# Iowa CONSERVATIONIST

February 1991

Department of Natural Resources

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## FEATURES



## DEPARTMENTS



## COVERS

Front -- White-fronted goose by Lowell Washburn.
Back -- Great horned owl by Roger A. Hill.

*"Our profession began with the job of producing something to shoot. However important this may seem to us, it is not very important to the emancipated moderns who no longer feel the soil between their toes."*

Aldo Leopold, 1940, *Journal of Wildlife Management.*

# A Decade Of Growth

Article by Laura Spess Jackson
Photos by Ron Johnson

Forty years after Leopold's statement a new era did indeed begin to dawn within fish and game departments. Concern over non-hunted species and non-consumptive recreation began to grow within federal and state agencies and among the public. The word *nongame* was coined to represent non-hunted species and associated non-consumptive activities such as feeding birds and bird watching. In 1977, Colorado initiated an income tax checkoff to fund a Nongame Wildlife Program. In 1980, the United States Congress enacted the Fish and Wildlife Conservation Act (Nongame Act) to financially assist nongame wildlife. Between 1980 and 1983, 29 states began checkoff programs similar to Colorado's to fund nongame programs, and numerous state agencies changed their names from "fish and game" to "fish and wildlife" in recognition of *all* wildlife species.

In 1981, Iowa began a "Living Resources Program" (a.k.a.Nongame Program). The program began with one biologist and one technician spending only part of their time on nongame projects. The program was originally funded by hunting and fishing license money. Later in 1981, a bill was passed by the Iowa Legislature to begin a nongame income tax checkoff in 1982. In 1983, the money donated to the checkoff during 1982, was transferred to the Iowa Department of Natural Resources to fund the Nongame Program. Consequently, the name was officially changed, and personnel began nongame work full time. Meanwhile, it was voted to use 100 percent of the donations for nongame projects, and the Nongame Program has since been funded strictly from the checkoff and direct donations.

The most formidable curse of the program has been funding. Although national surveys have documented that while 90 percent of Iowa's population enjoys nongame-type recreation, less than three percent of the people make a contribution to the program. The 1980 federal Nongame Act has never been funded to assist the states, and contributions to the checkoff have varied widely (Figure 1). The problem stems from a common misconception. Ask most people if they think their State income tax money helps pay for wildlife programs, and the answer is usually yes. Unfortunately the true answer is *no.* Hunting and fishing licenses, habitat stamps and excise taxes on sporting equipment pays for the wildlife research, management and law enforcement activities of the State's fish and wildlife division. Only contributions to the checkoff or directly to the Nongame Program pays for nongame activities. No State moneies are used to help nongame, and only a tiny portion of the State's income is used to help State parks, preserves, public land acquisition and endangered species.

Interestingly, Iowans spend about $127 million on nongame-type activities each year, according to a 1985 United States Fish and Wildlife Service survey. Additionally, a 1985 Iowa tourism survey found that 54 percent of the people felt nongame wildlife was very

Ken Formanek

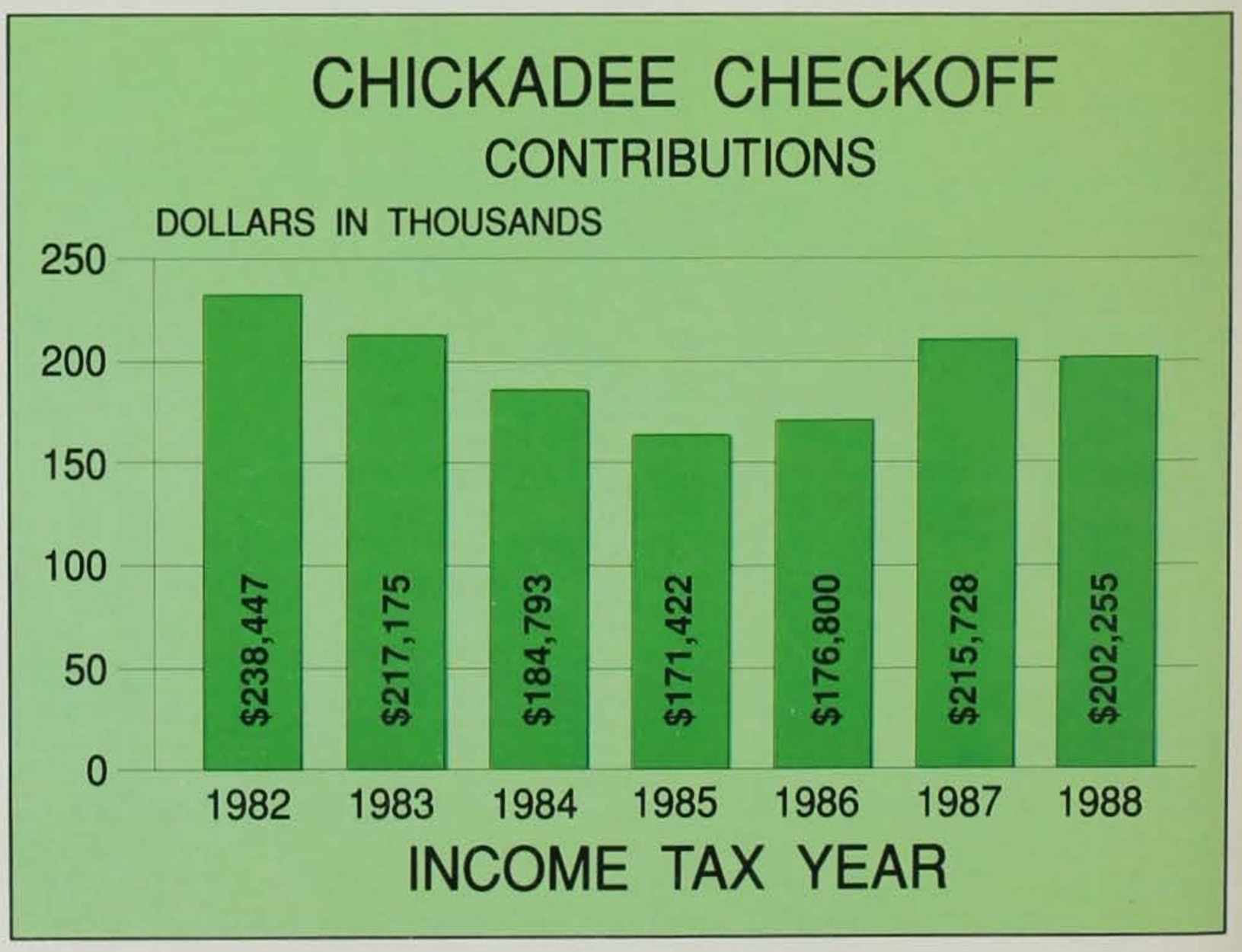
important to them and the state should spend more money to protect and manage these resources. This further emphasizes that most people do not realize the State does not pay any money for our nongame resources and the funding comes directly from individual donations only.

Despite funding problems, the Nongame Program has the philosophical support of most Iowans, has attracted a legion of dedicated supporters, and has grown into one of the most diverse and highly visible wildlife programs in Iowa. The Nongame Program is responsible for more than 80 percent of Iowa's wildlife species. This ranges from non-hunted frogs and turtles to small mammals, bats, river otters, songbirds and eagles. The program has worked cooperatively with the DNR's preserves and ecological services bureau to assist and reintroduce threatened or endangered species, and in the past, the Nongame Program has purchased land for endangered and nongame species and recreation. The program reaches 15,000 to 20,000 people annually through wildlife watches and talks and an untold number via publications and media exposure. Travel anywhere in the state and you're apt to see tell-tale signs of the Nongame Program -- kestrel boxes on highway signs, bluebird boxes along the road, hawk watchers at overlooks, bird watchers at home and wildlife posters in schools. No, the Nongame Program does not maintain every box, but dedicated individuals, wildlife biologists, county conservation boards, schools and conservation groups have grasped nongame ideas and have promoted them in their area. Their impact has been noticeable and greatly appreciated

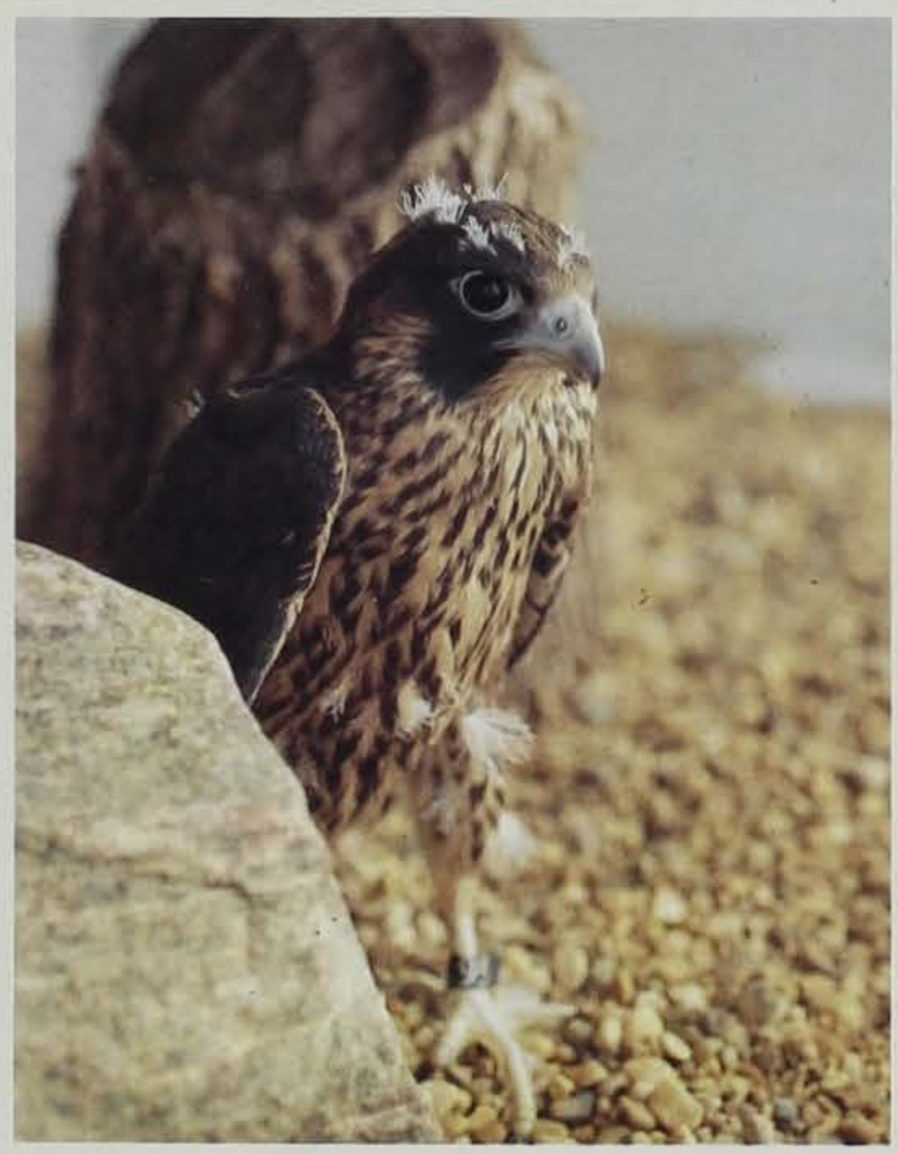
The main goals of the Nongame Program are:

- Maintain nongame diversity in Iowa.
- Encourage public awareness, appreciation and understanding of nongame wildlife and their associated habitats.
- Maintain funding for the Nongame Program.

The program began to address these goals in 1981 and 1982 through a variety of public talks and publications. By 1983, when project money was available and staff was full time, the Nongame Program began working with records of birds breeding in the state, wildlife rehabilitation and reintroduction



of the state-endangered barn owl. In 1984 an urban program and another biologist was added to address urban wildlife and urban wildlife education. Through the program plans for a frog and toad survey, a winter bird feeder survey and a systematic breeding bird survey were coordinated, several hundred bluebird boxes were produced, more barn owls were released and the first pelican watch was held.



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**To date, possibly the most widely recognized Nongame Program project has been the release of peregrine falcons. In 1989 and 1990, the young birds were released among the urban "cliffs" of Cedar Rapids.**

In 1985, the program reached its current staff level of two biologists and two technicians. Through the program, 16 state-endangered river otters were released at Red Rock Reservoir, radio-telemetry research was conducted on released barn owls, the kestrel nest box program was expanded, a hawk watch was initiated, the first Bald Eagle Appreciation Days was held, a quarterly newsletter was started, plans for wildlife areas in several cities were developed and a booklet on attracting backyard wildlife was published. In addition, the breeding bird, bird feeder and public education projects continued.

In recent years the momentum has increased. The first nongame poster was created in 1986, a butterfly garden was established, long-term research began on the effects of landscaping in city parks, plus the monitoring of data from bluebird boxes was begun, and educational workshops were initiated. In 1987, workshop information was condensed into slide programs for wider distribution, two bald eagle platforms were erected, a small grants program for nongame research was initiated and an urban wildlife session was hosted at the Midwest Fish and Wildlife Conference. New projects in 1988 included certifying the Governor's mansion as a backyard wildlife habitat area, publication of a bat booklet, production of more slide programs, computerizing all of the Nongame Program's data and financing research on Cooper's hawks, loggerhead shrikes, black terns, Forster's terns, piping plovers, least terns and kestrels via the small grant program.

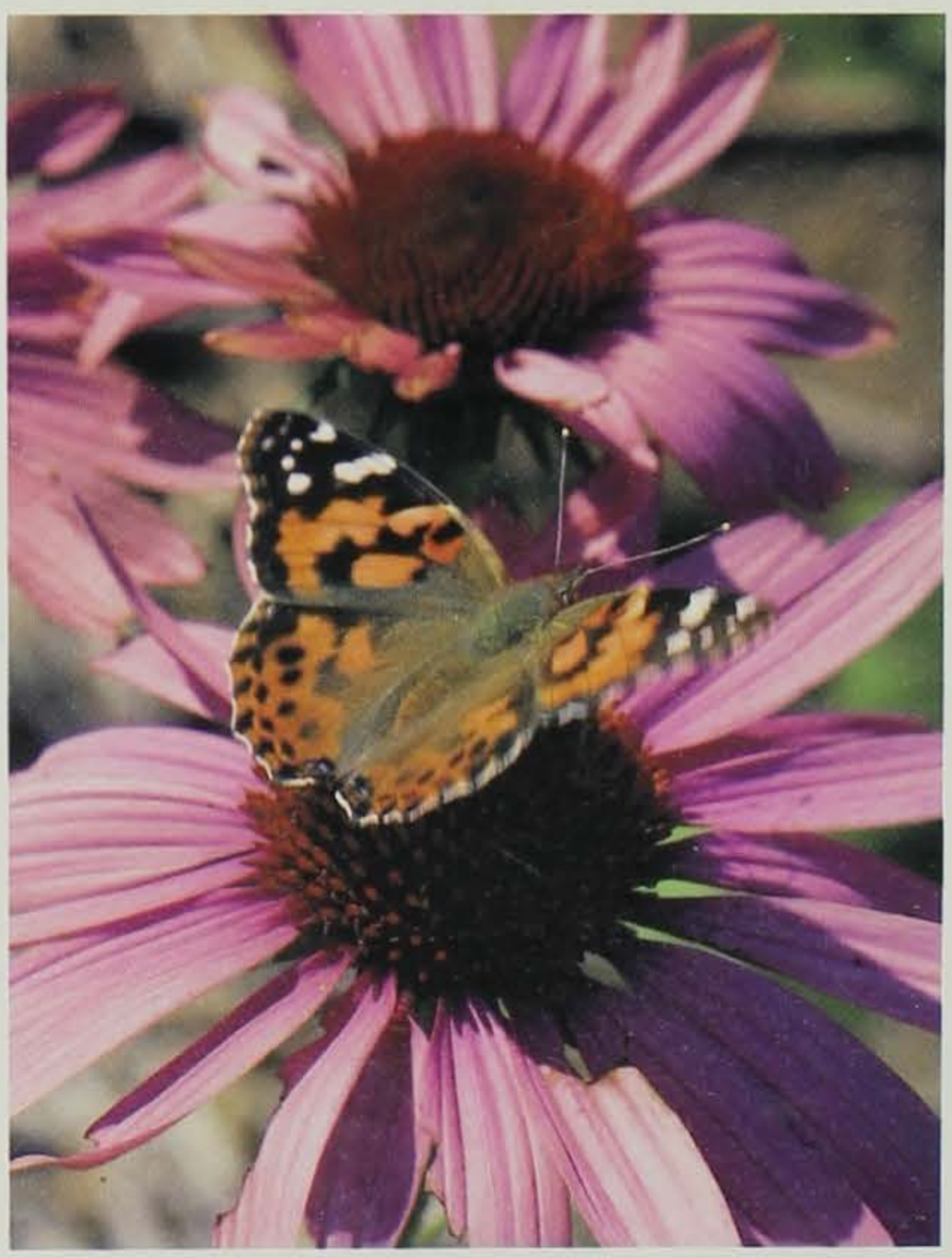
The most talked about program in 1989 was the peregrine falcon project in Cedar Rapids. The intention of the project was to release federally endangered peregrines in Iowa to re-establish the falcon as a nesting species by the turn of the century. This one project joined a city, county, a variety of businesses, individuals and conservation groups with a common goal. The result was a highly successful release, being able to release more young falcons than

originally planned because of fund raising, and incredible public awareness in the community and throughout the state. During 1989, program activities included conducting a market survey at eagle days, publishing information on peregrines, turtles and lizards, certifying the Boone DNR office as a national urban wildlife sanctuary, assisting at the Midwest Raptor Symposium, initiating a computerized urban wildlife habitat inventory, and financing research on red-shouldered hawks, nighthawks, Cooper's hawks, kestrels, re-established wetlands, and rare butterflies.

An eagle nest survey and heron rookery survey were added to other annual surveys in 1990. Field work was completed on the breeding bird atlas. Thirty-eight more river otters were released to complete phase one of the reintroduction project, with 222 otters released since 1985. Also in 1990, Bald Eagle Days was covered on national television and Iowa assisted with a tri-state workshop on habitat fragmentation and a national symposium on urban wildlife. A peregrine education kit was published, year two of the falcon releases was completed and plans for releasing peregrines in Des Moines began.

Now, a decade after its inception, the Nongame Program has much to celebrate, yet much left to do. Very little is known about entire classes of animals such as reptiles, amphibians and small mammals. Because many of these species have very restricted mobility, they may prove to be good indicators of the local environmental quality of the air, water, soil, and habitat. A missing salamander could mean oxygen-depleted water or high pesticide concentrations. Likewise, a missing mouse could represent poor ground cover and future soil fertility problems because of inadequate leaf litter, lack of humus and soil compaction. In 1991, plans are to re-institute the frog and toad survey as a first step in learning more about our amphibians. The program will also start summarizing presence or absence information on birds, mammals, reptiles, amphibians, butterflies and plant communities within individual counties.

Through the Nongame Program, research will have to be done about the specific food-cover-water-and-space needs of species ranging from warblers to turtles, if Iowa is to maintain its present number of species. The Nongame Program also hopes to expand public appreciation of wildlife through a "watchable wildlife" program so people



▶ **A butterfly garden was established on the State Fairgrounds in 1986 through the Iowa Nongame Program.**

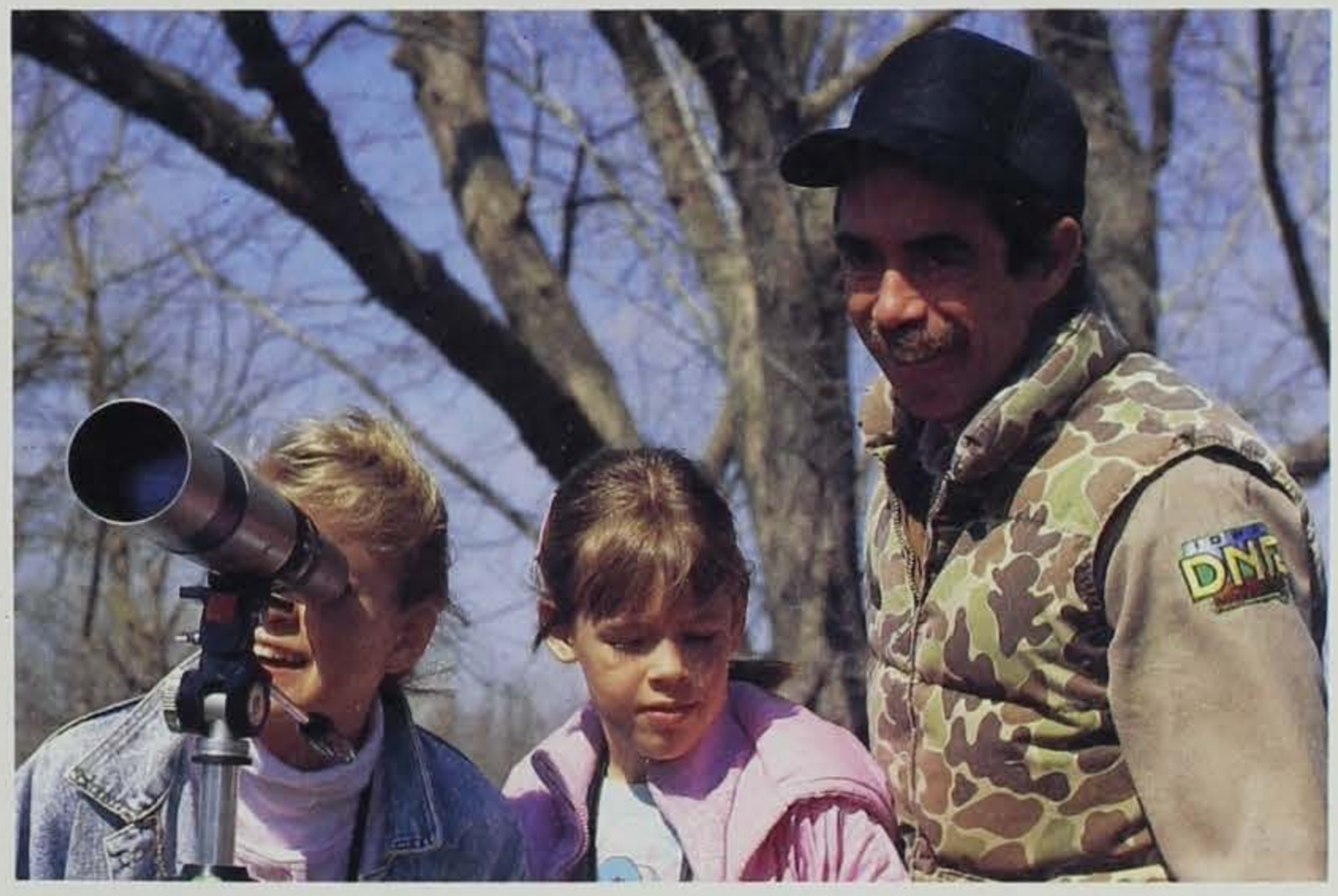
know where to go and what to see throughout the state.

The only problem with detailed research and program expansion is the cost. Illinois, Indiana, Ohio, Michigan, Minnesota and Wisconsin have nongame budgets more than twice that of Iowa's. Besides personal income tax checkoffs, these states are obtaining money for nongame programs through general state appropriations, real estate transfer taxes, sale of items and corporate checkoffs. These states have been aggressive in seeking money and it has paid off in Nongame Programs large enough to have regional biologists or specialists concentrating on birds, mammals or reptiles.

Realistically, Iowa's Nongame Program needs similar funding at a half million or $1 million level to truly identify, research, manage and conserve our nongame species and to help Iowans appreciate the diversity of life in our state. When financial support becomes commensurate with philosophical support and general popularity, the Nongame Program will flourish uninhibited by financial shackles. This will result in an astounding boon in our knowledge of Iowa's nongame species and our ability to enhance and maintain those species in the future. It will also be an educational bonus to every child who has ever caught a butterfly, watched polliwogs turn into frogs or wished they could fly south with the birds. For adults, it will mean a greater understanding of Iowa's native wildlife treasures and the security of knowing that we can measure the quality of our environment and recognize the warning signs eagles, peregrines and other wildlife can provide. For the state, it will mean increased revenue from tourism to watch wildlife and perhaps more public lands for Iowans to enjoy. It will also benefit state pride -- yes, there are beautiful places and a fascinating diversity of wildlife to see in Iowa.

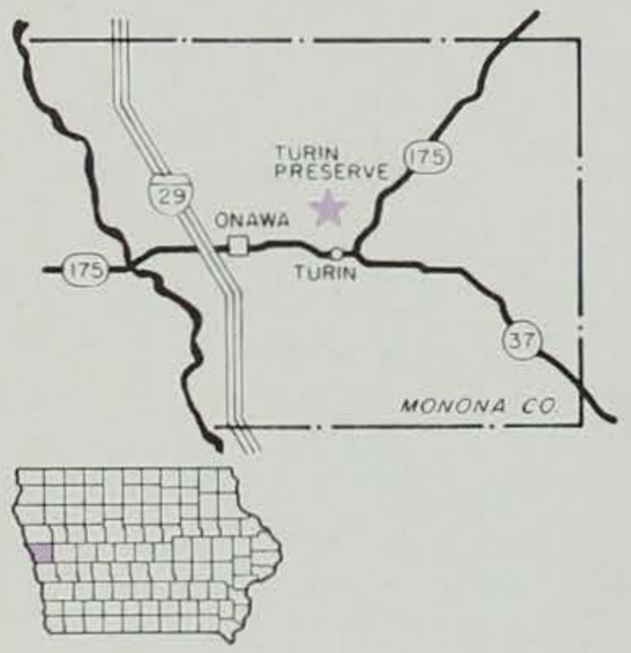
The past decade has been a wonderful era of growth for the Nongame Program. In many ways we are like a young falcon -- impatient to fly with skill and grace, but currently bound to the ground by the lack of full-grown flight feathers and temporary restraining bars across our hack box. During the next decade, our flight feathers will be ready, the real and imaginary bars will be removed, and we'll soar into an even higher understanding of our state's nongame resources. Meanwhile, please remember to make a contribution to the Chickadee Checkoff this year. Our thanks to the many donors, participants, volunteers and professionals who have supported the Nongame Program during the past decade. You have been the basis for our growth and you're our hope for the future.

*Laura Spess Jackson is a nongame biologist for the department in Boone.*

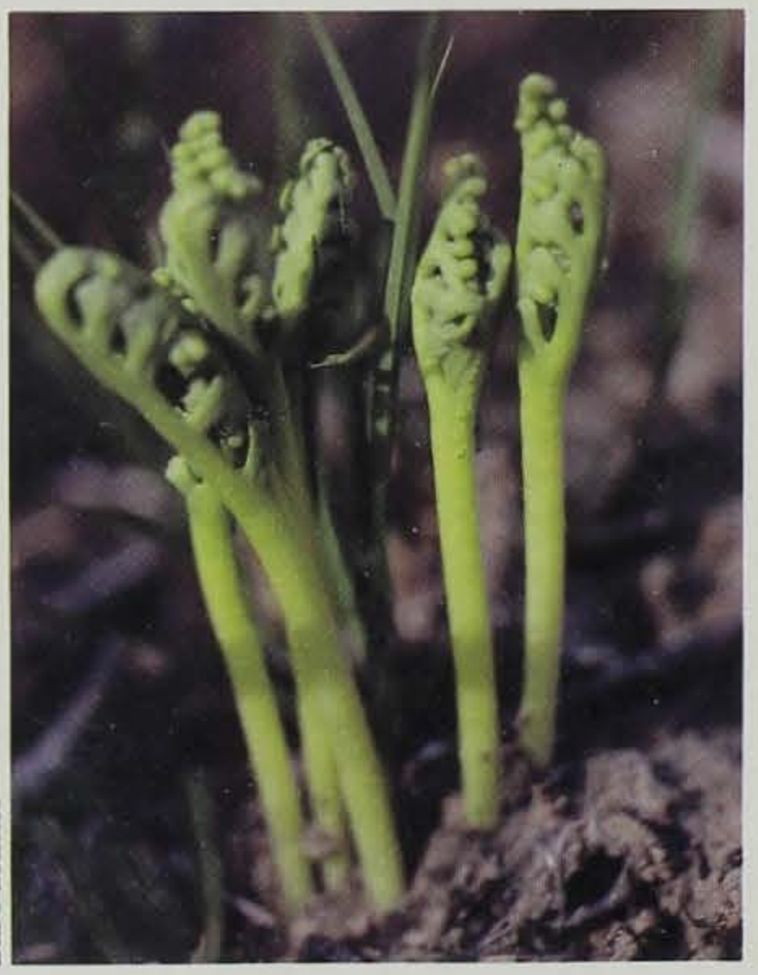



▲ **In 1985 the first Bald Eagle Days was held, growing in popularity each year. Last year the event was covered by national television.**

Dean Roosa




▶ **Prairie moonwort. This diminuitive fern was discovered as a plant new to science in Iowa's loess hills in 1982.**



Bill Pusateri

Bill Pusateri

**Large-flowered penstemon.**

## Spotlight on a Preserve

# Turin Loess Hills State Preserve

The loess hills of Iowa extend in a narrow band along the length of the Missouri River valley in western Iowa. These hills were formed during a period of glacial retreat, from sediment released from melting glaciers farther north. During the winter seasons between 30,000 and 14,000 years ago, the prevailing westerly winds carried this silt from the Missouri River floodplain across the state, dropping the coarsest particles in a thick deposit parallel to the river. Deposits in this narrow band may reach depths of 150 to 200 feet. It is this extreme vertical relief that sets these loess deposits apart from other such deposits in the world.

An excellent example of loess topography has been preserved in a 220-acre area two miles north of Turin in Monona County. This area, called the Turin Loess Hills State Preserve, was designated as a state preserve in December 1978. It provides habitat for several plants normally found on the Great Plains. Included are soapweed, skeleton weed, cutleaf ironplant, locoweed, nine-anther dalea and the recently-described prairie moonwort fern.

The principal vegetation-type in the loess hills has historically been tallgrass prairie. This is illustrated atthe Turin Preserve by the presence on the ridges of big bluestem, little bluestem, prairie turnip, large-flowered penstemon, redroot and purple coneflower.

These west- and south-facing slopes can be beastly hot in the summer. The combination of this xeric environment and periodic prairie fires kept the hills treeless for centuries. But the lack of naturally occuring fires in recent decades has permitted the invasion and establishment of woody species such as smooth sumac, gray dogwood and red cedar. These represent a threat to the survival of the prairie and need active management. The Department of Natural Resources regularly uses fire to control the woody invasion and is beginning to remove the cedar trees to promote re-establishment of the prairie species and prevent further loss of the prairie community.

During cooler times, especially at sunset, these ridgetops, always breezy, provide a peaceful and reflective experience, as well as a spectacular view of the flat Missouri River floodplain. It is well worth the climb up some of Iowa's most rugged terrain.

This preserve offers a variety of passive and active recreational pursuits, and hunting is permitted in season.

*Dean Roosa is state ecologist for the department in Des Moines.*

by Dean Roosa

Dean Roosa

Sylvan Runkel

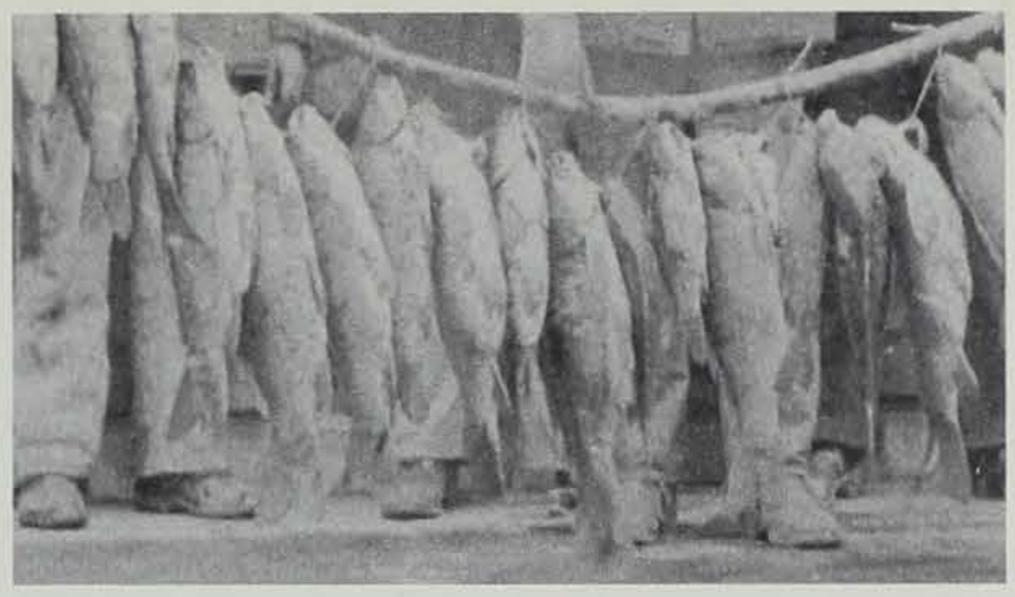
▲

**Soapweed. In Iowa, this Great Plains plant is restricted to the loess hills.**

**Lambert's crazy weed.**


▲
**Not so long ago the lowly carp was a prize catch to the lucky angler. It was a respected, pampered and highly valued fish, and, for a brief period in our fishing history, carp was king.**


Manchester Collection



# When Carp Was King

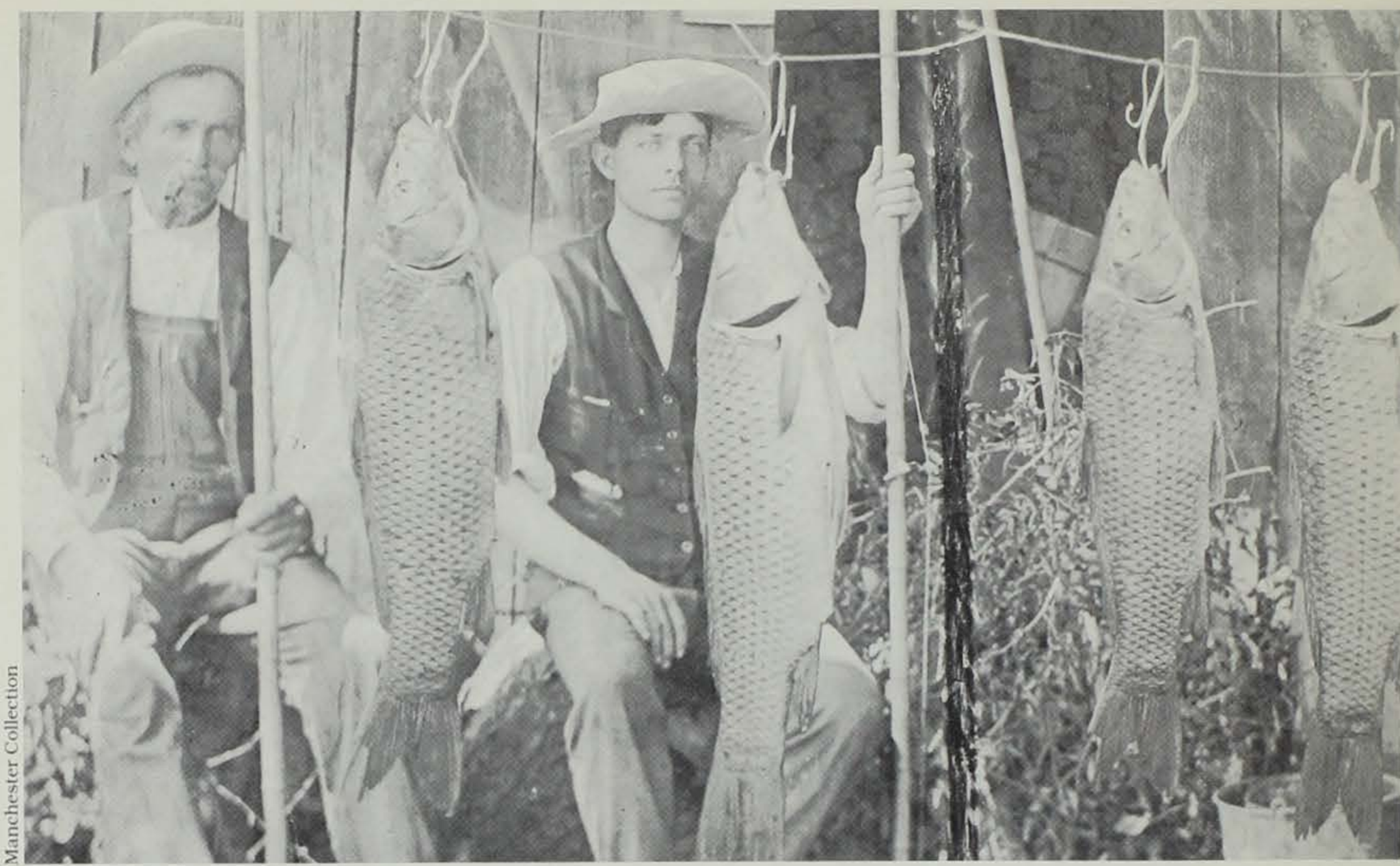
by Richard Martens

*"Received of the Iowa Fish Commission, 20 German leather carp. I agree to care for the above carp, and to deposit in the public waters of the State of Iowa, under the direction of the State Fish Commissioner, as great a number as above receipted for, and also one third of the increase of said carp. The deposit in the public waters to begin as soon after breeding as the fish arrive at the proper age and size to deposit and to continue for five years thereafter."*

*-- Samuel Lewis*
*Greeley, Iowa*
*April 30, 1883*

Have you ever caught a carp? That may seem like a silly question to the modern Iowa angler, and it may even cause the "purist" to unhappily shake his head, but not so long ago the lowly carp was a prize catch to the lucky angler. It was a respected, pampered and highly valued fish, and, for a brief period in our fishing history, carp was king.

The story of carp begins somewhere in eastern Europe or western Asia, but because of the widespread stockings made during the Roman empire, an exact location is impossible to determine. Artistotle first spoke of the carp as "a



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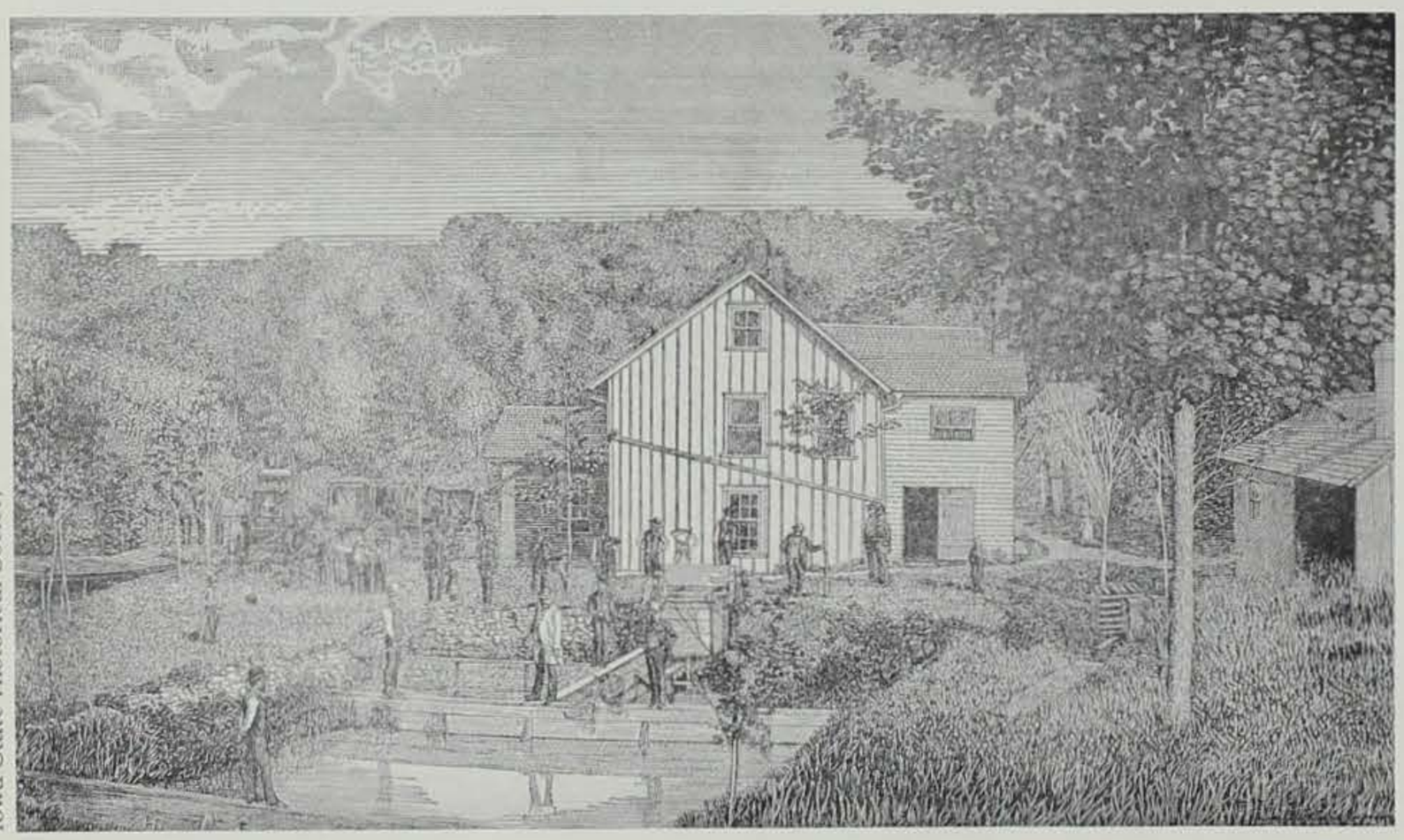


Iowa State Historical Society

▲
**Two proud turn-of-the-century carp anglers.**

◀
**The first state fish hatchery in Iowa. The hatchery was in operation from 1874-1886 near Anamosa.**

river fish without a tongue, but having a fleshy roof to its mouth; as producing eggs five or six times a year, especially under the influence of the stars; as having eggs about the size of millet seed; and as being occasionally struck by the dog-star when swimming near the surface." During the Middle Ages, monasteries bred and cultured the fish, spreading it across Europe. Its importance is evident when, in 1532, King Henry VIII paid rewards to people bringing "carpes to the King." Izaak Walton extolled its noble virtues just over 100 years later, writing, "The carp is the queen of rivers, a stately, good and very subtle fish." European immigration to America assured this popular fish would soon follow, and in 1872 the most successful immigrant to swim in our waters arrived from Europe.

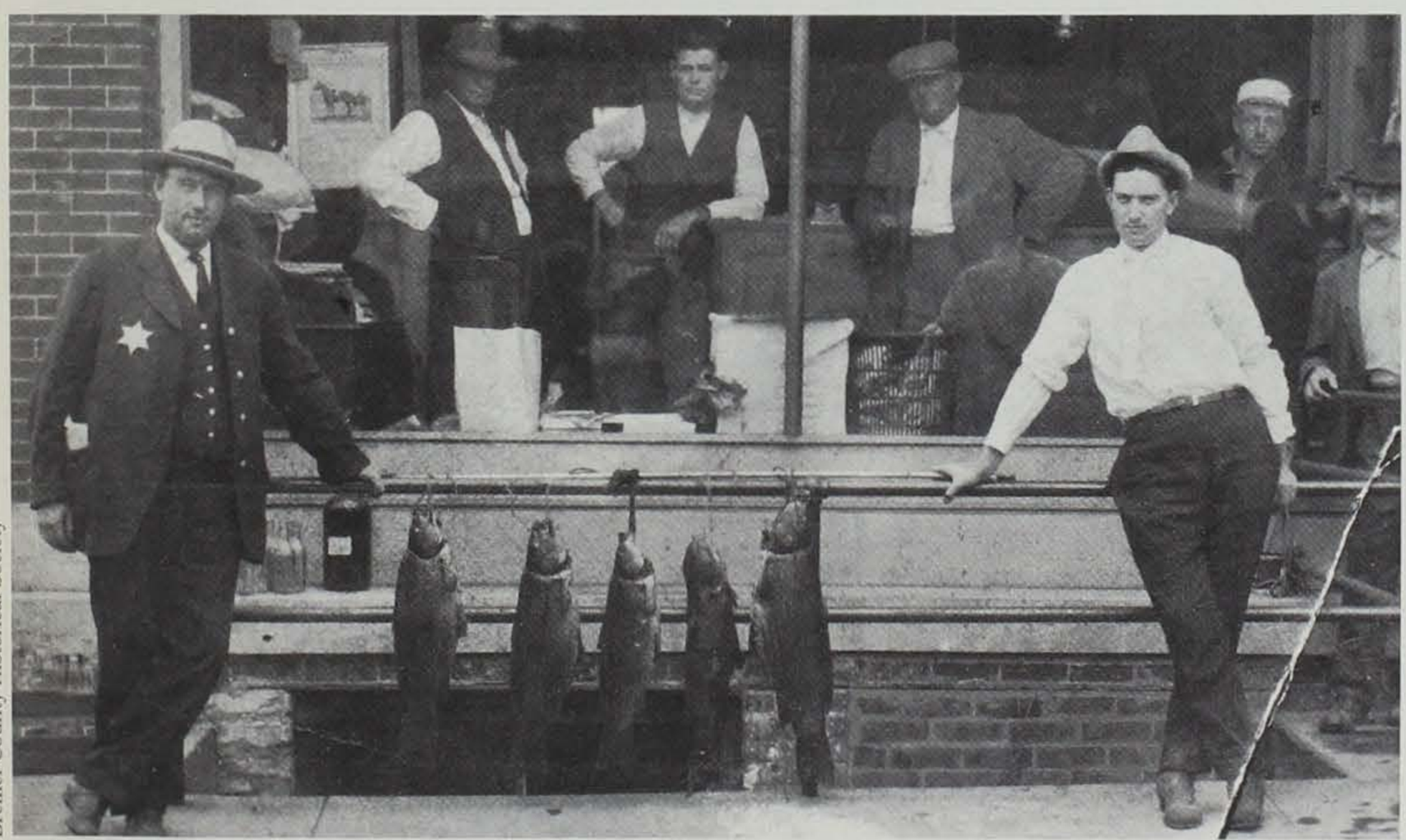
Julius A. Poppe arrived at Sonoma, California, on August 5, 1872, with a precious cargo of five small German carp. His adventure began that spring in Reinfield, Germany, where he purchased

83 of the fish up to two feet in length. The crossing to America was made aboard a steamship equipped with a staircase of water tanks. As water flowed down to the bottom 22-gallon tank, he dipped it back by hand to the top tank. Only eight fish survived the trip to New York, and three more perished on the cross-continent trip to California. Mr. Poppe's efforts resulted in the first successful stocking of carp in America and "endelkarpfen" were soon thriving in their new home. It wasn't long before farmers in California, Hawaii and Central America ordered and received this new product. Iowa would likely have been stocked by individuals such as Mr. Poppe, but the U.S. Fish Commission took the lead in rolling out the red carpet for Mr. Carp.

Just prior to the arrival of carp in California, the U.S. Fish Commission was established and given the congressional mandate to introduce "foodfishes in the waters of the United States." Thus began an aggressive stocking program of both native and foreign fish species with dramatic consequences. In 1877, the fish commissioner made this promising statement concerning carp: "I fully believe that within 10 years to come this fish will become, through the agency of the United States Fish Commission, widely known throughout the country and esteemed in proportion." The commissioner had little intention of introducing carp into waters already stocked with good native species. They were considered too valuable a fish to risk losing and best suited for small ponds and tanks.

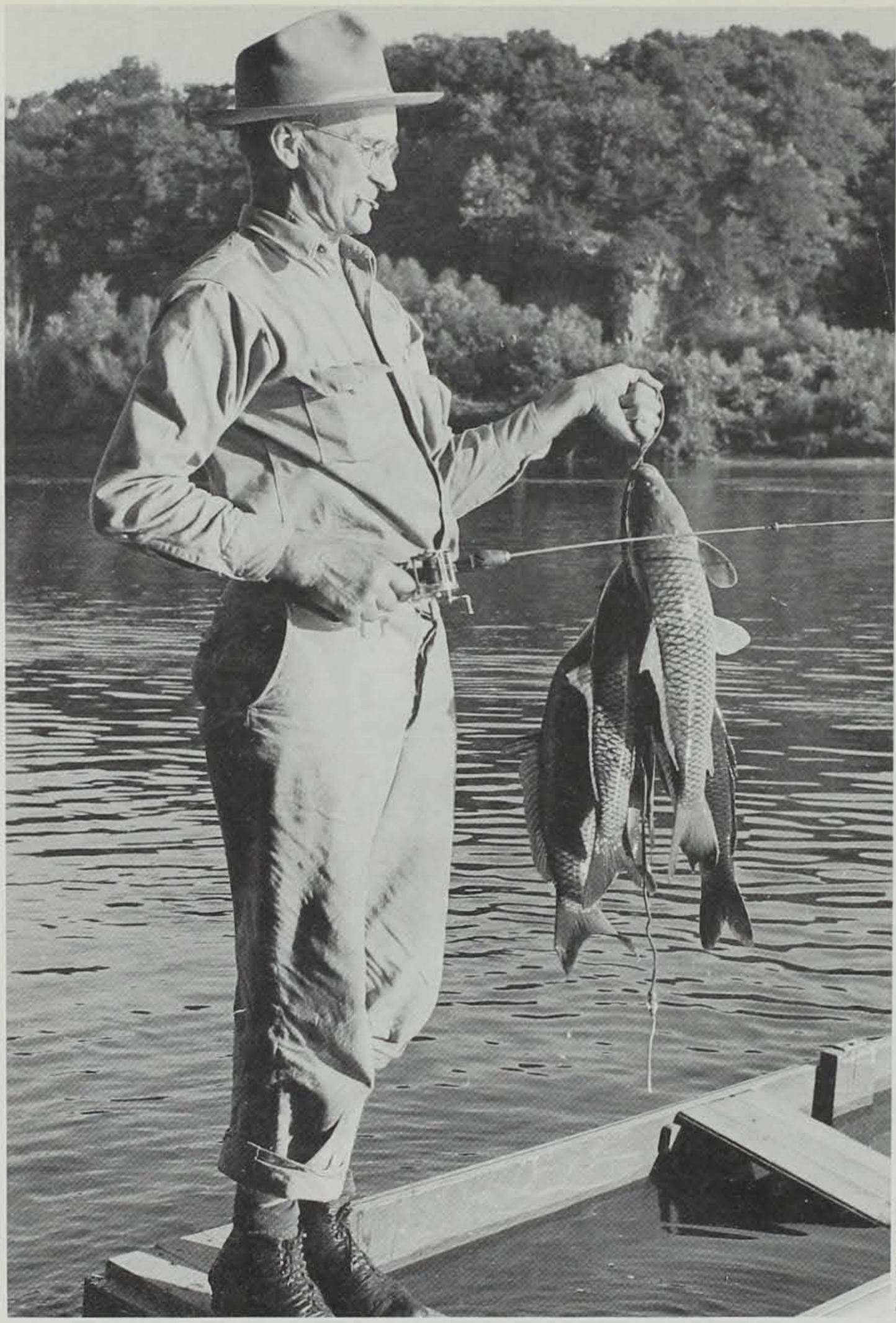
The commission imported scaled, mirror and leather strains of carp from Germany and temporarily held them in a state hatchery near Baltimore. Congress established a more permanent home with a special appropriation of $5,000 for construction of carp rearing ponds on the grounds of the Washington Monument. From 1879 through 1896, the Fish Ccommission distributed approximately 2.4 million carp. Aided by special railroad cars with holding tanks, every state and territory in the U.S. except Montana received

During the Middle Ages, monasteries bred and cultured the fish, spreading it across Europe. Its importance is evident when, in 1532, King Henry VIII paid rewards to people bringing "carpes to the King."



Bremer County Historical Society

▲ A good catch for Waverly anglers.



Jim Sherman

◀ **Carp was first introduced into Iowa waters in the early 1880s and quickly became a favorite of anglers. Their reign as "king," however, had ended by the turn of the century.**

**This angler enjoyed some fine carp fishing from the Cedar River in 1949.**

fingerling carp by 1882. This success was praised by newspapers, magazines and private recipients who spread the word about their new king.

No one did more for the promotion of carp in Iowa than Benjamin F. Shaw, first Fish Commissioner of Iowa. Born in 1830, Shaw never obtained an advanced education but had a genius for learning new trades. A determined and restless entrepeneur, he became a blacksmith, wagon maker and pioneer photographer in New York and Indiana. Moving west he traveled through Illinois and Wisconsin teaching music, vocal and band. While in Wisconsin, he changed occupations once again, becoming a lumber buyer and shipper. In 1858, Mr. Shaw settled in Anamosa, Iowa, where he was superintendent of schools, proprietor of a leading hotel and part owner of a stone quarry. An appointment to the newly formed Iowa Fish Commission came in 1874, and Shaw established a fish hatchery near the Wapsipinicon River. For the next 10 years, his energies were focused on fisheries and he became an immediate carp enthusiast.

Unable to secure fish from the first federal carp stockings of 1879, Shaw wrote in his report to the Governor. "There is, in my opinion, no fish known the introduction of which into Iowa waters promises so much and such general good as the carp. Desirous as I have been to procure and introduce this fish, I have so far been unable to do so; I am in hopes soon, perhaps the present season, to procure enough at least for a beginning; and I have the promise of the U.S. commissioner that our state will receive a share . . ." Keeping his promise, carp were shipped to Iowa recipients in 1880 and carefully reared by Shaw at five newly constructed ponds. Late the following year, young carp were found in the Anamosa ponds, and Benjamin Shaw became the first to produce carp in Iowa. He successfully reported to the Governor, "In the next few years we will be capable of furnishing to the waters of the

state quantities of these valuable fish sufficient to fully stock both public and private waters." As the stocking of waters began, Shaw wrote, "I am very much impressed that the introduction of carp into Iowa is to be of great benefit, both to those who may desire to raise them in private ponds and to the public. I believe they can be raised with much less labor, time and expense, and with much greater certainty than chickens, and will, I believe, in time be as common to be seen on the farm. And they have only to be introduced into our public waters to insure an abundant supply, for the great quantities of vegetable and other food contained in them will make a suitable home. And I feel quite confident that the bass, wall-eyed pike, etc., will be many times increased by their introduction."

Not all of his stocking efforts were appreciated, however, and Benjamin Shaw was replaced as fish commissioner in 1884. Surprisingly, the new commissioner wrote a glowing endorsement of his predecessors carp program, "No more desirable fish of the foreign varieties has been introduced into the waters of Iowa than the German carp. This fish is a favorite in Iowa. A less number of German carp has been distributed in Iowa during a shorter period than of any other foreign variety, and they show greater results. In the last year I have received nearly a hundred individual testimonials of the adaptation of German carp to western waters."

Through time and research, we have learned that carp are often the symptom rather than the cause of our fisheries problems. While inhabiting almost every stream and lake in Iowa, they seldom interfere with the success of modern sportfishing.

But the short reign of the carp was coming to an end. Too successful in its new home, carp were displacing more desirable species from public waters. Pond culture soon died out as the flesh was generally considered inferior to that of native species. By 1896 the U.S. Fish Commission discontinued stockings. The Iowa Legislature in 1902 authorized the warden to grant permits to whoever he might see fit in order that they might "take from certain designated portions of the waters of the State, buffalo, carp, quillbacks, red-horse suckers, and gar." Public criticism was increasing and by 1903 Iowans called for a carp bounty "of about three cents or so."

This sentiment is expressed in Edward Whites' 1915 history of Shelby County, "A good many years ago the United States government stocked the streams of southwestern Iowa, including the Nishnabotna, with carp, and it is the prevailing opinion that this was a bad day's work, since it is almost certain that the carp, now very numerous, by floundering in the mud and in other ways, possibly by eating it, destroy the spawn of the bull-heads, and especially of the channel catfish, a fish infinitely superior. Anyone, however, thinking he would like a mess of carp is respectfully referred to the following standard recipe for cooking this fish: 'Clean the fish nicely, let it dry for two days in the sun. Nail the fish to a pine board, cover with salt, and after standing for two days longer put in the oven and bake slowly for six hours. Then draw the nails out, throw the carp away and eat the nails and board, which are said to be the best part of the fish.'"

Although there was still some question as to their value, the state fish commission supervised the removal of carp from Lost Island Lake in 1909. For much of the next 50 years, a warlike effort was made to eliminate the "nuisance" using seines, nets, chemicals, barriers, spears and clubs. Anglers watched and cursed, but the one-time king was here to stay.

Through time and research, we have learned that carp are often the symptom rather than the cause of our fisheries problems. Changes in Iowa's lakes and rivers caused by erosion, siltation, habitat destruction and pollution have provided improved conditions for carp and deteriorating conditions for game species. While inhabiting almost every stream and lake in Iowa, they seldom interfere with the success of modern sportfishing. Those attributes which once made the common carp so popular in the past, now present a real commercial and sportfishing opportunity to the present. Today Benjamin Shaw would probably see the great potential for the fish he helped spawn. A large resource is in our waters, waiting for Iowa anglers to once again recognize carp as king.

*Richard Martens is a fisheries technician for the department at Manchester.*

Confused with the variety of terms — and the semantics surrounding the types of wastes and forms of waste reduction? Despair no more. Set aside your dictionary and thesaurus. Forget that in the past "precycle" referred to laundry and "waste reduction" meant pressing the 'compaction' button on the trash compactor. Remember, this is the 90s . . . the age of reckoning with our wastes and our "waste age" terms.

What follows is a glossary of the most commonly used "garbage" terms together with their definitions as determined by the National Recycling Coalition (NRC). The NRC is the only coalition in the country working to establish comprehensive nationwide plans for the reduction, reuse and recycling of wastes.

So, why all this hullaballoo about nomenclature and semantics? Most of the terms presented here are commonly used words. Each person believes the next person knows exactly what is meant, and so differences in usage are obscured. What is considered "garbage" in one community may be considered "trash" in another. While the goal is that we all speak the same language, this does not mean that we will all read from the same script. The NRC maintains using standardized definitions makes us more keenly aware of the differences among communities, provides more accurate communication and allows for more detailed context when reporting program data.

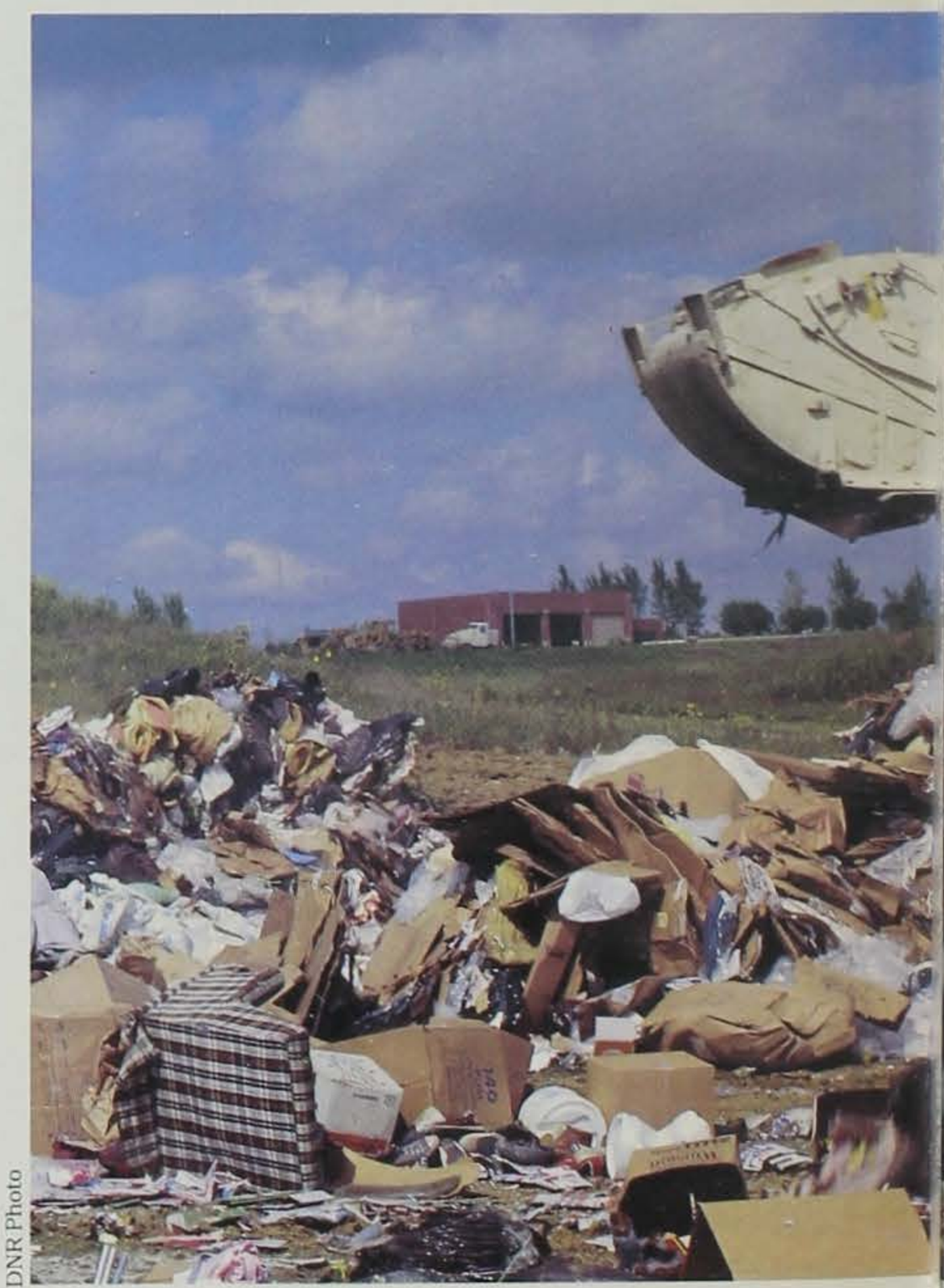
In some instances, the NRC definitions differ from colloquial usage or usages serving other purposes. For example, citizens are asked to "recycle" when what is really meant is "source separation."

Notably, these definitions do not serve all purposes, nor do they constitute a definitive glossary of terms. Rather, this glossary addresses a limited subset of terms that relates primarily to types of wastes and forms of reduction.

# A Garbage Glossary

Need clarification on some of the "new" waste management terms?

by Julie Kjolhede



DNR Photo

## Types of Wastes

***Garbage***, once a term regarded as synonymous with "trash," "refuse," "rubbish" or "waste," traditionally has been a useful term to distinquish food waste from "dry trash" when garbage was fed to swine. However, the more standardized, updated, 90s definition of garbage is waste that will decompose or rot such as food waste or animal carcasses.

***Waste*** is now recognized as material discarded by the generator as no longer useful to the generator. In the past, waste classifications have been categorized into bulky, commericial, construction, demolition, food, inert, hazardous, industrial, post-consumer, residential, solid and yard waste. Today, waste is classified as:

***Solid waste*** or any nonliquid, nongaseous waste.

***Municipal solid waste***, including residential, commercial and institutional nonhazardous solid waste.

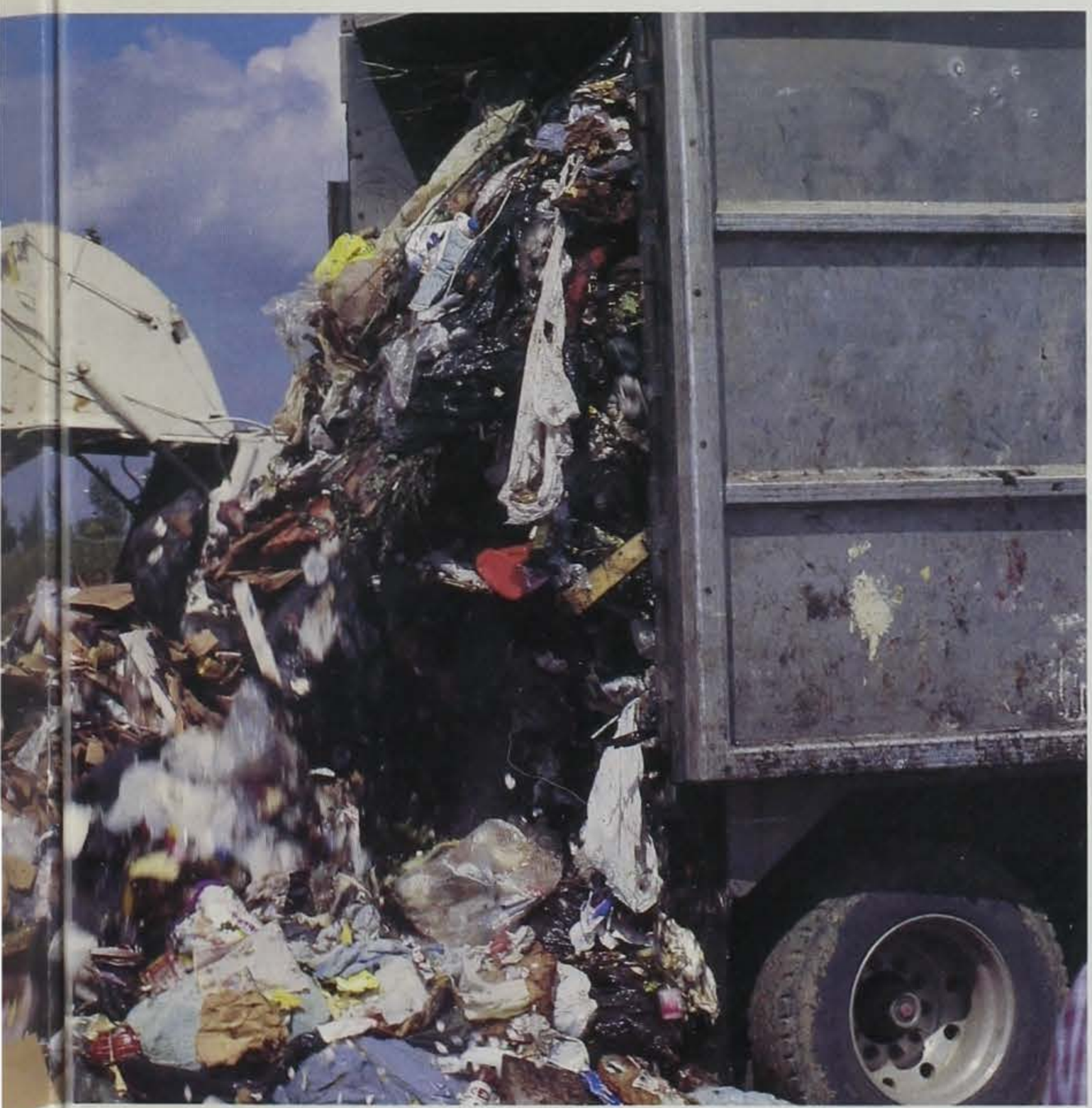
***Residential waste***, referring to solid waste originating from private households such as single-family homes and apartments.

***Commercial waste*** originates in retail or private sector services, for example, financial and insurances offices, retail establishments and theaters.

***Industrial wastes*** are all nonhazardous solid wastes other than residential, commercial and institutional, but may also include small quantities of wastes generated from cafeterias, offices or retail sales departments on the same premises.

And finally, as a waste management strategy, ***composting*** is the controlled, biological decomposition of organic materials into a humus-like material product called compost that may be used as a soil amendment or mulch.

All these are new and improved terms for a process that still allows for the dispensing of garbage at an alarming rate.



Remember when "throwing away the garbage" meant anything from 'tossing out' a wrapper to 'putting out' the trash for pick-up by a hauler? The NRC remembers, too. And they have extended their glossary to include the following terms to entice people to "throw away" wasteful practices and habits by understanding and incorporating waste reduction as a way of life in the 90s and beyond.

## Forms of Waste Reduction

Waste reduction or decreasing the quantity of materials and/or products that must be disposed ranges in form from purchasing items in large quantities to selecting a durable rather than disposable product.

***Source reduction*** (also known as ***precycling***) includes any action that avoids the creation of waste by reducing waste at the source. A company that uses two-sided photocopying, shopper preference for items using less packaging, reducing hazardous waste in the home by replacing mothballs with cedar chips and volume-based fees for waste collection services are examples of source reduction.

When waste reduction results as a consequence of a community's population decline or economic trends, ***incidential reduction*** occurs. Less people generate less trash; slow economic activity slows waste output. Even the weather can produce incidential reduction. A summer with limited rainfall may reduce the amount of yard waste produced.

Iowa has a beverage container deposit system. How does that system fit into this "recycling" thing? The deposit system captures glass and plastic bottles for recycling BEFORE these materials enter the community's waste management system. The recycling takes place independently of the waste management system. This form of waste reduction called ***pre-discard recycling*** is also represented by waste exchanges where one company exchanges its waste with another company having the capacity to process that waste into a viable product -- preventing discarded materials from ever entering a waste management system. One company's trash is another company's treasure.

But even after consumer attitudes have been adjusted and waste and source reduction practices have resulted, there may still be some trash left to discard.

This discarded trash will experience ***source separation*** as the waste generator initiates separation of the materials for some form of special handling or recovery. Following source separation, the materials are set-out or placed for collection (set-out refers to trash as well as recyclables). The recyclables are put through a series of activities called ***recycling*** by which materials that would otherwise remain as wastes, are collected, separated or processed and used in the form of raw materials to create a new product that is available for purchase by the consumer.

And finally, some remaining materials in the trash may experience ***resource recovery*** -- any process that recovers value from the waste stream in the form of materials or energy, *before* being considered for disposal or placed in a landfill.

Throughout history, almost every era can be represented by the terms of its times -- the catchwords, phrases and lasting lingo distinquishing decade from decade. This is the 90s -- the age of reckoning with our waste, the decade of the environment, "green" consumerism and garbage glossaries. "Trash," "junk," "garbage" or "waste" -- term it what we will as long as we set out to *reduce, reuse* and *recycle.*

## About the National Recycling Coalition

The National Recycling Coalition (NRC) is concerned primarily with the process of setting recycling policy at all levels — federal, state and local governments, businesses and industries. It has developed the first national recycling policy and is presenting it to the U.S. Congress for consideration.

The NRC also provides educational and technical assistance to its members with advice on topics such as recycled paper procurement guidelines and composting programs. For further information, contact:

*National Recycling Coalition*
*1101 30th Street Northwest, Suite 305*
*Washington, D.C. 20007*
*202/625-6406*

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*Julie Kjolhede is a recycling planner for the department's Waste Management Authority Division in Des Moines.*

# WARDEN'S DIARY

CHUCK HUMESTON

## FISHING SAFETY

We talk a lot about how to catch fish and where to catch fish, but we never talk about fishing safety.

What could happen? Sure, one could fall out of the boat, you could fall asleep and slide off the bank, you could get hooked in the finger. I'm talking about officer safety, real danger as I faced one day.

First, I have to preface this by telling you weird stuff seems to happen to me. I lead an interesting, often unusual life.

It was a spring day, and I was walking around a lake checking anglers. I noticed a solitary fisherman on the next point apparently casting for bass.

Starting to approach him, I noticed he was casting directly behind him with the usual double, treble-hook lure, then out into the lake, so I started to walk up behind him to his left.

At that moment he decided to turn to his right. I saw his fishing pole bend back toward me. Before I could react, I saw the lure sailing at warp speed toward me.

It felt like someone slapped me in the back of the head. I knew immediately what had happened. I reached up with both hands, grabbed the fishing line and yelled, "Don't cast!"

Too late. The hook had been set. I was caught. I now knew what it was like to live as a bass.


Illustration by Newton Burch

Should I start jumping and shaking to give him a fight? I reached for my knife and immediately cut his line.

The fisherman ran up to me horrified. He looked at the back of my head and turned white. "Is it bad?" I asked.

"Both hooks," he said.

Reaching up I could feel I had become victim of a River Runt. It didn't hurt really, but it wasn't comfortable either.

The fisherman smiled and said, "Boy, I've never caught anything this big before." I know he was trying to ease the situation, but all I could think was, "Real funny, you should have your own TV show."

"I've got go to," I said. If I was really dedicated, I would have checked his license. I considered how macho it would be just to walk around with this lure, but not being into the punk look, I made haste for the hospital.

Now the ordeal really began. I explained to the nurse my problem. "You did what?" she asked, barely trying to conceal her laughter while leading me to the emergency room.

"Aren't you a . . . ," she asked looking at my uniform. "Yes," I croacked.

The doctor came in, looked at my head and said, "We'll have to give you a shot, shave off the hair there, and cut that out."

"You mean you can't just cut off the barbs and slip out the hooks?" I wailed.

"No, it's in too deep."

"Say, aren't you a . . . "

"YES I AM -- JUST GET THIS THING OUT!"

I was glad they gave me a shot as the pain would have been worse from the shaking hands while they were laughing.

Finished, the doctor asked, "Do you want the lure?"

"No, thank you," I answered. Humbled and with a headache, I waited for him to ask about the daily catch limit.

I haven't resorted to wearing a helmet while checking anglers since then, but I'm more careful now. Weird things can happen.

# CONSERVATION
## UPDATE

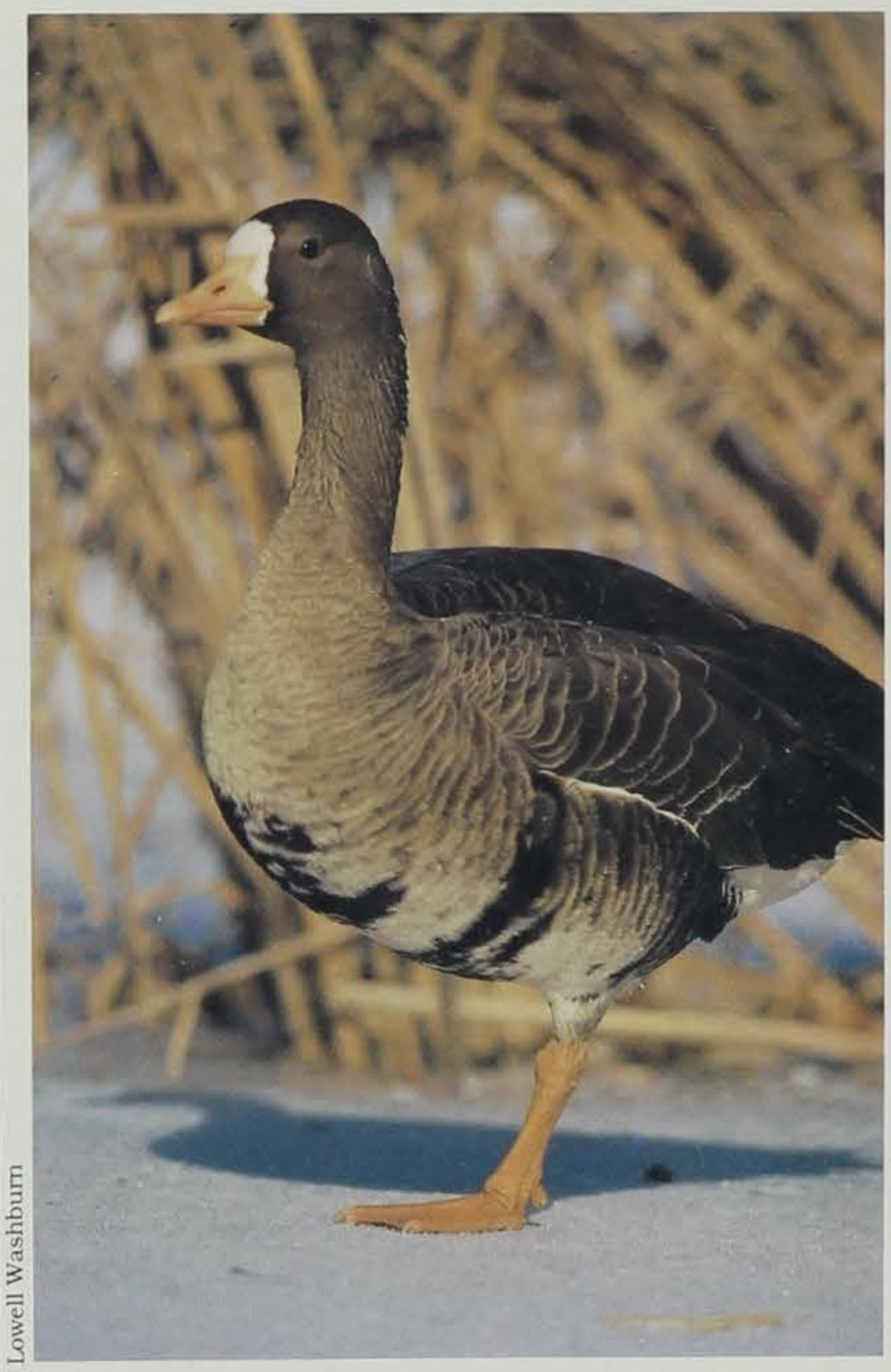
## DNR TO SURVEY WHITE-FRONTED GEESE

by Lowell Washburn

On March 20, 1991, DNR personnel across the state will be scanning the skies in an effort to survey flocks of north-bound white-fronted geese.

According to Guy Zenner, state waterfowl biologist, the goose census will occur simultaneously throughout mid-continent America as the migrating birds head for breeding areas in the Canadian arctic. Although most goose species are annually inventoried as they gather into huge wintering flocks, this technique has proven ineffective with white-fronts.

"Most white-fronts which migrate through Iowa each autumn spend the winter along the gulf coast wetlands of Louisiana and Texas where they 'mix and disappear' among hundreds of thousands of snow and Canada geese," said Zenner.



Lowell Washburn

However, during the spring migration, the species becomes segregated and tends to funnel through a fairly narrow band of habitat. This makes mid-March the period when biologists can obtain their most accurate counts.

In Iowa, white-fronted geese achieve their greatest densities in the western line of counties adjacent to the Missouri River. A total of 6,249 white-fronts were observed in the state during the 1990 spring survey.

**Beware of Lake Ice**

"Winter's freeze-over of inland waters often does not mean it is safe for anglers to venture out onto the ice," said Sonny Satre, recreational safety officer for the Iowa Department of Natural Resources. "Prolonged freezing temperatures are required for solid ice. Also, snow-covered ice can be dangerous because the snow insulates the ice, preventing it from becoming very thick."

Satre reminded outdoor enthusiasts to look for bluish ice as a safety sign. Slush ice is about half as strong as clear, blue ice, and river ice is 15 percent weaker than lake ice. New ice is generally stronger than old, but repeated travel over the same route weakens any ice, as do underwater springs and currents. Persons desiring to drive motorized vehicles on the ice are urged to exercise extreme caution.

The following measurements are safety tests for lake ice: two inches will support one individual on foot; three inches will support a group of people traveling; five inches will support a snow-

mobile; seven and one-half inches will support an automobile (two-ton gross); and 12 inches will support a heavy truck.

Look out for clear or honey-combed ice, stay clear of dark spots in the ice and don't tread into areas of the lake where snow cover looks discolored.

For added safety, test the ice with an auger or spud, beginning at the shoreline and working out.

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*SKEET (an old Scandinavian form of the word "shoot") was discovered in the Northeast around 1910 by bird hunters anxious to improve their wingshooting skills in the off-season. "Shooting Around the Clock," developed by the late outdoor writer William Harnden Foster was designed to simulate many of the shooting angles encountered by hunters in the field to help overcome inconsistent gun mounting and lack of follow through. It is also interesting to note that low-gun skeet was America's first experiment into one of today's fastest growing clay target games -- sporting clays. With various classes and gauge competitions, skeet offers something for every age group, skill level and gender.*

*--Ducks Unlimited*

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**Energy Quiz**

**Q.** The Iraq invasion caused greater percentage increases in crude oil prices than either of the two previous oil crises. True or false?

**A.** *False. The Arab oil embargo caused a quadrupling of crude prices from $3 to $12 per barrel while the Iraq invasion caused crude to go from $16 to as high as $40 per barrel.*

**Q.** Arab leaders are secretly thanking Saddam Hussein for raising oil prices to the $40 per barrel level. True or False?

**A.** *False. Statements from oil-producing countries suggest that they would rather see prices move up slowly in a stable pattern and level off around $25 per barrel. The concern is that sudden high prices will dampen demand too severely and cause more loss of revenue in the long run. A report by Shearson Leaman predicts as much as a 20 percent reduction in oil consumption with a doubling of crude prices.*

**Q.** The U.S. consumes what portion of the world's oil production?
a. 1/8 b. 1/4
c. 1/2 d. 1/3

**A.** *b. 1/4*

**Q.** Iraq/Kuwait oil production of 4.7 million barrels per day represents what percentage of world oil production?
a. 2% b. 7%
c. 10% d. 15%

**A.** *b. 7%*

**Q.** Interruption of Iraq/Kuwait oil production represents a cut-off of what percentage of U.S. oil consumption?
a. 4% b. 15%
c. 20% d. 30%

**A.** *a. 4%*

**Q.** When were U.S. gasoline prices at their lowest levels historically when measured in dollars adjusted for inflation? a) just prior to the 1973 Arab oil embargo b) during the Ford Model-T era c) just prior to the Iraq invasion d) April 1978.

**A.** *c. Gas had never been cheaper when adjusting for inflation, according to the U.S. Department of Commerce.*

**Q.** The price paid in the U.S. for energy reflects the actual cost of energy. True or false?

**A.** *False. All the costs to society are not computed. Clean-up costs from air pollution are not reflected in prices nor is the cost associated with the military in providing energy security.*

**Q.** Which country has the largest number of natural gas-powered vehicles? a) Italy b) Canada c) USSR d) Japan.

**A.** *a. Italy. More than 300,000 vehicles are powered by compressed natural gas in Italy. Due to limited range (approximately 100 miles) these are usually fleet vehicles used for local delivery or transportation.*

*--Iowa Energy Bulletin*

**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 Commision:**
--March 7, Dubuque
--April 4, Council Bluffs
--May 2, Rock Rapids

**Environmental Protection Commission:**
--Feb. 18-19, Des Moines
--March 18-19, Des Moines
--April 15-16, Des Moines

**State Preserves Advisory Board:**
--March 12, Des Moines

**Changes In 1991 State Fishing Laws**

The Iowa Department of Natural Resources has made a few changes in the 1991 sport fishing regulations.

-- *Muskellunge or hybrid (tiger) muskellunge.* The minimum legal length has been increased to 36 inches in all public waters.

-- *Black bass (largemouth, smallmouth, spotted).* A 14-inch minimum length limit shall apply to all portions of the Mississippi River in Iowa bordering Wisconsin and Illinois. The catch-and-release fishery on the Middle Raccoon River has been expanded downstream to the dam at Redfield. All black bass caught from the Middle Raccoon River, Guthrie County, extending downstream from below Lennon Mills Dam at Panora to the dam at Redfield must be immediately released alive.

-- *Catfish.* A daily bag limit of 15 and possession limit of 30 has been imposed on both the Missouri River and Big Sioux River.

-- *Walleye.* A 14-inch minimum size limit has been placed on Clear Lake, Cerro Gordo County, and a 15-inch minimum size limit is in place on Storm Lake, Buena Vista County. No more than one walleye above 22 inches in length may be taken per day from either lake. A 15-inch minimum length limit shall apply to all portions of the Mississippi River in Iowa bordering Wisconsin and Illinois. For the boundary rivers (Mississippi, Missouri and Big Sioux) the aggregate daily bag limit for walleye and sauger is 10 (no more than six (6) can be walleye) and the aggregate possession limit is 20 (no more than 12 can be walleye). For purposes of length limit and bag limit regulations, anglers must check the lower portion of the tail fin. Fish with a white tip on the lower tail fin are walleye and fish without the white tip are sauger.

-- *Trout.* All trout caught from the posted portion of Hewett and Ensign Creeks (Ensign Hollow), Clayton County, must be immediately released alive. Fishing in the posted area must be by artificial lure only.

-- No person shall transport or possess on any waters of the state any fish unless a) the species of any such fish can be readily identified and a portion of the skin (at least one square inch) including scales is left on all fish or fillets, and b) the length of fish can be determined when length limits apply. "On any waters of the state" includes from the bank or shoreline in addition to wading and by boat and ice fishing. This regulation does not apply once the angler transports the fish away from the water and shoreline.

**Editor's Note:**

Some of our readers may have noticed the recent absence of our recycled paper logo on page two.


To use the recycled logo, the State requires the paper contain a minimum of 40 percent recovered material by weight, and at least 10 percent by weight must be post-consumer material.

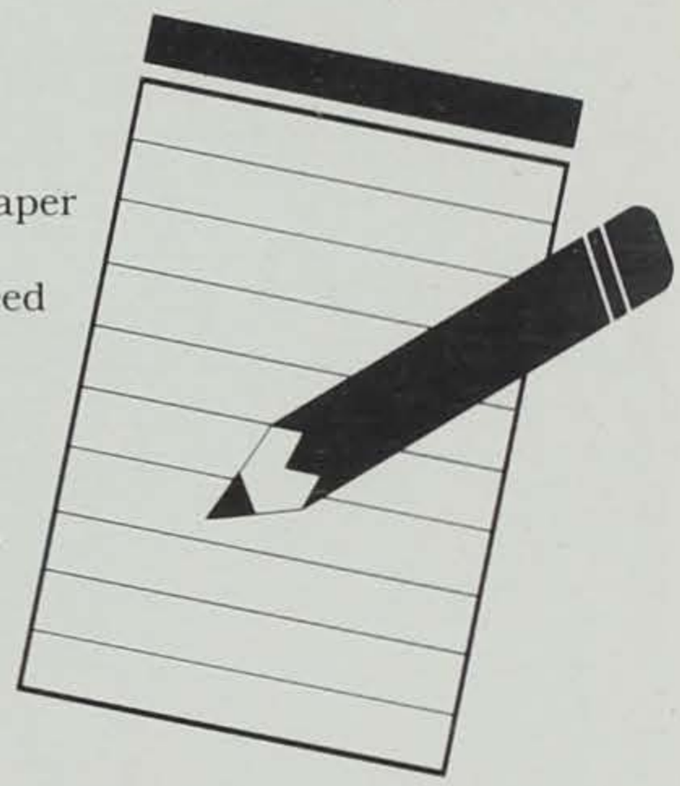
For the State of Iowa, post-consumer waste is defined as those paper materials that have been generated by a household or business and have served their intended purpose. They must have been separated or diverted from solid waste for recycling.

Although Pentair does contain more than 40 percent recycled paper, its definition of post-consumer waste does not match Iowa's.

We are currently looking for a stock which will meet the State's criteria. In the meantime, we will continue to use Pentair, without the recycling logo.

## CLASSROOM CORNER

by Robert P. Rye



A walk in the woods, reading the newspaper or knowing the major statewide natural resources' projects makes us recognize the need for forests and the understanding of them. Did you know fish need trees for shelter, water purification, shade, food source and retaining walls? Did you know the DNR is placing a high priority on acquiring western Iowa's Loess Hills Pioneer State Forest? The following words and definitions will provide information and a better understanding of forest vocabulary.

1. Mast
2. Silviculture
3. Stumpage
4. Log Scale
5. Crown
6. Den Tree
7. Snag
8. Understory
9. Board Foot
10. Regeneration Cut

a. All trees in a forest that grow beneath the main canopy.
b. The fruit and nuts of trees which serve as food for wildlife.
c. The common measure of timber volume 144 cubic inches or one foot wide, one foot long and one inch thick.
d. Living trees with a cavity large enough to shelter wildlife.
e. The art and science of creating and maintaining a forest.
f. A table showing the amount of lumber which could be sawed from a log.
g. A harvest that is made to remove the old trees and create conditions favorable for the establishment of the next generation of trees (includes clearcut, seed tree and shelterwood).
h. A dead standing tree which does not take any moisture or sunlight from adjacent trees and is important for many species of wildlife.
i. The branches, twigs and leaves of a tree.
j. The value of a tree or group of trees standing in the woods uncut (on the stump).

**ANSWERS:**

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

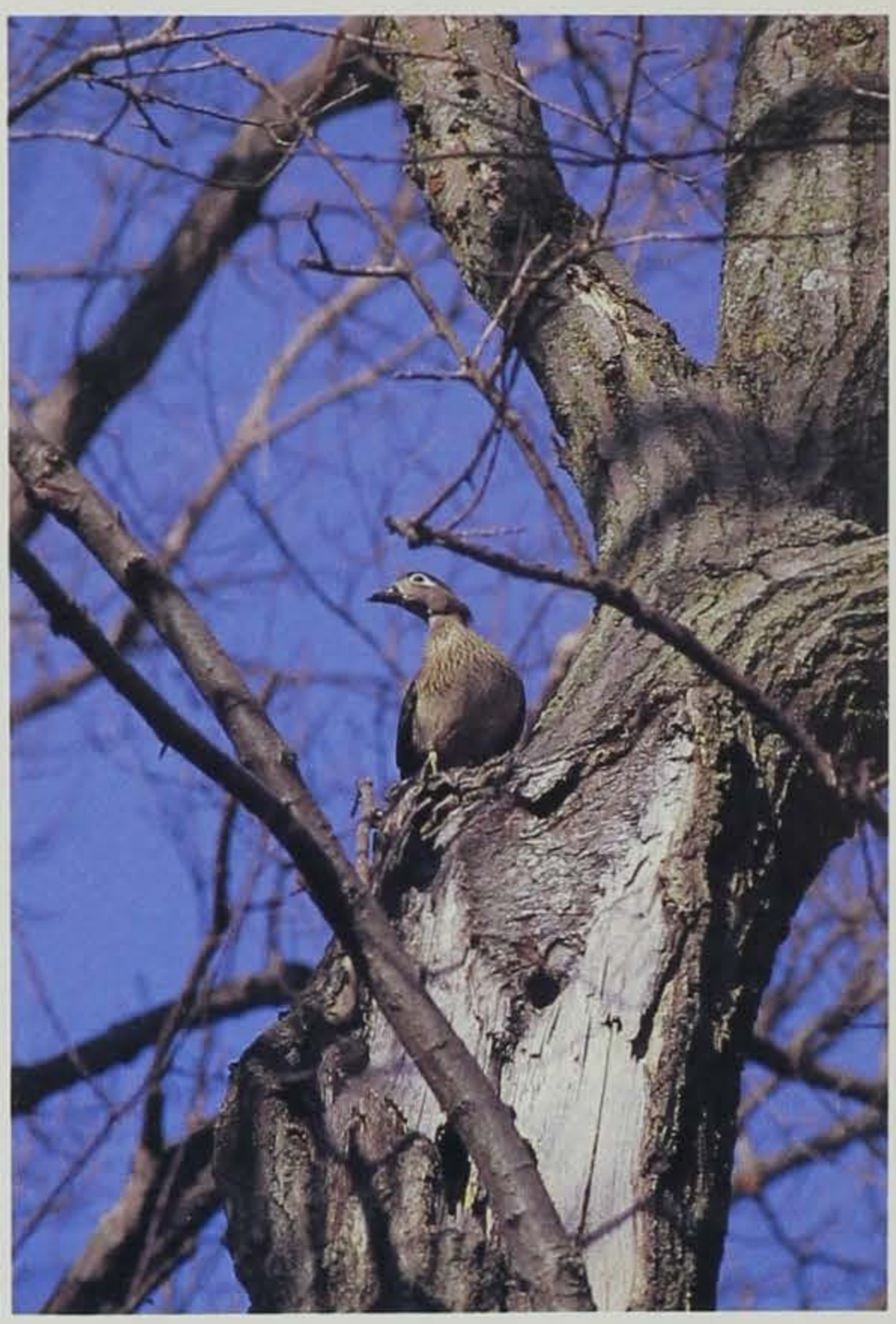
## THE FLIGHT HOME

by Melanie Perry

It was this young female wood duck's first trip north from her wintering grounds in the Gulf of Mexico. She was not quite a year old, but she had already experienced much of her life. She steadily and rhythmically beat her wings to maintain flight as she returned to her birthplace.

Life for the young female duck began in a wooded draw near a small pond somewhere in southwest Iowa. She hatched sometime in June in a nest inside an old cottonwood tree. What a warm and dry home it was! There was just enough sawdust in the bottom of the cavity for good drainage and padding, and, with the soft, warm down from the mother, the 12 whitish eggs were never chillded. The cavity even had an opening that was just the right size for her mother to fit through snugly.

The young duck didn't remain in her cavity home long. The morning after she pecked her way out of the shell, she and her siblings left the comfort and warmth of the tree house. Her mother flew from the cavity, checking for danger. Perched on a nearby limb, the mother started calling to her young. The calm cavity immediately became a mass of jumping, excited bodies as the chicks tried to reach the cavity entrance. The young female jumped several times before finally reaching the entrance, standing there for a moment and leaping with her little wings and feet spread wide. The landing was a bit rough, which might be expected since she fell nearly 20 feet to the ground.



Lowell Wahburn

Her mother led the young ducks to the nearby pond. It was time for feeding and growing. They fed on plant materials -- anything from duckweed to acorns, which were crushed in their gizzards -- and they ate a few insects now and then. But the wood ducks weren't the only ones interested in feeding. Hungry snapping turtles snatched up several of the young ducks, and they were always on the lookout for hawks and owls. The young ducks stuck close to the mother duck for protection during these first few weeks of life.

After about three weeks, the young female wood duck grew "real" feathers that replaced her downy softness. It took another eight weeks before she had enough feathers to actually fly. From her first flights, life on the pond went by quickly as she fed and grew stronger.

Soon the evenings began to turn cooler and the leaves on the trees turned brilliant colors. Then, with no prompting or understanding, she and her flock began to fly south for the winter.

It was a long flight, but one of many stops, some to eat and some to rest. There

Lowell Washburn

were a few more encounters with hawks and owls, and human hunters -- a new predator. A few more of her flock would not make it to their winter's destination.

Upon reaching the gulf, most of the young duck's time was spent loafing, feeding on plentiful food, preening and gathering together with the other wood ducks in swamp roosts to spend the nights. The males began their courtship behaviors to attract a mate, showing off with their colors and displays.

And now, with spring approaching and a gust of wind behind her back, the female wood duck flies with her mate close by. He is following her back to that same pond in southwest Iowa where she was hatched less than one year ago.

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**Author's Note:** Unfortunately, for many wood ducks and other cavity-nesting birds, most tree cavities have been destroyed, resulting in a lack of natural nesting sites. You can help! Wood ducks, bluebirds and other cavity-nesting birds readily accept artificial cavities such as wooden boxes. If you have a farm pond, put up a box to attract the beautiful ducks. If you have an open pasture or field, a bluebird would appreciate a nest box home.

For more information about building nesting boxes and habitat requirements for these and other cavity-nesting birds, contact your local county conservation board office.

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*Melanie Perry is a naturalist with the Cass County Conservation Board.*

# "Who Ya Gonna Call?"

*What do you do with hazardous waste?*
*Where do you take used oil or paint?*
*These answers -- and many more -- are available by calling the Groundwater Protection Hotline at 1-800-532-1114.*

by Susan J. Miller

The Groundwater Protection Hotline was created in 1987, as a result of the passage of the Groundwater Protection Act. This landmark legislation began a new era of environmental awareness in Iowa.

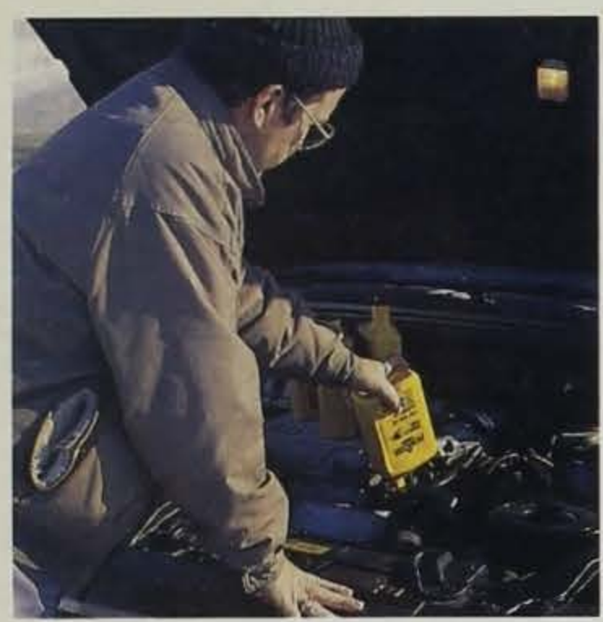
When you call this number you reach the Iowa Department of Natural Resources in Des Moines. If your questions are in regard to solid, hazardous, infectious, or low-level radioactive waste, household hazardous materials, recycling, or Iowa's Bottle Bill, you will most likely be connected with a person in the Waste Management Authority Division.

The following list contains some of the most common questions received over the hotline number, along with the answers.

In addition to answers to specific waste disposal questions, the DNR can send you informational brochures on any topic from composting and recycling to household hazardous materials and industrial waste reduction. If your local civic group needs a speaker on solid waste issues, call the Groundwater Protection Hotline.

The Groundwater Protection Hotline is available to provide you with the most up-to-date information regarding environmental issues, including waste reduction, recycling, composting, hazardous waste reduction and disposal, and safe management of hazardous materials in the home.

*Susan J. Miller is a program planner with the department's Waste Management Authority Division in Des Moines.*



Ron Johnson

## *"I just changed the oil in my car. What should I do with the used oil?"*

Since July 1, 1990, it has been illegal to put used oil into your trash. State law requires any retailer of motor oil to either accept waste oil back from the general public or post a sign indicating the name and location of a waste oil collection site within the county.

Used oil is recyclable. It is a valuable resource which should be taken to your local waste oil collection site. The DNR has a list of waste oil collection sites in each Iowa county. Call the Groundwater Protection Hotline for the location of a collection site near you.


Ron Johnson

▲
**Old paint can often be reused. If it cannot, latex paint should be dried out and placed in the trash; oil-based paint should be saved for a local household hazardous waste cleanup event.**

## *"I'm moving and I have a lot of old paint in my garage. How do I get rid of it?"*

If the paint is still useable, give it to a neighbor, relative or friend to use, or call your local community theater or high school drama department. Many times these local groups will accept old useable paint to decorate scenery. Your local community action group may also accept useable paint for distribution to low-income or elderly citizens.

If the paint is not useable or no other outlet is available, any latex paint can be dried out and placed in the trash. In a well-ventilated area, preferably outdoors, pour the latex paint into an old cardboard box lined with crumpled newspaper. Pour in thin layers and let each layer dry completely. When all of the paint is dry in the box and in the can, the dried paint can go in the regular trash. If there is only a small amount of paint in the can, take off the lid and let the paint air dry for a couple of days.

Unuseable oil-based paints should be saved for a local household hazardous waste cleanup event. Because you are moving, take the materials with you, if you can, or ask someone you trust to save them for the next cleanup event.

In the future, you may wish to purchase latex paint for your painting needs because it is much easier to dispose of any leftovers. In addition, solvents, such as turpentine, are not required when using latex paint. You should also make every effort to buy only the amount of paint that you need.


Tammra K. Pavlicek

## *"What can I do with old, dirty paint brush cleaner? It is so full of paint particles, I'm sure it's no longer useable."*

Don't be so sure it's not useable! Paint thinner doesn't wear out -- it just gets dirty. Let the container set for a few days until the particles of paint settle to the bottom. When the top liquid is clear again, carefully pour it off into another container through two or three layers of cheesecloth, taking care that most of the paint particles remain in the original container.

The paint particles and the cheesecloth should be allowed to dry in a well-ventilated area, outdoors or in a shed, and then they can go in the trash. The filtered brush cleaner can be reused again.

Ron Johnson

## "I have had about a gallon of old gas sitting in my garage for a long time. It's surely unuseable. How can I dispose of it?"

Old gas can be used again, if it is re-conditioned. Re-condition old gas by mixing one gallon of old gas with five gallons of new gas. This gas can now be used in your lawn mower, snow blower or other small engine.


Tammra K. Pavlicek

## "I have some old pesticides that I want to get rid of. Where can I take it?"

There is, at this time, no permanent collection site for pesticides or any other household hazardous waste. The best way to dispose of these materials is to use them for their intended purpose. That is, of course, provided the pesticide is not banned. Banned pesticides, such as chlordane and DDT, should be stored safely and brought to a hazardous waste cleanup event.


Ron Johnson

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**The DNR has a listing of recycling locations in Iowa that take newspapers, jugs, bottles and cans for recycling.**

## "Where can I take my newspapers, milk jugs, glass bottles and tin cans to be recycled?"

We have a list of all the recycling locations in Iowa. You can receive a listing by city or county from the DNR.

The number of recycling locations is growing rapidly. However, there still may not be a location near you. If that is the case, you should contact your local county board of supervisors or your local solid waste or landfill commission and ask them about their plans to establish or encourage the establishment of local recycling programs.

State law requires that all cities and counties provide a waste reduction program for their citizens. Furthermore, the State has set a goal to reduce the amount of waste going to landfills 25 percent by 1994.

Ron Johnson

## "My local grocery store refused to accept my empty beverage containers. Is it legal for them to do that?"

The store cannot legally refuse to give you a refund, as long as: a) the store sells the brand you are returning; b) the containers are reasonably clean; and c) the containers are reasonably intact (e.g. not flattened).

If any of the above conditions exist, then the store has the right to refuse your beverage containers. If none of the above are true and your store still refuses your containers, call the Groundwater Protection Hotline.

*Temporary hatcheries are filling a need for more walleye at the Spirit Lake Hatchery.*

# Satellite Spawning Stations

by Lannie R. Miller


Ron Johnson

During the early to mid-1980s, traditional walleye brood stock sources were not adequate to provide the number of walleye eggs necessary to meet the ever-increasing demand. Without a sufficient number of eggs, walleye fry and fingerling stockings would have to be reduced or in some cases eliminated in many of Iowa's walleye waters. A decision was made to take eggs at additional lakes. Clear Lak and Storm Lake were chosen in 1987 because of their excellent walleye populations and proximity to the Spirit Lake Hatchery. Biologists, as well as local conservation officers, have staffed these satellite stations.

At the Clear Lake fish and wildlife office, the basement was converted to a temporary walleye hatchery by adding 10, 270- to 330-gallon tanks and a large pump which provides lake water to the tanks. These tanks hold both male and female walleye which are used in the egg-taking operation. Fertilized eggs are water hardened at the satellite station and then transferred to the Spirit Lake facility to hatch. Adult fish are returned to the lake.

The marina, located in the southwest corner of Storm Lake, has also been used as a temporary walleye hatchery in much the same way as the Clear Lake facility. Due to the lack of room and shortage of tanks, both unripe females as well as ripe males are kept in large, floating net cages in the marina. The water in the protected marina is several degrees warmer than the main lake which helps facilitate ripening in the females. Two 270-gallon tanks inside the building are used to hold ripe females until they are ready to be stripped of their eggs. A small portable pump supplies a continuous flow of lake water to the tanks and the egg hardening trough. As at Clear Lake, fertilized eggs from Storm Lake are transferred daily to the Spirit Lake Hatchery.

Although the facilities are "primitive" when compared to modern hatcheries, the satellite hatcheries have contributed a significant portion of the required number of walleye eggs for the hatchery process. In the three years of operation, the Clear Lake facility has produced 846 quarts of walleye eggs while Storm Lake, during the same period, produced 550 quarts. Fertility estimates for both satellite hatcheries range from 50 to 70 percent, which compares favorably with the permanent hatcheries at Spirit Lake and Rathbun Reservoir.

The actual gill-netting and egg-taking operation takes place when water temperatures reach 43 to 45°F, usually one to three weeks after ice-out. However, preparations at the satellite hatcheries have been going on for weeks prior to this time. Tanks and pumps must be

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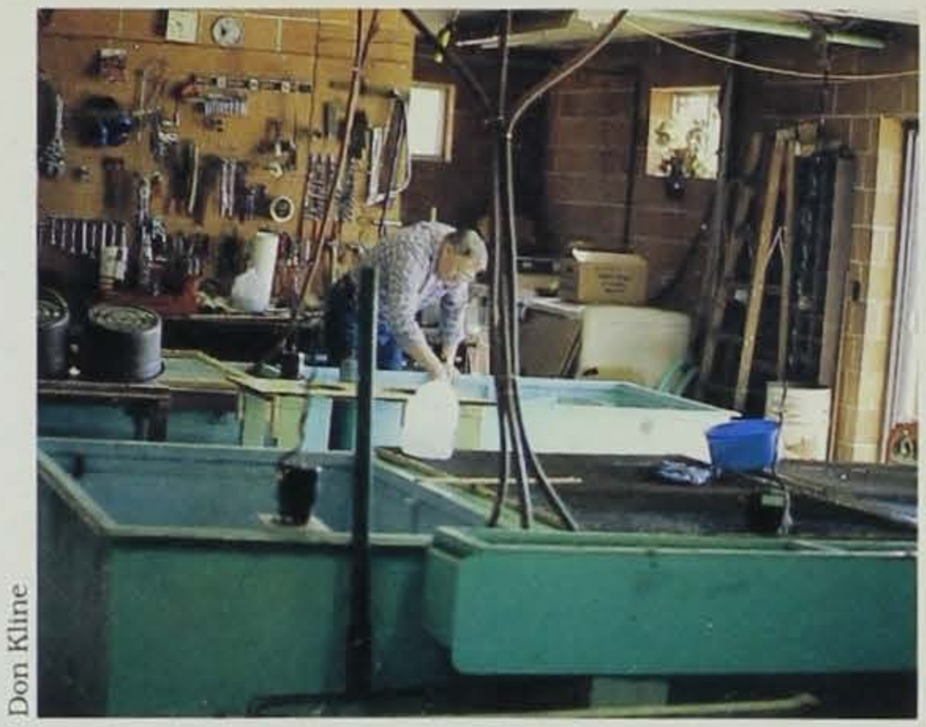
**The Clear Lake shop converted into a satellite walleye hatchery.**

Don Kline

inspected, repaired and set up. Gill nets have been tied by the hatchery personnel at Spirit Lake during the winter months and must be transported to the satellite hatcheries along with tubs, buckets and holding nets. Boats, motors and lights must be inspected and in good working order. Water temperatures must be monitored daily in order to begin netting immediately prior to the peak spawning period.

A typical day at the satellite

# *Stripping, Fertilizing and Egg Handling*

by Don Herrig

Walleye have been produced in hatcheries in Iowa for more than half a century. The process of stripping, fertilizing and transporting eggs to intensive culture batteries at a full-scale hatchery begins with the gill netted fish. First the sex and condition of maturity of the fish must be determined. The male fish are generally smaller and always slimmer than the females. Pressing on the fish's abdomen will determine its ripeness. A ripe fish will immediately dispense a substance from its vent (anal area). A white liquid -- milt -- will be dispensed from a male, while a grainy tapioca-like material -- egg --, will issue from a female. Although male walleye (bucks) are almost always ripe during the netting period, females go through a fairly long period of gonadal development and are ripe for only a short period of time, sometimes a single night. As a female walleye ripens, its distended abdomen becomes softer until slight pressure on it will cause eggs to flow freely from the vent.

The walleye eggs are fertilized in a plastic dishpan approximately 12 inches in diameter. Excess water is dabbed from the vent area of the female and the fish is held firmly in one arm with the vent directed into the pan. Pressure is applied, with the edge of the hand, in a stroking motion that begins behind the ribs and moves to the vent of the fish. Only enough pressure is applied to keep eggs flowing from the vent. In many cases, only two or three strokes are necessary to expel the entire egg mass. The eggs that are stripped into the pan should be a cream to bright yellow color and free of lumps or blood. Only one-quarter to one-half inch of eggs are stripped into the pan so that a higher percentage of eggs can be successfully fertilized.

Bucks are stripped into the pan in a similar manner. In most cases, two bucks are used per pan of eggs. Eggs and milt are stirred for a short period of time to ensure mixing. At this point water is added to the pan and the eggs are gently mixed with a feather or paint brush. It is only after the water is added that the actual fertilization begins. The gentle mixing proceeds for two minutes which is ample time for the eggs to be susceptible to fertilization by the sperm. At this time, the fertilized eggs are carefully

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station consists of long hours and varied jobs. Each two-person crew is given three, 180-foot gill nets and assigned a general location for netting. Since walleyes spawn at night, the nets are set at 7 p.m. The first run begins at 10 p.m. and usually takes one to two hours. Walleyes are carefully removed from the gill nets and placed in an oxygenated tank of water in the net boat. Each net is reset after the fish are removed. When all three nets have been run and reset, the fish are taken back to the satellite hatchery.

"Green" females are placed in one of the large floating nets while males are placed in another. Ripe females are placed in the two inside tanks.

The second run begins at 1 a.m. and gill nets are removed from the lake following this run. Fish are again sorted according to sex and egg development and placed in the appropriate net or tanks. By the time the second run is completed and fish are sorted, it is 3:30 a.m.

A two-person crew from the Spirit Lake Hatchery arrives at the satellite hatchery at 8 a.m. and sorts through the "green" female walleye from the previous night's catch to look for additional ripe females. These are brought into the hatchery and placed in the tanks with the other ripe females. Ripe males are also brought into the hatchery in preparation for egg taking. Fish are then stripped of the eggs and sperm (see page 30). Fertilized eggs must be water hardened prior to shipping to Spirit Lake. Scientific data such as lengths, weights and scale samples are taken from each fish that enters the hatchery. Immediately after stripping and data collection, the fish are transported by boat back to the main lake and released. Eggs are water hardened for three to four hours, put into plastic bags filled with water and oxygen and transported to the Spirit Lake Hatchery by late afternoon. The crews begin to assemble at the satellite hatchery at 6:30 p.m. to begin setting out the nets for another night of brood stock collection.

Netting and stripping operations continue for five to, hopefully no more than, seven nights of brood stock collection, depending on weather conditions and fish availability.

Hopefully, within the next few years, the brood stock walleye population at Rathbun Reservoir and Spirit Lake will again be sufficient to provide the required number of eggs. Until that time, the satellite walleye hatcheries at Storm Lake and Clear Lake will continue to assist in the endeavor.

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pored into a mixture of water and Fuller's Earth, a special clay-like substance. This step is done to coat each individual egg and counteract the adhesive qualities of walleye eggs. Under natural conditions the fertilized eggs would drift to the bottom of a lake and stick to the rocks over which walleye normally spawn. To have a successful hatch, these eggs cannot stick together. They must be free to drift in hatching jars with a continuous flow of well-oxygenated water.

After the eggs are gently mixed in this clay bath and have lost their adhesive properties, they are thoroughly rinsed and poured into hardening trays. These trays are made of net material so fine that the eggs cannot fall through the mesh. This netting is attached to a rectangular wooden frame that fits into a trough which is provided with a continuous flow of fresh water. The eggs are gently rinsed several more times and then allowed to water harden. Any unnecessary movement at this time will break the outer shell and the egg will be destroyed.

After the eggs are water hardened -- usually three to four hours -- they can be safely moved. The eggs must be carefully packed to prevent jarring and an ample supply of oxygen must be provided. A heavy plastic fry bag is inserted into a specially designed cooler and filled approximately one-third full of lake water. A measured amount of water hardened eggs are ladled into the bag, which is then filled with pure oxygen and double sealed. The cooler lid is replaced and the eggs are ready for shipping to the hatchery at Spirit Lake or Rathbun for incubation.

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