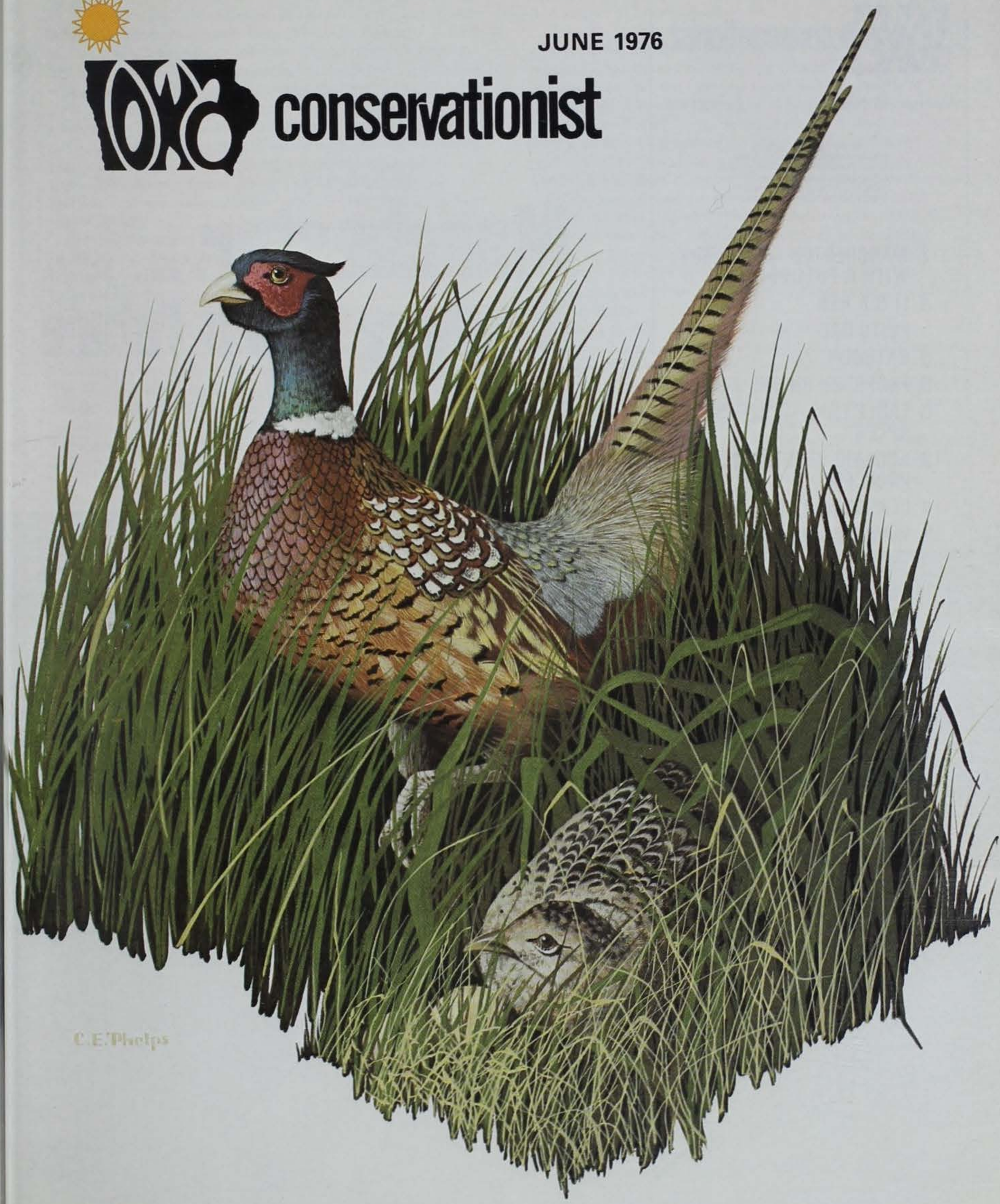
JUNE 1976

Iowa conservationist



C.E. Phelps

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COVER

Painting by Carl Phelps, 1323 B Ave. N.E., Cedar Rapids, Iowa 52402. Prints are available for purchase from the artist.

Back Cover Painting by Mark Reece of Des Moines.

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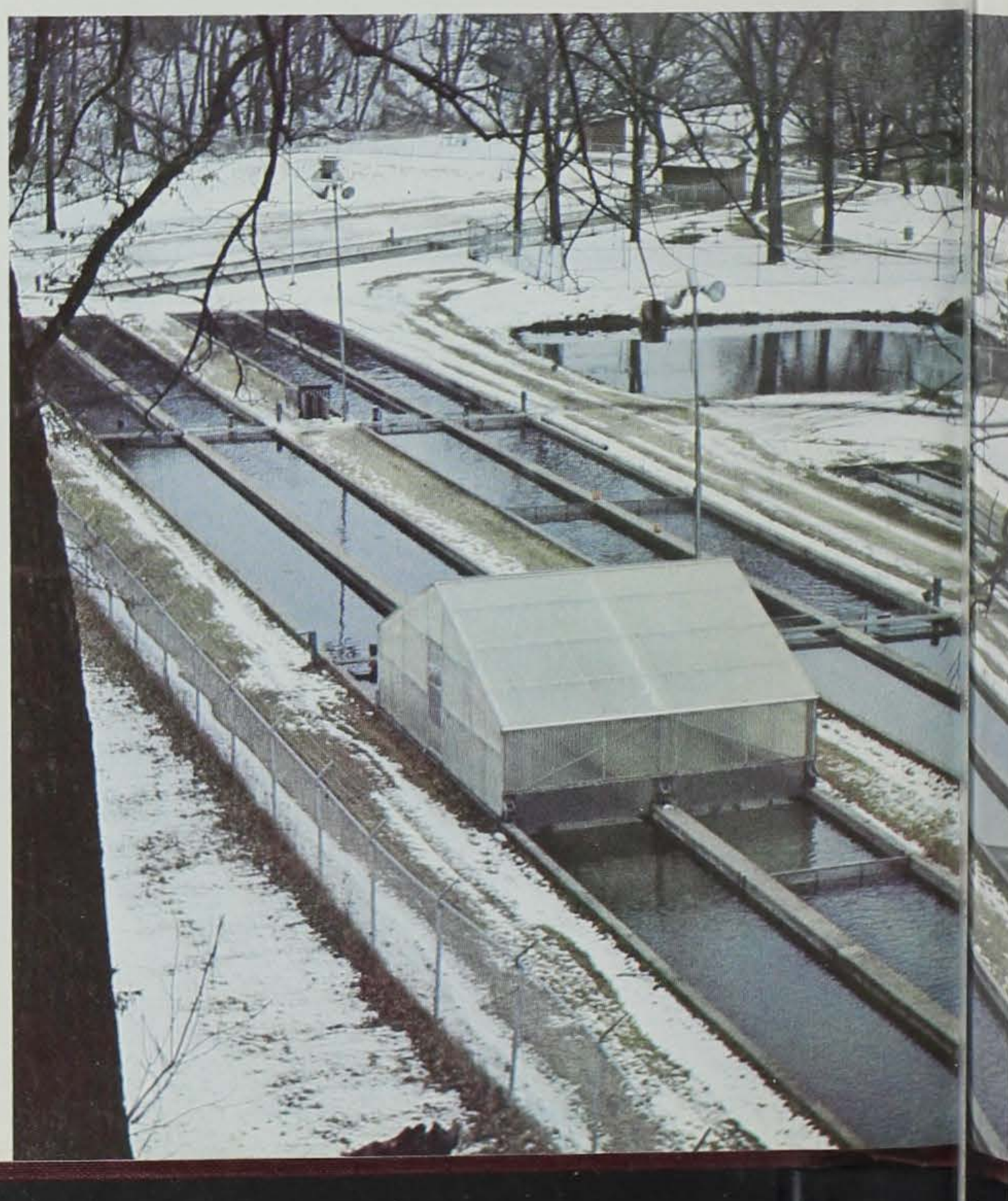
Manchester... Hatchery with a Future

By Michael Larkin
HATCHERY MANAGER

Photos by the Author



MOST OF IOWA'S TROUT will begin their life at the Commission's Manchester Trout Hatchery. This facility was recently acquired from the U. S. Fish and Wildlife Service and transferred to the Iowa Conservation Commission. The trout produced at Manchester by the Fish and Wildlife Service were shipped mainly to states adjoining the Great Lakes. Now the trout produced at Manchester by the Iowa Conservation Commission will be stocked solely in Iowa streams.

This hatchery will function primarily as a brood stock station, that is, producing the eggs and sperm required to begin the life of a trout. Why do we need a brood fish hatchery? There are two primary reasons: heavy fishing pressure and loss of natural spawning areas.

For the trout angler to have an enjoyable time fishing, there must be fish in the stream. Because of the large number of anglers on some of our streams, we have to stock hatchery fish to maintain a good fishable population.

The other primary reason for stocking hatchery trout is because of a loss of natural spawning areas. For natural reproduction, trout require a clean gravel in the stream bed - a condition no longer available in most streams due to silt being deposited in the gravel. The Manchester hatchery will fill this void by providing the eggs and developing them into small trout.

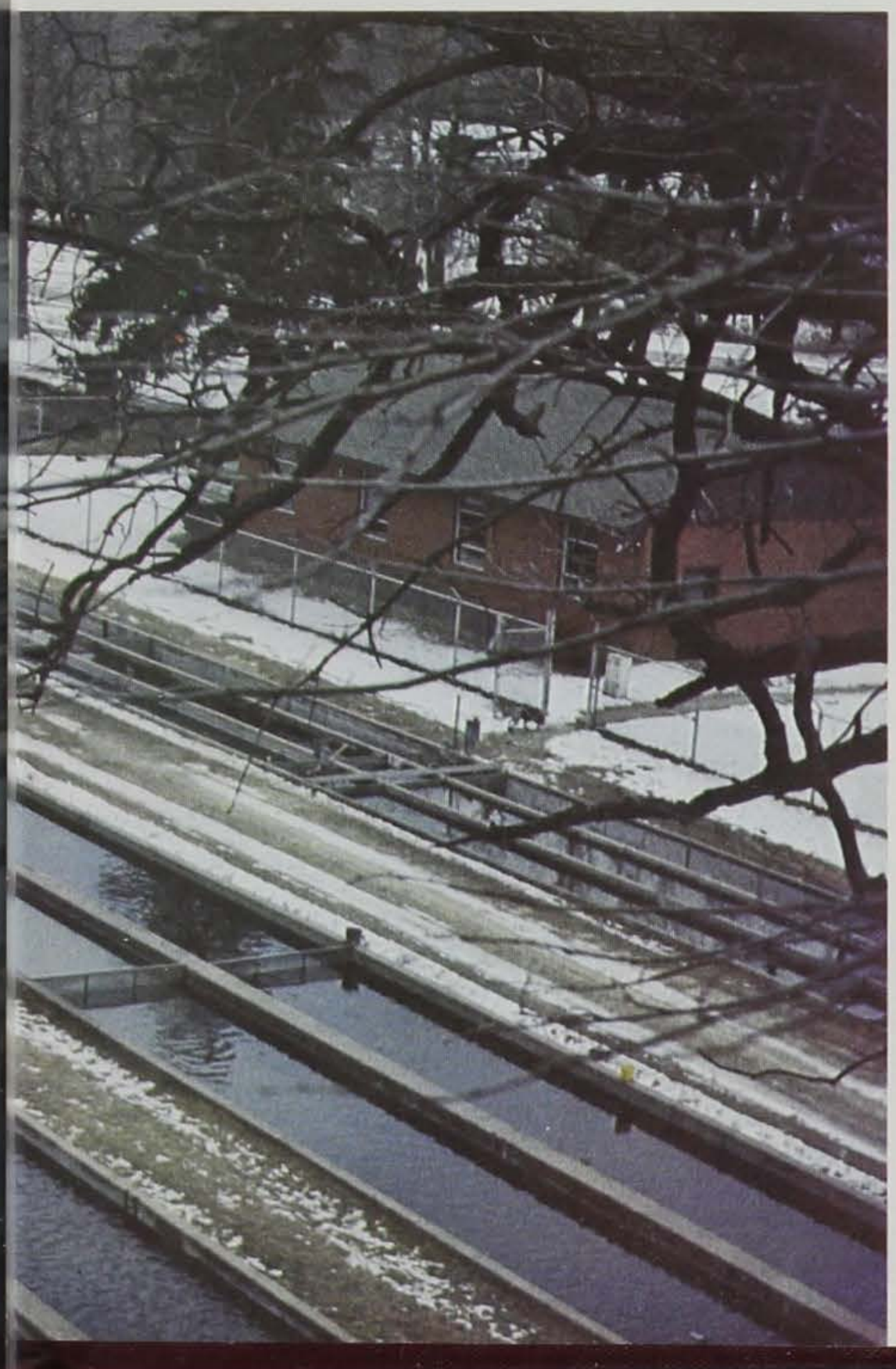
Some of these small fingerling trout (3-5 inches) will be stocked in streams to grow on ther own. Fingerling brown trout are planted into streams that are not capable of producing fish on their own, but these streams do have the necessary requirements for survival and growth of brown trout.

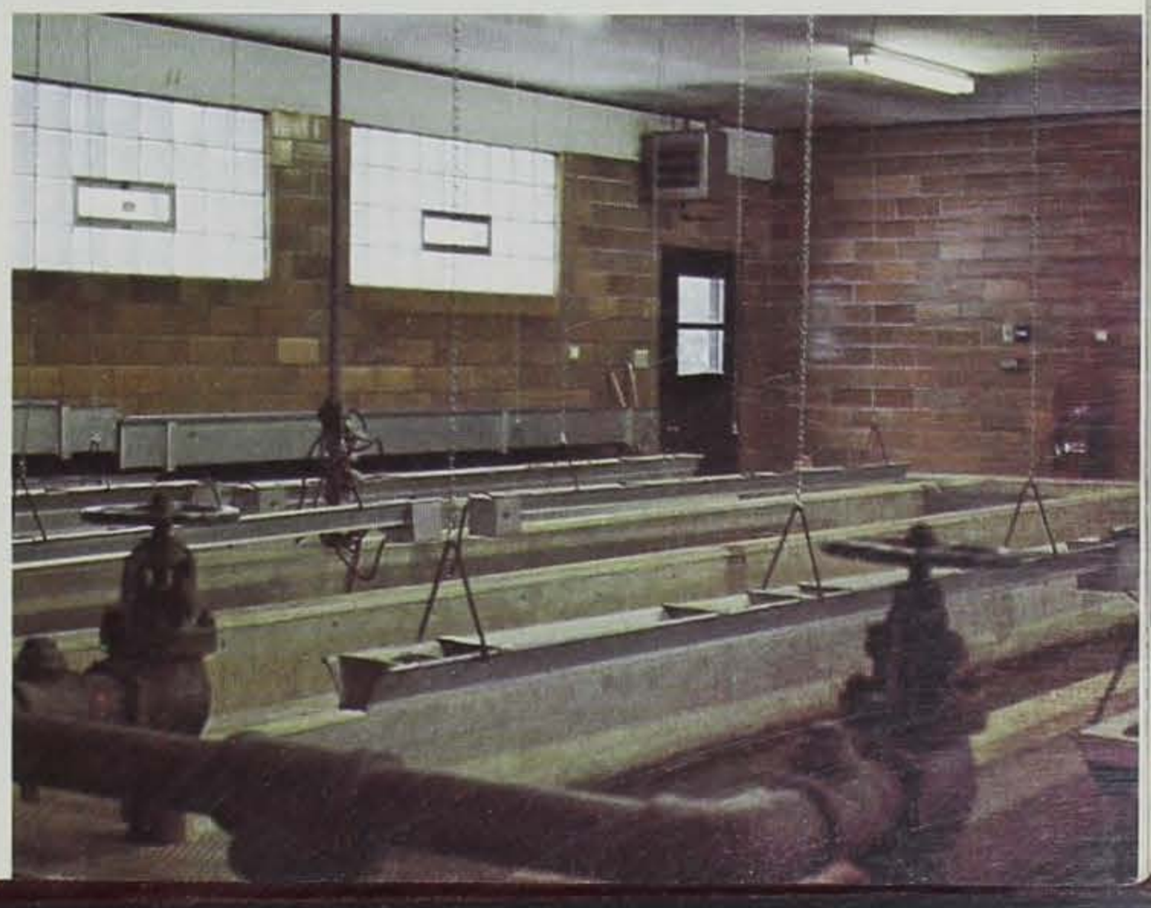
Another portion of fingerlings will be transferred to both Big Springs Trout Hatchery at Elkader and Decorah Trout Hatchery, where they will be fed until reaching a catchable size (10-11 inches).

How do we get the eggs and sperm to begin the life of a fish? Mature fish (2-5 years old) will be kept at Manchester to provide this service. During the spawning season, the trout are checked once each week to determine if they are ready to spawn. When they are "ripe", the eggs and sperm are removed from the fish by stroking the fish along the belly region. The eggs and sperm are then mixed together, washed, and put into incubators until they hatch.

After hatching, the fish are put into small troughs and fed 10 to 12 times per day. Upon reaching a length of approximately 1.25 inches, they are transferred to larger tanks where they are fed until they reach 2.5 inches in length. They are then moved outside into larger ponds; thus completing the early phase in the life cycle of a hatchery trout.

Streams in four counties: Clayton, Delaware, Dubuque, and Jackson, will be stocked with catchable trout from the Manchester Hatchery. Most streams are stocked once each week on a random basis (different day each week) when the water temperatures are cooler than 70°F. The stocking season is from April 1 through October each year. If you desire further information, feel free to contact us at: Manchester Trout Hatchery, R.R. 2, Manchester, Iowa 50257, Phone (319) 927-5736. The hatchery is open to the public seven days each week from 7:30 a.m. to 4:00 p.m. □





Cover Story

It's a Hen!

By Al Farris
WILDLIFE RESEARCH SUPERVISOR

IT'S A HEN! IT'S A HEN! How many times does that cry sound across the Iowa out-of-doors during the pheasant season? No doubt several times where the conscientious sportsman is hunting. There is also no doubt that some individuals deliberately kill the bird that produces the future generation. However, even the most reputable hunter can make a mistake and shoot a hen. Many of the hens killed during the hunting season are shot accidentally. These birds are usually on the fringe of a shot pattern that is aimed at a cock. No matter how the hen is shot, either intentionally or accidentally, the important consideration for the biologist is the extent of hunting related hen pheasant mortality and its effect on future pheasant populations.

A study was conducted following the 1973-74 and 1974-75 hunting seasons to estimate the magnitude of the hen pheasant kill in Iowa. Conservation officers, wildlife biologists, technicians and workers were asked to collect pheasants killed by non-hunting means after the close of each hunting season. Most of the birds were killed on highways, but some were victims of the blizzard of January, 1975. The birds were labeled with the county where they were picked up and then frozen. All pheasants collected the first year were X-rayed for the presence of lead shot. Birds collected during the second year were first scanned with a fluoroscope. Those that appeared to contain lead shot were then X-rayed. On an X-ray the dense lead shot appears as a bright white spot and is very easy to detect. All of the pheasants were examined at the Veterinary Diagnostic Laboratory at Iowa State University by the author and trained technicians from Iowa State University.

Once the percent of cocks and hens with body shot was determined, the illegal hen kill was calculated using the following formula:

$$\frac{B - A}{K - A} = \%\text{ of the prehunting season hen population killed}$$

A = the number of cocks per 100 hens after the hunting season
B = the number of cocks per 100 hens before the hunting season
K = the percent of cocks with body shot divided by the percent of hens with body shot

The number of cocks per 100 hens before the hunting season was obtained from the August roadside pheasant counts. Cocks per 100 hens after the hunting season was determined from winter sex ratio counts. Both the August and winter data were collected from all counties in Iowa by Conservation Officers and wildlife employees.

Altogether 135 cocks and 249 hens were checked. These birds were collected from 65 of our 99 counties. It was found that 32 or 24 percent of the cocks were carrying lead shot while only 8 or 3 percent of the hens were carrying shot. This was expected since the cocks are the legitimate target of the hunter. Using the formula given above it was calculated that nine percent of Iowa's fall hen population is killed illegally or accidentally. The table shows that Iowa compares very favorably to our neighboring states.

An assumption of this study was that the relationship between the percent of cocks with shot and the percent of cocks killed by hunters is the same as the percent of hens with shot and the percent of hens killed. There are many counteracting factors which make it impossible to clarify the true relationship. While hens are smaller and therefore harder to hit, they would be more likely to die as a result of being shot because of their smaller body size. Hens tend to flush closer than cocks and those intentionally shot would be more likely to be killed. Hens accidentally shot would either be fired upon from longer range or else would be on the periphery of the shot pattern. In either case, the chance of mortality would be less than for a cock. Because of selective hunting of cocks, the annual turnover is higher for cocks than hens. This would tend to raise the proportion of live hens carrying lead shot because they are more likely to contain shot from previous hunting seasons.

The hunter should not shoot the light-brown ones.

The question of utmost importance is what is the effect of this illegal or accidental hen kill on future pheasant numbers. It has been found in states where legal hunting of hens has been tried that hen kill at or exceeding 20-25 percent of the fall hen population lowered future pheasant numbers. Harvest reates below this level had no apparent effects. From this it appears that the nine percent figure for Iowa does not harm our pheasant population. However, it should be the goal of each license holder to take every precaution possible to lower this accidental hen kill in the future.

Table 1. Composition of estimated pheasant kill.

	Number examined		Percent with body shot		Calculated percent of fall population killed	
	Cocks	Hens	Cocks	Hens	Cocks	Hens
Iowa	135	249	23.7	3.2	75	9
Minnesota	98	152	28.6	5.9	67	11
North Dakota	154	390	24.0	5.1	65	11
South Dakota	407	977	24.8	3.4	57	6
Wisconsin	90	283	35.5	7.4	79	13

Editorial

Our Enemy – The Slob Hunter

By Fred Priewert
DIRECTOR

The hunter who pays any attention to national trends and public feelings concerning his sport probably considers the anti-hunting sentiment his number one enemy. While it is a fact that these people and organizations use emotional information and cheap propaganda to stir public resentment toward the hunting sports, it is a few hunters themselves who help to fuel the fire.

Why is it that so many hunters who are so quick to profess a love and devotion to sport hunting are the very ones who will take game after hours, trespass, violate laws or fail to turn in those who do?

The anti-hunting element is very interested in these actions and uses them in their mindless babble as a demonstration of how hunters persecute alleged helpless game. A perfect example of this is the recent "Guns of Autumn" in which, lacking any real biological data, the producers seized questionable hunting practices and presented them as tastelessly as possible.

Feeling very little resistance from rank and file hunters, the anti-hunting organizations have now centered their attacks upon professional wildlife managers. Now we, as wildlife biologists and scientists, are being named as naive pawns of the arms manufactures and the greedy hunting fraternity.

Dr. Ed Kozicky, Director of Conservation for Winchester-Western, in a speech he made recently in Kansas, pointed out that the demand for freedom without responsibility on the part of the slob outdoorsman presents the greatest threat to the sport of hunting that exists today. I couldn't agree more.

The public has the right to demand several things of us, according to Kozicky. 1. That a wildlife population be able to sustain the hunting pressure exerted on it. 2. That hunting not affect nonconsumptive uses of wildlife. 3. That the hunter conduct himself in an ethical manner. The first two have been accomplished in this country as a result of the combined efforts of sportsmen's clubs and professional wildlife managers over the last thirty years. But, as the science of game management matured the sportsmen's clubs were left with very little to do. Having less and less direct contact with off-season wildlife projects the younger hunters were often susceptible to straying from pure hunting ethic. Emphasis on sportsmanship afield is being replaced by discussions of who shot the most or biggest game with the least amount of effort. It is this situation which must be corrected.

One of the best ways now at our disposal is the development of a solid hunter education program at the state level. These programs should be mandatory to the hunter with stringent requirements, competent instructors and first class teaching materials. In addition to gun safety they must include basic instruction in game management, hunting ethics and survival. Most importantly they must instill an a biding intolerance for slob hunters.

You, as a hunter, must begin to police your sport much more diligently. Instead of looking the other way, you must report and see prosecuted any game law violaters you see in the field. It is incorrect to assume that our problems would be over if we hired more game wardens. Your pride and skill as a sportsman is our most important ally. Without a concentrated effort by all hunters to expell the ignorant slob hunter, there are rocky days in our future. There **is** something you can do. In fact, the choice is yours.

RATHBUN '76

Photo by Ken Formanek

Photo by Gary Ackerman

By Jim Bruce
FISHERIES BIOLOGIST

MANY OF YOU HAVE fished Rathbun Lake during the past six years and know that it has provided some excellent angling. The following will show how good the fishing was and how the fishing picture has changed during the first years of this new lake.

First, some background information for those of you not familiar with Rathbun lake. Rathbun is located in South Central Iowa near Centerville, and covers 11,000 acres at multi-purpose or conservation pool. The two mile long dam was completed in 1969 by the U. S. Army Corps of Engineers. The lake has a maximum depth of approximately 40 feet. Water quality is good, with water clarity generally excellent in the lower portion of the reservoir. The shoreline extends 180 miles and varies from steep tree covered banks to gently sloping grassy shore. There are seven camping areas around the lake managed by the U. S. Army Corps of Engineers and the Iowa Conservation Commission. The Corps has increased the number of surfaced camping pads from 100 to 500 during the past year and is providing drinking water to more areas than in the past.

A limited number of electrical outlets are available for campers at Honey Creek State Park. No other campground provides electric service. For boaters, Rathbun has 10 surfaced boat ramp units on the main body of the lake with ample parking at most areas.

Initial stocking of channel cat, largemouth bass, walleye, musky, white bass and striped bass took place in 1970 or shortly after. Walleye have been stocked annually since 1970. Other fish present include crappie, shad, carp, carpsucker, buffalo, flathead catfish, bluegill and freshwater drum (sheepshead). These last species were present in the Chariton River prior to impoundment of the reservoir.

Well, back to the fishing picture; and there's some good news and some bad news.

The bad news first: Largemouth bass fishing has not developed as well as many people had hoped or would like. The percentage of largemouth bass in the creel has dropped from 19% in 1972 to 1% in 1975. Much of this percentage change has resulted from the tremendous increase in the crappie population during this period. However there has also been a decrease in the numerical harvest of largemouth bass, from 16,100 in 1972 to 4,100 in 1975. The cause for the lack of largemouth is not known. Theories include generally unsuitable habitat, lack of good spawning sites and predation by or competition with other fish species. Study has been initiated to determine the cause of low largemouth bass numbers and possible solution.

The survival of walleye stocked since 1972 has been low and most of the fishing for walleye has resulted from fish planted in 1971 and '72. These fish survived in good numbers and have provided an interesting addition to the crappie fishing up to this date. The percentage of walleye in the angler harvest has decreased from 16% in 1972 to 2% (7100 fish) in 1975. In the fall of 1975, 50,000 walleye fingerling were stocked. These fish may make a significant contribution to the walleye harvest. In general, however, it will be necessary to increase the stocking of walleye if we are to maintain the fishing at its present level.

Enough bad news! Let's go to the good. Crappie numers, although down from previous years, continue to be good and nice catches have been reported this year. This fish should continue to provide the bulk of fishing at Rathbun.

Another bright spot is the white bass, also commonly called the silver bass. These fish were first stocked in October of 1971. Only one plant has been made, 2800 adult fish, which were netted in the Mississippi River and transferred to Rathbun. Last year is the first time they have entered the catch in signifcant numbers, although there were some good individual catches reported in 1974. The white bass caught in 1975 averaged approximately 11 inches in length and weighed about ¾ of a pound. The estimated harvest in '75 was 5600 fish, and accounted for about 2% of the total catch.

Fish population sampling in 1975 indicates a buildup in the number of white bass in Rathbun and the harvest this year will be controlled by the number of people interested in the fish and their ability to catch them.

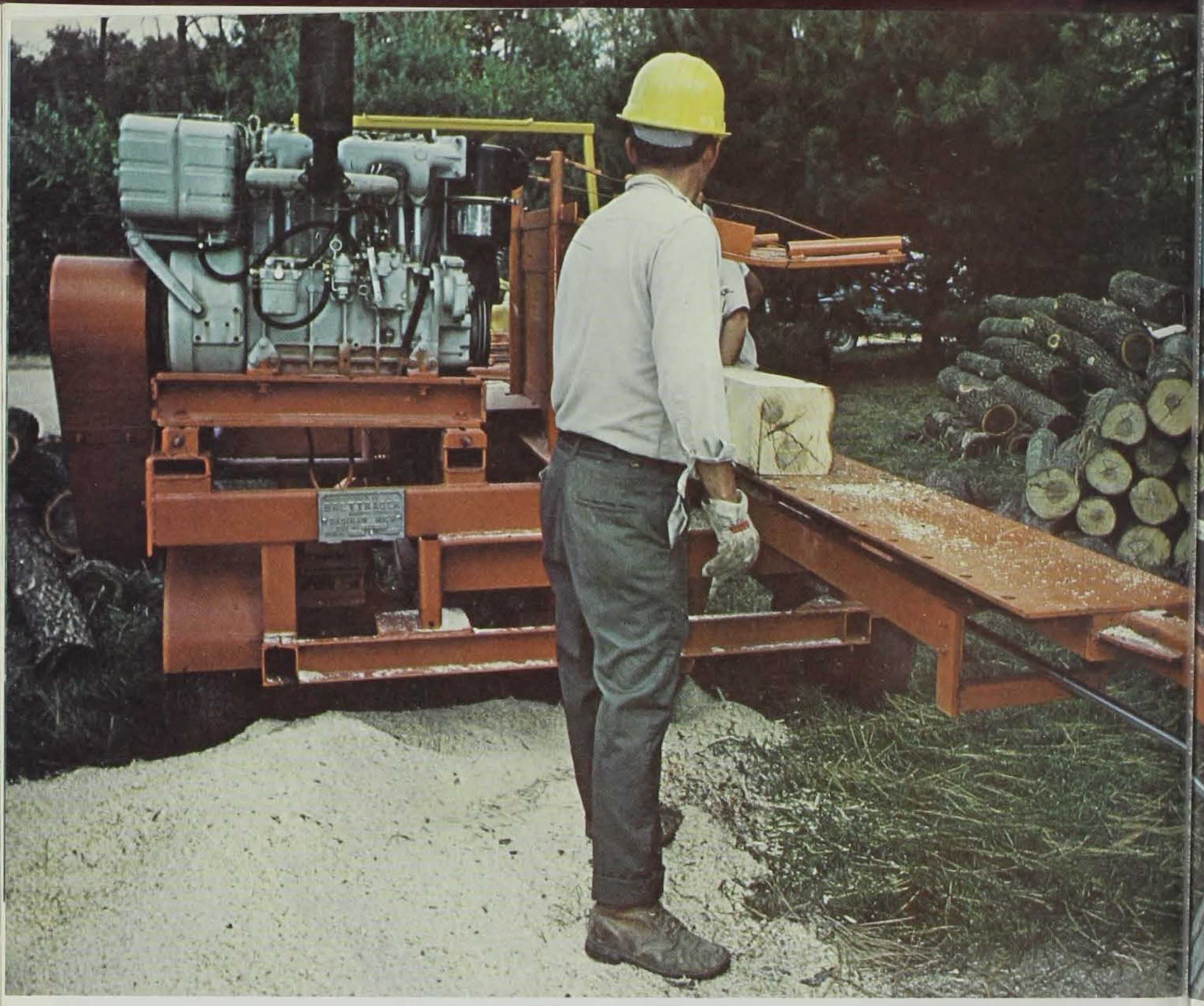
White bass are more of an open water fish than largemouth and the angler should look for them over bars, near long sloping shores and old roadbeds near deep water. The fish travel extensively in schools when feeding. It has been reported that this movement is predictable, in that the same route will be followed repeatedly, and generally in a circular pattern. Now, if it had just been reported what the interval of repetition was and whether they went clockwise or counterclockwise, we would have the battle half won.

Feeding schools of white bass will drive shad to the surface of the water, which in turn will attract gulls to the area. This presents a method for locating the schools; watch for any unusual movement of "minnows" at the surface, or any gulls feeding in open water areas. When a school is located a number of fish can usually be taken in a short time. White bass are taken on any number of small hairy, feathery and shiny lures. Minnows are also effective.

Channel catfishing also increased greatly during 1975, with the harvest going from approximately 2000 in 1974 to 6000 in 1975. These were up to 7 pounds, with most catfish caught being 12 to 15 inches in length. One of the favorite areas for catfish is the timbered area at the upper end of the reservoir. Here's another tip: Several musky in the 20 pound class were taken in nets this spring, indicating that these fish are big enough to make some interesting angling.

Rathbun offers a variety of fishing and many acres in which to do it. Try it soon. □

Photo by Ken Formanek



Forestry On The Farm

From "Forests and Forestry in t

ONE OF THE RICHEST farming areas on earth, Iowa, like most prairie states has most of its timberlands adjoining the rivers and streams. Early maps (1832 to 1850) show about 6½ million acres covered with timber, of the total of 35½ million acres of the state. Best estimates now indicate that about 2½ million acres still are classified as timberland.

The farmer, not the logger, cleared Iowa of her forests. While inevitable and beneficial in many areas, in some it has led to poor farming and bad erosion.

The lumber industry in Iowa dates back about 140 years to the establishment of the first sawmill in 1831 located on the Yellow River in the northeastern part of the state. Soldiers from Fort Crawford under the direction of Lieutenant Jefferson Davis (later to become President of the Confederacy) constructed a dam. For many years water power implemented the numerous sawmills which multiplied rapidly, especially along the Mississippi and its main tributaries.

In the early days the pioneers made use of hardwood lumber sawed by small mills in their vicinity. As early as 1860, the U. S. Census Bureau recorded sawmills operating in about 70 percent of the Iowa counties - with the heavier concentration along the larger rivers. Since this period, the small portable mill has served to supply limited amounts of native lumber. Today, they furnish only a small part of the total lumber consumption of the state.

For over a century Iowa citizens, societies and associations made efforts to promote forestry and tree planting.

Conservation-minded members of the State Horticultural Society took the lead in attempting to advance the forestry interests in the state. This was particularly true during the period from 1866 to about 1900. Other agencies had a definite influence on conservation especially after 1900. Among these agencies were the Iowa Academy of Science, the Iowa Agricultural College (later the Iowa State University), the State University of Iowa and the Iowa Park and Forestry Association.

Forest trees for distribution over the State were produced on nursery lands operated by the Forestry Department of the University. From 1912 to 1925 limited supplies of forest trees were produced on State college land (raised largely by the students enrolled in the forestry course) for experimental reforestation projects and for many

Photo by Jerry Leonard

...n the American States"

windbreak and shelterbelt demonstrations over the state.

Between 1917 and 1922 thousands of these trees were furnished private landowners, the Indian Service, the State Parks and other agencies to establish sizable plantations on eroded and sandy lands. Some of these forested areas have already produced returns from thinnings for pulpwood and other products.

The facilities for greatly increasing tree distribution came with the advent of the Civilian Conservation Corps program and the acquisition by the State of a nursery to increase the effectiveness of the program. Hundreds of acres of state lands were planted with trees and shrubs for timber production, erosion control, wildlife habitat and recreation.

Early in the 1930's there was a wide-spread realization among conservationists of a specific need for a general revamping of the entire conservation work in the state. Among those who led in this move were Dr. Thomas H. Macbride and Dr. Bohemul Shimek of the State University of Iowa and Dr. Louis H. Pammel of the Iowa State University. A proposal to prepare a longtime conservation plan was spearheaded by J. N. Darling, cartoonist of the Des Moines Register and a member of the Fish and Game Commission.

The 25-year plan recommended the consolidation of the Iowa Board of Conservation and the Fish and Game Commission into a single body. This proposed consolidation was effected by legislative action soon after the plan was published. The resulting reorganization set up the present Iowa State Conservation Commission with a Director and three major divisions - (1) Administration, (2) Fish and Game, and (3) Lands and Waters.

The legislation at this time specified that "Said Director shall, with the consent of the Commission, employ assistants including a professionally trained state forester of recognized standing . . ." The position of State Forester has been continued since that time.

The State Forester appeared before both branches of the Iowa Legislature in 1935 making an appeal for supplementary state financing for the Civilian Conservation Corps program. The General Assembly appropriated a total of one million dollars for the C.C.C. work.

State C.C.C. funds made possible the acquisition of about 12,000 acres of state forests in southern and northeastern Iowa, and the addition of a number of new state parks, as well as increasing the area of many existing parks.

During 1933 and 1934 the State undertook the extensive survey of the "forest and wastelands" of the state. They mapped the townships of the state to show timbered areas, woodland pastures, brushlands, eroded areas, shelterbelts, swamps and lakes. A large volume of data was collected showing tree species, soil conditions, and other matters which had a bearing on developing the forestry program.

State passage of the Natonal Forest Enabling Act in December, 1933, was an attempt to get farmers off the poorer lands of the state unsuited to agriculture. It was the feeling of many conservationists that there was a place in the state for relatively small National Forest units which could serve as forest management demonstration areas.

Four National Forest purchase units were set up in southern Iowa; the Keosauqua, with a gross purchasable area of 126,080 acres; the Chequest with 224,040 acres and the Grand River with an area of 307,360 acres. The four approved purchase units totaled 829,000 acres which were considered potential national forest lands.

The Iowa purchases were postponed presumably because forest lands in some other states were available for purchase at one-fifth the price of the optioned Iowa land. From a strictly national standpoint, the delayed action on the Iowa program was probably justified although the state lost an opportunity for needed forest demonstration areas.

Several years later the National Forest Reservation Commission authorized the purchase of about 5,000 acres in southeastern Iowa. The limited funds at the disposal of the Commission at that time precluded more extensive purchases and made it difficult for the Forest Service to administer economically the limited areas of acquired lands. About 12,000 acres in the former federal purchase units have since been acquired by the state for state forests.

The limited responsibility for administering what would be considered "State Forestry" in Iowa has shifted over the years. The Iowa Horticultural Society was the more or less official agency delegated with forestry and tree planting duties from about 1870 to 1924. In 1935 with the establishment of the present Iowa State Conservation Commission, the offical forestry responsibilities were turned over to the Commission.

The major forestry activities of the Commission are:

- to administer the State Farm Forestry program under the Federal Cooperative Management Act. This involves 12 field projects in the state with a technically trained forester in charge who assists woodlot owners in securing better management and returns from their forest lands.
- to administer and manage the state forests and forest reserves. These involve a total charge of 25,000 acres.
- Management of these areas includes timber stand improvement, planting, recreation, fire protection and general development of roads, fences and equipment. Recently, limited prison labor has been available for development work on the state forests in southern and northeastern Iowa.
- to cooperate with the U. S. Forest Service under the Clarke-McNary Law. So far as funds will permit, the Commission provides fire protection to both public and private lands.
- to administer the State Forest Nursery.
- to cooperate with other agencies on forest research.

The interest of conservationists in the early 1900's in holding the poorer lands for timber crops was largely responsible for the passage of tax exemption legislation. The incentive of reduced taxes was expected to induce landowners to hold their poorer lands in timber not only as a supplemental source of farm income but also for erosion control, watershed protection and game cover. The act was met with indifference in many of the better agricultural areas of the state but with enthusiam in some of the more heavily timbered sections.

The major concern of Iowa forestry has been and will continue to be on the farm. Here is where Iowa's major industry is located. Here is where her trees grow. □

EAGLE LAKE

EAGLE LAKE is a 914 acre wildlife management area located in Hancock County. It is a natural marsh situated in the upper reaches of the Iowa River watershed, with a drainage area of approximately 6,866 acres. A dike and a water control structure were established at the north end of the area earlier in the 1900's thus providing the means to control the water level within the impoundment.

The Wildlife Section of the Iowa Conservation Commission has been assigned the responsibility of managing Eagle Lake as a waterfowl production and harvest area. Funding is attained through a joint federal-state cooperative effort, with the federal government providing 75% of the operating funds through an 11 percent excise tax on sporting arms and ammunition. The state's 25% share is obtained through the sale of hunting licenses. A 26 acre wooded area on the west shore of Eagle Lake is maintained by the Hancock County Conservation Board under a 25 year Management Agreement with the Iowa Conservation Commission.

Eagle Lake has traditionally been regarded as an excellent waterfowl production and harvest area, and early accounts make reference to the waterfowl populations and hunting camps associated with it. A 1916 engineering report states "the water is shallow, four feet being the greatest depth. The Lake is used almost entirely as a hunting resort. Three or four boat houses are maintained on the western shore by local sportsmen, and the lake is visited by many parties of hunters from more distant points. The reeds and rushes of the lake itself, and the timber along the shore, make the best of cover and nesting places for a great variety of birds. Ornithologists from this and other states frequently visit the lake to make field studies of the many varieties of birds that find shelter in this little patch of wilderness."

Eagle Lake is still considered an excellent waterfowl marsh. However, like many other marsh impoundments, it does require periodic management efforts to provide optimum habitat conditions and wildlife use. It has a very pronounced cyclic nature about it, due in part to the physical characteristics associated with the area. A combination of high water levels over an extended period of time, and excessive muskrat numbers have resulted in drastic vegetation loss on several occasions. When this occurs wildlife populations are quick to respond to the negative habitat conditions created and their numbers soon diminish.

By 1973 it was apparent that Eagle Lake had reached the open lake stage of the marsh cycle and it could remain in this relatively unproductive condition for several years unless corrective marsh management measures were taken. Emergent aquatic vegetation was confined to the perimeter of the marsh and a few other isolated locations. Wildlife populations were reduced, and hunting and trapping success was low.

In February 1974 the decision was made to draw the water level on the marsh down and revegetate the area. A public meeting was scheduled, to explain the management plan and answer questions concerning the project. Stoplogs were then removed and the water level was lowered. Public response to this action was mixed, with hunters generally favoring the measure and other interests opposed to it. From past experience with drawdown practices, Conservation Commission biologists predicted that an improved vegetative condition and an expanded wildlife population would result from the project.

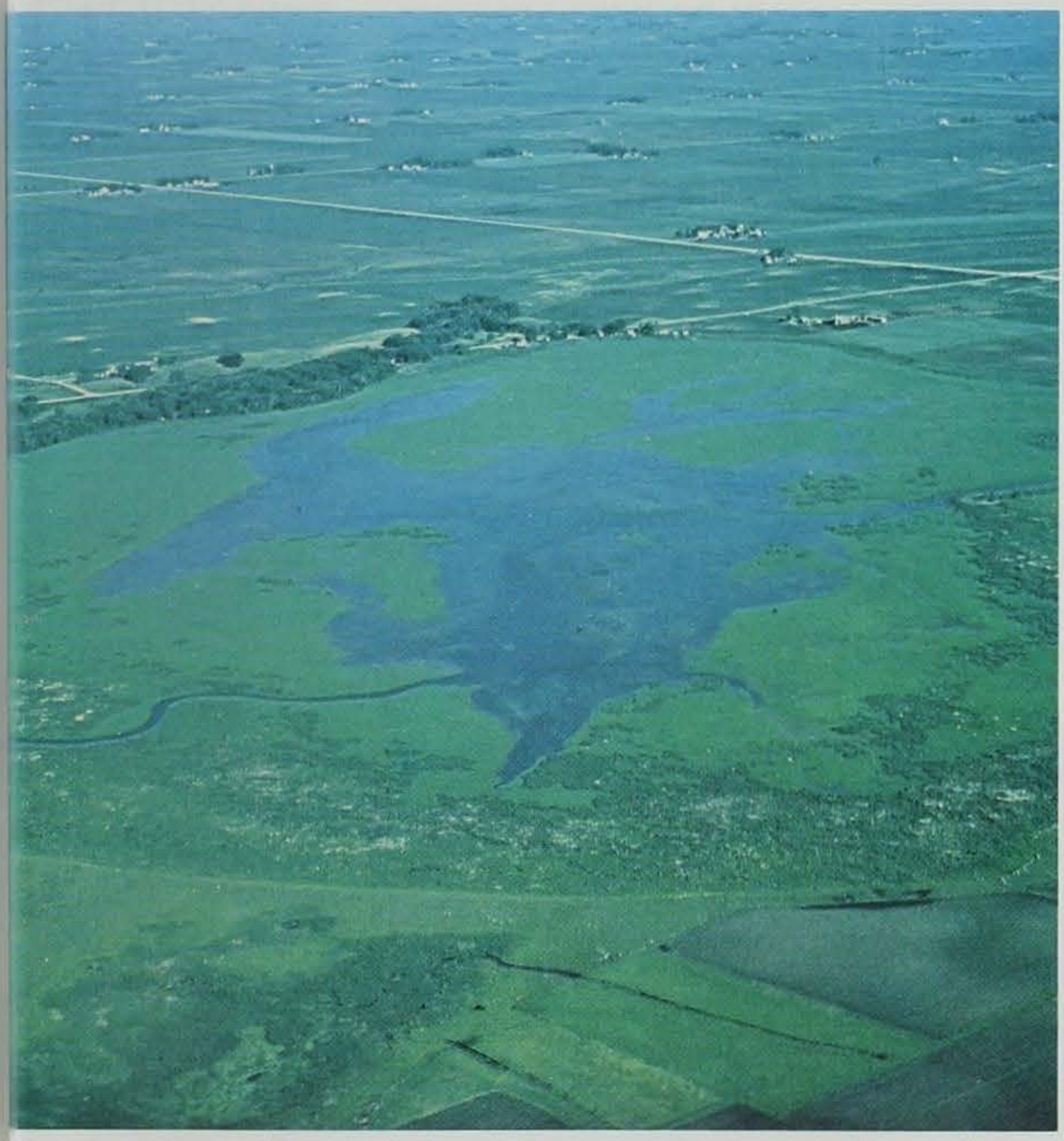
By May the marsh was completely drained with the exception of a few potholes that remained in the shallow depressions. As the warm sunlight reached the exposed mud flats the marsh floor began to sprout new vegetation. The seeds had been lying in a dormant condition on the bottom of the marsh, and exposure to the sun and air caused them to germinate. Annual plant species appeared like a blanket over the marsh floor, with smartweed, bidens, and roundstem bulrush the predominant species present. Cattail and river bulrush sprouted around the marsh edge. Wild Rice was aerially seeded in April, and by August it had made its appearance over extensive portions of the marsh.

Approximately 1.5 feet of stoplogs were placed in the control structure in late August 1974, with the thought that a shallow water

Before & After

By Dean Dalziel
District Wildlife Supervisor

Photos by the Author



condition could provide some hunting opportunity without endangering new lant growth. Rainfall was very light, however, and the marsh remained essentially dry that fall.

Water levels on the marsh were held down the following winter and spring to allow the new vegetation to take root and become better established. This is a very critical period, and there is a distinct danger of putting too much water on the early growth and drowning it out or uprooting it. The safest technique is to bring the water level up at about the same rate as the vegetative growth, taking special precaution not to cover the mergent plants. By May 1975 the spotlogs had been replaced, vegetative growth was vigorous and the marsh was ready to fill. However, drought conditions set in at about this time and prevailed throughout the summer and fall. The end result was a water level of 2-2½ feet on the gauge during the hunting season, instead of the desired 3½ feet.

Large numbers of ducks were evident at Eagle Lake throughout the summer, and by fall the marsh was teeming with waterfowl. The revegetated marsh continued to attract large numbers of ducks during the hunting season, providing some of the best hunting success in the state according to a waterfowl survey conducted by Commission personnel on the area. An average of two ducks per hunter were harvested at Eagle Lake during the first season, and 1.68 ducks per hunter during the overall season. The total duck harvest for Eagle Lake in 1975 is estimated at 2,754. In terms of average ducks bagged per hunter this was one of the highest success rates in the state. The area also supplied some fine goose hunting during the fall migration. Furbearer populations are still below average due to the effects of the drawdown, but they are expected to increase dramatically in response to the improved habitat conditions present on the marsh.

The immediate future is bright at Eagle Lake, and sportsmen can look forward to some excellent waterfowl and furbearer production and harvest there over the next few years. Without question, this would not have been the case if the Conservation Commission had not taken positive action and restored the marsh to its full management potential. Biologists are now seeking methods to extend the productive years of the marsh cycle and reduce the frequency of complete drawdown. Through a combination of timely water level control and intensive muskrat management there is a good possibility of success. If so, both the visiting public and the resident wildlife populations associated with Eagle Lake will be benefited. □

Aquatic Vegetation Problems

By Don Degan
FISHERIES BIOLOGIST

Photos by the Author

THE MAJOR PROBLEM in many of Iowa's 70,000 farm ponds is an over-abundance of algae and/or rooted aquatic vegetation. Large mats of filamentous algae, or moss, and thick beds of rooted plants including cattails, water lilies, pondweeds, and coontail reduce recreational boating, swimming, and fishing opportunities in many of Iowa's waters. Thick vegetation growths also prevent predatory fish from capturing bluegills and other panfish resulting in stunted panfish populations. In addition when the vegetation dies the decomposing matter removes oxygen from the water causing fish kills.

All lakes and ponds have some aquatic vegetation growth, including planktonic or free floating algae, filamentous algae or "moss", and rooted aquatic vegetation. All of these vegetation types are important in maintaining a proper food chain and an ecological balance in a pond.

Free-floating or planktonic algae is the primary food link in an aquatic system and the relative abundance of this algal type determines the productivity of a pond or lake. Algae converts sunlight into plant tissue, which in turn provides food for minute animals which young fish feed on. Filamentous algae and rooted plants provide food for aquatic insects, shelter for predatory fish and their prey, shoreline protection, food for waterfowl, and aesthectic beauty.

Eutrophication

Eutrophication is the process of nutrient enrichment of water either by natural processes or by man's activities. Iowa's water resources are nutrient rich because of the rich soils, limestone bedrock, and lack of soil conservation practices on most areas. As time passes after a lake is formed or constructed nutrients are added to the water increasing the richness, or eutrophic condition. This nutirent change then alters the biological communities in the lake.

There are two major nutrient sources for a lakes water, groundwater and surface water drainage.

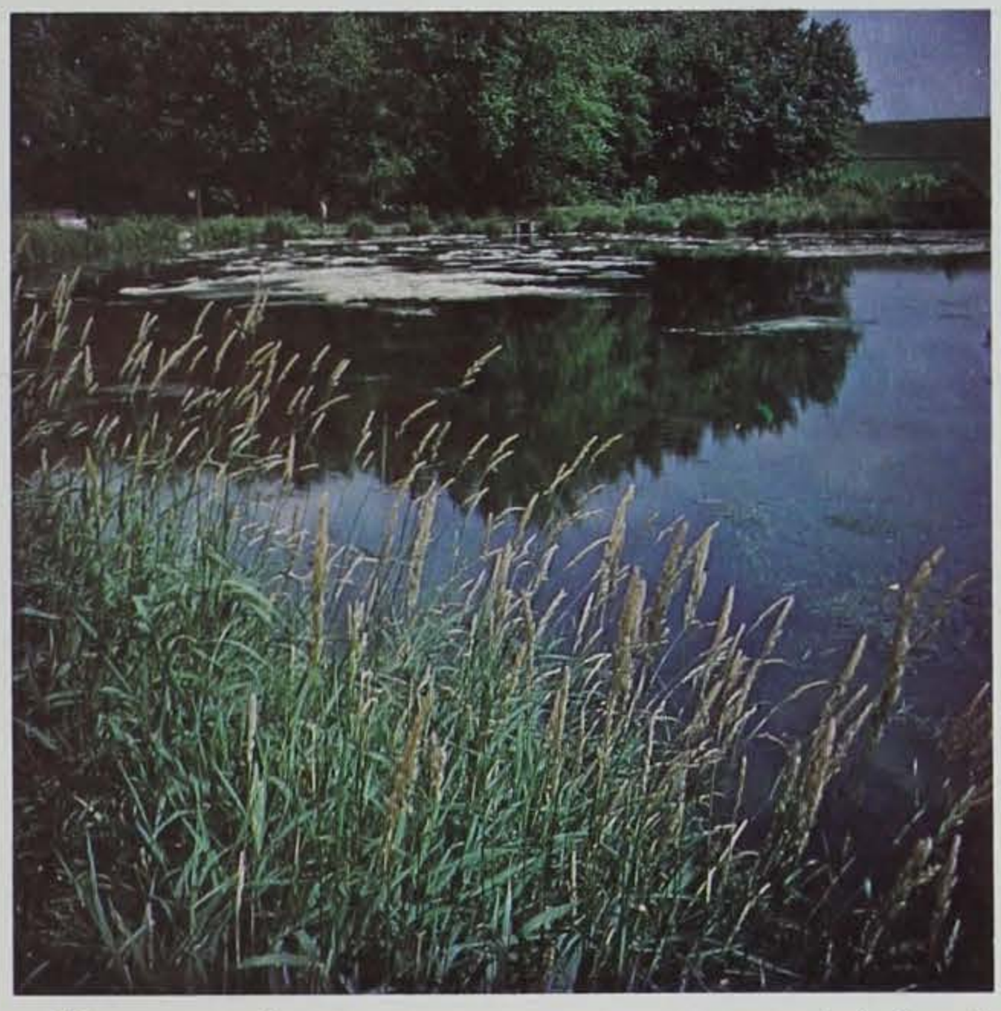
Surface water drainage is the most important source because it carries public sewage, feedlot runoff, fertilizer runoff, and silt. Iowa's agricultural industry contributes the majority of the nutrients and silt flowing into our rivers and lakes. Phosphates and nitrates are added to streams and ponds when the rich top soil and fertilizers are washed away with the spring thaw and heavy rains.

Groundwater is the second major source of nutrients for rivers and lakes. As water percolates through the soil, soluble substances are picked up and carried with the water into the groundwater. Since nitrates are highly soluble, groundwater contributes a significant amount of nitrates to the water, and in many areas high nitrate concentrations in the groundwater have made water from wells nonpotable.

Because of our inability to control nutrient runoff and siltation, nutrients have accumulated in our lakes and ponds causing nuisance algal and vegetation growths. Until control of nutrient runoff is possible only the symptoms, i.e., excessive algae and vegetation growth can be treated.

Algae

Iowa waters produce two types of algae growths during the summer months. Planktonic algae produce nuisance blooms in those ponds which are highly eutrophic. These floating cellular plants can "bloom" or produce large numbers of algae units that give a visible green cast to a body of water. Several "blooms" may occur during the summer months providing food for the insects and small fish. An excess of nutrients can cause nuisance growths resulting in fishy odors, unsightly conditions, and increased oxygen demand resulting in low oxygen levels.



Filamentous algae, or moss, occurs more commonly in Iowa's lakes and may interfere with swimming, boating, and fishing.

Chemical control is the only practical method of planktonic algae control at present, however, large mats of filamentous algae can easily and inexpensively be raked or mechanically removed from small ponds.

Copper sulfate has been used to control algae, since the early 1900's. Recently Cutrine and Hydrothol 47 have proven effective for short term control of algae. With all chemical control methods the algal growth is not stopped even with several applications throughout the summer.

Copper sulfate should be applied as a liquid directly to the surface of the algae at 1.0 ppm, but if an entire pond is treated a concentration of 0.2 ppm should not be exceeded. Copper sulfate is toxic to fish and aquatic insects at 1.0 ppm and therefore an entire pond should not be treated at once. A second difficulty exists when the algae die and decompose. Decomposing vegetation utilizes oxygen from the water and a total pond treatment may easily result in a fish kill. Copper sulfate quickly reacts with hardwater or bottom muds to form a less toxic chemical to algae. It is for this reason that copper sulfate crystals should uot be used, and the liquid form should be introduced into the water as close as possible to the target algae.

Nutrient inactivation by the use of alum (aluminum sulfate) has been effective in reducing algal growth in some Wisconsin lakes. This method utilizes alum to precipitate out the phosphorus from the lake water and combine it with the bottom muds. Positive results have been obtained but large equipment is necessary to apply the approximately 1000 ponds of alum per surface acre of water.

Vascular Aquatic Vegetation

Aquatic plants are normal and desirable constituents of an aquatic environment, but an excess of nutrient runoff and clear water can produce nuisance plant growths. Rooted vegetation growth is highly dependent on nutrient enrichment of our waters, but they also require light penetration to the bottom.

Mechanical control is effective in reducing the vegetation in a lake or pond, but the size of the lake usually determines its feasibility. Raking or pulling with chains and bedsprings can effectively remove vegetation from a pond or shoreline of a lake. Weed-cutters advertised commercially in farm pond magazines will collect and remove vegetation from a lake, but are costly.

Biological controls, such as the white amur, have had insufficient research to determine any real value in Iowa, and it is presently against the law to import any non-native species of fish into Iowa without a written permit from the Iowa Conservation Commission. The only biological control now being examined as a possible means of vegetation control in Iowa is the grass carp, or white amur. The Iowa Conservation Commission is presently studying the introduction of white amur in three lakes to determine any effect they will have on the vegetation and fish populations in the lake.

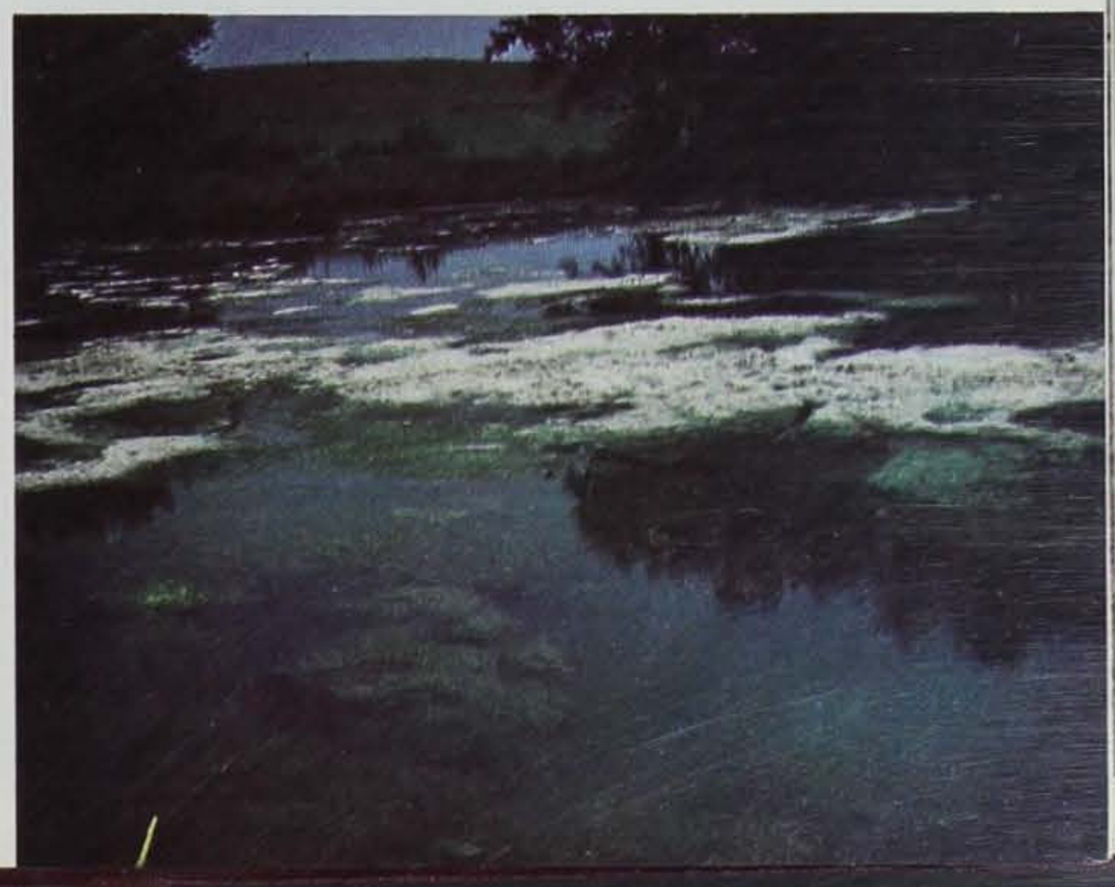
Chemical control of aquatic vegetation has met with limited success. An ideal herbicide has not yet been found. An aquatic herbicide should be safe and easy to apply, nontoxic to other aquatic organisms including fish and aquatic invertebrates, be nontoxic to man and other water users, easily breakdown to harmless products quickly, and kill the target vegetation quickly and inexpensively. Aquathol, aquathol K, diquat, 2,4-D, 2,4,5T, and Silvex have exhibited limited control of some aquatic plants, although none can be used to indescriminately kill all species of aquatic plants.

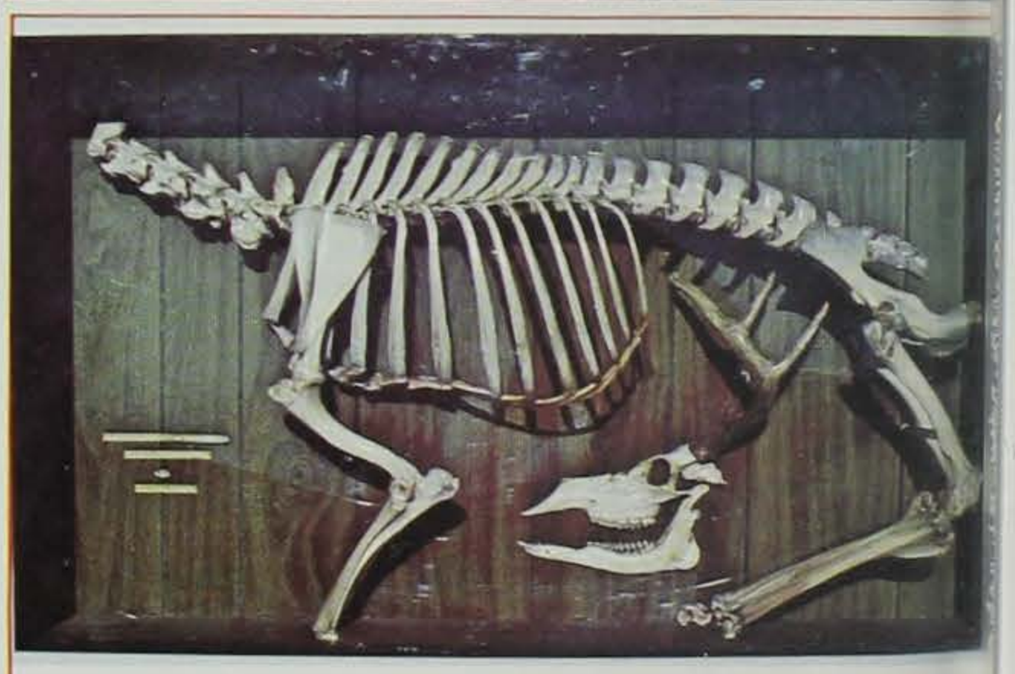
If you have a question about vegetation control in your pond contact the fisheries biologist with the Iowa Conservation Commission in your area for information and assistance. ■

Aquatic Weed Control With Chemicals

Aquatic Plant	Aquathol	Aquathol Plus	Diquat	2,4-D	2,4,5-T	Silvex
Pondweeds	C	C	C	NC	NC	NC
Coontail	C	C	C	C	C	C
Bladderwort	NC	C	C	NC	C	C
Watercress	NC	C	NC	C	C	C
Smartweed	NC	C	NC	C	C	C
Water Buttercup	NC	NC	C	NC	NC	NC
Waterweed (Elodea)	NC	C	C	NC	C	C
Duckweed	NC	NC	C	NC	NC	NC
Arrowhead	NC	C	NC	C	C	C
Waterlily	NC	C	NC	C	C	C
Cattail	NC	NC	C	C	C	C
Water Willow	NC	NC	NC	C	C	C

C = *controlled*
NC = *not controlled by herbicide*





Above, left: Mounted birds of prey. Right, top: Waterfowl and game birds are well represented. Right, below: Skeletal reconstruction of whitetail deer.

Photos by Ken Formanek

CLASSROOM CORNER

by Robert Rye
Administrator, Conservation Education Center

A NATURE CENTER such as the Conservation Education Center has a great advantage over other institutions providing information and education. The Center is a living, operating, natural system which offers many roads to enjoyment and knowledge.

Nature is endless, tireless and continually supplying evidence of the innumerable ways in which all its parts are related to each other. Man, of course, is not tireless or unlimited, and so it is convenient to break the study of nature into special subjects.

Below, left to right: Geodes, Indian artifacts, and bird nests displayed at the Conservation Education Center at Guthrie Center.

At the Conservation Education Center we study conservation -- the wise use of nature. We study the parts of nature and also have a living outdoor demonstration of the connections between all the different bits of human knowledge.

Collections have been made for years. You can name almost anything -- butterflies, rocks, invertebrates, artifacts -- and there are people who collect them. One sad fact is that most collections remain unobserved except by the collector (and no one else knows of them.)

We at the Conservation Education Center have been "collecting collections" and making displays or exhibits from them. Our exhibits tend to be specific rather than general, interpretive rather than authoritative, flexible, and capable of change as the season or program requires.

We have reference collections which are scientific in nature and are valuable in the Center's interpretive program. These collections are actually an inventory of Iowa and specifically local areas with definite information associated with them.

Some exhibits (collections) which are presently available for viewing in the Center itself are rocks, birds, bones, Indian artifacts, clams, spiders and plants.

Rocks and their counterparts, minerals, have always been of interest to people of all ages. Whether it be a small shinny pebble from a road or the fabulous Hope Diamond -- each has a story or history behind it.

The Center's display covers those rocks, minerals, gem stones and fossils essential to providing a variety of educational experiences. Most of the native Iowa stones are present.

The basic rock groupings, igneous, metamorphic and sedimentary are present. Also a small but complete mineral collection is present. Some examples are quartz, calcite, copper, fool's gold (iron pyrite) and geodes. Some of the fossils are shells, fish, brachiopods, dinosaur droppings, and plants. There are also agates, and other rocks for lapidary work. The rocks and minerals help to instruct groups in soil formation and spur individuals to go out and develop an appreciation of our natural resources.

Another popular exhibit is an Indian artifact collection on loan to the Center by Ivel and Jim Carrol. This collection is composed of arrowheads, spear points, scrapers and fragments of Indian pottery. The American Indian was our first conservationist; living with the land and the creatures that dwelled on it. These artifacts help to relate the Indian's pacesetting roll in conservation.

The Fish and Game Officers have placed many specimens at the Center. The display room contains complete skeletons of deer, deer antlers and skulls of other animals. These and other mammals are high on visitor's lists of interest. How conservation of our natural resources affects these mammals is an edifying experience to the visitor.

Birds are both museum and taxidermy mounted. Museum mounts are also called study skins. There are upland game birds, pheasant, quail, partridges, song birds, owls, hawks, eagles, swans, pelicans, and waterfowl, ducks and geese. Further, there is a wing display pointing out the identifying parts of the wing and a bird nest collection.

Nests tell facts about the resident. You can look at your own room or home and find they tell a story about you -- your hobbies, favorite color, and possibly what you like to eat.

Only legal game birds taken in season may be in a private collection. Birds such as hawks, owls, and song birds require a special permit to collect.

Invertebrates also have their place in nature's scheme -- they make up approximately 95% of all animals. Invertebrates have a large range in size, diversity, and in adaptations to different ways of existence. They are found in all environments. In our present collection we have from one-celled microscopic animals to large clams. Snails, in their many shapes from both land and the water. Insects, spiders, centipedes and millipedes leeches and parasites. These all fill an important roll in food chains. And a collection of these animals can be made in any season of the year.

When a group uses the Center they are either seeking general or specific information. If you know what you are looking for or can compare something with what you saw, half the work is already done for you! Hopefully, we can help you identify it.

Warden's diary

by Rex Emerson
Law Enforcement Supervisor

SO YOU want to be a Game Warden! Over the years I have had a lot of people, for various reasons, ask how they could get a job as a game warden.

Quite a number have asked, "How do you get one of those jobs where you can hunt and fish all the time?"

One 56 year old man said, "The doctor said I have to quit farming since I hurt my back. I could handle a job like yours." Some want the job so they can arrest the people they don't like. In one case it was because of a fence dispute that a man wanted to get even with his neighbor. College students not necessarily interested in wildlife conservation are looking for a job, any job.

Once in awhile we run across a person who wants to do his part in conserving our natural resources for future generations and who also likes people. That is the kind of person it takes to make a good game warden, and we have sixty of them in the state of Iowa. We are permitted to have only sixty officers for the whole state of Iowa, and they can work only fifty-eight hours per week. Far too few for the most important job in the Conservation Commission. If you have spent the best years of your life at some other career and just want a job to supplement your pension--forget it. Now, if you are still interested in becoming a game warden, read on.

You must first take the State Merit test. A college degree is not required, but it sure helps in getting a good score on this competitive test. The people with the top grades are later interviewed by our department whenever there is a vacancy. By this time we know all about you. If you are hired you must agree to live and work anyplace in the state that the Conservation Commission wishes. As soon as he is put on the payroll, the new officer is sent out for six weeks of training with experienced officers. After that, a territory will be assigned that might be either one or two counties. As soon as possible the new officer will then attend a six week course at the State Police Academy in Polk County. The first six months is a probationary period and during that time the new officer could be dismissed if found to be unsatisfactory. After that, the job is protected by the Merit Commission.

It's important to have a love of nature. The game warden must like to be out-of-doors in all seasons of the year and all kinds of weather. There is a lot out there that can't be learned from books. It helps to have had some experience in hunting, fishing, boating and trapping. Some people may not agree, but I think that is the best way to learn about nature and also learn to appreciate our natural surroundings.

The most important qualification is to like to deal with people because most of the work is going to be public relations or people management. The wildlife could take care of itself if it were not for people. Sometimes people in their own greedy way can really drive you up a wall. There are some who think they should have special privileges because of who they are or who they know. There are also the ones who think we shouldn't allow non-residents to hunt in our state, or that the seasons should be opened first for residents. (I always wonder how many of those people go to some other state and enjoy hunting and fishing.)

Before you decide that you want to be a game warden, talk it over with your partner in marriage. Invite your local officer to come and visit with both of you about the job. You are going to miss a lot of meals that you intended to be home for. There will be a lot of nights your family will be home alone, or school programs missed while you are working on a case. Your family should know just what to expect from this job you are thinking about. It takes very special people to be a game warden's family, and if they are not happy with the job you will be doing, then you will not be a good game warden.

Actually being a game warden is not just a job, but a way of life. And I enjoy every minute of it. Well, *almost* every minute!

Red Head Ducklings By Mark Reece.