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IOWA CONSERVATIONIST

Volume 20 April, 1961 Number 4

WE ARE EXTERMINATING THE ROBIN

GLACIATION IN IOWA STATE PARKS

Professor C. S. Gwynne
Department of Geology
Iowa State University

... seen hard winters, but ...
You have probably heard that Iowa was once covered with glacial ice. If what you heard is really true, you might expect to find evidence of it in our state parks, assuming that evidence was left after the ice had melted away. Well, let us see what we can find.

First, let us get an over-all view of what geologists believe to have been the main events of this recent Great Ice Age. The glaciation is thought to have all started with a change in climate some three or four hundred thousand years ago. It is believed, until recently, that this was as much as a million or two million years ago. Strangely enough, the evidence for the time that came from the studies of sediments taken from the ocean floor, but that is another story.

Glaciers from Snowfall

What is required for an onset of glaciation is a change of climate which results in a year-by-year accumulation of snow. What it amounts to is that not all the snow of one winter melts away before that of the next winter. Gradually, the snow becomes thicker and thicker, the lower layers compact, recrystallizes, and changes to ice. When the ice has reached a thickness of a few hundred feet or so, the bottom begins to behave somewhat like a plastic mass and slowly moves outward.

If the snow-covered area is a plains country, the movement may be a spreading one; or less in all directions. An ice cap or ice sheet, if large enough, thus forms a continental glacier.

In any case, the glaciers developed not here in the Mississippi valley, but up in Canada. It is generally believed that there were at least two centers from which the ice moved: one in Labrador; the other, the Keewatin, west of Hudson Bay. Of course their



Several times during the summer season the spray crews of city, county and state come by with their air-borne poisons. All this is done with a purpose, but the end result is depleted wildlife populations who are defenseless against this type of attack.

Jim Sherman Photo.

Roger Fliger
Naturalist

... And without trying too hard we can add a dozen more to the list.

Sounds a little shocking doesn't it, yet every day we see or read of our accelerated programs to get rid of noxious weeds, insects, harmful rodents and a list of dreadful things that modern man just can't seem to get along with.

Each time a news item appears to eradicate another offender of man's laws we get a sprinkling of letters from alarmed people concerned with the after-effects of using herbicides, pesticides, DDT and 2,4-D.

Perhaps the most pressing program now and one of our greatest threats to Iowa wildlife is the campaign against Dutch Elm disease.

What are their effects? Jack Musgrove, Curator of the State Historical and Archives Building, relates how he fed sprayed dandelion greens to his pet parakeets. Overnight almost half of the birds were dead with only a third of them able to be restored to health. Musgrove says that spraying is one of the most dangerous assaults on the balance of nature. He added, "I believe that the drastic reductions of bluebirds, goldfinches, even nuthatches and downy woodpeckers, are a result of insecticides and other roadside spraying. Who can tell the effect of residual buildups of poisons in our streams and rivers? Certainly fish life will be depleted."

After Canadian thistles were sprayed along French Creek I've seen big brown trout lying dead at the ends of the pools. What type of trout stocking program can be devised to cope with the deadly pollution from a few drops of 2,4-D?

Tests at the University of Wisconsin show that an 86 to 88 per cent mortality rate of robins occurred on the University campus after spraying DDT on elm trees. While a single dose of the toxicant showed no results when taken orally, continued meals of DDT caused robins to develop tremors and then die 7 to 15 days later.

spreading must have been helped by the change in climate which they brought about. Sort of a snow-balling effect. In the course of events, the ice at one time or another covered 4,000,000 square miles of North America and attained a thickness of as much as 10,000 feet.

The ice spread slowly year by year. Now-and-then, it may have stalled, with some warming of the climate or lowered precipitation. Finally the ice got as far south as what is now the Missouri River. This has been dubbed the Nebraskan glaciation by geologists. Then, with a change of climate in the reverse direction, the ice slowly vanished. Not all at once over a wide area, but with a backing-up process. Even though the ice was still moving down from the north, melting at the front more than cancelled-out this forward movement. Year by year, the ice margin was found to be farther and farther north, until the ice had disappeared.

Interglacial Periods

Then for thousands of years this part of the country had a climate more or less like that of today—even a little warmer at times. Things geological went on much as they do today. At the surface, the deposits left by the glacier were slowly changed by weathering, streams developed and excavated valleys.

Another change of climate brought down another glacier, this one called the Kansan by geologists. It also reached the Missouri River, but it missed much of northeastern Iowa. Then it also faded out with a reverse change in climate.

Another lapse of some tens of thousands of years, and still another invasion of glacial ice from the north country. This one, the Illinoian, reached only into the southeastern counties of Iowa.

Finally, some 30 or 40 thousand years ago, more glaciation. This one is called the Wisconsin. In the

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COMMISSION MINUTES Des Moines March 1, 1961

GENERAL

A plaque was presented to W. L. Frank who is retiring as Supervisor of Erosion Control.

Director Glen Powers presented a report on the progress of conservation bills now in the legislature.

Authorization was given for two people to attend a flood control meeting at Chillicothe, Missouri.

PARKS

A report was given on planning for a state park road construction program by the Highway Commission.

Approval was granted for a construction permit for a road right-of-way in Ambrose A. Call State Park in Kossuth County.

WATERS

The Commission authorized Director Glen Powers to approve regatta permits.

A construction permit was approved for Brumm, Moore and Teeter to construct steps of wood only on East Okoboji Lake.

Approval was given to construct a boat dock on the Mississippi River in the Beaver Slough area in Clinton County for DuPont De Nemours and Company.

A report on erosion control problems in the Rock Creek watershed in Jasper County was given by the Superintendent of Waters.

COUNTY CONSERVATION ACTIVITIES

Polk County Conservation Board was given approval for the purchase of 80 acres at \$210 per acre as an addition to Chicaqua Wildlife Area.

Black Hawk County Conservation Board was given approval for the purchase of 70 acres at \$50 per acre for a Wapsipinicon River Access area.

Approval was given to Linn County Conservation Board for a lease on the Lewis Access area located on the Cedar River for 40 years at a cost of \$1.00.

Linn County Conservation Board

EDITORIALLY SPEAKING

ONLY ONE CAN LEAD

No matter what group denies it, the fisherman still ranks first in numbers. And no wonder, for what other sporting activity has so much to offer to every age bracket of our population. Angling is a social equalizer. People can spend however much or little as they choose for equipment, but in terms of pleasure there's no measure for calibrating the fun of landing a big fish.

Every year somebody compiles statistics to prove that something or other has replaced fishing. It's all to no avail. The 23 million people who buy licenses, plus several other millions who don't have to, consistently prove the popularity of the sport.

The closest runner-up among outdoorsmen is the hunter who buys licenses totaling about 18 million. Golfers, as a matter of comparison, number approximately 5½ million in the whole of the United States.

One might suppose from the big play given indoor sports by radio and television that these activities overshadow all else. Not so! Bowlers top this category by quite a distance, the figure being about 23 million; still somewhat below piscatorial enthusiasts.

In a survey of recent outboard motor purchases, nearly half were intended for use while fishing. Other stated purposes were for pleasure boating, water skiing and hunting, in that order.

The fisherman still speaks with the voice of authority outdoors. His game has been around for several hundred million years and has been pursued and consumed by man practically since man himself came on the scene. It will take some doing to change this pattern because what's there to live for if there's no fishing?

One explanation for angling's continued popularity through the drastic social changes of the last several decades is rendered by Bernard Venables, an English writer for a London newspaper:

"If one bit of freedom remains anywhere, if there is one sanctuary where a man is at least free of all strains, all restraints, where all the stresses and demands of society are washed away, it is in his fishing.

"That is as valuable a quality as there is in fishing. You may be overworked, you may be worried; your responsibilities may be over-heavy, your home may be unhappy, you may find the strictures of your bit of society too irksome. You may, in daily life, be forced to fit, willy-nilly, into some bit of society, some group. Your inborn right to be nothing but just simply yourself may be frustrated. You are probably forever hedged about by hollow unreal importances.

"Then you go fishing. Suddenly, in that, you are free. Suddenly you are so submerged in the delights, the problems, the aloneness of your concentration, that all else has ceased to exist because you have forgotten it. You are no longer tied to the tail of the ordinary world, to your group, to self-important make-believes, to worries, to the competitive rat-racing need to keep up with others, the Joneses or anyone else.

"You, normally bedeviled by 'important' considerations, carrying the burden of them, holding your place, are now utterly taken up by something which has importance of quite a different kind. You, like a child, are feeling the true pulse of life, the freshness and delight of life, the original pleasures of sight and sound and smell and the mystery and excitement of finding fish in water."

also received approval for the purchase of 137 acres on the Wapsipinicon River near the Central City Dam at a cost of \$90 per acre to be used as part of a large multiple use county park.

Hancock County Conservation Board received approval for a roadside park on Highway 111 on the south shore of Crystal Lake consisting of 9.76 acres.

Chickasaw County Conservation Board received approval for development plans for two parks called Chickasaw Park and Haus Park.

Calhoun County Conservation Board received approval for development plans for a wildlife preserve consisting of 15.67 acres and for two wildlife roadways which cover 2 one-mile stretches of roads that are being discontinued as county roads.

An agreement with Humboldt County Conservation Board for management of the Bradgate Area (a fishing access area) located on the Des Moines River was approved.

FISH AND GAME

A request to use fish obtained from farm ponds by electric shocking for use in fee fishing was denied by the Commission.

A request for a construction permit by Northern Natural Gas Company across the Sweets Marsh Area in Bremer County was granted.

Approval to exercise an option for land purchase of 169 acres at a cost of \$35,000 in the Otter Creek Marsh Area in Tama County was approved.

Approval of a cooperative operation plan for the Clear Lake

GET THAT HUNTIN' FISHIN' LICENSE —TODAY!

Stan Widney

Years ago when I had a lot of time to fish and hunt, my cousin Newt, and I never thought of going out to do either one without taking both gun and rod, except in the dead of winter. (If my young friends say that was because we feared an Indian ambush I'll point out that I've still got a full head of hair with only a sprinkling of gray.)

The reason for the gun in summer was to keep in practice for the hunting season. If the fishing was good, we used the gun on tin cans, corn cobs, or empty shells. If fishing was poor we'd visit a flyway near crow headquarters in that area and I would watch Newt knock off a few of the black critters. I never could hit a flying object, but Newt on the end of a shotgun is a thing of beauty.

In winter, except when the snow was too deep, we'd spud in where we knew the carp were abundant and bait our hooks with canned whole corn.

Many's the time in winter we have come home with two meals cinched. You just can't beat a pound and a half carp in January and we always got our share of rabbits. Trouble was in those days we had to take off on foot and walk miles carrying all equipment—but it was sure worth it.

Now, with good roads and automobiles that will take you within a mile of anywhere you want to go, it's easy to take both rod and gun whenever you're on an outing. Just leave whichever you're not using in the car.

So there's no excuse not to get all the enjoyment possible out of every day spent outdoors by buying a combination hunting and fishing license. They're on sale now at your county recorder's office and at sporting goods stores, many drug stores, etc., for 1961-62. Get yours and be ready for the morning a fishing or hunting buddy calls up and says, "Looks like a peach of a day. What do you say?" and you can answer heartily, "Let's go!"

Hatchery with Iowa State University was approved.

A report was given on investigation of title on the MacCoon access area in Jefferson County on the Skunk River.

The Superintendent of Game gave a report on game cover needs in Iowa and methods for improving the game cover in this state.

FORESTRY

The Commission accepted a gift of five acres of land adjacent to the Cedar Creek Unit of the Stephens Forest Area from James Brown on condition that the abstract cost would not be prohibitive.

MOON SHY

What is it about the moon shining on the water that causes the fish to stop biting? This question has been asked more times than any other, I am sure.

The evening I was fishing the river with a fair amount of success. It was cloudy and the moonlight was not striking the water. Gradually the cloud cover began to thin and the moon shone through. Within minutes after the moon came out, the fish stopped biting.

The next night, another fisherman was working the same piece of water while the moon was out bright and clear. He was unable to get a single bite. Minutes after the moon set in the west, the fish (both catfish and walleye) began to bite and he returned home with a beautiful stringer of fish.

Night after night this moonlight fishing theory has been tested and everytime the same result. Why do fish refuse to bite while the moon is shining on the water? I wish I knew. If you have the answer, will you please share it with me?—*Marvin Lyon, Jefferson*

FOX CALLING

Fox hunting can be fun, even, or perhaps especially, without the costly hounds, horses and haberdashery of yesteryear.

An experiment conducted by the Minnesota Department of Conservation gives some good advice for good sport.

Some commercial predator calls were tested. None were sure fire but all worked. The recorded squeal or distress call of a rabbit also worked.

Calling was most successful in April, May and July during the last four hours of daylight. Little wind is best and the caller should approach the calling site upwind. The hunter must remain absolutely silent and motionless. Concealment is not necessary. A good calling site should have good visibility upwind. The best was a series of short, harsh calls gradually decreasing in volume and pitch. The series was 8 to 12 seconds long followed by 30 to 90 seconds of silence, then repeated. Fifteen minutes at any site was determined to be sufficient.

Results showed in the experiment 73 foxes were called up by a single individual making 401 fifteen-minute calls. He called up a fox for every seven tries and averaged one fox called up for every two hours of hunting. Forty-four per cent of the foxes came within 100 feet of the caller—some as close as 50 feet—and 74 per cent of the animals showed up within 10 minutes. —*New York Conservationist.*

Two hours after eating before you enter the water. Nausea and stomach cramps can cause the most expert swimmer to be down.

BIG SPRING TROUT HATCHERY PURCHASED

Iowa's best trout water spring plus an operating hatchery came into the hands of the Conservation Commission March 1 of this year. Located a few miles northwest of Elkader in Clayton County the Big Spring purchase eliminates the development of a rearing facility previously planned at South Bear Creek and also the necessity of renting ponds in the Elkader vicinity for rearing young trout.

Water flows from the underground source at a fairly constant rate of 10,000 gallons per minute, the amount varies less than at either of the other two trout hatcheries. Temperature of the water, too, is an important factor; it doesn't change from 48 degrees through heat of summer nor cold of winter. With such uniformity of the water supply the young trout make steady and economical growth, that is, the amount of feed and the cost of production are lowered.

The advantages of the purchase will allow this hatchery to be made into Iowa's primary trout production station and to modify the other two hatcheries at Decorah and Backbone Park to finish the trout just before stocking. Finishing the trout means putting on the final weight gain. Trout stocked by the Commission average between one-third and one-half pound and are legal size when put in the streams. Some anglers make a point of fishing freshly stocked waters, but trout need a couple of weeks in the stream for best fight and flavor.

Prior to acquisition by the Conservation Commission, Big Spring was a commercial producer for the fish pond on the grounds. Members of the club paid an annual dues or bought memberships of several years' duration plus paying \$1.25 per pound of live trout taken from the pond. Owner Otto Bankes and his wife managed the trout production and grounds for several years.

Hatching capacity of Big Spring is about 200,000 trout per year. Fish in the hatchery ponds at the time of sale will be stocked along with that of the other stations this spring. So if you happen onto a "rainbow" that bends your fly rod out of shape, it might well be a former denizen of Big Spring.

SWIM ONLY WHERE SAFE

Never swim in unsupervised waters. Rivers are most dangerous of all, and many drownings occur each year when people swim alone and have no help available when it is most needed. Swim at supervised beaches and pools, where there are trained lifeguards ready for any emergency.

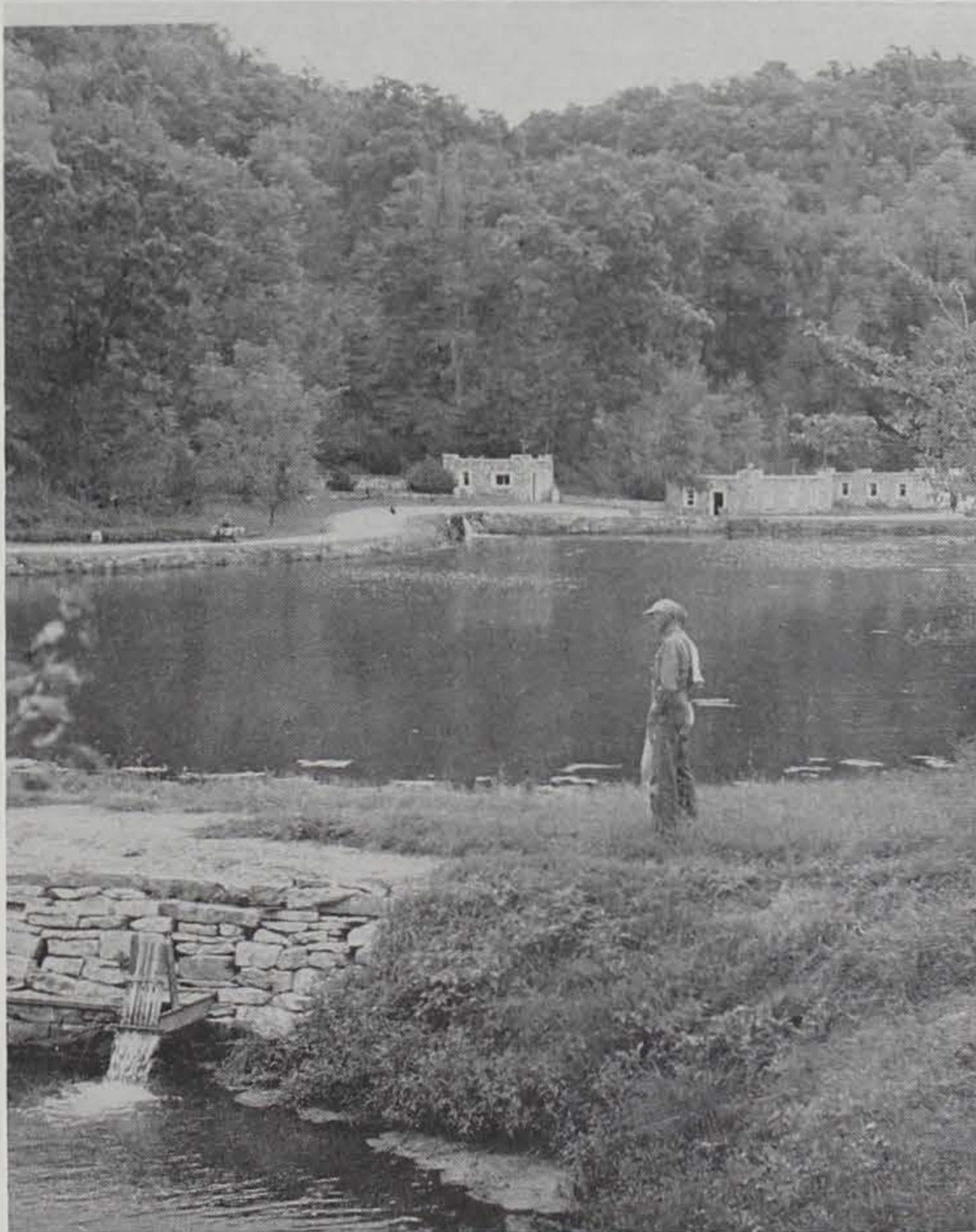
Carrion, lizards, toads and snakes frequently serve as food for the coyote.

BIG SPRING FROM THE AIR . . .



The 24 rearing and holding ponds at the Big Spring Trout Hatchery are nearly all visible from the air. Running nearby is the Turkey River. Big Pond was for fishing.

. . . AND ON THE GROUND



On the far end of the 1.7-acre fishing pond at Big Spring stands the hatchery building. *Jim Sherman Photo.*

SEEDLING SECURITY

Malcolm K. Johnson

During the next couple of months many thousands of young trees will be planted in every quarter of Iowa. Most of them will survive, some won't. If you are among those who will be setting out seedlings for the first time there are a few things to fix in your mind for successful planting.

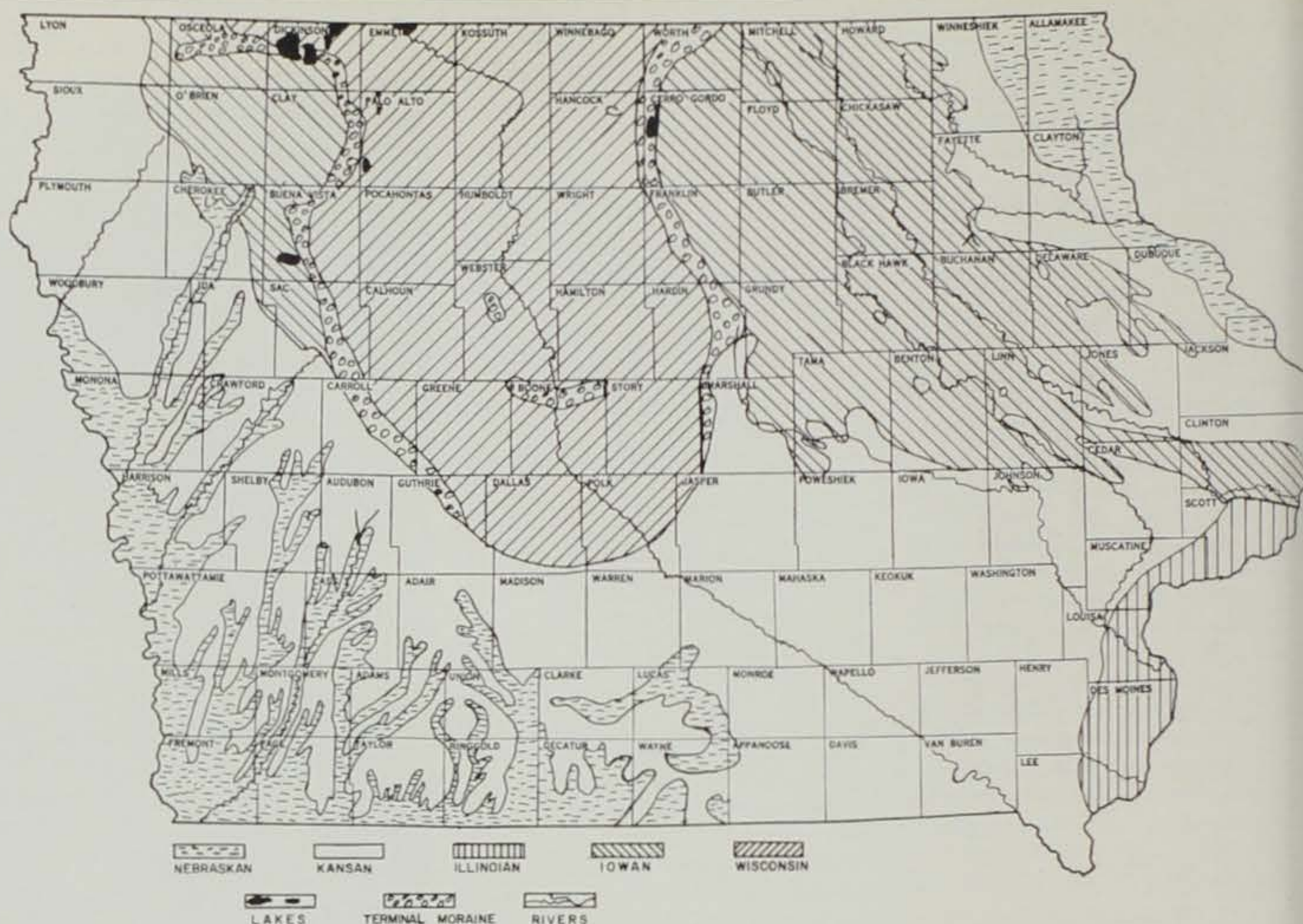
To begin with, tree and shrub seedlings are a good deal like babies. They both need some care and attention to make a good start in this world. The plants should be in good shape when they arrive from the nursery and ought to be planted as soon as possible. When packed in moss at the nursery the root hairs are moistened, but will dry within several days if not watered. Failure at this point to take care of the plants will result in wasted planting effort. Like babies, they must be nursed along until able to make their own way in the world. If you're going to wait a day or two before planting leave the seedlings in the bundles they were shipped in. If time doesn't permit immediate planting then they should be heeled in.

Heeling in involves no more than placing the seedlings in a shallow trench deep enough so that the root hairs lie straight and so that the stems are covered with dirt up to the ground line. Fill the trench loosely and water frequently.

Then when planting take only as many seedlings as can be planted in one session. Put the seedlings in a bucket of wet mud and plant after a rain. Don't keep them in clear water for any length of time or they are liable to drown.

If hand planting, a dibble helps to make the operation fast and sure. This is a half shovel with a foot bar sticking out to one side and it functions admirably for its purpose. Push it in deep, pull back on the handle, lift it out and there is your hole. Drop in a seedling, pull it up to the ground line and make sure the roots are lying straight down in the hole. With the dibble make another hole about four inches to one side of the first one. Pull the handle back to pack in dirt around the roots and to fill up the air pocket and then push the handle forward to fill in around the top. Finish the job by tamping the earth around the plant with your heel. This packs it well and also makes a pocket to catch rain water. In case a dibble isn't available, a tile spade works almost as well.

If using a planting machine the idea is still the same: roots straight, well covered, and the plant upright when you leave it. The test for proper planting is to be able to pull a couple needles off without pulling up the seedling. Just like junior; when there is no response to a pull from the apron strings, he's ready to meet the world on its terms.



Although other ice ages existed, the last one is all we can speak of with reasonable certainty. Between each period of ice coverage called respectively, Nebraskan, Kansan, Illinoian, Iowan and Wisconsin, there were inter-glacial periods in which the climate was much as it is now. This leads geologists to believe that we may expect a return of the ice sheets—many years hence we hope.

GLACIATION—

(Continued from page 121)

first sub-stage, known as the Iowan, the ice covered much of northern Iowa. Then, after retreat and perhaps disappearance, ice soon advanced again in what is known as the Tazewell sub-stage. This advance also reached only into northern Iowa. Then another forward movement brought a tongue, or lobe, of glacial ice as far south as Des Moines. This was the Cary sub-stage. And last of all, in the Mankato sub-stage, the ice moved forward over the same general area, but did not extend as far south. It has now been some nine to ten thousand years since the Mankato ice disappeared.

So, it seems that all Iowa has been covered by glaciers or, as geologists say, *glaciated*. In the northeastern corner, the part covered only by the Nebraskan glacier, so much time has elapsed that with minor exceptions the effects produced by the ice have been eroded away. The country looks much like the Driftless Area of southwestern Wisconsin, an extensive area believed never to have been covered by glacial ice.

Glacial Residue

Elsewhere, in the Kansan, Illinoian, and Wisconsin areas, it is a different story. Here, the country is covered with a deposit of glacial drift averaging perhaps 200 feet in thickness. This drift is material which was once the residual sub-soil of country to the north, in Minnesota, Wisconsin, and Canada. It became frozen into the lower part of the glacial ice and was dragged along. Most of it simply

slumped down when the ice melted, and so is not sorted or separated into layers of different particle size as it would be if it had been carried by meltwater. This unsorted material is called till. The bulk of it is clay and silt, but it also contains pebbles, cobbles, and boulders up to many tons in weight.

It is in the presence of this glacial drift, and its contained materials, that we find evidence in our state parks of the glaciers having been here. Some parks, as is the case with Sharon Bluffs, have good exposures of glacial till. Other parks may show a section through the till along a lakeshore, or there may be such a section along a nearby county road.

But, better yet, as evidence of the glaciers having been here, are the stones from the drift. Most of these have come from areas north of Iowa, where the solid rock of the earth's crust is quite different from what it is here in Iowa. These glacial erratics, as they are known, bear mute witness to the forces that brought them here. They have been used in the construction of buildings at the Ledges, Springbrook, Pikes Point, Pilot Knob, and many other state parks.

Swell and Swale

This glacial drift was left as a sort of blanket over the country covered by the ice. Over wide areas the surface was almost level, but generally it was a "swell and swale" country, with irregularly distributed low mounds and intervening shallow depressions. In other areas hilly country was developed. That was the case when

the ice maintained a static front for a while, neither advancing nor retreating very far, but melting in season, and being continually on the move. Thus, terminal moraines were formed. Most of our natural lakes in Iowa are in depressions in terminal moraine areas of Wisconsin. Also, Pilot Knob State Park is a high point on a Wisconsin terminal moraine area.

The very gently rolling part of the Wisconsin drift plain is good farming country, obviously not the most interesting place for a state park. But there are state parks scattered throughout this area of younger drift, and that requires a bit of explanation. Many of these parks are on the shores of lakes in the terminal moraines. Other parks are along river valleys cut by running water in post-glacial times. Witness the Ledges and Dolliver parks along the Des Moines River. Away from these relatively small park areas the glacial deposit is but little eroded. There, the plain country of the swells and swales or the hilly country of the terminal moraine, prevail. In southern Iowa's older drift, the state parks are along post-glacial valleys.

A good exposure of the glacial drift within the park, along a stream or in a neighboring roadside ditch or highway cut, would be a real "find" in your exploration. It is more than dirt. It is material brought here from the country over which the ice rode. Some of the erratics may be a thousand miles or more from their original home. Think that over when you contemplate these interesting glacial erratics in our state parks.

EXTERMINATING ROBINS—

(Continued from page 121)

The brown creeper succumbed to poisoning the same day as treated. Other species affected as late as six weeks later were the starling, grackle, cardinal and yellow-headed flicker. The reason that we don't often see the large numbers of dead and dying birds is that when affected by the poison they seek shelter and seclusion and pass on unnoticed by those who see them in.

A recent article in the *Des Moines Register* tells of an insecticide dealer who refused to sell one of the river towns DDT because it was not economically feasible, dangerous and could cause rapid increases in mites, aphids, scale, and other tree diseases.

Even individuals have no objection against spraying even on their own property. "Please, don't spray" signs are found in increasing numbers. Here are excerpts from a letter from Mrs. Donald Peterson of Slater, Iowa. "In order to prevent them (the city) from spraying our yard I have to talk out on the sidewalk. Of course if we are not home they spray anyway and we can see a decrease in our bird count. We plant shrubs and trees to attract birds and the berries hold the spray—they die when eating too many."

And what of the damage to human beings; Professor Galloway at Drake University believes that a high percentage of undiagnosed human deaths are caused by insecticides. Partial, then complete paralysis and deaths are the symptoms in humans as well as birds. These toxic materials when sprayed are absorbed by the ground and from there can pass to plants so that whatever we eat—grain from the field, meat from the animal or fruit from the trees—we cannot escape.

To quote F. H. Davis, regional supervisor of the Fish and Wildlife Service, "From our observation the greatest loss of bird life occurred with use of hydraulic sprayers where a large part of the DDT emulsion ran off the treated trees to pollute natural bird foods, water areas, and many instances to form puddles from which the birds drank."

We have read dramatic examples of man's unthinking decimation of certain wildlife populations as the passenger pigeons, whooping crane and bison. We consider their greed short-sighted, but we pay no attention to the present situation that threatens many species of fish and game. How can conservation programs hope to match campaigns by cities and counties to eradicate species of weeds, plants,



Jim Sherman Photo.

Violently opposed to indiscriminate spraying, many farmers and landowners have posted signs to prevent it. They know that nature takes care of her own problems.

insects or birds? By their very nature, poison sprays are unselective killers. Beneficial as well as unwanted organisms must die.

Alarming, yes, but it is remarkable how easily many can violate

the unwritten laws of nature. The warning has been served, we have the examples of the past; let's not have future generations refer to us as the people who exterminated the bluebird and goldfinch.

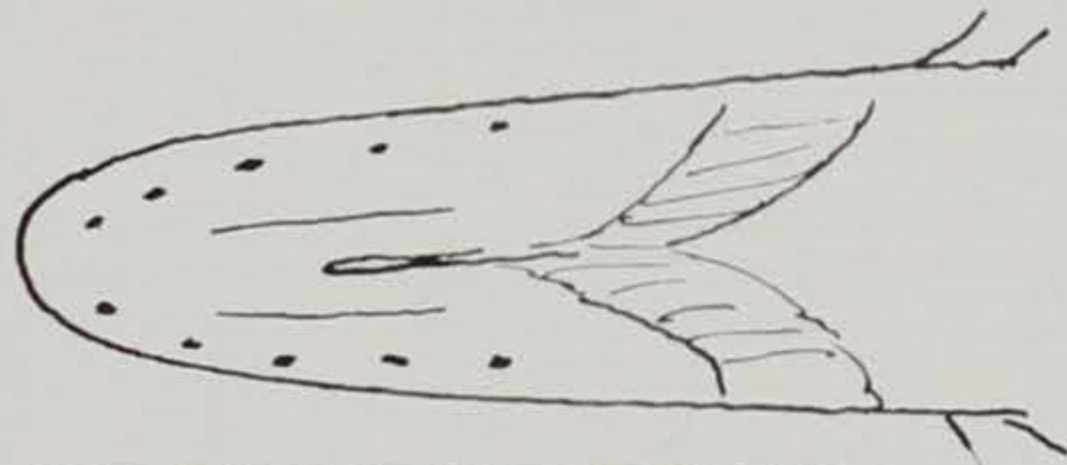
DIFFERENCE BETWEEN SOUTHERN AND NORTHERN MUSKIES

The distinguishing features between muskies and northern pikes are generally quite evident. First thing to look for would be body spots or stripes, usually lengthwise on the northern pike and vertical (up and down) on the musky. Another difference is found on the cheek where the northern is fully scaled while the musky has no scales on the lower half, next place to look for is the surest would be on the underside of the lower jaw. The northern pike has five holes on the side of the jaw (mandibular) and the musky has six to

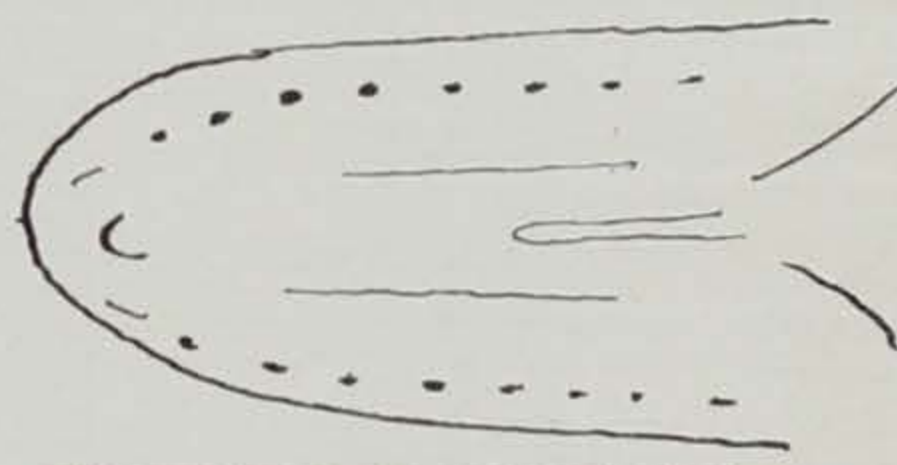
seven. The general coloration of both muskies and northern pikes varies widely. The northern pike is usually a green to gray on the back with irregular rows of light yellow spots on the sides. Muskies are often an olive to dark green with dark overmarkings on the sides that may be in the form of vertical or horizontal bars, spots, blotches and render a "tiger-stripe" appearance.

Although not many muskellunge are placed in West Okoboji and Lake in last year's experimental stocking, anglers must use care if accurate results of the season are to be obtained. By the end of summer the muskies are expected to have grown to 18 to 24 inches. If, by chance, you should happen to catch one and take it home, you will be violating the law because as of this year there is a closed season on this fish.

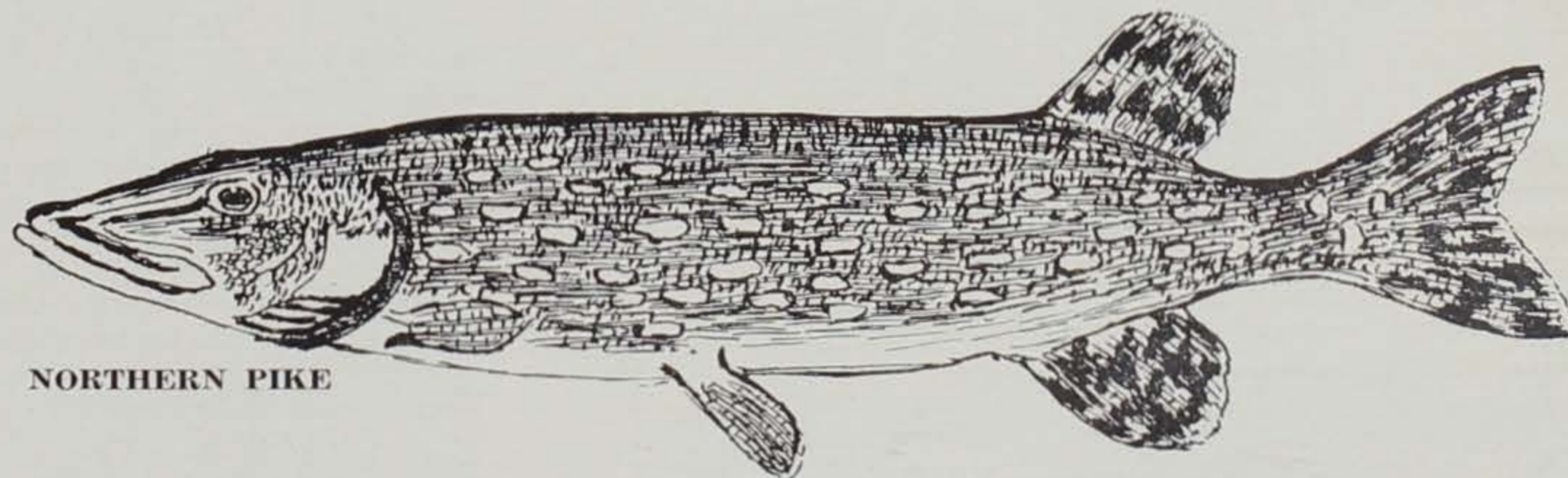
KNOW THESE FISH



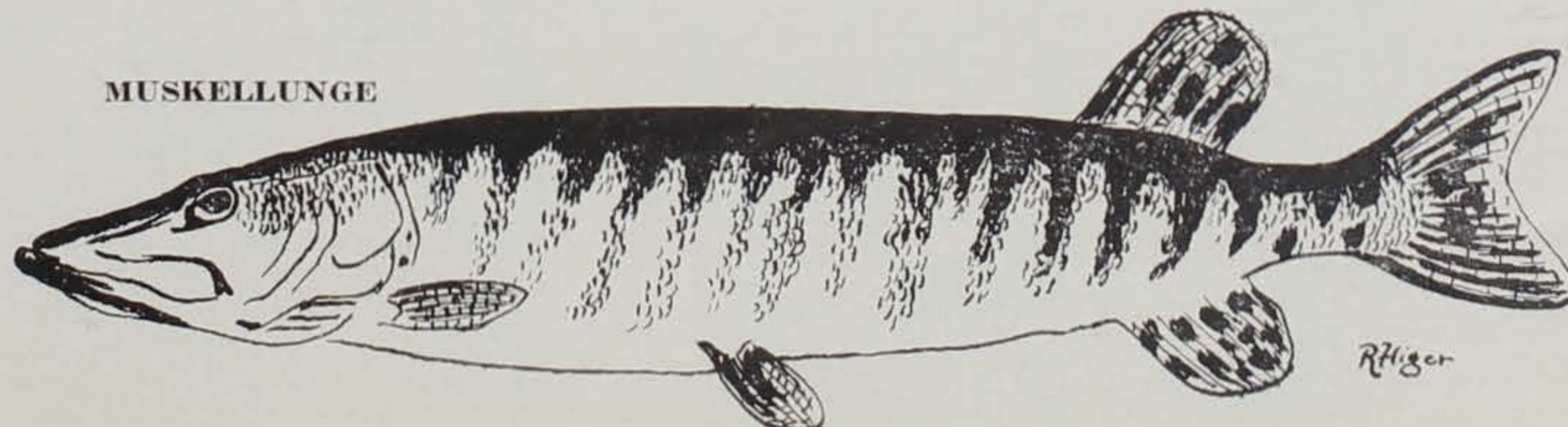
UNDERSIDE OF NORTHERN JAW



UNDERSIDE OF MUSKY JAW



NORTHERN PIKE



MUSKELLUNGE

RHiger

YOUR GAME WARDEN

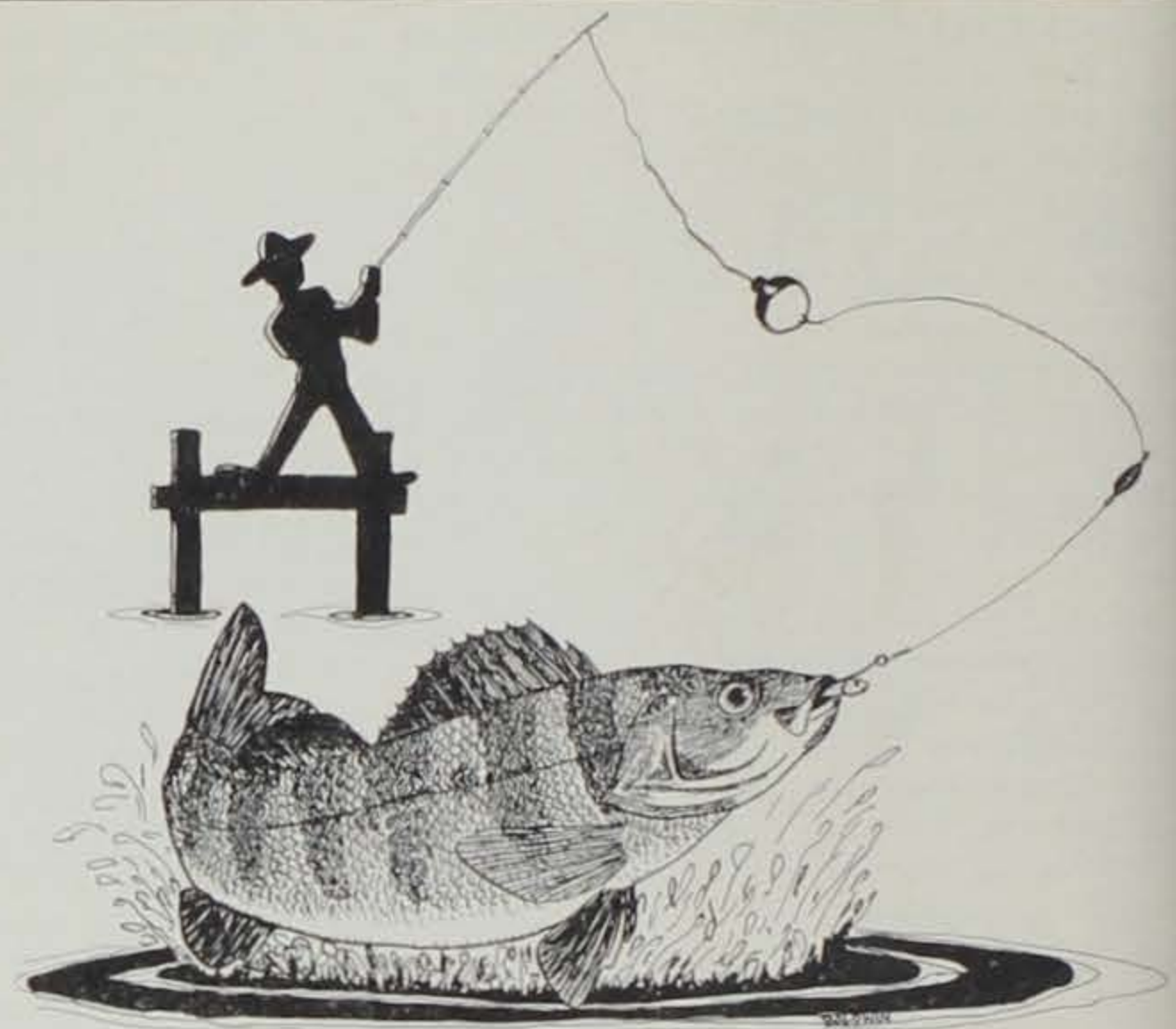
The conservation officer, popularly and preferably known as "game warden," is charged with shepherding Iowa's wildlife resources. You'll most often meet him on the stream bank, in the hunting field, at club meetings presenting programs or anywhere that people interested in wildlife congregate.

His duties are multitudinous and as a peace officer he is on call 24 hours a day. His maxim follows the line that an ounce of prevention is worth more than a pound of cure. In a sense, a primary part of the job is to protect people from themselves—to help keep them informed so that well-intentioned sportsmen don't unwittingly violate the fish and game laws. Enforcing the law is usually a distasteful job. It represents a failure on the part of people to observe the statutes that their duly elected representatives established. Violators take that which belongs to their friends.

His joys are great when sportsmen understand and cooperate with the needs of wildlife. His frustrations are tremendous when his charges suffer from unlawful and unsportsmanlike treatment. He is the friend of both hunter and hunted, encouraging and actually planting trees and shrubs for cover and telling all who inquire where cover and game exist. Space is too short to explain all of his functions, but as one game warden put it, "our duties lie in several general divisions." They are public relations, office work, hunting, fishing and trapping patrol, and game and fish management. In short, his every function is directed to benefit sport and sportsman.

Following is a list of the counties and the game warden in charge. Get acquainted.

County	Name of Officer	Address
Adair	Marlowe Ray	Box 201, Guthrie Center
Adams	Lester (Dutch) Lemke	Route 2, Bedford
Allamakee	George Kaufman	Lansing
Appanoose	Mark Uhlenhake	302 W. Francis, Centerville
Audubon	Rex Emerson	Route 3, Atlantic
Benton	Glen Angell	714 W. 10th, Vinton
Black Hawk	Bill Boswell	Box 54, Reinbeck
Boone	Warren Wilson	121 Cedar, Boone
Bremer	Bruce Parker	105 E. Hamilton, New Hampton
Buchanan	Jim Becker	512 4th, Independence
Buena Vista	Frank Starr	802 W. 6th, Box 402, Storm Lake
Butler	Jim Gregory	401 12th Ave. N.W., Route 2, Hampton
Calhoun	George (Dick) Tellier	Box 410, Fort Dodge
Carroll	Jim Ripple	402 E. Harrison, Jefferson
Cass	Rex Emerson	Route 3, Atlantic
Cedar	Bob Mineck	211 13th St., Box 29, Tipton
Cerro Gordo	Miles Camery	Ventura
Cherokee	Frank Starr	802 W. 6th, Box 402, Storm Lake
Chickasaw	Bruce Parker	105 E. Hamilton, New Hampton
Clarke	Harold Carter	830 S. Park, Osceola
Clay	Jim Baldwin	121 W. 10th, Spencer
Clayton	Harlan Frankl	Guttenberg
Clinton	Howard Lovrien	1604 N. 4th, Clinton
Crawford	Ray Cmelik	807 Courtright, Mapleton
Dallas	Louis Lemke	DeSoto
Davis	Wesley Beecher	Box 21, Bloomfield
Decatur	Harold Carter	830 S. Park, Osceola
Delaware	Jim Becker	512 4th, Independence
Des Moines	Kenneth Kakac	518 Ramsey, West Burlington
Dickinson	Bill Basler	Box 265, Lake Park
Dubuque	Bob Fagerland	2270 Hoyt, Dubuque
Emmet	Verl Holmes	103 Call St., Emmetsburg
Fayette	Wesley Ashby	Fayette
Floyd	Ben Davis	732 Pine, Osage
Franklin	Jim Gregory	401 12th Ave. N.W., Route 2, Hampton
Fremont	Jim Shipley	301 Fremont, Route 2, Shenandoah
Greene	Jim Ripple	402 E. Harrison, Jefferson
Grundy	Bill Boswell	Box 54, Reinbeck
Guthrie	Marlowe Ray	Box 201, Guthrie Center
Hamilton	Duane Wilson	Alden
Hancock	Miles Camery	Ventura
Hardin	Duane Wilson	Alden
Harrison	Jerry Jauron	Earling
Henry	Kenneth Kakac	518 Ramsey, West Burlington
Howard	Curtis Smith	704 4th Ave. E., Cresco
Humboldt	Floyd Rokenbrodt	403 6th Ave. N., Humboldt
Ida	Jim Wallace	Box 32, Lake View
Iowa	Wendell Simonson	Oxford
Jackson	Keith Ranning	212 S. Otto, Maquoketa
Jasper	Bob Rollins	308 N. 7th Ave. E., Newton
Jefferson	Berl Downing	Box 347, Fairfield
Johnson	Wendell Simonson	Oxford
Jones	Bob Mineck	211 13th St., Box 29, Tipton
Kossuk	Charles Olofson	202 "K" Ave. W., Box 381, Oskaloosa
Kossuth	Frank Tellier	Burt
Lee	Jerry Hoilien	1821 Ave. "F", Fort Madison
Linn	Orlan Handeland	Route 2, Cedar Rapids
Louisa	Dan Nichols	819 Cedar, Box 202, Muscatine
Lucas	Melvin Johnston	Route 3, Chariton
Lyon	Jack Meggers	606 S. Boone, Rock Rapids
Madison	Louis Lemke	DeSoto
Mahaska	Charles Olofson	202 "K" Ave. W., Box 381, Oskaloosa
Marion	Glen Harris	910 E. 1st, Indianola
Marshall	Walt Harvey	6 N. 2nd, Marshalltown
Mills	Christie Hein	7 Elm St., Box 329, Glenwood
Mitchell	Ben Davis	732 Pine, Osage
Monona	Ray Cmelik	807 Courtright, Mapleton
Monroe	Mark Uhlenhake	302 W. Francis, Centerville
Montgomery	Christie Hein	7 Elm St., Box 329, Glenwood
Muscatine	Dan Nichols	819 Cedar, Box 202, Muscatine
O'Brien	Jim Baldwin	121 W. 10th, Spencer
Osceola	Jack Meggers	606 S. Boone, Rock Rapids
Page	Jim Shipley	301 Fremont, Route 2, Shenandoah
Palo Alto	Verl Holmes	103 Call St., Emmetsburg
Plymouth	Gene Newel	176 S. Main, Sioux Center
Pocahontas	Floyd Rokenbrodt	403 6th Ave. N., Humboldt
Polk	Lloyd Huff	2604 37th St., Des Moines 10
Pottawattamie	Myron Speer	2835 Ave. "I", Council Bluffs
Poweshiek	Bob Rollins	308 N. 7th Ave. E., Newton
Ringgold	Archie (Pat) Tilley	1101 Orchard Dr., Creston
Sac	Jim Wallace	Box 32, Lake View
Scott	Charlie Adamson	2511 W. Locust, Box 882, Davenport



1961 FISHING REGULATIONS EFFECTIVE MARCH 1, 1961, TO MARCH 1, 1962

Kind of Fish	Open Season	Daily Catch Limit	Possession Limit	Minimum Length or Weight	BOUNDARY
					WATERS
Carp, Buffalo, Quillback, Gar, Dogfish, Gizzard Shad, Sheepshead, Sucker, Redhorse, Chub, Sunfish, Bluegill, Bullhead, Rock Bass, Yellow Bass, Warmouth, Minnows, and Sand Sturgeon	Continuous	None	None	None	Mississippi and Missouri Rivers and Inland Waters of Lee County
Rock Sturgeon	Closed				Closed
Paddlefish	Continuous	15	30	5 lb.	Same as inland waters
Perch, Crappie, Silver Bass					Same as inland waters except no catch or possession limit
Trout	Continuous	15	30	None	Same as inland waters
Catfish	Continuous	6	12	None	Same as inland waters
Smallmouth Bass and Largemouth Bass	Continuous	8	16	None	Continuous open season, catch or possession limit
Walleye and Sauger	May 27-Feb. 15 N. of Hwy. 30 Continuous S. of Hwy. 30	Combined smallmouth and largemouth 5	Combined smallmouth and largemouth 10	None	Same as inland waters except continuous open season. Daily catch 10, possession 20 in aggregate
Muskellunge	Closed				Closed
Northern Pike (Pickerel)	May 13-Feb. 15	3	6	24 in.*	Continuous open season. Daily catch 5, possession 10
Frogs (except Bullfrogs)	May 13-Nov. 30	4 doz.	8 doz.	None	Same as inland waters
Bullfrogs (Rana catesbeiana)	May 13-Nov. 30	1 doz.	1 doz.	None	Same as inland waters

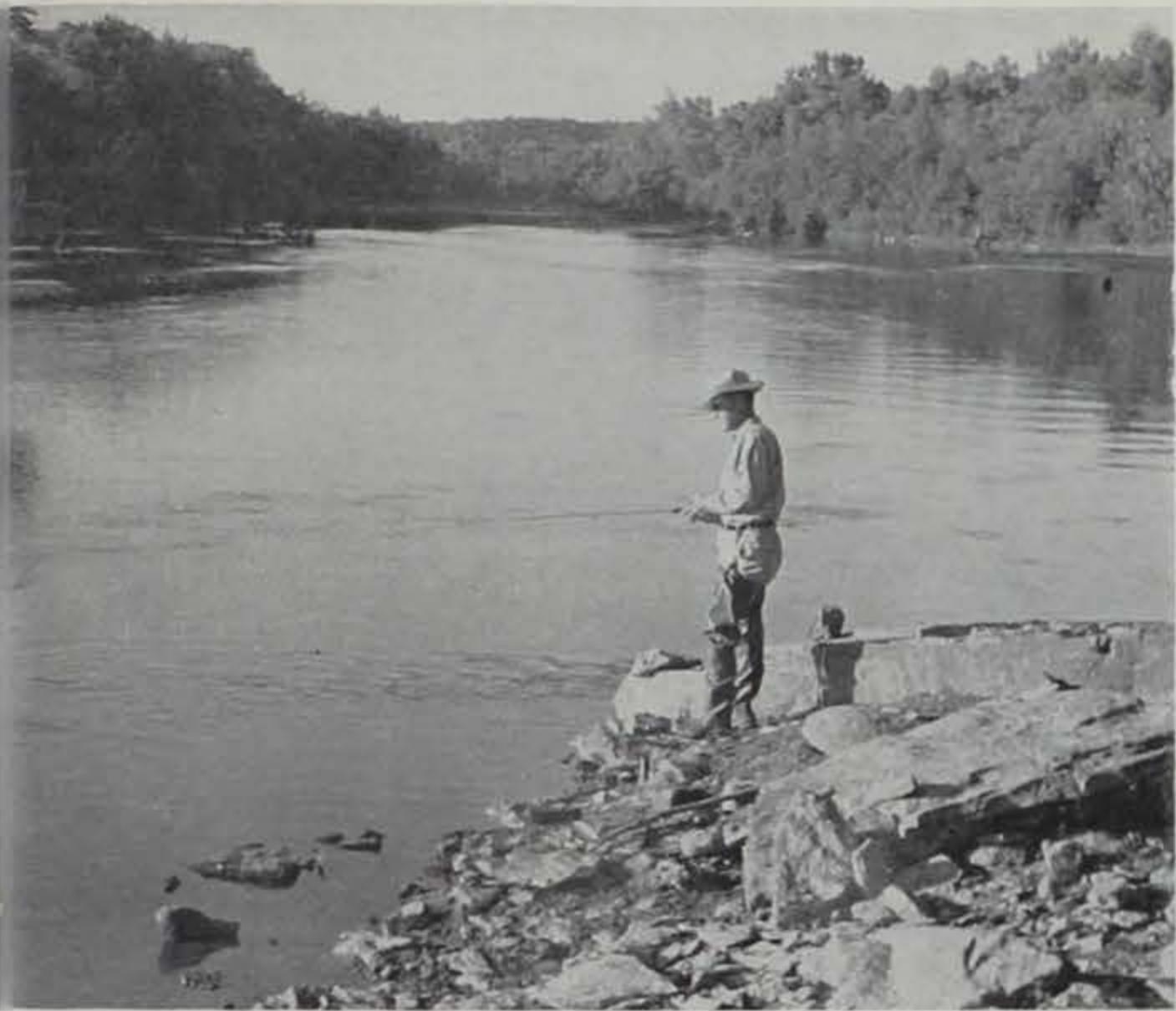
Where waters are located within the confines of state, city, municipal parks, etc., fishing will be permitted when such areas are open to the public.

EXCEPTIONS: On all state-owned natural lakes, all angling through ice is prohibited between the hours of 6:00 p.m. and 6:00 a.m.

In Little Spirit, Dickinson County; Iowa and Tuttle (Okamanpedan) Lakes, Emmet County; Burt (Saw Lake, Kossuth County); and Iowa Lake, Osceola County, the following exceptions apply: WALLEYE, daily catch limit 6, possession limit 6; NORTHERN PIKE, daily catch limit 3, possession limit 3; SUNFISH, daily catch limit 15, possession limit 30; CATFISH, open season, Saturday preceding May 15 to February 15, daily catch limit 16, possession limit 16; SMALLMOUTH and LARGEMOUTH BLACK BASS, open season, Saturday preceding May 30 to November 30, catch limit 5, possession limit 5; BULLHEADS, CARP, SUCKERS, REDHORSE, BUFFALO, BURBOT, DOGFISH, GAR-FISH, QUILLBACK, SHEEPSHEAD, no closed season, no daily catch, possession or size limits. The possession limit shall not exceed thirty (30) fish of all kinds in aggregate except that the aggregate possession limit shall not apply to fish named on which there is no daily catch limit.

*Length Limit applies only to natural lakes and Blue Lake, Browns Lake and Manawa.

Shelby	Jerry Jauron	Earling
Sioux	Gene Newel	176 S. Main, Sioux Center
Story	Warren Wilson	121 Cedar, Boone
Tama	Glen Angell	714 W. 10th, Vinton
Taylor	Lester (Dutch) Lemke	Route 2, Bedford
Union	Archie (Pat) Tilley	1101 Orchard Dr., Creston
Van Buren	Wesley Beecher	Box 21, Bloomfield
Wapello	John Horton	511 Ray St., Ottumwa
Warren	Glen Harris	910 E. 1st, Indianola
Washington	Berl Downing	Box 347, Fairfield
Wayne	Melvin Johnston	Route 3, Chariton
Webster	George (Dick) Tellier	Box 410, Fort Dodge
Winnebago	Wilfrid Macheak	Forest City
Winneshiek	Curtis Smith	704 4th Ave. E., Cresco
Woodbury	Duane Luchtel	508 S. Lewis Blvd., Sioux City
Worth	Wilfrid Macheak	Forest City
Wright	Duane Wilson	Alden



Jim Sherman Photo.

the public lands held by the state are the banks of the meandered rivers up to the ordinary high water mark where permanent and aquatic vegetation meet. Higher water and ice action make this line. The 15 meandered streams are listed below.

IOWA RECREATION LANDS

Where and How Much

Lloyd Bailey

Superintendent of Land Acquisition

Evans, are you looking for a place to hunt, fish, swim, boatride, picnic or just relax? Many of you do not realize the extent of the public recreational areas in our state which, although admittedly limited, do offer many and varied types of recreation.

There are, within the boundaries of the state, approximately 690 square miles of land and water under the jurisdiction of the State Conservation Commission and Federal agencies available for public use.

One hundred ninety square miles, or 2 per cent of the State of Iowa's total area of 55,986 square miles, is about the same as the area of Monona or Winneshiek County.

In contrast, 4.2 per cent of the

State of Missouri, 27 per cent of the State of Minnesota and 54.4 per cent of the State of Wyoming are occupied by public recreational lands as graphically illustrated. Missouri has a total of 69,674 square miles, Minnesota 84,068, and Wyoming 97,506.

Where It Comes From

Iowa's recreational lands are comprised of 84,651 acres or 132 square miles acquired by gift, purchase or exchange; 46,578 acres or 73 square miles which remain of those natural and unsold, drained lake beds acquired by Federal grant when Iowa became a state; 420 square miles of meandered or navigable river beds also acquired by sovereignty and an estimated 55 square miles of federally owned or controlled areas.

In addition, the Conservation Commission controls by lease and license from Federal agencies approximately ten square miles of land and water which is managed for recreational purposes.

"Meandering" Explained

A meandered or navigable stream or lake is one which, at the time of the original government survey, was so surveyed as to mark, plat and compute the acreage of the adjacent fractional sections. The surveyed meander line is not a property boundary. The Iowa Supreme Court has ruled that the boundary between meandered lake and stream beds and the adjacent riparian lands is the ordinary high water mark determined as the line of demarcation between terrestrial or permanent types of vegetation and aquatic or lack of vegetation adjacent to a

meandered lake or stream. Such a line is created by action of ice and water.

Meandered streams in Iowa are the Mississippi, Missouri, Big Sioux and Des Moines, which form part of the state's boundary, and portions of the Upper Iowa, Turkey, Little Maquoketa, Maquoketa, Wapsipinicon, Iowa, Cedar, Skunk, Des Moines, Raccoon, and Nishnabotna Rivers lying inland in the state.

Water for Recreation

There are 309 named recreational areas, exclusive of the meandered streams, varying in size from less than one acre that provide access to a stream or lake, to areas such as Big Marsh in Butler County containing 2,760 acres and Spirit Lake with a lake bed of 5,660 acres.

Of these 309 areas, 171 are fish and game management areas providing 44,630 acres. About 30,600 acres are land and marsh and 14,000 acres are water. Shallow water areas not suitable for other than duck boats or other small, shallow draft craft are termed marshes. Also many areas support fishing streams not included in the water area.

There are in Iowa 65 natural lakes with 46,580 acres of water and marsh offering many types of recreation and 93 state parks and recreational preserves containing a total of 46,580 acres, 27 of which have artificial lakes providing an

additional 4,225 surface acres of water.

Although regulations limit park use to certain hours there are no such restrictions on fish and game management areas.

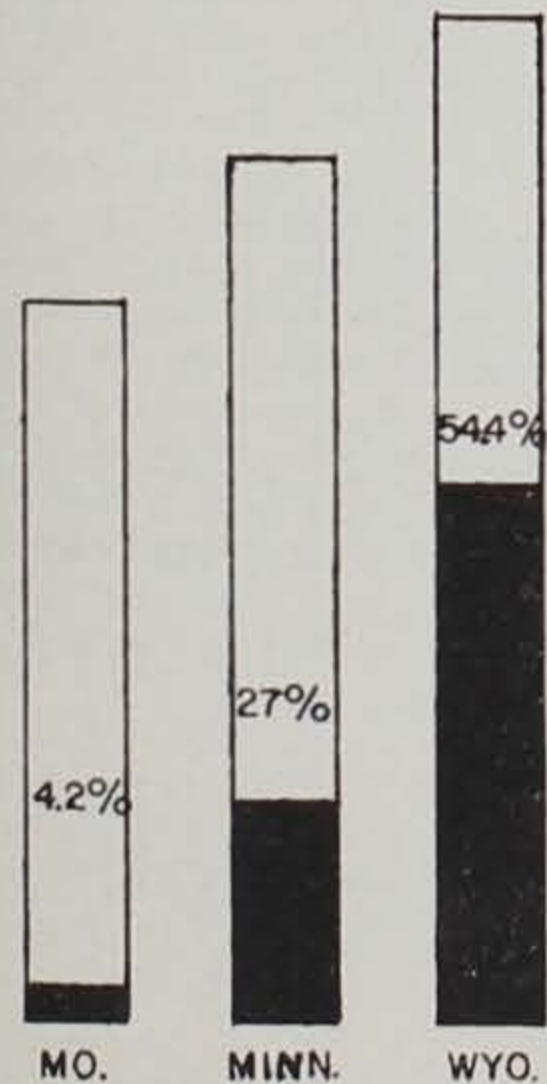
Land for Recreation

Of the 166 fish and game management areas, 69 offer access to stream fishing and hunting, 75 offer access to lake or pond fishing, waterfowl hunting and boating, and 164 of these areas offer upland game hunting in addition to other recreational uses.

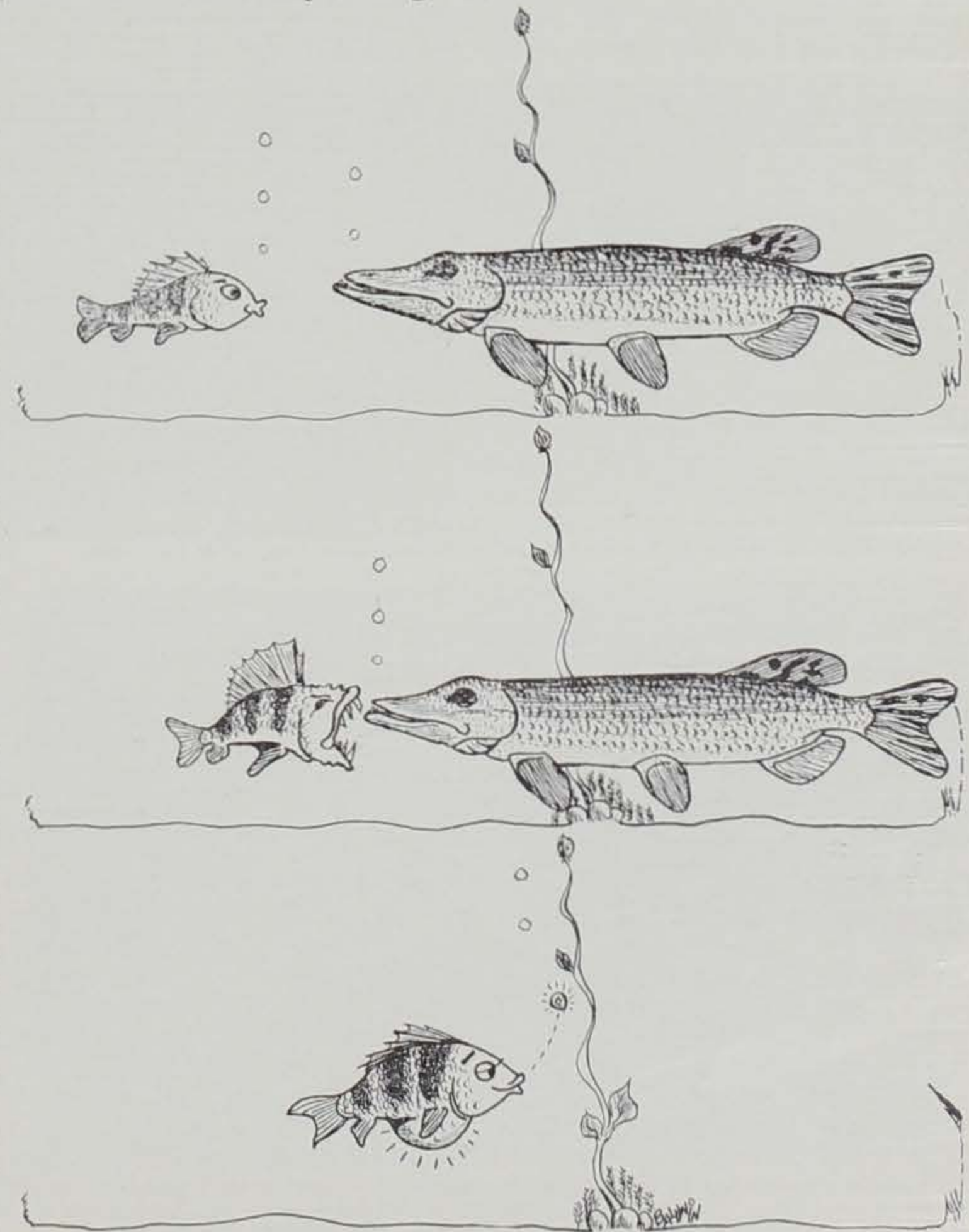
Except for small tracts acquired to straighten boundaries or consolidate areas into compact units, these recreational areas consist of marginal lands or sub-marginal lands. They are either low, flat and wet, or rolling to rough in topography and unsuitable for agricultural purposes other than grazing or timber production.

Many support natural phenomena of interest to outdoor lovers and naturalists in addition to facilities developed for campers, boaters, picnickers, fishermen and hunters.

Although few areas offer everything, no Iowan has to travel far to find a state area offering some kind of outdoor recreation. If you don't like crowds, visit some of the little known spots. You may have to "rough it" but you will go home relaxed and surely discover something of interest during your visit.



The shaded area in each column denotes the amount of public recreation area in relation to the total area of the states.





Exploding from their hideout, these hen pheasants must find another place that offers suitable protection from the elements and from marauding predators. They travel no more than a half-mile from their home grounds in search of food so must have cover within reasonable distance of nourishment. In north central Iowa the birds are on the southern border of the primary pheasant range and make extensive use of farm grove windbreaks where available. Pines and honeysuckle are favored homesites.

FARM WINDBREAKS SHELTER PHEASANTS

Richard Nomsen
Pheasant Biologist

Farm groves and windbreaks in many areas constitute the only available safe winter cover for

Iowa's number one game bird. This cover, too, has been depleted by trimming and cutting so that its



In the distant background a farm windbreak stands surrounded by bare fields. Winter shelter for the ringnecks is a must if we are to continue as second in the nation.



Honeysuckle interspersed with pine trees is recommended as best for winter protection of the game birds. "The honeysuckle tightens up the farm grove and holds back the winds," said Dick Nomsen, Commission biologist stationed near Hampton, Iowa.

value as a windbreak and wildlife cover is greatly reduced.

Pheasants are hardy game birds and can well withstand the rugged Iowa winters if proper cover is available. But, if dense cover is lacking, loss by exposure can be severe.

Our primary pheasant range includes the fertile upland of northern and central Iowa and a few isolated areas in the southern part of the state. The land is intensively farmed and dense cover is at a premium.

Exposure Danger

Winter mortality of pheasants can occur by exposure, road kills, starvation and predation. The most serious losses occur from exposure to severe winter weather. Birds are smothered when their beaks and nostrils are encased by ice and snow during sub-zero blizzards. Many are lost from freezing when their protective coat of feathers becomes filled with ice and snow. The greatest loss of pheasants by exposure happened during the winter of 1935-1936 when nearly half of the winter population in parts of northern Iowa were killed by freezing and smothering.

How Windbreaks Help

Windbreaks are designed to break the force of strong winter winds that sweep across the plains. They shelter the farmstead, hold the snow away from the buildings and add beauty and value to the farm. Windbreaks will often mean the difference between survival and death of pheasants on the farm. Excellent bulletins on Farm Windbreaks may be obtained from your



Jim Sherman and George Tovey photo. Brrrrr, but it's cold back there! The feathers will grow back on this cock, but the freezing rain certainly embarrassed the otherwise dignified roosters.

local County Extension Office or from Iowa State University, Ames, Iowa.

There are several factors which are important to pheasants wintering in a farm windbreak. First, all cover must be close to the ground. Evergreens that retain their lower branches are excellent. If deciduous trees are used, two or three rows of honeysuckle around the outside will break the biting winds to shelter the birds. Extra cover for wildlife should not be placed near roads where traffic kills could occur.

Distribution of windbreaks is also important. Pheasants rarely travel more than a half mile in search of food during January and February. Ten windbreaks harboring 30 birds each would be much better than one trying to support 300.

Planting farm windbreaks can improve the farm as well as provide pheasant habitat. Habitat improvement is a long term investment—results will not be apparent for several years. But the importance of adequate winter cover is evident, and with fewer farms and more intensive agriculture in the future, the value of farm windbreaks as wildlife shelter will increase.

There are no birds in the redwood trees of California. The trees secrete poisonous substances which are deadly to the insects upon which the birds would normally feed.

Bats are the only mammals capable of sustained flight. Flying squirrels can only glide.

Volume 20
SIGNALS
FROM CREEL
Roger Flig
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