Iowa CONSERVATIONIST

October 1990

Department of Natural Resources

Iowa
CONSERVATIONIST
October 1990, Vol. 49, No. 10

SPECIAL PHONE NUMBERS

DNR Central Office	1-515/281-5145
Emergency Spill Response	1-515/281-8694
Telecommunications Device for the Deaf	1-515/242-5967
Groundwater Hotline	1-800/532-1114
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Iowa Conservationist *(USPS 268-780) is published monthly by the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034. Second class postage paid in Des Moines, Iowa, and additional mailing offices.* ***Subscription rates: $6 for one year or $12 for three years.*** *Include mailing label for renewals and address changes. POSTMASTER: Send changes to the* Iowa Conservationist, *Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.*

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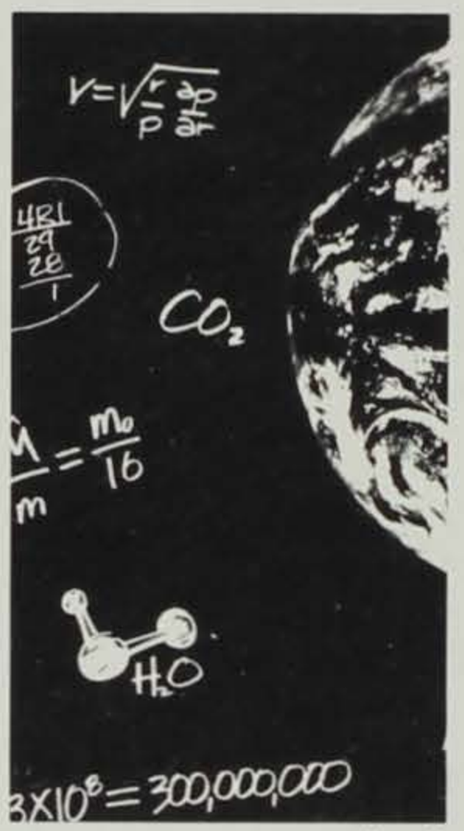

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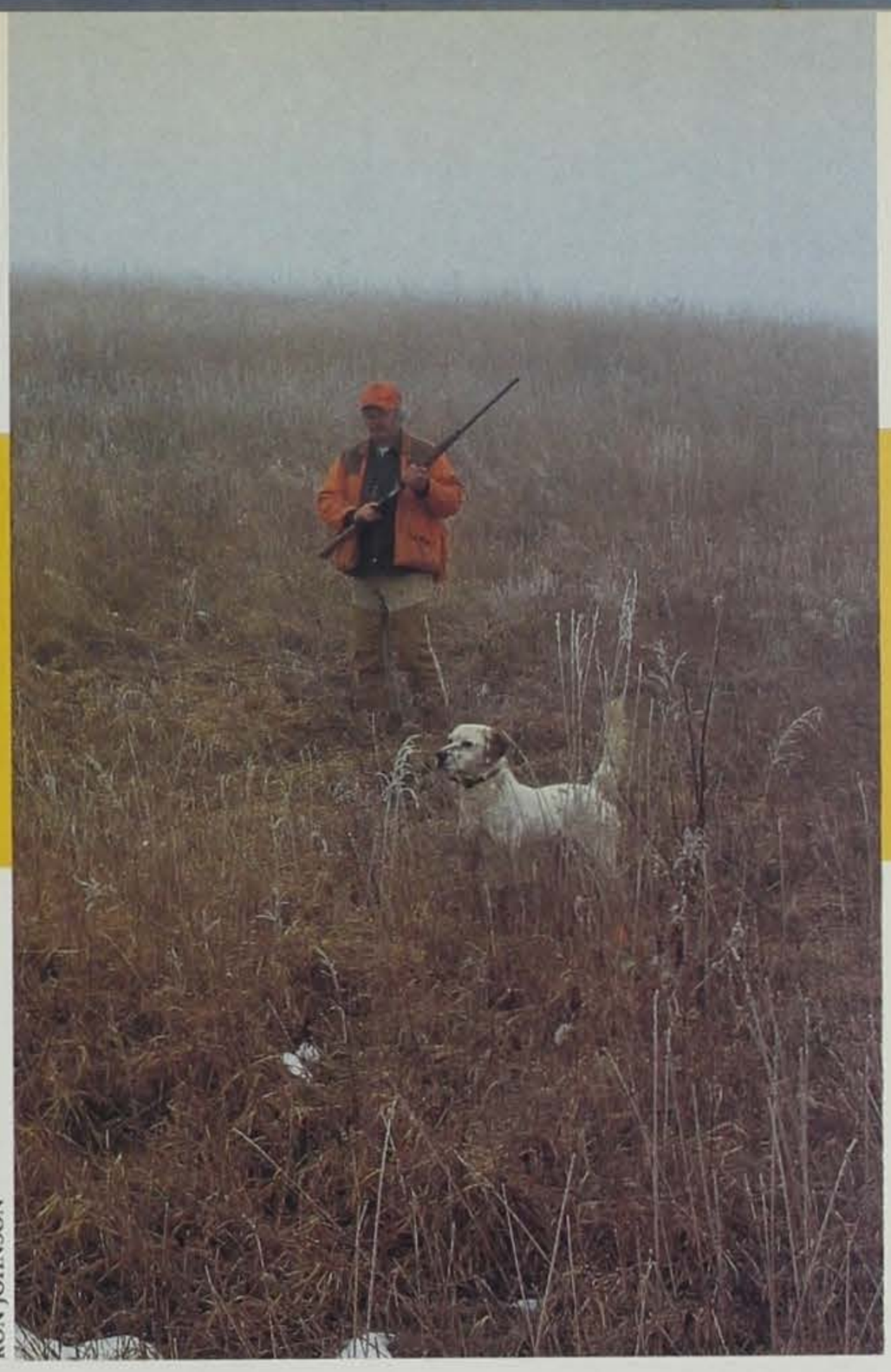
COVERS: **Front** -- Ring-necked pheasant. Photo by Roger A. Hill. **Back** -- Fall foliage in Iowa. Photo by Ron Johnson

by Terry W. Little

1990 Hunting Forecast



RON JOHNSON

The instant replay is either the bane or blessing of sports fans, showing their team's successes or failures over and over again. "Instant replay" will be an apt description for a 1990 hunting season that, in many ways, will repeat 1989's successes and failures. This is, of course, either good or bad news depending on whether you hunt ducks, pheasants or deer or if you live in northern or southern Iowa.

Weather during May and June is the final arbiter that determines the fate of most small game populations. This year's prolonged rains and extensive flooding were quite different from the searing drought of the last two summers, but the effect on most wildlife seems to have been similar. Read on to see how this will affect your favorite hunting sport.

Upland Wildlife

Pheasant and quail hunters living in southern Iowa can't be blamed if they are beginning to feel cursed. The Conservation Reserve Program (CRP) was hailed as a boon to wildlife when it was enacted in 1983. It has resulted in the planting of the most nesting cover in Iowa since the soil bank days of the 1950s and 60s. But, just when bird hunters were beginning to drool in anticipation, severe drought hit southern Iowa in 1988 and 1989. Water sources dried up, nesting cover burned up and farmers were forced to graze or bale crop fields for forage. Pheasant populations plummeted and hunting became difficult as frustrated hunters tried to find pheasants and quail in a sea of dense grass.

The drought was not nearly as severe north of Interstate 80 and northern Iowa hunters enjoyed one of the best hunting seasons in decades in 1989. CRP fields were not as common in northern Iowa, but good habitat produced numbers of pheasants reminiscent of the early 1960s. Record numbers of gray partridge were also found. The total pheasant harvest of 1.44 million birds was one of the best in a decade but was very unevenly distributed across the state.

Early predictions were that 1990 would be much better than 1989. Fall and early spring rains brought an end to the severe drought and rejuvenated CRP and hay fields. Early nesting cover had never looked better. Then the rains came and did not stop. Torrential downpours resulted in extensive flooding in central and southern Iowa during the peak of the hatch in June. Newly hatched pheasants, quail, partridge and turkeys suffered repeated drenchings and chillings, and many yet-to-be hatched nests were flooded. The effects of these rains were substantial -- roadside surveys conducted in August indicated pheasant numbers are down as much as 25 percent from 1989 in areas that were hit hardest by heavy rains. Pheasant numbers will still rate poor to fair in much of the southern half of Iowa, which normally is considered to be excellent pheasant range.

Northern Iowa's rains came much later in the summer after most chicks were able to tolerate a soaking. Roadside surveys indicated most of northern Iowa will see improved pheasant numbers and good numbers of ringnecks will be more widespread than last year.

Statewide the pheasant outlook is slightly down from last year but portions of north-central, northeast, east-central and southwest Iowa will have excellent pheasant populations. Nearly 40 percent of Iowa's counties fell into the "good" category based on roadside sur-

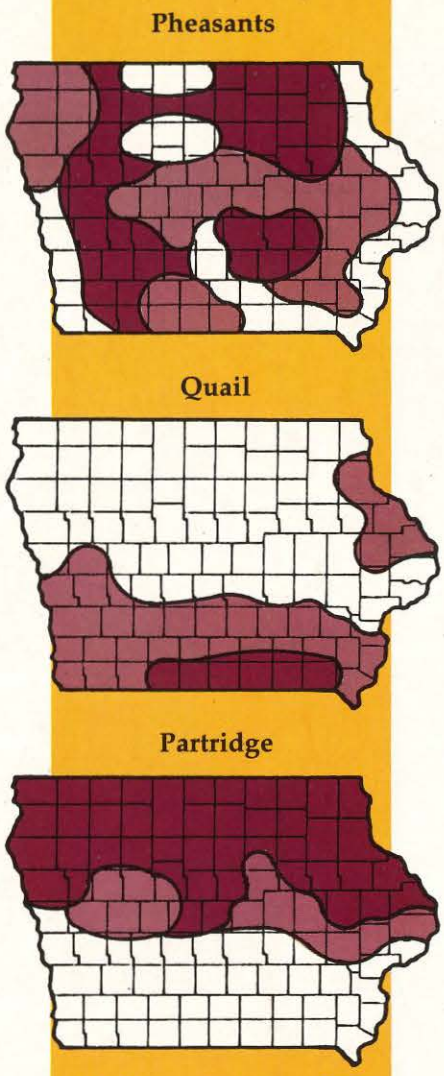
veys, so a season equivalent to last year's seems likely. Only a potentially delayed crop harvest caused by wet fields and late maturing crops seems likely to dim this outlook and could slow down early season hunting success.

Quail have been less affected by drought than pheasants with last year's take of 426,000 birds being the best in nine years. Most quail range lies within the area hit hardest by rains and roadside surveys indicated a drop in quail numbers of approximately 25 percent. Most of the prime quail range in our southern three tiers of counties will rate only "fair" this year as a result.

Southern Iowa hunters shouldn't be overly discouraged by these events. Pheasants and quail are persistent nesters. Hens that lose a nest will usually lay another clutch of eggs and keep trying to hatch a nest until they are successful or run out of summer (see *Questions About Quail*, page 26). Quail are particularly stubborn and occasionally hatch a brood as late as October. Evidence from the roadside surveys and sightings by DNR field personnel suggest that a late nesting effort is occurring in southern Iowa and could improve the outlook considerably by the time bird season begins.

Unlike northern Iowa pheasants, gray (Hungarian) partridge numbers did decline sharply. Areas of heavy rain north of Interstate 80 did show partridge declines of up to 50 percent from last year. Partridge numbers were at all-time peak levels last year, however, so good numbers still remain over most of northern Iowa. Partridge range continues to expand with verified sightings now reported from virtually every county. I saw four different partridge coveys while hunting in Wayne County along the Missouri border last fall, so even southern Iowa hunters might expect to see partridge more frequently. Unfortunately, these southern partridge seem to hold no better for bird dogs than their skittish northern Iowa counterparts. Quail hunters looking for a substitute quarry may be disappointed in their shooting opportunities.

1990 SMALL GAME DISTRIBUTIONS



Ruffed grouse are our only other commonly pursued upland game bird and huntable populations are limited to the northeast quarter of the state. The DNR has no surveys that indicate the status of ruffs, but states and Canadian provinces north of us indicate continuing excellent numbers of this most-difficult-to-shoot gray rocket. Because we generally lag a year or two behind the 10-year boom-and-bust cycle followed by northern grouse populations, Iowa grouse hunters should find good numbers of birds for at least another year.

Woodcock populations in the Central Management Unit (stretching from Ontario to Louisiana) are stable. The handful of woodcock hunters in Iowa should find sporting but brief shooting similar to last year. Peak woodcock migration through Iowa often lasts a week or less in mid- to late October.

Cottontail rabbits and tree squirrels (fox or gray) are our two most common, but least appreciated, small game animals. Both are abundant in their own habitats but are hunted less each year as hunters' interests have shifted to game birds or big game. Production of rabbits is affected very little by rainfall, so it is no surprise that statewide rabbit numbers are up 75 percent this year as the quality of CRP fields improved. Many hunters pursue rabbits only as an afterthought following the bird hunting seasons. By then hungry


ROGER A. HILL

coyotes and great horned owls have depleted rabbit numbers tremendously. For the best rabbit hunting, go early in the fall.

The DNR has no survey information on squirrels, but they are abundant all across the state. A good nut and seed crop last fall and a mild weather bode well for squirrel populations this fall. Few game tastes better than young fried squirrel.

Wild Turkey

Fall hunting for wild turkey is growing regularly in popularity as huntable populations have developed all across Iowa. Last year's 15,343 hunters and 5,345 birds harvested represent all-time records and the number of fall hunters now nearly equals the number of spring turkey hunters. Nonresidents were allowed to hunt turkeys for the first time last fall but the interest was limited; only 157 licenses were sold.

Turkey hens and poults are as susceptible to drought and flooding as other ground nesting birds but with an added twist. Compared to pheasants and quail, hen turkeys are much less persistent nesters. Once a hen loses a nest she is not likely to try nesting again; most simply give up and wait until next year. Thus, losing a nest has much greater consequences to the number of birds turkey hunters can expect to find. Fortunately, turkeys are much longer lived than their smaller cousins and can ride through a year or two of bad production with less obvious consequences.

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Final results of the 1990 turkey brood survey are not available as this is written, but preliminary returns indicate production is down considerably from last year. Production was the poorest on record in southern and central Iowa last year, so the outlook for this year seems poor. Northeast Iowa had excellent turkey populations last year and suffered little from early summer rains, so the impact there will be minimal. Hunters in all zones can expect to find fewer turkeys and will have more difficulty calling experienced adults than the young birds. Turkeys are still abundant and the season is long enough that nearly half of the hunters should eventually bag a wild-grown Thanksgiving dinner.

1990 HUNTING SEASONS AND BAG LIMITS

SPECIES	SEASON (dates inclusive)	SHOOTING HOURS	BAG LIMITS DAILY	BAG LIMITS POSSESSION
Cock Pheasant	Oct. 27 - Jan. 10	8:00 a.m. to 4:30 p.m.	3	12
Quail	Oct. 27 - Jan. 31		8	16
Gray Partridge	Oct. 6 - Jan. 31		8	16
Turkey (Gun or Bow)+	Oct. 15 - Nov. 30	1/2 Hour Before Sunrise to Sunset	One turkey per license	One turkey per license
Turkey (Bow Only)+	Oct. 1- Nov. 30* and Dec. 17 - Jan. 10*	1/2 Hour Before Sunrise to 1/2 Hour After Sunset		
Deer (Bow)**	Oct. 1 - Nov. 30 and Dec. 17 - Jan. 10		Bow & Muzzleloader: One deer Shotgun: One deer per license	One deer per license
Deer (Muzzleloader)**	Oct. 13 - Oct. 21* or Dec. 17 - Jan. 10			
Deer (Shotgun)***	Dec. 1 - Dec. 5 or Dec. 8 - Dec. 16	Sunrise to Sunset		
Rails (Sora & Virginia)	Sept. 1 - Nov. 9		15	25
Ruffed Grouse+	Oct. 13 - Jan. 31		3	6
Snipe	Sept. 1 - Dec. 16		8	16
Woodcock	Sept. 15 - Nov. 18		5	10
Rabbits (Cottontails)	Sept. 1 - Feb. 28		10	20
Rabbits (Jack)	Oct. 27 - Dec. 9		3	6
Squirrels (Fox & Gray)	Sept. 1 - Jan. 31	None	6	12
Crows	Oct. 1 - Nov. 30 and Jan. 15 - March 18		None	
Pigeons	Oct. 1 - March 31			

+Check regulations for open areas.
*Residents only
**Special regulations, seasons and limits may apply to the Iowa Army Ammunition Plant in Burlington.
***Shotgun hunters may hunt during one period -- not both.

For detailed regulations on hunting and trapping, see the *1990 Iowa Hunting and Trapping Regulations* brochure. This brochure is available through county recorders, license vendors and conservation officers, or by writing the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

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White-Tailed Deer

Observers of white-tailed deer populations and deer hunters must be wondering where it will all end. Each year in the last decade has set new records for licenses issued and deer harvested. The nearly 100,000 deer shot last fall is more than the total number of hunters that went afield as recently as 1980. Nearly as many people now hunt deer as hunt pheasants -- phenomenal for an agricultural state renowned for its pheasant hunting but with little remaining forest cover. The expansion of seasons to accommodate specialized types of weapons now permits deer hunting of some sort for nearly three and a half months. Nonresidents were even allowed to hunt deer for the first time in 1989.

Deer populations in Iowa are controlled mostly by hunting and are not very susceptible to weather events. For the first time in more than 10 years there is some indication that hunters have finally curbed the growth in the deer herd. Putting any-sex deer licenses in virtually every hunter's hands in 1989 and allowing some hunters to take more than one deer seems to finally be paying off. The DNR's objective has been to stop the rapid growth in deer numbers and reduce the pressure on crops caused by deer damage. This strategy seems to be working.

Regionally, deer numbers seem to be stabilized in southern, eastern, and northeast Iowa and have declined somewhat in northwest and north-central Iowa. Success rates declined slightly for most hunters in northern Iowa last year, and the proportion of bucks in the harvest declined to about 45 percent. Trends in several deer surveys and vehicle collisions with deer both indicate the deer herd has stabilized in most regions and is slightly down in northern Iowa.

Deer seasons will be similar in structure to last year with a few minor adjustments. Hunters during the first regular gun season in zones 1, 2 and 10, and portions of zone 7 will be restricted to antlered-deer-only licenses to curtail the harvest of does there. These zones have little habitat and few, if any, complaints about deer causing crop damage, so deer numbers can be safely increased. The second tag for bow hunters has been liberalized somewhat, allowing them to take a second anterless deer during the first portion of the bow season and a deer of either sex during the late bow season. A larger portion of southern Iowa has been opened to second tags for anterless deer during the second gun season (portions of zones 3, 4, 5 and 6) and hunters no longer have to choose to hunt in these zones on their first license to qualify for a second license.

Even with the reduction in any-sex permits in some zones, an excellent deer season looks inevitable. Deer numbers are high and hunters can choose from a variety of seasons to suit their preference for time and style of hunting. Landowners concerned about deer on their property have opened more land to deer hunting than ever before. With proper behavior on the part of hunters and careful management by the DNR, these opportunities should continue into the foreseeable future.

Waterfowl

Drought on the prairies. Loss of wetlands. Intensified agriculture. Destruction of nesting habitat. Plummeting duck populations. These are phrases the waterfowler has come to despise. The down side is things are nearly the same as last year. Not much improvement has been seen in duck populations. Most of the prairie pothole duck factory that stretches from northern Iowa to west-central Canada remained historically dry during the waterfowl breeding season. A wetter winter and spring improved water conditions somewhat in prairie Canada, but Montana and the Dakotas were drier. Even where water returned to wetlands there was insufficient time for nesting vegetation to redevelop. Overall wetland numbers were still 18 percent below the average in Canada and 12 percent below in the Dakotas.

Because of the marginal improvements in breeding habitat duck populations remain at or just above all-time low numbers.

The good news is that harvest restrictions, in terms of shorter seasons and more restrictive bag limits, have worked to keep populations from going lower, and are providing a base from which to rebuild duck numbers once drought cycles are reversed.

Total breeding duck numbers showed virtually no change from 1989. Mallards, wigeon, pintails, scaup and redheads had breeding populations similar to last year; gadwall, green-winged teal, northern shoveler and canvasback numbers increased more than 10 percent and blue-winged teal decreased 11 percent. Populations of all species except gadwall and

1990 WATERFOWL HUNTING SEASONS AND BAG LIMITS

SPECIES	SEASON (dates inclusive)	AREA	SHOOTING HOURS	BAG LIMITS DAILY	BAG LIMITS POSSESSION
Ducks Early season	Oct. 6 - Oct. 7	N. Zone	1/2 Hour Before Sunrise to Sunset	3 (see below)	6 (see below)
	Oct. 20 - Oct. 26	S. Zone			
Ducks Late season	Oct. 20 - Nov. 16	N. Zone			
	Nov. 3 - Nov. 25	S. Zone			
Geese Canada/ White-fronted/ Brant	Sept. 29 - Dec. 7	Check Regulations		7 (no more than 2 Canadas and 2 White-fronted)	14 (no more than 4 Canadas and 4 White-fronted)
	Oct. 13 - Dec. 21	SW Goose Zone			
Geese Snow	Sept. 29 - Dec. 17	Check Regulations			
	Oct. 13 - Dec. 31	SW Goose Zone			
Coots	Same as Ducks			15	30

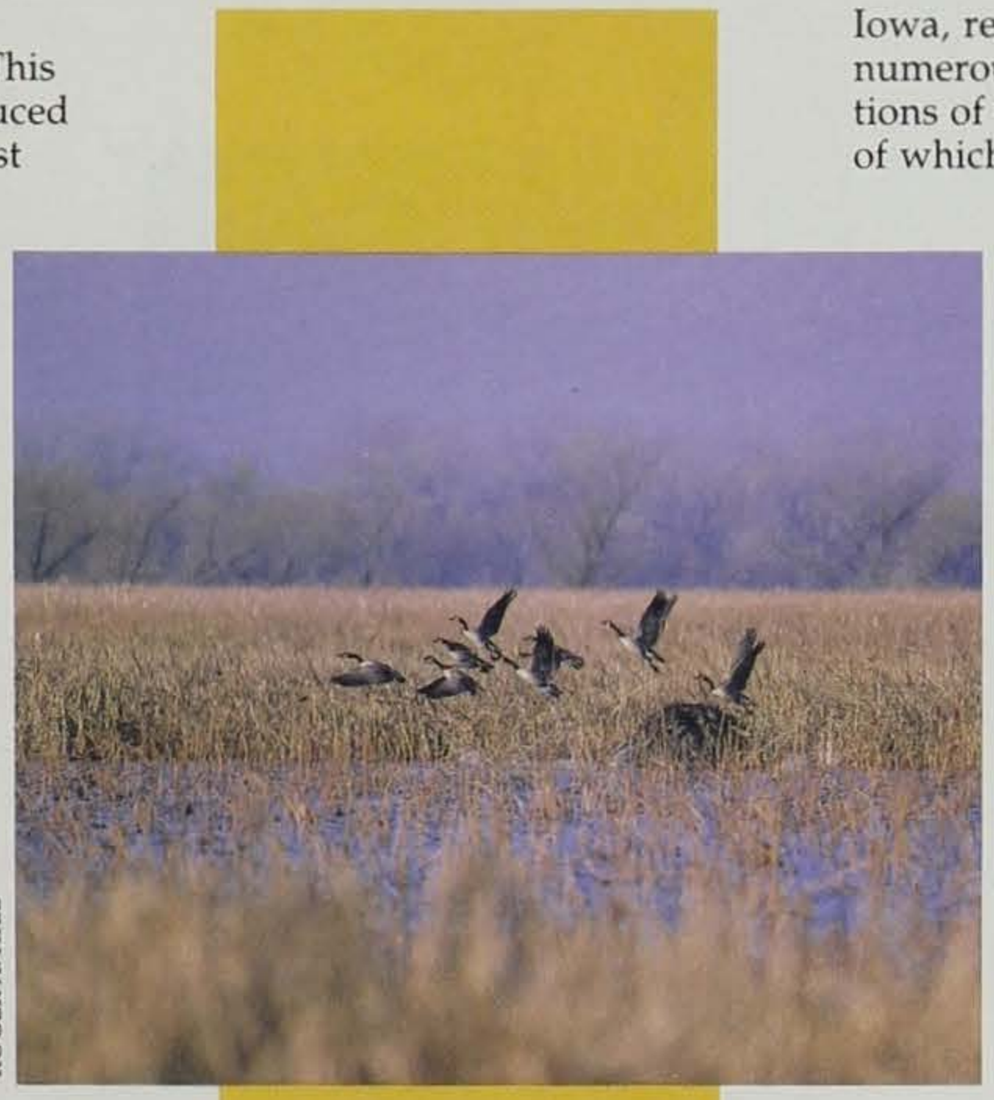
Ducks: The daily bag limit is three (3) ducks and may include no more than two (2) mallards (no more than one (1) of which may be a female), one (1) black duck, two (2) wood ducks, one (1) redhead and one (1) pintail. **Canvasbacks -- the season is closed.**
The possession limit for ducks shall not include more than four (4) mallards (no more than two (2) of which may be female), two (2) black ducks, four (4) wood ducks, two (2) redheads and two (2) pintails.
Mergansers: Daily bag limit is five (5) (no more than one (1) of which may be a hooded); possession limit is ten (10) (no more than two (2) of which may be hooded).
Check regulations for areas closed to waterfowl hunting.
Steel shot is required statewide for waterfowl hunting.

green-winged teal remain well below the average levels for 1955-89. With little change in breeding populations, a fall flight similar to last year's is expected.

Because duck populations remain low, duck seasons will be similar to the last two years. A 30-day season will be split into two different segments north and south of Interstate 80. The bag limit will be three ducks per day with special restrictions on mallards, wood ducks, pintails and redheads. This season structure last year produced Iowa's third lowest duck harvest since records were started in 1961. The fewest number of hunters hunted the fewest days and took only five ducks per hunter for the entire season.

Most of our wetlands were dry in 1989 and there were few places to hunt ducks. Late summer rains have replenished many of our natural wetlands this year and have produced excellent habitat to attract and hold migrating waterfowl. Reservoirs and artificial impoundments along our river systems have suffered extensive flood damage and fluctuating water levels have destroyed a great deal of vegetation that would normally attract ducks. On balance, the outlook for duck hunting will be improved even with duck numbers similar to last year.

How long will it take for things to turn around for ducks? Only nature holds the key. Hopefully, the small improvements in water conditions on the prairies offer a light at the end of a long dark tunnel. The plight of waterfowl has spurred massive public and private efforts in Canada and the U.S. through the North American Waterfowl Management Plan to restore and improve duck habitat. The Prairie Pothole Joint Venture, Iowa's part of the NAWMP, has resulted in 2,800 acres of new wetlands created or restored, and similar efforts are occurring continent-wide (see *From Cattails to Cornstalks and Back Again*, page 16) . Hunters that choose not to hunt while duck populations are low can support these efforts by continuing to purchase state and federal waterfowl stamps to hasten the day when duck numbers are improved.



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Excellent populations of Canada and snow geese offer the waterfowler an alternative quarry while duck numbers are low. Arctic-breeding geese remain largely unaffected by drought on the prairies and many populations are at all-time high levels. The Mississippi Valley and Eastern Prairie populations that migrate down the Mississippi River corridor and across the western two-thirds of Iowa, respectively, are particularly numerous. Local breeding populations of Giant Canada geese, many of which were started by the DNR's Giant Canada goose restoration program, are also thriving and produced at least 8,000 young geese this year. Iowa goose hunters set an all-time harvest record of 19,000 Canada geese last year and the outlook for 1990 is as good or better. Rejuvenation of most dry wetlands will provide more places to hunt and the reinstated 70-day Canada goose season will give goose hunters, in all parts of Iowa, a better chance at good hunting regardless of the timing of migration.

Furbearers

In spite of excellent populations of most furbearers, interest in trapping and hunting them is extremely low. Mink and muskrat numbers are low because most wetland habitats have been dry for two years. Populations of raccoons, skunks, foxes and coyotes seem to be increasing rapidly, perhaps in response to a broader habitat base supplied by CRP areas and reduced hunting and trapping. Complaints about skunks and raccoons invading and damaging urban and rural yards and buildings, for example, are at a level last seen in the 1960s. In spite of this abundance, the number of furs sold to furbearers in 1989 was the lowest in 20 to 30 years.

The answer to this enigma lies in the European fashion market. Furs and fur products are in extremely low demand in the fashion centers of Europe. As a result, a glut of furs has saturated the market and pelt prices paid to furharvesters are extremely low. The total value of all fur sold in Iowa last year was just over the $1 million mark, down from a peak value of $10 million sold in 1986.

The interest in trapping and hunting is strictly tied to pelt prices. Trapping is an expensive hobby. Traps, scents, hide stretchers, a host of small tools and gasoline to run a trap line all cost money. When prices are high, the number of trappers swells as profit is readily available. When prices are low, only the die-hard trapper remains active. This has some positive benefits in that the dedicated trapper usually is more skilled, has a higher standard of conduct and respects landowner's and other trapper's rights. Conflicts involving trappers are almost nonexistent now that trapper numbers are down.

Populations of furbearers benefit little from this decreased trapping effort, however, because nature has its own ways of dealing with overly abundant wildlife. Disease is the common leveller of small mammal populations. Outbreaks of disease in raccoons and skunks have been reported all across Iowa the last two years. Canine distemper, rabies and parvovirus are commonly diagnosed and all are transmittable to pets or humans. Controlling populations through regulated trapping and hunting and making use of pelts seems much preferable to having to destroy and discard diseased animals.

1990 SEASONS FOR FURBEARERS

SPECIES	OPENING	CLOSING
Mink, Muskrat, Raccoon, Weasel, Striped Skunk, Badger, Opossum, Fox (red & gray)	Nov. 3 March 2, 1991*	Jan. 20, 1991 April 7, 1991*
Beaver	Nov. 3	April 7, 1991
Civet Cat (spotted skunk), Bobcat and Otter	Continuous Closed Season	
Coyote (trapping)	Nov. 3	Jan. 20, 1991
Coyote (hunting)	Continuous Open Season	
Groundhog	June 15	Oct. 31

*On selected areas established in February, for muskrats only

All furbearer seasons open at 8:00 a.m. on the opening date. There are no daily bag or possession limits.

Summary

All things considered, a 1990 hunting season similar to 1989 wouldn't be bad. If waterfowl numbers improve a little because of better available habitat, hunters will be faced with a real dilemma in November. During the month, hunters could be confronted with a choice of good to excellent hunting on pheasants, quail, partridge, ducks, geese, wild turkey, rabbits, squirrels, ruffed grouse and bow hunting for deer. Not a bad choice to have to make!

ROGER A. HILL

Terry W. Little is the department's wildlife research supervisor in Des Moines.

Iowa's Wild Turkeys Need Your Help!

The DNR is responsible for managing populations within the state for the use and enjoyment of Iowa residents, now and in the future. But successful management requires a great deal of accurate and detailed information -- often much more than the biologists themselves can personally collect. Successful management requires the help of Iowa residents.

The turkey restoration program is a good example of successful management achieved by the DNR through the help of individuals outside the department.

When the restoration project began, many people were excited about the opportunity to observe wild turkeys, and their interest and enjoyment led many to notify DNR personnel of turkey sightings. These reports, now in the form of the summer turkey brood survey, give biologists the necessary information to monitor the success of the stocking program. But this is only one element of successful management.

Once a population is successfully established, it needs to be continually monitored to insure its stability. For this information, the DNR relies on data provided by randomly selected hunters via survey postcards. These survey cards are an integral part of the DNR's management efforts. The accuracy of the information depends on individual integrity and thoroughness when filling out the cards, and the precision of the data depends on the number of survey cards returned. When turkey hunting seasons were first opened, hunter response to survey cards was high and cards were returned in a timely fashion. Recently, however, the return rate of the cards has dropped off, and it is taking longer to reach the targeted 75 percent return rate.

It appears many people are now taking turkeys for granted, as many of us do with anything we think of as "common." But without the knowledge provided by hunters, the DNR has little data to adequately manage this majestic wild bird. Your help is needed now. If you receive a harvest survey card, please take five minutes after your hunt to complete the card and drop it in the mail.

Don't take wild turkeys for granted, they were eliminated from our state once . . . and once is enough.

1989 HUNTING SEASON AT A GLANCE

Species	No. hunters	Harvest	1989 compared to: 1988	1989 compared to: 10-year avg.
White-tailed Deer				
Archery	30,815	11,799	+19%	+89%
Early muzzleloader	5,362	2,619	+43%	—
Shotgun	124,810	81,124	+1%	+116%
Late muzzleloader	9,459	3,715	+17%	—
Nonresident	877	475	—	—
Total	**171,323**	**99,732**	**+6%**	**+122%**
Wild Turkey (Fall)				
Archery	1,353	66	—	—
Shotgun	13,833	5,212	—	—
Nonresident	157	67	—	—
Total	**15,343**	**5,345**	**+21%**	—
Upland Game				
Ring-necked pheasant	211,586	1.44 million	+26%	+27%
Bobwhite quail	79,971	426,302	+47%	+6%
Gray partridge	48,785	118,282	+14%	+45%
Ruffed grouse	9,611	13,335	+4%	+6%
Gray/fox squirrel	80,937	583,183	+14%	-22%
Cottontail rabbit	89,054	435,791	+3%	-41%
Furbearers				
Raccoon	—	120,000	-40%	-59%
Mink	—	8,500	-39%	-97%
Muskrat	—	75,000	-62%	-85%
Fox (red and gray)	—	14,425	-16%	-33%
Coyote	—	4,200	-17%	-53%
Beaver	—	9,000	-51%	-19%
Waterfowl				
Mallards	—	36,200	-13%	-11%
Blue-winged Teal	—	2,947	+116%	-89%
Wood duck	—	16,727	+47%	-63%
Green-winged Teal	—	18,275	+46%	-31%
All ducks	—	**88,503**	**+13%**	**-69%**
Canada geese	—	19,847	+65%	+63%
Snow geese	—	4,468	-55%	-74%
All geese	—	**24,404**	**+10%**	**-18%**

RON JOHNSON

Holiday Gift List . . .

❖ *Iowa Conservationist* -- 12 issues per year; one-year subscription, $6; three-year subscription, $12. Include names and address of gift recipients on separate sheets. All gift recipients will receive a free *1991 Iowa Conservationist Calendar* ($3 value).

❖ ***1991 Iowa Conservationist Calendar*** -- 12-month; full-color photos of Iowa's native wildlife and colorful outdoors; $3.

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❖ ***The Ring-Necked Pheasant In Iowa*** -- Allen L. Farris, editor; 147 pages; color photos; hard bound; $5.

❖ ***Waterfowl In Iowa*** -- Jack M. Musgrove, editor; 130 pages; color plates by Maynard Reece; hard bound; $3.

❖ ***1990 Nongame Poster*** -- features a bluebird, photo by Carl Kurtz. Make tax-deductible donation of $5 or more to the Chickadee Checkoff to be used to support nongame wildlife.

❖ ***1990 Nongame Support Certificate*** -- features a bald eagle, photo by Don Poggensee; image 6" x 8-1/2"; 5,000 limited edition numbered; available until March 31, 1991; $5.

Please enclose proper remittance with your order form. To ensure delivery by Christmas, orders must be postmarked by November 9, 1990. Offer expires January 15, 1991. Offer is limited while supplies last.

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Plum River Fault Zone

by Greg A. Ludvigson

Devastating earthquakes, such as those experienced in [Iran,] Soviet Armenia and Mexico City, are obvious and newsworthy effects of geologic faults. Within the United States, many people also are aware of the periodic activity along the San Andreas and kindred fault systems in southern California. Fewer people may realize that the most violent earthquakes to shake North America since European settlement occurred in the mid-continent during 1811 and 1812, near New Madrid in southeastern Missouri. Some eastern Iowans have felt tremors of lesser midwestern earthquakes in recent decades. Few people are probably aware that geologic faults are known to exist in Iowa. Even though the Earth's crust here in the continent's midsection is quite resistant to deformation, and is generally considered the most stable of geologic realms, geologists recognize that the mid-continent crust is broken by several significant fault systems.

Faults in Iowa generally have received little attention. There is a lack of topographic expression of bedrock faults on the Iowa landscape, as compared to the dramatic example of the Front Range along the Golden Fault in Colorado. The subdued topography indicates that no major recent movement has occurred along the faults in our state. The widespread cover of glacial deposits across Iowa further complicates matters by obscuring the bedrock geology, making detection and interpretation of faults difficult. Finally, although data are scant, there is no current information to suggest that geologic faults in Iowa pose any significant seismic hazard.

Geologic faults are linear to curving belts of deformed rock along which differential movements of the Earth's crust have taken place. These features are host to unusual geologic phenomena that can subtlety record important aspects of an area's geologic history. Faults display a wide range of effects, from microscopic dislocations in the structure of individual mineral crystals to major boundaries in the Earth's crust. They record the failure and deformation of earth materials from stresses that build up in the crust. Rocks can be deformed by compression, stretching, extension, or shearing. Shearing, the angular distortion between the opposing rock masses, is the mechanism that distinguishes most faults. Detailed studies of the rock products of faulting have shown that both plastic flow of solid earth materials and brittle cracking are the processes usually involved in movements along major fault systems.

The Plum River Fault Zone of eastern Iowa and northwestern Illinois, while ancient in origin, has been recognized by geologists only since the mid-1970s. Geologists

Looking south across the sag marking the fault trace in Jones County, gray Devonian rocks in the foreground are exposed at the same elevation as the much older, brown Silurian rocks in the distant quarry.

from the state geological surveys of Iowa and Illinois were aware of the peculiar geology in the area by the early 1890s. Rock strata to the south of the fault zone have been uplifted several hundred feet relative to those on the north. Since the range of land surface elevations is the same on both sides of the fault, the fault separates crystal blocks that are eroded to different stratigraphic levels, and thus different age strata are exposed on opposing sides of the fault. For many years, the structure was known as the Savanna-Sabula Anticline, in reverence to the river towns in Illinois and Iowa where this feature crosses the Mississippi Valley. The long-held interpretation of the structure as an anticlinal fold, or upward bending of rock strata, was modified because of detailed field studies in Illinois. Corresponding field work in Iowa showed that the fault zone extends westward much further into Iowa than was previously believed. The fault system terminates to the south of Cedar Rapids in Linn County, although subtle evidence suggests that related rock deformation may extend farther to the southwest in to the Amana Colonies in Iowa County.

The Iowa portion of the Plum River Fault Zone was first investigated during regional groundwater studies of the bedrock aquifers in east-central Iowa. It was recognized then, that the fault zone can impact the local availability of groundwater from these aquifers. This occurs because of the "normal" layering of sedimentary bedrock units is physically rearranged in the area of the fault. Thus, the very existence of regionally persistent bedrock aquifers is in question near the fault. Additionally, the mechanical and chemical processes by which the rocks were deformed can alter their water-bearing characteristics. Zones of closely-spaced fractures in limestone have the capacity to yield abundant water supplies, provided that these networks are not closed by fracture-filling mineral growths. The grinding of rocks along a fault into powder-sized fragments has the effect of reducing the permeability of those rocks, creating barriers to groundwater flow.

The geometric complexity of the Plum River Fault Zone, and the interplay of these other factors, can make the exploration for groundwater supplies a difficult proposition in the vicinity of the fault. Local effects of the fault zone have complicated the development of municipal water supplies in several Iowa communities, including Mount Vernon and Oxford Junction.

The earth movements responsible for the formation of the Plum River Fault Zone occurred in the distant geologic past. The origins of the structure probably date back nearly two billion years, when most of the continental crust in the Iowa area was formed. As with many fault systems in the continental interior, periodic episodes of deformation in the shallow sedimentary rocks of the Plum River Fault Zone resulted from reactivated movements of the older, buried fault systems along the weakened continental crust. Microscopic studies of deformed rocks exposed in the fault have identified multiple episodes of rock deformation that were subsequently healed by the precipitation of distinctive assemblages of mineral cements. A variety of these cements have been found, notably the carbonate minerals calcite and dolomite; the silicate mineral quartz; the sulfide minerals pyrite, marcasite, galena and sphalerite; the sulfate mineral barite; and the oxide minerals goethite and pyrolusite. Small galena deposits were mined for lead from localities near the fault zone during the 19th century, but they have long since been abandoned.

These mineral assemblages were emplaced during or shortly following separate episodes of movement in the development of the fault system. This concept was developed through microscopic studies of the rocks and by geochemical studies of the mineral cements. The minerals were precipitated from ancient groundwaters of varying composition that once saturated the rocks along the fault zone. These chemical environments at the time of deformation and cementation determined not only which groups of minerals were deposited, but also controlled their trace-element and isotopic

chemistry. The movements of these mineral-rich groundwaters were influenced by the regional episodes of deposition and erosion that formed the sedimentary rock sequence in Iowa. Evidence now shows that deformation along the Plum River Fault Zone occurred during the Ordovician, Silurian, Devonian, and probably the Mississippian periods of geologic time.

Research results indicate that the last significant movement along the Plum River Fault Zone occurred about 300 million years ago, partly overlapping with the deposition of Early Pennsylvanian sedimentary rocks across eastern Iowa. Later, about 260 million years ago, minor cracking of the rocks bordering the fault occurred during a brief episode in which hot subsurface brines flowed into the continental interior from a rising mountain belt along the southern margin of North America. The lead deposits along the Plum River Fault Zone apparently formed during this time.

While the Plum River Fault Zone is probably the best studied of the fault systems in Iowa, other faults also have been the focus of geologic research. The Thurman-Redfield Structural Zone of southwest Iowa is a complex fault and fold system that resulted from rejuvenated movements of buried faults along the Midcontinent Rift System. The Fort Dodge Fault is known from exposures along the Des Moines River valley, from underground mine workings, and from drillhole data in Webster County. Some of these geologic structures along the rift system have been drilled for commercial use as underground natural-gas storage facilities. These include installations at Redfield and Dallas Center in Dallas County, and Vincent in Webster County. Drillhole data from Decorah in Winneshiek County also suggest the presence of a fault system whose configuration remains poorly known. There are other localities in Iowa where faults are suspected but have not been investigated.

The economic importance of geologic faults in Iowa results from their influence on the distribution and availability of natural resources, including stone products and underground water supplies. Geologic faults are also known to be associated with concentrations of metallic mineral and petroleum deposits in many areas, although the prospects in Iowa are poorly known. From a scientific viewpoint, geologic faults in Iowa and the rest of the midcontinent remain mysterious in many respects. Where are they; what are their regional patterns of occurrence, their histories of movement, and what processes triggered deformation in the stable continental interior? What, if any, degree of seismic hazard is posed by these structures? These are questions that can only be addressed by further geologic studies.

Grinding along the fault has broken this Silurian dolomite into angular fragments, later cemented with calcite and iron oxides.

Zones of color in these microscopic calcite crystals (yellow) record periodic episodes of mineral growth from ancient groundwaters that flowed through the fault-fractured rocks (black: iron-oxide; blue: epoxy; 2 mm field-of-view).

Reprint from Iowa Geology 1989, *Number 14.*

Greg A. Ludvigson is a geologist with the department's geological survey bureau in Iowa City.

Everyone has heard about soil erosion and groundwater contamination and acid rain. But what do these environmental problems have to do with Energy Awareness Month? Literally everything!

The way we produce and use energy has a direct impact on our environment. We can protect our land, air and water by using energy more wisely. The environment and energy connection is reflected in this year's national Energy Awareness Month theme — *Energy: Plan it for the Planet.*

Some of the energy/environment link facts --

✳ Air pollution, acid rain and the greenhouse effect are the products of burning fossil fuels (coal and oil). The average American car pumps its own weight in greenhouse gases into the atmosphere every year.

✳ Nuclear energy produces waste that will be radioactive for hundreds of years.

✳ Our drinking water is contaminated by nitrogen fertilizers derived from natural gas, by leaking underground gasoline storage tanks and by used oil disposed of improperly. One gallon of oil (the contents of one oil change) can contaminate a million gallons of water.

✳ Tillage practices that waste energy also increase soil erosion that depletes our farmland and pollutes our surface water.

✳ We are throwing away materials that could be recycled to save energy and reduce the need for landfills. Iowa's landfills are expected to be full within 12 years, and no one wants a new landfill in their "backyard."

✳ Exploring for, extracting and transporting fuels causes environmental damage, often in the most fragile areas. Oil spills in Alaska and Texas in the last two years have contaminated rich fishing grounds and wildlife areas.

The best way to deal with environmental damage is to prevent it from happening in the first place. And the best way to prevent pollution is to plan our energy use wisely. Every individual can make a difference by making a few of the following changes.

✓ Buy the most fuel-efficient vehicle possible to meet your driving needs. Keep it operating at its most efficient level.

✓ Take advantage of programs offered by your local utility company to help you reduce your consumption of electricity and heating fuels in your home. Such programs include rebates on energy-efficient appliances, energy audits to identify wasted energy and financing for energy improvements.

✓ Participate in recycling programs in your area. If you don't have one, either at home or at work, get together with neighbors or co-workers and start one.

✓ Find alternatives to household hazardous materials whenever possible. For those you need to use, be sure to use and dispose of them properly.

✓ If you farm, make your farming operation as energy-efficient and environmentally sound as possible. Demonstration programs currently are showing farmers how to use integrated management to reduce inputs and increase profitability.

The month of October is designated as Energy Awareness Month, and it is during this month that most Iowans are preparing for winter. This year, when you are putting up your storm windows and replacing your antifreeze, think about what else you could do to save energy during the winter and year-round. Plan your energy use "for the planet."

Plan It for the Planet

$E=mc^2$

$r=\sqrt{\frac{r}{\rho}\frac{\partial p}{\partial r}}$

CO_2

$\frac{n\hat{M}}{N\,m}=\frac{m_0}{16}$

H_2O

$A+BC \rightarrow AB+C$

$H_2O_2+H^+ + Br^-$

$3\times10^8=300{,}000{,}000$

ATOM

ENERGY AWARENESS MONTH

OCTOBER 1990

UNITED STATES DEPARTMENT OF ENERGY

From Cattails to Cornstalks and Back Again

Article by Lee Gladfelter
Photo by Roger A. Hill

Early settlers in Iowa encountered two to three million acres of pristine wetlands scattered among seven and one-half million acres of prairie pothole country. This fantastic complex of tall prairie grasses and aquatic habitat was produced by glaciers that pushed into northern Iowa as recently as 13,000 years ago. Just imagine the huge flocks of waterfowl and other migratory birds that must have taken wing every time their "space" was invaded by settlers moving across this vast wilderness. The diversity of plant and animal life must have been amazing to those early pioneers that emerged from the eastern forests into the tall grass prairies of the Midwest. But soon, most of the prairie was plowed up and the potholes drained to produce food for a rapidly growing nation. Today, only a fraction of the prairie and less than two percent of the wetlands remain. The impact on our prairie and wetland wildlife has been devastating.

Wetland loss has been a nationwide problem with less than 100 million acres remaining from an original 215 million. Wetland drainage, combined with many years of drought conditions in Canada and the United States, has created a need for an international plan to reverse downward population trends in waterfowl and other wetland wildlife. A partnership for action between Canada, Mexico and the United States was initiated in 1986 and was called the North American Waterfowl Management Plan (NAWMP). This plan involves all levels of government along with many conservation organizations, businesses and private citizens. The NAWMP creates specific wildlife production and habitat goals for geographic regions called "joint ventures." The major goal of this plan is to produce a breeding duck population of 62 million and an average fall flight of about 100 million birds by the year 2000. This population goal is equal to the average waterfowl populations existing during the 1970s.

Iowa is cooperating in the NAWMP's Prairie Pothole Joint

Venture (PPJV) along with North and South Dakota, Minnesota and Montana. The goal of the PPJV is to produce 6.8 million breeding ducks by protecting and managing an additional 1.1 million acres of habitat. Iowa's goal, as part of the PPJV is to acquire 2,000 acres of wetlands and associated uplands per year for the next 15 years in 35 northwest and north-central counties. This new public property will be intensively managed for wetland wildlife with various techniques such as wetland restoration, water level manipulation, nesting habitat management and installation of nesting structures. Another important PPJV goal is to restore 700 acres of wetlands on private land each year to provide new wetland habitat for wildlife. The annual cost of the PPJV in Iowa will be in excess of $2 million and will be funded by all the partners cooperating in this project. Funding sources include federal duck stamp revenues, state waterfowl and habitat stamp sales, special federal and state legislative appropriations (North American Wetlands Conservation Act, Iowa Resource Enhancement and Protection bill, etc.) fund-raising efforts by various national and local conservation organizations and private donations.

Only about 35,000 acres of prime wetlands remain in Iowa, most of which -- about 30,000 acres -- is already in public ownership. The remaining existing private wetlands are generally not available for purchase. Therefore, if wetland resources are to be increased, those areas previously drained for agricultural production must be restored to their former condition. Two methods are being used to accomplish PPJV wetland restoration goals. First, potential wetlands and associated upland nesting cover are purchased from willing sellers and placed into public ownership with intensive management for many wildlife species. The second objective is to encourage landowners to restore wetlands on their land by paying for wetland development costs and providing continuation of federal farm program payments such as the Conservation Reserve Program (CRP). Biologists estimate that between 200,000 and 300,000 acres of drained wetlands could be restored on private land without interfering with drainage districts or farming activities of adjacent landowners.

Counties Targeted by PPJV

Research studies in Iowa indicate that restored wetlands provide a diverse plant and animal community that rivals those of existing wetlands. Revegetation of restored wetlands by aquatic plants occurs almost immediately after water is again impounded. Seeds from numerous aquatic plant species remain stored in the soil for many years, waiting for a chance to sprout and renew their life cycle. Restored wetlands soon provide all the benefits associated with natural wetlands by preserving the environmental health of this state.

Landowners interested in restoring wetlands on their property should contact an Iowa DNR wildlife biologist to determine if a wetland restoration project is feasible. Soil maps are consulted to determine if wet soil types exist, and an area survey is conducted to estimate the amount of work necessary to accomplish a restoration project. In some cases, ditches were used to drain wetland basins and installation of a simple ditch plug is all that is necessary to restore water to the area. Most basins, however, were originally drained with subsurface tile and restoration can be achieved by digging up about 50 feet of original tile and replacing it with nonperforated flexible plastic tile. One section of plastic tile is connected to the upstream side of the line and brought to the surface to provide

water to the new wetland. Another section of nonperforated plastic tile is used to provide an outlet for the marsh by placing one end at a predetermined height and connecting the other end to the downstream section of original tile. Usually, a small dike about 100 to 150 feet long is constructed to maintain a water level of one to three feet.

Because restored wetlands are usually very shallow, they do not maintain good fish populations. A water control structure is often installed on large public area projects to allow water level manipulation to benefit aquatic vegetation.

Wetland restoration projects on private land are being funded by the U.S. Fish and Wildlife Service, Iowa DNR, Ducks Unlimited, Inc. and various other conservation organizations. About 80 percent of the projects have been completed on land enrolled in CRP. This continues the landowner's payments because wetlands are an approved CRP cover crop. In addition, associated uplands around restored wetlands provide wildlife with high-quality nesting cover. Landowners continue to maintain control over access to their wetlands just as they do on the rest of their property. Landowners will be allowed to drain restored wetlands at the end of their CRP contract period if they wish, as long as dredged or fill material is not placed in the wetland. This can be accomplished easily by reconnecting the original tile line. Of course, it is hoped that once landowners see the many benefits of wetlands, they will not want to drain them again. Future wetland easement programs or CRP extensions will probably be developed to provide incentives for landowners to retain restored wetlands.

Since 1987, 258 wetland restoration projects have been initiated on private land in Iowa. These projects include restoration of 411 wetland basins producing a total of 1,840 acres of new wetland habitat. The average size of restoration projects on private land is about four and one-half acres and they range from one-half to 40 acres. An additional 171 basins were restored on public land involving 835 acres of wetlands. Since implementation of the PPJV in Iowa, a total of 2,675 acres of wetlands have been restored on private and public land in addition to the purchase of about 6,000 acres of associated uplands for nesting cover.

There is a new consciousness toward protecting wetlands being demonstrated across Iowa and the nation. People are realizing the importance of wetlands for preserving water quality, recharging groundwater supplies, reducing soil erosion and flood potential while providing critical habitat for waterfowl and other wetland wildlife. You can help by restoring a wetland on your farm or by talking to farmers in your area and encouraging them to participate in this program. Use the tear-off contact sheet below to request assistance with wetland restoration on private land. Continuue to support local and national conservation organizations that are partners in the PPJV and buy state and federal waterfowl stamps whether you hunt or not. This important natural resource can be protected, providing a higher quality of life for all of us and future generations of Iowans. Together we can have a profound positive effect on wetland habitat and the wonderful wildlife it produces.

Lee Gladfelter is a wildlife biologist for the department, in Des Moines, working on special projects, such as Iowa's Prairie Pothole Joint Venture.

More than 150 species of wildlife depend on Iowa wetlands. Unfortunately, most of these areas have been destroyed and wildlife is disappearing with them. But there is good news. Currently, the Iowa Department of Natural Resources and the U.S. Fish and Wildlife Services are aiding landowners in reestablishing wetland areas on CRP and other private land. Development is free of charge and wetlands are an acceptable CRP practice. There is no obligation, and wetlands may be returned to cropland at a later date. Why delay? Bring wildlife home to your CRP acres.

Please fill out and send in the tear sheet attached below to receive additional information. Your inquiry will be forwarded to a local wildlife biologist who will contact you. **Mail to:** Iowa DNR, Spirit Lake Fish Hatchery, R.R. Box 7722, Spirit Lake, Iowa 51360.

Please have a local wildlife biologist contact me concerning wetland restoration.

Date _____

Name _____

Address _____

City _____

Phone (home) _____ **(work)** _____

Restorable Wetland Location

County _____

Twnsp. _____

Section _____

1/4 Section _____

WARDEN'S DIARY

Opening Day by Chuck Humeston

The alarm blares away right next to my ear. One of my greatest joys, the day after retirement, will be to take that alarm clock and smash it to pieces.

I get out of bed. It is still dark outside. It seems incongruous to get up in the dark after going to bed in the dark. Oh well, too early in the day to philosophize. I prefer dealing in realities rather than abstractions anyway. The reality is there is something I got up this early for, but my fuzzy brain is failing to function. Maybe I could just go back to . . . Oh no -- pheasant season opens today! I run for the shower.

Opening the closet I get out a uniform. At least I don't have to worry about what to wear. I strap on all the equipment.

I look down at my wife, Deb, still sleeping with that "sure-is-warm-in-here" look on her face. I think about how much an officer's spouse has to put up with. She is the greatest.

I head downstairs to get a jacket and my boots. I go by my boy's room. I step in to see him. Looking down at him, I wonder how many dads will be out hunting with their sons. Tom and I have never gotten to share such an opening day moment, and probably never will until he is grown with a family of his own. I head up the stairs remembering advice a sage warden gave to me, "Your first duty is to come home safely."

I open the door. Oh great, it's raining! I run to the squad car, fire it up and sign on with state radio. At the first stop sign, it's time to open the thermos and snarf down a couple of donuts (wardens really eat healthy). A news broadcast on the radio catches my ear, and I turn it up.

ILLUSTRATION BY NEWTON BURCH

"The DNR expects 200,000 hunters in the field for today's pheasant season opening with up to 35,000 nonresident hunters expected to . . ." Suddenly I feel outnumbered. I have two counties to cover. How can they possibly expect me to cover all of this? It's still dark and still raining. My attitude is starting to get as wet as the weather.

The sun comes up and conditions have not improved. A pickup to my left pulls into a field. A man gets out, uncases a gun, loads it and walks into the field with a dog. First hunter of the day to check. Bad day or not I manage my most pleasant, "Good morning." He looks at me, reaches for his billfold and says, "I'm sure glad to see you out here," and smiles.

It's all worth it. It's going to be a good day . . .

[It's opening day of the pheasant season.] Outside it's dark and raining. My attitude is starting to get as wet as the weather. A pickup to my left pulls into a field. First hunter of the day to check. Bad day or not I manage my most pleasant, "Good morning."

CONSERVATION UPDATE

Energy Conservation is Better Than Money in the Bank

If you are a typical homeowner and think you have implemented all the practical and cost-effective energy improvements possible, here is an opportunity to compare your knowledge with the latest research.

A report from the Consumer Energy Council of America Research Foundation states that investing in home energy conservation pays better than most other consumer investment opportunities. The research report compares different energy efficiency improvement investments with putting money in the bank and says energy conservation pays three to eight times better.

Where should you invest your energy dollars first? The Southface Journal of Energy and Building Energy Conservation illustrates how energy is typically used in a poorly insulated home (see chart above) and offers the following steps to transform a home to "good" or "great."

FIRST: Adopt no-cost measures (manually set the thermostat back, turn off lights in unoccupied rooms, etc.).
-- Install at least R-30 insulation in the attic and ventilate it.
-- Install an insulative water heater jacket.
-- Use a low-flow shower head.
-- Seal holes, cracks, penetrations in walls with caulking.
-- Repair windows.

SECOND: Install a programmable thermostat.
-- Install foam gaskets in electrical outlets.
-- Caulk window and door frames.
-- Weatherstrip leaky doors and windows.

THIRD: Insulate crawl spaces.
-- Install ceiling fans, whole-house fans.
-- Put up storm windows.
-- Add insulation in attic to R-40.
-- Shade windows with solar screens, awnings, blinds or film.

FOURTH: Insulate walls.
-- Install radiant barrier in attic.
-- Install storm doors.
-- Add movable window insulation (window quilts, plastic, etc.).

Energy Bills for a Typical Home ($ per year)

	Level of Energy Efficiency			
	Poor	Moderate	Good	Great
Heating	$1,705.90	$ 908.60	$ 423.40	$ 230.20
Cooling	481.90	273.00	188.10	119.80
Hot Water	312.00	286.80	236.40	186.00
Appliances	295.00	270.00	235.00	190.00
TOTAL	**$2,974.80**	**$1,738.40**	**$1,082.90**	**$ 726.00**

Energy Publications Available From the DNR

The Iowa Department of Natural Resources has several publications that address anything from wind power to making farm buildings more energy efficient. To obtain information on energy issues, write to the Iowa Department of Natural Resources, Energy Bureau, Wallace State Office Building, Des Moines, Iowa 50319-0034.

There are also two national hotlines that can answer specific energy questions:

Questions on the U.S. Department of Energy, renewable energy and funding:
Renewable Energy Information
P.O. Box 8900
Silver Spring, MD 20907
1-800-523-2929

Specific technical questions on energy:
National Appropriate Technology Assistance Service (NATAS)
U.S. Department of Energy
P.O. Box 2525
Butte, MT 59702-2525
1-800-428-2525

Record Number of Turkeys Taken During Spring Season

Iowa hunters harvested a record number of wild turkeys during the 1990 spring season. Wild turkey gun harvest was estimated at 8,117 bearded birds, up 21 percent from 1989, according to DeWaine Jackson, forest game research biologist for the Iowa Department of Natural Resources.

A four-season format with a quota of 4,420 licenses available during the first three seasons and an unlimited license quota for the fourth season resulted in a record 27,444 shotgun licenses issued, a 25 percent increase over spring 1989. An additional 1,075 archery-only licenses were issued, a 21 percent decrease from 1989. However, archery harvest increased 21 percent and totaled 117 turkeys.

Another milestone was the issuing of nonresident licenses. Although 450 licenses were available, only 184 were issued. Nonresidents were successful, harvesting 74 bearded turkeys.

Shotgun hunters had excellent success with more than 35 percent harvesting a turkey. "Iowa's small tracts of timber and high turkey densities allow hunters to quickly locate and call in gobblers," said Jackson.

"Although we issued a record number of licenses, I did not expect a record harvest," said Jackson. "Iowa has experienced poor turkey brood production the last couple years and I expected hunters to be less successful in harvesting a turkey than they were. This was the second year the entire state was open to spring turkey hunting, we had an excellent population of adult gobblers, and there was reasonably favorable weather during most of the hunting season. Hunters can now distribute their efforts over a very large area compared to just a few years ago. As an example, there were only 18 counties without reported turkey harvest in 1990 and the highest number harvested in any one county was 873."

Nine Sites Eligible For Superfund Money For Cleanup

Nine Iowa sites have been added to the U.S. Environmental Protection Agency's national priority list under the federal "Superfund" program, making them eligible for "Superfund" money should it become necessary to clean up these sites.

The addition of these nine sites comes as no surprise to the state, according to Larry Wilson, director of the Iowa Department of Natural Resources. DNR officials and the EPA have, over the past several years, identified potential hazardous waste sites, characterized the degree of environmental threat posed by these sites, and worked with parties responsible for these sites to eliminate any threat to the environment.

"We have been working and will continue to work with the EPA and responsible parties to ensure Iowa's environment is protected from threats posed by these sites," said Wilson.

The DNR and EPA look to responsible parties to pay for work necessary to clean up these sites. If these parties are financially unable or are otherwise unwilling to accept their responsibilities, then state and federal agencies could clean up these sites using state and federal funding. The state and federal governments can then bring suit against the responsible parties to recover cleanup costs.

The nine sites are the Northwestern States Portland Cement Co., Mason City; Lehigh Portland Cement Co., Mason City; Farmers' Mutual Cooperative, Hospers; Fairfield Coal Gasification; Iowa Army Ammunition Plant, Middleton; Peoples Natural Gas, Dubuque; Sheller-Globe, Keokuk; White Farm Equipment, Charles City; and E. I. DuPont Co., West Point.

These nine sites brings the total number of Iowa sites on the national priority list to 20. A total of 44 sites are currently listed with the State as needing some form of remedial action under state hazardous waste laws.

Autumn Color Report

People interested in the fall foliage color changes this autumn may call (515) 233-4110 for a weekly progress report from the Iowa Department of Natural Resources' forest nursery in Ames. The recorded information is updated each Tuesday and will run through mid-October. The weekly message describes fall color throughout the state, which tree species are most colorful and when the peak color will likely occur in different areas of the state.

Upcoming NRC, EPC and Preserves Board Meetings

The dates and locations have been set for the following meetings of the Natural Resource Commission, Environmental Protection Commission and the Preserves Advisory Board of the Iowa Department of Natural Resources.

Agendas for these meetings are set approximately 10 days prior to the scheduled date of the meeting.

For additional information, contact the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

Natural Resource Commission:
-- Nov. 1, McGregor
-- Dec. 6, Des Moines
-- Jan. 3, 1991, Des Moines

Environmental Protection Commission:
-- Oct. 15-16
-- Nov. 19-20, Des Moines
-- Dec. 17-18, Des Moines

State Preserves Advisory Board:
-- Dec. 11, Des Moines

Iowans Urged To Turn In Poachers

With the fall hunting seasons here, many people are out in the woods and fields scouting out prospective hunting areas. "Most of these people are law-abiding, honest citizens who are enjoying the out-of-doors. However, there are a few who may spoil it — poachers," said Steve Dermand, TIP coordinator for the Iowa Department of Natural Resources.

Since Iowa's Turn-In-Poachers (TIP) program began in 1985, more than 3,500 TIP calls have resulted in nearly 900 arrests, and approximately $47,000 has been approved in reward payments.

A minimum of $25 is paid as a reward for information leading to an actual arrest. Payments of up to $1,000 have been made to anonymous TIP callers on cases dealing with commercial poaching operations, endangered species or other more severe fish or wildlife cases. All TIP information is confidential and anyone reporting a poaching incident is guaranteed anonymity. Persons witnessing or having knowledge of violations against fish and wildlife can call the 24-hour toll-free TIP hotline number 1-800-532-2020.

According to Dermand, all funds used to pay rewards are raised through memberships, cash donations and private fund-raising efforts by the private TIP of Iowa organization, a group comprised of sporting clubs, corporate members and individuals. For information on becoming a supporting member of TIP, see the form below.

of Iowa, Inc.

Turn in Poachers of Iowa, Inc.

Box 872 Waterloo, IA 50704

MEMBERSHIP APPLICATION

Name _____ Date _____
(Business, organization, individual)

Address _____ City _____ State _____ Zip _____

Business Memberships		Organization Memberships		Individual Memberships
☐ Gold Award	$1000.00	☐ Gold Award	$1000.00	☐ $20.00 .... includes lapel pin
☐ Silver Award	$ 500.00	☐ Silver Award	$ 500.00	Supporting Memberships
☐ Bronze Award	$ 250.00	☐ Bronze Award	$ 250.00	☐ Any Amount $_____

Memberships include: quarterly newsletter, membership card, window decal, and bumper sticker.

Anyone interested in becoming a member of TIP, should fill out the above order form and send with remittance to Craig Karr, Box 872, Waterloo, Iowa 50704.

Donations

Family of William Hunt Johnson, Jr.	$433 memorial for fisheries management
Larry Nelson Lake View	30 mounted fish for use in aquatic education program, valued at $2,764
Family of Howard E. Hagans	$125 for catfish research
Jim Watters Anamosa	Parking curbs and cement valued at $93 for fireplace construction at Wapsipinicon State Park
Harold Elchlepp Cedar Rapids	Taxidermy mounts valued at $2,960 for E. B. Lyons and South Bluff nature centers
University of Okoboji Foundation Okoboji	Playground equipment valued at $1,000 for Gull Point State Park
V & Y Truck and Trailer Council Bluffs	Plastic barrel valued at $860 for goose nesting boxes at Lake Manawa State Park
Kermit Kew Clear Lake	Snow removal valued at $100 at Clear Lake State Park
Kurt Lehmen Slater	Plow valued at $500 for wildlife management at George Wyth State Park
Pioneer International Toledo	50 bags of corn valued at $3,500 for wildlife plantings at George Wyth State Park
Pioneer International Reinbeck	5 bags of sorghum valued at $100 for wildlife plantings at George Wyth State Park
Anonymous	Shelves and hardware valued at $400 for George Wyth State Park
Brent Salmons Sioux City	Material and labor valued at $314 for sign construction at Stone State Park

Classroom Corner

by Robert P. Rye

What items can you pick up and keep as you walk down one of Iowa's roads? Many beautiful fall, winter and spring decorations dress up a home or classroom. Skeletons, fancy rocks and maybe a baby animal can be found before the green of grass and wildflowers hide these for another year.

This month's quiz is about these items. Do you know which ones you can collect and bring home or to school? All of the questions can be answered yes or no.

Questions about other items in your locality should be directed to your conservation officer *before* you collect it.

Can you keep:

1. eggs or bird nests?
2. fish caught in a pond? live fish?
3. insects caught on the playground?
4. a bottle of pond water?
5. a raccoon hide trapped in a cornfield?
6. a clover bloom?
7. spiders collected from your home?
8. minnows collected from a stream?
9. any snake collected from your yard?
10. a squirrel nest?

ANSWERS:
1. Yes. Can be collected legally in season using appropriate license. A collector's permit is also required.* 2. Yes. Can be collected legally in season using appropriate license. Landowners, tenants and landowner's children are exempt from license requirement.* 3. Yes. 4. Yes. 5. Yes. Can be collected in season using appropriate license. Landowners, tenants and landowner's children are exempt from license requirement.* 6. Yes. 7. Yes. 8. Yes. Use caution -- not all small fish are legal fish to take. 9. No. Only common garter snake and timber rattlesnake can be collected. 10. Yes.

*Before collecting these items, contact the Iowa Department of Natural Resources for appropriate licensing information. Federal regulations may also apply.

COUNTY CONSERVATION BOARD FEATURE

Hawk Watch by Gail Barels and Dawn Snyder

ROGER A. HILL

Red-tailed hawk

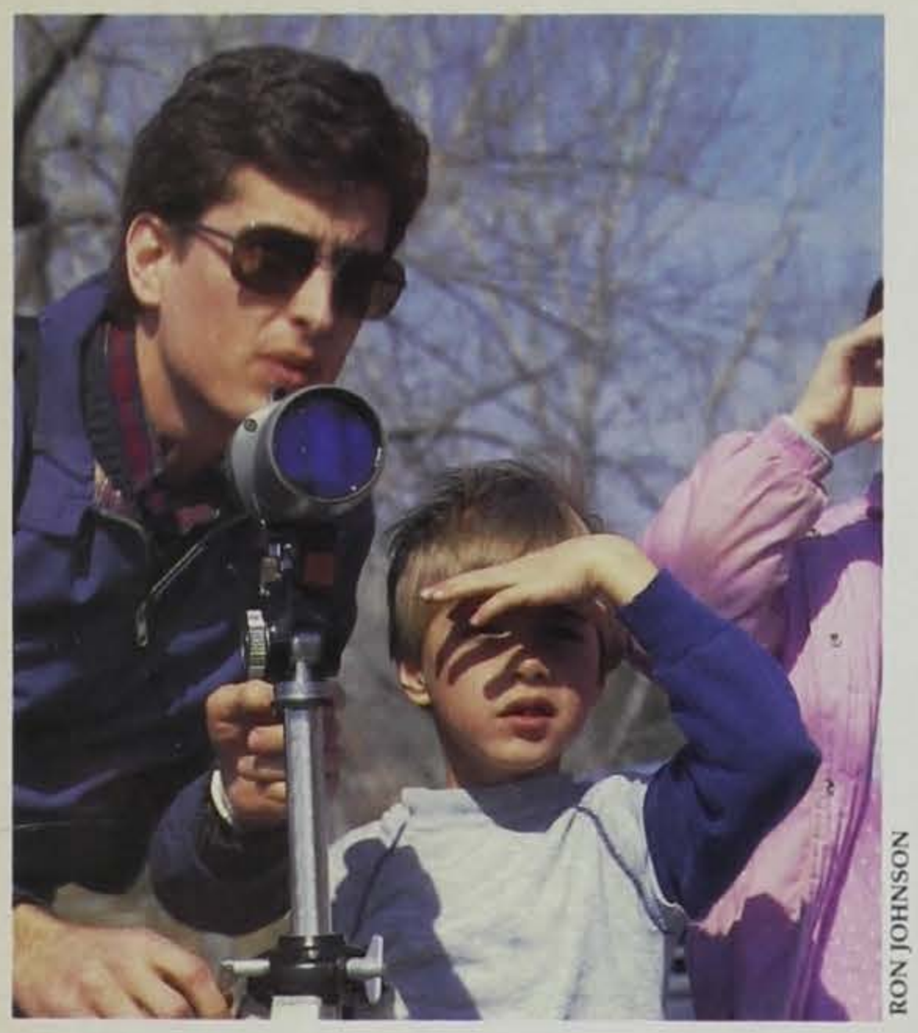
". . . we saw Swainson's hawks perching on fencepost after fencepost. They were gathering together for the autumn migration."

-- Edwin Way Teale

Standing on the high loess bluffs overlooking the Missouri River valley, anxious viewers scan the late-morning sky. High above, a small accipiter -- a sharp shinned hawk -- drifts into view. The first raptor is sighted, and the annual Stone State Park Hawk Watch has begun!

Through the cooperative efforts of local, county and state organizations, nearly 1,000 people enjoyed the opportunity to observe raptors -- the family of birds including hawks, owls, eagles and vultures -- as they migrated through the Loess Hills north of Sioux City early in October. The Loess Hills Audubon Society, Woodbury and Plymouth county conservation boards and Stone State Park coordinated the day's events which included educational programs to delight audiences of all ages.

Naturalists set up spotting scopes and binoculars at three observation sites along the park's bluffs, and trained volunteers identified birds throughout the day. Only 40 raptors were sighted, compared to 90 species sighted last year, as a strong southerly



RON JOHNSON

Spotting scopes are set up at observation sites so visitors can view raptors up close.

wind hindered afternoon flights of the majestic birds.

Red-tailed and sharp-shinned hawks, Swainson's and marsh hawks, as well as turkey vultures, soared overhead. Representatives of the falcon family including merlins and American kestrels were sighted. And many visitors were rewarded with a spectacular view of an osprey as it perched and fished at a pond in the lower valley of Stone State Park.

Not all of the birds observed that fall afternoon were migrating to southern feeding areas. Kay Neumann, falconer and wildlife rehabilitator, presented a program describing the natural history of raptors while she displayed a live red-tailed hawk. She explained that the red-tailed hawk was not able to be released into the wild because its wing was permanently injured.

Participants learned more about rehabilitation during a presentation by Linda Hinshaw, wildlife rehabilitator and founder of Orphaned and Injured Wildlife, Inc., a licensed, non-profit wildlife care facility located at Spirit Lake. Hinshaw's educational program stressed the importance of all wildlife and emphasized the need for understanding and respect for all wild creatures.

Her lecture was illustrated by the presence of a non-releasable short-eared owl, an Iowa endangered species. Later, Hinshaw applied emergency first-aid treatment to an injured great-horned owl brought to her earlier that day as a concerned audience watched intently and learned.

Hawk watch visitors also learned about different types of raptors by watching a slide program about Iowa's hawks and owls and viewing a variety of displays. The positive and enthusiastic response from participants were encouraging to the organizers who plan to sponsor more hawk watches in the future. Hopefully, through such educational programs as this northwest Iowa hawk watch and others throughout the state, more and more people will begin to appreciate, understand and protect these magnificent birds.

Gail Barels is a naturalist with the Plymouth County Conservation Board.

Dawn Snyder is a naturalist with the Woodbury County Conservation Board.

CALENDAR

OCTOBER 13 AND 14

Heritage Days. Osborne Pioneer Village in Clayton County is the location for pioneer crafts and skills. For more information, contact Clayton County Conservation Board, Osborne Conservation Education Center, Elkader, Iowa 52043, (319) 245-1516.

OCTOBER 13 AND 14

Forest Crafts Festival. Lacey-Keosauqua State Park is the location for wood crafts and demonstrations, buckskinners and an operating sawmill. For more information, contact Lacey-Keosauqua State Park, Box 398, Keosauqua, Iowa 52565, (319) 293-3502.

OCTOBER 20 AND 21

Halloween Night Hike. Nature hikes with educational skits about the environment and natural resources. For more information, contact Todd Von Ehwegen, Sac County Conservation Board, Rte. 3, Box 96A, Sac City, Iowa 50583, (712) 662-4530.

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BALD EAGLE APPRECIATION DAYS:

Jan. 5, 1991 -- Mines of Spain/E. B. Lyons Nature Center, Dubuque.

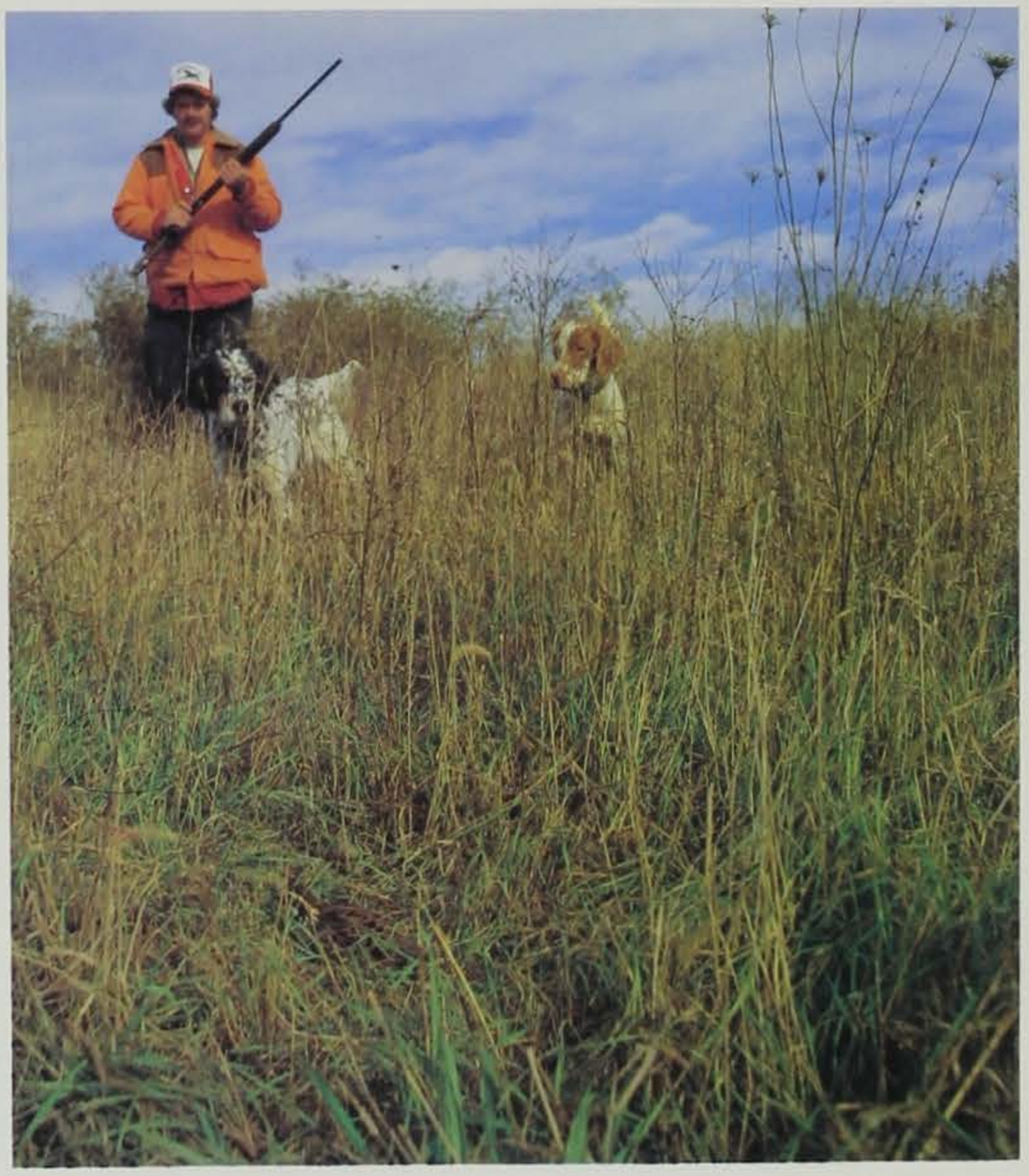
Jan. 19-20, 1991 -- Keosippi Mall, Keokuk.

Feb. 2-3, 1991 -- RIMCO Building, Quad Cities.

March 9-10, 1991 -- Community Center, Pella.

For more information on the Bald Eagle Appreciation Days, contact Laura Jackson, Wildlife Research Station, Rte. 1, Boone, Iowa 50036, (515) 432-2823.

Questions About Quail



Many wildlife enthusiasts become concerned about quail populations in years when hard winters reduce quail numbers to low levels. Even though the last few years have produced mostly mild winters, these same concerns were expressed after the extreme cold weather in December 1989. People with these concerns often suggest we need to reduce hunting seasons or bag limits or that we need to stock birds into areas that were "wiped out."

If we look at past survey information, however, we see that only one to three years after one of these hard winters, the quail population has rebounded and is again at a high level. Although this information often calmed the public's concerns, many biologists felt a little uneasy since we lacked specific information about the mechanism by which the population had recovered. To address this concern and gain more insight into dynamics of quail populations, a research project was conducted in Lucas and Wayne counties in southern Iowa.

Data was collected from 1983-88 by trapping and following radio-tagged quail. A prime example of the mechanisms influencing quail numbers were exhibited by two marked quail, female #86 and male #268, in that study. Female #86 had been captured and outfitted with a transmitter in March 1984 along with her covey associates. Feather molt patterns indicated she had hatched some time during the previous summer. Male #268 had been captured and transmitted in July 1984. He was alone when captured, which is typical of males during the breeding season.

Bird #86 stayed with her covey until the covey began breaking up in late April and early May. She initiated a nest about May 26 and successfully hatched a clutch of 17 eggs on July 3. She remained with the chicks until about 4 p.m., July 23, at which time she began a dispersal movement. By 7:47 p.m., she had traveled almost one mile in a meandering route. Visual observations indicated she was alone.

Before following her further, let us look at #86 and her brood movements. Between July 3 and 23, the total

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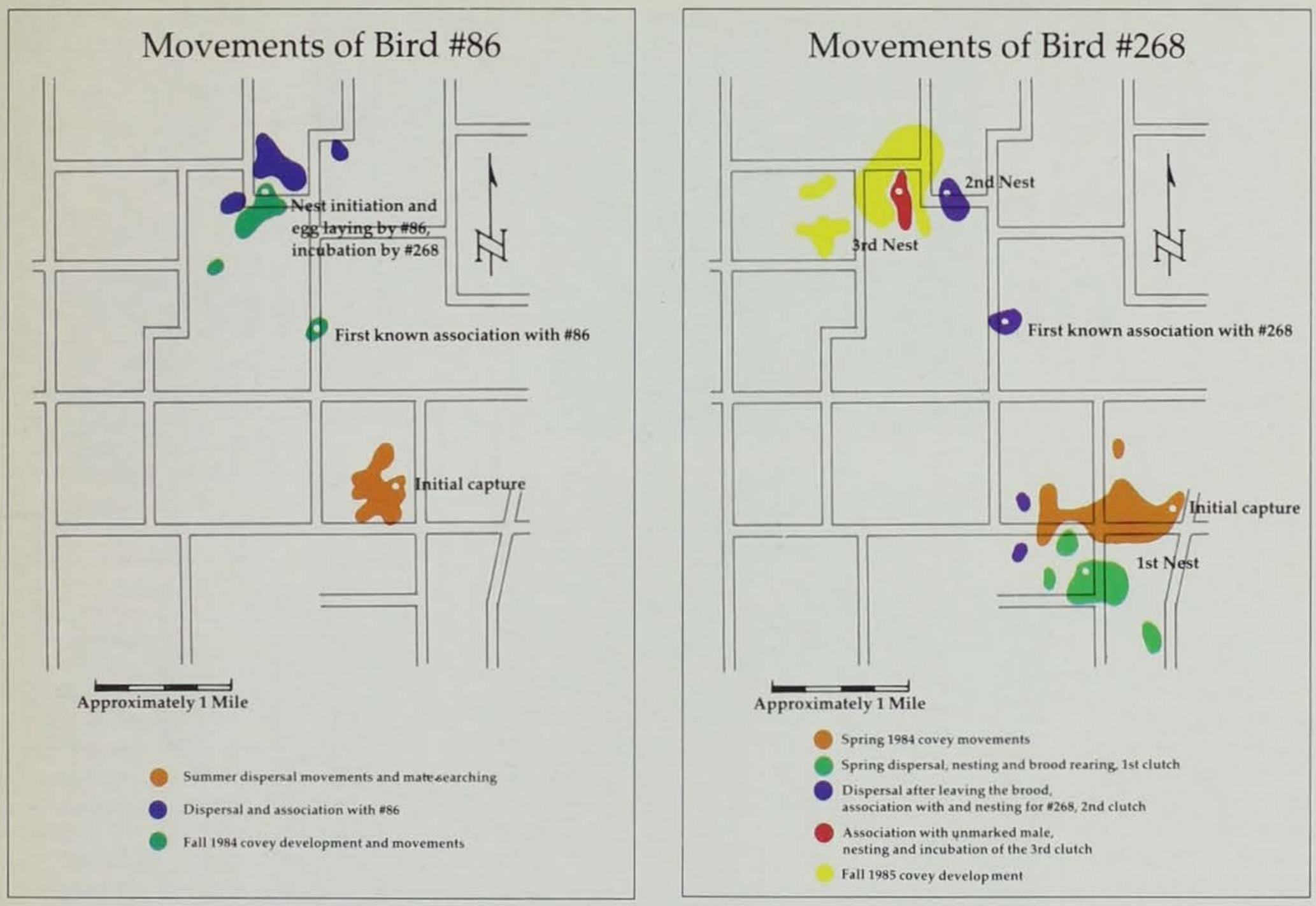
Article by Ronald J. Munkel
Photo by Ron Johnson



area she used was about 25 to 30 acres, as determined by telemetry locations. Intensive location monitoring, once per hour during the day, indicated the daily use area was relatively small -- five acres or less. This area tended to become larger as the chicks grew older.

The day after #86 left her brood an attempt was made to determine the chicks' fate. While searching the area regularly used by the brood in the past, a covey of young quail of the approximate age and number as #86's brood were flushed. We assumed they were probably hers. At this point, we realized we needed some way of documenting the survival of the young to lend validity to the unfolding events.

Now if we again pick up with #86 after she left her brood, we find that on July 24, she and male #268 located together approximately one and one-half miles north of her last July 23 location. We lost radio contact until July 27, when both birds were located together approximately one mile further to the northwest. The two birds localized in this vicinity.

It appeared that #86 laid another clutch of eggs and male #268 began incubating the eggs about August 15. The clutch being incubated by #268 was predated about September 4, just two days before it was to hatch.

In the meantime, female #86 moved approximately one-quarter mile and began associating with an unmarked male. They stabilized at this new location. Bird #86 appeared to begin incubating another clutch on September 5. On September 10, this nest was predated.

Although there was only one successful nest, one can begin to understand the potential for quail populations to recover so rapidly from extreme lows. We were somewhat skeptical about how common this type of nesting activity was. This was the first and only well-documented occurrence during the 1984 nesting season. Was it just a rare occurrence or was it the norm? A major barrier to learning more were small numbers of birds marked in the early years of the study. However, after 1984 our sample sizes increased, and we observed similar nesting efforts until the study ended in 1988.

This nesting and movement behavior created more questions. In particular, what happened to the chicks? Were they able to survive on their own at 20 days of age? Were they lost to a catastrophic event? What became of them?

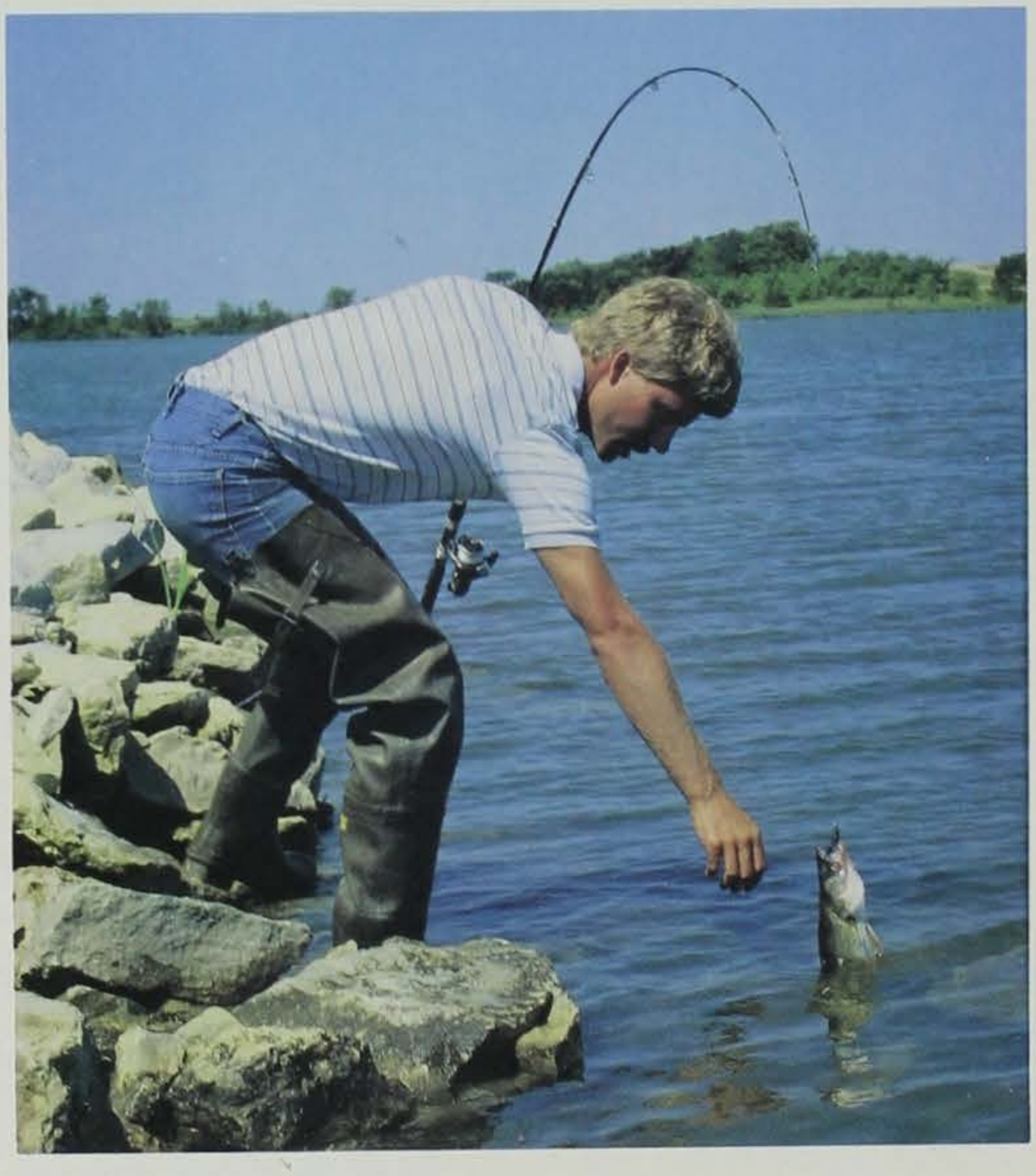
These additional questions broadened the scope of the project. We acquired miniature transmitters to place on chicks prior to the hen leaving in hopes of answering these new questions, but then that is another story.

This quail study was funded through Pittman-Robertson Wildlife Restoration W115-R.

Ronald J. Munkel is a wildlife technician for the department in Chariton.

Prescription For An Aging Lake

by Mike McGhee



LOWELL WASHBURN

The title of this article might give you the impression that we are talking about a project to be done on a lake that is at least 50 years old. Not so, Lake Icaria in Adams County is only 15 years old and water quality problems at the lake developed before it was a decade old. These water quality problems were primarily due to eroding soils from agriculture ground in the watershed. Not only at Lake Icaria, but throughout Iowa, the greatest threat to our water quality is soil erosion.

When Lake Icaria was initially impounded, the 700-acre lake developed a tremendous fishery for crappie, channel catfish, largemouth bass and bluegill. Walleye fishing was an additional bonus. A variety of other recreational uses such as water skiing, boating, camping, swimming and picnicking were making the lake a very popular spot in southwest Iowa.

However, land use patterns in the lake's watershed (drainage area) were changing, with many acres of pasture and hay ground being converted into row crop production. Soil erosion was increasing dramatically. By the early 1980s only 55 percent of almost 17,000 acres of land in the Icaria watershed had soil losses that met the Soil Conservation Service's yearly tolerable soil loss guidelines, commonly called "T." The "T" value and goal for cropland in this region is soil loss of not more than five tons per acre per year. This meant that 45 percent of the land in the watershed was experiencing soil losses exceeding tolerable limits and in many instances 10 to 20 tons per acre per year soil losses were taking place with certain areas exceeding 30 tons per acre per year. The problem was further aggravated because the pasture and hay ground had soil losses of less than two tons per acre per year, but when converted to row crop soil losses exceeded "T." So even with the best soil management practices (minimum tillage, terraces, etc.),

erosion was increasing at a minimum of 200 percent.

The water quality problem at Lake Icaria became especially noticeable in 1984, when several heavy rainfalls and the subsequent runoff created muddy water conditions at the lake that lasted the entire summer and fall recreation period. Between the years 1976 and 1986 the lake lost 31 surface acres (4.4 percent) and 1,715 acre/feet (18 percent) of its water volume to siltation.

Something had to be done. Carp numbers were on the increase and the bass, bluegill, crappie and walleye populations were suffer. Consequently recreational use of the lake was declining. It was decided to attack the problem from two different directions. One was reducing soil losses entering the lake and privately held agricultural ground, and secondly in-lake remedial measures were undertaken.

Since 1984, the SCS, through the "public owned lakes watershed list program," has spent $30,000 to $50,000 yearly, offering 75 percent cost-share assistance for terrace construction on land above Lake Icaria. A program begun this year will make available $60,000 a year for the next three years to build approximately 60 grade-stabilization structures and ponds within a one-half mile of the lake. An additional proposal is being considered that would construct 75 more structures further up in the watershed with $500,000 of cost-share monies. Both these projects will be offered on a 75 percent cost-share assistance basis. One of the best soil management practices that could benefit the lake's water quality would be converting marginal row crop acres to pasture or hay ground and continued high cattle prices just might encourage this.

The in-lake work required a more drastic and direct approach. The lake was lowered 12 feet below conservation pool in the fall of 1987. At the upper reaches of the three major arms of the lake, rock-covered sediment dikes (basically low-head dams) were constructed. These structures slow the turbid water entering the lake following a heavy rainfall. A significant portion of the sediment load is deposited above the dike with the rest of the lake maintaining better

MIKE MCGHEE

MIKE MCGHEE

Shoreline erosion at Lake Icaria contributed to poor water quality. To help remedy the problem, a total of three and three-quarter miles of shoreline was riprapped.

An additional improvement at Lake Icaria includes the construction of a handicapped-accessible fishing pier.

MIKE MCGHEE

Detailed Map of Lake Icaria Available From the DNR

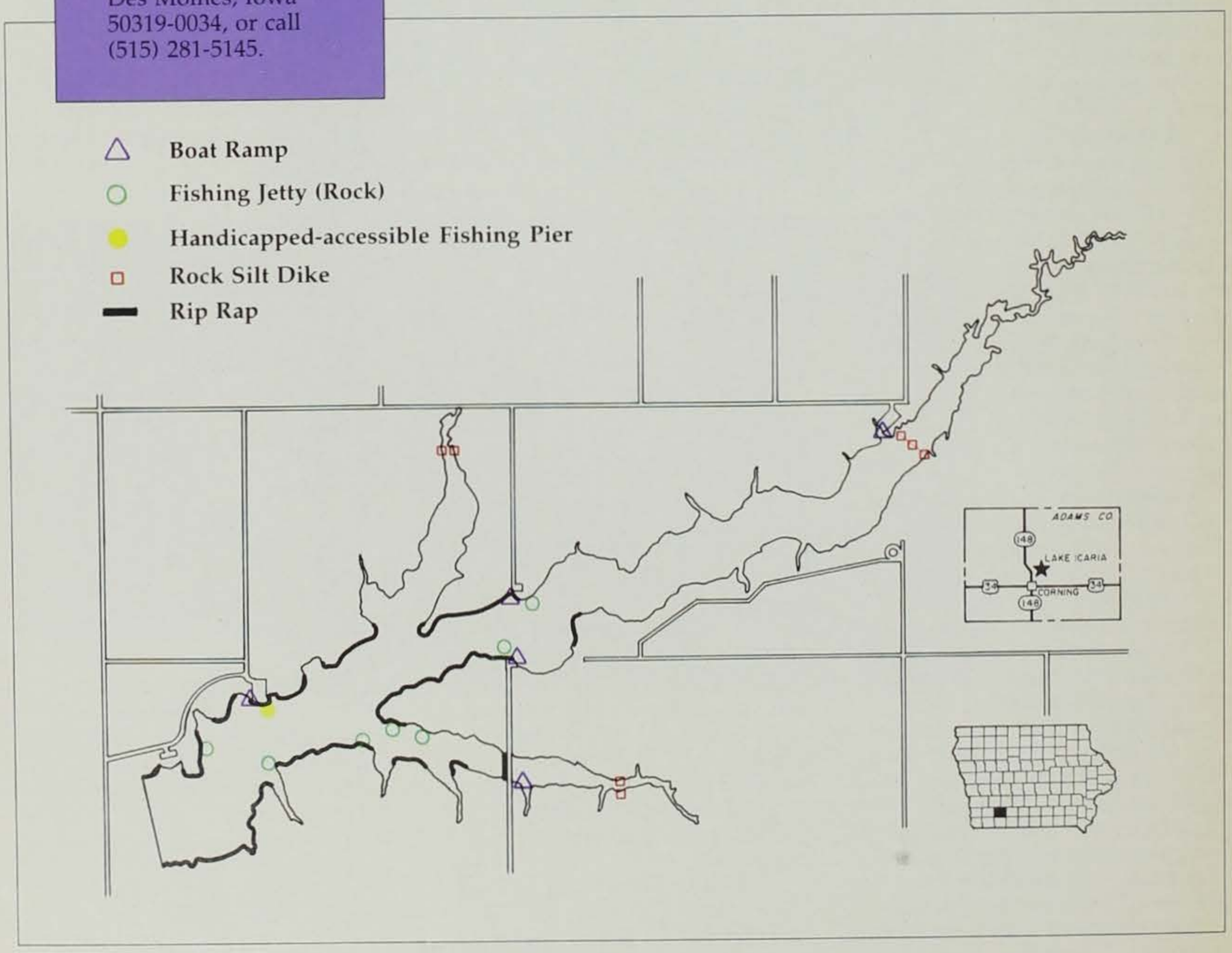
A detailed map on Lake Icaria is available from the Iowa Department of Natural Resources. The map includes the facilities at Lake Icaria, lake bottom contours as well as fish habitat structures.

For a free copy write: Lake Icaria Depth Map, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034, or call (515) 281-5145.

water quality. Those water areas above the dikes will eventually silt full and be lost to anglers, but the rest of the lake will benefit. Shoreline erosion at the lake was also contributing to poor water quality, and to remedy this problem a total of three and three-quarter miles of shoreline was riprapped.

Six fishing jetties, 90 to 140 feet in length, were built. Dirt from the lake bottom was used in building the jetties, so the water area around the jetty would be deeper. The jetties were then covered with limestone riprap and gravel on the tops. These jetties will reduce wind and powerboat-generated wave action and also provide great places to fish.

A wooden fishing pier that is handicapped-accessible was constructed. The pier totals 150 feet in length and is 10 feet wide. The lake bottom was excavated around the pier location leaving water depths



of 9 to 12 feet under the pier when the lake is full. Additional rock was also placed on the dam and on an existing jetty to protect them from erosion and provide excellent fish habitat. Total rock used for the entire Lake Icaria project was a little more than 30,000 tons.

Additional fish habitat work was also accomplished while the lake was down. Stakebeds made of oak stakes were placed in eight locations. A total of 8,000 stakes were driven in the lake bottom. With volunteer help from the Creston/Corning Bass club, the Adams County Conservation staff at Lake Icaria and DNR fisheries personnel, almost 1,000 cedar trees from nearby road ditches and pastures were secured on the lake bottom in more than 95 locations. These brush piles are now covered with 5 feet to 15 feet of water.

Work in the lake was completed in early 1988 at a total project cost of just under $500,000. Funding came from a combination of sources using monies from the Fish and Wildlife Trust Fund, Wallop-Breaux Fund and the Marine Boat and Fuel Tax Fund. Once the project was completed, lake waters were allowed to rise, but drought conditions prevailed and lake filling that should of taken less than a year required a little more than two years. The good news is the lake is now full and to date water quality is great.

An aggressive fish stocking campaign has really boosted the largemouth bass population and modification of the walleye stocking program has more than doubled walleye numbers in Lake Icaria. Saugeye, a hybrid cross between female walleye and male sauger, have also been stocked in the lake for the past four years. Increased predator numbers are very important to help control

RON JOHNSON

future carp production and small yellow bass that are in the system.

Lake Icaria is managed cooperatively by the DNR and the Adams County Conservation Board. The county maintains a modern campground with 50 sites, a primitive area with 80 vehicle and 40 tent sites (all areas have modern rest rooms and showers).

There are five shelter houses and more than two miles of nature trails at the lake. A swimming beach and marina with bait, tackle, boat rental and boat repair facilities are also located at the lake. Five public boat ramps surround the lake and Icaria has a zoned power boating area. Also, a large public hunting area is clearly marked and offers waterfowl, upland game and deer hunting.

Mike McGhee is a fisheries management biologist with the department at Mt. Ayr.

RON JOHNSON

Aggressive fish stocking has greatly improved the largemouth bass population (above), and modification of the walleye stocking program has more than doubled walleye numbers (top) in Lake Icaria.