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# CONTENTS

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## Iowa CONSERVATIONIST

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page 13



page 16

## FEATURES

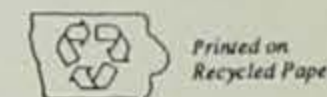
- 3 1991 HUNTING FORECAST -- IS THIS THE YEAR?**  
by Terry Little
- 10 DUCKS FINALLY HOLD THEIR OWN** by Lowell Washburn
- 13 IOWA'S PEATLANDS** by Carol A. Thompson  
Protecting unique fen habitats involves increased knowledge of the groundwater sources feeding them.
- 16 IOWA AND SOUTH DAKOTA PHEASANTS -- LOOKING BACK**  
by Terry Z. Riley and Steven P. Riley  
A comparison and history of pheasant management in Iowa and South Dakota.
- 24 SOME FACTS ON TRASH -- PUTTING WASTE INTO PERSPECTIVE** by Julie Kjolhede
- 27 HOLIDAY SPIRIT AND MORE** by John Walkowiak  
The "real" Christmas tree offers families the tradition of the Christmas spirit, but that's not all.
- 29 PHEASANT IN A SHOREBIRD BODY** by Michael J. Lannoo and Neil P. Bernstein  
What's a bird like that doing in a place like this?

## DEPARTMENTS

- 19 Warden's Diary
- 20 Conservation Update
- 23 Classroom Corner

## COVER

*Willow Bottom Ringnecks* by Larry Zach (image reversed). Available as a limited edition print (image size approximately 16" x 24"). To receive a print send a check for \$85 for the print, \$6 for shipping and handling, and tax if an Iowa resident to Larry Zach, 901 SE Trilein, Ankeny, Iowa 50021 or call 515/964-1570 to order by phone. *Willow Bottom Ringnecks* prints will also be available at Pheasants Forever banquets.





1 9 9 1  
HUNTING  
FORECAST

# Is This The Year?

Article by Terry Little  
Photos by Roger A. Hill

Four years ago in an article in the *Iowa Conservationist* titled "1987-1997 A Decade To Remember?" I predicted that the coming decade might be the best ever for the Iowa hunter. Deer and wild turkey numbers were on the rise, the U.S.D.A.'s conservation reserve program (CRP) promised to put more acres of potential wildlife habitat on the land than Iowans had seen in 20 years, goose populations were expanding and there was an indication that duck populations might be on the way to recovery. Certainly there was every reason to be optimistic.

So what happened? Was all that enthusiasm warranted? As in all attempts at predictions, unforeseen events have a way of deflating our expectations. Two years of drought in Iowa and continued drought in the prairie pothole region slowed the growth of habitat on CRP fields, held back the expected pheasant boom somewhat and curtailed the recovery of duck numbers. Then torrential rains during the nesting season kept down pheasant numbers in 1990 even though nesting habitat had improved. Turkey populations were also affected by poor production during the drought years, but populations were so high that hunters hardly seemed to notice. Meanwhile, deer and Canada goose hunting continued at levels never before seen in the Hawkeye State. On balance, the past four years have been good for all but the duck hunter, but perhaps below the level we all expected in 1987. Evidence from the DNR's many wildlife surveys indicates that 1991, however, might be the year we've all been waiting for.



**UPLAND WILDLIFE** ■ Iowa is known far and wide as a pheasant hunter's paradise, perhaps the best in the nation at producing an annual take of one to one-and-a-half million gaudy ringneck roosters for a vast legion of resident and nonresident hunters. Although we're known in recent years for some amazing deer and turkey har-

vests, ask most hunters what Iowa's best hunting is for and they will emphatically state "pheasants!"

Everything indicates that 1991 will do nothing but enhance that reputation. For the first time since CRP was implemented, a combination of good early-season nesting habitat and moderate weather existed



# 1991 HUNTING FORECAST

over most of the state. Locally heavy rainfall in parts of northern and central Iowa in late May and early June may have decreased nesting success somewhat, but the regions hit hardest are not our best pheasant areas. Roadside counts conducted by wildlife biologists and conservation officers in early August produced an estimated 16 percent increase statewide in pheasant sightings. The best increases were in western and southern Iowa -- finally recovered from the drought -- and in east-central Iowa.

For the first time in recent memory nowhere will be rated as "poor" for pheasant hunting, and the state will be about equally divided between areas rated "fair" or "good." This

Ron Johnson



could result in the harvest exceeding 1.5 million roosters for the first time since 1974. It should also spread out pheasant hunters and result in better hunting for everyone. Only a

late crop harvest could dim the picture for the October 26 opener and even that would only mean better hunting later.

The outlook for other upland game is good, but not quite as rosy as for pheasants. Bobwhite quail numbers are down 10 percent statewide; counts decreased 11 percent in southern Iowa but are up 13 percent in western Iowa. Other regions have too few quail to provide accurate predictions from the

roadside counts. The reasons for this mixed signal on quail numbers isn't very clear. Dry weather during their peak nesting time (mid-June through August) should only have



**For detailed regulations on hunting and trapping, see the 1991 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.**

## 1991 HUNTING SEASONS AND BAG LIMITS

SPECIES	SEASON (dates inclusive)	SHOOTING HOURS	BAG LIMITS	
			DAILY	POSSESSION
Cock Pheasant	Oct. 26 - Jan. 10	8:00 a.m. to 4:30 p.m.	3	12
Quail	Oct. 26 - Jan. 31		8	16
Gray Partridge	Oct. 5 - Jan. 31		8	16
Turkey (Gun)+*	Oct. 14 - Nov. 30	1/2 Hour Before Sunrise to Sunset	One turkey per license	One turkey per license
Turkey (Bow Only)+*	Oct. 1 - Dec. 6 and Dec. 23 - Jan. 10	1/2 Hour Before Sunrise to 1/2 Hour After Sunset	One deer per license	One deer per license
Deer (Bow)**	Oct. 1 - Dec. 6 and Dec. 23 - Jan. 10			
Deer (Muzzleloader)**	Oct. 12 - Oct. 20* or Dec. 23 - Jan. 10			
Deer (Shotgun)	Dec. 7 - Dec. 11 or Dec. 14 - Dec. 22	Sunrise to Sunset	15	25
Rails (Sora & Virginia)	Sept. 7 - Nov. 15		3	6
Ruffed Grouse+	Oct. 12 - Jan. 31		8	16
Snipe	Sept. 7 - Dec. 22		5	10
Woodcock	Sept. 14 - Nov. 17		10	20
Rabbits (Cottontails)	Aug. 31 - Feb. 29		3	6
Rabbits (Jack)	Oct. 26 - Dec. 8		6	12
Squirrels (Fox & Gray)	Aug. 31 - Jan. 31	None	None	
Crows	Oct. 1 - Nov. 30 and Jan. 15 - March 18			
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.



helped quail production, but the counts do not reflect much of a positive response. Vast acreages of grasses on CRP lands now dominate much of our best quail range. Bobwhites are dependent on seeds produced by weeds in annually tilled areas and on crops, so perhaps quail habitat is deteriorating somewhat as pheasant range improves. On the other hand, quail are not as drawn to roadsides as are pheasants and are always more difficult to count. Those same CRP fields are producing many more acres for coveys to hide in and may be diluting the same number of quail over a larger landscape. Whatever the cause, quail hunting will still be good in most of southern and western Iowa and the harvest could exceed a half million birds.

Gray partridge counts were down 46 percent statewide with substantial decreases noted in the heart of the best range in northwest and north-central Iowa. Huns evolved originally on arid Asian steppes and do best on this continent in the Dakota and Canadian prairies. Partridge numbers were at all-time high levels during the recent drought years, but were hurt by the wet weather during this year's nesting season. Those dry years hurt pheasant, quail and turkey production but were a boon to partridge. Now the reverse has occurred and huns have declined. Counts are still good over vast areas of northern Iowa and these little gray rockets continue to spread to the southern half of the state.

► For the first time in a decade most of Iowa's waterfowlers have something to be optimistic about -- an excellent early hunting season is expected.

There will be plenty of partridge to provide pheasant hunters with a wing-shooting challenge and a tasty addition to their game bag.

Cottontail rabbits are the enigma of the 1991 roadside counts. Rabbit sightings were down 39 percent statewide in what should have been a banner year. Certainly summer weather should have played no role in this decline. We do know that the advent of CRP has provided a tremendous prey base for a variety of predators. Fox, coyotes, hawks and owls



have all increased in recent years as CRP grasslands have produced an abundance of mice and other rodents. Perhaps predation has killed off cottontail numbers as well.

For whatever reason, rabbits have declined somewhat from very high levels last year but there are still plenty available. Early season rabbit hunting provides two months of potential recreation and is a good way to loosen up those leg muscles and shooting eye before the serious bird hunting develops in November.

**WATERFOWL** ■ For the first time in a decade most of Iowa's waterfowlers have something to be optimistic about. The rains have returned and fully replenished most of Iowa's wetlands. Marshes that dried up completely and revegetated in 1988 and 1989 are now full of water, and habitat is generally excellent. More ducks were produced in Iowa this year than at any time in the last 15 years. Early season hunting should be excellent as early migrants and locally produced ducks flew into excellent wetland habitat. The exceptions are Corps of Engi-

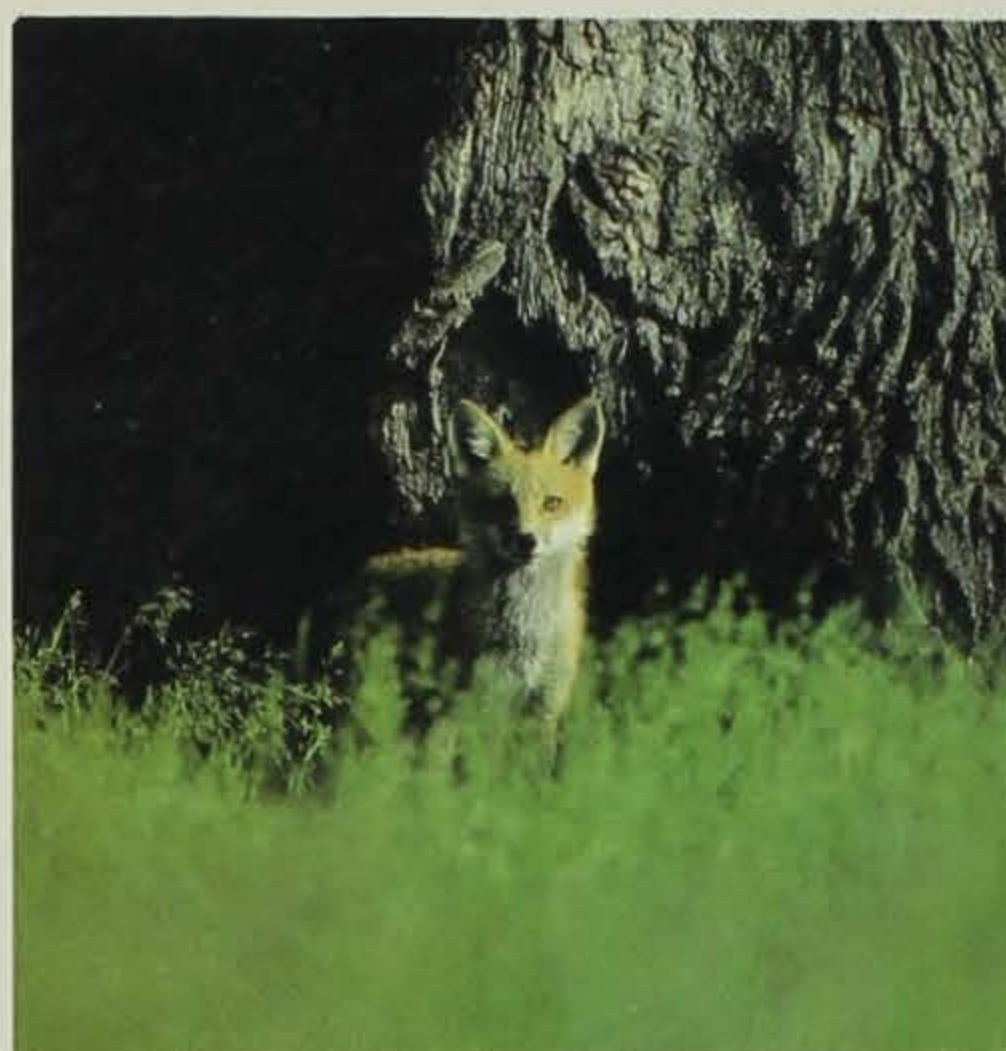




# 1 9 9 1 HUNTING FORECAST

neers' flood control reservoirs and state-managed public hunting areas along major rivers. High water throughout the summer damaged some areas and prevented vegetation from developing on others. Hunters should check their favorite areas for hunting conditions prior to the season. (See *Ducks Finally Hold Their Own*, page 10.)

**FURBEARERS** ■ Little has changed since 1990 in the fur harvester's world. The collapse of the demand for wild-grown furs in the European fashion market three years ago brought about a staggering decline in the interest in pursuing furbearers. Fur harvester



numbers have fallen to record low levels as not coincidentally, furbearer numbers have increased dramatically. The combination of low fur harvester interest and expanded habitat in CRP fields has increased populations of raccoon, fox, beaver, skunk and other furbearers. Complaints about damage to property and livestock from predators are very

common.

Unfortunately, nature does not treat these high predator populations kindly. Mange, distemper, parvovirus and occasionally rabies all have sustained outbreaks over the past three years as nature handles these problems in its own way.

The outlook for trapping and hunting furbearers remains excellent. For the recreational trapper this is the opportunity to hone skills and enjoy leisurely

days of outdoor activity without the pressure from other fur harvesters that occurs when pelt prices are higher.

**WHITE-TAILED DEER** ■ Deer hunting in Iowa has finally come of age. Last year 169,000 hunters took 98,000 deer -- the third consecutive season the deer kill ranged between 90,000 and 100,000 animals. This sta-

## 1991 WATERFOWL HUNTING SEASONS AND BAG LIMITS

SPECIES	SEASON (dates inclusive)	AREA	SHOOTING HOURS	BAG LIMITS	
				DAILY	POSSESSION
Ducks Early season	Oct. 5 - Oct. 6	N. Zone	1/2 Hour Before Sunrise to Sunset**	3 (see below)	6 (see below)
	Oct. 19 - Oct. 25	S. Zone			
Ducks Late season	Oct. 19 - Nov. 15	N. Zone		7 (no more than 2 Canadas and 2 White- fronted)	14 (no more than 4 Canadas and 4 White- fronted)
	Nov. 9 - Dec. 1	S. Zone			
Geese Canada/ White-fronted/ Brant	Sept. 28 - Dec. 6	Check Regulations			
	Oct. 12 - Dec. 20**	SW Goose Zone			
Geese Snow	Sept. 28 - Dec. 16	Check Regulations		15	30
	Oct. 12 - Dec. 30**	SW Goose Zone			
Coots	Same as Ducks				

\*\* Goose hunting shooting hours for SW zone, Oct. 12-Dec. 1, 1/2 hour before sunrise to 1 p.m.

**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.**

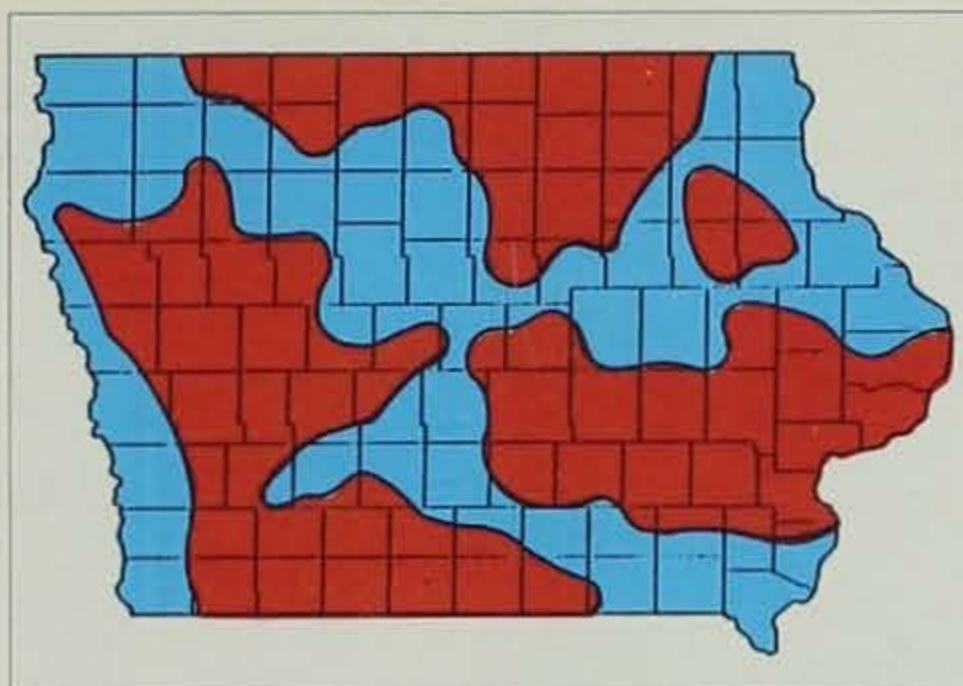


bilization followed 12 years of unparalleled growth in deer hunting; in 1977 just 15,000 deer were taken. Deer population surveys indicate that deer numbers are basically stable -- in some areas populations are still growing slowly, in others deer numbers are down somewhat.

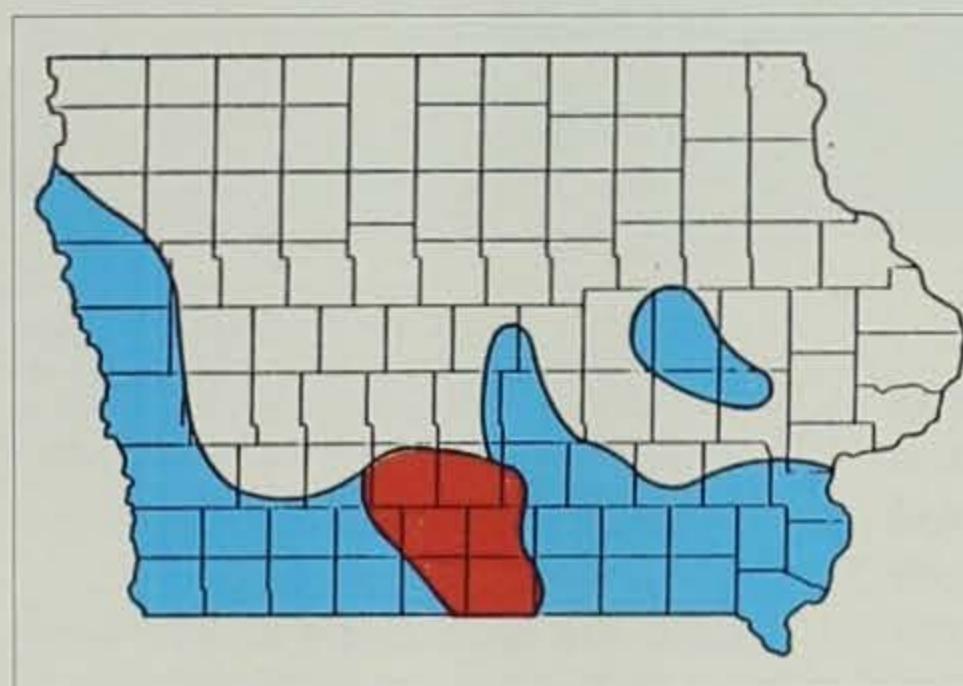
Last year's harvest was down about two percent from 1989, a decline that occurred not by accident but by design. Landowners and hunters confirmed DNR survey trends that indicated deer numbers had declined across much of the northern half of the state. Many asked the DNR to rebuild these deer herds. As a result, all hunters in the first season in some zones were given buck-only licenses to reduce the doe harvest. Statewide the distribution of the deer harvest was good (42 counties had a kill of more than 750 deer) and only the counties with restricted any-sex permits exhibited a decline. About one-third of bow hunters, 45 percent of muzzle-loaders and two-thirds of the gun hunters took home a deer.

Besides just being successful, Iowa deer hunters take home some outstanding trophies. In 1989, 181 Iowa bucks were registered in either Pope and Young (archery) or Boone and Crockett (firearm) record books, second only to the 237 animals registered in 1988. Iowa ranks among the top 10 states in Boone and Crockett and Pope and Young record books in terms of total bucks registered. Trophies have been reported from virtually every county in the state.

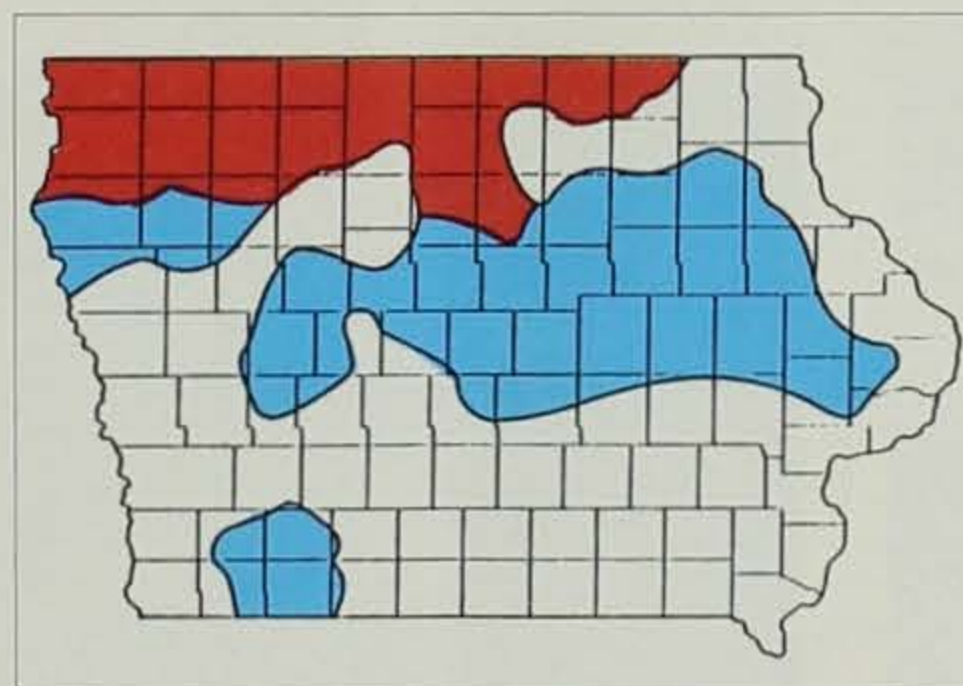
The outlook for the 1991 season remains excellent. Surveys indicate deer numbers are still high and with one exception, the season will be structured similar to last year. To continue protecting northern



Pheasant



Quail



Partridge

#### 1991 SMALL GAME DISTRIBUTIONS

Good ■ Fair ■ Poor ■

Iowa herds, first season hunters in zones one, two, seven and 10 will all receive buck-only permits this year. No second bow or firearm permits will be issued except in the southern two tiers of counties, and all second licenses will be for antlerless-only deer. This should protect even more deer in northern and central Iowa while directing additional pressure to slowly increasing southern Iowa deer



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## HUNTING FORECAST

herds. These second license restrictions will also protect several hundred bucks that could have been shot on second permits to grow even larger for next year's hunt. This will improve the trophy quality of the deer herd as well.

So how has deer hunting come of age? Hunting regulations have stabilized the growth in deer numbers. The DNR is no longer attempting to increase deer numbers everywhere. Deer managers are now faced with the situation that there are a few too many deer in some areas and a few too few deer in other areas. Therefore, hunting regulations are being adjusted to maintain a balance. Hunters can expect almost yearly adjust-



Because deer numbers are low in some areas of the state and high in others, hunting regulations are being adjusted to maintain a balance.

### 1991 SEASONS FOR FURBEARERS

SPECIES	OPENING	CLOSING
Mink, Muskrat, Raccoon, Weasel, Striped Skunk, Badger, Opossum, Fox (red & gray) (trapping)	Nov. 2	Jan. 26, 1992
Raccoon, Opossum, Fox (red & gray) (hunting)	Nov. 2	Jan. 26, 1992
Beaver	Nov. 2	April 5, 1992
Civet Cat (spotted skunk), Bobcat and Otter	Continuous Closed Season	
Coyote (trapping)	Nov. 2	Jan. 26, 1992
Coyote (hunting)	Continuous Open Season	
Groundhog	June 15	Oct. 31

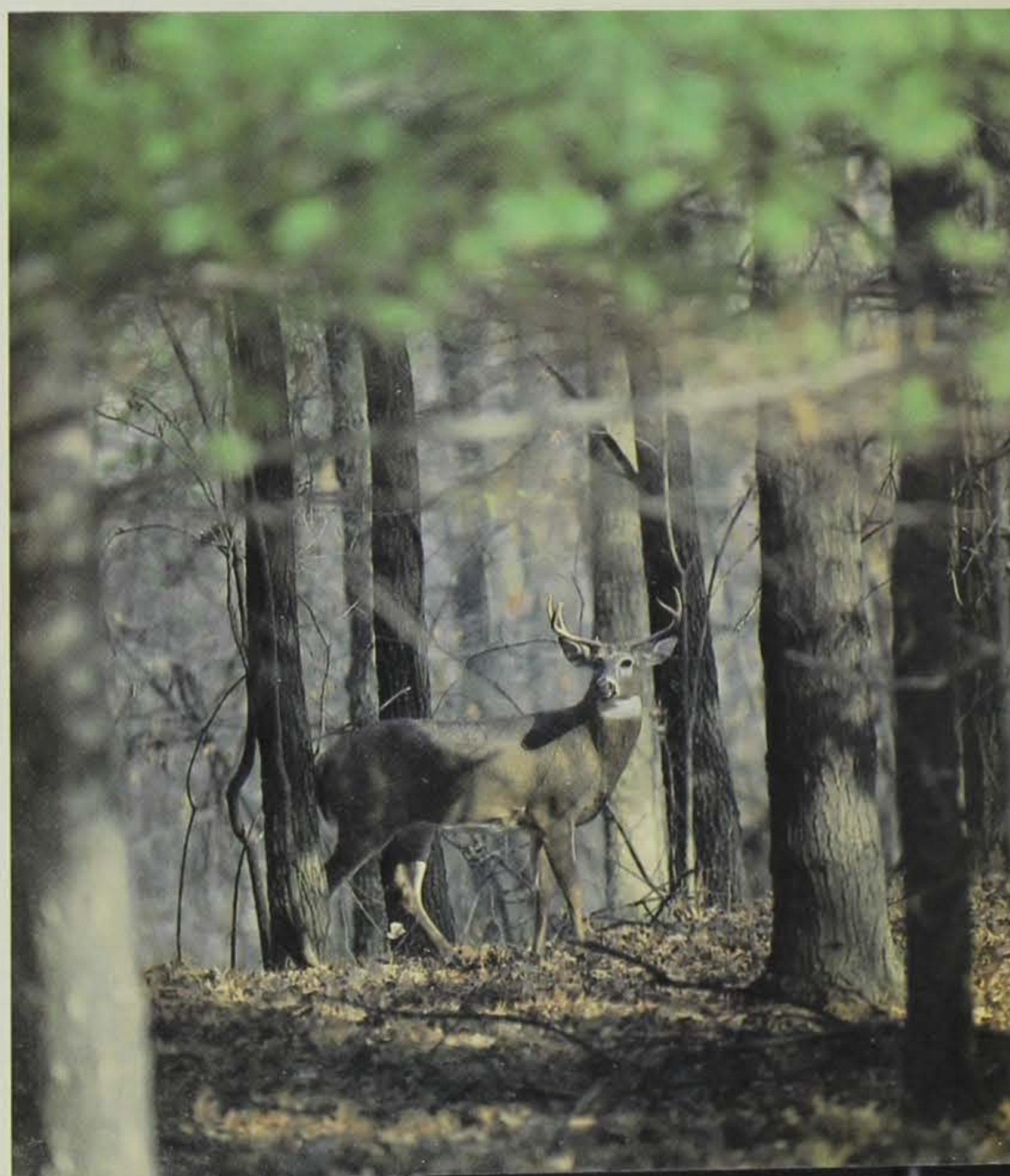
\*Selected areas, which may be established in February, will be open for muskrat trapping only. All furbearer seasons open at 8 a.m. on the opening date. There are no daily bag or possession limits.

ments in regulations as the DNR tries to balance deer numbers with human and habitat needs.

**WILD TURKEY** ■ Fall hunting for wild turkey is unique in that it is the only sport in recent years to be closed to the majority of Iowa hunters. Temporary declines in pheasant, quail or waterfowl populations are sometimes met with restrictions in seasons but seldom with closures. Why the difference with turkeys?

Pheasant, quail and other small game animals sustain a high percentage of losses annually, sometimes exceeding 70 percent. They offset these losses by producing many young each year. Hunting merely

replaces losses that would have occurred to predators or weather and has no effect on





next year's population size. These hunting seasons are seldom changed.

White-tailed deer are the other end of the spectrum. They produce few young annually but can live many years if they survive the hunting seasons. Deer hunting regulations have to be carefully watched and often adjusted as a result.

Wild turkeys fall somewhere between the extremes. They are not as long lived as deer but easily outlive all but the most fortunate pheasants, for example. They can produce a brood of a dozen or so poults each year, but not many hens are successful at hatching young. When production is average or better, a limited take of turkeys of all ages and sexes is permissible in the fall. If



production fails, populations will decline temporarily but can recover with better hatches, although not as quickly as pheasant or quail.

For the past three summers,

turkey production across most of Iowa has been poor. No action was taken after the first two poor nesting seasons because we had never gone through more than two con-

#### 1990 HUNTING SEASON AT A GLANCE

<u>Species</u>	<u># Hunters</u>	<u>Harvest</u>
<b>White-tailed deer</b>		
Archery	31,622	10,146
Muzzleloader	19,124	8,703
Shotgun	118,255	79,153
<b>Wild Turkey</b>		
Spring Season	23,109	8,191
Fall Season	10,130	4,588
<b>Upland Game</b>		
Ring-necked pheasant	211,000	1.41 million
Bobwhite quail	72,900	321,500
Gray partridge	49,200	148,000
Ruffed grouse	7,100	9,300
Gray/fox squirrel	70,500	466,100
Cottontail rabbit	87,000	609,800
<b>Furbearers</b>		
Raccoon	N/A	118,650
Fox (red and gray)	N/A	13,733
Coyote	N/A	4,073
<b>Waterfowl</b>		
Ducks	23,600	173,000
Geese	14,800	36,800



Ron Johnson

▲ In general, hunters can expect an above average hunting season this year.



# 1 9 9 1 HUNTING FORECAST

secutive poor years. After 1990's hatch failed, the decision was made to close the 1991 fall season and speed the recovery of turkey flocks that had fallen to such low levels that hunters and landowners alike were concerned. Only northern Iowa escaped this closure because turkey production there remained about average in two of the last three years. Closing the season will not bring back turkeys unless production improves, but it will speed the recovery to the excellent levels Iowa turkey hunters expect.

As of this writing, results from the 1991 turkey brood survey are not available. Incidental reports of broods are encouraging so it may be that the corner has been turned. It will take at least two or three years of good production before statewide seasons are implemented again.

**SUMMARY** ■ It took a little longer than expected, but the hunter's heyday appears finally to have arrived. Excellent deer, goose and pheasant hunting, above average quail, partridge and rabbit hunting and locally good duck and turkey hunting will compete for the avid hunter's attention and vacation time. Weather permitting, and with more typical rains on the Canadian prairies, the remaining years of the "Decade to Remember" could be just that.

*Terry Little is the wildlife research supervisor for the department's wildlife bureau in Des Moines.*

# Ducks Finally Hold Their Own

Article and photos by Lowell Washburn

Following an overall dismal decade of drought and declining populations, the number of ducks breeding in North America held their own in 1991.

Mallards remained the same as last year with about 5.3 million breeders on the 1991 inventory. The number of blue-winged teal increased a healthy 34 percent, and scaup numbers were up 25 percent. (Blue-winged teal, scaup and northern

shovelers are now only slightly below the long-term average.)

The northern pintail remains the prairie-nesting species of greatest concern. Spring pintail counts were down 20 percent from last year and have sagged to more than 60 percent below the long-term average.

Although total duck numbers have only increased around seven percent from last year, the fact that they have







stopped decreasing should be viewed with optimism, according to Guy Zenner, waterfowl biologist with the Iowa Department of Natural Resources.

The 1990 fall flight index called for an estimated migration of 57 million ducks, while the 1991 fall flight forecast predicts a migration of 60 million birds.

"But it is the goose hunting forecast that represents the brightest spot. In addition to locally produced giant Canadas, Iowans depend on three separate migratory populations of dark geese," Zenner said. "These geese nest in the far north and most are associated with the Arctic tundra near Hudson Bay."

For the Eastern Prairie Population (EPP) of Canada geese, a record number of breeders -- 308,000 -- were counted this spring. The average number of eggs per nest and nest success was the best in four years. EPP Canada geese staged a record fall flight last year, and this year's migration should equal or surpass that

number. EPP Canadas account for 20 percent of Iowa's goose harvest.

Another Arctic nesting colony of geese that migrate through Iowa are the Mississippi Valley Population (MVP). This population also enjoyed excellent spring nesting conditions, and this year's fall flight of MVP geese is expected to

equal the record number seen in 1990. About 15 percent of the annual Iowa goose harvest is derived from MVP Canadas.

The third group of Canadas to fly through Iowa are the Tall Grass Prairie Population. Known to hunters as "Hutchinson geese," these small, nearly mallard-sized honkers have become of increasing importance during recent years.

These birds winter along the Gulf coasts of Texas and Mexico and comprise about five percent of Iowa's goose kill. An excellent, and perhaps record, number of "Hutches" are expected to migrate southward this fall.

In Iowa, locally nesting giant Canadas had the best production year on record.

"More than 11,000 goslings were produced in Iowa this year, and our June surveys showed a count of more than 27,000 total geese statewide," Zenner said.

Zenner said this figure is conservative since many areas holding geese were not included in the survey. A full 60 percent of Iowa's annual goose harvest is comprised of giant Canadas.

In Minnesota and Manitoba, the production of giants should equal that of last year. South Dakota had a "better than average" number of Canadas while Wisconsin and Illinois report a bumper crop for 1991.

Snow goose hunting continued a downslide in 1990 that has plagued hunters throughout the last decade in spite of very high snow goose populations. Snow geese that used to migrate all across Iowa in October and November, and provided widespread hunting opportunity, now migrate late in the fall to a few nesting places along the Missouri River and depart quickly.

The development of large reservoirs in the Dakotas and center-pivot irrigation systems in central Nebraska have tended to hold geese north longer and provide alternate resting and feeding areas west of Iowa. At the same time fall plowing and intense hunting pressure during the short period geese are here have reduced the attractiveness of goose resting areas at DeSoto Bend National Wildlife Refuge and Riverton and Forney lake state wildlife areas. In an attempt to compensate, the DNR has implemented half-day goose shooting hours in southwest Iowa during November to try and encourage geese to stay longer. Goose hunters should check regulations for shooting hours and zone descriptions.

According to Zenner, this year's duck hunting regulations will be similar to last year with a 30-day duck season offering a three-duck daily bag limit. The DNR has approved a 70-day goose season.

"Given our current production and habitat conditions," Zenner said, "there's no question that we'll be looking at a very good duck and goose opener in 1991."



# Have a Wild Holiday

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★ **Iowa Fish and Fishing** -- 1987 edition; James Mayhew, editor; 323 pages; color plates by Maynard Reece; hardbound, \$15 each.

★ **The Ring-Necked Pheasant in Iowa** -- Allen L. Farris, editor; 147 pages; color photos; hardbound; \$5 each.

★ **Waterfowl in Iowa** -- Jack M. Musgrove, editor; 130 pages; color plates by Maynard Reece; hardbound; \$3 each.

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Des Moines, Iowa 50319-0034**



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# IOWA'S PEATLANDS

M

ention wet-lands to an Iowan and they think of low watery areas with abundant cattails, marsh

grasses and waterfowl. Mention peatlands and the response is likely quite different. Few Iowans are aware that the state has deposits of peat. Peatlands, or mires as they are sometimes called, are more characteristic of northern boreal and subarctic regions, but they actually occur in many climates, even in tropical areas. In the United States, deposits of peat are known to occur in all 50 states.

Peat by definition is a deposit of incompletely decomposed plant remains. Water plays an important role in peat development and evolution, as perennial waterlogging of soil slows the rate of plant decomposition and can lead to the accumulation of peat. The absorbency of peat itself can then affect water movement and perpetuate the conditions for continued peat accumulation.

Most of the world's peatlands are classified as bogs. Bog is from the Celtic word "bocc,"

by Carol A. Thompson



Carol A. Thompson

▲ Groundwater seeping from this Cerro Gordo County hillside has created a permanently saturated deposit of peat that may have been accumulating for several thousand years. Determining the source and quality of recharge waters is an important aspect of protecting these fen sites.



Jean Prior

◀ An unusual upwelling of mineralized groundwater at Silver Lake Fen State Preserve in Dickinson County collects in elongated pools forming a fragile wetland habitat for rare plants, such as the delicate bloom of grass of Parnassia shown here.



## PEAT FACTS

■ Peat has been used in a variety of ways for hundreds of years. Its use as a domestic fuel dates back at least to Roman times. The U.S.S.R. introduced its first peat-burning generating plant in 1914. Ireland generates about one-third of its energy requirements from peat. North America's first peat-fired powerplant started operation in Maine in 1990 and produces 22.8 megawatts of electricity hourly.

■ Various crops are harvested from peatlands including blueberries, cranberries, wood, grains and hay. Cranberries have a commercial value of more than \$600 million annually in the U.S.

■ Because of the absorbent properties of peat, it has been used to diaper children, as surgical dressings, and recently as an absorbent agent for use on oil spills. Peat has been used as insulation in homes, blended to make plywood, peat cork and peatcrete, and as a wood preservative. Peat baths have been used as a treatment for various injuries and medical conditions. Peatlands have also been used to treat sewage wastes.

■ Bronze and Iron Age artifacts are frequently found in European peats including jewelry, clothing, weapons and musical instruments. European bogs have yielded more than 2,000 well-preserved human bodies, most dating from 800 B.C. to A.D. 400. In Florida bogs, several hundred bodies from the Archaic period were found and brain tissue and associated DNA recovered.

■ Peatlands appear in the writings of Tacitus, Shakespeare, Linnaeus and Emily Dickinson. Sir Arthur Conan Doyle in *The Hound of the Baskervilles* wrote, "Rank reeds and lush, slimy water-plants sent an odour of decay...while a false step plunged us more than once thigh deep into the dark, quivering mire."

meaning "soft," which is a rather apt description of these waterlogged terrains. A bog is an acidic peatland which depends entirely on rainfall, thus leading to nutrient-poor conditions. Because there is less decomposition in these environments, very fibrous peats are produced. The term "fen," from the Anglo-Saxon meaning "mud," is used to describe another type of peatland which depends on a groundwater source in addition to rainfall, and has a rich nutrient status. Iowa's peatlands are fens. In these more chemically neutral environments, greater plant decomposition occurs leading to a less fibrous, more mineralized material known as muck or peaty muck.

Much of the peat mined in the United States today is used as a soil conditioner and for potting soil. In 1988, 23 states produced 900,000 tons of peat, worth about \$20 million; Florida and Michigan are the leading producers. Approximately 14,000 tons of peat were produced from Iowa peatlands in 1988.

The preserves and ecological services bureau of the Iowa Department of Natural Resources conducted a statewide survey of fens, locating more than 100 sites in 23 counties. Iowa's fens are found on upland hillslopes and drainageways, on stream terraces, and within abandoned meanders of rivers. Botanically they are dominated by sedges, grasses and reeds. Peats in Northern Europe and Minnesota have radio-carbon dates as old as 10,000 years, but dates from the base of some Midwestern peat deposits only range from 5,500 to 1,200 years old.

Iowa's fens are home to more than 200 species of plants, including 24 rare species. Twelve of these rare plants are restricted to fen habitats. As such, fens provide important sites for preserving Iowa's botanical diversity. Because these sites depend on groundwater flow, fens may be threatened by deteriorating groundwater quality or by changes in groundwater flow paths. Because Iowa is dominantly an agricultural state, most fens are surrounded by row crops, primarily corn and soybeans which receive heavy applications of agricultural chemicals. Peats do have a great capacity to take up additional nutrients, which is why they have been used to treat sewage sludges. Some studies have shown, however, that excess nutrients, particularly nitrogen, can lead to shifts in species composition and lower species diversity. A shift to more nutrient-tolerant plants could seriously affect survival of the rarer species.

The geological survey bureau is evaluating the hydrology and water chemistry of 20 Iowa fens across the northern part of the state. Monitoring wells have been installed just upslope of each fen. The samples collected during drilling were examined to determine the character of the surrounding geologic materials and, in particular, the characteristics of the deposit recharging each fen. In 1989, water samples were collected from the wells to evaluate incoming groundwater quality, and from the fens to evaluate chemical interactions within the peat deposit.

The fens can be grouped into four basic geologic settings. The majority of sites are those whose groundwater source is a sand and gravel deposit buried within more clayey glacial materials (inter-till). Past erosion along a drainageway has removed other geologic deposits leaving the sand and gravel unit near the surface, resulting in a seep over which the peat has formed. Another geologic setting includes fens whose groundwater source is an alluvial or glacial outwash sand and gravel originally deposited at the land surface. A few fens appear to be recharged



by underlying limestone aquifers; still others are found in abandoned river meanders which may recharge slowly through surrounding alluvium.

Knowledge of these various geologic settings enables an assessment of the vulnerability of Iowa fens to loss or degradation. Fens that have sand and gravel at the surface, such as in an alluvial or terrace setting, are highly vulnerable to contaminants infiltrating from the land surface. The vulnerability of fens whose source is a buried sand and gravel is more dependent on the characteristics of the surrounding geologic materials.

There are noticeable differences between the fens in eastern and western Iowa. Eastern sites respond quickly to changes in precipitation, which is also reflected in their vegetation. During drought conditions, eastern fens are drier; during wetter periods, the fens recover quickly. The western fens also respond to changes in precipita-

Iowa's fens are home to more than 200 species of plants, including 24 rare species. As such, fens provide important sites for preserving Iowa's botanical diversity.

tion, but on a delayed basis. Exceptions to this are the western fens in alluvial or terrace settings where precipitation changes are rapidly translated to the fen. The reasons for these variations relate to differences in geologic materials surrounding the fens. The materials upslope of the eastern sites are more permeable and allow rapid flow-through of water. The glacial deposits around the western fens have slower infiltration rates and also allow more water to be stored, thus damping precipitation response.

There are also differences in water chemistry between eastern and western fens. Western sites have higher dissolved-mineral concentrations than eastern sites in the groundwater sampled from both the upslope wells and within the fens. This trend is particularly noticeable for calcium, magnesium and sulfate concentrations. These differences may be the result of the climatic gradient across the state, which becomes drier to the northwest. Alternately the trend may be related to differences in the geologic materials. Slower recharge rates allow more time for minerals to be leached from the surrounding glacial deposits. Also, western Iowa glacial materials often contain gypsum, a calcium-sulfate mineral.

Nitrate concentrations at the fens are high, with 8 of 20 sites having concentrations over the drinking water standard (45 mg/L as  $\text{NO}_3$ ), and 14 of 20 sites having concentrations elevated over normal background concentrations. Nitrate concentrations decrease to the west, a reverse trend from that of most chemical ions. The higher recharge rates for the eastern Iowa sites and the alluvial and terrace settings in western Iowa allow nitrate from the surface to move more readily into the aquifer and then into the fen.

Pesticides were found at 11 sites in seven wells and 10 fens. Atrazine, cyanazine, metolachlor, alachlor, metribuzin and trifluralin were all detected, most at concentrations just above the detection limit. Of note was the fact that different pesticides were found in the wells in contrast to the fens. There are several possible explanations. The movement of pesticides in fens may be retarded with the result that the pesticides may represent last year's or even older field applications. Alternately, pesticides in the fens may be entering by different pathways, such as surface runoff (although this appears minimal at many sites) or through rainfall.

Direct physical threats also exist to Iowa's fens. Cattle trampling can cause serious and sometimes irreversible damage. Draining of fens is another irreversible alteration. Even tapping fens for watering livestock can alter their flow characteristics and cause detrimental changes.

Our studies of Iowa fens are continuing. Further stratigraphic studies will include topographic mapping, peat-thickness mapping and collecting samples for radiocarbon dates. Detailed water-quality studies will be done on selected sites. This will help define the groundwater flow paths at these sites and also allow an assessment of variations in water quality over time.

Peatlands world-wide are being threatened. Although many virgin peatlands still exist, only a small percent are protected in most countries. Only seven of Iowa's fens are protected in parks, preserves or wildlife areas. Hydrogeologic data will provide us with important information about the sources of the groundwater system, potential threats to the system, and possible remedial actions to restore damaged fens. This, in turn, will enable development of a more complete protection strategy, such as the use of buffer lands and easements for protection of present and potential fen preserves.

--Reprinted from Iowa Geology 1990, Number 15.

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



## Iowa and South Dakota Pheasants

# Looking Back



Article by Terry Z. Riley  
and Steven P. Riley

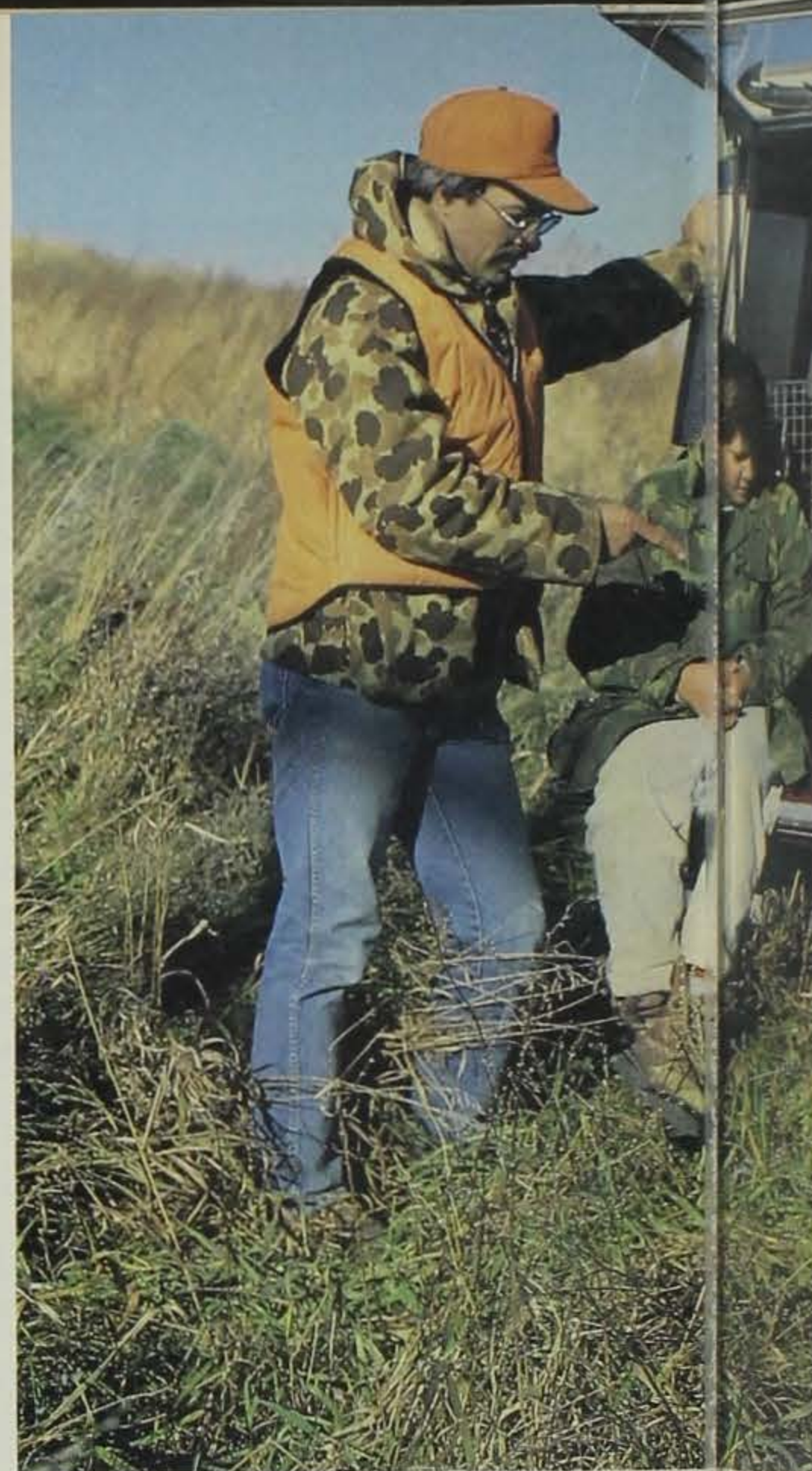
Photos by  
Lowell Washburn

Watching the ring-necked pheasant with its array of vivid colors makes it difficult to picture the Midwest without this beautiful bird. Although the pheasant is not native to North America, it has been enjoyed by many, since its introduction, for its beauty and grace as well as being a favorite game bird.

Whenever the states of Iowa or South Dakota come up in a conversation among hunters, visions of corn fields and flushing pheasants race through their minds. The efforts of wildlife managers, researchers, private landowners and conservationists in these two states throughout the last 90 years have resulted in the establishment of healthy populations of the Asian bird.

### IOWA

The ring-necked pheasant became a permanent resident of Iowa sometime during the first decade of the 20th century. Rumor has it that a wind storm and some anxious wildlife enthusiasts liberated some 2,000 game farm birds in northeast Iowa sometime around 1900. This "accidental" stocking was supplemented with successful introductions in north-



west and north-central Iowa about eight years later. By 1910, Iowa became actively involved in the pheasant stocking effort by distributing more than 6,000 pheasant eggs to some 180 farmers from 82 counties with instructions for hatching and raising the young chicks. The rest of the story is now etched in Iowa's history.

Pheasants quickly established themselves over most of the northern third of the state, and numbers appeared to have peaked in the early 1940s and 1960s. Much of this was accomplished through the stocking efforts of the Iowa Department of Natural Resources, but it was obvious by the late 1940s that natural reproductions was accounting for most of the spread of pheasants into any unoccupied habitats left in Iowa. Artificial stocking efforts continued, particularly in southern Iowa, until the early 1970s, when all





Today, more pheasants are harvested in Iowa each year than in any other state, and the average South Dakota hunter harvests more birds per day than in any other state.

pheasant brood stock from the state game farm near Boone was released to the wild.

Legal pheasant hunting in Iowa began in the early to mid-1920s and was limited to a couple of dates each year. Only 13 counties in northwest Iowa were open to legal hunting in those early years, but by 1951, all but a few counties in southeastern Iowa were open. The entire state has been open to legal pheasant hunting since 1976. Hunting season length gradually increased from three days in the mid-1920s to nearly 60 days in the early 1970s (see Figure 1). In 1989, an attempt was made to standardize the season length by opening the season on the last Saturday in October and closing it on January 10. This provides for a maximum season length of 78 days and a minimum of 72 days, depending on the calendar.

Shooting hours for pheasants have varied widely since those

earlier hunting seasons but generally were between sunrise and sunset. After two closed seasons in the mid-1930s, shooting hours were restricted to between noon and 5 p.m. Pheasant shooting hours were gradually increased after those restrictive years until 1967 when Iowa adopted the present system of 8 a.m. to 4:30 p.m. This arrangement provides for more recreational opportunities for the pheasant hunter while keeping impacts on the pheasant population and private landowners at a minimum.

Bag limits for pheasants have remained relatively unchanged since the early 1920s with three roosters per day. But possession limits have varied from as few as three to a high of 18 in 1944. The present bag and possession limits allow for three roosters per day and 12 in possession.

Data from Iowa's pheasant

population surveys indicate that the present season length, shooting hours and bag and possession limits are achieving a harvest of approximately 70 to 80 percent of cock birds with a fairly even distribution of that harvest throughout the season (see Figures 2 and 3).

## SOUTH DAKOTA

Like Iowa, South Dakota first had "wild" pheasants in the early part of the 20th century. As the story goes, in 1908 two men from the Redfield, South Dakota, area were successful in establishing the first wild, breeding population of pheasants. Although they and many others had worked for several years prior — apparently with no success — in 1908 the age of pheasants arrived. Some believe that these original wild stocks were brought directly from China by these avid pheasant enthusiasts. An interesting



event if true.

The population escalated quickly and the first pheasant hunting season was held during the fall of 1919 — for one day. From that beginning of pheasant hunting on that rainy day until 1940, it was estimated that more than 20 million pheasants had been harvested in South Dakota. The mid-1940s brought South Dakota the largest pheasant population ever recorded in North America — estimated at more than 16 million. In 1945 an estimated 7.5 million pheasants were har-

vested in South Dakota (see Figure 2).

Similar to occurrences in Iowa, South Dakota had a second population peak in the late 1950s and early 1960s. That these peak events occurred simultaneously in both states is no coincidence. Many wildlife scientists have concluded that the vast amounts of habitat created by widespread fallowing during World War II and during the Soil Bank program of the late 1950s and early 1960s (up to 1.7 million acres of agricultural land were fallowed in South

Dakota), led to the pheasant population increases. Another peak is expected over the next few years due to the federal Conservation Reserve Program (CRP). No one can accurately estimate how high the population will rise, but it will almost certainly increase.

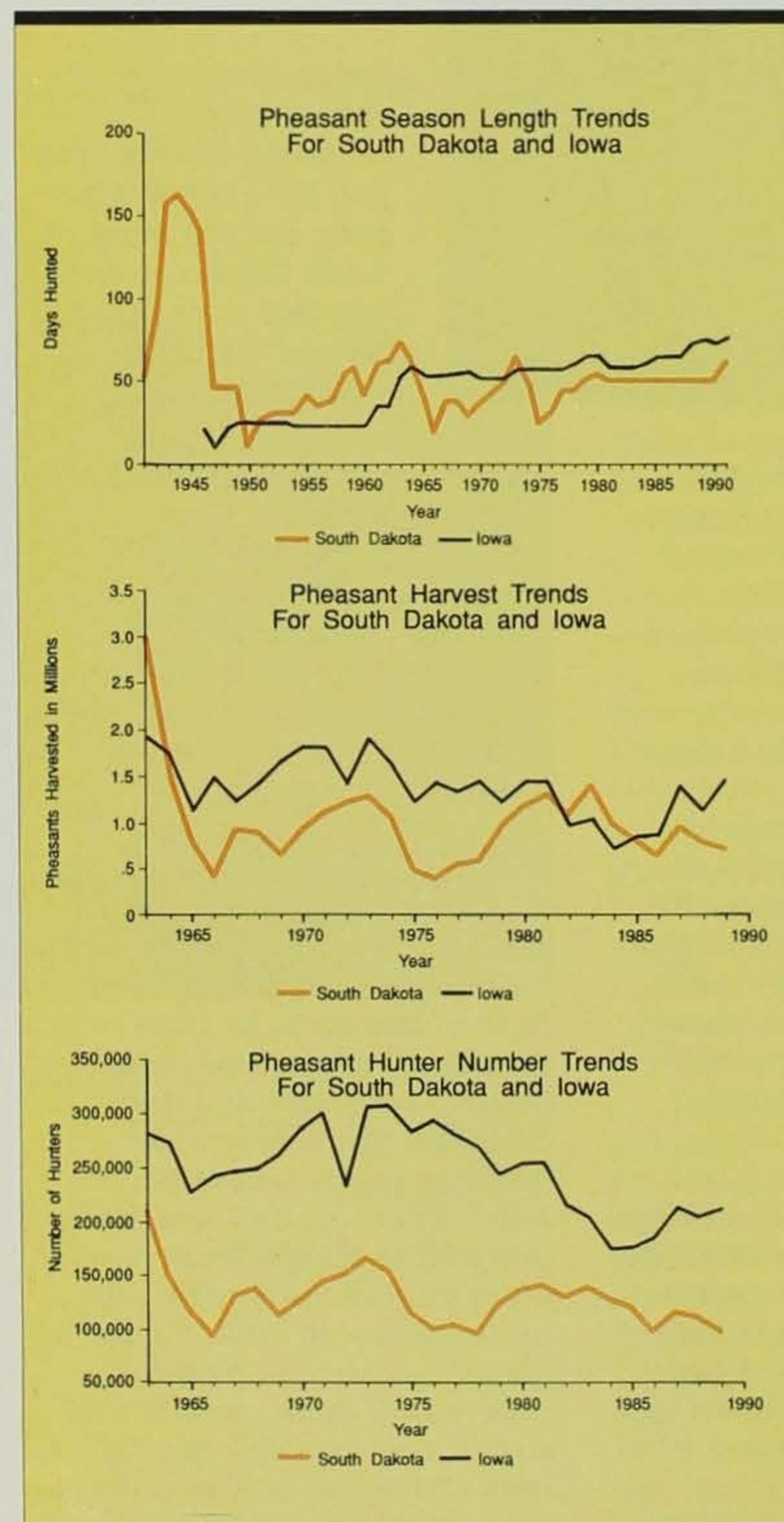
Since the onset of pheasant hunting, South Dakota's pheasant season strategies have been more unstable than corn prices (see Figure 1). The season length has varied from one to 163 days, the daily bag limit has swayed from one to 15 (10 roosters and five hens), and shooting hours have gone from beginning at dawn and ending at dusk to begin-

ning at noon and ending at sunset. To help reduce the fluctuations, the South Dakota Game, Fish and Parks Commission "stabilized" season strategies in 1979.

During the years 1979 through 1990, the pheasant season was basically stable at 51 days, with a bag limit of three roosters, and a noon opener (which becomes a 10 a.m. opener a few weeks after the season opens to provide additional recreational opportunity). In May 1991 the South Dakota Game, Fish and Parks Commission approved a 65-day season after hearing testimony that extending the season would not hurt the population. This 65-day season represents a compromise for opponents and proponents since the commission had proposed a 74-day season. The end result is a season that is still shorter than, but more comparable to, Iowa's 76-day season.

Iowa and South Dakota have a long history of great pheasant hunting. Almost everyone wishes we had as many pheasants as in the mid-1940s, but even now we have really good pheasant hunting (compared to other parts of the Midwest). In fact, in recent years, more pheasants are harvested in Iowa each hunting season than in any other state, and the average South Dakota hunter harvests more birds per day of hunting than hunters in any other state.

*The authors are upland game biologists for their respective states, as well as brothers. Terry Riley has been with the Iowa Department of Natural Resources in Chariton since 1989. Steven Riley has been with the South Dakota Department of Game, Fish and Parks in Pierre since 1987.*





# WARDEN'S DIARY

CHUCK HUMESTON

During the hunting seasons we spend a lot of time, of course, patrolling for hunting violations. A person committing a violation is either arrested or, in lieu of arrest, issued a citation requiring the person to either pay a fine or to appear in court at a certain date. At the time we file the charge, our job is finished, unless the person believes they are innocent, then a time is set for a trial where we appear to tell our side of the story.

Now a person is innocent until proven guilty beyond a reasonable doubt in a court of law, as it should be in a free society. This system works under the assumption once under oath a person will always tell the truth. Do they? Hmm . . .

Okay, I know what you're going to say. "You've been a cop too long, Chuck, you're cynicism is starting to peek through." Not, so fast. I have faith in the system. I just want to point out a few of the pitfalls conservation officers face.

Sometimes a person will retain an attorney to represent them. Now, I'm not so extreme to advocate William Shakespeare's solution for attorneys, but the fact is defense attorneys and officers do have somewhat of an adversary relationship. The problem may be two-fold. First, officers come out of the Iowa Law Enforcement Academy more well-versed in criminal law than most attorneys coming out of law school. Second, faced with the evidence against them, the defense's only recourse is to put the officer on trial attempting to make the

officer appear a babbling fool.

Many times this backfires. An attorney faced with seemingly insurmountable odds noticed the officer was wearing glasses. Aha, perhaps the officer really couldn't see what he thought he saw! Thus, he asked with a smug smile, "You can't see very well, can you?" The officer answered, "Well, every morning I see the sunrise in the East and they tell me it's more than one billion miles away!"

Sometimes the defendant will represent themselves. After watching as many episodes as possible of *L. A. Law* or *Matlock*, the tactic of putting words in our mouth may be used. Example: At a trial the issue was whether or not a deer was killed with an arrow rather than a gun. The defendant, placing an arrow in front of the officer, stated, "Doesn't that arrow look like it went through a deer?" (In other words, "Officer, you fool, can you not see the obvious?") Calmly, the officer stated the obvious. "It looks like an arrow covered with blood to me! I don't know where this arrow has been!" Verdict? Guilty!

In my first trial, I charged a person with hunting without a wildlife habitat stamp. It was in another county rather than where I was assigned, and it was about a three-hour drive to get to court. Sworn in, I sat down and was asked my name and address. The magistrate said, "You mean you had to drive all the way from Emmetsburg for this?"

"Yes."

"Proceed."

"How long have you been a conservation officer?"

"One month." (Real impressive, huh?)

I told my story I had seen a person wearing blaze orange and holding a shotgun. He had a deer license and a hunting license and that was all. The defendant took the stand. He pulled out a thick stack of legal paper. "Oh no. I'm sunk," I thought. "Look at that research."

He said, "I would like to begin by defining the word, 'mandatory . . .'" The magistrate brought his fist down on the bench, "This court is not interested in your definitions. Did you or did you not have a habitat stamp during the time in question?"

"No," he answered.

"Then if you have no other evidence to offer, this court finds you guilty without any further delay!"

"Wow," I thought. "I won my first case."

Since then, I've sat in that chair many times. Oh, I left unanswered the question do people always tell the truth? One case involved the question was the defendant hunting or not hunting during the deer season? The defendant claimed only along for the ride. After being found guilty the defendant came up to me and a fellow officer to shake our hands. "No hard feelings," he said. "I'm always running around with a gun in the pickup. I'm always hunting." I'll leave the question unanswered.



# CONSERVATION UPDATE

## THE BAT: CREATURE OF HORROR OR BENEVOLENT BENEFACTOR?

Bats hold the distinction of being the world's only flying mammals. During the day they hang out in caves and forests waiting for the sun to sink beneath the horizon.

They are the most notorious of all night creatures; no real horror story is complete without them. But when the story ends and the frightful visions fade, the real bat is left in the real world with a finely tuned set of natural instincts that have insured its survival for centuries.

Of the thousand species of bats known worldwide, only three seek blood. These real life vampire bats carouse in the twilight of Central and South America, where they tend to weaken cattle and other livestock by repeatedly biting them.

But the persistent lore portraying all bats as bloodsucking vampires is really a

myth. The myth actually started around 1400 with a Transylvanian count name Dracul.

Dracul killed many of his subjects, dismembering and impaling them in heinous ways. He was an insatiably bloodthirsty fellow who is still known in Romania as the evil Count Dracula.

Even though vampire bats were not identified until 1500 when European explorers landed in South America, all bats bear the blood-sucking stigma. However, most bats throughout the world eat insects. A few have sweet teeth and prefer fruit, while other dart in and out of plants searching for pollen.

There are even a few who are quite adept at catching fish.

Because bats thrive on insects, they are unwitting benefactors to a state that relies so much on its agricultural economy. In one hour, the little brown bat can devour up to 900 insects.

But Iowa bats are disappearing faster than they can reproduce. One of the reasons for these declining numbers is the very insects the bats eat.

The insects have pesticides on them. When a bat eats an insect, it ingests some of the insecticide that is on the insect's wings or other parts of its body. This insecticide builds up

each time until it reaches a level that is lethal.

Another problem hastening bat extinction is curiosity. Bats are true hibernators, at least those that choose a seasonal climate. And most bats choose a dark, remote cave or a rotted-out tree for their winter slumber. In preparation for this six-month nap they eat plenty and store a lot of fat to carry them over to spring.

But sometimes human curiosity disturbs the bats' sleep. If people go into a cave during the winter and wake them, the bats' metabolic processes speed up and they use up those fat reserves,



Ron Johnson

◀ The big brown bat, the most widely distributed species of bat in Iowa, roosts in both natural and artificial places and feeds on a variety of insects.



which may not leave them enough to get through the winter.

Bats are true survivors, however. One of the reasons they've fared so well is their built-in radar system, called echo location.

Bats actually attack their prey by emitting a very high frequency sound wave that starts in their larynx and bounces off objects around them. The bats then pick their prey by calculating the strength and distance of the rebounding signal.

Bats are the subject of countless myths. There is the one that bats are rabid, for example.

Over the last 10 years fewer than 10 people in the U.S. and Canada have contracted rabies from bats.

Rabies-carrying bats store the virus in their salivary glands. Because they are very social animals, bats transmit rabies to each other through social contact. However, less than one-tenth of one percent of all bats in the world have rabies.

--Reprinted from *Illinois Resources*, Illinois Department of Energy and Natural Resources

### **New State Record Flathead Catfish**

A new state record has been set for the flathead catfish. Joe Kauffman of Wayland caught the 64-pound, 13-ounce, fish on Aug. 14, 1991, from the Skunk River in Henry County. It measured 51-3/4 inches in length.

The old record catfish weighed 62 pounds and was 46 inches long. It was taken from the Iowa River in Johnson County in July 1965 by Roger Fairchild of Coralville.

### **Fall Colors Are the Forests' Shining Glory**

Every year Iowans anticipate the brilliant display of fall colors. But how many people know how and why the leaves of Iowa's trees change color?

The leaves of deciduous trees change color because of chemical alterations that take place within the leaves involving the amount of pigments present. The signal for this chemical process to take place is the steady decline in daylight, not cold weather.

Environmental

factors such as weather and the amount of nutrients present in the soil influence the timing, duration and the intensity of the fall colors. The best fall for color occurs when conditions are clear, dry and cool. On the other hand, cold weather can ruin this brilliant show of colors by killing the leaf cells responsible for color change, while strong winds and heavy rains may cause the trees to prematurely drop their leaves.

The pigments that color leaves fall into four groups: the chlorophylls (green), tannins (brown), carotenes (yellow and orange) and anthocyanins (red and purple). The production of these pigments is controlled by tree genetics, which accounts for differences in color among tree species and between individuals of the same tree species.

As the leaves die and fall to earth, trees begin their long winter slumber. The fallen leaves, which through the warmer growing season converted carbon

dioxide into oxygen and reduced global warming, now take up another task, enriching the soil and providing the nutrients for future generations of



Ron Johnson

▲ **The signal for leaves to begin changing color each autumn comes from a decrease in sunlight, not cooler weather.**

trees. By the time this year's leaves fall, next spring's new leaves will be tightly wrapped in buds ready for a new growing season.

Anyone interested in the fall foliage color changes this fall can call (515) 233-4110 for a weekly progress report from the DNR. The recorded information is updated each Tuesday and will run through mid-October.



# CONSERVATION

## UPDATE

### **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. 7, Corydon

--Dec. 5, Des Moines

### **Environmental Protection Commission:**

--Nov. 18-19, Des Moines

--Dec. 16-17, Des Moines

### **State Preserves Advisory Board:**

--December, Des Moines

### **Waste Reduction Awards Announced**

Four Iowa companies have received Iowa Governor's Waste Reduction Awards. Each company entered a project into the annual competition that demonstrated environmental, economic and safety benefits. Employee involvement, degree of innovation and ease of transfer to other companies were other evaluation criteria.

The winning projects resulted in annual cost savings to the companies of \$4.7 million, and 4.4 million pounds of waste material will be prevented from entering the state's landfills each year.

United Technologies Automotive of Iowa City manufactures vinyl padded automotive parts, such as arm rests and instrument panels. After extensive testing, the company was able to replace the toxic solvent they had been using with a non-toxic recyclable material. Worker exposure to harmful chemicals was eliminated, and toxic

air emissions were reduced by about 125,000 pounds annually.

Norand Corporation of Cedar Rapids manufactures and markets hand-held computers, communications equipment and other portable data collection systems. With involvement of employees, Norand created a multi-faceted waste reduction program. Laser printer cartridges, paper, cardboard and aluminum are recycled. Less toxic chemicals are used in manufacturing, including total elimination of Freon (TM). Hazardous waste is reused in an alternative fuels program.

Overall, worker exposure to harmful chemicals and emission of toxic air pollution were reduced. Solid and hazardous wastes have been reduced nearly 125,000 pounds per year. Ongoing savings are estimated at \$109,000 a year.

Glacier Vanderbell, Inc., of Atlantic manufactures bushings and bearings for the transportation industry. The company began an inten-

sive recycling program for cleaning solvents, scrap metal, raw materials drums, cardboard and wood. The amount of hazardous sludge they generated was reduced by new equipment.

Rydell, Inc., of Waterloo is an authorized dealer for Chevrolet-Geo-Mitsubishi. The dealership converted their natural gas central building heating system to use waste motor oil as fuel. The conversion was the first on such a large scale in the state of Iowa.

Rydell now burns all the waste oil generated during servicing, and provides a convenient disposal site for customers who change their own oil at home. The project could prove cost effective for other dealerships.

The Governor's Waste Reduction Awards were begun in 1989 and are co-sponsored by the Iowa Department of Natural Resources, the Iowa Waste Reduction Center at the University of Northern Iowa, the Iowa Association of Business and Industry and the Iowa Safety Council.



## Fish Iowa! Workshop Series

*Fish Iowa!*, a module for teachers and youth leaders, including scouts and 4-H, will be offered in a series of one-day workshops during the 1991-92 school year.

Sessions include lectures, demonstrations and hands-on activities for teaching fish identification, aquatic habitats, regulations, water safety and basic spincasting.

The cost of the workshop is \$7.50, which includes lunch and materials.

Workshop locations are:

◆ Nov. 9, 1991, 8:30 a.m. to 4 p.m., Western Hills AEA (Woodbury County). Contact Dawn Snyder at (712) 258-0838.

◆ Dec. 6, 1991, 8:30 a.m. to 4 p.m., Loess Hills AEA (Pottawattamie County). Contact Charlene Alyea at (712) 328-5638.

◆ Jan. 25, 1992, 8:30 a.m. to 4 p.m., Story County Conservation Center. Contact Cele Burnett at (515) 232-2516.

◆ March 21, 1992, 8:30 a.m. to 4 p.m., Hartman Reserve Nature Center (Cedar Falls). Contact Vern Fish at (319) 277-2187.

## CLASSROOM CORNER

by Danielle Wirth

More than 25 percent of current medicines contain ingredients which are derived from plants. Iowa folklore is rich with information about Native American and pioneer use of plants for healing and seasoning. Uses for some of our more common plants may surprise and ultimately delight you.

1. This common lawn plant has been called the bandaid plant. Proleotic enzymes released when the leaves are crushed, help to relieve painful bee stings and heal open wounds.  
a. dandelion      b. red clover      c. plantain      d. wild rose
2. A fresh, almost sweet, taste is associated with the leaves of this plant. Children are amused with the slippery, slimy feel of the chewed leaves. This slippery property is also helpful in soothing sore throats.  
a. red clover      b. violet      c. dandelion      d. crab grass
3. One cup of cooked greens from this plant can provide up to 1,000 International Units of vitamin A.  
a. wild onion      b. red clover      c. dandelion      d. bee-balm
4. Modern-day spinach can trace its ancestry to this plant.  
a. Lamb's quarters      b. yellow dock      c. velvet leaf      d. plantain
5. A folk remedy for arthritis, still used today, can be made from the dried leaves of this plant taken in tea form.  
a. nettles      b. red clover      c. violet      d. day lily
6. The roots of this plant are reported to have a high insulin content. For this reason a root preparation is helpful in balancing blood sugar levels.  
a. dandelion      b. burdock      c. violet      d. alfalfa
7. The dried leaves of this plant were used to make a hair rinse and also were believed to counteract baldness.  
a. bee-balm      b. nettles      c. violet      d. rose hips
8. This soft leafed, gray-green biennial produces tall flower stalks the second year of growth. These tan stalks were used as torches.  
a. burdock      b. plantain      c. mullein      d. catnip
9. One of the most beautiful prairie wildflowers is also a proven stimulator of the natural immune system when taken internally.  
a. compass plant      b. purple coneflower      c. cup plant      d. heliopsis
10. These berries are reported by wild food gatherers to be nourishing to the heart.  
a. blackberry      b. strawberry      c. Juneberry      d. hawthorn

ANSWERS:

1. c 2. b 3. c 4. a 5. a 6. b 7. b 8. c 9. b 10. d



# SOME FACTS ON TRASH PUTTING WASTE INTO PERSPECTIVE



by Julie Kjolhede



In 1900, the average consumer in the U.S. lived about 48 years, worked six days each week, spent 46 percent of their income on food, consumed 71 grams of protein, 375 grams of carbohydrates, 65 grams of fat, ran the hundred yards in 22 seconds and had little awareness of environmental issues — they were also a litter lout.

In 1991, the average consumer in the U.S. lives about 74 years, works five days each week, spends about 20 percent of their income on food, consumes approximately 69 grams of protein, 246 grams of carbohydrates, 98 grams of fat, runs the hundred metres in less than 10 seconds and understands the bottle bills and curbside collections, but is still a litter lout.

Americans comprise only a small percent of the world's population, yet we produce more than a quarter of its trash! Every day, at home and at school, at work and during play, Americans generate garbage. All told, this country manages million of tons of municipal solid waste each year. As a nation — and as individuals — if we don't begin to reverse our present garbage generating habits, it is estimated that by 2010 we'll be producing garbage at the rate of nearly one-and-a-half times the amount we create today.

A survey conducted last summer by the Roper Organization shows that Americans are concerned more than ever about the environment. Improving the environment ranks fourth on the list of national priorities after solving the problem of crime and drugs, finding a cure for AIDS and containing health costs. At the

same time, the survey, sponsored by Johnson and Johnson, adds to the evidence that most Americans know very little about effective ways of preventing pollution and conserving energy. This suggests that the public may be receptive to learning more, but the environ-

we don't want -- trash resulting from convenient, disposable products. Add to that the U.S. Environmental Protection Agency's estimate that about half of the landfills operating today will be closed in the year 2000 because they are either full or

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## Every five years, the average American discards, directly or indirectly, an amount of waste equal in weight to the Statue of Liberty. -- EIA

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mental message must be made clearer.

The Roper survey shows, for example, that Americans think the four biggest contributors to the solid waste stream are disposable diapers, plastic packaging, plastic bottles and aerosol containers. In fact, these amount to only about 10 percent of the material in U.S. landfills. Conversely, the survey shows that Americans think that four of the smallest contributors to the solid waste stream are waste paper, paper plates and napkins, food scraps and yard waste, which in fact, make up more than 46 percent of the national solid waste stream.

So, what does the average American consumer's eating, living and thinking habits have to do with "facts on trash"? *Everything!*

This average American consumer — you and I — behaved our way into the current solid waste crisis by demanding accommodating products to correspond with our fast-paced lives. We got what we wanted -- convenient, disposable products. What's more, we also got what

suspected or known to be leaching hazardous or toxic materials into local water sources. With that end in sight, consumers are beginning to realize that everything in this universe is connected. When something is "thrown away" it doesn't just "go away" -- instead, it just goes somewhere else. In Iowa, that "somewhere else" is likely to be our groundwater. And this is a serious concern when one realizes that approximately 80 percent of the drinking water in Iowa comes from Iowa's groundwater resources.

If the watchwords *reduce*, *reuse* and *recycle* haven't found their way into your vocabulary or your thinking yet, read on. What follows are some trash facts representative of the often staggering numbers reflecting American's wasteful habits. They are offered here to encourage us — the American consumer — to respond to the solid waste crisis affecting our planet, because the least known, most important environmental fact is this: One consumer's impact on the solid waste crisis *does* make the difference.



## SOME FACTS ON TRASH

Americans dispose of enough glass bottles and jars to fill the 1,350-foot twin towers of New York's World Trade Center every two weeks. -- *Environmental Defense Fund (EDF)*

1.1 million tons of plates and cups made to be disposed of are 'thrown away' by Americans every year. That is enough to serve a picnic to everyone in the world six times. -- *Environmental Business Journal (EBJ)*

American consumers and industry expend enough aluminum to rebuild our entire commercial air fleet every three months, and enough iron and steel to continuously supply all U.S. automakers. -- *EDF*

Americans annually throw away: two billion razors and blades, 18 billion disposable diapers, 1.6 billion pens, 220 million tires, 350 million gallons of motor oil, 25 billion polystyrene foam containers and 20 billion pounds of plastics. -- *Environmental Impact Associates (EIA)*

The single largest component of solid waste in landfills is newspaper, which contributes 14 percent by volume. -- *Garbage: The Journal of the Environment*

Americans spent more for food packaging in 1986 than the nation's farmers received in net income. -- *EIA*

One third of the waste stream is composed of packaging material. Of that material, 48 percent is paper, 25 percent is glass, 13 percent plastic, six percent steel, two percent aluminum and five percent miscellaneous. -- *Garbage*

For every \$1000 worth of sales in fast food establish-

ments, 200 pounds of trash is created. -- *EIA*

One dollar out of every \$11 spent by consumers in the grocery stores is used to pay for packaging costs. -- *How to make the World a Better Place*

Iowa households generate an estimated seven pounds of hazardous wastes per year including but not limited to batteries, paints, cleaning solvents, aerosol cans, garden pesticides and fluorescent bulbs. That's 4,000 tons or eight million pounds statewide. -- *Waste Management Division, Iowa DNR*

One gallon of gasoline can contaminate 750,000 gallons of drinking water. One quart of used motor oil will foul the taste of 250,000 gallons of water. -- *50 Simple Things You Can Do to Save the Earth*

The EPA estimates that for every 100,000 residents, 3.75 tons of toilet bowl cleaner, 13.75 tons of liquid household cleaners and 3.44 tons of motor oil are dumped into city drains each month. And only 10 percent of our household hazardous wastes are disposed of properly. -- *50 Simple Things You Can Do to Save the Earth*

Every five years, the average American discards, directly or indirectly, an amount of waste equal in weight to the Statue of Liberty. -- *EIA*

The lifetime garbage of the typical American equals at least 600 times his or her adult weight. -- *Worldwatch Institute*

63.7 billion pieces of

third-class mail were delivered nationwide in 1989. Over the course of a lifetime, the average American professional will devote eight months to sifting through direct mail offers. About 43 pounds of junk mail is generated for each adult American. Of that amount, 44 percent is disposed of, unopened. -- *Time*

The energy saved by recycling the 110 billion beverage containers sold in the U.S. annually would serve the energy needs of Washington, D.C., for four years. -- *National Container Recycling Coalition*

Energy saved if all paper had 50 percent recycled content: 11.5 billion kilowatt hour. Money saved if all paper had 50 percent content: \$1.8 billion. -- *Conservatree*



Be it 1900, 1991 or 2010, America's solid waste management will always be an issue of global proportion. So, what can we do? Take a few minutes to go through our garbage.

Recall that we don't want to be written into history as a member of the less than elite litter lout society.

Respond by re-thinking the way we live.

Reduce, reuse and recycle. Just by incorporating these Rs into our lifestyle we will make the difference — for all of us.

And that's a fact.

Julie Kjolhede is a planner for the department's Waste Management Division in Des Moines.





In today's fast-paced and highly commercial world, the "real" Christmas tree still offers Iowa families a symbol and the tradition of the Christmas spirit. For children of all ages, picking out a real Christmas tree from a local retail lot or from a nearby Christmas tree farm is an annual event of special significance and simple fun that brings the fragrance and freshness of the forest into our homes. But, did you ever realize that Christmas trees are good for Iowa's economy and the environment too?

More than 250,000 Christmas trees are sold every year in Iowa. Approximately 22 percent or 55,000 trees were grown in 1990 by more than 600 Iowa growers. The remaining Christmas trees come from large Christmas tree farms in the nearby lake states of Minnesota, Wisconsin and Michigan. Assuming a \$20 value per tree, Iowa-grown Christmas trees contribute \$1.1 million to our state's economy, annually.

Iowa Christmas tree farms

are generally small, part-time family businesses that require a tremendous amount of hard work and dedication to produce fresh, quality trees. But to most growers, Christmas trees offer more than a commercial crop. Often, Christmas tree farming is a long-term investment (eight to 10 years) to fund a college education or retirement with a hands-on approach of working with and protecting the environment.

Christmas trees in Iowa are usually grown on lower quality agricultural sites, where corn or soybeans are not practical. Unlike these annual row crops, trees help bind the soil, helping to prevent soil erosion and protecting water quality. Growing Christmas trees also offers critical winter cover for nu-

merous varieties of wildlife from songbirds to small mammals. Finally, real Christmas trees are a renewable resource that help reduce the "greenhouse effect" by storing carbon and releasing oxygen. In fact, one acre of Christmas

trees produces a year's supply of oxygen for 17 people. According to the National Christmas Tree Growers Association, four trees were planted for every Christmas tree that was harvested last year.

### Tree-Cycling

In response to ever-decreasing landfill space, yard wastes such as grass clippings, leaves, tree branches and Christmas

# Holiday Spirit and More

by John Walkowiak





DNR photo

▲ More than 250,000 Christmas trees are sold every year in Iowa. In 1990, approximately 22 percent of these were grown in Iowa.

trees were banned from state-licensed landfills, beginning January 1, 1991. Although, Christmas trees contributed a small fraction of the landfill component in Iowa (about 2,500 tons per year, statewide), they can be put to better use than taking up space in a landfill.

Christmas trees are only a brief seasonal problem for most local community public works departments as more and more Iowa communities are initiating "tree-cycling" programs. Tree-cycling is a coordinated program where Christmas trees are collected or brought to central areas after the holiday season and chipped into landscape mulch. Tree-cycling programs in Des Moines and Dubuque have proven that advanced promotion and local coordination are required to be successful. (See

sidebar, *Starting a Tree-Cycling Program in Your Community*.)

Other Iowa communities sink used Christmas trees in local ponds and lakes in cooperation with DNR biologists to improve fisheries habitat. And, others place their used Christmas trees in their backyards to provide winter cover for wildlife, then later chop them up for landscape mulch and firewood.

### Choosing a Family Christmas Tree

Most Iowans buy real Christmas trees, Scotch pine being the most popular, from local retail lots, often operated by area service clubs. Others make buying a Christmas tree a family adventure by going to a nearby Christmas tree farm and "choosing and cutting" their

own fresh tree. The Department of Agriculture and Land Stewardship and the Iowa Christmas Tree Growers Association have developed a "Choose and Cut" Christmas tree directory that lists more than 120 different Christmas tree farms across the state. For your free copy, contact the state horticulturalist's office at 1-800-383-7658 (Des Moines-area residents call 281-7658). Growers recommend coming early to guarantee the best selection and the freshest tree. Generally, the Thanksgiving weekend is a good time to select a precut tree. For families wishing to cut their own, talk to your local tree farmer about selecting and tagging your tree now for cutting later.

If purchasing a cut tree from a retail lot, these simple steps can make it easier to choose a Christmas tree that is right for your family:

- Hold a branch about four to six inches from the tip between your thumb and forefinger, and pull your hand towards you. As the branch slips through your fingers, needles should stay on the branch and not fall off in your hand.
- Bump the base of the tree on the ground. Dry green needles should not fall off in substantial numbers, but loss of brown needles is normal.

### Keeping Your Tree Fresh and Fire Safe

Some people may hesitate buying a real Christmas tree due to potential fire. But recent research in California indicates that Christmas tree fires are rare and are due primarily to faulty electrical fixtures and



lights. Following some simple tips can keep your tree fresh and fire safe:

- If it will be a few days before you set up your tree, store it in a cool, damp area where it will be protected from the wind and sun, such as a garage or storage shed.
- When you move the tree inside, make a straight cut across the base about one to two inches above the original cut. Place the tree immediately in a large water-holding tree stand.
- Christmas trees are thirsty. Check the water level in your tree stand twice daily and fill as needed.
- Carefully inspect your Christmas tree lights, replace bulbs and discard light sets with worn wires.
- Place your tree away from heat sources, such as space heaters, television sets, heating vents and fireplaces. Turn off the tree lights when you leave your home and before you retire at night.

### **"Living" Christmas Trees**

The use of "living" Christmas trees is gaining in popularity. These are potted trees that, once the holiday season is over, can be planted in the yard. The success of "living" Christmas trees in Iowa has always been limited, but can be improved if you plan ahead and follow these tips:

- Pick out a location to plant your tree in the fall. Dig the planting hole before the ground freezes and store the soil so it will not freeze. Cover the planting hole to prevent injury to people and pets.
- Choose a containerized or balled and burlapped (B&B)

tree three to six feet tall from a local nursery or tree farm. Living Christmas trees are bulky and heavy, carry or carefully roll the tree's root ball or container, do not carry the tree by its trunk or main stem.

- Condition your tree prior to bringing it into the house by placing it in an unheated garage or storage area for a few days.
- When placing the tree inside, keep it away from heat sources and direct sunlight. Put it in a large tub and keep the root ball moist at all times, but avoid standing water.
- It is best to limit the tree's stay indoors to less than one week. Recondition the tree in an unheated area for a few days, then plant it as soon as possible with the stored unfrozen soil when temperatures are above 20 degrees. Water the tree during thaws and days with temperatures above freezing.

Use mulch (wood chips) four to six inches deep around the tree's drip line to help stabilize soil temperature and maintain moisture.

When you walk into a home with a real Christmas tree, the smell and sight gives even a Scrooge some Christmas spirit. Real Christmas trees are not only beautiful; they help the state's economy and help protect the environment. For more information on choosing or growing Christmas trees write to the Forests and Forestry Division, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

*John Walkowiak is an urban forestry coordinator for the department's Forestry Division in Des Moines.*

### **Starting a Tree-Cycling Program in Your Community**

Plan on running the program for approximately two weeks, after January 1.

Advertising the program is essential. Use radio, newspaper, letters sent home with school children before the holidays. Ask local Christmas tree farmers and tree vendors to pass out information with every tree sold.

Depending on the resources available (chippers, labor, vehicles), the program can be handled as a curb-side service or at specific drop-off points.

Enlist the help of local civic organizations -- Lions clubs, scout and 4-H groups, garden clubs.

Reduced landfill fees will offset the fuel and maintenance costs associated with the program. Encourage tree vendors to participate at a minimal cost per cubic yard of unsold trees.

Chips can be taken by the participants for their own private use, or used by service groups or city parks departments.



by Michael J. Lannoo  
and Neil P. Bernstein

# Pheasant in a

Naturalists used to seeing fish in the water, deer in the woods and snakes in the grass may be disturbed by the upland sandpiper (*Bartramia longicauda*, named in honor of William Bartram [1739-1823], the first great American ornithologist). Disturbed, not so much by its haunting wolf-whistle call, but by the incongruence between this bird's anatomy and its ecology. While the anatomy of this once common Iowa bird clearly tells us "shorebird" (the upland sandpiper is classified scientifically in the order Charadriiformes along with other more familiar shore-

birds such as the killdeer and spotted sandpiper), its looks are deceiving. The upland sandpiper is a bird of the prairies; it is seldom found near water. Ecologically, the upland sandpiper is more similar to the introduced ring-necked pheasant, and the native prairie chicken, its one-time companion on the Iowa prairie, than to the shorebirds that it most closely resembles.

The upland sandpiper is a medium-sized, brown speckled bird with a small head, large eyes, a long slender neck, long tail, long tapered wings and yellow legs. When not hidden in the grass, they perch on fence posts, telephone poles and tree saplings. Their diet in-

cludes seeds and insects. Adults nest on the ground in small depressions of matted prairie grasses. Both sexes incubate a clutch of four eggs, colored buff to faded pink and mottled brown. Chicks have exceptionally long legs. Aldo Leopold writes about upland sandpiper chicks in his classic book *A Sand County Almanac* -- "From the moment their down is dry, they scamper through the grass like mice on stilts . . .". More recent scientific studies have determined that newly hatched chicks can move up to a hundred yards a day.

At the Iowa Lakeside Laboratory, we teach field courses in vertebrate biology and ornithology. Our students come to

## Upland sandpiper chicks ▼



Michael Lannoo



# Shorebird Body

learn first hand animal anatomy, behavioral ecology and evolutionary history. Incongruous animals, such as the upland sandpiper, are used to demonstrate principles of adaptaton. For example, the similarities between upland sandpipers and hen and juvenile pheasants illustrate recent adaptations to prairie living. These features include diet, camouflaged feathers, precocial young and a tendency to run rather than fly. These traits are termed *convergent*, because pheasants and upland sandpipers are unrelated to each other and therefore must have evolved these features separately, in response to a prairie lifestyle.

On the other hand, the similarities between upland sandpipers and their shorebird relatives illustrate older and more fundamental adaptations to a shorebird lifestyle. These features include partially webbed feet, overall body shape, elongated legs and bill and egg number. These traits are the result of inherited genes and a deeply ingrained pattern of development. Conserved traits such as these are considered *constraints*, because they are the relatively inflexible, historical features that upland sandpipers either overcame or worked within, to achieve their prairie adaptations. Webbed feet on a summer prairie bird can be explained reasonably only by considering an aquatic ancestry.

As ideal as upland sandpipers would seem for studies of adaptation, such projects have been limited by the recent low numbers of these birds. From 1975 to 1986, the upland

sandpiper was included on the Audubon Society's Blue List, which was created to provide an early warning of range or population reductions among bird species in North America.

In Iowa, upland sandpiper numbers were severely reduced at the beginning of this century. In a 1960 *Iowa Bird Life* article, W.H. Brown writes that in Grundy County "... from 1898 to 1903, upland plovers [sp] were as plentiful as meadowlarks, and one could see four or five in half a mile. There were five or six pairs on 160 acres."

This was during the era of the "Duck Special," a train which formed both a fascinating and tragic part of Iowa's history. This train carried market hunters from Des Moines to Spirit Lake. Along this track the Special would make unscheduled stops where game was abundant. Some places became regular stops. Towns arose and were named after game, Mallard, Curlew and Plover -- the town that was named after the old term for upland sandpiper.

Before the 1916 Migratory Bird Conservation Act which ended market hunting, upland sandpipers were decimated by hunters frustrated by the dwindling numbers of passenger pigeons. Reflecting this nostalgia for past game, upland sandpipers were sometimes called "prairie pigeons." There was commercial value in their meat, which the French considered an aphrodisiac. Overhunting, along with more recent agribusiness practices, including the aggressive application of herbicides, made the upland sandpiper whistle a rare and lonely sound in Iowa.

"From the  
moment their  
down is dry,  
they scamper  
through the  
grass like mice  
on stilts . . ."

Aldo Leopold  
*A Sand County Almanac*

Today, these pressures have been relaxed and, happily, on Cayler Prairie in Dickinson County, upland sandpiper numbers appear to be higher than anytime in the remembered past. The first students of the Lakeside Laboratory (during the summer of 1909) never had the opportunity to study these birds in numbers approaching their pre-settlement abundance. With upland sandpiper numbers rebounding locally, we are glad future students will be able to learn the biological lessons offered by this small but valuable part of Iowa's natural heritage.

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Michael Lannoo was a professor of vertebrate biology at the Iowa Lakeside Laboratory this past summer and is currently an assistant professor at the Muncie Center for Medical Education at Muncie, Indiana.

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