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FRONT COVER: Dragon Fly by Jerry Leonard

BACK COVER: Iowa's state bird, the Goldfinch was painted by Jim Landenberger of 2031 Northgate Drive, Cedar Rapids.

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WILDLIFE and the Hunter

by Thomas J. Neal
Wildlife Biologist

LATE SUMMER and early fall are times of plenty in the fields and forests of Iowa. Nature has stocked her pantry with an abundance of wild things, not only birds and animals, but also fruits, insects, and grains for them to eat. But winter is just around the corner, and this is a time of difficulty for our wildlife.

All that nature produces cannot survive. It is the plan of nature to produce large quantities of excess animals each spring to insure that the necessary few to carry on the species will survive the harsh winter. It is a fact that, in this way, nature is wasteful. But must all wild things that are not needed to further the species be wasted? Let us look at an alternative.

Students of wildlife use the term "compensation". Briefly, it means that if one thing doesn't harvest the extra wildlife, something else will. Wildlife must be thought of as a crop. It is a product of the land the same

as forty acres of corn. Wildlife cannot be stored any more than can a field of ripe standing grain. When it is ready to be harvested, something must use it or it will go to waste. There simply are not enough suitable places for all wildlife to survive cold weather. When things get tough in the winter, those with the poorer "homes" will perish.

It is possible for the hunter to get in ahead of natural mortality and convert some of the annual surplus to his own use by taking it before something else happens to it. Those animals that the hunter takes are those that storms, predators and disease would have taken later. This has been proven again and again in carefully controlled experiments. Something is always going to harvest the annual surplus or crop. It must happen! The hunter, when hunting within the laws and bag limits, is not reducing the game population, but is salvaging what would otherwise be wasted. □



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THE VOO DOO BIRD

by Richard A. Bishop
Wildlife Reserach Biologist

AS THE SUN dropped behind the hills, leaving behind a blanket of evening, a squealing whistle drifted down through the bottomland hardwoods. The sound trailed off as noisy wings carried the Voo Doo bird towards its roosting spot somewhere along the back waters of the Mississippi.

The Voo Doo is the name I assigned this bird from our many associations where his eerie call from timbered river valleys or misty marshes has touched me. Beautiful, secretive and witch-like in flight, the wood duck is truly one of Mother Nature's most exquisite creatures.

Once sought after for its feathers and flesh, the population was reduced to such a low ebb in the early 1900's that many people feared the wood duck's extinction. Unregulated harvest and the clearing of vast areas of bottomland timber were responsible for this tragic decline.

The signing of the Migratory Bird Treaty Act on August 16, 1916 by the United States and Great Britian, acting in Canada's behalf, was the first big step in protecting the wood duck. This act gave the Fish and Wildlife Service the authority to regulate the harvest of migratory waterfowl and set the stage for the first hunting seasons. The resulting regulations prohibited the taking of wood ducks from 1918 through 1941 in the Mississippi Flyway and only one wood duck was allowed in the daily bag from 1942 through 1961 except for the years 1954, 1956, 1957 and 1958 when the season was again closed. In 1962 the daily bag limit was increased to two wood ducks where it has remained.

Protection, controlled harvest and the duck's ability to adapt to a changing world has enabled this species to rebound from near extinction to the status of being the third most important duck in the hunter's bag in the Mississippi Flyway. It is now outranked only by mallards and teal.

The success story of modern day conservation. The wood duck breeding range extends only into the winter range is the summer duck south, or tree duck selects a natural cavity site. The size and height from the ground. The female can pass through a dull white eggs in 1 to 31 days.

After hatching, for danger and then of the young duck jump from the ent ground. The fall, the ducklings any.

The story of Iowa United States. Pop where woodies were destruction by timber threatened its status wood duck could habitat. Well, Mr. bird used one of man's influence. northwest Iowa which provided accustomed to for.

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The adaptation pioneering of the northwest Iowa provided a haven woodies were not provided good comeback in the places to live. On marshes along with farm grove. Also, many state.

The success story of the wood duck should strike hope in the hearts of modern day conservationists.

The wood duck is principally a bird of the United States. Its breeding range covers most of the eastern half of the United States and extends only into the southern parts of central and eastern Canada. The winter range is confined to the southern States. Commonly called the summer duck because it breeds and spends the summer so far south, or tree duck due to its habit of nesting in trees, the wood duck selects a natural cavity in the trunk or large limb of a tree for its nest site. The size and depth of the cavity selected can vary greatly and its height from the ground may be anywhere from 3 or 4 feet to 40 or 50 feet. The female weighs about 1 1/4 pounds, is about 18-inches long and can pass through a hole 4-inches in diameter. She usually lays 10 to 15 dull white eggs in the cavity of her choice and incubation takes from 28 to 31 days.

After hatching, the hen will fly to the ground, closely survey the area for danger and then quietly call to the ducklings in the nest. The exodus of the young ducks is a sight to behold. They simply and awkwardly jump from the entrance of the cavity and half fall and half sail to the ground. The fall, even from heights of 50 feet, usually does not cause the ducklings any harm.

The story of Iowa wood ducks is quite similar to that of the eastern United States. Populations increased during the 40's and 50's to a level where woodies were considered common; however, continued habitat destruction by timber clearing and drainage for agriculture greatly threatened its status in Iowa. At that time few people believed the wood duck could tolerate this destruction of nesting and brood rearing habitat. Well, Mr. Wood Duck surprised us all. This marvelous little bird used one of nature's most valuable survival tricks. It adapted to man's influence. Wood ducks moved to town, to the prairies of northwest Iowa and to many narrowly timbered rivers and creeks which provided only a remnant of what their ancestors were accustomed to for comfortable living.

It is not totally surprising to see wood ducks utilizing nesting cavities in large old trees in many towns. In some instances, towns provide the only good nesting area along rivers and streams and predation by raccoons is often lower. It is not uncommon for 100 or more wood ducks to hatch from nests located in Clear Lake, Iowa. The town cradles the 3,600 acre lake and provides good nesting habitat.

Some people have enticed wood ducks to nest in their yards or tree groves by providing wood duck houses. Frederic Leopold of Burlington, Iowa, started a nesting box project in his yard in 1943 and in the early 60's, had 100 percent use of his 16 to 20 boxes. As long as adequate protection from predation and vandalism is afforded by such nesting sites they are usually well accepted by wood ducks.

The adaptation to nesting close to humans is not as surprising as the pioneering of the wood duck to prairie Iowa. North-central and northwest Iowa, once covered with prairie marshes and sloughs, provided a haven for nesting teal, mallards, pintails and redheads but woodies were not common. This area lacked the trees of the type that provided good nesting cavities. However, during the population comeback in the late 50's and 60's, wood ducks started looking for new places to live. Oddly enough the drainage ditches that drained the marshes along with a few undrained areas provided the water habitat while farm groves with mature trees produced the nesting cavities. Also, many state owned prairie marshes with wooded areas nearby

experienced increased wood duck use. We have banded as many as 80 young wood ducks in one summer on a single prairie marsh. The adaptation to this previously marginal habitat has allowed for expansion of the base population of wood ducks in Iowa. Because the wood duck will utilize many different habitat types it is possible for Iowans to observe wood ducks in any county of the state but certainly the timbered river valleys of eastern Iowa support the highest wood duck populations.

Management of wood ducks is based on careful study of population surveys, breeding data, setting annual hunting regulations, habitat preservation, nest box programs and research.

Biologists and officers across the state float a number of inland rivers in late June and count the number of wood duck broods observed. This is one technique being used to detect changes in wood duck populations and production.

Each year a number of wood ducks (in recent years up to 1,600) are captured and banded in Iowa. When these birds are shot or recaptured, the information is sent to Washington D.C. This data is then returned to the person doing the banding and it allows biologists to know how many ducks are shot each year, how long they live and where they migrate.

Bands from Iowa wood ducks have been recovered in most southern states from Florida westward to Texas. Iowa hunters harvest, by a big margin, the highest percent of birds banded in Iowa. Louisiana, Texas, Arkansas, Minnesota and Illinois in that order, make up the other high harvest states. From these bands we have found that many young female wood ducks return to nest in close vicinity to where they were hatched. This is a behavioral trait that enables the increasing of local nesting populations. Evaluation of banding data, collected throughout the Mississippi Flyway by state and federal biologists, provides some insight into the status of flyway populations which is used when fall hunting seasons for waterfowl are set.

Beside establishing wise hunting regulations, the purchasing of wetlands by state and federal conservation agencies is probably the best management tool that can be used in Iowa. These wetlands will provide a safe home for ducks for many years to come. Without preservation they would be drained and the ducks lost forever.

One other important management tool for wood ducks is erecting and maintaining wood duck boxes. This can be done by the public as well as by conservation organizations. There are many designs and blueprints available for wood duck houses but generally a wooden box, 12 inches by 12 inches by 25 inches high with a 3 or 4 inch oval hole is accepted. The bottom should be covered with about 4 inches of sawdust or wood chips. The houses should be predator proof and placed in trees near rivers or ponds or erected on poles completely surrounded by water in marshes or ponds. If wood ducks frequent the area, a breeding colony could be started.

This bird lends itself to intense management and should probably receive more attention by waterfowl enthusiasts. It is the most abundant nesting duck in Iowa and it certainly looks like our duck of the future.

Look for the long, dark silhouette darting along a stream at sunset. Listen for the eerie call of the Voo Doo bird as it flushes from its roosting spot or searches the woods for a nesting place. Encountering this bird in nature's dwindling wild wood must assuredly strengthen the character of those who witness it. □



Photos by the Author



GEODE LAKE DEDICATION TO BE JUNE 20

Tentative plans for the dedication June 20 of Geode State Park northwest of Denmark were approved at a meeting of the Geode development committee in the Burlington City Hall.

Approximately 10,000 persons are expected to attend the dedication of the park and its lake, according to a member of the development committee's executive group. That figure is based on attendance at openings of similar projects throughout the state, he said.

The plans, drawn up by the executive committee, call for a 2½ hour program of music and speeches, including the main dedication speech by Governor William S. Beardsley. Power was given the committee to complete all other details necessary to fill out the program.

State Representative Thomas Dailey of Burlington was named the master of ceremonies for the afternoon program scheduled to start at 2:00. Ed H. Smith of New London will give the history of the park and lake.

Invocation and benediction will be given by the Rev. Oren Wilson, pastor of the Mt. Pleasant Presbyterian church, and by the Rt. Rev. Msgr. William B. Schmidt, V.F., pastor of St. Mary's Catholic church in Fort Madison.

The flag raising will be in the hands of the southeastern Iowa Girl Scouts assisted by other youth groups. Boy Scouts of southeast Iowa will handle refreshments.

Music will start at 1:00 and continue until the 2:00 starting time of the program.



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Geode Lake

by Joe Brill
State Parks Superintendent

THE ABOVE ARTICLE appeared in the Iowa Conservationist in June of 1951. It was a nice sunny day and a new park was officially presented to the people of Iowa. Nearly twenty-five years have passed since that dedication. What ever happened to the girl scouts, the boy scouts, the reverends or the musicians that participated in the events of that day so long ago? We have gone through two foreign conflicts and four presidents since then. Perhaps some of the people who were there that day still use and enjoy Geode State Park. For although we may have lost track of these people, the Conservation Commission has kept pretty close tabs on the park.

Here is an idea how the park has changed over the years.

Geode improvements (1) Increased in area from 60 acres to 1640 acres; (2) A camp area has been developed which will accommodate 400 camper units; (3) Two shower buildings have been built in the camp area; (4) 72 electrical plugs installed in camp area as well as a \$60,000 water treatment plant with waterlines and water storage tank; (5) Completed second park residence; (6)

Installed two sewage lagoons on both sides of lake with a lift station and sewer lines; (7) Built three additional open shelters; (8) Constructed a four-stall service building; (9) Built 1.8 miles of new road with pavement surface; (10) Built one bathhouse 180' x 10'; (11) Enlarged beach from 100' to 380' with modern facilities; (12) Built one boathouse 40' x 60' with modern facilities; (13) Built two boat ramps with dock to accommodate 40 private boats; (14) A concession has grown whose gross is 3rd largest among state-owned areas; (15) Developed 3 additional picnic areas; (16) Drilled one deep well 890' deep; (17) A new 2,600' landing strip constructed which is listed in National Register.

During this time we have employed inmates from Ft. Madison at a special labor camp in the park. Since 1954 the number of workers has ranged from six to as high as 27 men. These men have worked for a period of 12 years making all of the above improvements with the exception of the big water treatment plant, one modern shower building and paving the road.

In addition to the above, the inmates built picnic tables, picnic area stoves, boat docks, portable check-in station, cement log boat ramp, prefab latrine, garbage can holders, and fair displays, which were shipped to every park in the state.

As far as our own personnel are concerned, there have been four different park rangers in the state during the life of the park. These men have helped serve many people over the years, but let's see how its changed since the very first year.

RECORDS FOR 1951

Park Attendance 42,189
Campground attendance 60 individuals

RECORDS FOR 1974

Park Attendance 514,925
Campground attendance 17,541 individuals
27,337 Guest Days
\$19,425.00 Fees Collected
\$29,309.38 concession gross receipts

As you can see, many things have changed for Geode State Park. There is one thing, however, we hope never will change. Geode is a great place to spend a summer day. □

"Fishin' Holes"

by Jim Bruce
Fisheries Management Biologist

Easy access and improved fishing highlight Lake Keomah.

Photo by Jerry Leonard



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Lake Wapello - siz

IF YOU FIND you have the late-season fishing "blahs", maybe the following will give you some ideas for another fishing trip. You may even find your new favorite south central Iowa fishing hole on the list.

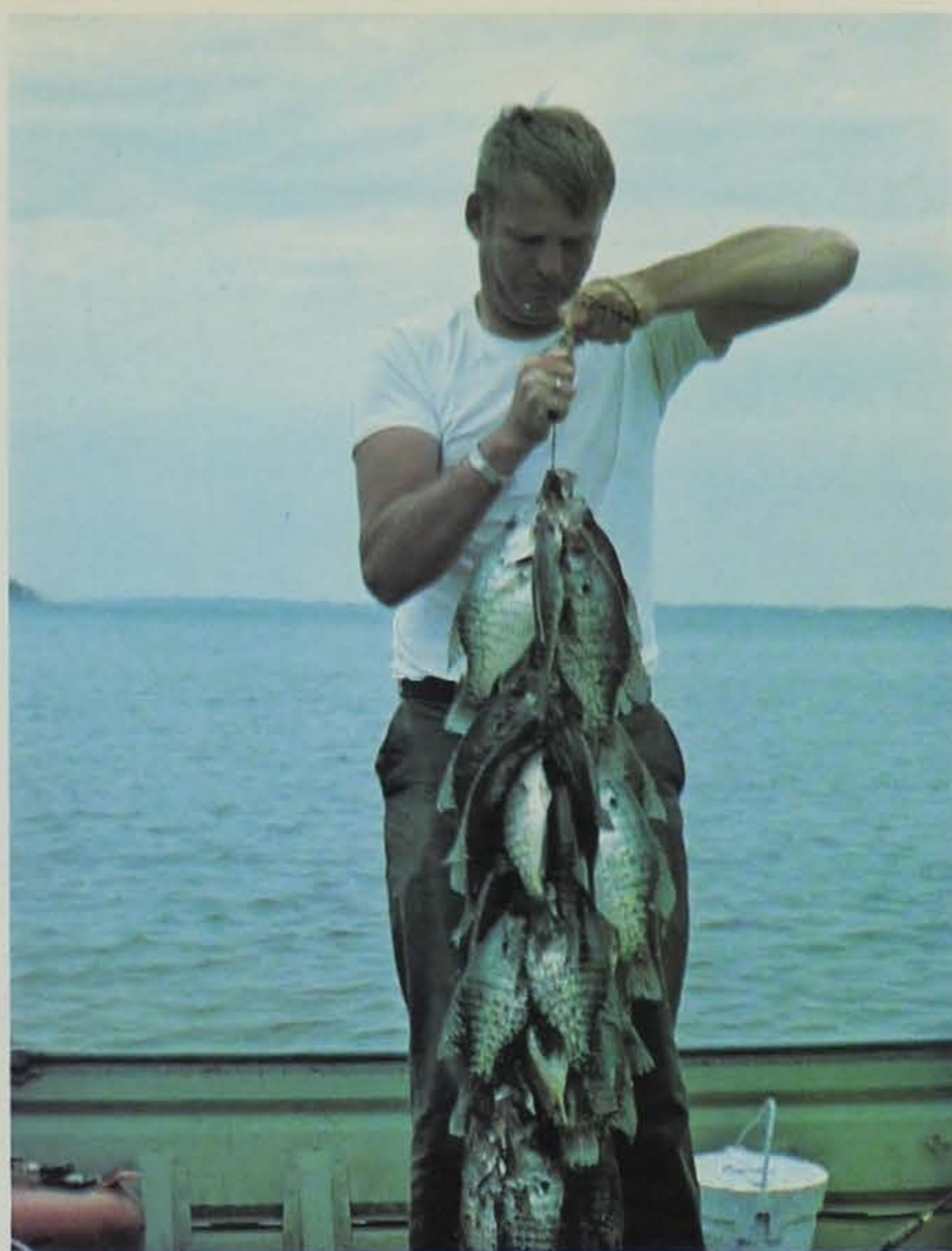
The largest and most important lake, from the standpoint of angling pressure and harvest, is Rathbun Lake. This 11,000 acre reservoir, constructed in 1970, continues to provide increasing numbers of fish to increasing numbers of anglers. During 1974 over a quarter of a million fish were caught at Rathbun Lake. Fishing success continues to be good this year. Approximately 90% of the 1974 catch was crappie, with over 50% being in the 10 and 11 inch size class.

Although the harvest of walleye has decreased during the past three years, the average size caught has increased from 15 inches in 1974 to an average of 17 inches this year. The spillway below the dam, rip-rap areas of the lake and shallow mud bars are the most popular areas of the walleye fishermen. Many walleye are also taken by the crappie fisherman and are a bonus to his catch.

Largemouth bass harvest has also decreased during the past three years from 19% to 2% of the total harvest. But netting and the angler harvest this spring indicates a big increase in the number of larger largemouth in the lake. A number of 4 pound bass were sampled in gill and pond nets and there have been reports of 7 pound bass being taken by anglers. The bass fishing has been overshadowed by the fabulous crappie fishing. Much of the reduced catch in walleye and largemouth can be attributed to this tremendous crappie population which is most certainly competing with these other predatory species.

Numbers of white bass continue to increase in Rathbun Lake, and it is anticipated that they will become a significant part of the harvest in the near future, possibly late this year. As many of you are aware, white bass are a schooling fish and when an angler gets into a feeding school, fishing is fast and furious! Last summer one angler reported taking 80 white bass in about an hour's fishing. This fishing should improve in the future.

Lake Wapello - size largemouth



Photos by Ken Formanek

An armload of crappies from Lake Rathbun

Channel catfish provide less than 1 percent of the angling harvest checked at Rathbun. However, a good population of these fish is available to the angler in the upper part of the lake and the spillway. The best bet would be night time fishing with stink bait below the dam.

Fish surveys indicate that the striped bass stocked during 1974 survived in good numbers and it can be expected that some of these ocean bass may enter the catch this year or next. It is not unusual for these fish to reach a weight of 20 pounds in freshwater areas.

Facilities are adequate at Rathbun Lake, with some seven campground areas and 10 boat ramps available on the main portion of the lake.

While Rathbun Lake is the largest, there are other fishing lakes in the area. One of these is Lake Wapello located about 15 miles northwest of Bloomfield. This is one of the oldest and most scenic artificial lakes in the state, being constructed in 1932. The lake provides good fishing for largemouth bass, crappie, bluegill and channel catfish. Other species which provide fishing include walleye, northern pike and carp. This lake has some very nice largemouth bass available to the angler, with several bass over 7 pounds being taken each spring. There are also a few catfish approaching the twenty pound class taken each year. Lake Wapello has a tradition of being one of the better fishing lakes in the state.

Lake Keomah, 6 miles east of Oskaloosa is another of the older lakes in the state. Keomah has in the past been troubled with stunted panfish, and an overpopulation of bluegill and crappie had resulted in extremely poor growth of these species. In the fall of 1973 chemicals were used to eliminate a portion of the panfish population. This resulted in greatly improved growth of crappie and bluegill and the size of fish being caught is much better than during the past few years. The reduction of panfish numbers also permitted better survival of the largemouth reproduction in 1974 and there is presently a large number of bass in the lake. These fish should be of harvestable size in 1976. Channel catfishing has been good, with some strings of catfish and some individual fish up to 7 pounds being taken.





One of the states top panfish lakes — Red Haw

Photo by Ken Formanek

Facilities at Keomah State Park include boat ramp, fishing jetties, picnic and camping areas, beach, and a concession furnishing boats and lunches. No gasoline motors are permitted on boats at Lake Keomah.

Red Haw Lake, located in Red Haw State Park just southeast of Chariton, is noted for its bluegill fishing. Crappie, largemouth bass and channel catfish are also taken in good numbers. Red Haw Lake is also the site of some interesting research on the white amur. The study is evaluating the desirability of utilizing the white amur (grass carp) as a method of controlling aquatic vegetation in Iowa lakes and will be reported on in a future issue of the *Conservationist*. Facilities at Red Haw Lake include boat ramp, beach, picnic areas and camping access. Red Haw is less than 100 acres therefore outboard motors, other than electric trolling motors, are banned.

Miami Lake (135 acres) is located approximately six miles north of Albia. This state lake provided some excellent bass, bluegill and crappie fishing shortly after impoundment in 1966. Turbidity during

the past several years has resulted in poor growth of the fish, and fishing has been slow. There are some nice fish in the lake however and it continues to provide considerable recreation. A number of northern pike, up to 10 pounds, are taken each year. Last summer during a fisheries survey, a 2 pound 14 ounce crappie was netted and returned to the lake. Largemouth bass fishing is periodically good. A watershed program is in the mill and it is hoped that the silt retention dams planned for construction will decrease turbidity in the lake and permit better fish growth. Outboard motors no larger than 6 H.P. are permitted on Miami Lake. Facilities at the lake include two boat ramps and parking. The Monroe County Conservation Board maintains a picnic and camping area.

Bob White (Allerton) Lake is located in Bob White State Park at Allerton southwest of Corydon in Wayne County. This 115 acre reservoir also suffers from excessive turbidity and resultant slow growth in panfish. However, there is a large population of small crappie and fair numbers of largemouth bass. Facilities at Bob White

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Lake include boat ramp, picnic and camping areas.

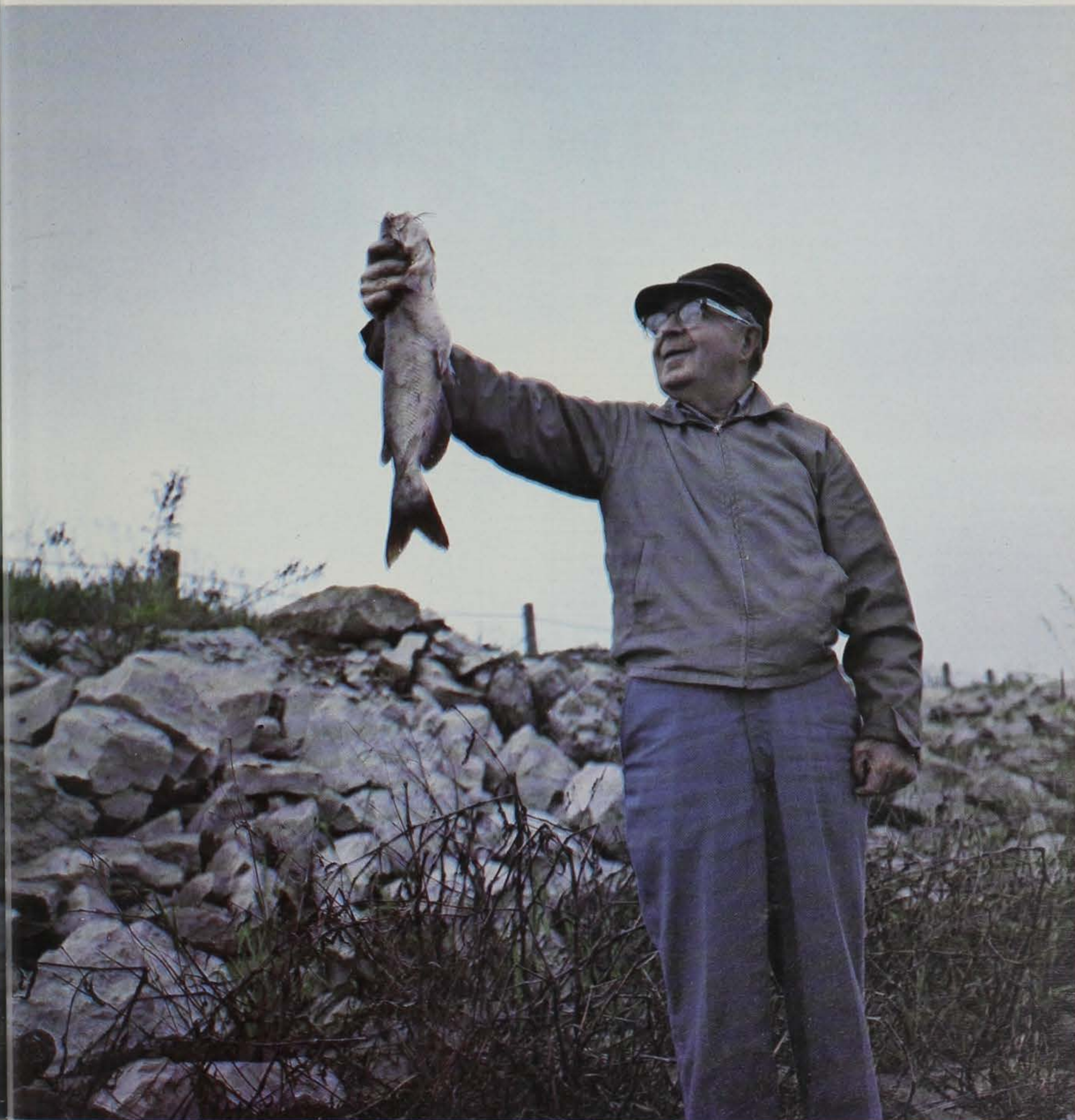
There are a number of city water supply reservoirs in the area that should be of interest to largemouth bass anglers. Centerville Reservoir in Centerville and Ellis Lake just east of Chariton both contain good populations of bass. Sampling of the fish population last year with the electro-shocker indicated that Centerville Reservoir contains more nice sized largemouth bass (2-6 pounds) per acre than any other reservoir in the area.

There are also public water supply reservoirs open to public fishing at Albia, Bloomfield, Corydon, Humeston and Seymour.

Two lakes in Van Buren County are Lacey-Keosauqua and Indian Lake. Lacey-Keosauqua is located in Lacey-Keosauqua State Park. This small (39 acre) lake has a relatively well balanced population of bass and bluegill. Facilities available at the lake include a boat ramp, beach, picnic and camping areas, as well as rental cabins. Indian Lake (45 acres) at Farmington was partially renovated last fall to reduce the shad population. The lake has been stocked with channel catfish and a good population of bass and bluegill was already present. Whenever you plan your next fishing trip remember these south-central area lakes -- it could make the difference. □

Channel catfish are abundant in most southern Iowa fishin' holes

Photo by Jerry Leonard



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FISH SCALES TELL TALES

by James Mayhew
Fisheries Research Supervisor

IF YOU ARE a fisherman, you probably consider scales as a cursed nuisance. But have you, after landing a prized bass or walleye, wondered how many years this fish roamed the depths? Fisheries biologists use the scales of some fish species as built-in diaries which reveal a great deal about the age of a fish, its rate of growth and general condition. You can also age the fish you catch by using some simple preparations.

The technique of using scales for aging was originally developed by H. W. Johnson before the start of the 20th century. He observed that the growth of fish and their scales was not a continuous process through all seasons of the year, and identifiable marks are formed on scales each winter when growth slows.

There are three types of scales on fish. The spiny-rayed fishes such as crappie, walleye, bass and bluegill have rough scales called ctenoid. Soft-rayed fishes such as sucker, northern pike and trout have a smooth, nearly round scale called cycloid. Garfish and sturgeon have scales that are almost like armor plates called ganoid. Not all fish have scales which can be used for aging, so biologists study other bony structures, such as cross sectioned fin rays or spines and ear bones called otoliths. Some fish, such as catfish, bullhead, garfish and sturgeon are somewhat difficult to age by conventional methods.

Equipment for the amateur is quite simple — all that is needed are a pocket knife or a small forceps to remove a scale sample, several small pieces of glass, and a means of magnifying the scale. For the latter, a common reading magnifying glass or a 2" x 2" slide projector will permit examination of the scale. Fisheries biologists, of course, use more elaborate methods of projecting the scale image, but with a little practice your simple tools will tell the story fairly well.

The first step, after landing your prize, is to remove about ten scales from the fish you wish to age. This number assures a representative collection of typical specimens. Scales from crappie, bluegill or bass, those with spiny-rayed fins should be taken below the origin of the large dorsal fin and immediately below the lateral line. For soft-rayed fishes such as sucker, trout or northern pike, scales should be taken above the lateral line.

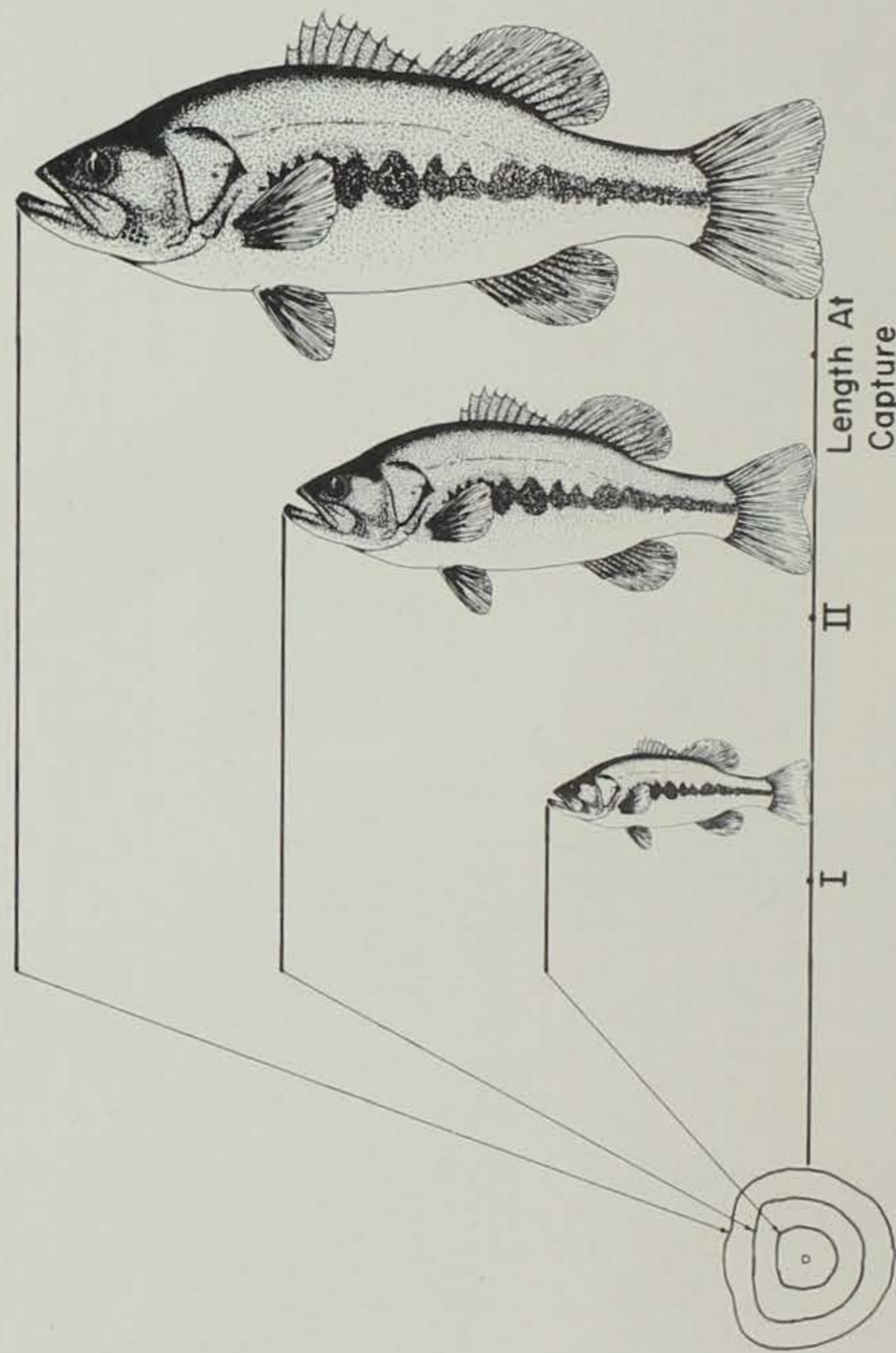
The mucous coating on the scales can be cleaned and removed by scrubbing the scale with a small stiff-bristled brush under running water or wiped several times between your thumb and index finger with a wet cloth. After blotting as dry as possible, place the scales between two pieces of glass so they dry in a flat position. Using a magnifying glass the scale can be examined between the glass pieces. If a more permanent mount is desired, and you have a 35 millimeter photograph slide projector, the scales can be mounted between glass covered prestomount slides and projected on your screen.

You will notice from the illustration of the highly magnified scale from a 2-year old crappie that it appears as a mass of concentric lines. If these lines, called circuli, were distributed evenly like a phonograph record, scales could not be used as a method of determining age. It is the uneven distribution of the circuli that reveal the age of a fish.

In the center of the scale you will notice the focus. As the fish grows, circuli are formed around this point. During autumn and winter months, when fish become semi-dormant and their feeding activity subsides, circuli growth slows down to the point where they do not completely encircle the scale ending on points along the edge. In spring and summer fish feeding activity and normal growth resumes. Instead of completing the old circuli, new circuli are rapidly laid down and cut across the unfinished edges of the old circuli. The result is an opaque band of new ridges called the annulus. To estimate the age of your fish, merely count the numbers of annuli.

The scale of a fish gives general life history information, but factors such as injury, disease, spawning and starvation also influence the growth rate of all fishes. It is also important to remember that one cannot determine the exact age of a fish. It is impossible to say a fish is exactly three years and four months old.

Not all fish scales reveal the true age. Some scales reveal a series of dark and light areas. In the light areas, which are periods of fast growth, the lines are spread further apart. These series of light and dark colored bands cannot always be used as accurate year marks because food supply in some lakes and streams varies within the summer season. In times of food abundance the bands are light and in periods of sparse food availability, just the opposite is true. Very often you will find scales bearing these false annuli or year marks, and they must be discarded.

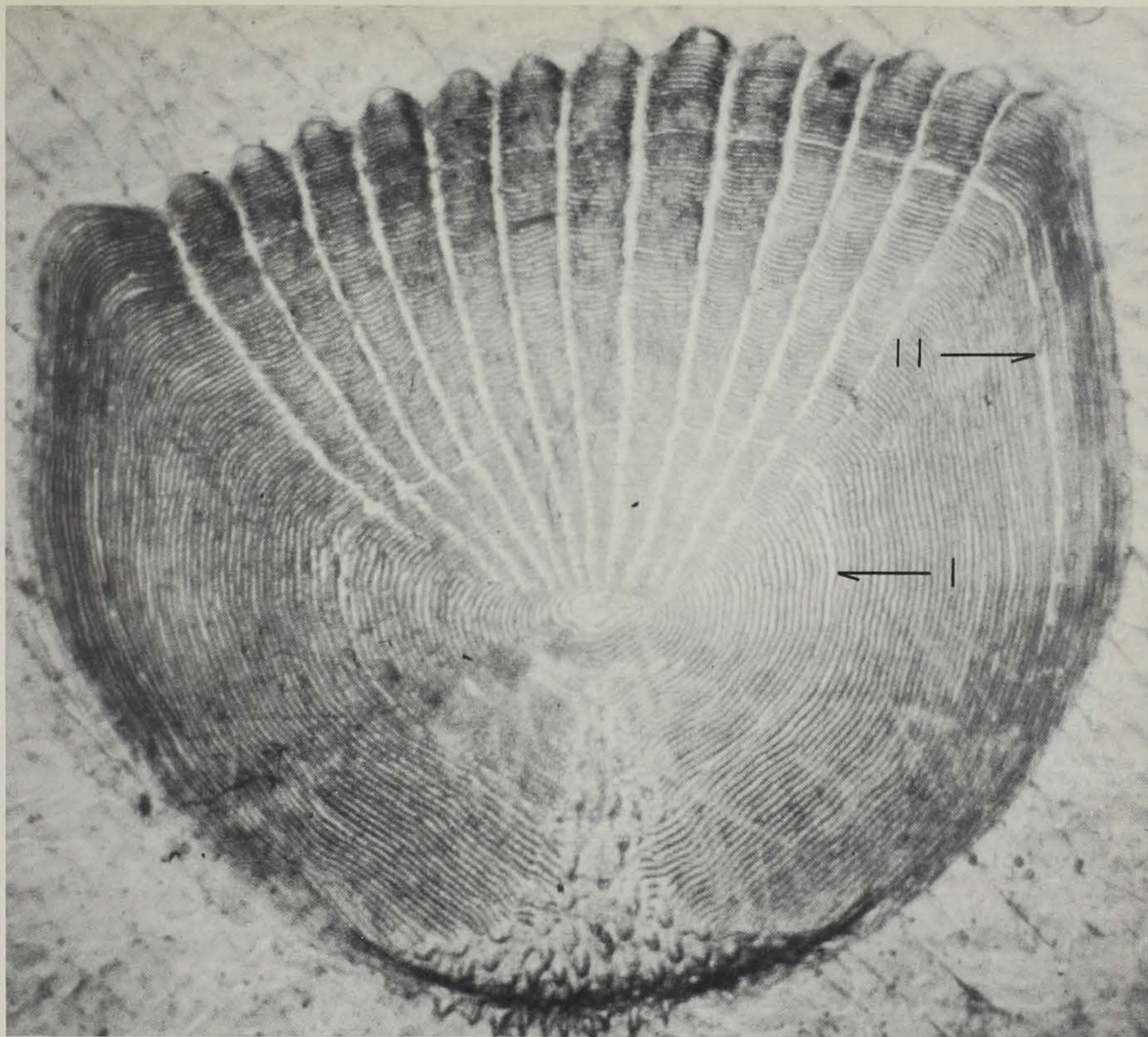


Often times you might find a scale with a very large focus that does not appear quite clear. Whenever a scale is lost by the fish on a rough object, a new scale is formed — without the year marks. That is one reason for collecting ten scales in your original sample. These regenerated scales can be discarded.

One of the common techniques used by fisheries biologists to assess populations of fish is to determine the growth history of fish. This simple procedure involves knowing three values: the radius of the scale from the focus to the outer scale edge, the same measurement from the focus to each annulus and the length of the fish. Usually the growth of

scales and the entire life of the fish at each year of the annulus and the radius was 12 in length at the first year of the same me

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Conservation Commission Photo



scales and the body of the fish remain proportional throughout the entire life of the fish. As shown in the illustration, the length of the fish at each year of life can be determined by multiplying the length of the fish at capture and the magnified radius of the scale from the focus to the annulus and dividing this value by the magnified total scale radius. Suppose you had a 10 inch, 2-year old crappie and the magnified scale radius was 12 inches and the first annulus radius was 6 inches. Then the length at the first year of life would be $10 \times 6 / 12 = 5$ inches at the end of the first year of life. The length at the second year would be calculated in the same manner.



Expert fisheries biologists have adopted the scale technique as a general measurement of fish well-being. They can determine how long it takes fish to reach sexual maturity, or how long it takes to reach catchable size. Growth in one habitat compared to others and the impact of environmental conditions can be checked. Life expectancy and mortality rate is also estimated from scale aging. This information is vitally important to better management of our fishery resource. And when you get right to it — it means more fish on the stringer for you. □

THE LIFESTYLE OF ALGAE

or A Bloom is not Necessarily Sweet

By Bob Runge

MOST lake and pond fishermen are only too aware of some of the problems algae can produce for the angler. Algae "bloom" has become a commonly used term in reference to some lakes and ponds in Iowa. But what is algae and why can it cause these problems?

As far as Iowa is concerned, there are three main types of algae. (1) Blue-green algae — The most simple but yet perhaps the most abundant algae. An enormous biomass of this type of algae may develop in a pond or lake. Some of the blue-green algae are able to fix gaseous nitrogen into nitrates which is essential for other plant life in the water. (2) Green Algae — This group contains single cell and multi-cell varieties both attached and free floating. A filamentous species known as spirogyra is often known to fishermen as "pond scum" which may become tangled on his line and hooks. (3) Diatoms — Yellow or brown in appearance this algae is usually box shaped and of free floating nature. They, like all algae, are important in the food chain. Most insect larvae and zooplankton "graze" on these diatoms. The larvae and zooplankton become food for higher "consumers" and eventually the fish population.

Algae, being a plant, is capable of photosynthesis and in doing so performs an important role in the aquatic society. Oxygen and carbohydrates are produced in abundance. In some cases, however, this friendly little fellow can become a killer. Certain nutrients, especially phosphates, accumulate in the winter when temperature and light are not favorable for growth. In the spring a "bloom" occurs as light and temperature become favorable. Suddenly, there is an explosion in the algae population. As the algae grow and die, they use great quantities of oxygen. Added harm results as the bloom can actually shade the bottom and kill off other aquatic plants no longer able to receive the much needed sunlight. When the plant population is drastically cut, two things can happen. First the bottom can be more easily stirred up by wave action and cloud the water. This additional sun filter will cause problems for the aquatic plants remaining. In addition, when the plants go, the major source of oxygen goes with them. Then the fish are in trouble and a fish kill can result, especially in relatively shallow ponds and lakes with large fish populations.

Biologically there is a built-in control. Soon the growing zooplankton population catches up and the previously available nutrients are not ample for the vast algae population. The bloom disappears. If the damage to other life in the lake was not severe, everything returns to normal. In the fall, as the water cools, nutrients are again pulled up from the bottom and another bloom can occur. This one is usually cut short by falling temperatures. In addition runoff containing phosphate bearing fertilizers can cause problems throughout the summer. Although silt is the major runoff problem, these fertilizers can become a significant problem in reservoirs.

In most cases, the angler is not appreciative of algae. The scum on the line, the slippery moss on rocks and other problems tend to make life a little harder for fisherman. And yet they are as vital to fishing as the water itself. Being the main "producer" in the ecology of the lake, they are the foundation of the food chain. Hopefully, the fisherman is at the top of the chain. That is, if he is smart enough to forget algae identification and start catching fish. □

FROM THE

By Rex E

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IOWA CONSERVATION

FROM THE

Warden's diary

By Rex Emerson,

Law Enforcement Supervisor

DURING HOT WEATHER many fishermen go out after sundown when it's a little cooler. The catfish often bite better at night too. Checking fishermen by car tonight at the bridges and other access areas made me think about a similar August night many years ago in Cass County.

I had been checking fishermen for licenses along the Nishnabotna River. About 11:00 p.m. I ran across a new deputy sheriff from Pottawattamie County who thought he would like to ride along just to see how a game warden worked. We continued to check a few licenses on some bridges, and then drove down a dead-end road to the river. At the end of the road was an old car which I recognized, but I failed to tell this to my passenger. We could see a campfire burning on the river bank about one hundred yards away, so we headed through the timber on foot. We didn't use our flashlights because if any of them were without a fishing license they might run. It was a dark night and the poor young deputy didn't know where all the logs were, so he fell over every one. He spent much of this time on his hands and knees, and sounded like an elephant going through the woods.

As I walked into the campsite my young friend stopped in the shadows of the trees. He didn't know that the half dozen men sitting around the fire were all good friends of mine. They had some throw lines out (being legal south of Hwy. 30) which they would check about every hour and then sit around the campfire. The conversation that took place between us can't be put into print. When they found out who was standing back in the shadows the rough talk got louder, and then when I got into their grocery box and helped myself to a hot dog and a bun they got even louder. They squealed like a pig under a gate when I complained about no mustard. After all, who ever heard of a hot dog without mustard! There was no use in checking their fishing licenses, as I had sold them their licenses months before. The whole episode around the fire took about fifteen minutes. As I started to leave, Tom and Poncho threatened to throw me in the river, and I threatened them with a night in jail.

When we got back to the car the young deputy sheriff said he thought I had more nerve than anyone he had ever seen, and that he wouldn't have my job for anything in the world. He wanted to get back to his car without checking any more fishermen. I intended to tell him they were friends of mine, but just didn't get around to it. I doubt if he would have believed me anyway.

Bank lines are legal south of Hwy. 30, but the fisherman must have his name and address on each line. Tonight a court citation had to be written when one fishermen failed to do this. He was using a gas lantern to check his throw line. As he crawled back up the bank he set his lantern on my foot. While I was making out the citation he said, "You know, when I looked up I would have sworn you were ten feet tall."

Most of the fishermen were legal tonight and were catching fish. That's the way we like to see it. They were having the best luck with crayfish for bait. I like for the fishermen to use that smelly catfish bait. When they use that I can find them in the dark.

CLASSROOM CORNER

by Robert Rye

Administrator, Conservation Education Center

Heat is ranked high on our list of concerns. We hear the temperature broadcast daily and hourly on our radios. We have thermometers in and around our homes. It is a prime consideration when planning clothing or activities for the day. Many consider it when deciding on a place to live.

A biologist must think of heat when stocking an area with fish or other animals. Trout require the cooler waters. Pheasant are found in warmer areas than spruce grouse. Certain plants require cooler or warmer seasons. Even eggs require a specific amount of heat to hatch.

During the warmer days of summer the temperature rises and the different ways animals deal with heat may be observed. We at the Conservation Education Center consider many aspects of our environment. How heat can be dealt with is one of these.

There are two basic groups of animals when talking about relative effects of temperature. Animals can be classified as either coldblooded (poikilothermic) or warmblooded (homoiothermic).

The coldblooded animals cannot control their temperature. Fish, frogs, turtles and insects are some of these. They must adapt by moving either to a warmer or cooler spot. Cooler places can be found in deep water, deeper in the soil, or in the shade of a tree or rock.

The warm blooded animals include birds and mammals. They are able to control their temperature without changing their surroundings. These animals use their body water to maintain their temperature and cool off. Some perspire (sweat) and others pant, such as a dog.

How does this work? Isn't perspiration the same temperature as the body? Isn't panting merely to get oxygen?

Anyone who has boiled water knows that heat must be applied before it will boil. The same principle applies with the animal body. The heat that is used is body heat.

This happens on the body surface—perspiration—or in the lungs, panting. Water "boils" or evaporates slowly from the body and takes with it a lot of heat.

A demonstration can be utilized to feel this effect. You could use water, but it evaporates too slowly for the purpose of the experiment. Rubbing alcohol evaporates more rapidly, making it a good choice. Care must be taken to keep it away from fire because alcohol is very combustible.

Place the alcohol on your hand and as the material evaporates you will feel a cooling effect. You feel cooler because as the substance left your hand it took some of the body heat with it.

The rate at which this evaporation takes place is affected by one other thing. The amount of the water that is already in the air. In summer the warm air holds more moisture (humidity). High moisture levels causes the rate of evaporation to slow down and as a result you feel warmer. If there is low humidity, evaporation will occur more rapidly. Fast evaporation rates will cool your body more rapidly and you will hopefully feel cool.



J.F. LANDENBERGER