) | 39. Lamson Woods (20 acres) | 68. Savage Memorial Woods (12 acres) |
| 12. Cayler Prairie (160 acres) | 40. Liska-Stanek Prairie (20 acres) | 69. Searles Cave (43 acres) |
| 13. Cedar Hills Prairie (35 acres) | 41. Little Maquoketa River Mounds (42 acres) | 70. Sheeder Prairie (25 acres) |
| 14. Cheever Lake (366 acres) | 42. Malchow Mounds (6 acres) | 71. Silver Lake Fen (10 acres) |
| 15. Clay Prairie (3 acres) | 43. Manikowski Prairie (40 acres) | 72. Silvers-Smith Woods (20 acres) |
| 16. Claybanks Forest (56 acres) | 44. Mann Wilderness Area (103 acres) | 73. Slinde Mounds (32 acres) |
| 17. Coldwater Cave Spring (60 acres) | 45. Marietta Sand Prairie (20 acres) | 74. Starr's Cave (143 acres) |
| 18. Crossman Prairie (10 acres) | 46. Mericle Woods (132 acres) | 75. Steele Prairie (200 acres) |
| 19. Decorah Ice Cave (3 acres) | 47. Merrill A. Stainbrook Geological Preserve (23 acres) | 76. Stinson Prairie (32 acres) |
| 20. Dinesen Prairie (20 acres) | 48. Merritt Forest (20 acres) | 77. Strasser Woods (40 acres) |
| 21. Doolittle Prairie (25 acres) | 49. Montauk (46 acres) | 78. Toolesboro Archaeological Site (3 acres) |
| 22. Fallen Rock (122 acres) | 50. Mossy Glen (80 acres) | 79. Turin Loess Hills (220 acres) |
| 23. Fish Farm Indian Mounds (3 acres) | 51. Mount Pisgah Preserve (1 acre) | 80. Turkey River Mounds (62 acres) |
| 24. Five Ridge Prairie (789 acres) | 52. Mount Talbot (90 acres) | 81. White Pine Hollow (712 acres) |
| 25. Fleming Woods (20 acres) | 53. Nestor Stiles Prairie (10 acres) | 82. Williams Prairie (30 acres) |
| 26. Fort Atkinson (5 acres) | 54. North Woods (10 acres) | 83. Wittrock Indian Village (5 acres) |
| 27. Frank Pellett Memorial Woods (20 acres) | 55. Ocheyedan Mound (14 acres) | 84. Woodland Mounds (195 acres) |
| 28. Freda Haffner Kettlehole (110 acres) | 56. Old State Quarry (8 acres) | 85. Woodman Hollow (63 acres) |
| | 57. Palisades-Dows (330 acres) | 86. Woodthrush Woods (25 acres) |

White Pine Hollow, Dubuque County

Fort Atkinson, Winneshiek County



Ken Formanek



Ken Formanek



DNR Photo

Northern wild monkshood

and counties; many are owned by the state.

If an area is deemed worthy of preserve status, the landowner, the preserves board and the preserves and ecological services bureau of the DNR enter negotiations. The parties draw up a mutually acceptable document describing the land's qualities, stipulating acceptable land uses, administrative details, and providing a management plan to maintain the land's natural characteristics. Management may be handled by the owner or delegated to another group. These details vary from preserve to preserve, depending on the preserve's features

and the owner's desires. However, all provisions must enhance the goal of preserving the area's special features. The signature of Iowa's governor formally dedicates the parcel into the preserves system.

Individuals and public agencies owning land with outstanding features are encouraged to consider dedicating the area into the state preserves system. Land may be dedicated in several ways. Some landowners dedicate land as a preserve while retaining private ownership. Some donate land to the state. The state may dedicate land already in state ownership.

How are State Preserves Protected?

By designating land as a preserve, the State of Iowa declares that preservation is the best and most important use of that land.

Certain preserves require active management programs to maintain biological features. For example, prairies and other fire-dependant communities must be burned periodically to prevent invasion of trees and shrubs. Selective manual cutting and judicious application of herbicides may also be used. Such measures are intended to safeguard characteristics for which the land was preserved, not to alter the land's integrity.

Preserves are meant to remain for centuries to come. Allocation to alternative purposes is nearly impossible.

These parcels are not subject to the state's condemnation statutes. In the rare instance that an alternative use is determined to be of "imperative and unavoidable public necessity," a lengthy procedure (including public hearings, joint action of both houses of the Iowa Legislature, and concurrence of the governor, Iowa Department of Natural Resources and the Preserves Board) allows removal of land from the preserves system.

How Can State Preserves Be Used?

Iowa's preserves are meant to be enjoyed. State preserves are dedicated for the permanent protection of significant natural and cultural features. Most are open to hiking and photography. Many preserves are game management areas, purchased with hunting license fees and are open to hunting, fishing and trapping. Activities prohibited on most preserves include: driving of motor vehicles, camping, fires, horses, removal of or damage to plants, animals (except as noted above), and other natural materials and archeological and other cultural materials.



Wayne Schennum

Exceptions made on some preserves are posted. A few preserves are closed to the public because they are privately owned, because all access is privately owned, or for the protection of sensitive communities on the site.

Because preserves vary in amount and type of use they can withstand, a management plan is drawn up for each preserve. Use is directed to avoid destroying or degrading the area's features. Uses of an educational or scientific nature are especially encouraged.

Research related to the natural history and management of specific areas is occasionally funded by the Preserves Board. All researchers and collectors must obtain a permit from the board before commencing a project.

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

▲ Anderson Prairie, Emmet County

Preserves are areas judged worthy of protection not for a year, not for a decade, but for centuries to come.

Preservation of unique features depends on careful use.

Certain activities are not allowed on some preserves -- please observe all posted rules. Your cooperation will help maintain the quality of our preserves.

IOWA'S OUTDOOR COOKBOOK

The cold frosty weather of winter is here and what better way to ward off the cold than with some warm, tempting dishes? But don't save these recipes for just the cool months -- they are also delicious any time of the year.

Do you have a favorite outdoor recipe you would like to share with our readers? Send to "The Outdoor Cookbook," *Iowa Conservationist*, Wallace State Office Building, Des Moines, Iowa 50319-0034. We regret that we cannot acknowledge receipt of recipes or return recipes. We will print as many as space allows.

Venison Enchiladas

- 1 lb. ground venison
- 1/2 medium onion, chopped
- cooking oil
- 6 black olives, chopped
- salt and pepper
- 2 cans enchilada sauce
- 1 dozen corn tortillas
- 1/2 lb. sharp cheddar cheese, grated
- 4 green onions, chopped

Place venison and onion in skillet and saute in oil until meat is browned and onion cooked through. Stir in olives and salt and pepper to taste.

Heat enchilada sauce in large round pan. Dip each tortilla in the hot sauce, remove almost at once and place on flat surface.

Spoon 1 tablespoon of meat mixture on tortilla, roll up and place in greased 9x14 baking dish. Repeat with all tortillas and make single layer in dish, top with cheese and green onions. Bake 15-20 minutes at 375 degrees.

--*Nebraskaland Magazine*
Country Cookbook,
January/February 1988

Pheasant Under Cream

- 2 tbsp. flour
- 1 cup sweet cream
- pheasant
- flour
- salt and pepper

Cut pheasant into serving pieces. Soak in salt water for 15 minutes. Wipe dry.

In a pressure cooker, heat fat. Roll pheasant pieces in flour seasoned with salt and pepper. Sear golden brown. Add the cream. Place cover on cooker.

Allow steam to flow from vent pipe to release air from cooker. Place indicator weight on vent pipe and cook 15 minutes with pointer at "cook." Let pointer return to "off" position. Juices in pan can be used to make gravy.

--*Gertrude Lovig, McGregor, Iowa*

Deer Chili

- 4 lb. venison, ground
- 5 cloves minced garlic
- 5 tbsp. chili powder
- 2-1/2 tbsp. paprika
- 1-1/2 tbsp. comino seeds
- 1 tbsp. salt
- 1 tbsp. white pepper
- 2 quarts water

Brown venison in a small amount of fat in a kettle. Add the garlic, chili powder, paprika, comino seeds, salt and pepper.

Stir in 2 quarts of water. Cover and cook slowly, stirring occasionally, for about 3 hours. If more water is needed during cooking, add 1 cup at a time.

Makes 3-1/2 quarts.

--*Warden's Cookbook*

Barbecued Quail

- 8 quail
- 1/4 cup butter
- 1/4 cup onion, chopped
- 1/4 cup green pepper, chopped
- 1/4 cup water
- 1/4 cup ketchup
- 1/2 tsp. dry mustard
- Worcestershire sauce, to taste
- salt and pepper
- softened butter
- hot rice, buttered
- parsley sprigs or greens

Split quail. To make sauce, fry onion and green pepper in butter in a frying pan over medium heat for 5 minutes. Add the rest of the ingredients and simmer for 10 minutes. Preheat oven to 450 degrees.

Butter a large baking dish. Arrange quail skin-side up. Brush butter on quail and spread some barbecue sauce on each quail piece.

Place in oven for 25 minutes, basting the quail occasionally.

Serve on hot buttered rice. Ladle pan juices over rice and add parsley.

--Warden's Cookbook

Squash Creole

- 1 small-medium zucchini squash, peeled
- 1 medium onion
- 1 green pepper
- 2 fresh tomatoes
- garlic salt
- 4 tbsp. margarine
- shredded cheddar cheese

Cut the vegetables into bite-size pieces. Sprinkle with garlic salt and toss in a large bowl to cover all. Let stand for a few minutes.

Melt the margarine in a large skillet. Put in vegetables. Fry and stir until squash is tender.

Top with shredded cheddar cheese before serving.

--Warden's Cookbook

Puddle Duck Breast

- 1 1/4 lb. thinly sliced 1/4-inch breast pieces
- 3 tbsp. butter
- 1/2 cup crushed cornflakes
- 1/4 cup grated Parmesan cheese
- salt and pepper to taste
- 1 egg, beaten
- 1 8-oz. can tomato sauce
- 1/4 tsp. basil
- 1/2 tsp. oregano
- 1/4 tsp. sugar
- 3 slices Mozzarella cheese

Melt the butter in shallow baking dish. Combine the cornflakes, Parmesan cheese and salt and pepper.

Dip the breast fillets in egg then in the cornflake mix. Put in a baking dish.

Bake at 400 degrees 40 minutes or until tender. When the meat is tender, pour the sauce over and drape Mozzarella cheese over each fillet. Bake in the oven until the cheese is melted. Serve hot with buttered noodles.

--Warden's Cookbook

Cream of Wild Rice Soup

- 2 cans cream of potato soup
- 2 cups shredded American cheese
- 2 pints half and half
- 9 slices bacon
- 1 medium onion
- 1-1/2 cups cooked wild rice

Cut up the bacon and saute with onion; drain. Combine with wild rice and half and half; add the soup and cheese. Mix until the cheese melts. Serves 6-8.

Note: One-half cup dry wild rice equals one and one-half cups cooked rice. Soak the rice overnight in water and drain. To cook, mix the soaked rice in 3 cups water, bring to a boil and cook covered for 30 minutes on low.

--Warden's Cookbook

Editor's Note: In the September/October 1992 issue we published a recipe for Molasses-Sorghum Cake but neglected to credit the recipe. The recipe belongs to Marlana Bandurski of Des Moines. Marlana tells us she has won numerous contests with this delicious cake recipe. In case you missed it the first time around, we are reprinting it here.

Molasses-Sorghum Cake

- 2-1/2 cups flour
- 1 tsp. ginger
- 1 tsp. cinnamon
- 1/4 tsp. salt
- 1/2 cup shortening
- 1/2 cup sugar
- 1/2 cup molasses
- 1/2 cup sorghum
- 2 tsp. instant coffee
- 1 tsp. baking soda
- 1 cup hot water

Cream shortening; gradually beat in sugar and continue beating until light and fluffy. Stir in molasses and sorghum.

Sift flour with ginger, cinnamon and salt.

Dissolve baking soda and coffee in water; add alternately with flour mixture to batter, beating after each addition until smooth.

Pour into a 9x9x2-inch square pan lined on the bottom with waxed paper.

Bake in a 350-degree oven 45-50 minutes or until top springs back when lightly pressed. Cool in pan 15 minutes; remove to wire rack.

CONSERVATION UPDATE

The Environmental Challenge of Providing Sustained Community Forest

by Kathryn Stangl

The results of a 1990 DNR urban forestry survey showed that in a typical Iowa community, five trees were removed for every one planted. Yet the existing trees along our community streets, in our local parks and even in our yards are monuments to the Iowans of yesterday who believed in Iowa's future.

Desirable species of community trees when properly located and planted, play major roles in decreasing the buildup of CO₂, conserving energy, protecting water quality, binding our soil, sheltering wildlife and increasing the value of our homes.

Recently, the multiple benefits of community trees have again been recognized as the world faces major environmental problems such as tropical deforestation. Interest in tree planting has been rekindled across the state.

During the last three years both volunteers and professionals, working together, have helped establish more than 200 local tree planting programs by matching local utility funds through Trees Forever and through several federal grants such as the Small Business Administration



▲ City streets like this were once lined with stately elms. The now barren streets show the need for replantings.

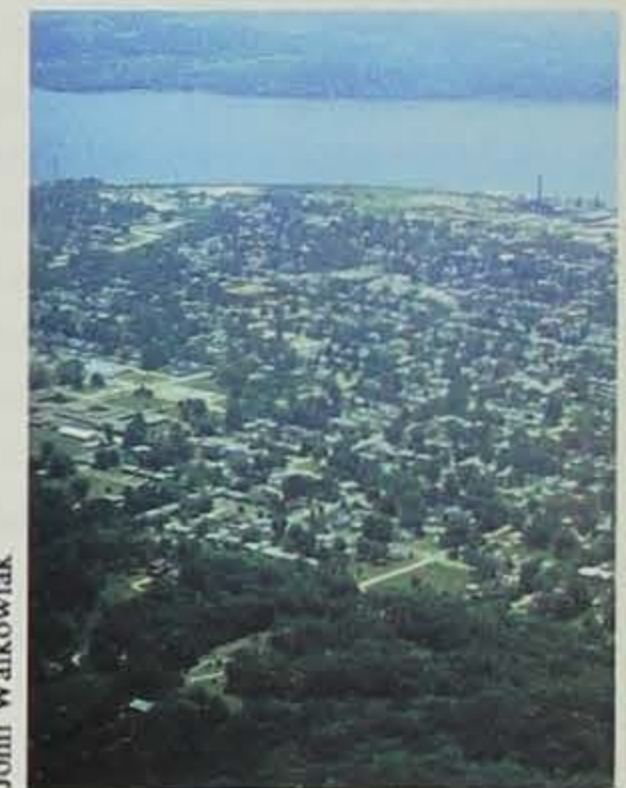
Tree Planting Program. In addition, the continued growth of *Trees For Kids*, Iowa's unique tree education and planting program for Iowa teachers and students, is due to partnerships between the DNR, the Iowa Nursery and Landscape Association, Iowa Bankers Association, the Telephone Pioneers and People's Natural Gas. These results show that Iowa's youth and adults are overwhelmingly supportive of environmental concerns and natural resource conservation.

Urban and community forestry means more than tree planting in metropolitan areas. It means the many benefits of trees scattered throughout all of Iowa's communities, large

and small. Trees absorb and block noise in towns and cities. They provide habitat and food for birds and other animals and create "microclimates" that would otherwise be absent from a community's residential, commercial or industrial areas.

Planting trees is not the end, but rather the beginning of reforestation and management of Iowa's community forests. Tree care and maintenance must receive the same recognition and budgeting as tree planting because it is the commitment of long-term maintenance that fully yields the environmental benefits of trees in our communities. The challenge is in sustaining the interest and care of community trees across the state, for

▼ Community trees are part of a town's infrastructure, and the benefits they provide are there 24 hours a day, everyday.



future generations to use and enjoy.

Two of the successful community programs are gearing up for their 1993 efforts and information on how to become involved in these programs follows.

Small Business Tree Planting Grants For Public Property Available Now

The U. S. Small Business Administration (SBA) has announced the 1993 funding of its highly successful National Tree Planting Program. State agencies and local governments can apply for matching grants for public tree plantings using small

businesses. Small businesses are defined as those with less than 100 employees. Public lands eligible for the plantings include state, county and local community areas such as parks, schools and streets.

In Iowa, the SBA Tree Planting Program is being administered through the joint cooperation of the DNR's Forests and Forestry Division and the Iowa Department of Economic Development (IDED). The application deadline is 4:30 p.m., Feb. 5, 1993

In 1993, Iowa is eligible for \$171,522 in 50-50 matching funds. During the last two years, the SBA program has funded 41 Iowa projects resulting in more than 4,000 landscaped-sized trees (those taller than five feet) and 13,000 seedlings, planted on state, county and local community areas.

Applicants need to prepare a maximum four-page proposal describing the planting, project costs and matching funds. Maintenance for a three-year period after the planting can be used for a portion of the match. Other federal funds may not be used as a part of the match. Special consideration will be given to projects that use as many local businesses as possible on a cost-effective basis.

Interested state agencies and local governments may request the SBA Tree

Planting Program application packet by calling IDED at (515)242-4899 or the DNR's urban forester at (515)242-5966.

Trees For Kids and Trees For Teens

Trees For Kids (TFK) will again be available to Iowa schools beginning in early March. The program for elementary through high-school students and teachers is sponsored by the DNR, Iowa Nursery and Landscape Association, Iowa Bankers Association, Telephone Pioneers of Iowa and People's Natural Gas. In the past three years the program has worked with more than 5,500 teachers, 385,000 students have received tree education, and more than 80,000 landscape trees and seedlings have been planted.

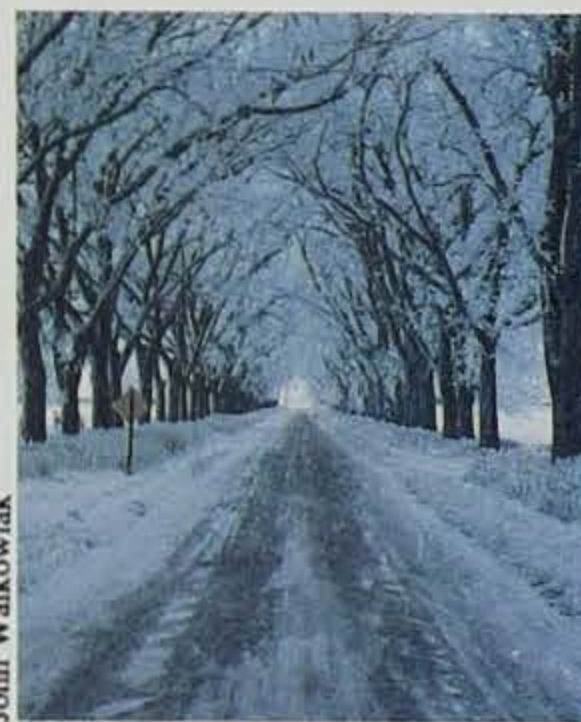
Using funds donated by People's Natural Gas, the DNR produces and makes available, upon request, *TFK* classroom packets to any Iowa public or private school teacher. These packets contain updated and revised information on Iowa trees such as identification, planting and care needs, the global benefits of Iowa tree plantings, education posters, classroom activities and an opportunity to receive a free landscape-sized tree, five to six feet tall, for the class to plant during Earth Week (April 25-May 1, 1993).

The trees are made

available thanks to the Iowa Nursery and Landscape Association selling trees at or below wholesale costs and the members of the Iowa Bankers Association picking up the remainder of the costs in order to make the tree free to participating schools. The Telephone Pioneers help coordinate local nursery and bank contacts.

In addition, a *Trees For Teens* program is available to high school science and vocational teachers in the People's Natural Gas service area only. This program stresses teen involvement and career opportunities in natural resource issues and management.

For more information, or to receive a *Trees For Kids* or *Trees For Teen* classroom packet contact the DNR's urban forester at the DNR Central Office, 900 East Grand, Des Moines, Iowa 50319-0034, (515)242-5966.



John Walkowiak

▲ **Snow- and ice-covered lanes will again be filled with spring green and summer shade.**

Breeding Bird Atlas Project Seeks Photos

The *Breeding Bird Atlas* project, co-sponsored by the DNR and the Iowa Ornithologists' Union is nearing conclusion. Field work and data analysis are complete, and work is beginning on composing the species accounts. The final product will be a book summarizing data on each of the bird species known to breed in Iowa.

The project would like to include a photo of each species described in the publication. If you have photos which you would like considered for inclusion in the publication, please submit them as soon as possible. The pictures can be either of the bird itself or adult or young birds at the nest.

Crisp black and white photos or high contrast color photos which can easily be converted to black and white are needed. Please send your pictures by Feb. 15. All photos will be acknowledged when they are received. The project cannot pay for photos but will credit each photo selected for publication. If your picture is selected you may also request a receipt, for tax purposes, noting the donation.

Slides or high quality prints should be sent to John Fleckenstein, DNR, 900 East Grand Des Moines, Iowa 50319-0034.

CONSERVATION UPDATE

CONSERVATION UPDATE

Easily Degradable Foam Packaging "Peanut" Is Made From a Surprising Source

by Kathryn Stangl

Excelsior is defined in Webster's unabridged dictionary as "finely curled wood shavings forming a resilient mass for packing delicate materials." It was one of the first packaging materials many of us ever encountered and numerous youngsters (those of us from *somewhat* earlier days) first unwrapped and unpacked a treasured toy china tea set or finely crafted train set from amongst the tiny wood shavings. While excelsior is still widely sold, many of today's children have removed similar items only from within boxes of polystyrene "peanuts." The little poly pellets may be the only packaging materials, now called "void filling materials," they have ever seen.

But times change and products change in response to consumer and market demands as well as environmental regulations. There are now new "peanuts" that are perhaps more environmentally friendly but look much like the commonly known poly variety. The same company that still sells excelsior, as well as other packaging products, markets this new "peanut."

The company has watched the new peanuts' sales climb as some environmentally conscious consumers evaluate the disposability and renewability of the product.

The new "Eco-foam" loose fill material is more than 95 percent cornstarch. Created from a special hybrid corn, primarily grown in Iowa and Indiana, the pellets look much like the traditional poly pellet. The material, while anti-cling and anti-static, is also water soluble. To dispose of the packaging, if it is not going to be reused, a consumer can

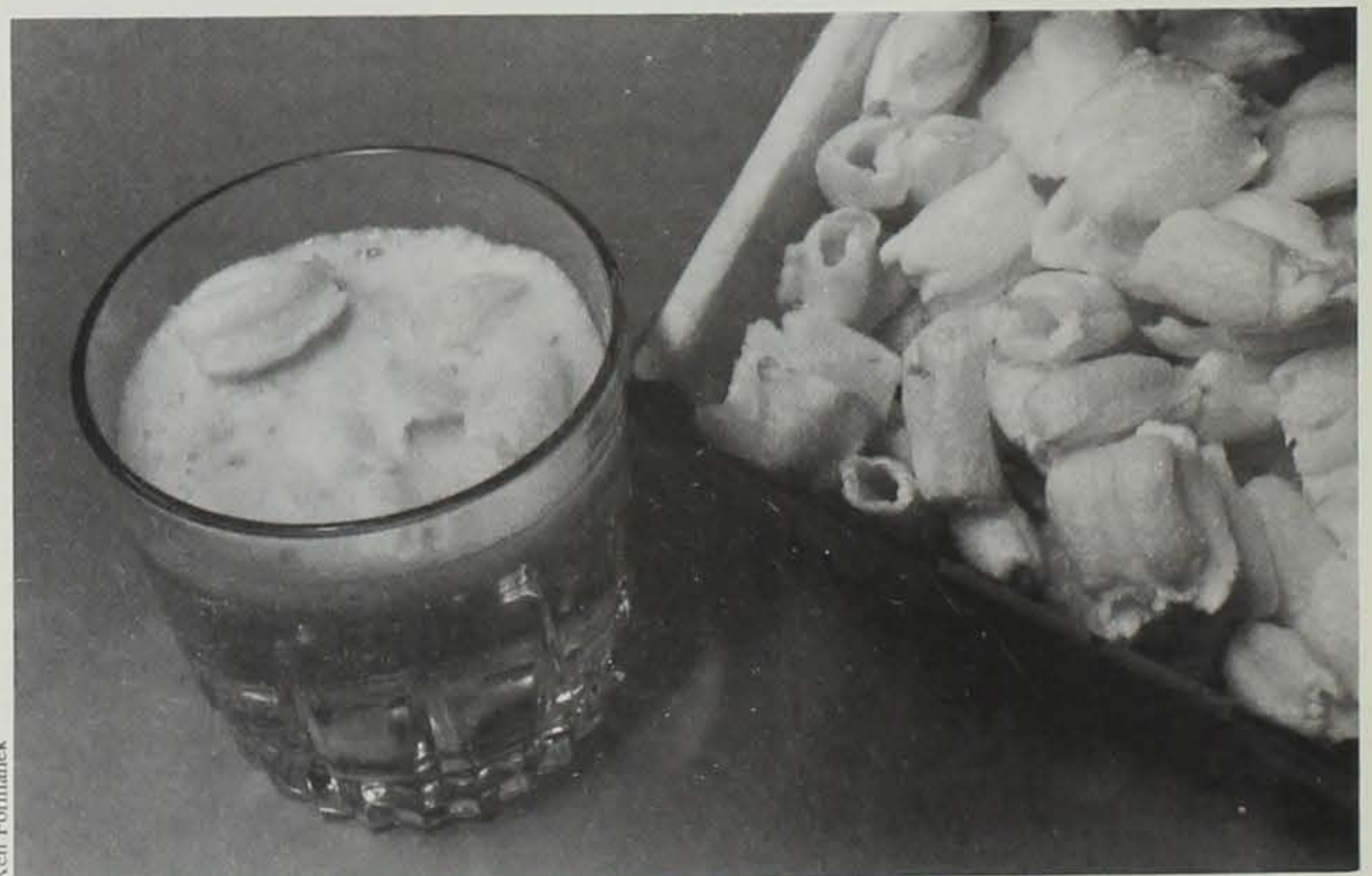
run water over the material and let the residue run down the drain, put it on the lawn for the rain to dissolve or even put it on the compost pile where moisture and microbes can help it dissolve quickly.

The product does not require any new equipment or even any equipment modifications in order to be used by larger commercial operations that currently use polystyrene pellets. The foam pellets can immediately be used in conventional air conveying or gravity systems that distribute traditional polystyrene "peanuts." The foam works like expanded

polystyrene loose fill, cushioning loads and filling empty spaces, but unlike petroleum-based plastics, it begins to decompose once it is saturated in water. It is also made from an annually renewable resource that does not require deforestation.

The cornstarch-based loose fill does not use any CFCs in its production process and is manufactured in much the same way as many breakfast cereals and snack foods. It is extruded in comparable equipment, using a similar heat and steam process to create the

▼ **The material was discovered while experiments were underway to find a cereal product that would stay crispy in milk for longer periods of time. The pellets appear much like conventional polystyrene pellets, are water soluble and the hybrid corn used in their manufacture is grown primarily in Iowa and Indiana.**



Ken Formanek

flexible foam pieces.

In fact, the material was discovered while experimenting to find a cereal product that would stay crispy in milk for longer periods of time. While the goal of the original project was to increase the "milk tolerance" of cereals, experiments resulted in a material that looked and felt very flexible and spongy and appeared very similar to polystyrene.

Gradually, interest increased in seeing if a cornstarch product could be produced that was similar to polystyrene and fit the same niche in packaging needs. While the material is primarily composed of U.S. Food and Drug Administration "food grade" material, the flavor, fats, oils and aroma are removed during the manufacturing process so that the pellets do not attract vermin.

The remaining additive is a water-soluble organic polymer that meets "food contact" specifications. The product is not a food item but has been shown to be nontoxic and does not pose a significant danger if ingested by animals or small children. Once the starch is extracted from the hybrid corn, the by-products are sold to converters who process them into corn oil or animal feed so that none of the product is wasted.

Toxic Cleanup Day Host Sites Sought

The Waste Management Assistance Division of the DNR is seeking proposals for host sites for the fall 1993 Household Hazardous Materials/Toxic Cleanup Day Program. The host site proposals must be submitted to the DNR by Feb. 15, 1993.

Toxic Cleanup Days (TCD) are collection programs for the safe management of household hazardous wastes from urban and rural residents. The one-day events, held on a Saturday in the spring or fall of the year, collect waste such as caustic cleaners, pesticides and solvents which need to be disposed of by hazardous waste contractors. A local task force composed of community representatives oversees all aspects of the program, in connection with the Department of Natural Resources.

The TCD events are part of a comprehensive program for household hazardous waste management that includes many aspects other than simple collection and disposal of wastes. These additional aspects include:

- reducing the amount of waste by using up supplies of products classified as household hazardous materials (HHM);
- promoting the recycling of materials such as batteries and used oil;

- developing sources for the reuse of unwanted material such as useable paint;

- distributing educational materials about HHM;

- promoting source reduction by the purchase and the use of less or non-toxic alternatives as well as the purchase of smaller quantities of HHM.

Revisions in the TCD program have made it even more efficient. The most significant of these revisions are: 1) reducing costs by collecting only wastes which cannot be used up, reused or recycled; 2) the use of a screening and appointment system, providing speedy, three- to five-minute service for those attending the event; 3) additional HHM education for all citizens in the community, and 4) the establishment of local sources who can assist with HHM information.

There is no required format for the application but the application must address information specified in the request for proposals (RFP). Please call the department for information on the application process. Applicants for the host sites must include in the application the names and responsibilities of the members of the local task force and outline a plan on how the task force will accomplish its responsibilities.

If you have any questions about the program, the request for proposals or how to complete your host site application call WMAD at (800)-367-1025.



Ice Safety Reminder

Practice ice safety when enjoying all winter sports. To be sure, test ice thickness with an auger. Use caution at all times, but here are a few guidelines on how much weight various thicknesses of ice can support safely.

One inch -- NO! Stay off the ice.

Two inches -- Why risk it? Are you sure you are *that* light?

Three inches -- A group in single file.

Five inches -- General use by people.

As ice thicknesses vary over a body of water, use caution. Remember snow insulates and ice may not be as thick where there is a heavy snow cover. Clear, bluish ice is the safest. Watch out for black or rotten ice.

Continuous travel over the same area of ice will weaken it. Be cautious at all times. It only takes a few minutes in the water at winter temperatures to suffer hypothermia, other serious injury or death.

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:

- January 15 (Friday), Council Bluffs
- No February meeting
- March 4, Des Moines
- April 1, Fort Dodge

Environmental Protection Commission:

- January 19 (Tuesday), Des Moines
- February 15, Des Moines
- March 15, Des Moines

State Preserves Advisory Board:

- March 9 (Tuesday) Iowa City

Bald Eagle Appreciation Days

Bald eagle watching events are found throughout the state this winter. The Nongame Program is sponsoring three events this year: Keokuk, January 16-17; Quad Cities, January 30-31; and Pella, February 27-28. Each of these programs will include an hourly indoor program including live raptors. Various indoor displays will offer information regarding eagles. Outside, there will be observation areas where people can view eagles in the wild. Biologists will be present at the observation sites, helping visitors with the spotting scopes and answering any questions.

At Keokuk, the indoor programs will be in the Keosippi Mall. Indoor programs will run from 9:30 a.m. through 3:30 p.m. on Saturday and 10:30 a.m. through 3:30 p.m. on Sunday. At the Quad Cities, the event will be held at the Quad Cities Conservation Alliance Expo Center at 2621 Fourth Avenue in Rock Island. The indoor programs will run from 10 a.m. through 4 p.m. on both Saturday and Sunday. At Pella, the indoor program will be at the Pella Community Center. Indoor programs will run from 9 a.m. through 4 p.m. on Saturday and noon to 4 p.m. on Sunday.

Last year, more than 20,000 people attended Bald

Eagle Appreciation Days. The event draws people from Chicago, Minneapolis, Grand Rapids and Indianapolis. It is a beautiful sight to see the majestic bald eagles perch, soar and fish along Iowa's rivers. If you have not attended a Bald Eagle Appreciation Day, it is time to bundle up the kids and head down to the river.

Eagle Watching On Your Own

If you decide to view eagles on your own, it has been recommended you stay inside your automobile, use a blind or hide behind a stationary object. Do not approach an eagle closer than 300 yards of its roost. It is a federal crime to harass an eagle. Disturbing an eagle and forcing it to fly causes the eagle to waste precious energy and increases its stress level. Winter is a tough time for many animals due to inclement weather and shortages of food. So, do not let your desire to see a bald eagle up close or to get that perfect photograph, jeopardize the life of an eagle. Use binoculars or spotting scopes to see these birds up close in the wild.

The banks of the Mississippi River are a traditional roost site for bald eagles. Since wintering eagles feed upon fish and sick waterfowl, open water areas are popular sites to view these majestic birds. Look for eagles below the lock and dams where the

currents do not allow the river to freeze.

For more information about the events, contact the Nongame office, (515)432-2823.

Additional Bald Eagle Events:

The Dubuque Eagle Watch with outdoor viewing is at Dam 11, Jan. 9, 8 a.m. through 4 p.m. Indoor programs and exhibits are 9 a.m. to 3 p.m. at the Marshal School, 1450 Rhomberg Avenue in Dubuque. For more information call Dubuque Convention and Visitors Bureau at (319)556-4372.

The Lock and Dam 14 Eagle Watch is Jan. 10 at the Mississippi Valley Welcome Center, 900 Eagle Ridge Road, LeClaire, Iowa, seminars at 1, 2 and 3 p.m. Outdoor viewing is at Lock and Dam 14. Call (319)289-3009 for more information.

The Jackson County Conservation Board Eagle Watch is Jan. 10 at the fisheries station south of Bellevue. Call (319)652-3783 for more details.

The Saylorville Eagle Watch is Feb. 20, noon to 4 p.m. at the Saylorville Visitor's Center, (515)276-4656.



CLASSROOM CORNER

by Bob Rye

What Animal Am I?

The following activity is from *Sharing the Joy of Nature* by Joseph Cornell and was part of a workshop held at the Springbrook Conservation Education Center in July 1992.

Background:

Animals are more than the livestock we raise for food, or the fish and game we hunt. There is a wealth of wildlife species ranging from salamanders to eagles that are nongame wildlife. Many species including insects, bats and reptiles are not fully appreciated or suffer an "image problem" reinforced by mass market television, movies, books and even fairy tales and nursery rhymes.

This activity can give students an opportunity to appreciate the diversity of Iowa wildlife by recognizing the unique features of a particular species. The specific features of an animal can demonstrate the place it "fits" in the ecosystem and show the richness and diversity of the world around us from wetlands, forests and prairies to the small patch of grass in a suburban backyard. The clues below are sample cards that describe a spider and a frog. Other animals that could be used in this group are the hummingbird, otter, bat, bald eagle, butterfly, etc. Any book of animal descriptions and behaviors can be used for specifics and visual clues such as webbed feet or gills can be drawn to help students who are too young to read well.

Sample clues -- Frog

- I am able to breathe and drink through my moist skin.
- I have two webbed feet.
- The males of my kind sing to attract the females. But neither males nor females build nests or care for our babies.
- I have four legs, two eyes and a backbone.
- I am green and live in and out of the water.
- When I am young, I breathe through gills. Later, as an adult, my body changes and I develop air-breathing lungs.
- My tongue is located at the tip of my mouth. I flip it out to catch insects.
- I am cold-blooded, swim and lay my eggs in water.
- If it is cold, I will spend my winter in the mud on the bottom of a pond.
- I find safety in water from those who might eat me.
- When I am young I eat plants, but as I grow older I change to a diet of insects.

Age:

6 years and up

Objectives:

Students will be able to discover the identity of each of four animals and gather all 10 clue cards that describe the animal. The game will capture the group's enthusiasm and create bonds between the people in the group.

Method:

Students will mingle, getting all 10 cards for an animal together in a group by calling out the name of the animal they think their clue describes.

Materials:

Forty 3" x 5" cards, on each of which is written a single clue to the identity of one of four animals (10 clue cards per animal).



Extensions:

1. Repeat the activity with clues that the students have researched and written.

Resource Materials:

Cornell, Joseph, *Sharing the Joy of Nature*, Nevada City, CA: Dawn Publications, 1989.

Any of the *Peterson Field Guides*.



Roger A. Hill

Bob Rye is a training officer with the department's Conservation Education Center in Guthrie County.

Sample clues -- Spider

- Usually I am brown, gray or black, but I can also be red, green or yellow. I do not have two or four legs, and really, I am not such a bad critter.
- I eat a lot of insects, many of which carry diseases or are harmful to plants. I wear my skeleton on the outside of my body.
- I change my skin often as I grow older and larger. This process is called molting. I molt 4-12 times before I am a full-grown adult. I never change my looks, just my size.
- Scorpions, ticks, mites and crabs are some of my relatives.
- My eight simple eyes help me see to the front, behind, above, below and to the sides. I also have eight legs.
- I have poison fangs to paralyze my prey. I suck their insides and discard their empty shells.
- Most of us spin our own silk which we use to make egg cocoons, construct webs and traps, line our burrows, and wrap up our prey before we eat them.
- When I am born, I look just like mom and dad -- eight eyes, two body sections and quite a few legs. I do not have any wings or antennae, though.
- There are 50,000 species of my kind. We are very adaptable and live in many different places. Our kind have been around for 300 million years. Now many of us live with you in your house!
- I catch a lot of insects with a trap that I make.

Procedure:

1. Prepare the clue cards, shuffle and hand out one or two cards to each player.
2. Players should be standing and able to mingle freely.
3. Tell the players that the goal of the game is to discover the identity of each of the four animals and gather the 10 clue cards that describe each animal. Tell them to wait and start on your signal.
4. The players call out the name of the animals they think are described on their clue card. A player's card might say: "You are warm-blooded and have a long tail and four feet." The player thinks "Maybe I am a squirrel," so he calls out, "Squirrel! Squirrel!" No one else shouts "Squirrel," but someone is shouting "Otter!" and the player notices several people heading in the otter-person's direction. He checks his clue again and realizes he could be an otter, so he joins the group and they try to collect all 10 otter clues.
5. For quickest results, the group should choose one person to try to collect all the animal clues. Thus, a player might want to give his otter card to the otter collector and concentrate on the other cards. Children who cannot read well can be given the easier reading clues.
6. Have the groups read two or three of their most interesting cards to the rest of the class.
7. Hint for developing the clues: Choose animals that have distinct and easily identified characteristics. Add additional information if the clue can fit more than one of the animals. For very young students you can use pictures on the clue cards such as webbed feet or a nest.

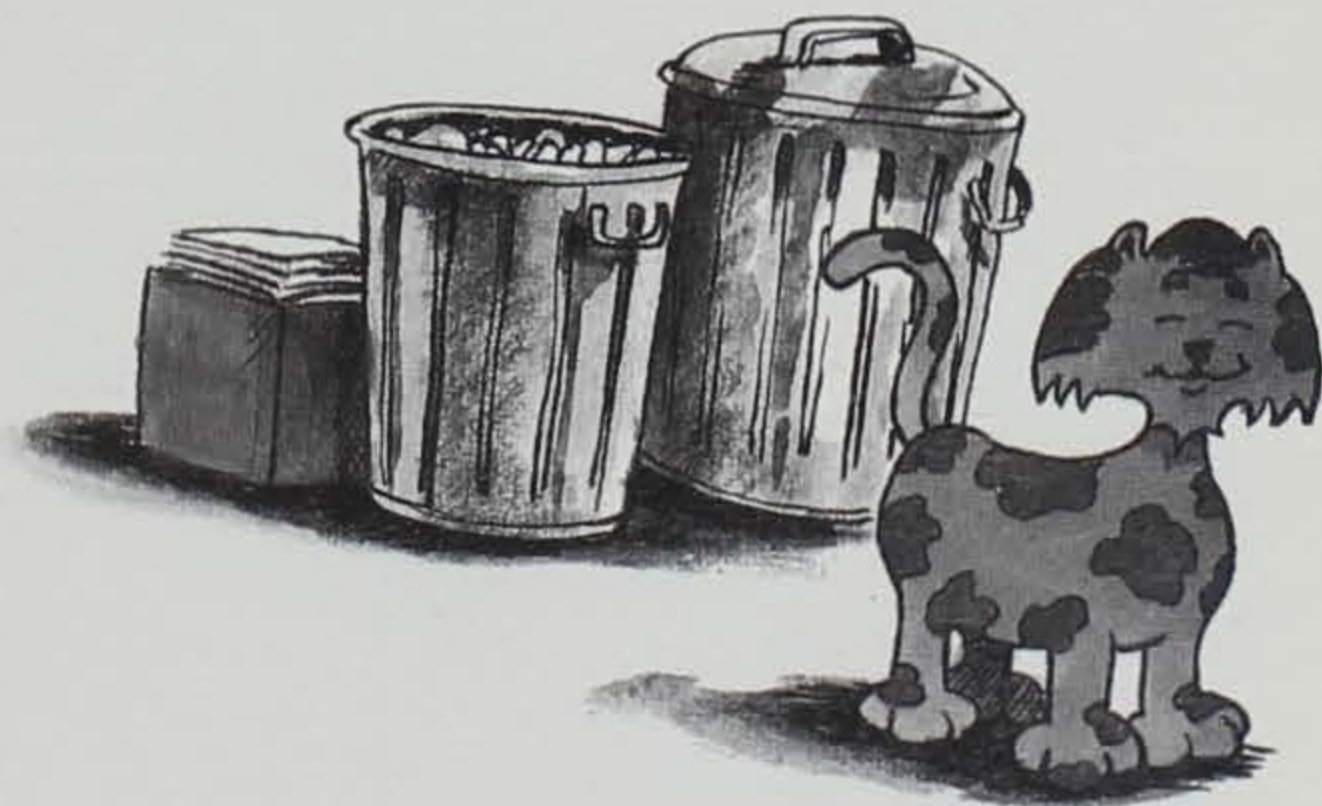
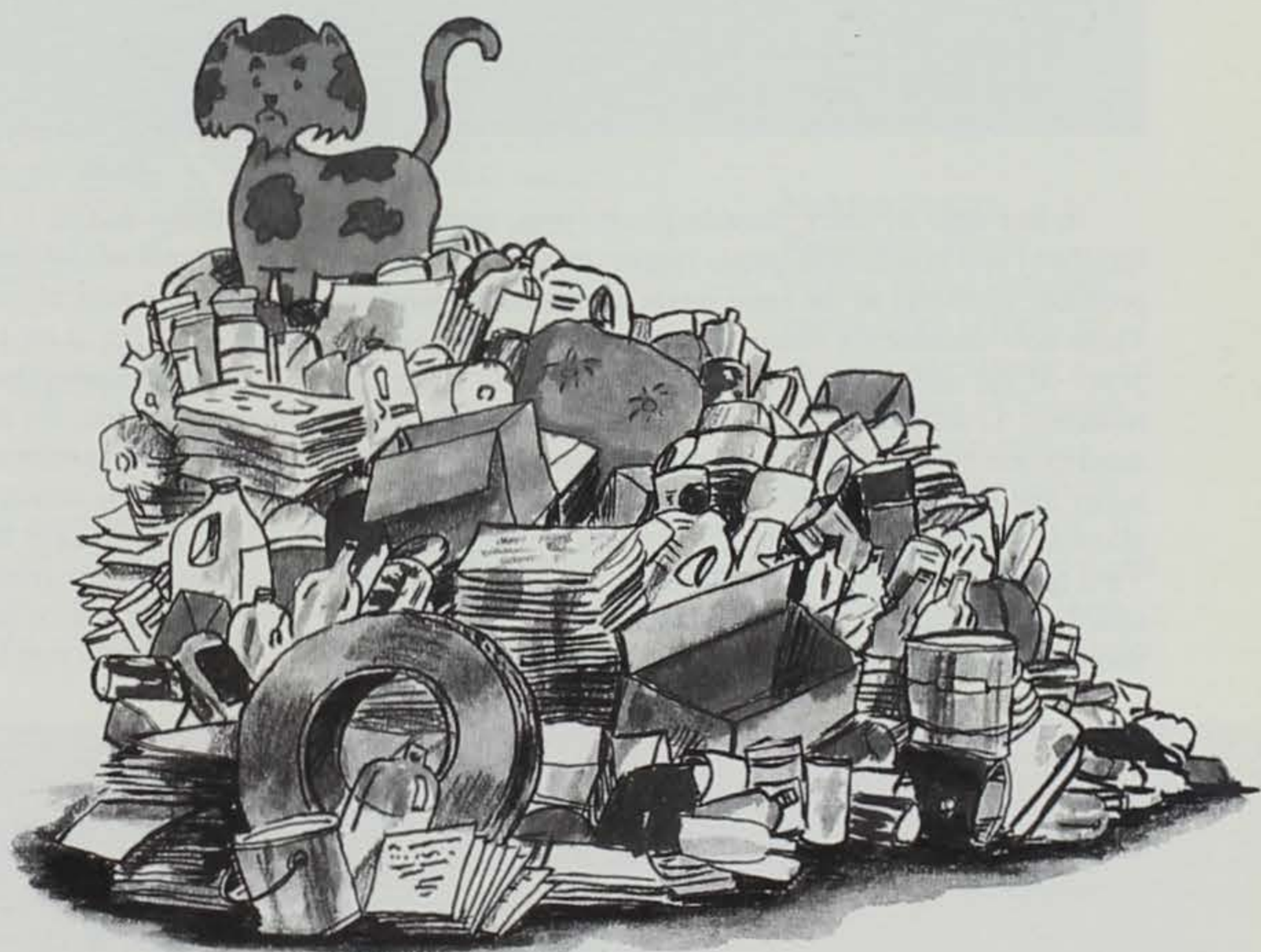
HOW TO CUT DOWN ON EVERYONE'S LITTER... EVEN THE CAT'S

People can help solve a growing problem . . . garbage! Individual consumers can help alleviate America's mounting trash problem by making environmentally aware decisions about everyday things like shopping and caring for the lawn. Like the story that says cats have nine lives, so do many of the items we use every day. Empty cans and jars can be reused to store many items, such as nails or thumb-tacks. The baking soda bought to bake a cake also can be used to scrub the kitchen counters. The container that began its life as a plastic milk jug can be washed and reused to water plants, create an arts and crafts project, or be transformed into a bird feeder. Eventually, the milk jug can be recycled to create a new plastic product.

Reusing products is just one way to cut down on what we throw away. There are practical steps to reduce the amount and toxicity of garbage. These aren't the only steps that can be taken to reduce waste, but they're a good start.

The Problem is Too Much Trash

Each year, Americans generate millions of tons of trash in the form of wrappings, bottles, boxes, cans, grass clippings, furniture, clothing, phone books and much, much, more. Over the years, we have gotten used to "throwing it away," so it's easy to understand why now there's too much trash and not enough acceptable places to put it.



Source Reduction Alternatives Around the Home

Drain cleaner -- Use a plunger or plumber's snake.

Oven cleaner -- Clean spills as soon as the oven cools using steel wool and baking soda; for tough stains, add salt (do not use this method in self-cleaning or continuous-cleaning ovens).

Glass cleaner -- Mix one tablespoon of vinegar or lemon juice in one quart of water. Spray on and use newspaper to wipe dry.

Toilet bowl cleaner -- Use a toilet brush and baking soda or vinegar. (This will clean but not disinfect.)

Furniture polish -- Mix one teaspoon of lemon juice in one pint of mineral or vegetable oil and wipe furniture.

Rug deodorizer -- Deodorize dry carpets by sprinkling liberally with baking soda. Wait at least 15 minutes and vacuum. Repeat if necessary.

Silver polish -- Boil two to three inches of water in a shallow pan with one teaspoon of salt, one teaspoon of baking soda and a sheet of aluminum foil. Totally submerge silver and boil for two to three more minutes. Wipe away tarnish. Repeat if necessary. (Do not use this method on antique silver knives. The blade will separate from the handle.) Another alternative is to use nonabrasive toothpaste.

Plant sprays -- Wipe leaves with mild soap and water; rinse.

Mothballs -- Use cedar chips, lavender flowers, rosemary, mint or white peppercorns.

Flea and tick products -- Put brewer's yeast or garlic in your pet's food; sprinkle fennel, rue, rosemary or eucalyptus seeds or leaves around animal sleeping areas.

In less than 30 years, durable goods (tires, appliances, furniture) and nondurable goods (paper, certain disposable products, clothing) in the solid waste stream nearly tripled. These now account for about 75 million tons of garbage per year. At the same time, container and packaging waste rose to almost 57 million tons per year, making packaging the number one component of the nation's waste stream. Container and packaging material includes glass, aluminum, plastics, steel and other metals, and paper and paperboard. Yard trimmings such as grass clippings and tree limbs are also a substantial part of what we throw away. In addition, many relatively small components of the national solid waste

stream add up to millions of tons. For example, even one percent of the nation's waste stream amounts to almost two million tons of trash each year.

Source Reduction: A Basic Solution

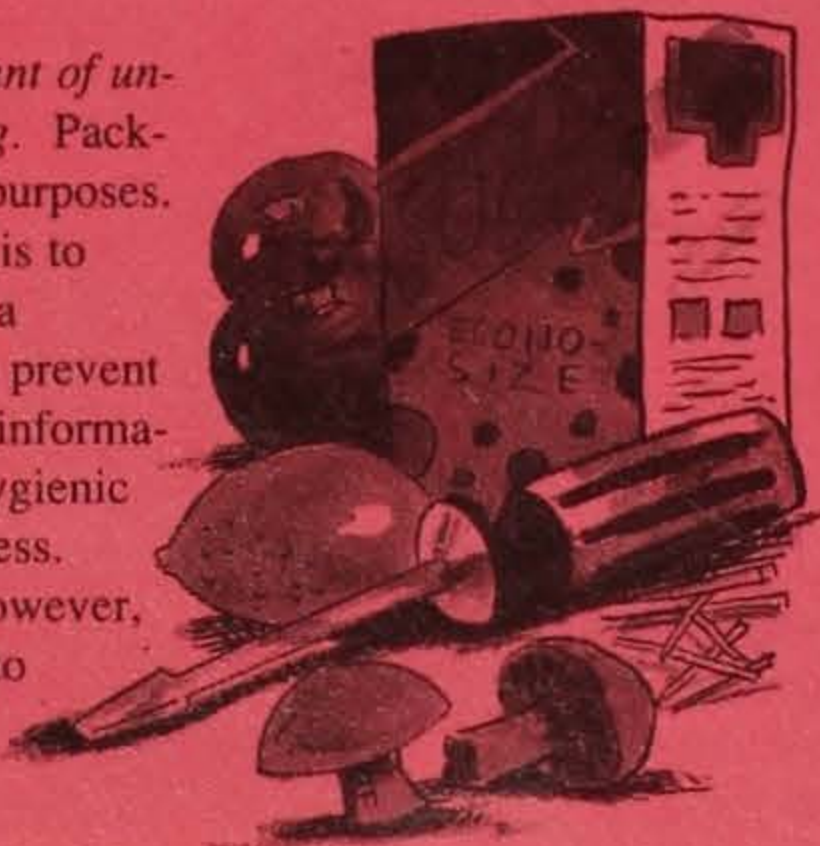
As a nation, we are starting to realize that we can't solve the solid waste dilemma just by finding new places to put trash. Across the country, many individuals, communities and businesses have found creative ways to reduce and better manage their trash through a coordinated mix of practices that includes source reduction (see box on page 54).

Simply put, source reduction is waste prevention. It

TIPS FOR REDUCING SOLID WASTE

REDUCE

1. *Reduce the amount of unnecessary packaging.* Packaging serves many purposes. Its primary purpose is to protect and contain a product. It also can prevent tampering, provide information and preserve hygienic integrity and freshness. Some packaging, however, is designed largely to enhance a product's attractiveness or prominence on the store shelf. Since packaging material accounts for a large volume of the trash we generate, they provide a good opportunity for reducing waste. In addition, keep in mind



that as the amount of product in a container increases, the packaging waste per serving or use usually decreases.

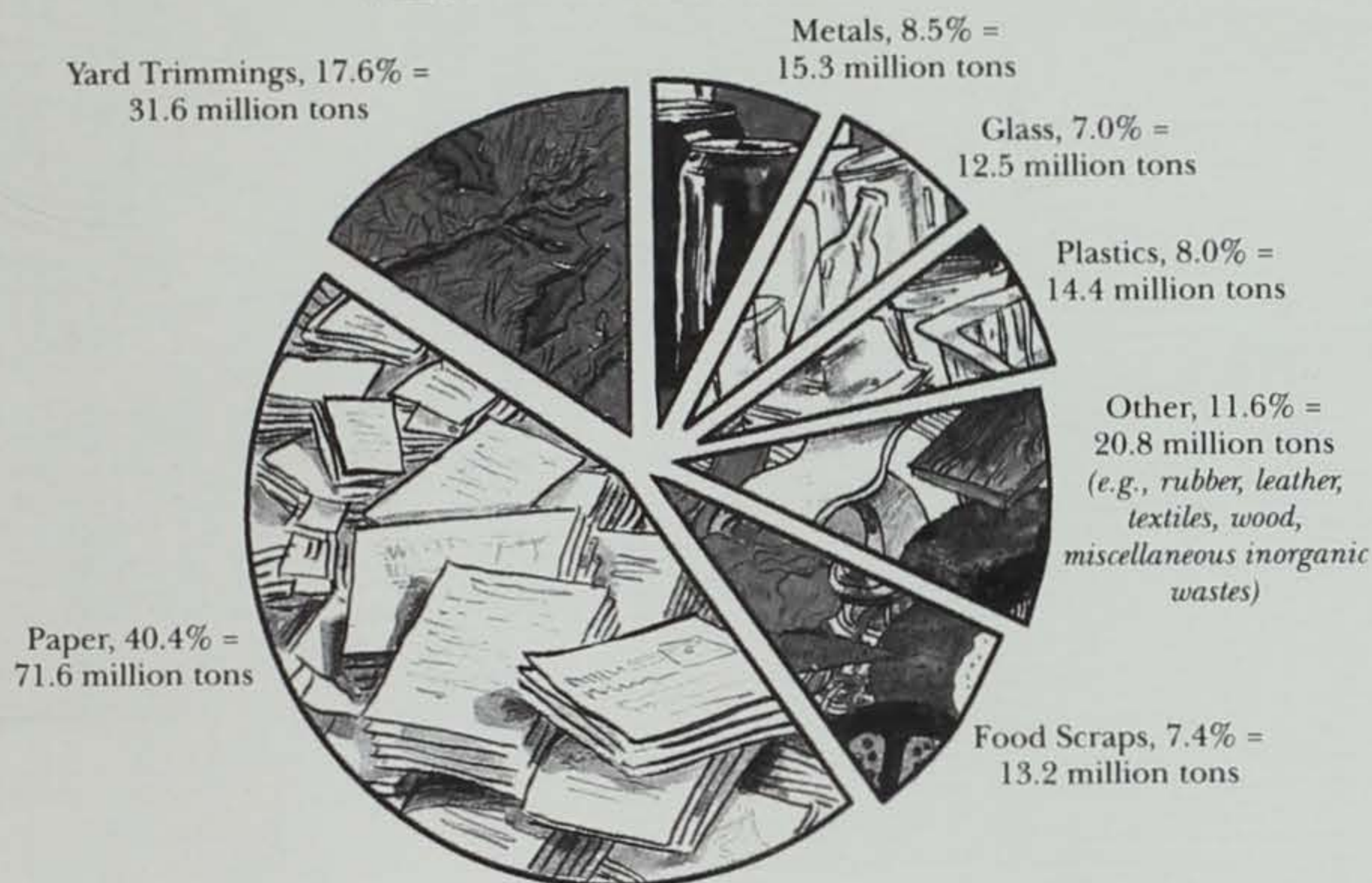
2. *Adopt practices that reduce waste toxicity.* In addition to reducing the amount of materials in the solid waste stream, reducing waste toxicity is another important component of source reduction. Some jobs around the home may require the use of products containing hazardous components. Nevertheless, toxicity reduction can be achieved by following some simple guidelines.

REUSE

3. *Consider reusable products.* Many products are designed to be used more than once. Reusable products and containers often result in less waste. This helps reduce the cost of managing solid waste and often conserves materials and resources. (Remember, reusable containers for food must



What's In America's Trash?



**Total Weight = 179.6 Million Tons
(1988 Figures)**

Source reduction is a basic solution to the garbage glut: Less waste means less of a waste problem. Because source reduction actually prevents the generation of waste in the first place, it comes before other management options that deal with trash after it is already generated. After source reduction, recycling (and composting) are the preferred waste management options because they reduce the amount of waste going to the landfills and conserve resources.

Making Source Reduction Work

Putting source reduction into practice is likely to require some change in our daily routines. Changing habits does not mean a return to a more difficult

lifestyle, however. In fact, just the opposite may happen. If we don't reduce waste, the economic and social costs of waste disposal will continue to increase, and communities -- large and small, urban and suburban -- will face increasingly harder decisions about managing their trash.

includes many actions that reduce the overall amount or toxicity of waste created. Source reduction can conserve resources, reduce pollution and help cut waste disposal and handling costs (it avoids the costs of recycling, composting, landfilling and combustion).

be carefully cleaned to ensure proper hygiene.)

4. *Maintain and repair durable products.* If maintained and repaired properly, products such as long-wearing clothing, tires and appliances are less likely to wear out or break and will not have to be thrown out and replaced as frequently. Although durable products sometimes cost more initially, their extended life span may offset the higher cost and even save money over the long term.

5. *Reuse bags, containers and other items.* Many everyday items can have more than one use. Before discarding bags, containers and other items, consider if it is hygienic and practical to reuse them. Reusing products extends their lives, keeping them out of the solid waste stream longer. Adopt the ideas that work for you, add



some of your own, and then challenge others in your school, office and community to try these ideas and to come up with others.

6. *Borrow, rent or share items used infrequently.* Seldom-used items, like certain power tools and party goods, often collect dust, rust, take up valuable storage space and ultimately end up in the trash. Infrequently used items also might be shared among neighbors, friends or family. Borrowing, renting or sharing items saves both money and natural resources.

7. *Sell or donate goods instead of throwing them out.* One person's trash is another person's treasure. Instead of discarding unwanted appliances, tools



Integrated Waste Management

Integrated waste management refers to the complementary use of a variety of practices to safely and effectively handle municipal solid waste. The following is the Environmental Protection Agency's preferred hierarchy of approaches.

1. Source reduction is the design, manufacture, purchase or use of materials (such as products and packaging) to reduce the amount or toxicity of trash generated. Source reduction can help reduce waste disposal and handling costs because it avoids the costs of recycling, municipal composting, landfilling and combustion. It also conserves resources and reduces pollution.

2. Recycling is the process by which materials are collected and used as raw materials for new products. There are four steps in recycling: collecting the recyclable components of municipal solid waste, separating materials by type (before or after collection), processing them into reusable forms, and purchasing and using

the goods made with reprocessed materials. Recycling prevents potentially useful materials from being landfilled or combusted, thus preserving our capacity for disposal. Recycling often saves energy and natural resources. Composting, a form of recycling, can play a key role in diverting organic wastes from disposal facilities.

3. Waste combustion and landfilling play a key role in managing waste that cannot be reduced or recycled. Combustion in specially designated facilities reduces the bulk of waste and provides the added benefit of energy recovery. Source reduction and recycling can remove items from the waste stream that may be difficult to burn, cause potentially harmful emissions, or make ash management problematic. Landfilling is -- and will continue to be -- a major component of waste management. The portion of waste requiring incineration or land disposal can be significantly reduced by examining individual contributions to garbage and by promoting the wise use and reuse of resources.

All parts of society need to work together to change current patterns of waste generation and disposal. The federal government develops and provides information and looks for incentives to create less waste. It also helps communities plan and carry out source reduction measures. State, local and tribal governments can create the most appropriate source reduction measures for their areas. For example, some communities already are using fee systems that require house-

holds and businesses to pay for trash disposal based on the amount they toss out.

Large consumers -- manufacturers, retailers, restaurants, hotels, schools and governments -- can prevent waste in a variety of ways, including using products that create less trash. Manufacturers also can design products that use fewer hazardous components, require less packaging, are recyclable, use recycled materials, and result in less waste when

or clothes, try selling or donating them. Opting for used and "irregular" items is another good way to practice source reduction. Such products are often less expensive than new or "first-quality" items, and using them will keep them from being thrown away.

RECYCLE

8. *Choose recyclable products and containers and recycle them.* When you've done all you can to avoid waste, recycle. Producing goods from recycled materials typically consumes less energy and conserves raw materials. Yet, our landfills are packed with many packages and products that can be recycled.

9. *Select products made from recycled materials.* Participating in a local or regional recycling pro-



gram is only part of the recycling process. For recycling to succeed, recyclable materials must be processed into new products, and those products must be purchased and used. Look for items in packages and containers made of recycled materials. Use products with recycled content listed whenever you can. Encourage state and local government agencies, local businesses and others to purchase recycled products such as paper, re-refined oil and retread tires.

10. *Compost yard trimmings and some food scraps.* Backyard composting of certain food scraps and yard trimmings can significantly reduce the amount of waste that needs to be managed by the local government or put in a landfill. When properly composted, these wastes can be turned into natural soil additives for use on lawns and gardens, and used as potting soil for house plants. Finished compost can improve soil texture, increase the ability of the soil to absorb air and water, suppress weed growth, decrease erosion, and reduce the need to apply commercial soil additives.



REDUCE the amount of trash discarded.



REUSE containers and products.



RECYCLE, use recycled materials, and compost.



RESPOND to the solid waste dilemma by reconsidering waste-producing activities and by expressing preferences for less waste.



they are no longer useful.

Individuals can evaluate their daily waste-producing activities to determine those that are essential (such as choosing medicines and foods packaged for safety and health), and those that are not (such as throwing away glass or plastic jars that could be reused or locally recycled). There are many practices that reduce waste or help manage it more effectively. Adopt those that are right for you and others that you think of yourself. Discuss your ideas with neighbors, businesses and other members of your community. It's important to remember that all actions will have some effect on the environment. If reusable products need to be washed, for example, there may be an increase in water use. Individual consumers, however, can substantially reduce solid waste by following the four basic principles in the box at left -- Reduce, Reuse, Recycle and Respond.

This article is reprinted, in part, from the booklet, "The Consumer's Handbook for Reducing Solid Waste," published by the U.S. Environmental Protection Agency. To order a copy of the booklet, write U.S. Environmental Protection Agency, RCRA, Docket OS305, Washington, D.C. 20460.



RESPOND

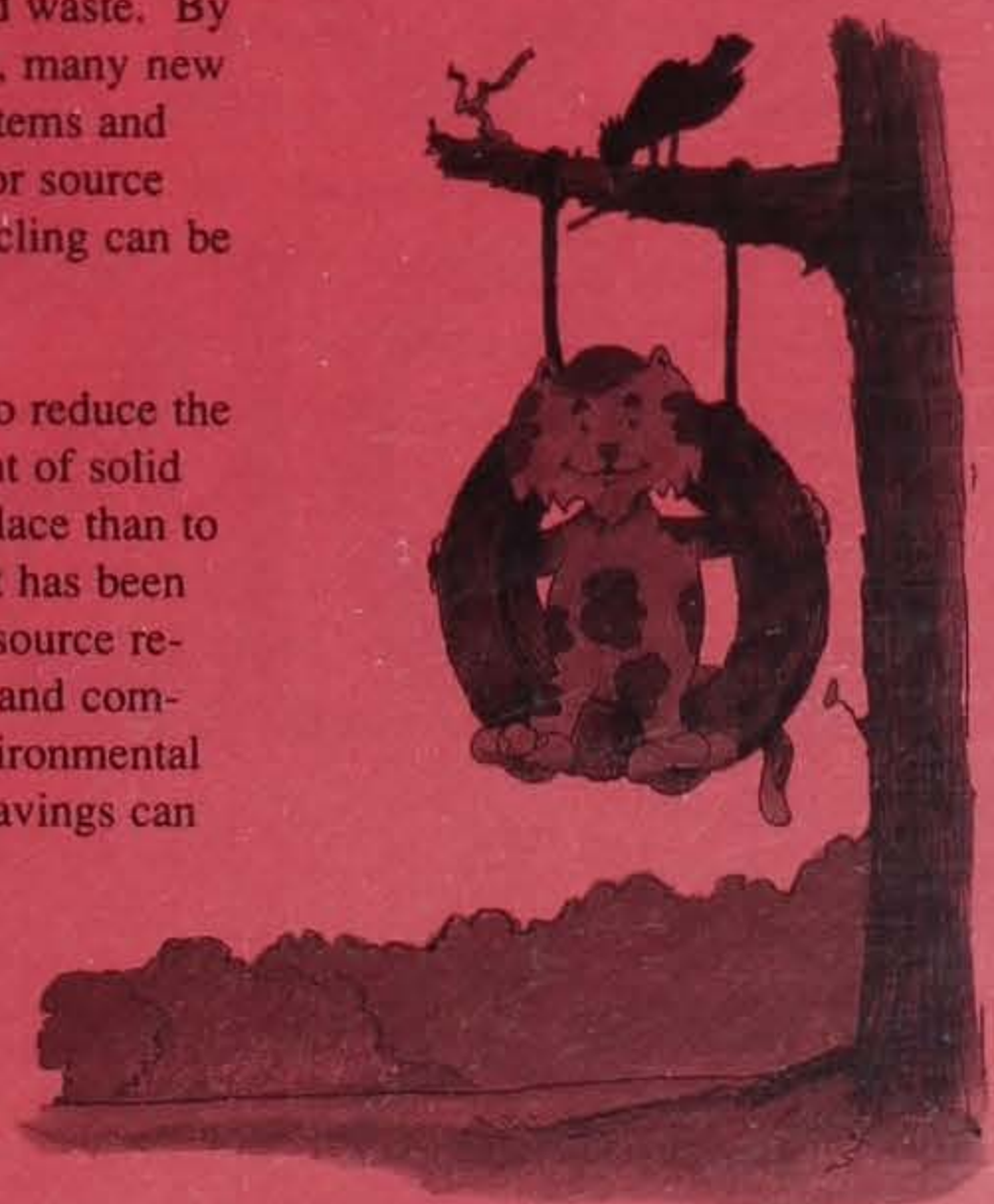
11. *Educate others on source reduction and recycling practices. Make your preferences known to manufactures, merchants and community leaders. Share information about source reduction, recycling and composting with others. Spread the word to family, friends, neighbors, local businesses and decision-makers. Encourage them to learn more about solid waste issues and to work toward implementing and promoting source reduction,*

recycling and composting. We all have the power to influence others and help create the type of world in which we want to live.

12. *Be creative -- find new ways to reduce waste quantity and toxicity. There are many ways to reduce the amount and*

the toxicity of solid waste. By thinking creatively, many new uses for common items and new possibilities for source reduction and recycling can be discovered.

It's far better to reduce the toxicity and amount of solid waste in the first place than to cope with it after it has been created. Through source reduction, recycling and composting, many environmental benefits and cost savings can be realized. Just remember the four "Rs" . . . Reduce, Reuse, Recycle and Respond.



SOLID SOLUTIONS FOR WASTE DISPOSAL

One inescapable fact is that Iowa has a finite capacity in which to safely dispose of the mountains of solid waste generated each and every day. Calls for reduction in the generation of solid waste and the need for increased recycling efforts have become louder, more frequent, and more urgent from environmentally alert Iowans. ▲ Over the past five years one state initiative, the Landfill Alternatives Grant Program, has provided more than 9.7 million dollars in matching grants to 86 applicants to reduce the amount of solid waste destined to be landfilled. Financial assistance has been provided for such projects as establishment of recycling centers, initiation and expansion of waste reduction and recycling programs, construction of regional yard waste composting facilities, assistance for used tire recycling -- and the list goes on. ▲ One benefit of the Landfill Alternatives Grant Program that is not readily apparent but is extremely important to the environment and to a large number of Iowans, is that of meaningful employment for the mentally and physically challenged persons, specifically referring to the work activity centers and sheltered workshops located throughout the state and the clients they serve. Work activity center and sheltered workshop landfill alternative grant projects are providing employment to a typically hard-to-place segment of the population, thereby doing something positive for themselves, their respective com-

munities and our environment by decreasing the exploitation of natural resources through recycling. ▲ As of the December 1991 funding period, 12 grants have been awarded directly to work activity centers and sheltered workshops. The total award for these projects is \$1.5 million. In addition to these 12 grants, several other projects have been funded that indirectly involve

these facilities. Recycling, in general, decreases the expenditure of funds in the form of landfill tipping fees, decreases the amount of solid waste being landfilled, extends the life of many Iowa landfills and saves capital during the manufacturing process. Recycling at activity centers and sheltered work shops provides the additional benefit of allowing many formerly institutionalized individuals to become part of the community and to earn wages for meaningful work. In each case, the facility's clients are matched to the job or jobs for which they are best suited, based on their abilities. Goggles, gloves and other protective equipment is provided and worn by clients while on the job and the recycling floorplan

and recycling equipment is carefully designed to maximize safety. ▲ A discussion of all of the work activity centers and sheltered workshops receiving a Landfill Alternatives Grant is not possible in this article. Instead, we highlight three facilities that are in various stages of the Landfill Alternatives Grant Program.

One benefit of the program is the employment of mentally and physically challenged persons to help decrease the exploitation of natural resources.

Article by Tom Anderson
Photos by Ken Formanek

BOONE COUNTY WORK ACTIVITY CENTER

The Boone County Work Activity Center (BCWAC) located in Boone was awarded a \$213,000 landfill alternatives grant in June 1991. The project expanded the limited recycling program in place at that time through the joint efforts of the Boone County Work Activity Center, Walters Sanitary Service, Inc., and the Boone County landfill administrator. Expansion of the existing program generates a higher recyclable recovery rate thereby further reducing the amount of recyclable solid waste going into the Boone County Landfill. The grant project includes expansion of existing processing facilities, implementation of a voluntary curbside collection program in Boone, increasing the number of drop-off sites in Boone County communities that do not have curbside collection, and implementing a public education and awareness program.

In speaking with Charlotte Nelson, director of the Boone County Work Activity Center, it became evident that the expanded program is working. At the time the grant application was submitted, the center was processing approximately 600 tons of recyclables annually. Through the processing of material at the center, approximately 1,400 tons of recyclable materials were diverted from the Boone County landfill in 1992 -- an increase of 133 percent over 1991. Currently all solid waste haulers in the county bring their recyclables to the center. BCWAC is processing paper, glass, plastic and tin for recycling. Nelson indicated revenues generated through marketing of PET plastics and newspaper enable the BCWAC to break even or show a modest overall profit.

Recycling materials and showing a profit at the Boone County Work Activity Center are not the sole measures of success. With the help of the grant program, the center created 17 new jobs and enabled six individuals previously living in the institutional setting of Woodward State Hospital-School to move to the community and perform successfully at their new jobs. These are true measures of success. Nelson indicated that making the transition from the institution to the



▲ **Boone County Work Activity Center director, Charlotte Nelson, stands next to bales of shredded newspapers. One of the center's successful recycling efforts involves the shredding of newspapers for animal bedding. The demand for shredded newspapers currently far exceeds the supply.**

▶ **The cardboard recycling baler, purchased with grant money.**



community was not only a major step forward for the individual but also benefits the entire county. According to Nelson, Boone County taxpayers are saving approximately \$24,000 annually per individual who has returned to the community. In all, 65 clients are employed by the Boone County Work Activity Center for processing recyclables. Clients of BCWAC earn wages for their work and are achieving a great sense of pride in what they are doing.

One of BCWAC's successful recycling efforts involves newspapers. The demand for shredded newspaper used as animal bedding far exceeds the current supply. Nelson indicates the center could process and market every piece of newspaper in Boone County for livestock bedding and could sell as many as 50,000 bales if the center were provided with enough raw material, in this case used newspapers.

"Persons who have tried the cen-



◀ The can crushing facility at the Boone County Work Activity Center.

▼ Shredded plastic containers.



BUENA VISTA WORK ACTIVITY CENTER

Buena Vista Work Activity Center, located in Storm Lake, was awarded a \$136,150 during the December 1991 funding round. The grant will assist the center in increasing efficiency and productivity in the collection, handling, processing and marketing of aluminum cans, office and computer paper, newspaper and glass. The grant will also allow the center to initiate cardboard collection and recycling services, construct a building addition, and implement broad recycling education programs.

The Buena Vista Work Activity Center originated in the basement of a

local church in 1973. Moving to a new location, the center initiated its first local recycling effort in 1976 when a program for the collection and sale of newspaper for reuse was developed and implemented. The program has grown from recycling 30 tons of used newspaper the first year to its current volume of nearly 300 tons. Officials of the Work Activity Center anticipate the amount of collected newspaper to increase by 30 to 40 percent as a result of the Landfill Alternatives Grant and increased local participation.

In the early 1980s the center began a redemption center for recycling returnable beverage bottles and aluminum cans. The center currently works with many of the area's beverage distributors and processes approximately eight million cans



ter's shredded newspaper bedding are very pleased with the quality and results. Orders of as much as 1,000 bales at a time have been received from one customer," says Nelson. "Many landowners feel the used livestock bedding made from shredded newspaper breaks down and blends well with the soil when applied to the land -- a natural soil conditioner."

Other recyclable materials processed at the Boone County Work Activity Center are sold to various firms in Iowa.

and bottles annually.

As you can see, recyclable materials collection, processing and marketing is not new to the Buena Vista Work Activity Center. The expanded recycling program should serve the local area well. Center officials indicate they are very excited by the voluntary participation of residents and by the great support of the business community. The center has initiated a weekly route to pick up recyclables from local businesses and would like to provide limited source collection services for area schools, hospitals and the community college. Center officials hope to expand the recycling program into portions of the adjacent counties of Ida, Pocahontas, Calhoun and Cherokee.

Center officials say that with recognition of receiving the grant and the associated exposure, the amount of all materials collected has significantly increased. "Overwhelmed" would be an appropriate description of how the center staff feels about the level of participation through this voluntary program. Processing of recyclable materials is taking place as quickly as the materials are collected but staying ahead of the game is sometimes difficult. The staff is definitely looking forward to the new equipment being in place and the facility improvements being completed.

Just as the Buena Vista Work Activity Center itself has grown so have the clients of the center. When the center started, it served seven clients whose typical daily activities included crafts and games. Currently the center employs 50 clients, all of whom are involved in the recycling program and are earning wages for their work. Lloyd indicated the grant project will allow the addition of five more clients. Many of their clients are very excited about the project and have expressed a desire to work in the new building. As the philosophy of human rights for people with disabilities gained momentum, activity centers became a viable alternative to institutions. Funding agencies also realized a cost savings due to activity centers being partially self-funded through work contracts and donations.

Since the program was implemented, there has been a 17 percent decrease in the amount of materials going to the landfill.

Through the work training services and personal and social adjustment services available at the activity center, client employees are responsible for processing the recyclable materials, performing routine maintenance on equipment and assisting the route driver on materials collection and delivery to the center.

CEDAR COUNTY WORK SHOP, INC.

Cedar County Work Shop, Inc., of Tipton was awarded a \$130,000 landfill alternatives grant in the spring of 1990 and is in the final stages of the grant program. Their project involves a two-phased recycling program for clear, brown and green glass, plastics, metal cans, office paper and newspaper. In the first phase of the project 1,500 plastic containers were distributed to residents of Tipton for voluntary curbside separation of recyclables. A city crew collects and delivers recyclable materials to the facility. Paper is separated at the curb with plastics, glass and tin commingled. Clients of

the facility then sort and process the recyclable materials which in turn are marketed as appropriate.

The second phase of the project involved setting up similar curbside and drop box collection of recyclables in other Cedar County municipalities. Collection of recyclable materials has also expanded from Cedar County into portions of Jones and Clinton counties where these materials are delivered to the facility for sorting, processing and marketing.

The Cedar County Work Shop, Inc., employs approximately 50 people, 35 of whom are developmentally disabled clients. To date, twelve people are employed in the recycling program. Gaining independence, pride and self-confidence are benefits of this type of recycling program not often understood by those who are not directly involved. Kathy Lewis, director of the Cedar County Work Shop, Inc., takes great pride in the project and feels the level of success has been tremendous in terms of both the environment and the effect it has on clients of the workshop. Lewis says the clients sort recyclable materials at the rate of more than one ton per hour.

Cedar County Work Shop, Inc., receives, sorts and processes recyclable materials from nine communities in Cedar, Jones and Clinton counties. Nearly 300,000 pounds of materials have been sorted and processed from the curbside collection program over the past 12 months. Participation has steadily increased as have the amounts of recyclable materials handled.

Mark Nahra, manager of the Cedar County Solid Waste Transfer Station indicated he has seen a significant decrease in the amount of recyclables in the waste stream at the transfer station since the program was implemented. According to Cedar County Work Shop, Inc., staff, there has been a 17 percent decrease in the amount of materials going to the landfill between 1990 and 1991. The amount of materials processed at the workshop has increased 300 percent due, in part, to the Landfill Alternatives Grant Program and the increased recog-

Work Activity Centers and Sheltered Workshops Grant Recipients

Comprehensive Systems, Inc.
Charles City, Floyd County
\$181,778
Teresa Klobassa
(515) 228-4842

Genesis Development
Jefferson, Greene County
\$168,840
Tim Moerman
(515) 386-3111

Buena Vista Work Activity Center
Storm Lake, Buena Vista County
\$136,150
Cindy Richardson
(712) 732-5038

Boone County Work Activity
Center
Boone, Boone County
\$213,000
Charlotte Nelson
(515) 432-6911

Horizons Unlimited
Emmetsburg, Palo Alta County
\$205,420
Ron Ludwig
(712) 852-2211

Spectrum Industries
Decorah, Winneshiek County
\$68,380
Chris Frantsvog
(319) 382-8401

Cedar County Workshop, Inc.
Tipton, Cedar County
\$130,000
Kathy Lewis
(319) 886-6046

WACO, Inc.
Sioux City, Woodbury County
\$24,500
Miles Patton
(712) 258-3576

Sac Area Recycling Center/
Howard Activity Center
Sac City, Sac County
\$150,000
John Winkleman
(712) 662-7844

DAC, Inc.
Maquoketa, Jackson County
\$73,000
Benjamin Wright
(319) 652-5252

Skyline Center
Clinton, Clinton County
\$118,170
Jack Robinson
319-243-4065

Humboldt Workshop, Inc.
City of Humboldt, Humboldt
County
\$38,182
Mary Mulligan
(515) 332-2841

Grant applications are available by writing or calling the Iowa Department of Natural Resources, Waste Management Assistance Division, Wallace State Office Building, Des Moines, Iowa 50319-0034, (800) DNR-1025.

of this program was to assist in determining and implementing various solutions to the problem of solid waste disposal. The grant program has been and continues to be very successful to this end. However, success of the Landfill Alternatives Grant Program does not stop with the implementation of environmental projects. For this program, success may also be measured in terms of meaningful employment for physically and mentally challenged citizens of Iowa.

Independence, earning wages, working at something enjoyable and important are things that all of us would like to attain in our lives. For the majority of Iowans it is within grasp. The Landfill Alternatives Grant Program has helped to provide hundreds of disabled individuals the opportunity to achieve a level of supervised independence, earn wages through recycling and gain a sense of pride in what they are doing at several work activity centers and sheltered workshops. Clients of many of these facilities are living in group homes or supervised apartments and realize they are contributing members of their communities. Through the use of grant funds, these facilities have been able to provide employment for additional numbers of hard-to-place individuals who are now members of their community in every sense of the word.

Directors and staff at Iowa's work activity centers and sheltered workshops are dedicated to providing a higher quality of life for their clients and seeking out new ways to provide greater service to their communities. Reward them for their recycling efforts by making use of the services these facilities provide.

If you would like additional information please contact the Department of Natural Resources, Waste Management Division or any of the facilities listed at left. Grantees involved with the work activity centers and sheltered workshops are rightfully proud of the accomplishments of their clients, proud of their recycling programs and more than willing to share.

dition of what the Cedar County Work Shop Inc., is accomplishing.

"Since we are a workshop for the handicapped, our main focus is to employ disabled persons and recycling does this for us," says Lewis. "Recycling also slows the landfill from becoming full and helps to save the environment. The county

saves money in landfill costs plus workshop costs."

When the Groundwater Protection Act of 1987 became effective, several environmental programs were initiated. The Landfill Alternatives Grant Program was one of those programs. The basic intent

Tom Anderson is an environmental specialist with the department's Waste Management Assistance Division in Des Moines.

WARDEN'S DIARY

by Chuck Humeston

Six Steps Guaranteed to Improve Your Sport

In my last column I gave you six criticisms I hear from the public about hunters. A key point for you to remember is do **not** think I hear these comments just from nonhunters. I also hear them from other hunters which brings up the first, and most important, step in improving your sport.

Get involved.

Yes, I know no one wants "to tell" on someone who is breaking the law or acting unethically. Keep in mind the person who takes game illegally is stealing from you. As the bumper sticker says, "Poaching is a crime." The careless person is taking you down with them in the eyes of the public. The public's reasoning may be, "This person is hunting and acts this way; therefore all hunters act this way." That same reasoning can work to your advantage if you conduct yourself responsibly.

Be active.

Sadly, many hunters have a way of sitting back and saying, "Somebody will fix this for me." Perhaps this attitude has been handed down along with the individualism of the sport. You have to make your voice known. Taking the time to pick up your phone and tell an officer how you feel is one thing, but making the effort to take pen and paper and writing your views can mean more.

Remember the old saying, "If you aren't part of the solution, then you are part of the problem." It's easy to complain about an issue, but you should also be prepared to suggest a solution or an alternative. It is easy to make suggestions, but how will your



suggestion affect the resource and others? There are also some fine existing organizations such as Ducks Unlimited and Pheasants Forever, the Izaak Walton League, or one of the many other outdoor, conservation or wildlife groups. Join them. Support them. Be concerned about threats to the resource.

Be courteous.

A thank you to the landowner, especially in form of written, as well as spoken, words goes a long way. Do you use that person's land then forget that person the rest of the year? If you are an urban dweller, developing a relationship with a rural landowner enables you to see the landowner's concerns, and also enables the landowner to see your concern for the sport. Maintain that contact.

Be safe.

Taking a hunter education course is not only the law, it is a good idea. It can be a good parent/child activity. Do you wear blaze orange whenever possible to allow you to be seen? Do you wear it even when it is not required? With that gun in your hand **THINK, THINK, THINK** at all times. If in doubt, don't take the shot. Be prepared to be vocal with others who don't conduct themselves safely. Refuse to hunt with them until they clean up their act.

Be skillful.

Don't wait until opening morning to get the gun out of the case. Be sure

it is in good operating order. Practice, practice and then practice some more. Hone your skills at a shooting range or other safe place. I have seen proven over and over the truth, "Good shooters are made, not born."

Be respectful.

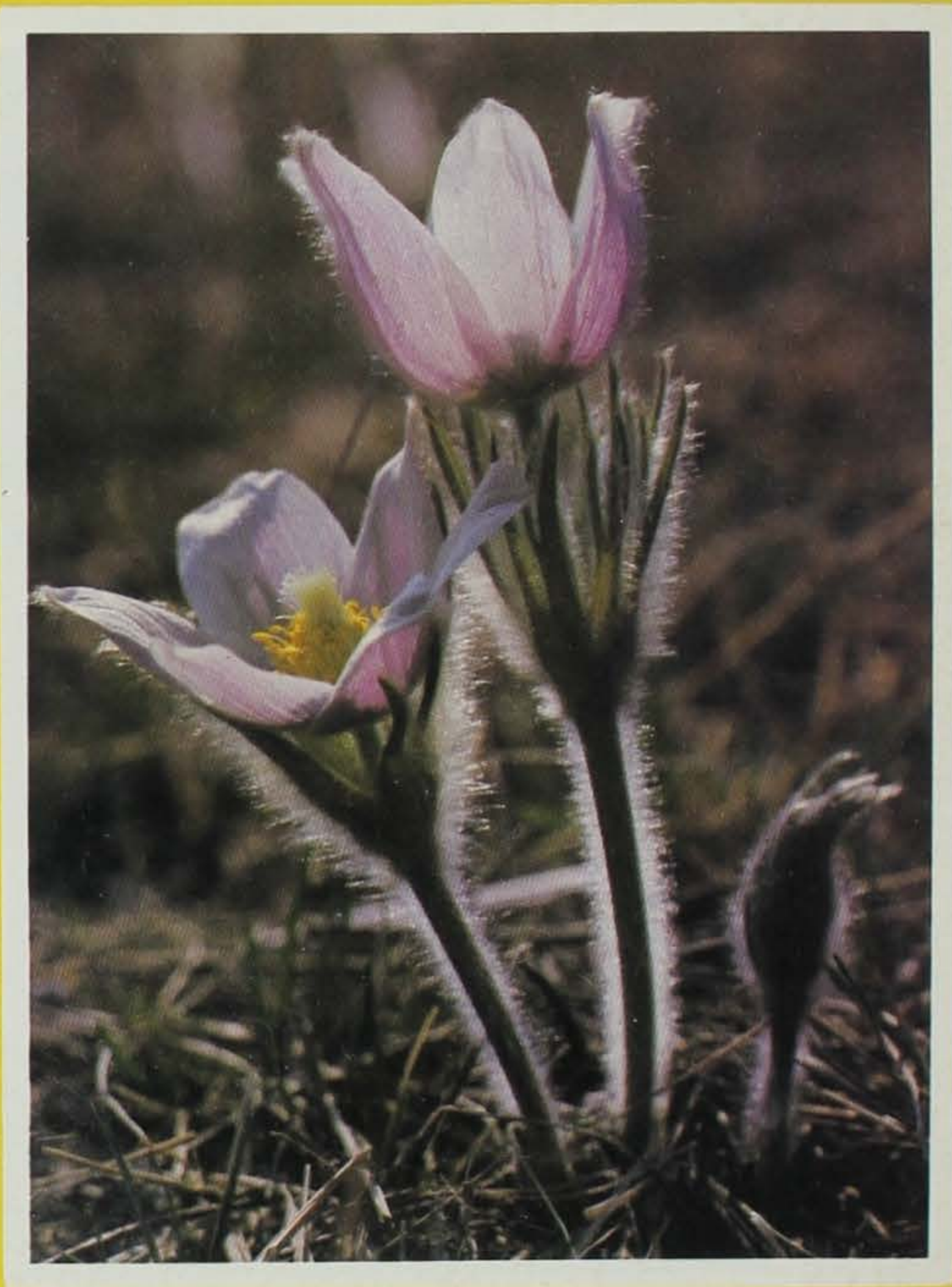
This is the common thread throughout all your actions. Respect the landowner. Respect the other hunter. Respect the resource. Respect yourself and the gift the hunting experience should be. Take the time to seriously consider your attitude.

I still recall the duck season opening day I found two older gentlemen standing at the access to a marsh. I walked up to them and asked if they planned to hunt. One said he couldn't anymore due to his health. But he added, "You know this sport and this place have given me more than 40 years of pleasure and memories." He looked at me and said, "I just want to stand here and see the sun come up. Or, maybe I just want to see the ducks flying and the youngsters enjoying what I've enjoyed."

He smiled at me and turned his face back into the wind coming across the marsh and nodded his head at all he was seeing. "This is a wonderful place," he said, "a really wonderful place."

Don't wait 40 years to develop that attitude. Don't wait to be concerned.





STATE LIBRARY OF IOWA
East 12th & Grand
DES MOINES, IOWA 50319