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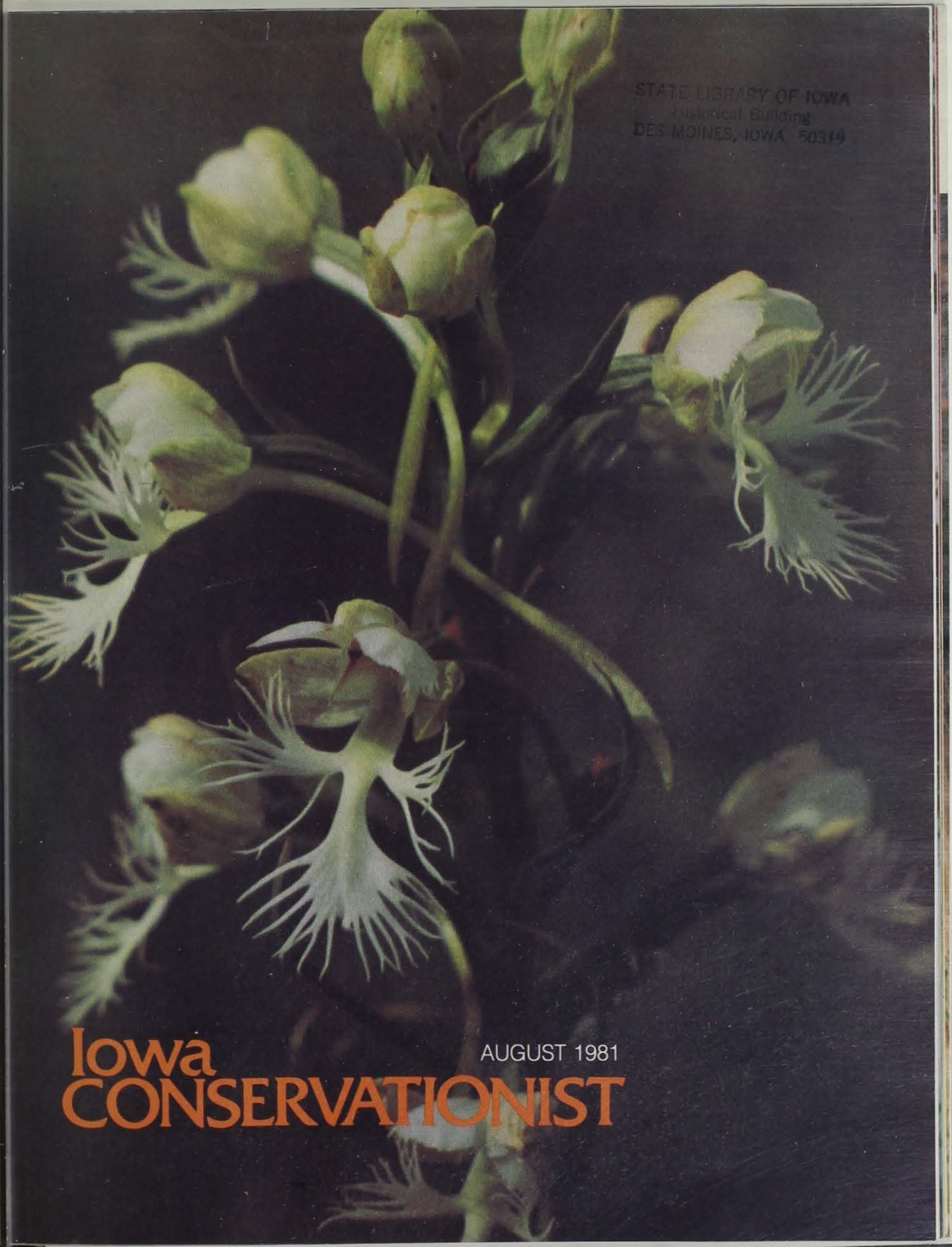

Iowa CONSERVATIONIST

AUGUST 1981

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THE HERITAGE PROGRAM

Preserving Iowa's Natural Gems

by Daniel R. Landon

THE IOWA CONSERVATION COMMISSION, in conjunction with the Iowa Chapter of the Nature Conservancy, recently approved a project which will prove invaluable in the accomplishment of its duty to preserve and manage the natural resources within the state. This program, entitled the Heritage Program, is designed to produce an inventory of the unique elements within Iowa's diversity of natural resources. This inventory will help both public and private organizations make better managerial decisions regarding the use of Iowa land and the natural characteristics on it.

What is the Heritage Program? The purpose of the program is to produce a source of information regarding the quality, quantity, and location of the unique natural areas found within the state. This involves several tasks. First, existing knowledge about the location of unique examples of plant and animal communities, habitats, and exemplary aquatic and geologic features will be compiled. A second task is locating undiscovered examples of these unique natural characteristics. By gathering such information through the use of aerial photographs and field exploration teams and adding it to existing knowledge, the project staff will compile a comprehensive set of information concerning the location of the state's natural areas. Using this information, which will be available in both manual and computerized form, project staff will then identify the best examples of unique natural characteristics found within the state.

This data base will have several valuable uses. The Conservation Commission, for example, will use this information to insure that it devotes its resources to preserving optimal examples of the rare, threatened, or otherwise unique natural elements in the state. Knowing the quantity and quality of an area's natural characteristics allows conservation organizations to determine how much of its resources should be devoted to preserving that area's characteristics. Therefore, the Heritage Program allows the Conservation Commission to make the most informed decisions possible in protecting and managing the natural areas within its jurisdiction. For example, the Commission's land acquisition program, which purchases unmanaged tracts of land harboring truly unique or rare natural characteristics, will benefit greatly. Conservation Commission land acquisition staff will be able to identify the best examples of particular natural characteristics so that money will not be wasted buying lesser quality examples. Realizing the importance of such a data base, 27 other states have completed or are in the process of completing similar natural area inventories.

The Conservation Commission is not the only beneficiary of the Heritage Program, however. Private industries and other governmental agencies interested in knowing the extent to which particular areas can be disturbed will also benefit. Industry leaders interested in constructing facilities on Iowa land will be able to determine if their facilities will seriously disrupt unique natural characteristics. They may then choose to adjust their plans accordingly, thus avoiding costly lawsuits and delays. Utility companies are but one example of private industries which will benefit from the existence of the centralized data base created by the Heritage Program.

Governmental agencies will also benefit from the Heritage Program. For example, the Department of Transportation will be able to avoid constructing highways and roads which would destroy unique natural areas. The Corps of Engineers will also

be able to use this information in developing or managing flood control areas so that flood control will not irreparably disturb unique ecological characteristics. Federal agencies required to make environmental impact statements concerning the construction and operation of governmental facilities will be aided in their duties by having accessible information regarding the location of unique natural areas. Finally, the Iowa Preserves Board, an independent group of scientists which makes recommendations to the Conservation Commission concerning the preservation and management of unique natural areas, will be greatly benefitted by the Heritage Program. The preserves board, like other organizations, needs easier access to such accurate, comprehensive information.

The Heritage Program is important to all of those who care about the preservation of unique Iowa resources. The key role played by the Nature Conservancy in promoting and funding the Heritage Program reflects this concern for preserving these natural characteristics. Better informed decision-making insures that optimal examples of natural areas will be preserved and managed for the enjoyment of all Iowans.

The Heritage Program will benefit Iowans in several ways. The inevitable question arises, however — who will pay for this program? The Conservation Commission has agreed to provide about $50,000 worth of office facilities and staff support during the study. The U.S. Heritage Conservation and Recreation Service, a federally-funded agency, is expected to contribute $160,000. The Iowa chapter of the Nature Conservancy will contribute another $100,000 to the project.

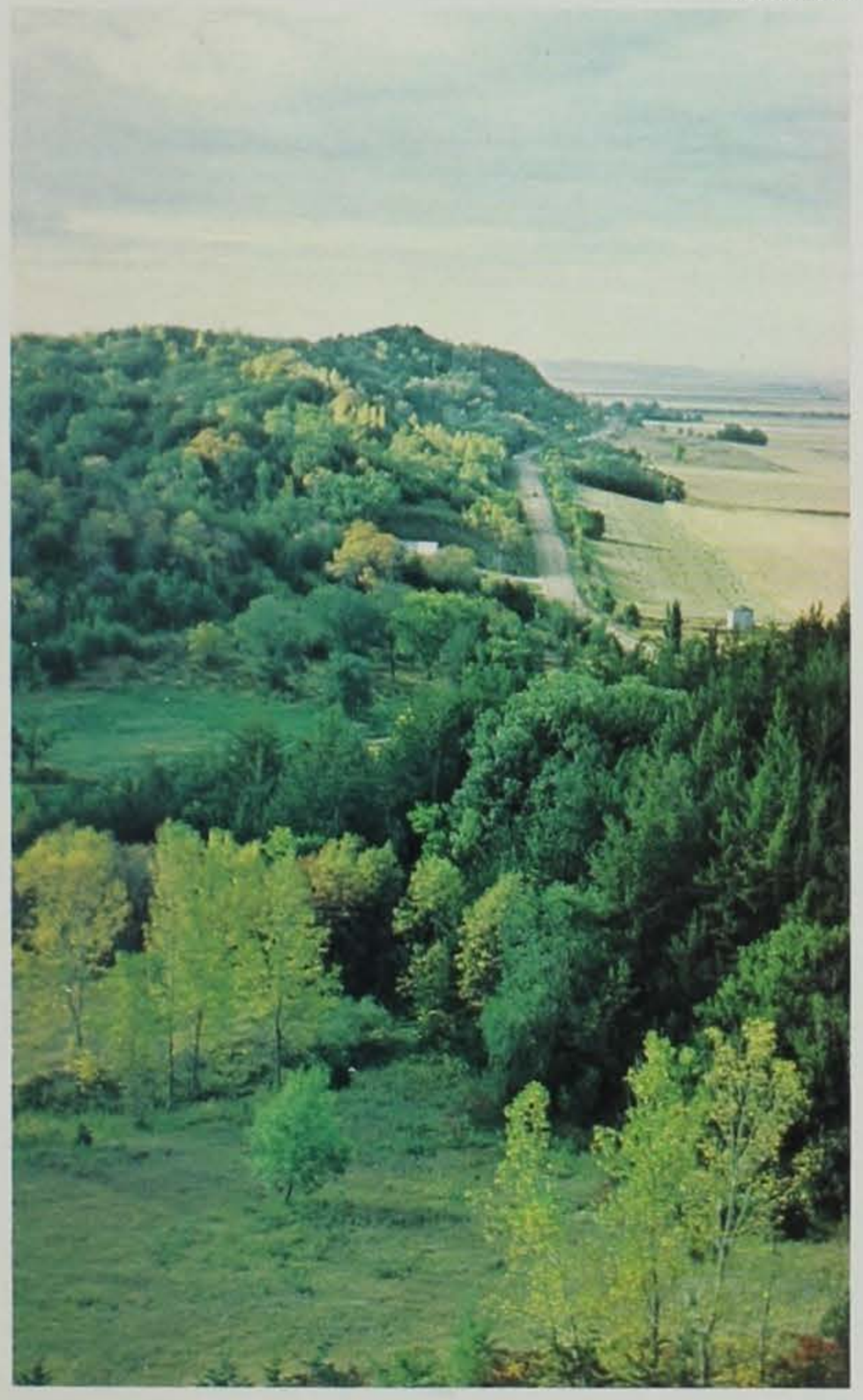
The Heritage Program will take about two years to complete. After that, an estimated $50,000 will be needed to maintain and update this information so that the data base information will remain current.

According to Dean Roosa, State Ecologist, the Heritage Program staff will emphasize the identification of examples of natural characteristics which are endangered and not managed or protected, such as plants and animals in immediate danger of extirpation or extinction. These gaps in the protection of endangered species or habitats will change as land is brought under management and different habitats or species become more susceptible to irreparable damage. Also, natural areas themselves change over time. Therefore, the need for current information will remain after the initial two-year Heritage Program.

The Heritage Program is a project which will benefit many Iowans right now while helping to insure that irreplaceable natural areas remain for the benefit of future residents and visitors to Iowa. □

Clockwise from left: Loess Hills; Drake Wood Duck; White-Tailed Deer; Muskrat; Sheeder Prairie (Guthrie County). Center: Male Yellow Headed Blackbird.

Ron Johnson



Ken Formanek

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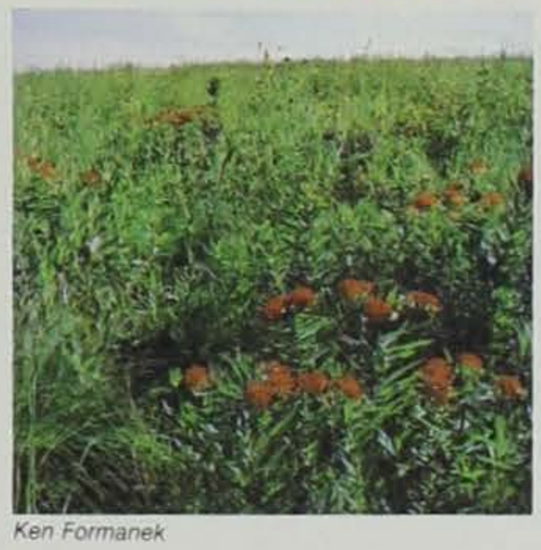


Ken Formanek

Jerry Leonard

Cerro Gordo's Wetlands

by Ben Van Gundy,
Executive Officer
CERRO GORDO COUNTY CONSERVATION BOARD

THE FIRST MARSH I remember seeing was in Gull Point State Park. My family and I were on vacation, enjoying a walk along the beach.

I was at that age when involvement with natural things is at a peak. Since catching frogs was one of my accomplished skills at the time, a reedy area beyond the beach quickly drew my attention.

To a small boy that marsh was a little frightening; there were strange sounds coming from that dense growth of tall plants in the shallow water. Any fears I had of the place, though, were soon replaced by fascination. I especially remember the noisy birds with the bright yellow heads.

Some twenty years later, I find myself working for the Cerro Gordo County Conservation Board, one of Iowa's leaders in wetland protection. Since the board was formed in 1958, it has acquired over 700 acres of public wetlands and associated uplands.

One of the most significant, both ecologically and recreationally, is Zirbel Slough, 330 acres of priceless marsh located 5 miles south of Clear Lake and visible to the west from Interstate 35. Like all wetlands, Zirbel Slough is an oasis for many wild inhabitants of the area. A number of American bitterns, black crowned night herons and a variety of other wading birds find it ideal for their needs. With keen observation and a little luck, northern phalaropes and the uncommon upland plover can be seen.

Zirbel Slough is also good for the local economy. Long a popular hunting spot for waterfowlers, it adds thousands of dollars to the pockets of local trappers annually.

Mallard Marsh is the second largest wetland managed by the Cerro Gordo County Conservation Board. Like all wetlands, it provides much pleasure and many treasures. One of the most impressive features of Mallard Marsh are the prairie knolls that overlook it.

Blazing star, big and little bluestem, leadplant and many other prairie plants can be found on the high ground where they have existed for many years. They offer an insight to the past and their deep roots that reach down and hold the earth convey a sense of stability and security to anyone aware of these original Iowa natives.

These prairie hills also give visitors a prime place to experience the many sights and sounds just below.

During the migration season, Mallard Marsh draws in large numbers of various waterfowl; the water and sky above are filled with noise and motion. Many stay to nest. Individual members of an expanding Iowa flock of giant Canada geese have also found this place to their liking; last year we were happy to have a successful nesting pair establish residence. This year the marsh was drawn down to stimulate growth of emergent vegetation.

If you are looking for a wetland that has a tremendous amount of natural diversity packed into a small area, you should visit the Conservation Board's 34 acre White Wildlife Area, near Rock Falls.

Photos by the Author

Inch for inch this marsh/timber/upland complex is the county's best wildlife area. Because of this variety, our Conservation Board's naturalist, Jim Heintzman, finds the area an ideal location for public nature walks. "Varied habitats are ideal for people as well as wildlife," he says. *"This is one of the important concepts we hope to convey with our environmental education programs."*

The Board's newest wetland acquisition was made in the fall of 1980. At that time the Board purchased a 75 acre blend of wetland, oak timber and grassland called the Haugen Wildlife Area. Approximately 20 acres of the area are scheduled for marsh restoration. This includes limited dredging of the existing marshy areas and planting of desirable wildlife grasses.

When improvements are complete this tract should provide a fine wildlife production area and will be open for both consumptive and non-consumptive wildlife uses. Acquisition of the Haugen Wildlife Area was possible because sportsmen contributed funds through the Wildlife Habitat Stamp Program.

Another wetland type that has been conserved by the Conservation Board is shallow oxbow ponds. The Shellrock River Greenbelt has five of these old oxbows that shine like jewels along the area's seven mile length. They add much ecological richness to this important recreation area. These ponds are actually left over sections of river channel: when the river changed its course, they stayed behind to mark the river's past.

They are different in character from a cattail marsh. These wetlands are associated with woodlands. Like their prairie marsh cousins they also provide a welcome environment for many living things, including people.

Most are small, but one stretches over a half-mile, a haven for woodducks and great blue herons.

I often think of how much poorer we would all be if these natural areas did not exist. It was a stroke of luck that far-sighted and caring individuals set up a system of county Conservation Boards that made these public areas possible.

Wetlands are valuable to all of us. I've never lost my love of marshes. Millions of marsh critters and a certain black lab seem to share my feelings. □

Left: Oxbow on Shellrock River; Above: Marsh wildlife watchers; Below: Zirbel Slough.

Seldom Seen Gems of the Grasslands

IOWA'S PRAIRIE ORCHIDS

by Douglas Harr
WILDLIFE MANAGEMENT BIOLOGIST
PHOTOGRAPHS BY DOUG HARR AND BOB MOATS

Ask 100 average Iowans where orchids might be found growing wild and chances are 95 might respond with, "In the jungles". Another 3 or 4 might recognize Showy Lady's Slipper, state flower of neighboring Minnesota, as a wild orchid but would assume it limited to northern woodlands. With luck, one out of a hundred people might realize we have several varieties of orchids native to Iowa.

Eastern and northeastern Iowa lay claim to some of these which are species generally associated with woodlands. These include Showy Lady's Slipper, Yellow Lady's Slipper (or moccasin flower), Showy Orchis, and Round-leaved (or Hooker's) Orchis, to name a few. Surprisingly, though, several more orchids can be found scattered across northern and western Iowa's prairies and wetlands, perhaps most frequently occurring on state-owned wildlife areas and preserves. Before becoming better acquainted with some of these jewel-like wildflowers, let's first back up and discuss a little about orchids in general.

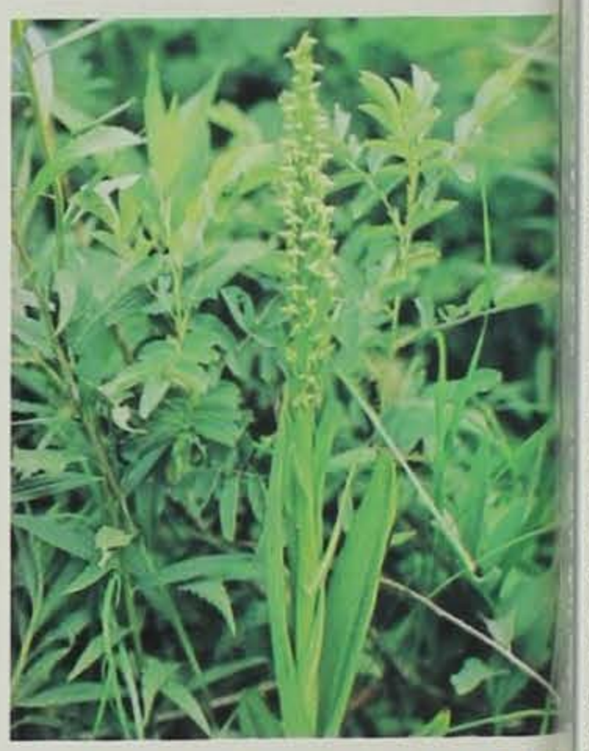
Members of the plant family Orchidaceae are considered to be among the world's most beautiful and interesting flowers. They constitute one of the largest plant families, numbering well over 20,000 species worldwide. As many people would suspect, a large percentage of these are confined to warm, moist, tropical regions, especially the rainforests of southeast Asia and Central and South America. It is some of these that are frequently cultivated and hybridized to create the colorful flowers we recognize in greenhouses or botanical gardens and that we commonly use for corsages.

Orchids may be found on every continent except Antarctica and grow in habitats as diverse as frigid mountain ranges, arid deserts, flowing streams, and rolling prairies. Some rare Australian types even live almost entirely underground. Many tropical species are epiphytic, that is, living drooped high in tree branches, roots dangling in air to absorb water and nutrients. In North America the majority of species are terrestrial, living like most other plants with roots in the ground and with relatively upright leaves, stems, and flowers.

All orchids are called monocots and are generally described as having parallel-veined leaves, related more closely to grasses than to other common wildflowers. Though appearing radically different from species to species, orchid flowers are really quite similar in structure when examined closely. Each flower has only three petals, the lowest of which is almost always modified into an odd-looking lip or shoe, thought to resemble a moccasin or slipper in some showier types of North American orchids. The petals are usually backed up by three prominent sepals which confusingly appear more like petals. These plants are extremely specific in how they must be pollinated, in some instances requiring precisely one variety of insect to accomplish the specialized task.

Orchids often favor damp or wet habitats, and Iowa's prairie species tend to follow this pattern. The Small White Lady's Slipper *(Cypripedium candidum)* may be most easily recognized as a wild orchid because of its familiar shoe-like lip. This little ten-inch orchid lives in isolated colonies around a very few, glaciated prairie wetlands or bogs. The flower is short-lived, occurring usually in early June each year. Another profile of this rare species was featured in the June, 1980, *IOWA CONSERVATIONIST*.

Two more species are sometimes found growing in the same habitat as the Small White Lady's Slipper. Northern Green Orchis, also called Frog Orchid *(Habenaria hyperborea)*, is recognized by a



Clockwise from above: Nodding Lady's Tresses; Prairie White Fringed Orchis; Northern Green Orchis; Bog Twayblade; Small White Lady's Slipper.

multitude of tiny, yellow-green flowers crowding a foot-high stalk or raceme. One might first mistake it for something other than an orchid until it is examined carefully. This and other members of the genus *Habenaria* are often called, as a group, rein orchids. If examined closely with a hand lens or magnifying glass the tiny flowers will reveal why they are given this name. Behind the lipped, lower petal will be found a miniscule rein or spur, rather small on the Frog Orchid but relatively longer and more prominent in other species. Like Small White Lady's Slipper, Northern Green Orchis is also on Iowa's threatened and endangered species list.

Perhaps smallest of all Iowa orchids is the obscure little Bog Twayblade *(Liparis loesellii)*. Seldom exceeding three or four inches and well camouflaged in greenish-yellow flowers, these plants may be easily overlooked while standing within a few feet of them. Flowers on the raceme are usually quite few in number. Its leaves are characterized by a definite keel down the center of each. Though frequently found in association with the two previously described species it is not on our state's endangered species list. Nonetheless, Bog Twayblade is still far too uncommon to be tampered with.

On prairies with somewhat moist — but not boggy — soils may be found the rare and breathtaking Prairie White Fringed Orchis *(Habenaria leucophaea)*. Like the Northern Green Orchis, it is one of the so-called rein orchids. This plant is, however, quite different in both size and flower. At one to three feet in height, Prairie White Fringed Orchis is one of Iowa's largest orchids. It is also one of the showiest, having an elongated lower lip on each flower, this lip further divided into three parts with deeply fringed edges. One of our rarest wildflowers, it must never be disturbed when discovered.

Another genus of orchid is represented by two species occurring on low prairies. These are the Nodding Lady's Tresses *(Spiranthes cernua)* and the closely related Hooded Lady's Tresses *(Spiranthes romanzoffiana)*. The hooded variety usually begins blooming in mid-July, but Nodding Lady's Tresses is quite unusual because it may be found blooming in September — much later than most other orchids. A prominent feature exhibited by all members of genus *(Spiranthes)* is the interesting spiral arrangement of their small flowers around the raceme. Though Hooded Lady's Tresses is extremely rare and endangered, Nodding Lady's Tresses will sometimes spread from natural stands into neighboring roadside ditches and is often found along old railroad rights-of-way where prairie plants continue to thrive.

There are other wild orchids in Iowa grasslands and around marshes, not to mention the more commonly known forest types. But almost all species are threatened with gradual disappearance, a result of mankind's encroachment upon Iowa's already pitiful remnants of the great prairies, woods, and wetlands which abounded before the advent of agriculture. B. O. Wolden, in *"The Flora of Emmet County, Iowa"*, first published in 1932, listed ten species of orchids native to that northern county. At least three of those are probably now extinct, not having been recorded for many years.

Because Iowa's orchids are so fare and so demanding of precise habitat or microclimate conditions, locations of known plants cannot be revealed. But if you should by chance happen upon one of these precious wildflower gems, please take caution to respect its fragile nature. Admire its beauty and photograph it if you wish, but do not disturb its peace. Our remaining orchids must serve as vivid reminders of just how little abuse all our remaining resources can tolerate and still be expected to survive. □

WARDEN'S DIARY

by Jerry Hoilien

WE'D BEEN ASSIGNED to work a stretch of river in another area because the violators wouldn't recognize us as easily as the local officer. Seems there was a lot of illegal fishing going on there. My partner Ken and I put our boat in over a cut bank after hiding our car in a wooded area. We hadn't been looking very long until we located several illegal fish traps. Pulling across the river to decide what to do, we tied up to a snag. Suddenly, we heard a car coming. It drove right past us and stopped just upstream at an old cabin. Holy Cow! This may be the illegal fishermen, and we're in the open. Just as they slid a boat into the river, we jerked off our uniform shirts, grabbed our fishing gear, and tried to look like a couple of innocent fishermen. The three men in the boat came floating downstream right past us while at the same time giving us a good looking over. Good thing they didn't notice there wasn't any line on my pole — I didn't have time to string it up and was trying to look concerned about my fishing and not them. We both nodded as they apparently bought our cover and started their motor, heading upstream. The man in the bow stood up raising a dip net with a ten-foot handle while his partner threw the weighted wires over the side and the "shockers" were in business. Right in front of two game wardens — how about that!

We watched them until it got dark. Not wanting to dive for the shocker if they threw it in the river, we hiked up to their car and waited for them to land. My partner was to wait until they passed him, then turn on his flashlight. If they ran, I would be at their car in front of them . . . good plan.

As I stood in the darkness, I heard the boat hit the dock. Soon I heard one of them coming up the steps. Suddenly — I heard one of them shout *"Hey! Who are you? I don't know who those guys are!"* (Silence. Complete silence) I started forward. What happened to my partner? Why hadn't he turned on his light? Someone started to laugh, then the sound of scurrying back down the steps. More laughter. Now all three were coming back up the steps. From the sounds, they were carrying something. What was happening?

No light or word from my partner? As they reached the top — SNAP — on came a flashlight behind them. As they ran forward to get away from the voice who identified himself as a State Conservation Officer, I turned on my light and we placed them under arrest. After loading the shocking gear and the three men in the car, I couldn't stand it anymore. *"What in the world was all that yelling earlier?"* I asked. One grunted that his "buddy" was trying to scare the others by saying there was game warden up on the bank. I thought that was amusing, but they seemed to have lost their sense of humor by this time.

I was in the service station one of the "fish shockers" operates a few days later when one of our biologists happened to pull in after having a flat down the road. *"How much to fix a flat?"* he inquired. Glancing at the emblem on the vehicle, the station operator responded, *"three hundred dollars plus costs"*.

A Recipe for Successful
THE UPPER PINE

by Stephen L. Schutte

FISHERIES MANAGEMENT BIOLOGIST

Photos by the Author

UPPER PINE LAKE, located within the confines of Pine Lake State Park near Eldora in Hardin County, is a 69-acre artificial impoundment. The dam, constructed in 1934 by the Civilian Conservation Corps (CCC), created the beautiful lake that is approximately one mile in length and about 1,000 feet at its widest point. At crest, Upper Pine Lake has a maximum depth of 16 feet, a mean depth of 7 feet, with over two and one-half miles of shoreline. The entire lake is surrounded by timber.

As more of Iowa's native prairie land gave way to intensive agriculture, the quality of Upper Pine Lake began to deteriorate due to siltation. Iowa citizens in the Eldora area became very concerned and decided to save the attractive recreation area. Together with the Hardin Soil Conservation District, the Soil Conservation Service (SCS), the Agricultural Stabilization and Conservation Service (ASCS), and the Iowa Conservation Commission, concerned landowners in the Upper Pine Lake watershed initiated a massive watershed conservation program in 1965. The project stressed erosion control practices with emphasis on parallel, grassed backslope terraces, recreation and rural beautification along with wildlife cover plantings. As a result of the rapid and successful implementation and completion of this project, soil erosion problems in the watershed were virtually eliminated, and Upper Pine Lake was out of jeopardy of ''dying a slow death.''

For many years routine fisheries management practices on Upper Pine Lake were employed, which included stocking of various species of fish and fisheries population surveys. In the early to mid 1970's, the fish population surveys revealed many problems at Upper Pine Lake and, because of the high recreational use of the area, the situation needed to be rectified.

Survey efforts from 1972-1975 revealed three major problems with the Upper Pine Lake fishery. First, all species of fish present were extremely slow-growing and in very poor condition. Secondly, a dramatic decrease in reproductive success was noted. Finally, rough fish, particularly carp, were appearing in increasingly large numbers. Taking these factors into account, it was decided that the only way to produce good fishing in Upper Pine Lake was to renovate the fish population. This was to be accomplished through the use of chemicals in conjunction with a partial drawdown.

All plans and details were finalized far in advance of the renovation scheduled for early September of 1976. Many formal and informal intersectional meetings were held between the Park Section, Law Enforcement Section and Fisheries Section at which time project details were worked out to the best advantage of all involved. Finally, the project plans were taken before the general public in the form of an information public meeting held at Eldora on 22 June 1976. The project details and the timetable of events were related to all in attendance, and the participants were given the opportunity to ask questions of the conservation officials present. The proposed renovation was well-accepted and supported by the community citizens.

During the remainder of the 1976 summer a great deal of preliminary work was done for the project renovation. Extensive fish population surveys were conducted on Upper Pine Lake using fyke nets, bag seines and electrofishing equipment. A depth contour map was made to derive the volume of water contained in the lake. This would be used to determine the exact quantity of chemical needed to renovate the lake. To facilitate the chemical application and reduce the amount of chemical (and cost) required, a request was submitted to the Iowa Natural Resources Council to draw down the water level of Upper Pine Lake seven to nine feet. The Natural Resources Council honored the request and issued a permit for the requested drawdown depth.

On 30 August 1976 a large net was stretched across the concrete outlet structure of Upper Pine Lake to prevent the escape of any rough fish into Lower Pine Lake during the drawdown. The sluice valve was then opened. As the water level receded during the eight-day drawdown period, attempts were made to salvage as many game fish from Upper Pine Lake as possible. Fyke nets were fished for one week and yielded 550 crappies, two largemouth bass greater than twelve inches and one 26-inch northern pike. All these fish were transported and stocked into the Iowa River Impoundment at Iowa Falls. The most successful salvage attempt was conducted on 6 September using electrofishing gear. The lake had been drawn down about eight feet by then and several submerged brush piles became visible just under the water's surface. The ''shocker'' was worked

sfFishing —
NLAKE STORY

over these brush piles and within three hours 52 largemouth bass over twelve inches (one of them in excess of 7½ pounds!) were captured in addition to a few crappies and bluegills. These fish were transported and stocked into Lower Pine Lake. All channel catfish taken during the salvage attempts were returned to Upper Pine Lake.

Early on 8 September the sluice valve was closed, the lake having been drawn down a total of eight feet, reducing the surface area to one-third of its crest acreage. The lake was divided into three sections using plastic bleach bottles as marker buoys. At 5:45 a.m. three two-man crews began applying the predetermined amount of chemical to their assigned sections. The total time to apply the renovation agent was one hour.

The chemical used in this renovation was Antimycin-A, a fish toxicant that is selective to only scale fishes. "Skin" fish species, such as bullheads and channel catfish, are not affected. In the manufacturing process, Antimycin-A is affixed to sand particles. The chemical is applied by simply punching a number of small holes in the bottom of each can and sprinkling the chemical into the water. As the sand particles fall through the water the chemical dissolves leaving an even distribution of toxicant through the vertical water column.

Antimycin-A, which is a slow acting toxicant, is undetectable by fish. It is taken into the blood stream through respiration which occurs at the gills. The chemical blocks the oxygen transfer from the blood cells to the body cells and kills the fish by internal suffocation.

Approximately two and one-half hours after application of the 40 units of Antimycin-A (each unit being about 8 pounds) the smaller crappies and bluegills began showing signs of stress. They swam erratically in circles near the water's surface and gathered in large groups near the shoreline. The carp displayed the same symptoms about three hours later, and within 24 hours all scale fish were dead.

The major source of water into Upper Pine Lake is a small creek (Pine Creek) which flows in from the east. To insure that no fish escaped the chemical treatment, twenty-five gallons of Rotenone (a fast acting, nonselective fish toxicant) was applied to Pine Creek from its mouth upstream one and one-half miles.

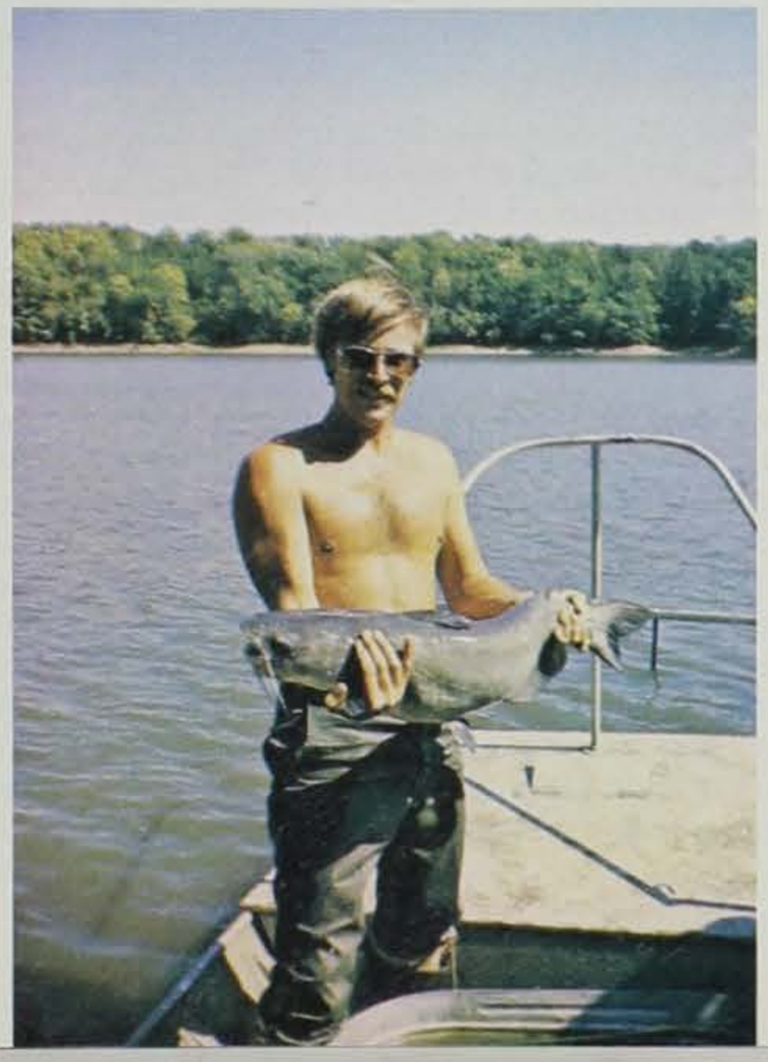
Cleanup of the dead fish began on 9 September and continued through 13 September. An estimated 19,300 pounds of carp (averaging 3.5 pounds per fish) and 2,200 pounds of crappies, bluegills and other minor species were picked up and buried. A total of 263 pounds of fish per surface acre were removed from Upper Pine Lake. It is interesting to note that the pre-renovation game fish salvage attempts were amazingly successful with large-mouth bass. Only five bass in excess of 12 inches were collected during cleanup activities.

Following the cleanup, Upper Pine Lake was extensively surveyed with fyke nets and electrofishing equipment. Only channel catfish and a few bullheads were sampled with no scale fish present. The renovation was a smashing success and all that was left to do was restock the lake and wait.

Approximately one month after the renovation, restocking efforts commenced. A total of 80,250 one and one-half inch bluegills and 10,700 two-inch channel catfish were stocked. In the spring and summer of 1977 the lake received 8,200 two-inch largemouth bass and 90 pairs of adult black crappies. During 1978 Upper Pine Lake was stocked with 8,200 two-inch largemouth bass, 1,000 seven-inch channel catfish and 1,640 three-inch northern pike. The northern pike were introduced as a "trophy" species. Maintenance stockings of channel catfish occurred in 1979 and 1980.

Upper Pine Lake has developed into one of the finest fishing lakes in north-central Iowa. Fish growth and reproduction of virtually all fish species is excellent. Carp have not been seen in Upper Pine Lake since the renovation. A 14-inch minimum length limit on largemouth bass was imposed after the renovation to protect the bass until they are old enough to spawn. All largemouth bass caught from Upper Pine Lake under the legal length limit must be returned unharmed.

During the 1981 open water angling season Upper Pine Lake will produce some largemouth bass in excess of three pounds. It will be possible to catch large numbers of "keeper-sized" crappies; channel catfish will be at a premium. For an "up-to-the-minute" fishing report on Upper Pine Lake, contact the Park Ranger at Pine Lake State Park (515/858-5832) or the Fisheries Biologist at Clear Lake (515/357-3517). Plan a fishing trip to Upper Pine Lake and enjoy the fun and excitement this summer! □



Left: channel catfish stocked in 1977 are now table fare. Above: clean up operations. Right: many large fish like this channel catfish were salvaged and returned to the lake.

FISHING MISSISSIPPI RIVER WING DAMS

by John Pitlo and Tom Boland
FISHERIES BIOLOGISTS
PHOTOS BY JOHN PITLO

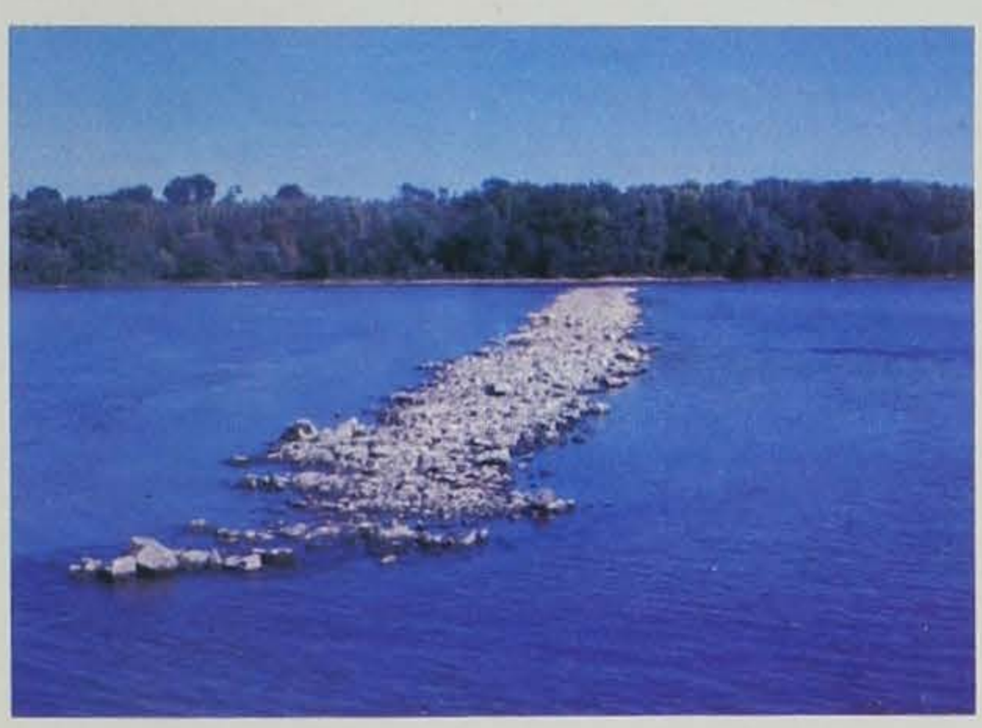
A THIN CURTAIN OF FOG hangs over the river giving off that heavy, damp river smell in the air. Within minutes the sun will peek over the tall shoreline trees. There is no wind and the water surface looks like a mirror, except for the wake of your boat. There is no need to hurry because the areas you are going to fish are ignored by most fishermen. As you cut your motor and get ready to fish the first structure in a series of five, you know that if river conditions are right and the fish are willing, there is an excellent chance of catching a nice mess of "greenies".

If you haven't guessed by now, the river is the beautiful Upper Mississippi. The area you're fishing is one of the many channel maintenance structures or wing dams and the fish you are after is the much sought after walleye. For those readers not familiar with the Mississippi River and its system of locks and dams, a little background information may help to give a better understanding of the river as it appears today.

Since about 1820, the Mississippi River has been improved for one purpose — to keep the river open for a highway of commerce. This early improvement consisted mainly of clearing stumps, logs, snags, and other debris from the navigation channel. Congress authorized a 4½ foot channel in 1878 and a 6 foot channel in 1907. The U.S. Army Corps of Engineers (COE) was charged with the responsibility of maintaining these depths and began to systematically construct wing dams, closing dams, and bankline rip-rap to maintain the required depths in the navigation channel. Wing dams had been successfully used prior to the 1880's on the Ohio and Illinois Rivers but seldom lasted more than a few seasons before deteriorating. A better design was needed. Wing dams on the Danube and Upper Rhine Rivers of Europe proved to be of a more permanent nature. Consequently, most Upper Mississippi River wing dams constructed after the 1880's were very similar to the European design. These wing dams were constructed from alternat-

ing layers of rock and willow mats extending from shore toward the main channel. The willows were lashed together into 1 by 20 foot bundles and tied together to form 12 foot wide mats. The mats were then floated into position and sunk with limestone rock. The early experimental wing dams were built by the COE using hired labor. The majority of the dams built after 1880 were by private contractors.

The success of this relatively simple method of channel maintenance can best be explained by looking at a river cross section. The Upper Mississippi is actually two streams, one over the other. The upper stream consists of water, moving at approximately 2-3 mph. The lower stream is the bottom substrate, mostly sand, moving at a much slower pace. The lower stream or river bottom is constantly lifted by water currents and carried along. These moving particles are continually shifting about forming new sand bars and islands. Consequently, wing dams work by constricting flows and forces the water to scour one main narrow channel. Prior to construction of the wing dams on the upper river, the natural width of the channel varied from around 350 feet to 1400 feet near St. Louis. The network of wing dams created a channel that was 1200 feet wide or less. Also, each section was constructed to a width necessary to produce the desired water depth for navigation. Closing dams were built from the same materials as wing dams, but were constructed across the mouths of backwater cuts and sloughs to divert water toward the main channel. Rip-rap was placed along the bank to prevent channel changes and stabilize and reduce erosion along the river bank.



Opposite page: wing dam as it appears at present during low flood periods. Note notch in center of dam.
Above: wing dam as it appears during low flood periods.
Right: the rippling effect wing dams show when wind blows against current.

Congress authorized a 9 foot channel in 1930. Current wing and closing dams were not adequate to maintain the new depth. The present series of 29 concrete locks and dams was completed by the COE in 1933 in order to maintain the new depth. By the early 1930's, about 73 miles of wing and closing dams had been constructed along the Iowa border in pools 9 through 19, numbering about 560 dams. Presently there are nearly 46 miles of wing and closing dams remaining. The other 27 miles have been removed, eroded, or covered with sediments and sand spoil. Those that remain are an oasis of rock and boulder in a sea of shifting sands and provide valuable habitat to many fish species.

Wing dams break the current and provide important resting areas for fish that live in the main channel or channel border. The rocks on the wing dams also provide excellent attachment sites for aquatic insects which provide forage for many fish species. The numerous cracks and crevices in the rock provide shelter for young fish, crayfish, and minnows, which in turn attract the preditor fish.

One word of caution before we proceed. For those boaters not familiar with the river, it is strongly recommended that you stay in the main channel when moving from one fishing spot to another. Depending on river stage, wing dams may be under 10 feet of water, exposed, or anywhere in between. If you cannot "read" the water and are not familiar with wing dam locations, you can ruin a lower unit on your motor, not to mention a more serious accident.

FISHING WING DAMS

Wing dams can be fished effectively by either trolling or still fishing. Fishermen pursuing sauger or walleye generally troll, although still fishing can be productive at times. Trolling backwards (backtrolling) is popular because you can control the boat better and it eliminates line tangle in the prop. Backtrolling is most effective by staying 10-50 feet above the area and working your lure or bait across the top and upstream face of the wing dam. This may sound relatively simple, but it takes some experience to master. The current will want to push your boat over the wing dam and because of the hydrology of the structure, the closer you get to the wing dam, the stronger the current. A depth recorder or "fish finder" can be a valuable aid in keeping you in position. If you do not have one, use 3 or 4 land marks (trees, points of islands, channel markers, etc.) to keep you in the right location. It helps considerably if the wind is blowing against the current. This causes a series of ripples to appear below the wing dam and its location can be pin-pointed.

A variety of baits and lures can be used while trolling, but the most popular and effective method is a three-way or Wolf River rig (Fig. 1). Most fishermen use either a Rapala type floating plug or a live minnow on the business end of the three-way rig. The size or weight of the sinker varies, depending on how strong the current is, but should be heavy enough so you can bump the rocks. Don't drag the sinker along the bottom or you will snag constantly. Instead, apply a yo-yo type action that allows you to bounce the sinker along the tops of the rocks. You will get hung up occasionally but you can usually free your lure by getting directly over it. If you don't get hung up occasionally and cannot feel the sinker bumping rocks, you are fishing too far above or below the dam, or the sinker is not heavy enough. Some fishermen use a heavier sinker and fish nearly under the boat, while others use a lighter sinker and fish 30-40 feet behind the boat. It's preferred to fish 30-40 feet behind the boat because you're less likely to spook the fish on a shallower wing dam. There are many occasions when walleye or sauger swirl the surface as they strike the plug. These fish were actively feeding on the top of the wing dam in one or two feet of water and unusual noise will scare them.

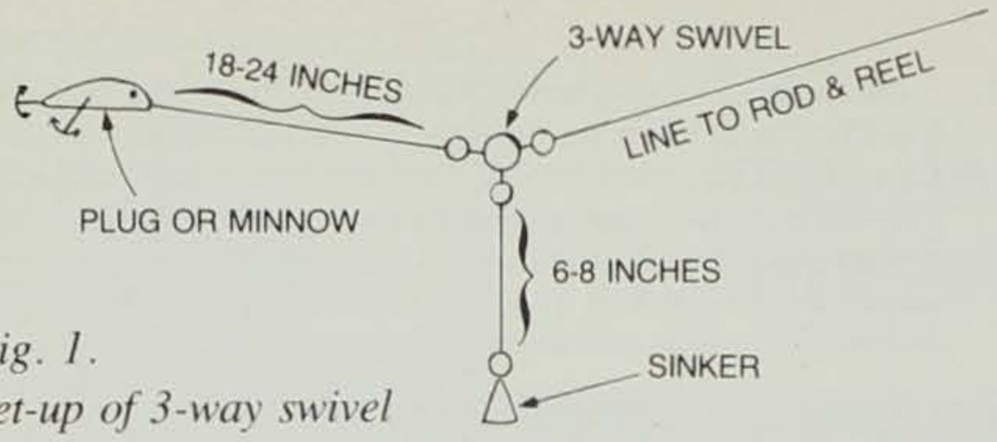


Fig. 1.
Set-up of 3-way swivel

Once a fish or two have been caught from a wing dam you can concentrate your trolling in that area, but many fishermen prefer to anchor and cast to the fish. Favorite lures include jig and minnow combinations and deep diving floating plugs. Anchor 10-20 feet above the wing dam and cast the jig slightly upstream and allow it to settle near the bottom before retrieving. A slight twitching action helps, but the most important thing is that the jig should be bumping and bouncing along the tops of the rocks. Too light a jig and you won't feel the bottom, too heavy a jig and you will be hung up constantly. The right weight jig depends on current flow and you will have to experiment a little. The deep diving plug is cast so that the retrieve will bring it across the wing dam. Retrieve just fast enough to make the lure bounce along the rocks. If the lure gets snagged, give enough free line to allow the plug to float to the surface and free itself. Although the catch is primarily sauger and walleye with this technique, you can be occasionally surprised by a good northern pike, channel catfish, largemouth bass, crappie or white bass.

Stillfishing just above and below the wing dams can produce good catches of channel catfish and freshwater drum. Cut bait, stink bait, night crawlers, and crayfish fished above the dam near the outer tip or navigation channel border produce good catches of freshwater drum and channel catfish. If you do not get any action above the dam be sure to try below. Use enough weight to get your bait near the bottom using a slip sinker that is stopped with a splitshot about 18 inches above the hook.

Fluctuations in river stage during the summer and fall will cause wing dams to be partially or completely exposed. When you can see the rocks on a wing dam, it is a good time to try for largemouth bass. Bass seem to move into these areas of reduced current, especially if the exposed wing dam is connected to the shoreline. Anchor within casting distance above the wing dam and cast to the base of the exposed rocks. Good lures include spinner type baits, diving plugs and jigs dressed with twister tails. Try a few casts below the wing dam, but the majority of the bass concentrate above the structure.

Probably the fastest and most exciting fishing action occurs when the white bass or ''strippers'' go on a feeding spree on a wing dam. Strippers tend to feed in schools and when they move onto a wing dam to feed, the water literally boils with strippers and bait fish breaking the surface. Casting a jig or small spinner bait into the middle of this fish actively produces a fish on nearly every cast.

Your next question will probably be, which wing dams are the best? That is difficult to say since most wing dams have produced fish at one time or another. Generally more walleye and sauger have been caught from wing dams that have a good scour hole above or below the structure. Wing dams that have been sanded or silted in with little exposed rock appear to be inferior.

Deep wing dams (8 feet or deeper) are more difficult to fish and do not appear to hold fish like the shallower ones. A number of wing dams that have cuts or notches in them are good producers. If you are not familiar with an area, local bait dealers can often supply information as to the location of good wing dams, otherwise you will have to find them by yourself. Select a good looking wing dam, spend ½ hr. fishing it and if you do not catch anything, move on to the next one.

Next time you get on the Upper Mississippi River, try your skill at fishing these overlooked but excellent fishing areas. □

Photo by R. F

NEW LAKE PHENOMENON

by JIM BRUCE
FISHERIES BIOLOGIST

NEW CARS AND NEW LAKES are wonderful. The comparison between cars and lakes is a little farfetched and is used only to point out that lakes, like many things, ''run'' better when they are new.

How productive a new (or old) lake or pond will be depends on the quality of the material that goes into it and how carefully it is assembled. The word ''productive'' in this case refers to the quantity and quality of fishing provided to the anglers using the lake. The word ''material'' refers to the nutrient potential of the lake basin and watershed. ''Assembled'' refers to a number of factors; lake-watershed area ratio, shoreline development, water depth, angler facilities, structure, and initial fish stocking.

The proper implementation of the points mentioned above will go a long way in determining the quality of a body of water. However, even disregarding the above factors, it can be said with near certainty that the first years (3 - 7) of a lake or pond's existence will be the most productive for fishing. This is certainly not a new idea or concept; but a fact that has been recognized by biologists and experienced anglers for years.

One recent example of the excellent fishing quality provided by a new lake is Rathbun. This 11,000 acre reservoir was completed in 1969 and filled to a multi-purpose pool level in 1970. Initial stocking of the lake took place during that year. The creel survey information gathered during the 1972-78 period shows a rapid increase in fishing success and harvest through 1975 when the harvest peaked at 375,000 fish. This number represents the number of fish taken by anglers during the daylight hours from the first of April through September; it does not represent the total harvest for the year. The number of fish harvested increased approximately 100% in 1973 over 1972, and increased about 50% per year

during the next two years. This rapid increase in angler success and harvest can be readily understood. The fish population is expanding to fill a void. The competition between species and individuals in a species is relatively low, and decomposition of terrestrial vegetation in the new basin provides an available source of nutrients for fish food organisms. Another factor which may increase the harvest is a tendency for the fish to be more active and "bite" more readily during this expansion phase of the fishery. This "willingness to get caught" has been observed in western lakes where single species management of trout in lakes (where they do not reproduce) allows more control of population numbers.

While the rapid increase in fishing success is readily understood, the reason for the decline in angler success after the peak is less obvious. During the three years of Rathbun creel survey following 1975, the harvest of fish equaled about ⅓ to ½ of that which occurred in 1975. This doesn't necessarily mean that the fishing was bad; in fact, the catch-per-man-hour (success) was higher in 1978 than in 1975 but harvest equaled only 52% of the 1975 level.

Logically, a decrease in the fish harvest indicates that there were less harvestable sized fish available for the angler to catch. Fishing pressure can also affect the harvest. However, it would seem that the pressure potential on any given water would remain relatively stable from year to year, and the actual pressure would be largely controlled by the fishing harvest being achieved.

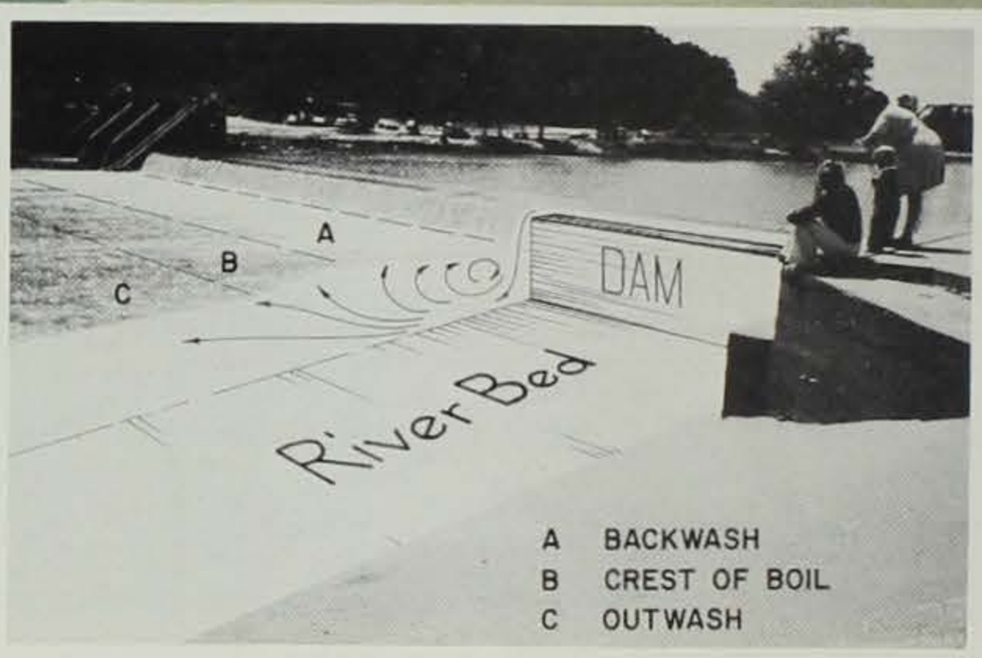
We can assume that reduced harvest results from a reduction in the number of harvestable sized fish available to the angler. This lack of recruitment into the ranks of catchable-sized fish results from either a stagnation in growth of the sport fish population caused by an inadequate food supply (due to inter and/or intra specific competition), or a lack of reproduction and survival of sport fish species caused by competition, angling predation and natural predation. The latter is more likely to occur in larger lakes, while overpopulation and slow growth is typical in smaller lakes and ponds.

Considerable credit or blame for the change in fishing success as a fish population develops in a new lake has been given to a change in the level of basic nutrients available for conversion to fish flesh. It is questionable whether the basic nutrient level has any great effect, since a new lake situation can be duplicated or at least imitated by simply removing the existing fish and starting over with a new fish population. This indicates that much of the variation results from changes within the fish population itself.

In any event, the decline in fishing success after the initial peak is disconcerting to the biologist, as well as the angler. Considerable effort is expended in an attempt to recreate the good old days when everyone caught a boatload of the big ones. While this effort generally falls short of total success it is not wasted since it maintains the fishery at a higher level than it might deteriorate to if left to progress without interference. Some of the methods utilized in the effort to improve fishing include; changes in stocking (species and/or number), introduction of new species (predator and/or forage), habitat improvement (erosion control on the watershed or shoreline), placement of fish structure or shelter to improve catchability or survival of fish, partial or complete renovation and the use of fishing regulations. Considerable effort is also made to keep the angler informed as to the best time and place for fishing. □

THE DROWNING MACHINE

by Betsy Maleug
WATER SAFETY COORDINATOR



The pulling force of the rolling water (hydraulic) below even a small 10-foot dam has enough power at high water to carry an object back into the dam from as far downstream as 50 yards!

ON THE AVERAGE, five Iowans will become trapped each year in the perfect drowning machine — the recirculating current below a dam or spillway.

Dams come in many shapes and sizes, everything from the huge lock and dam structures on the Mississippi River to the small, "lowhead" structures on our inland streams. The huge lock and dam structures are owned and operated by the U.S. Army Corps of Engineers. Ten of these structures are located on the Mississippi River. On the inland streams, there are approximately 200 lowhead dams. Typically, these structures are between 5 to 10 feet in height. Few people realize, however, dams of all sizes are dangerous — more dangerous than they appear. The danger of a large dam such as Red Rock should be obvious, but even the small lowhead dams can kill the best swimmer. In Iowa, firemen and other rescuers have been killed in attempts to save persons trapped in the rolling current below a lowhead dam.

One should understand the mechanics of a dam or a spillway. The hydraulic action of water flowing over a dam creates a recirculating current that is very treacherous. The rolling water takes any object down to the bottom, releases it to the surface, sucks it back to the face of the dam, and pushes it back to the bottom again. This cycle can continue indefinitely.

A casual observer may not recognize these hazards. Dams are usually very pleasant places in the summer when water drops over them and gently bubbles before going on downstream with a refreshing supply of oxygen for fish and other aquatic life. However both ends of a dam are usually terminated with a vertical wall of stone and poured concrete. Even if a victim trapped in the tumbling action is strong enough to work over to the side, it is very doubtful he or she would have enough energy to climb over a vertical abutment of 10 to 20 feet. To make matters worse, a swimmer must fight with branches and other debris also trapped in the turbulence.

A small dam (see picture) does not look particularly dangerous, especially when viewed from a boat positioned upstream from the drop. But, during spring water levels, the boil crest will move downstream and the back wash will fill the area between the drop and the boil crest. This is when a small dam becomes a *drowning machine*.

Dams are particularly dangerous to fishermen. Many anglers are attracted to dams since fish often congregate below them. Unfortunately, safety is often overlooked. Generally, the cement surfaces and rocks around the dam become very slippery with algae. Wading on or near these structures is especially foolish. On the Mississippi, some fishermen tie up to the rollers along the lock and dam structures. Many fishermen are thrown into the grasp of the drowning machine when water is released from the dam and their boats suddenly capsize. Even a person wearing a life jacket has little chance for survival trapped in the hydraulic below a dam. The mixture of air bubbles and water weighs only two-thirds as much as water and has only two-thirds of the buoyancy. The victim sinks, not being able to swim out of it or breathe in it. In Iowa, half of the 24 persons who died near a dam in the past five years were fishermen. Other victims of the drowning machine were canoeists, waders, and water safety rescuers.

Dams provide flood control, energy, navigational help, and recreation. But all of us should also recognize their dangers and treat them with respect.

Statistical Review

No. of Deaths Last 5 Years	Location	Height of Dam
11	Inland Streams	10′ average
10	Mississippi River, Locks and Dams	15′ average

CLASSROOM CORNER

By Robert Rye
CONSERVATION EDUCATION CENTER ADMINISTRATOR

EVERYBODY KNOWS birds nest in the spring. We have watched robins feeding their young in May, and sparrows carrying grass to make their nests. However, the goldfinch usually nests in August when the maturing thistles can provide seeds for food and down for nest building.

Once the nest is securely built, what about the eggs which are in the nest? These eggs are magnificent structures.

When you think of eggs you think of chicken eggs with which everyone is familiar. Not all eggs have the familiar shell of the chicken egg. Did you ever look at fish, frog or toad eggs? Their eggs have no shells and must therefore, be deposited where they won't dry out. If it is a dry year, producing young will be difficult.

Snakes, turtles, and alligators have eggs which, in structure, are between the egg of the fish and frog and the birds. Reptiles have eggs with soft shells. They feel rubbery because of a lack of calcium. They do protect the embryo fluids from escaping too fast; however, it is still pervious, as water will pass through. Thus, the egg needs some protection from drying out or drowning.

Birds have come up with the best egg yet. It is a self-contained capsule which keeps the embryos moist, breathing and free of body toxins. It begins life inside the female as it moves down the reproductive tract with yolk, albumen (white), shell membrane and shell being added.

This production trip can take as long as 20 hours. During that time, the embryo has been provided with food, water, lung, bladder, and protection. The embryo has started to feed and grow. It now spends its incubation time in the nest.

Have you ever thought about the relationship between nest and eggs? Nests are important as a means for protecting eggs and keeping them warm, yet birds build a variety of styles of nests.

A bird's nest may be a mud plastering, such as that of the barn swallow; weigh several hundred pounds, as that of the eagle; look very delicate like the nest of the oriole; or be the very poorly constructed stick platform of the dove.

The eggs match the nest. Some eggs are made with one end much larger than the other. These will not roll in a straight line and fall to the ground from a loosely constructed nest. The oval shape some eggs have allows the eggs to roll close together to be efficiently incubated as in the nest of a sandpiper or snipe.

The color of eggs is noticed by humans. The robin's blue egg shells are commonly found on the grass. Ground nesting birds such as the whip-poor-will or the nighthawk lay pigmented (colored) eggs with spots of brown, olive, red, blue or green which help to camouflage them. Colors may vary within a species of bird and as the bird ages or feeds differently.

The eggs require different incubation periods and have different hatching times. Some birds start incubating immediately (hawks & owls) causing different hatching times. Ducks and geese do not start incubating until the last egg is laid. This allows for all birds to be the same age and size so the adults can shift from incubating to raising young immediately.

Have you ever looked for a bird nest above where you found part of a shell? This part of the egg story shows how the adult birds deal with predators. We aren't the only predators looking for the young when we find a shell. The parents, however, carry the shells and drop them to avoid detection by predators.

PHOTO BY JERRY LEONARD

Canada Goose and Blue-Winged Teal eggs.

Looking at a common item such as a bird nest or egg, we find that we are led into many discoveries. We can find many of these by looking and asking questions. The Conservation Education Center has a variety of programs of which you can take advantage. Call and make arrangements for leader, adult or youth groups (515) 747-8383.

WILDLIFE QUIZ

by Jim Zohrer
WILDLIFE MANAGEMENT BIOLOGIST

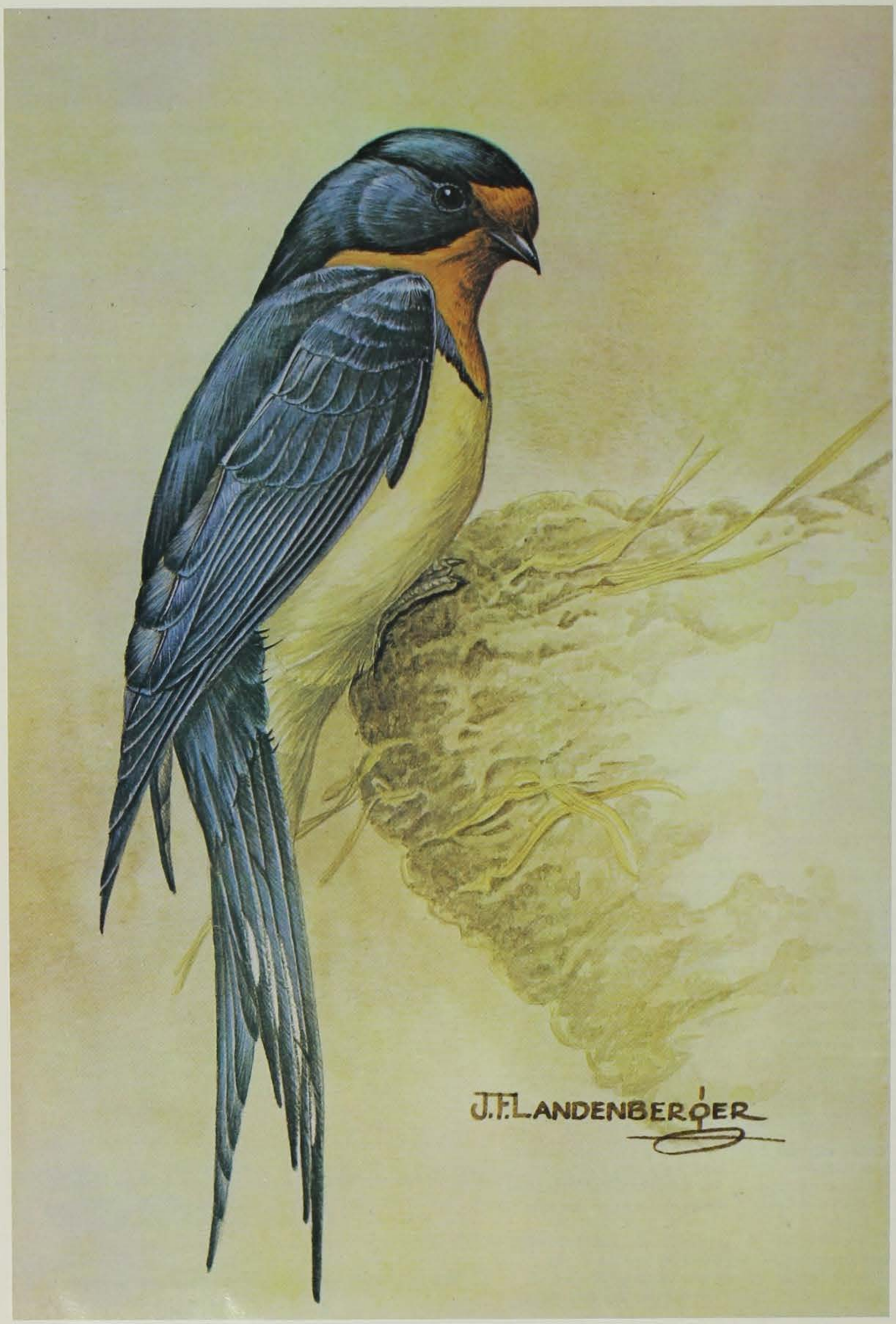
1. Poison ivy berries are one of its favorite foods: _____
2. Its fringed toes serve as snowshoes in the winter: _____
3. The young of this animal are called cygnets: _____
4. Iowa has more of this game bird than any other state: _____
5. The smallest duck found in Iowa: _____
6. Our only bird that can fly backwards: _____
7. Iowa's smallest mammal: _____
8. Lays a clutch of eggs that weighs three times as much as the female: _____
9. The most sought after game bird in North America: _____
10. Its young weigh only 1/1700 of a pound at birth: _____

Choices

a. Green-winged teal
b. Jumping mouse
c. Ruffed grouse
d. Opossum
e. Whistling swan
f. Ruddy duck
g. Belted kingfisher
h. Mourning dove
i. Yellow-shafted flicker
j. Ring-necked pheasant
k. Pygmy shrew
l. Wood duck
m. Hummingbird

Correct Answers

1. - i. Yellow-shafted flicker
2. - c. Ruffed grouse
3. - e. Whistling Swan
4. - j. Ring-necked pheasant
5. - a. Green-winged teal
6. - m. Hummingbird
7. - k. Pygmy shrew
8. - f. Ruddy duck
9. - h. Mourning dove
10. - d. Opossum


J.F.LANDENBERGER