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Telecommunications Device for the Deaf, (515) 242-5967
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The many benefits of wetlands may surprise you. See *Asset or Liability?*, page 3. Photo by Lowell Washburn.



ASSET OR LIABILITY?

Wetlands -- are they valuable environmental assets or mosquito-infested blights on the landscape? A group of experts examine these threatened and fragile ecosystems.

by Lowell Washburn

The atmosphere inside the county courthouse was heating up as public debate fastened on the question of whether or not the county conservation board should be allowed to purchase a local wetland.

The tightly packed room was clearly divided into two distinct camps -- those who vigorously and vocally supported the acquisition, and those who just as vigorously and vocally thought the notion of paying good money to preserve a "hunk of swamp ground" was simply inconceivable.

The final outcome of this meeting, as well as the eventual fate of the wetland, would be determined by the three-member county board of supervisors. Early on it became painfully evident that at least one or two of these board members did not care too much for "swamps"

themselves. At one point, one of these frustrated officials finally threw up his arms in despair and cried, "I do not see what all this fuss is about. Why, that ground cannot even grow corn."

As I recall, that comment drew both cheers and jeers, and although things did not seem to be going too well at that point the story did have a happy ending. That wetland ultimately became one of the first successful acquisitions under



Bruce A. Morrison

ASSET OR LIABILITY?

BENEFITS PART ONE
OF WETLANDS

Iowa's new Habitat Stamp Program.

But in many regards that stormy public meeting was by no means unique. And in spite of today's heightened public



Ron Andrews

▲ **Eagle Lake in Hancock County is heavily contaminated by agricultural runoff entering the lake. As the contaminated water passes through the marsh, it is "cleansed" of the pollutants.**

awareness toward environmental issues, the question lingers. What are wetlands really worth? Are they simply

(as I heard one attorney state at another public meeting) "a mosquito-infested blight on the community" or do wetlands represent a valuable social asset?

Certainly with each passing generation, and perhaps even with each passing year, an ever-increasing cross section of society is beginning to realize the value associated with the preservation of natural wetland systems. Of course, the most obvious and generally accepted wetland values focus on the recreational opportunities which are most often derived from both consumptive and nonconsumptive uses of wildlife. But upon closer examination sci-

ence continues to discover that natural wetlands have tangible values that go far beyond the obvious and that these complex ecosystems may indeed serve a critical function in maintaining the overall health of the environment.

According to Ralph Turkle, a Department of Natural Resources' environmental engineer, one of the greatest benefits attached to Iowa wetlands is their profound ability to improve water quality. These improvements occur within three or four different parameters. The easiest to document, says Turkle, is the basic reduction of water turbidity. In many cases, this reduction is readily evident to the naked eye and is accomplished in two fashions. First, as polluted, sediment-laden water enters the wetland basin it immediately begins to lose velocity. And as gravity has its effect, suspended solids begin to settle to the marsh bottom. Turkle noted that the process is further enhanced by the filtering effect of wetland vegetation. As water passes through the marsh a number of solids are "knocked out" as they catch or attach themselves to the roots and stems of aquatic plant life such as bulrush and cattail.

Often going hand-in-hand with the removal of sediments from contaminated water sources is the equally important function of nutrient reduction. Most of the improvement to water chemistry takes place due to plant growth. And a funda-

mental component of this function lies in the fact that nutrients such as nitrogen, phosphorus and carbon provide the basic elements for plant cell material. As wetland plant growth takes place, these three building block elements are removed from the water and put into cell production, says Turkle. The end result is cleaner water.

Although there is ample documentation of water quality improvements due to the cleansing effect of wetlands, the actual nutrient/chemical cycles that occur in marshlands is extremely complex, says DNR wildlife research technician Ted LaGrange. Nitrates present a serious source of groundwater contamination in Iowa. During recent years one of the greatest areas of concern is nitrate contamination of drinking water and the much-publicized "blue baby syndrome." Nitrates are highly soluble and readily leach through soil profiles into shallow aquifers and subsurface drainage tile, said LaGrange. But as nitrates enter a wetland they undergo a variety of chemical transformations. The most common transformation occurs when microbes (present in wetland sediments) convert harmful nitrates into harmless nitrogen gas. LaGrange noted that nitrogen is also removed from water by wetland vegetation.

In actuality, the ability of a prairie wetland to remove nitrates from contaminated water is really quite astounding.

In a 1989 study conducted on Hancock County's Eagle Lake Marsh it was found that 86 percent of the lake's nitrate level was removed by the time water reached the marsh's outlet. This compares closely with results obtained at Humboldt Saskatchewan where two artificial wetland cells are used for tertiary treatment of municipal sewage.

At the Humboldt lagoons, marsh vegetation -- cattail and bulrush -- removed 88 percent of the nitrogen. But perhaps the most interesting aspect of the Humboldt treatment plant was the comparison of costs between wetlands and traditional treatment methods. The cost of treating sewage in artificial wetlands was just four cents per cubic meter of wastewater, the cost of tertiary treatment in the "traditional sewage plant" of a nearby community was 34 cents per cubic meter. "People are discovering that wetlands work so well for purifying water that we are beginning to see an ever-increasing interest in using these systems to 'polish' the effluent of municipal waste treatment plants," says Turkle. Artificial wetlands may also be an economical way of holding and treating feedlot runoff, and sewage treatment wetlands have been used at the Iowa State University's hog research facility.

According to Turkle, there has also been research and documentation that some of the pesticides that wash into wet-



Lowell Washburn

▲ A marsh holds many benefits for the environment and for wildlife. An added benefit is its role as an outdoor classroom.

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ASSET OR LIABILITY?

BENEFITS PART ONE
OF WETLANDS



Lowell Washburn

▲ Perhaps the most intangible of all wetland values is its aesthetic appeal.

lands are also removed by various organisms and activities within the system. He added that some pesticides may also settle out with the suspended solids that drop to the bottom. Unfortunately, little work has

been done regarding the role of Iowa wetlands in the reduction of pesticide contamination. However, a study conducted by the National Aeronautics and Space Administration (NASA) and the Environmental Protection Agency (EPA) in the southern U.S. has indicated

that wetlands may play a very valuable role in this area.

Natural wetland systems can also play an important role in erosion and flood control. If a sufficient number of wetlands are present within the uplands of drainage basins, they can produce very favorable impacts on natural river systems, says Jack Riessen, supervisor of the DNR's floodplain management section. From a hydrological standpoint wetlands are valuable during cycles of both flooding and drought. Natural wetlands lessen flood peaks by storing rainfall. During drought years, marshes feed water back

into river systems and help maintain adequate stream levels. During periods of extreme drought the importance of this transfer cannot be over-emphasized.

Riessen added that many wetlands also occur along river floodplains. Although somewhat different in nature from the typical cattail marsh, these wetlands also serve to filter sediments and remove contaminants as surface water passes to underground aquifers. Although this class of wetlands does not probably have a big effect on flood levels, they are very valuable in terms of wildlife and water quality, said Riessen. Unfortunately, these floodplain ecosystems are perhaps the most vulnerable of all Iowa wetlands. Many of these floodplain wetlands have been and are continuing to be converted to cropland. Those that remain are being systematically bulldozed and tilled into oblivion.

Perhaps the most intangible of all wetland values is its aesthetic appeal. Aesthetics can never be measured in terms of dollars, percentages or pounds per acre. Yet for those of us who cherish wetlands, this is perhaps the greatest value of all.

Today we strive to maintain wetlands because they are good for wildlife and good for the environment. But perhaps one day we will learn to save them simply because they are good for the human spirit.

The Final Chapter

Restoring the Wild Turkey in Iowa

by DeWaine Jackson

The old oak outside my office still has a few dried, brown leaves clinging to their parent, afraid to fall. The leaves are tinged with frost from the frigid winter air. I sit facing a computer screen, dreaming of the chance to roam the spring woods after the majestic, long-bearded gobbler I observed last evening. I'm pleased I have the opportunity to pursue him and thank those biologists who reintroduced Eastern wild turkeys in Iowa a scant 25 years earlier. I wonder to myself how I can explain the restoration of the wild turkey in Iowa better than my counterparts have done in the past. All the clever sayings, cliches, biological speculations and historical information regarding the wild turkey restoration have been previously published in five earlier chapters (see July 1976, August 1976, June 1981, March 1986 and March 1989). So where do I begin? I'll begin at the end . . . the final chapter.

In less than 25 years, Eastern wild turkeys in Iowa increased from non-existent to a thriving, bountiful population. Based on spring harvest values, previous research and some basic biological assumptions, there are now between 75,000 and 100,000 wild turkeys in Iowa. The restoration of the wild turkey in Iowa is now complete!



Ron Johnson

Approximately 96 percent of the habitat suitable for maintaining wild turkey populations in Iowa now has turkeys. Dispersal of existing populations will provide turkeys to the remaining habitat currently without turkeys. The population growth and hunting regulation changes have, for the most part, been unidirectional and subtle enough that it may surprise you to recall where we were just a few years ago.

Iowa's remnant forests now total only two million acres, just six percent of the state and only one third of the seven million pre-settlement forest acres. Ninety-nine percent of Iowa's forest land is privately owned, with nearly half of the remaining one percent in state ownership,

38 percent owned by other public agencies and 14 percent in park-refuges withdrawn from active management.

Iowa has no national forests, parks or wildlife refuges devoted to forest land management. Therefore, it is amazing that turkeys have done as well as they have, considering the small size of Iowa's timber blocks and the noncontinuous distribution of those blocks. Surprisingly, it is the combination of Iowa's timber configuration and the interspersed agricultural lands that biologists attribute the success of the wild turkey population growth. A 50:50 ratio of timbered land and associated agricultural land has proven to

be an ideal combination for wild turkeys. The timber provides security, roosting and nesting sites, and most food items. The agricultural lands provide a ready alternate food source in the form of waste grain, particularly important in the winter months when snow covers the turkey's natural food sources.

The population growth and expansion of wild turkeys has far exceeded biologists' expectations. Initially, biologists believed that turkeys may only survive in Iowa's largest remaining parcels of timber -- Shimek, Stephens and Yellow River state forests. However, wild turkeys proved to be more adaptable than ever imagined and now occur state-wide.

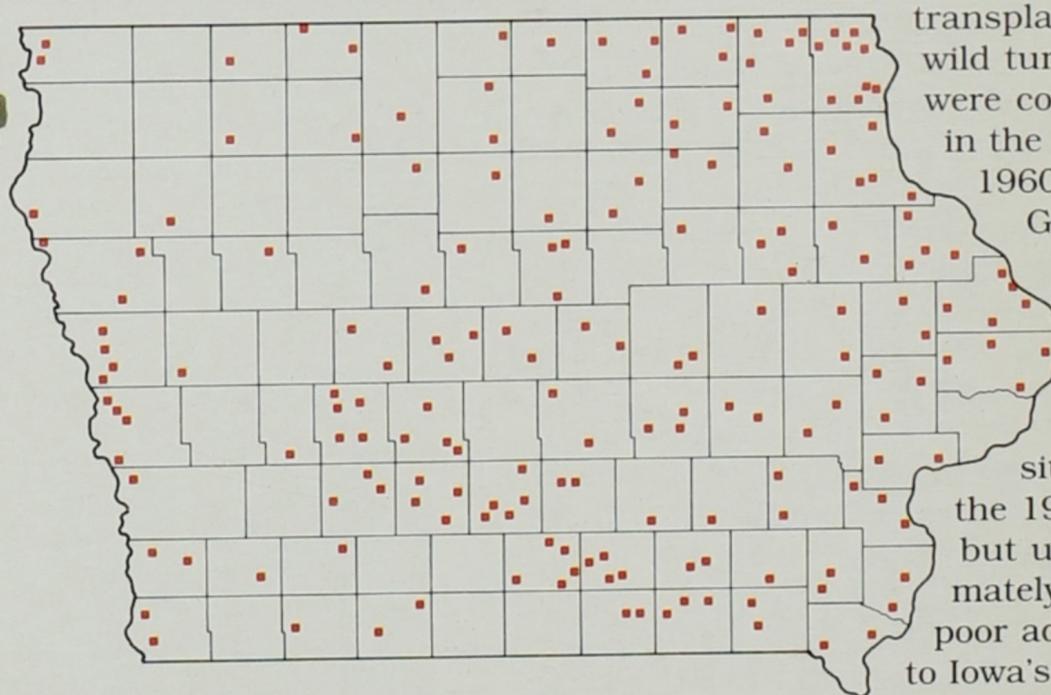
Probably the most significant influence in the population growth other than the adaptability of the turkey was the DNR's aggressive restoration program. The DNR began experimenting with turkey restoration in 1920 using pen-reared birds. Releases were made over the next 18 years but all releases were uniform failures. By 1960 no known wild turkey populations existed in Iowa.

The first attempts at releasing transplanted wild turkeys were conducted in the early 1960s. Rio Grande and Merriam's subspecies were released at several sites during the 1960s but ultimately their poor adaptation to Iowa's oak-hickory forest



Lloyd and Gaylon Crim

Figure 1 - Wild turkey release sites, 1960-1990



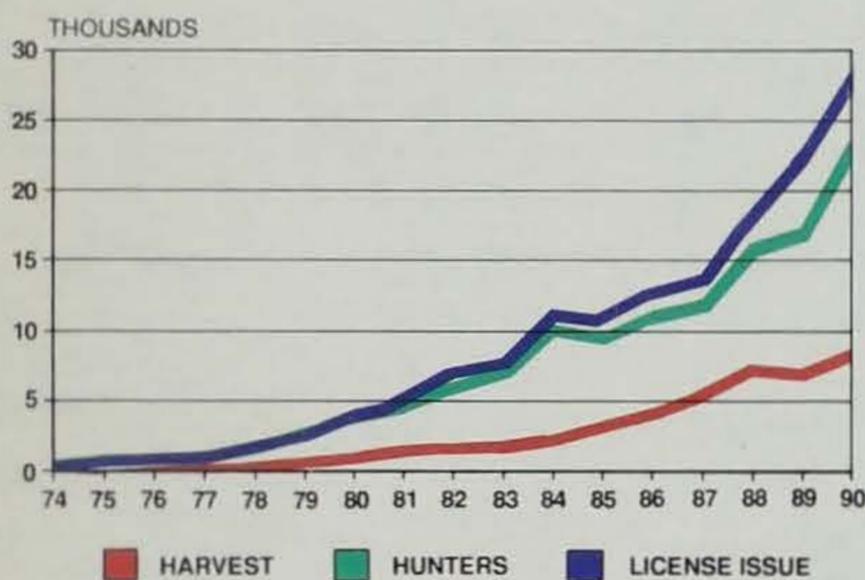


FIGURE 2. Iowa spring turkey statewide estimates 1974-90.

led to population failures for both subspecies.

The first release of Eastern wild turkeys was in 1965 in Lee County. The population response of these turkeys was phenomenal -- survival of released birds, reproduction and poult survival were all excellent. The success of this Eastern subspecies stocking led to an additional stocking that also proved successful. By 1970 it was obvious that the Eastern subspecies was the turkey to use in future restoration attempts.

Since 1965, when the first Eastern wild turkeys were reintroduced, 83 Iowa counties have received at least one stocking of wild turkeys. During the 25 years since 1965, more than 2,800 wild turkeys have been trapped and released at more than 200 different sites scattered across the state (Figure 1) at a stocking rate of approximately three adult gobblers and 10 hens per site. Nearly all sites are considered successful; however, the most recent stockings are still being evaluated. No sites are currently considered to be unsuccessful. Most sites have been opened to hunting after populations were

organism placed into a suitable, "vacant" unrestrained habitat. This population growth can be best visualized by examining the increase in spring hunter and harvest values since the first season in 1974. Annual licenses issued, hunters, and harvest increased gradually from 1974-87. However in 1988 and 1989, there were dramatic increases in licenses issued and hunter numbers due to an unlimited license quota in the fourth season. During the 16-year period, the area open to spring hunting in Iowa also increased dramatically from two small southern zones and one larger northeast zone in 1974 to the entire state during the 1989 spring

established, usually about five years after stocking.

Turkey populations have expanded rapidly into the available habitat as would any or-

season. Hunter numbers and timber acres with huntable turkey populations have increased proportionally -- both have increased about 10-fold -- allowing hunter densities to remain at less than four hunters per square mile of timber per season.

An unexpected consequence of the expansion of the turkey program was the increase in hunters that have continued to utilize available permits in the spring and fall. Biologists initially believed there would be an upper limit to the demand for permits, but as populations and the turkey hunting sport has grown in Iowa, so has the number of individuals that participate in the spring and fall hunts.

Population and hunter management schemes developed and implemented by the DNR have revolved around a centralized theme of maintaining a thriving wild turkey population in all available habitats in the state. A secondary goal is to maximize hunting opportunity while maintaining a quality hunting experience. Unfortunately, perceptions of "quality"

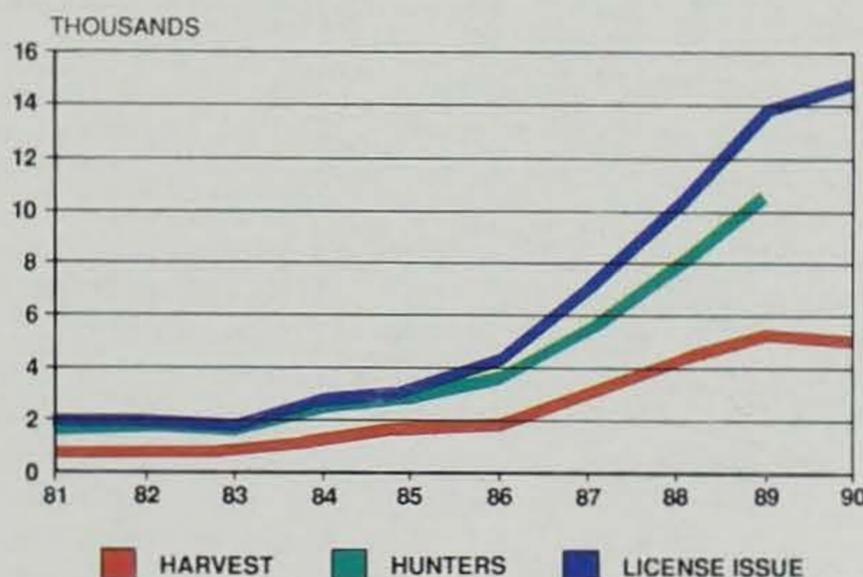


FIGURE 3. Iowa fall turkey statewide estimates 1981-90. (1990 harvest is estimated)

vary among individuals; thus, a quality hunt has been arbitrarily defined as the chance to hunt turkeys reasonably free of interference from other hunters. The primary method used to reduce interference is to control hunter densities through license quotas established for multiple zones and seasons. The DNR conducts an annual survey of spring hunters to evaluate the number of hunters that experienced interference. The DNR's goal for spring hunting is to keep this "interference rate" below 33 percent.

In the fall of 1981, any-sex turkey hunting was initiated in Iowa to provide additional hunting recreation from the wild turkey resource. Because any-sex hunts are more controversial than male-only hunts and potential exists for over-harvesting hens, carefully controlled fall hunts began in 1981, on an experimental basis, in portions of southern Iowa which had established, stable turkey populations. Fall turkey hunting has changed dramatically since the initial experimental 1981 season. The area encompassed by fall hunting zones has increased from two small zones in southern Iowa during 1981 to seven zones in 1990 that contain the majority of Iowa's turkey population and approximately seven times more area than in 1981. The number of fall licenses issued, hunter numbers and harvest have increased steadily since 1981 (Figure 3). Results from research and computer modeling of turkey population data suggest at least 20 percent of the population can be removed during fall hunting without reducing long-term turkey populations.

Fall turkey hunting is still a relatively new sport for Iowans. Hunting techniques are suffi-

ciently different from spring hunting so that past experience with spring hunting seems to have little impact on success in the fall. If anything, reliance on camouflage, sitting still and calling -- the basic spring hunting method -- may be less successful than walking and flush-

What landowners do with their land will ultimately determine future turkey populations in Iowa.

ing turkeys in the small woodlots which comprise the bulk of Iowa turkey habitat.

Because few reliable wild turkey census techniques have been developed, hunter success rates, turkey harvest levels, and age ratios of harvested birds are the best available indicators of relative turkey populations between hunting zones. However, biologists have found a significant relationship between poult:hen ratios recorded in August and the percent juveniles in the fall harvest to the total gobbler harvest in subsequent springs. This suggests that the index to annual productivity could be useful in establishing hunting regulations.

Thus the DNR conducts an annual summer wild turkey brood survey during the months of July and August. Compared to the more formalized census procedures used for more visible wildlife species, indices to eastern wild turkey productivity are generally based on random observations of broods. A list of cooperators (DNR personnel and private individuals living in rural portions of Iowa containing es-

tablished turkey populations), has been established. Each cooperator is sent self-addressed postcards and are asked to record turkey broods sighted between July 1 and August 30. Productivity indices are constructed from these returns.

Three consecutive years of poor turkey production across most of Iowa has lowered turkey populations from the very high numbers that existed in the late 1980s. Hunters will face some restrictions as a result. This decline is temporary, however, and will be quickly reversed if good hatches occur in the next few springs.

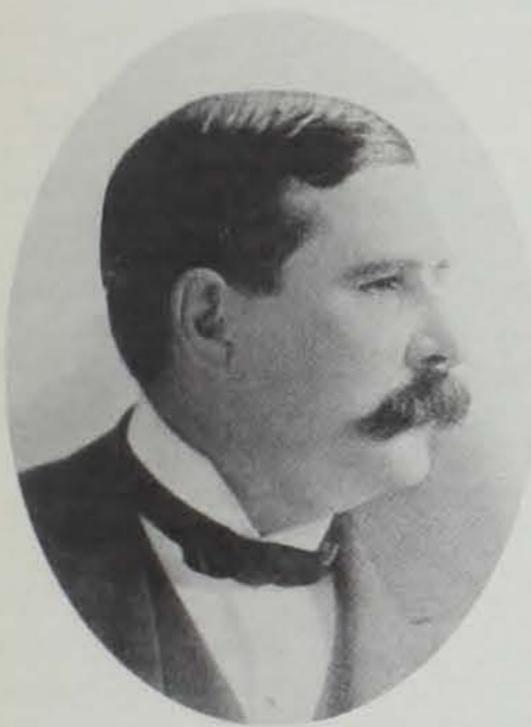
As for the future, the turkeys have done their part -- now it is up to us. The timber resources we have must be maintained and appropriately managed. Turkeys require specific habitat and since so much of Iowa is privately owned, what landowners do with their land will ultimately determine future turkey populations in Iowa.

"The restoration of the wild turkey to Iowa is truly an amazing story, and one whose final chapters still remain to be written." It has been 15 years since this comment was made in the *Iowa Conservationist*. Lots of changes have occurred in those 15 years, but probably one of the most significant for turkey hunters and wildlife enthusiasts is the return of the Eastern wild turkey to Iowa's timber. Now, the "final chapter" on the restoration of the wild turkey to Iowa has been written.

DeWaine Jackson is a wildlife biologist with the DNR wildlife research station in Boone.

by Karen Risch

MORE THAN JUST A NAME



State Historical Society of Iowa

▲
Senator Jonathan Prentiss
Dolliver

Visitors to Iowa's state areas immediately sense all there is to offer, from hiking and fishing to observing ecological systems at work. But history buffs may find these areas to be their vacation havens as well. Nearly one-third of Iowa's 83 state parks, recreation areas and forests were named after famous people. Most are native Iowans but others were simply visitors who in some way or another made Iowa history.

■ Some Iowa parks are named after famous politicians, such as Senator Jonathan Prentiss Dolliver, who was the namesake of **Dolliver Memorial Park** near Fort Dodge. Dolliver came to Iowa in 1878 at the age of 21. He had studied law in West Virginia and dreamed of making a fortune in this state. He wasn't successful as a lawyer, but he did gain fame for his oratory skills.

In 1888, Dolliver was elected to serve in the Iowa House of

Representatives. Twelve years later, he was elected to the U.S. Senate. At one time he was even seriously considered as a candidate for vice-president. He lost out to Theodore Roosevelt who had just gained fame in the Spanish American War.

■ **Lewis and Clark State Park**, located near Onawa, was named for the famous explorers Meriwether Lewis and William Clark. In 1804, Jefferson called Lewis and Clark to explore the vast territory included in the Louisiana Purchase. Before their expedition, no one in the U.S. had settled west of the Mississippi.

They started up the Missouri River from St. Louis early in the spring of 1804 and by August they had reached the spot where the park is now located. The expedition camped in the region for several days exploring and observing its geography, plants and animal life.

■ **Pike's Peak State Park** is another park named after a famous explorer. Located near Spirit Lake, it was first seen by explor-

ers Louis Joliet and Father James Marquette in 1673, although the Peak wasn't actually "discovered" until 1806 by U.S. Army Lieutenant Zebulon Pike.

The government had sent Pike to explore the Mississippi valley and find locations for military posts. Pike chose the Peak because of its view of the valley. The problem was that same peak which made the post



Jay Norwood "Ding" Darling, seated third from right in front row, attended the dedication of Lake Darling State Park. An editorial cartoonist, Darling used his pen to battle pollution, the extinction of waterfowl and poor agricultural practices.

desirable would also be a problem when trying to deliver men and supplies. The government agreed on the vicinity but instead selected Prairie du Chien in Wisconsin for the spot.

■ **Fort Atkinson State Park** was once a military post in Iowa. Named for General Henry Atkinson, this fort, located in the town of Fort Atkinson, was built not to wage war but to preserve peace.

In 1837 white settlers in Wisconsin began urging the chiefs of the Winnebago Indians to move their tribes west of the Mississippi River. The Native Americans were willing to move, but afraid of the Sac, Fox and Sioux who roamed the territory. After three years of negotiation, General Atkinson escorted the Winnebagos to the Turkey River

Valley in northeast Iowa and started construction of a fort to protect them from their enemies. Troops were maintained at the fort for seven years until the Winnebagos moved north to Minnesota.

■ **Ambrose A. Call State Park**, located in Algona, was named for another early Iowan. Ambrose Call and his brother, Asa, were the first to stake their claim in the area now known as Kossuth County. Ambrose carved the following on a walnut tree at the present site of the park -- "Ambrose A. Call claims this grove, July 10, 1854."

■ A well-known conservationist whose name will live on in the history of Iowa's state areas -- **Lake Darling State Park** near Brighton -- is Jay



Jim Sherman



State Historical Society of Iowa

◀
Chief Black Hawk of the Sauk and Fox Indian tribes

and his tribes refused and the Black Hawk War followed. In August 1832, the tribes were defeated at the Bad Ax River in Wisconsin. In 1838, Chief Black Hawk died and was buried near lowaville on the Des Moines River.

■ **Waubonsie State**

Park, located near Sidney, was named for another Native American chief. Waubonsie was chief of the Pottawattamie Indian tribe. The area on which the park is now located was once sacred ground.

■ Major John Fletcher Lacey was another Iowa politician honored with a memorial park. **Lacey-Keosauqua State Park**, which adjoins the town of Keosauqua, was originally named Big Bend in 1921. The name was later changed to Keosauqua because it was considered more "colorful." Keosauqua is an Indian term meaning "the stream bearing a floating mass of snow, slush or ice." In 1926, the name was again changed, this time to Lacey-Keosauqua in honor of Major Lacey.

Lacey, a native of West Virginia, served four years in the Iowa Volunteer Infantry during the Civil War. After the war ended, he moved back to West Virginia to study law. He returned to Iowa and was elected to the Iowa House of Representatives in 1868. By 1888 he was a member of Congress.

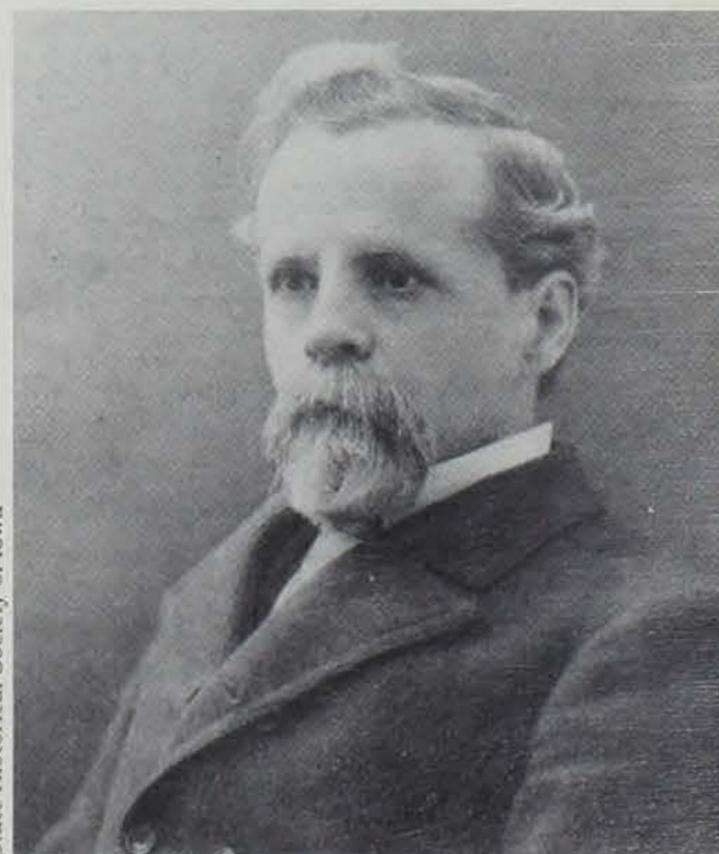
Lacey served 16 years in

Congress. He campaigned for conservation in Iowa before Theodore Roosevelt started the national movement and was a conservationist before his constituents were interested in the cause. He was the author of the "Lacey Bird Protection Act," which is described as his greatest legislative achievement. This act paved the way for legislation which was the most important single advance in wild bird protection up to that time.

Lacey was also involved in many laws establishing national parks including Yellowstone, Crater Lake, Yosemite and the petrified forests of Arizona. Lacey was a champion of a progressive national forestry program and was recognized in Congress as the spokesman of the forest.

Lacey was described by Dr. Louis Hermann Pammel, original chairman of the State Board of Conservation, as "by profession a lawyer, by necessity a

▼
Major John Fletcher Lacey



State Historical Society of Iowa

Norwood "Ding" Darling. Darling was an editorial cartoonist with the *Des Moines Register* for 40 years until he retired in 1949. During 32 of those years, Darling's work was syndicated in as many as 130 other daily newspapers throughout the United States. Through his art he championed the conservationist cause.

Darling won two Pulitzer Prizes for his political cartoons, but conservationists probably will remember Ding more for his work in wildlife. He used his pen to battle pollution, the extinction of waterfowl and poor agricultural practices. He died in 1962, his final cartoon headed "Bye now -- it's been wonderful knowing you."

■ Native Americans have also been the source of names for Iowa's state parks. Chief Black Hawk of the Sauk and Fox tribes was a famous warrior and the namesake for **Black Hawk Lake State Park** near Lake View.

In 1828, President John Quincy Adams formally declared that all land east of the Mississippi was to be sold to settlers. This meant that the Native Americans would be forced further west. Chief Black Hawk



DNR Photo



State Historical Society of Iowa

▲ **Pammel State Park** was named for the "father of Iowa's state parks," Dr. Louis Hermann Pammel. The park's most recognizable feature is the Harmon Tunnel. This tunnel was dug in the 1850s to divert water from the Middle River to provide power for operating a sawmill and grist mill.

soldier, by selection and design a statesman, but by nature and by choice a conservationist."

■ Pammel himself, was one of Iowa's most prominent conservationists. **Pammel State Park** is located near Winterset.

Often described as the father of Iowa's state parks, Dr. Louis Hermann Pammel was a botany professor at Iowa State University, but his real contribution to Iowa's natural heritage came in his work with the State Board of Conservation. It is a large part due to Pammel that Iowa was one of the first states to have a comprehensive conservation plan. Pammel served the board as chairman from its beginning in 1918 until his retirement in 1927. As a result of his work, more than 70 parks were acquired within the state.

■ **Lake Macbride State Park** near Iowa City is another park named for a university professor and conservationist. Thomas Huston Macbride was president of the University of Iowa from 1914 to 1916. He was also a noted botanist, forester and educator.

■ **Shimek State Forest**, near the southeast Iowa town of Farmington, was also named for an educator at the University of Iowa. Dr. Bohumil Shimek was head of the botany department from 1914 to 1919. He was also a naturalist and one of Iowa's early conservationists.

Shimek was born in 1861 to Francis Joseph and Maria Theresa Shimek, political refugees from Bohemia, who had participated in the 1848 political revolution against the oppres-

sive Austrian Hapsburg dynasty in present-day Czechoslovakia. Fearing for their lives, the Shimeks immigrated to America in 1856, settling in Iowa, where they took up farming.

Shimek graduated from the University of Iowa in 1833. His degree was in civil engineering, but his heart was in the natural sciences. He soon turned to botany as a source of income and personal satisfaction. He

returned to the University of Iowa in 1890 and became in time a professor of botany.

You can learn more about these famous people in Iowa history at your local library, but you could also visit an Iowa state park. See for yourself why Lewis and Clark chose that particular spot to explore during their famous expedition. Learn first hand what inspired Ding Darling to draw his conserva-

tion-minded cartoons and etchings. Make a little history of your own this summer while you ponder Iowa's historical past and its ecological future.

Karen Risch was a publications intern for the department last summer. She is currently a senior at Iowa State University where she is majoring in family consumer journalism.

More State Areas with Historical Names

Beed's Lake State Park in Franklin County -- William Beed, a Hampton merchant, purchased the area for recreational lake and park activities long before the Iowa park system was an accepted idea.

Emerson Bay State Park in Dickinson County -- The Emerson family homesteaded on the land in the 1860s.

Gardner Sharp Cabin in Dickinson County -- Abbie Gardner Sharp was the only survivor of the Spirit Lake Massacre. The cabin was her family's home and the site of the massacre.

George Wyth Memorial State Park in Black Hawk County -- George Wyth was a businessman from Cedar Falls whose hobby was the conservation of rivers and parks.

Hayden Prairie in Howard County -- Ada Hayden was a botany professor at Iowa State University who devoted her life to preserving prairies.

Lake Anita State Park in Cass County -- Anita Cowles was the niece of the land's original owner, Louis Beason.

Lake Wapello State Park in Davis County -- Chief Wapello of the Ioway tribe of Indians roamed this territory approximately 100 years ago.

Margo Frankel Woods State Park in Polk County -- Mrs. Frankel of Des Moines was a member of the State Board of Conservation in its beginning.

McIntosh Woods State Park in Cerro Gordo

County -- Rose M. McIntosh and her family were pioneers in this area.

Palisades-Kepler State Park in Linn County -- This park's original name was Palisades, a word meaning a line of lofty, steep cliffs, usually found along a river. The name Kepler was later added for the Louis Kepler Memorial tract, a piece of land adjoining the Palisades, which was officially added to the park in 1926.

Pillsbury Point State Park in Dickinson County -- Reverend Samuel Pillsbury lived here as a pioneer from the East. His first cabin was the Gardner Sharp Cabin, site of the Spirit Lake Massacre. He died in 1864.

Sheeder Prairie in Guthrie County -- The original homesteader was Oscar Sheeder and his family.

Stephens State Forest in Lucas County -- Dr. T. C. Stephens was a prominent educator and a Sioux City native.

Stone State Park in Plymouth County -- When Thomas Jefferson died, he divided his land equally between his son and his daughter. The daughter gave her part to Sioux City and her brother sold his land to the city which, in turn, gave the entire plot to the State of Iowa.

Wilson Island State Recreation Area in Harrison County -- George Wilson's political career spanned half a century. He was involved in all three branches of government.

by Jim Christianson

What's Up, Dock?

The sounds of lake-shore construction are a rite of spring to many lake-area residents, especially riparian lakeshore owners and commercial enterprises. This activity is a significant sign, after a long cold winter, of lake activities to come and is looked upon with great anticipation by potential dock users.

Docks, both private and commercial, are multi-use structures erected for the convenience of the user in pursuit of many water-related activities, including swimming, boating, sunbathing, fishing and just plain relaxing -- soaking up the atmosphere provided at a natural lake.

The multi-use docks of Spirit Lake lend themselves to

many water activities but one of prime significance and of considerable interest is fishing. Opportunities abound with species ranging from bullhead to northern pike, and fishing activity around the clock at various times of the season. The level of exertion ranges from constant casting and retrieval to sedentary fishing with bait and bobber.

As has been said in our society, "change is the only consistent activity." Spirit Lake and its associated adjacent properties are no exception. In the 1950s and early 60s there

were numerous boat liveries, public areas and resorts around the lake. Throughout the years, development has replaced the liveries and resorts with private lakeshore residents. Over a period of 25 years, the number of docks has increased to approximately 600, an increase of 61 percent. This increase has added a new dimension to the recreational fishery of the lake. Not only have private dock numbers increased but public ones as well -- to seven located around the lake and one pier structure at the "north grade" for angler use.

*The multi-use docks
of Spirit Lake
lend themselves
to many water
activities.*



Jim Christianson



Ron Johnson

Not only have private dock numbers increased but public ones as well -- including one pier structure at the "north grade."

Docks give the angler several advantages; they are very convenient for the lakeshore residents; they often get the angler into more productive water; and they provide food and shelter structure for panfish, bass and northern pike. Generally, the timetable for dock angling is walleyes in the spring, followed by fishing variety later into the spring and throughout the summer, and finally walleye again in the fall.

Dock angling is one of the most convenient ways to catch walleyes. You do not have to don a pair of waders with accompanying paraphernalia and stand in waist-deep, cold water to cast for in-shore moving fish; or climb in a boat and pursue the "marble eyes." Instead just grab an outfit and trudge onto the dock to cast or still fish. The best spring

walleye fishing usually begins when the water temperature is in the mid-50s after the walleyes have satisfied their spawning desire and start cruising the shallows in search of a meal. The most active fishing seems to be at dusk or shortly thereafter, but for the persistent angler there seems to be activity pluses throughout the night. The most popular equipment consists of a five-and-one-half-to six-foot spinning rod with six-pound test line rigged with an eight-ounce leadhead jig. The jig is usually dressed with a plastic body and tipped with a minnow. The most popular colors of plastic are white, black and chartreuse.

Fishing finesse varies from the bounce-and-reel to the reel-and-twitch to the straight-line retrieve at various speeds. Some experimentation is war-

ranted here because walleye can be very finicky and what works one night may not necessarily work the next night. Just remember, the old adage "fish slow in cold water for early season walleyes" does not always apply to dock angling because you are fishing for active fish, and it does not seem

Ron Johnson



to be a problem for these fish to catch up to a fairly fast retrieve.

Springtime angling lasts from two to six weeks depending on the number of walleye, in-shore movements and environmental conditions. Fall walleye angling is very similar in technique and equipment to spring fishing but is usually a bit shorter in duration, with activity peaking in late September and early October. Still fishing with either a minnow or leech can also be effective but is not as popular as the casting technique. A slip or a lighted bobber can be very helpful with the still fishing technique. Through information collected by the Department of Natural Resources, angling success has been documented at a few thousand to several thousand fish caught from docks, primarily in the spring.

As the water warms and the season lingers into summer, the dock walleye fishery tapers off and a variety of other species become active. The northern pike, a predator, is always looking for an easy meal while cruising the dock structures. Most active times are a couple hours before dusk and after dawn. For the active angler, casting a pink leadhead dressed with a white twister tail body is very effective as well as casting some type of minnow-imitating lure. But remember, unless you want to lose a lot of terminal tackle, you better use a short, four-inch, wire leader to combat these toothy critters. Still fishing can also be productive using a fairly good-sized minnow or chub fished below a float.

Bullheads, one of the most popular species for shore anglers, can be harvested from

docks. These fish make pre-spawn in-shore movements fairly early -- in late April and May -- and are looking for food. The juicy night crawler is a tempting meal too good to resist for the "slicks" and can be fished either on the bottom or suspended using a float if the bottom is too cluttered with new vegetation. Still fishing is definitely the technique, and day or night can be productive for the usually cooperative bullhead.

Panfish such as yellow perch, bluegill and crappie can be taken by the dock angler.

Dock angling has become a very popular fishing activity at Spirit Lake, partially because of convenience, availability, catch success and fishing variety.

These fish are using the dock structure for shade and food -- feeding off the small micro-organisms attached to the docks or small minnows using the same dock environment.

Casting with light tackle using a fairly slow retrieve is the preferred technique for panfish. A float about two to three feet above a mini-jig will suspend the bait off the bottom making it more controllable and available to the fish. For bluegill, the mini-jig is usually dressed with insect larvae or a piece of night crawler. For each perch and crappie, a plain mini-jig can be used or enhanced with insect

larvae, especially for yellow perch. Also, still fishing with small minnows can be an effective panfish producer.

Because two fishing rigs can be used by an angler in Iowa, a combination of techniques for any of these species fished from docks, may prove useful.

Largemouth bass, another species that takes advantage of docks can be caught throughout the day from late spring through the summer. Fish are taken on a variety of baits from night crawlers to buzz baits depending on the orientation of the fish to the dock, time of year and activity of the fish. Also, bass and panfish that use docks for habitat have become increasingly popular targets not only for anglers on the docks but for boat anglers who "work a dock" for these various species.

As in many fishing situations, dock anglers should try and reduce excessive noise to avoid spooking fish -- especially if the target species is using the dock structures for shelter.

Dock angling has become a very popular fishing activity partially because of convenience, availability, catch success and fishing variety. This type of fishing has become an important part of the Spirit Lake walleye harvest and an integral ingredient to the management of this species in particular.

These structures are definitely temporary micro-habitats that attract fish and, in turn, the opportunistic angler.

Jim Christianson is a fisheries management biologist for the department at Spirit Lake.

WARDEN'S DIARY

CHUCK HUMESTON

HOW I SPENT MY DAY OFF

This is not about hunting or fishing or boating or snowmobiling or even anything usually associated with a conservation officer. But it does involve outdoor recreation. Around April for the past two years people usually start saying, "Well, I suppose you've got your turkey hunting area all scouted, and are ready to go?" No, I don't. But I admire the officers who do, for they show a larger portion of sanity than I. For the past two years in April, I've enjoyed my own form of recreation . . . running a marathon.

If you are not familiar with this, it is a simple matter of strapping on a pair of running shoes and running a distance of 26.4 miles. I wish I had the patience to sit still under a tree hunting turkeys this time of year. I really do. What does this have to do with being an officer, you may ask?

Well it's a fact law enforcement is one of the most dangerous and stressful occupations in the country. I took up running so I could take out those stresses on the pavement rather than on my family and friends. Also, when a person puts on a badge, they accept an obligation to be as fit as possible, particularly in this job involving slog-ging through marshes, mud, rivers, snowdrifts and up or down hills. For me, it's also my time to think. (You have a lot of time to think during 26.4 miles.)

Two years ago I had been running distances of 10K and less, but the marathon held a mystique for me. Could I do it and survive?

Armed with an article aptly entitled "Running Your First Marathon," I began a training regimen of running six days a week of distances between four and 20 miles. I filled out my application and signed a check for the fee. There was no turning back. I was signed up for the Drake Relays Marathon in Des Moines. My friends questioned my sanity. So did I.

The night before the run, my wife and I drove to Des Moines, and I walked up and looked at

My friends questioned my sanity. So did I.

the finish line. Suddenly I was scared! I doubt I slept one hour that night. I had challenged myself.

The next morning, I limbered up at Drake Stadium and waited with the pack of about 500 runners. "Only 26 miles," I kept telling myself. Leaving out the .4 made it seem a little shorter. The gun went off, and it was underway. "Take them one at a time," I kept telling myself.

We started out with sunshine, and ended up in cold temperatures with drizzle and mist. I saw people dropping out with cramps, exhaustion and hypothermia. "Why am I doing this? Don't stop. Don't quit. One at a time."

At a certain point you feel

your energy starting to go. Your body has used all its reserve and starts burning its own muscle fibers for energy. At this point the whole question is up to you. "Quit or go on?"

You become intensely hungry. I saw people on the curb with food. I fantasized about stealing their food. At this point the run forces you to confront yourself. There are no excuses. Still, it's amazing the clarity with which you begin to notice things. Sort of like the difference between walking through the outdoors or rushing through it in a four-wheel-drive.

I turned the corner and could see the finish line. Just behind me someone had collapsed on the street and was being tended to by paramedics. So close. I felt for him because I understood the reasons.

I crossed the finish line in a blistering time of four and one-half hours. I walked (staggered!) directly to my wife who was waiting for me. There were no words to explain the elation.

One thing about conservation officers I've noticed is that we are all a bunch of characters with different interests. This experience, like all the adventures we have in the job, gets filed in our minds; memories nobody can ever take away from us, and only understood by those who have been there. Many of my friends right now will experience the challenge of the turkey hunt. Maybe I'll join them, but again I hear that pavement saying, "Show me what you've got."

CONSERVATION

UPDATE



DOT Photo

DOT and DNR Conduct Roadside Management

by Tracey Sheesley,
DOT information
specialist

Forests once covered 15 percent of Iowa; the remaining land was blanketed with tall grass prairie or savanna (a combination of trees and prairie). To reestablish and protect Iowa's "beautiful land" heritage, the Iowa Department of Transportation — on its own and in conjunction with the Department of Natural Resources — has developed several programs for the state's roadsides.

Spraying and mowing practices are constantly reviewed and updated to ensure they are suited to the environment and DOT needs.

The DOT stopped using dry herbicides in 1986 and has reduced the amount of liquid herbicide applied by 80 percent in the last five years. The three products now in use are lower in toxic ingredients and are of a consistency that practically eliminates spray drift that could damage surrounding plants.

Whenever possible, noxious weeds are spot mowed. Other mowing occurs on a specific schedule, depending on the time of year and height of plants. This mowing is designed to accommodate the completion of most wildlife nesting periods. It also enhances the safety of motorists, who have to pull off the road, by increasing visibility of guardrails and other obstructions, and by helping to reduce blowing and drifting snow.

Areas on urban freeways are mowed three times per year to blend with the look of adjacent lawn areas. This mowing also helps reduce rodent infestations and possible fire hazards. Gateways into the state are mowed several times per year to provide an attractive first impression to motorists entering Iowa and to match the gateway management of adjoining states.

A new approach to vegetation management is making an impact on Iowa roadsides. The Integrated Roadside Vegetation Management (IRVM) program supplies environmental information, safety training, and continuing education to state, county and city work crews.

The IRVM program builds on the existing programs at the DOT. Through the use of native wildflowers and native plants, these programs help control erosion and weeds; improve the climate and enhance water quality; increase the scenic value of the area; and accommodate recreation uses.

Along with other funds, the IRVM project uses money

from the living roadway trust fund, a part of the Resource Enhancement and Protection Program. Through the use of this money, the DOT has purchased native grass drills for each of the six DOT districts and several thousand dollars of seed to begin replanting more native wildflowers and grasses.

One of the DOT's more recent programs, a joint venture between the DOT and the DNR, is aimed at reforesting the roadsides along the state's highway system. More than 25,000 new trees and shrubs were planted last year at five sites around the state. Next year, approximately \$2 million will be spent to reforest at least six other areas along Iowa roadsides.

During the maintenance of highways, the DOT also replaces woodlands with an equal or larger number of trees and shrubs as close to the site as possible. Many wildflower and native grass stands are planted and nurtured to add color and provide a link to Iowa's tall-grass prairie heritage.

1990 Top 25 Turkeys

*New All-Time Top 10 Turkeys

TOTAL SCORE	WEIGHT	BEARD LENGTH	LEFT SPUR	RIGHT SPUR	NAME/CITY	COUNTY TAKEN
*88.94	25 lbs. 7 ozs.	10-4/8	2-1/8	2-1/8	Thomas J. Moravec, Cedar Falls	Allamakee
*83.06	28 lbs. 1 oz.	11-2/8	1-4/8	1-6/8	James H. Meeks, Solon	Van Buren
*81.06	25 lbs. 5 ozs.	12-2/8	1-4/8	1-5/8	Ronald James Moore, Pulaski	Davis
80.62	29 lbs. 2 ozs.	12	1-3/8	1-3/8	Gerry Hildal, Jewell	Hamilton
80.50	28 lbs.	11-7/8	1-4/8	1-3/8	Gale Harsha, Kellogg	Davis
80.12	27 lbs. 2 ozs.	10-2/8	1-5/8	1-5/8	Eddie W. Bartz, Hampton	Fayette
79.75	29 lbs.	11	1-4/8	1-3/8	James L. Malley, Keota	Washington
79.25	24 lbs.	12-5/8	1-3/8	1-5/8	Tony Sargent, Argyle	Lee
79.06	26 lbs. 5 ozs.	12	1-4/8	1-3/8	Rick Archer, Onawa	Monona
78.50	25 lbs. 4 ozs.	11	1-5/8	1-4/8	Rick Stevens, Ottumwa	Appanoose
78.50	27 lbs. 12 ozs.	11	1-4/8	1-3/8	Bobby D. Hull, Blockton	Ringgold
78.25	26 lbs.	10-4/8	1-4/8	1-5/8	Rustin J. Lakin, Cedar Rapids	Warren
78.25	27 lbs.	10-5/8	1-4/8	1-4/8	Steve Thomas, Albia	Monroe
78.19	29 lbs. 7 ozs.	11-2/8	1-2/8	1-3/8	Ray Waschkat, Waterloo	Allamakee
78.12	27 lbs. 2 ozs.	10-4/8	1-4/8	1-4/8	Gerald K. Tuttle, Sioux City	
78.00	27 lbs.	11-1/8	1-4/8	1-3/8	Keith Disterhoft, Marengo	Iowa
78.00	30 lbs. 8 ozs.	11-2/8	1-2/8	1-2/8	Edwin Earl Simpson, Jr., Albia	Monroe
78.00	25 lbs.	11-4/8	1-4/8	1-4/8	Robert L. Hines, Hamburg	Fremont
78.00	26 lbs. 4 ozs.	10-2/8	1-4/8	1-5/8	Michael A. Holtkamp, Cedar Falls	Black Hawk
77.88	23 lbs. 6 ozs.	11	1-5/8	1-5/8	Byron S. Shaw, West Burlington	Lee
77.75	27 lbs.	11	1-3/8	1-4/8	Robert W. Weber, Jr., Camanche	Clinton
77.50	25 lbs. 8 ozs.	11	1-3/8	1-5/8	W. K. Doran, Boone	Van Buren
77.38	25 lbs. 14 ozs.	12	1-3/8	1-3/8	David Wineinger, Glenwood	Mills
77.12	26 lbs. 6 ozs.	11	1-3/8	1-4/8	Steve Brauhn, Linn Grove	Monona
77.12	26 lbs. 2 ozs.	10-4/8	1-4/8	1-4/8	Paul Rummelhart, Iowa City	Monroe

All-Time Top 10 Turkeys

TOTAL SCORE	WEIGHT	BEARD LENGTH	LEFT SPUR	RIGHT SPUR	NAME/CITY	COUNTY TAKEN	YEAR
*88.94	25 lbs. 7 ozs.	10-4/8	2-1/8	2-1/8	Thomas J. Moravec, Cedar Falls	Allamakee	1990
86.63	29 lbs. 10 ozs.	11	1-6/8	1-6/8	Duane Frey, Winterset		1987
85.69	28 lbs. 3 ozs.	11-2/8	1-6/8	1-6/8	Matt Whatley, Riverside	Davis	1988
83.88	28 lbs. 6 ozs.	10-2/8	1-6/8	1-6/8	Bryan T. Hayes, Mystic	Appanoose	1989
83.31	30 lbs. 5 ozs.	11-4/8	1-4/8	1-4/8	C. L. Current, Monroe	Marion	1987
*83.06	28 lbs. 1 oz.	11-2/8	1-4/8	1-6/8	James H. Meeks, Solon	Van Buren	1990
82.75	28 lbs.	13	1-4/8	1-4/8	Steven M. Dirks, Wyoming	Jones	1988
82.25	25 lbs.	11	1-6/8	1-6/8	Bruce Parks, Burlington	Henry	1989
81.75	25 lbs.	12	1-5/8	1-5/8	Merlin Houselog, Dubuque	Dubuque	1989
*81.06	25 lbs. 5 ozs.	12-2/8	1-4/8	1-5/8	Ronald James Moore, Pulaski	Davis	1990

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 State 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:

- May 2, Cherokee
- June 6, Fort Dodge
- July 11, Corning

Environmental Protection Commission:

- April 15-16, Des Moines
- May 20-21, Des Moines
- June 17-18, Clayton County

State Preserves Advisory Board:

- June 11, Des Moines

Boating Registrations Expire

The Department of Natural Resources reminds boaters that this is the year to register boats. At midnight April 30, all boat registration certificates will expire.

Vessel owners may obtain an application for registration from the county recorder in the county in which they reside. Registration will be valid for a two-year period ending April 30, 1993. The fees are as follows:

Iowa Boat Registration Fees

			Odd-Numbered Year	New Registrations Only Even-Numbered Year
No Motor/ No Sail	Any length	New	\$5.00	\$2.50
		Renew	5.00	----
Motorboat OR Sailboat	Less than 12 Ft. in length	New	8.00	4.00
		Renew	8.00	----
	12 Ft. to less than 15 Ft.	New	10.00	5.00
		Renew	10.00	----
	15 Ft. to less than 18 Ft.	New	12.00	6.00
		Renew	12.00	----
	18 Ft. to less than 25 Ft.	New	18.00	9.00
		Renew	18.00	----
	25 Ft. or more in length	New	28.00	14.00
		Renew	28.00	----
Documented Vessels	Any length	New	25.00	12.50
		Renew	25.00	----

A \$1 writing fee is charged by the county recorder for each registration.

Boating Fatalities Increase from 1989

Iowa boaters were involved in 51 accidents during 1990, resulting in 10 fatalities, according to Iowa Department of Natural Resources' officials. Property losses exceeded \$100,000.

This is an increase from 1989 statistics when there were 49 reported accidents, resulting in five deaths.

Iowa's lakes and reservoirs proved to be the most dangerous, accounting for 27 accidents. Iowa's

inland and border rivers accounted for 24 accidents, 19 of which were on the Mississippi River. Types of accidents included six vessels capsizing, five people falling overboard, four vessels colliding with a fixed object,

six water skiing and tubing mishaps, four fires on board and 16 vessels colliding with other vessels.

According to Sonny Satre, recreational safety coordinator for the DNR, almost all of the accidents could have been avoided by using common sense and by following simple navigational rules. According to Satre, causes of accidents included improper outlook, rough or hazardous water, faulty equipment, operator negligence and alcohol use.

Satre urged boaters to be familiar with Iowa's boating regulations. To avoid collisions, boaters should be knowledgeable of right of way rules and speed and distance regulations. Boaters may obtain a copy of *Iowa Boating Regulations* from county recorder offices or by writing to the DNR, Wallace State Office Building, Des Moines, Iowa 50319-0034. *Keeping Iowa Waters Safe*, a 16-page booklet on water safety, can also be obtained.

CLASSROOM CORNER

by Robert P. Rye

Spring brings people outside. These trips outside are greeted by new leaves, flowers, baby birds and insects. How close do you look at insects? Do you look at the wings? What do insects eat? What is their egg-laying behavior? Answer the following questions and then go outside and find additional insect information.

1. Which insect can cross a pond without breaking the water surface?
a. Water boatman c. Water strider
b. Giant water bug d. Ripple bug
2. Which insect has only one pair of wings?
a. Housefly c. Mayfly
b. Butterfly d. Dragonfly
3. What is the only insect that can look over its shoulders?
a. Paper wasp c. Crane fly
b. Ant d. Praying mantis
4. Which insect glues its eggs in the fall on high twigs and in the spring has young that crawl down to eat developing leaves?
a. Rove beetle c. Buffalo treehopper
b. Tent caterpillar d. Doodle bug
5. Which insect spends the larvae stage of its life carrying a case around?
a. Dobsonfly c. Caddisfly
b. Ambush bug d. Milkweed bug
6. Which insect is known for being a pest that feeds on food, books, rugs and clothing?
a. Cockroach c. Horsefly
b. Silverfish d. Bedbug
7. Which insect is in a large family of dull-colored, medium-sized moths whose larvae feed at night on garden plants?
a. Maggot c. Cutworm
b. Sawfly d. Weevil
8. What insect makes paper from its shelter material?
a. Hornet c. Leaf cutting bee
b. Mudwasp d. Spider wasp

ANSWERS:

1. C 2. A 3. D 4. B 5. C 6. A 7. C 8. A

COUNTY CONSERVATION

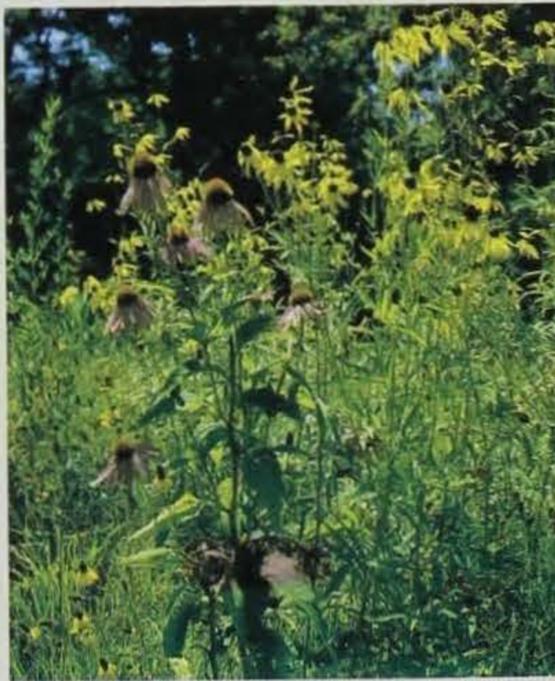
WHAT'S OUT THERE?

by Jerry Abma

Page County's natural history survey evolved from the Page County Conservation Board's outdoor education program. From its inception, the survey has guided the conservation board in educating the public and protecting Page County's natural resources.

Prior to 1982, the conservation board's director and other employees conducted programs for civic, community and church groups, schools and the general public in the county's parks and natural areas. The conservation board decided, in 1982, to expand its conservation education program, hoping to reduce vandalism and to acquaint the public with Page County's natural resources. The board believed that the more people knew about the conservation areas and natural resources in the county, the better they would take care of those resources.

The Page County Conservation Board hired a naturalist to take these ideas and translate them into a conservation education program. Materials and ideas were gathered, and programs were developed and sponsored. As people became more interested in Page County's plants and wildlife through these programs, the conservation board decided to



Ken Formanek

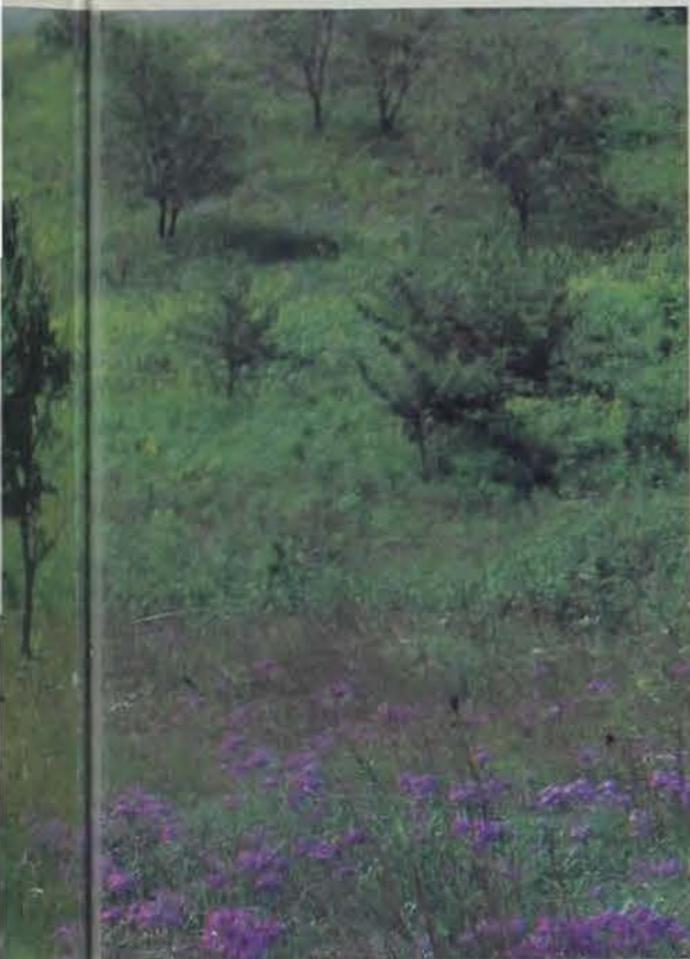
identify the native animals and flowering plants of Page County. The natural history survey developed from a desire to appreciate and learn about the wildlife in the county.

By compiling field guide information, historical records

◀ An inventory of the flowering plants of Page County was begun by looking at relatively undisturbed areas in the county, including prairie tracts, cemeteries and other "interesting" natural areas. To date more than 660 species of plants have been identified.

and personal observations, the results of the survey indicated that potentially more than 300 species of birds, 80 species of mammals, 40 species of fish and 40 species of reptiles and amphibians were found in Page County.

To inventory Page County's woodlands, the conservation board used aerial slides, iden-



Page County Conservation Board

tifying a total of 19,787 acres of woodlands in the county. This compared to the original surveyor's notes showing 51,200 acres of woodlands -- a 60 percent reduction of woodlands in Page County. In comparing the quality and type of woodland, only 2,195 acres -- or four percent -- resembled the original woodlands, while the remaining acres were urban, farmstead and fencerow plantings.

This information about Page County's wildlife and woodlands continually assists the Page County Conservation Board in providing quality educational programs for the public, as well as guiding the conservation board in wildlife habitat and forestry management projects.

In conjunction with the

◀ Page County's natural history survey has been popular with the people in the county as they become more aware of the tremendous variety of plants and animals dwelling within the county. As a result of the survey, the board has sponsored many activities for students, such as a "young naturalist day camp" at Palmquist Prairie last summer.

survey, the conservation board began to develop a slide file of Page County's wildlife. This slide inventory has also proven valuable in developing programs for hunter education, wildlife identification and many other conservation projects.

An inventory of the flowering plants of Page County was begun by looking at relatively undisturbed areas in the county, including prairie tracts, cemeteries and other "interesting" natural areas. To date more than 660 species of plants have been identified.

As a result of this inventory, the conservation board began a program of prairie plantings and restoration on county conservation areas and private property, gathering seed locally to maintain local genetic material.

The conservation board also sponsored a butterfly count, big tree contest and slide inventory of the flowering plants of Page County, adding information to the natural history survey and providing conservation edu-

cational opportunities for the public.

Page County's natural history survey has been popular with the people in the county as they become more aware of the tremendous variety of plants and animals dwelling within the county. The survey also continues to assist the conservation board in answering important management questions. What resources are available in Page County? Where are those resources found? How can we best manage those resources? How can we best educate the public to take care of those resources?

Page County's natural history survey will allow the people of the county to make informed decisions about the management of the natural resources in Page County -- now and for future generations.

Jerry Abma is the director of the Page County Conservation Board.



Ron Johnson

TREE CITY USA

A new small green and white sign is appearing at the entrances of many cities and towns across Iowa. It reads "TREE CITY USA."

TREE CITY USA is an annual community forestry award from the National Arbor Day Foundation and the Iowa Department of Natural Resources. This annual award represents more than just pretty trees. It is given to communities for a committed program of improved street and park tree management involving both city officials and volunteers.

The street and park trees in Iowa communities provide many economic and environmental benefits to their residents. Economically, trees can increase property values five to 15 percent. According to the Forest and Forestry Division of the DNR a typical city street tree in Iowa is worth \$800 in property value. Community

trees also reduce energy costs associated with heating and cooling by as much as 50 percent. An Iowa community with well-cared-for trees along its Main Street is always attractive to shoppers and tourists during any time of the year.

From an environmental standpoint, shade trees in their natural growth process actively reduce the amount of carbon dioxide (CO₂) in the air by storing the carbon in the

wood and releasing oxygen. One mature tree absorbs 14 pounds of CO₂ per year. Other benefits of community trees include wildlife habitat for game and nongame species, increased outdoor recreation opportunities and improved aesthetic considerations. In fact, recent studies around hospitals in the Midwest indicate that facilities with well-cared for trees improve the mental philosophy of patients and workers.

But the condition of Iowa's community trees can only be rated fair. Recent work by the DNR indicates that five trees are removed for every tree planted in the average Iowa community. Because the streets and parks of Iowa communities are dominated by three major species — green ash, silver maple and sugar maple — urban forests are susceptible to major losses from a potential disease or insect problem, similar to Dutch elm disease that wiped out Iowa's

by John Walkowiak

American elms in the late 1960s. Most of Iowa's urban trees are old for their locations and tough growing conditions, averaging between 60 to 80 years old. In addition, the constant battle between community tree growers and utility companies on clearing lines reduces the trees' vigor and makes them more susceptible to insects, disease and internal decay. Finally, as the urban areas of Iowa expand, more trees are lost to development for housing and shopping areas.

An urban or community forestry program with TREE CITY USA as a goal can reverse this trend of tree resource decline in any city or town, no matter what the size. Community forestry is a coordinated effort by both city officials and volunteers to increase tree planting, improve the maintenance of existing trees, and to expand public awareness about the value of trees. For community forestry to start in any city or town it requires a key individual or group to drum up support for trees. Groups that have shown the greatest amount of interest in trees in Iowa include volunteer tree boards, city park boards, beautification committees of the local chambers of commerce, garden clubs and many others. Most of these groups use TREE CITY USA as a realistic goal to achieve in dealing with the long-term management of trees.

To become a TREE CITY USA in Iowa, a community must meet four requirements — they must have a legally established or recognized tree board, they must have a city tree ordinance, the community must spend \$2 per capita on their tree resources and they must officially celebrate Arbor Day.

A legally established or recognized tree board demonstrates that the community is committed to long-term management of its community tree resources. Because trees are a long-term effort, groups need to constantly reinforce the importance of trees every year to the community.

A tree ordinance, on the other hand, defines the city's legal powers and responsibilities concerning community trees. A tree ordinance protects both residents' and the city's tree resource from improper management. A properly written tree ordinance generally involves only public property trees (street and park trees), but it can also act as a guideline to aid both the community's forestry program and private homeowners in proper tree care.

The \$2 per capita budget to be a TREE CITY USA does not have to be direct dollars spent. It can include in-kind services performed, donations and the tree trimming costs of the local utility company. Using these factors, the DNR has found that every Iowa community meets this criteria quite easily. For example, the City of Des Moines' Forestry Department has a budget of \$900,000 to manage its street and park trees.

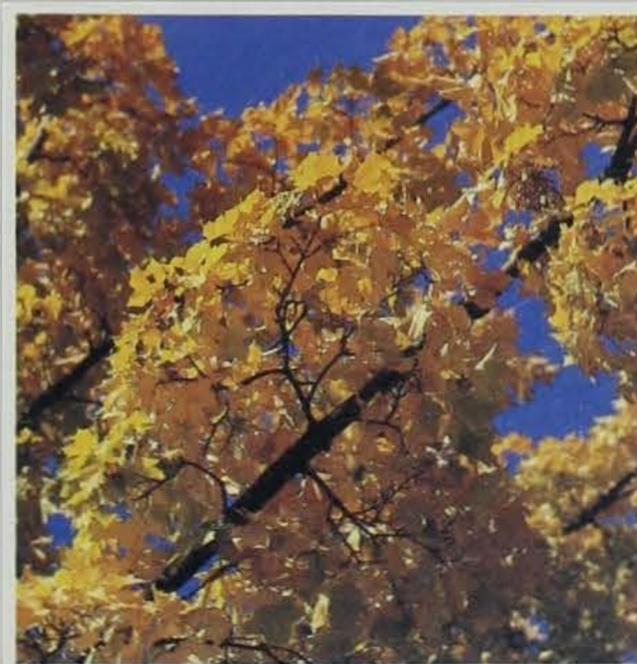
The celebration of Arbor Day with an official proclamation by the mayor provides the much-needed city recognition of the values of trees. It also offers the community a time to recognize the efforts of the hard-working volunteers and city workers involved in promoting proper tree care. The TREE CITY USA program has steadily grown in Iowa over the last few

years as more and more individuals want to do something to improve their community's trees. This can be demonstrated from the fact at the start of the program in Iowa in 1978, Cedar Rapids was Iowa's only participating community. In 1990, 27 Iowa communities will join more than 1,200 TREE CITY USA cities and towns nationwide.

The program recognizes qualifying communities with a large flag and entrance signs, given during Arbor Day celebrations across the state. In addition, participating communities receive up-to-date community forestry information from both the National Arbor Day Foundation and the Iowa DNR.

If you feel your city would like to become a TREE CITY USA or need additional information concerning a community forestry program, contact the Urban Forester, Forests and Forestry Division, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034 or call (515) 242-5966.

John Walkowiak is an urban forester with the DNR in Des Moines.



Jerry Leonard



Do you need conservation seedlings to develop wildlife habitat, help with erosion control, or to create a shelterbelt?

It's Not Too Late!

A number of popular seedling varieties are still available from the State Forest Nursery through the middle of May. Call or fax your minimum order of 500 seedlings (lots of 100) and you will receive a notice of the time and place of delivery. Trees and shrubs are delivered in a refrigerated truck to a central point in your county around mid-April. Trees can also be delivered by U.P.S.

Available Seedlings Include:

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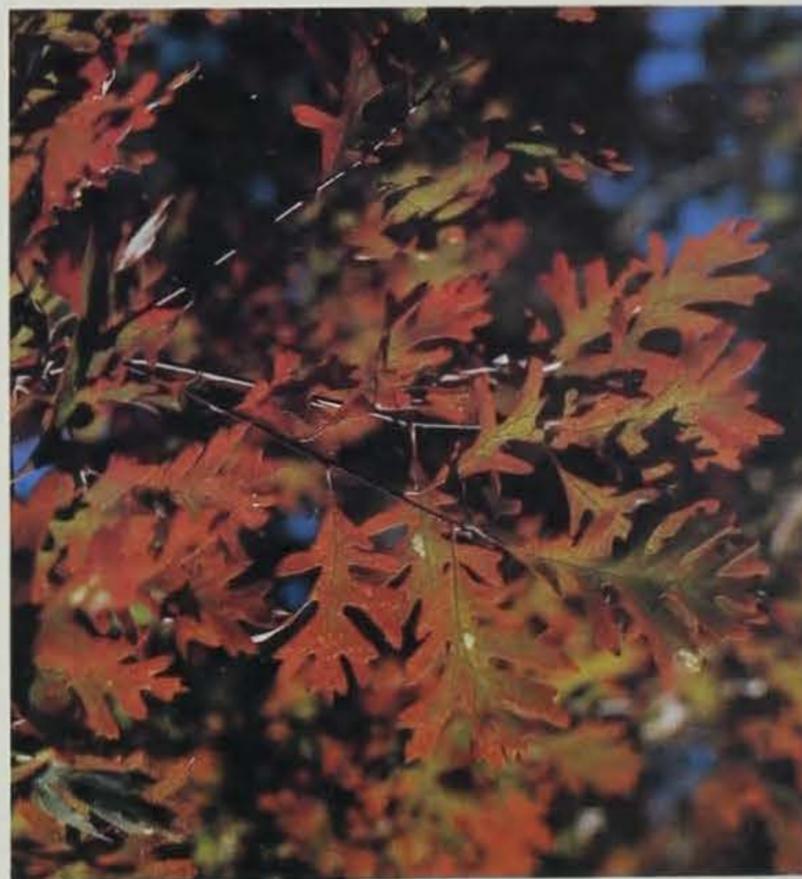
Green Ash
Jack Pine
Ponderosa Pine
Scotch Pine
Black Walnut
Red Oak
Red Pine
Silver Maple

☆ Shrubs

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☆ Prices

\$12.50/ 100 conifers
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Second in a Three-Part Series

On one hand, thousands of Iowa jobs directly depend on them. On the other hand, they're destroying the earth's protective ozone layer.

CFCs-

Can Iowa Do Without the Wonder Chemicals?

This is the dilemma Iowa manufacturers and policy makers are facing.

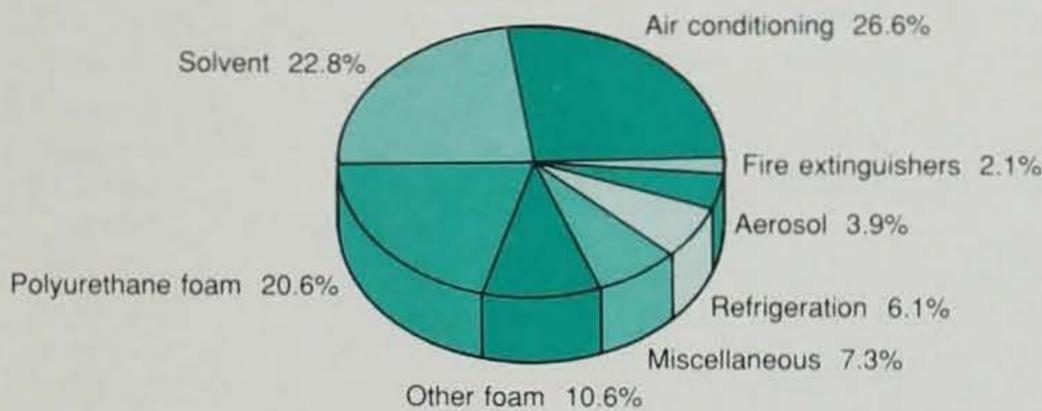
Invented in the 1930s, chlorofluorocarbons (CFCs) proved to be the ideal refrigerant for air conditioners and refrigerators. These nontoxic, nonflammable

and extremely stable "wonder" chemicals literally changed the nation by creating a demand for "cool" appliances in both homes and businesses. The affordability of CFCs put such appliances within the reach of many people.

Amana Refrigeration of Amana is an Iowa industry that has produced such sought-after appliances. Another Iowa employer, the Cedar Rapids-based Rockwell Industries, became involved with CFCs in the 1970s when the chemicals were recognized for their superior cleaning properties. The evaporative solvent was found to clean and then disappear, which is ideal for cleaning the small electronic parts Rockwell produces. And if a trace of the solvent does remain, it won't conduct electricity like water.

Ironically, the same stable quality that leaves the "wonder chemicals" nontoxic to humans also makes them resilient enough to travel the 15 to 20 miles up to the stratosphere and remain intact. Scientists discovered in the mid-1980s that once in the stratosphere, the CFC molecules break down and release their chlorine atoms. The chlorine atoms then attack and destroy the ozone layer — the earth's protective

Uses of Regulated CFCs in the U.S., 1985
Total Use: 660 million pounds



Source: Environmental Protection Agency

by Kristen Andrews

shell -- from powerful ultraviolet rays.

If CFCs are so destructive, why don't we do away with them? Realistically, an outright ban on CFCs would affect much more than Iowa's employment ranks. The majority of Americans depend on CFCs in their daily lives. Commercial and domestic refrigerators and freezers, air conditioning, foam insulation and padding are just a few of the now commonplace elements of the American lifestyle that would be at stake if CFCs were banned.

More likely a gradual phase out of CFCs will occur. The Montreal Protocol, an international agreement signed by 47 nations in 1987, initiated a 50 percent decrease in CFC use by the year 2000. A new agreement signed in London in June 1990 now calls for a total phase out by the end of the century.

The Search For Alternatives

Meanwhile, chemical companies are scrambling to find ozone-safe substitutes to replace the CFCs now vital to more than 375,000 U.S. businesses. And as the federal government places escalating taxes on CFCs, other companies are making concentrated efforts to recycle the increasingly expensive chemicals. Iowa manufacturers are seriously looking into both of these alternatives.

"Industry is nervous and rightfully so," said Gregory Carmichael, University of Iowa professor of chemical and biochemical engineering and researcher on the relevancy of global environmental issues in the Midwest. Carmichael predicts the first replacement chemicals on the market will merely be an interim solution. "The search for the eventual replacements is going to be a

Chemical companies are scrambling to find ozone-safe substitutes to replace the CFCs now vital to more than 375,000 U. S. businesses.

long one, but I'm quite optimistic they'll end up with a good product," he said.

Amana has been using CFCs since the beginning of its refrigerator production in 1934, and recognized the need to seek out substitutes in 1986.

The two CFC components essential in residential refrigerator manufacture are CFC-12, a circulating fluid that causes the appliance to get cold, and CFC-11, a blowing agent used to install the closed-cell foam insulation. The circulatory fluid in refrigerators remains in a sealed system and does not emit CFCs unless it leaks. Likewise, the insulation doesn't emit CFCs during consumer use, although four to five percent of the CFCs are released during the blowing process in manufacturing.

Du Pont, presently the world's largest producer of CFCs with \$30 billion in annual sales, is pushing to develop alternative chemicals for CFC-11 and CFC-12. These alternatives, called hydrochlorofluorocarbons (HCFCs), deplete the ozone only 2 to 10 percent as much as CFCs but are still in danger of being banned by a revised Clean Air Act in 2015 because of their stable qualities. Other alternatives called hydrofluorocarbons (HFCs), often called ozone-friendly substitutes because they lack chlorine, are also being ex-

amined. One major drawback to HFCs is that while they do not attack ozone in the stratosphere, they actually contribute to ozone production at the lower level where it becomes a nuisance more commonly known as smog.

"Although chemical manufacturers are willingly jumping on the bandwagon to find alternatives, the race against ensuing government legislation is on. And while many manufacturers work to find answers, more than a few companies are buying time through lobbying practices," said Ted Flanigan, manager of the Rocky Mountain Institute, a research center that focuses on energy and the environment.

"The Du Ponts of this world are concurrently looking for long-term and short-term answers and are afraid federal legislation will come about too fast," said Flanigan. "There's invariably going to be some jockeying and posturing going on."

Iowa industries argue that the production of CFC substitutes is out of their hands and that their actions depend on the chemical companies.

"We can't just arbitrarily say we're going to go to an alternative," said Ray Bohman, chief engineer at Amana Refrigeration. "The infrastructure for manufacturing the quantities needed just doesn't exist."

Changing Technologies

But revamping chemical manufacturing processes would only be the initial change. Bohman says if CFCs were banned today, Amana would have to stop production. None of the alternatives could be "dropped in" to the present refrigerator manufacturing process. Current equipment would have to be redesigned to accom-

modate the replacement substance. The process can be complicated, as new chemical makeups require different forces of pressure in a compressor and mix differently with essential lubricants that deter corrosion.

"We're looking at equipment that has been optimized over decades and decades. Now we're essentially starting from scratch," said Howard Shapiro, professor of mechanical engineering at Iowa State. Shapiro also points out that there are definite trade-offs involved in finding efficient substitutes.

The super-efficient insulator that has contributed to the huge gains in energy efficiency in refrigerators since 1960 is blown in with CFC-11. This foam becomes rigid between the walls when dried, leaving air holes filled with the CFC-11 vapor which is the insulating factor. Neither of the alternatives being considered, HCFC and HCF, is as effective. A drop in efficiency would require more electricity use and would, therefore, contribute to other environmental problems such as air pollution, acid rain and global climate change.

Bohman agrees with Shapiro. "We're trying to cram 50 years of development into a two-year timeframe. That is not an easy order," he said of the search for a replacement for CFC-12. Bohman doubts that the search will uncover a timely alternative that can meet the 25 percent increase in energy efficiency specified in energy regulations due in 1993.

"There's a bit of a dichotomy in the regulations mandated by the Department of Energy and the federal government," said Darrell Kula, manager of environmental affairs at Rockwell Industries, a manufacturer of communications and navigational equipment.

Bohman voices some real

concerns Amana has with future expenditures involving substitutes. "We would like not to have to make a double change," he said in light of his prediction that all ozone-depleting alternatives will be phased out by 2030.

While Amana would like to see a five-year transition to alternatives, Rockwell Industries says it hopes to change CFC strategies within the year. The company supplies both commercial industry and the military with radios, color radar and voice communications.

Last year Rockwell used roughly 11,000 pounds of CFCs, 3,000 pounds of which were recycled. Kula calculates that about 8,350 pounds were released into the atmosphere.

"In our business, we do have alternatives," said Kula of Rockwell.

'We're trying to cram 50 years of development into a two-year timeframe. That is not an easy order.'

According to Kula, the HCFC replacement solvent 111 trichloroethylene can be dropped into the electronic cleansing process relatively easily. With this chemical Kula estimates that only about one-fifth of the ozone-eating chlorine present in CFCs will reach the protective layer. He also predicts that even HCFCs will be banned within the next five years.

Rockwell has implemented an on-site recycling process. Electronic circuit boards to be degreased are put into a boiling mixture of water and the solvent. This mixture then goes

through a redistillation process in which the CFCs are reclaimed and can be reused. The portion that cannot be recycled on-site is sent to an outside recycling center. But hand cleaning the circuit boards creates a "100 percent loss," said Kula. This process includes the individual cleaning of the boards with cotton swabs doused with solvent.

Kula said Rockwell doesn't buy back CFCs recycled at outside operations because of government specifications that only allow the use of virgin CFCs or CFCs recycled on the company premises in military contracts.

Nevertheless Rockwell's incentive to recycle and phase out CFCs is more than just environmental. The solvent CFCs they use have tripled in price in the past year from \$13 to \$40 per pound. Kula attributes this to the government tax, a tax Rockwell would like to get away from by phasing out CFCs.

Whether Iowa industries cut CFCs out of their production voluntarily or by government force, the chemicals' future looks short in the next decade. Nevertheless the question remains, will substitutes simply be less-hazardous versions of the wonder chemicals?

Kula sees only one answer to this question. "The chemical companies are still trying to market ozone-depleting chemicals, but my contention is, why don't we get out of this and go to something that doesn't affect the ozone," he said.

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Kristin Andrews is an energy intern working with the DNR in Des Moines. She is a senior at Grand View College majoring in journalism.



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