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COVER: "November Frost -- Whitetails," by Larry Zach, 1202 SW Second Street, Ankeny, Iowa 50021, phone (515) 964-1570. Prints are available from the artist for $89.20 (cost covers the print, tax, shipping and handling).

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A SURVEY

White-Tailed Deer In Iowa

Farmers' Reactions To The Increasing Population

White-tailed deer management goals in Iowa involve providing the maximum amount of quality recreational opportunity possible while maintaining deer population levels that are compatible with agricultural interests. Deer have recently expanded their population in Iowa and all across the Midwest due to restrictive hunting seasons, increased utilization of marginal habitat, mild winter weather and excellent reproductive rates caused in part by a nutritious food source that includes agricultural crops. Higher deer densities have made them a controversial issue particularly when wet fall weather delays crop harvest and they take advantage of this abundant food source. But how do farmers really feel about deer and the damage they may cause to their crops?

ROGER HILL

A research study was initiated in 1988 to measure farmer attitudes about deer. Studies in other states such as Illinois, Kansas and Ohio have found that damage levels are relatively low and farmers have demonstrated considerable tolerance for deer in exchange for the pleasure of having them around. But, these studies also indicate that a small percentage of farmers are experiencing what they call "severe" or "unreasonable" damage to row crops, orchards and other types of crops. Iowa's study was designed to answer some of these questions and to find out how many farmers are having problems with deer, how they feel about these problems and other factors that could be involved. Some of the factors considered critical to proper interpretation of information were the farmer's age, size of farm, type of crops raised, farm ownership, farm location and local deer population size.

A telephone survey was selected for this study because it provided a chance to clarify farmers' questions and comments. Telephone interviews were conducted by personnel of the Iowa Agricultural Statistics Service (IASS) which is supported jointly by

by Lee Gladfelter

ROGER HILL

LEE GLADFELTER

Although deer cause damage to crops, most Iowa farmers do not consider the damage to be a major problem. Damage to corn (left) was reported most often in the survey because it was the most common crop planted. Other damaged crops reported included soybeans (lower left), hay, oats and wheat and orchard trees and nursery crops.

LEE GLADFELTER

the U.S. Department of Agriculture and the Iowa Department of Agriculture and Land Stewardship. IASS is well known by farmers because they routinely collect, analyze and publish agricultural information important to Iowa farmers and related agri-businesses. IASS also maintains a complete list of active farmers because of the many surveys they conduct on a variety of agriculturally related topics.

The telephone survey was conducted on weekday evenings in mid-November following the 1988 crop harvest season and prior to the 1988 firearms deer season. A total of 655 interviews were completed with farmers randomly selected from a list of *active* farmers from around the state. An *active* farmer, for this survey, was defined as an individual with at least $1,000 worth of annual agricultural income or expenses who owned or rented more than 40 acres of land. In addition to general background questions, farmers were asked to respond to questions about deer population size, crop damage (by crop type), their feelings about the amount of damage the crops had sustained and control measures they may have initiated. Their attitudes about deer hunters were also investigated with questions about land posting, who hunts on their land, whether or not individual farmers or family members hunt deer, and if they experienced any problems with hunters.

Some of the background information indicated that 91 percent of the survey respondents were male and ranged in age from 20 to 92 years. About 63 percent of the respondents derived more than three-fourths of their income from farming and 89 percent lived on the land they farmed. Most respondents owned and operated their farm (74 percent) while 19 percent were operators only and 8 percent were landowners only. An average farming operation was 425 acres in size and ranged from 40 to 3,400 acres. Corn was the most common crop raised (93 percent of farms) followed by soybeans (77 percent), pasture (54 percent), oats or wheat (29 percent), tree plantations (2 percent), orchards (2 percent) and nursery crops (1 percent). The average amount of crops planted by respondents was 175 acres of corn, 150 acres of soybeans and 75 acres of pasture. Half of all farms contained some timber acreage (average of 40 acres).

Most farmers (93 percent) currently had deer living on their land; 71 percent indicated that deer numbers had increased during the past five years while 3 percent felt they had decreased, 21 percent said numbers were stable and 5 percent had no opinion. However, 58 percent described the number of deer in their area was about right with 34 percent indicating the population was too high and 8 percent thought it was too low. Generally, more farmers from southern Iowa felt the population was too high (43 percent) compared to those in northern Iowa (26 percent).

Crop damage in Iowa is inevitable because of intensive row crop agriculture, high deer preference for crops as a food source and crop fields that are often interspersed with fingers of timber or other good deer cover. Forty-two percent of the farmers surveyed had experienced some type of crop damage, but only 5

percent felt damage was unreasonable. This is an important observation since it indicates that although damage is occurring, the vast majority of farmers do not consider deer damage to be a major problem for them. Farmers were not asked to estimate the cash value of crop losses because

(1) this is usually an impression and is not based on actual measurements in the field, and

(2) it is very difficult to differentiate between deer damage and losses caused by other wildlife, insects, weather and shading or root sapping by trees along field edges. In reality, the Department of Natural Resource (DNR) must deal with farmers' attitudes on crop loss, regardless of the actual value of the crops involved. The DNR must respond to crop damage complaints that span a wide range of significance since some farmers are upset with crop losses that others are willing to tolerate in exchange for having deer around.

LEE GLADFELTER

1989 Record Deer Racks

Editor's Note: This is a list of deer racks scored between October 1988 and September 1989. New entries into the *All-Time Top 10* Racks are designated by an asterisk (*). See page 24 for the listing of the *All-Time Top 10 Racks*.

SHOTGUN TYPICAL

(Minimum Qualifying Score - 150 points)

NAME	ADDRESS	YEAR	COUNTY TAKEN	TOTAL SCORE
* Monty Stark	Mount Pleasant	1984	Henry	189 3/8
Dan Bush	Winterset	1987	Madison	180 3/8
Denny Boots	Cedar Rapids	1988	Jones	178 5/8
Steve Huff	Knoxville	1988	Appanoose	178
Doug Kriegel	Central City	1988	Linn	176 6/8
Bud Vandekiest	Oskaloosa	1988	Mahaska	173 6/8
Doug Warrior	Bridgewater	1988	Adair	173
John H. Good	Des Moines	1988	Ringgold	171 2/8
Walter Church	Salem	1988	Van Buren	171 1/8
Michael Mathews	Mount Pleasant	1988	Henry	169 7/8
Mark Evans	Glenwood	1988	Mills	169 7/8
Scott Schilling	Colesburg	1988	Clayton	169 4/8
Dave Hageman	Cresco	1988	Winneshiek	168 7/8
Randy L. Prottsman	Mount Pleasant	1977	Henry	168 5/8
Randy Butler	Cedar Rapids	1985	Allamakee	168 4/8
Eymard Wanzek	Clinton	1988	Clinton	168 3/8
Tim Lamaster	Iowa City	1988	Jefferson	168
Chuck Pallwitz	West Des Moines	1987	Warren	167 6/8
Doug Roberts	Marengo	1988	Iowa	167 4/8
Daniel A. Farnum	Davenport	1988	Van Buren	167 3/8
Lloyd Moyers	West Point	1988	Lee	166 4/8
Don Sedlacek	Iowa City	1988	Johnson	166 3/8
Bruce Crabbs	Panora	1964	Guthrie	166 2/8
Eric Knapp	Bloomfield	1987	Davis	166 1/8
Elbert Van Gorp	Pella	1988	Monroe	166
Dale Roberts	Bridgewater	1959	Adair	165 4/8
Rick Meeker	Woodbine	1986	Harrison	165 3/8
Larry Hopkins	Bloomfield	1988	Decatur	165 1/8
Rod Stahlnecker	Council Bluffs	1984	Logan	165
Jeff Rasche	Princeton	1988	Scott	164 5/8
Mick Rotnicke	Mapleton	1988	Monona	164 4/8
Dan Kelley	Centerville	1988	Appanoose	164 4/8
Linda Pryor	Woodbine	1964	Harrison	164 1/8
Vern Wunschel	Ida Grove	1988	Ida	163 5/8
Mark Nolte	Sumner	1988	Fayette	163 4/8
Dennis Ciavarelli	St. Ansgar	1967	Butler	163 2/8
Harold Mount	Hamburg	1988	Fremont	163 1/8
Jeff Feisel	Toledo	1984	Tama	162 7/8
Jim Kobs	Mount Pleasant	1987	Henry	162 7/8
Dale Jones	Northwood	1988	Worth	162 6/8
Marv Christensen	Clemons	1988	Marshall	162 5/8
Harold Cobb	Derby	1988	Lucas	162 4/8
Dave Howell	Muscatine	1987	Muscatine	162 3/8
Wayne Rozenboom	Oskaloosa	1988	Mahaska	162
Tom Poole	New Sharon	1988	Wapello	161 6/8
Jeri J. Schwartzhoff	Davenport	1987	Allamakee	161 5/8
Bill Yaddoff	Preston	1987	Jackson	161 4/8
Gary Strickler	Centerville	1975	Appanoose	161 4/8
Todd J. Kann	McGregor	1986	Clayton	161 4/8
Gary Vetter	Elliott	1988	Montgomery	161 3/8
Dean Alfers	Neola	1988	Pottawattamie	161 3/8
Don Van Roekel	Sioux City	1988	Plymouth	161
Terry Davis	Mystic	1988	Appanoose	160 5/8
Curt Miller	Huxley	1988	Polk	160 3/8
Chris Crable	West Burlington	1988	Jefferson	160 3/8
Dan Welcher	Lorimor	1988	Union	160 3/8
Anthony Cantrell	Drakesville	1987	Davis	160 3/8
Daniel Eastman	Marshalltown	1988	Van Buren	160
Greg A. Oldsen	DeWitt	1976	Clinton	159 5/8
Duane C. Lange	McGregor	1988	Clayton	159 4/8
Doyle Curnes	Osceola	1987	Clarke	159 4/8
Danny Fisher	Decorah	1988	Winneshiek	159 4/8
Harold B. Wright	Marshalltown	1988	Marshall	159 3/8
Mike Stieger	Cedar Rapids	1988	Winneshiek	159 2/8
Greg Helms	Elgin	1988	Fayette	159 1/8
Thomas E. Adreon	Pleasantville	1988	Monroe	159 1/8
Russell Towsley	Waterloo	1988	Black Hawk	158 7/8
Dennis Carter	West Burlington	1988	Ringgold	158 6/8
Ken Hootman	Riverside	1988	Washington	158 5/8
Loren Miller	Postville	1988	Allamakee	158 3/8
Jerry Sietz	Lansing	1988	Allamakee	158 2/8
Dennis Clayton	Allerton	1988	Wayne	158 2/8
Brad Vogel	Mercer	1984	Decatur	158 1/8
Joe Smith	Dubuque	1988	Allamakee	158
Dennise Clayton	Allerton	1987	Wayne	157 7/8
Rick Ross	Leon	1988	Decatur	157 6/8

ROGER HILL

Farmers understand that hunting is the best way to control deer numbers, and a higher percentage of those with damage obtained a hunting license (43 percent) than those without damage (24 percent).

Mike Van Der Sloot	Sioux City	1988	Osceola	157 4/8
Lee Foresman	Cleghorn	1988	Cherokee	157 4/8
Bob Sauvain	Woodbine	1988	Harrison	157 3/8
Delbert Cormeny	Ottumwa	1987	Wapello	157 3/8
Karl Klemp	Elgin	1988	Fayette	157 1/8
David Davis	Bloomfield	1988	Davis	157
Clint Garside	Greenfield	1988	Adair	156 7/8
Bob Hagerty	Deep River	1988	Poweshiek	156 5/8
Kevin Alsup	Greenfield	1987	Adair	156 3/8
Dave Posuta	Toledo			156 2/8
Bradley Marlatt	Grinnell	1988	Washington	156 1/8
Ron Prinz	Mount Pleasant	1988	Henry	155 7/8
Phil Ferrel	Fairfield	1988	Jefferson	155 5/8
Brian Harrington	Cedar Rapids	1988	Tama	155 5/8
Richard A. Bird	Glenwood	1970	Mills	155 3/8
Bob Woods	Red Oak	1988	Montgomery	155 1/8
Dale Helle	Mt. Vernon	1986	Dubuque	155 1/8
Don Scott	Missouri Valley	1988	Harrison	154 7/8
Mark Blomquist	Guthrie Center	1986	Guthrie	154 4/8
Mark Wittrock	Halbur	1988	Audubon	154 4/8
Dude Hoehns	Knoxville	1988	Monroe	154 3/8
Daniel E. Taylor	Mitchellville	1988	Wayne	154 2/8
Richard A. Bird	Glenwood	1984	Mills	154 1/8
Mike Mescher	Council Bluffs	1988	Mills	154
Richard A. Bird	Glenwood	1973	Mills	154
Wayne Parker	Pleasantville	1986	Monroe	154
Leonard Kramer	Montrose	1988	Lee	154
Ron West	Centerville	1986	Appanoose	153 6/8
Larry Teal	Whiting	1988	Woodbury	153 6/8
Jack Triska	Salem	1987	Henry	153 4/8
Mike Parks	Melrose	1988	Appanoose	153
Steve Sonntag	Brayton	1988	Audubon	153
Robert Smith	Mount Pleasant	1988	Henry	152 6/8
Brian Deppe	Bellevue	1988	Jackson	152 6/8
Dave Conrad	Fort Dodge	1988	Webster	152 5/8
Larry Berry	Oelwein	1988	Fayette	152 4/8
Kurt Bush	Richland	1986		152 2/8
James Cluney	Washington	1988	Van Buren	152 1/8
Phil Bonnett	Eddyville	1988	Wapello	151 7/8
Tom Thompson	Eagle Grove	1988	Wright	151 6/8
Linda Kenobbie	Greenville	1988	Clay	151 4/8
James Fox	Fort Dodge	1986	Madison	151 3/8
Jim Park	Bedford	1988		151 3/8
Richard Stewart	Cedar Rapids	1988	Lee	151 1/8
Loren Lenth	Luana	1986	Allamakee	151 1/8
Kenny Bartlett	Orient	1988	Adams	151
Paul Stahlnecker	Honey Creek	1975	Pottawattamie	150 7/8
Russell Hillman	Muscatine	1984	Muscatine	150 7/8
Tim Davis	Maquoketa	1988	Jackson	150 7/8
John Peck	Fairfield	1988	Jefferson	150 7/8
Ivyl Gheer	St. Charles	1988	Decatur	150 6/8
Larry O'Tool	Lake City	1987		150 5/8
Rick L. Saltzman	Des Moines	1988		150 4/8
Keith Holdgrafer	Webster City	1986	Hamilton	150 2/8
Tom Petty	Leon	1979	Decatur	150 1/8
Larry Black	Ottumwa	1988	Davis	150 1/8
Greg Buster	Grandview	1988	Louisa	150 1/8
Chris Eckels	Solon	1988		150
Mervyn Dick	Stratford	1962	Hamilton	150
Dale Sturm	Villisca	1987	Montgomery	150

SHOTGUN NONTYPICAL

(Minimum Qualifying Score - 170 points)

	NAME	ADDRESS	YEAR	COUNTY TAKEN	TOTAL SCORE
*	Wendell Prottsman	Mount Pleasant	1988	Henry	238 1/8
	Loras Ernzen	Dubuque	1988	Van Buren	211 7/8
	Larry K. Harrington	Glenwood	1964	Mills	211 1/8
	James C. Reed	New Virginia	1988	Clarke	209 2/8
	Kelly Willis	Des Moines	1988	Monroe	209 1/8
	Kent Vogel	Lineville	1987	Decatur	207 2/8
	Roger Pettit and Wayne Van Mersberge	Bloomfield	1988	Davis	200 7/8
	Randy Kuhnke	Lansing	1987	Allamakee	199 5/8
	Don Jilovec	Mechanicsville	1988	Cedar	199 4/8
	Tracy Long	Albia	1985	Monroe	198 1/8
	Brad Messenger	Keota	1988	Keokuk	195 5/8
	Harry Nicholson, Jr.	Ottumwa	1988	Davis	189 5/8
	Dick Paul	Red Oak	1988	Montgomery	189 4/8
	Don Lent	Marion	1988	Van Buren	189 3/8
	Daniel R. Seda	Cedar Rapids		Fayette	187 7/8
	Richard Binning	Grand River	1988	Decatur	186 6/8
	Charley Daisy	Arlington	1988	Fayette	186 6/8
	Cris Conger	Ollie	1988	Keokuk	186
	Darl Ruble	Corydon	1987	Wayne	182 6/8
	Troy Willie	Farmersburg	1988	Clayton	182 5/8

Damage to corn was reported most often (39 percent) because it was the most common crop planted, is highly preferred by deer and is probably more obvious than damage to other types of crops. The next highest crop reported damaged was soybeans (22 percent) followed by hay (15 percent), oats and wheat (6 percent) and orchards, trees and nursery crops (1 percent).

Damage was reported more often by younger farmers, farmers with larger farms and those with more timber. Younger farmers (20 to 29 years old) may be less tolerant of damage because they have been raised during a period when deer were plentiful and cannot relate to past years when deer were scarce in this state. These younger farmers may also have higher expectations for farm income and profit margins than their elder counterparts. Larger farms experience higher levels of damage probably because of more opportu-

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John Fry	Corydon	1988	Wayne	182 1/8
Jamie Sifford	Elliot	1987		180 1/8
Eric Polich	Woodward	1988	Boone	179 4/8
Mike Paris	Boone	1988	Boone	178 5/8
Ray Newkirk	Hills	1988	Lee	178
Dale Cox	Moravia	1988	Appanoose	178
Alice Griffis	Council Bluffs	1957	Harrison	173 2/8
Steven J. Craig	Des Moines	1987	Monroe	172 6/8
James Schmidt	Keswick	1987		172 6/8
Dr. Charles Wyatt	George	1987	Mills	172 5/8
Ron Bankson	Ottumwa	1988	Lee	171 3/8
Mike Leith	Manson	1988	Harrison	171 3/8
Roger Armstrong	Des Moines	1988	Dallas	171 3/8
Dave Woods	Humeston	1988	Clarke	171 2/8
Dennis P. Schmid	Kingsley	1988	Plymouth	170 6/8
Jarret Golwitzer	Dedham	1988	Carroll	170 3/8
James Lasche	Maquoketa	1988	Jackson	170 3/8

BOW AND ARROW TYPICAL

(Minimum Qualifying Score - 135 points)

NAME	ADDRESS	YEAR	COUNTY TAKEN	TOTAL SCORE
Andy Reynolds	Mount Ayr	1986	Ringgold	172 7/8
Dale E. Smith	Des Moines	1988	Marshall	171 2/8
Bruce A. Mullen	Chariton	1985	Lucas	170 1/8
Paul Fedderson	Anthon	1988	Woodbury	169 4/8
Edward Wagner	Donnellson	1988	Lee	168 3/8
Paul J. Kluesner	New Vienna	1988	Dubuque	165 2/8
Robert L. McDowell	Ottumwa	1988	Wapello	165 2/8
Roger Williams	Council Bluffs	1988	Pottawattamie	164 5/8
Dean Monson	Clear Lake	1988	Cerro Gordo	163 1/8
Troy Wallis	Malvern	1988	Harrison	162 7/8
Jim Kimpston	Riverton	1988	Fremont	161
Jeff Stevenson	Moulton	1988	Appanoose	160 6/8
Noel E. Harlan	Keosauqua	1988	Van Buren	160 4/8
James Fox	Fort Dodge	1982	Madison	160 3/8
Terry Amling	Zwingle	1988	Jackson	158
Jim Humberg	Boone	1988	Boone	157 7/8
Don Allely	Shenandoah	1988	Fremont	157
C. R. Schneider	Carlisle	1988	Warren	156 4/8
Mick Sweeney	Waukon	1987		156
Dan Brimeyer	Sherrill	1988	Allamakee	155 6/8
Thomas L. Tucker	Knoxville	1988	Marion	155 6/8
Ron Nixon	Council Bluffs	1988	Harrison	154 2/8
Dan Mikkelsen	Atlantic	1988	Cass	154
Patrick J. McAndrew	Dubuque	1988	Dubuque	153 4/8
Vernon L. King	Afton			152 7/8
Chuck Ungs	Ames	1988	Boone	151 6/8
Al Foster	DeSoto	1978	Dallas	151 1/8
Dave Rimathe	Slater	1988	Boone	150 6/8
Jeff Gleason	Turin	1988	Monona	150 4/8
Scott L. Powers	Story City	1988	Webster	150 2/8
Steve Cox	Albia	1988	Monroe	150
Kenneth Hebard	Fontanelle	1988	Adair	149 6/8
Ken Uhl	Sioux City	1988	Woodbury	149 6/8
Travis Hansen	Traer	1988	Tama	149 2/8
Jeff Jacobi	Belle Plaine	1987	Benton	148 7/8
Leroy Matthias	Waterloo	1988	Bremer	148
Mark Wilson	Oakland	1988	Pottawattamie	147 7/8
Lyle Sindt	Montpelier	1988	Muscatine	147 4/8
Terry Lee Larson	Chester	1988	Howard	146 6/8
Randy Russell	Washington	1988	Washington	146 6/8
Norman Madison	Belle Plaine	1988	Benton	146 4/8
Susan Snyder	Miles	1988	Jackson	145 6/8
Jim Arnold	Chariton	1986	Lucas	145 3/8
Dan Monson	Clear Lake	1987	Cerro Gordo	145
Mark Thompson	Primghar	1988	O'Brien	145
John R. Koschmeder	Riceville	1988	Howard	144 4/8
Mike Kuethe	Tripoli	1985	Bremer	144 3/8
Larry Blum	Washington	1989	Washington	144 1/8
Mitch Rew	Barnum	1988	Webster	144
Jim Francois	Dubuque	1988	Van Buren	143 5/8
David Walker, Sr.	Oskaloosa	1988	Mahaska	143 5/8
Derick Knowler	Bloomfield	1988	Davis	143 4/8
Charles Norgaard	Spencer	1988	Clay	143 4/8
Ted W. Smith	Oskaloosa	1988	Mahaska	143 2/8
Roger M. Batt	Algona	1987	Humboldt	142 5/8
Dale Ott	Waucoma	1988	Fayette	142 4/8
Dennis Pine	Columbus Junction	1988	Louisa	142 4/8
Brad Huseman	Quimby	1988	Cherokee	142 2/8
Pat Killeen	Carroll	1988	Guthrie	141 6/8
Glenn D. Vondra	Grimes	1988	Madison	141 5/8
Leland Johnson	Orient	1968	Adair	141 3/8
Richard L. Baker	Story City	1988	Boone	141
Dennis Jacobe	Carlisle	1988	Warren	141
Marvin Purcell	Logan	1988	Harrison	140 7/8
Steve Aldrich	Garwin	1988	Tama	140 5/8

nity for interaction between deer and crops. Farms with timber had higher damage levels because of the protective deer cover provided by timber.

As might be expected, farmers with damage were more likely to feel deer numbers were too high and wanted reductions. However, for those farmers that reported damage, only 16 percent wanted deer populations decreased greatly and 42 percent wanted slight decreases while 34 percent wanted populations to remain the same and 8 percent actually wanted increases.

Farmers understand that hunting is the best way to control deer numbers, and a higher percentage of those with damage obtained a hunting license (43 percent) than those without damage (24 percent). In addition, almost twice as many farmers with damage allowed others to hunt on their land than those without damage. Very few respondents had initiated any deer damage reduction options (other than legal hunting) such as deer-proof fencing, repellents or scare devices either because of high cost, lack of effectiveness or lack of knowledge about such devices.

Less than one-third of all farmers surveyed posted their land with "no hunting" signs. Only one out of 10 respondents reported problems with hunters with trespassing being the problem most often encountered. Most farmers felt the few hunter problems they experienced were mainly due to carelessness and ignorance of those involved. This points out the need to increase hunter education programs directed at ways to reduce farmer/hunter conflicts. It does not appear that problems are caused by too many deer hunters since most farmers felt hunter numbers were about right or too low. In general, farmers felt that deer hunters were usually careful with weapons (79 percent), considerate of private property (77 percent), polite to farmers (87 percent), followed hunting regulations (82 percent), avoided littering (82 percent), avoided crippling deer (70 percent) and asked permission to hunt (78 percent).

This survey pointed out many aspects of farmer attitudes about deer and deer hunting that are important to successful management of the herd. Most farmers felt deer herd size was about right even though 42 percent had experienced some crop damage. Only 5 percent of those surveyed reported that crop damage was "unreasonable" while others with damage felt it was "insignificant" or "tolerable" in exchange for the pleasure of having deer around their farms. The majority of farmers used legal hunting to reduce deer problems on their farms, and only 10 percent reported any problems with deer hunters.

Hunting seasons are a major deer management tool because they provide population control to minimize potential damage to agricultural crops and other property. In addition, they provide many hours of quality recreation, as well as an important economic return to local communities in the form of hunter expenditures for goods and services. Hunting license fees are an important source of revenue for DNR programs such as habitat acquisition, research projects, habitat management projects on public and private land, enforcement of regulations and technical assistance for resource management. Deer are very susceptible to hunting pressure in Iowa because of limited timbered habitat, and hunter harvest can be effectively manipulated through regulations to obtain population control. In the end, the deer management program in Iowa must carefully balance public demand for hunting and viewing opportunities with population control to maintain deer numbers that are compatible with agricultural interests.

Dan Wilks	Gowrie	1988	Webster	140 4/8
Dean Westerland	Fort Dodge	1988		140 1/8
Thomas L. Tucker	Knoxville	1983	Marion	140 1/8
Gregory F. Lange	Cedar Rapids	1988	Johnson	139 3/8
Scott Golberg	Cedar Rapids	1988	Fayette	138 7/8
James Hougland	Bloomfield	1988	Davis	138 7/8
Robert Allen	Allerton	1988	Wayne	138 5/8
Chris Barton	Shenandoah	1988	Page	138 4/8
Tom Bluhm	Waverly	1988	Bremer	138 3/8
Jason J. Dannenberg	Sioux City	1988	Plymouth	138 2/8
Bruce Hupke	Carlisle	1988	Warren	138 2/8
Jack Jenkins	Clarion	1988	Wright	138
Jose Valdez	Montpelier	1984	Muscatine	137 7/8
John Carter	Burlington	1988	Des Moines	137 7/8
Tony Pitzen	Hamburg	1987	Fremont	137 5/8
Gary Forkner	Paton	1988	Webster	137 4/8
Paul Goldsmith	Creston	1987	Union	137 3/8
Sam Snyder	Cedar Rapids	1988	Linn	137 1/8
Rick Witt	Maquoketa	1988	Jackson	137 1/8
Ted Grabau	Marshalltown		Marshall	136 7/8
Danny Dickman	Woodbine		Harrison	136 7/8
Dennis Rush	Sloan	1988	Monona	136 7/8
Terry Adams	Menlo	1988	Guthrie	136 7/8
Darvin Dykes	Ottumwa	1988	Wapello	135 5/8
Mike Woolman	Des Moines	1988	Warren	135 5/8
Vern Wunschel	Ida Grove	1988	Ida	135 5/8
Dan Wilson	Blakesburg	1987	Monroe	135 5/8
Bill Ames	Sioux City	1988	Woodbury	135 4/8
Ron Mongar	Avon Lake	1988	Polk	135 3/8
Jack Danner	Knoxville	1988	Marion	135 3/8
Bob Rotherham	Sully	1988	Poweshiek	135 2/8
Sam Sexton	Decorah	1987	Winneshiek	135 2/8
Don Morris, Jr.	Sully	1988	Jasper	135 2/8
George Cason	Sioux City	1988	Monona	135 2/8
Dallas Eakes	North Liberty	1988	Johnson	135 1/8

BOW AND ARROW NONTYPICAL

(Minimum Qualifying Score - 155 points)

NAME	ADDRESS	YEAR	COUNTY TAKEN	TOTAL SCORE
* David Propst	Duncombe	1987	Webster	219 3/8
Tom Heitman	Council Bluffs	1986	Pottawattamie	178
Bill Bonney	Maquoketa	1988		177 7/8
Dan Ruiter	Clear Lake	1988	Cerro Gordo	167
Tony Pitzen	Hamburg	1988	Fremont	166 7/8
Gary Kelderman	Oskaloosa	1988	Mahaska	164 7/8
Harold Carr	Greenfield	1975	Montgomery	162 1/8
Ronald R. Baxter, Jr.	Ottumwa	1988	Louisa	159 2/8
Tom Weighner	Dorchester	1988	Allamakee	161 5/8

Lee Gladfelter is a special projects biologist for the DNR who specializes in deer-related research. He is located in Des Moines.

WARDEN'S DIARY

Getting Involved by Chuck Humeston

I was driving through Belmond, minding my own business, when the driver of a pickup flagged me down. It was not unusual. We get waved down quite often by persons wanting to ask us questions.

When I stopped, imagine my surprise to see someone I had known while working in northwest Iowa. It had been a couple of years since I had seen him. He farmed in a double section with a really nice slough running through his land. It was a haven for wildlife. Every time I see him I think of the circumstances under which we met.

About three years prior, while patrolling some state areas west of Emmetsburg, I heard state radio dispatching a trooper to a farmer having trouble with some hunters. Since I was only about 20 minutes away, I notified the trooper I would also respond.

Arriving at the farm, I found the farmer had chased and stopped a pickup carrying three young men of high school vintage. The farmer was not allowing the pickup to be moved until an officer arrived.

I soon found out the boys had driven past the slough where two occupants riding in the box of the pickup with their guns out, ready and loaded, had been shooting at pheasants. One of them shot a hen, leaving it in the field.

On top of all this, the boy driving the pickup was too young to have a driver's license. It was a situation where an officer could end up with writer's cramp.

Well, the trooper arrived and handled the traffic end of it, and I handled the hunting violations. The boys showed me their hunting licenses, and one also showed me a hunter safety card. We had a little talk about hunting ethics, laws and responsibilities. I asked them, "Did you boys learn anything today?" They answered that they did, vowing to all who would listen they would never do this again. We talked a while longer, and they left sounding like two future sportsmen who had learned a lesson.

So, I asked my friend in Belmond, "Have you caught anyone shooting hens lately?" He shook his head and answered, "Never again will I get involved in anything like that."

Apparently, he had been accosted later by one of the boy's father and friends, quite angry about the boy being "turned in."

I couldn't believe it! Apparently, someone felt it was all right to shoot out of pickups, and to shoot protected game birds. I imagine the talk I had with the boy about safety, laws and ethics was wasted.

It made me feel sorry for the sport receiving another undeserved blow. And I felt sorry for the farmer receiving this grief -- the farmer who spent his life as a sportsman, instilling the same appreciation of the wild in his sons and who had taken it upon himself to take personal action to protect his sport and his tradition. Needless to say, I would not advise anyone to try to apprehend violators. That is what law enforcement officers are trained and paid to do. But most officers I know have a real sense of admiration for the person willing to get involved and to stand up for his or her beliefs.

It is your sport. We cannot preserve it for you. The public has to get involved. It may be a phone call. It may be a call to the TIP hotline. It may be testifying. More than once I have seen the testimony of a concerned person, acting as a witness in court, help decide a case. Sometimes getting involved is not very popular. We know the price. We aren't asking you to do our job for us. You do not have to get as involved as my friend did, but will you help us? Your information might make all the difference.

THE ROLE OF GEOLOGY IN SHAPING THE ARCHEOLOGICAL RECORD

Insights into locating and interpreting remains of ancient American Indian cultures are gained by mapping patterns of erosion and deposition in Iowa's valleys.

by E. Arthur Bettis III

Beginning about eighteen centuries ago, a small band of Native Americans began wintering over in a gully in the Loess Hills, about twelve miles northeast of the junction of the Big Sioux and Missouri rivers. These people were hunters and gatherers who moved with the seasons in order to obtain food and other necessary resources. Deep gullies in the area provided an ideal winter camp — abundant wood for heat and cooking, shallow depths to water, and shelter from winter storms. During their stay the group lived in an oblong structure made from branches pushed into the ground and covered with hides. This house, which was divided into two rooms with a hearth in each, was probably occupied by an extended family. When the weather warmed and the snow began to melt, the group broke camp and moved to the spring hunting area. Their accumulated garbage and abandoned shelter in the gully were soon buried by silt deposited during spring and summer runoff. This scenario was repeated countless times during the next 10 centuries, and the remains of successive occupations were buried as the gully continued to fill with sediment. In time, this wintering area was abandoned in favor of other, deeper gullies which afforded greater protection from the elements.

In June 1976, the Native Americans' former winter camp (known to archeologists as the Rainbow Site) was discovered while planning for the Held Creek Watershed, an erosion and gully-control project in southwestern Plymouth County managed and funded by the U.S. Dept. of Agriculture, Soil Conservation Service (SCS). Since passage of the National Historic Preservation Act of 1966 and the National Environmental Policy Act of 1969, environmental impact statements (EIS) are required for federally funded projects. The purpose of an EIS is to ensure that the environment is not being adversely impacted by the project, or if it is, to mitigate the impact. Part of the environmental assessment involves inventory and evaluation of the historic and prehistoric cultural resources and dig shallow test pits searching for artifacts and other evidence of prehistoric human activity. These techniques work well in upland locations and other portions of the landscape where prehistoric sites are not deeply buried. In valleys, however, deep burial is common, and the difficulty of the archeologists' job is compounded.

Since 1976 geologists working with archeologists in Iowa have begun to unravel the sequence of geologic deposits in which the archeological record is preserved. This work has brought to light little-known aspects of culture history and has raised questions about the distribution and abundance of archeological sites.

It is important to realize that the archeological record is a product of both cultural and geologic factors. Where and when people engage in activities and leave behind artifacts is a cultural phenomenon. Once a site

Changing styles in decorative patterns of prehistoric pottery can date both cultural sites and geologic deposits enclosing them.

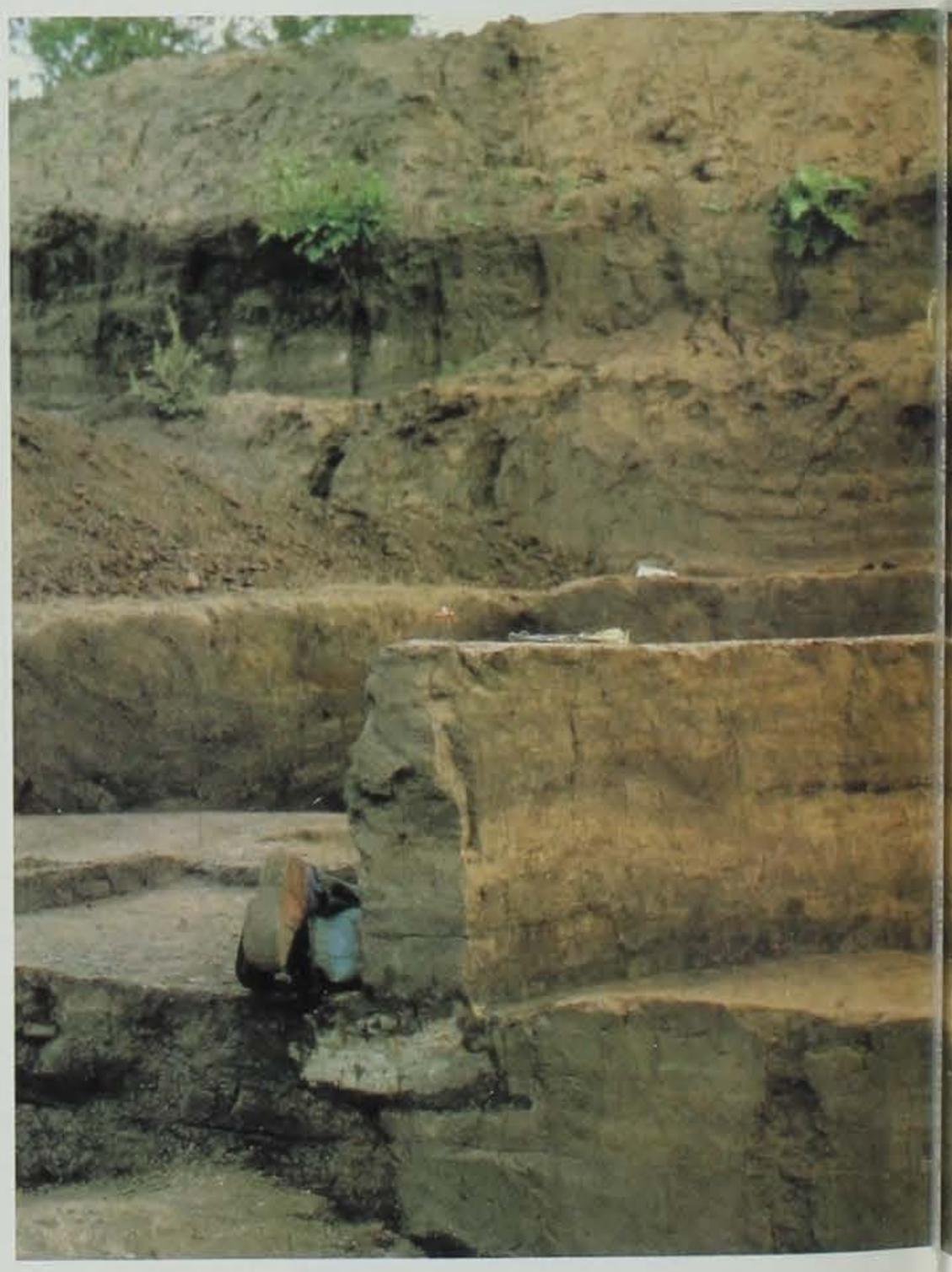
DAVE BENN

is abandoned, however, whether or not it is preserved and becomes part of the archeological record is a geologic phenomenon. This aspect of preservation is especially important in valleys, where stream erosion regularly removes older deposits. Equally important in assessing the archeological record is the potential for younger deposits to bury sites and prevent their detection. These two geologic factors, erosion (destruction) and burial, profoundly shape the archeological record as well as our perceptions of that record.

In western Iowa the inventory of known archeological sites is dominated by those less than 2,000 years old. Scattered evidence, however, indicates that the region was occupied at least 8,000 years ago. Following discovery of the Rainbow Site, the SCS initiated a study aimed at dating episodes of gully growth and filling during the

Charcoal, ash and fired earth are seen in the cross-section of a shelter's hearth (below). Note the dark, circular outline of the shelter's floor (bottom).

DAVE BENN



DAVE BENN

DEAN THOMPSON

last 10,500 years, and tracing distinct gully fills throughout the region. Six distinct fills were present in the area. Each of these accumulated during a specific interval of time and therefore has specific archeological associations.

Mapping the distribution of these deposits permits assessment of the geological potential for a valley to contain archeological remains from the various culture periods defined by archeologists. This assessment enables archeologists to determine which methods are needed to locate cultural resources in an area, and also helps planners avoid impacting high-potential areas, thereby decreasing the need for costly mitigations. The western Iowa studies demonstrated that abundant remains of pre-2,000-year-old occupations are deeply buried in valleys and alluvial fans. The systematic locating of these sites and our subsequent increase in knowledge of these early inhabitants represent a frontier in Iowa archeology.

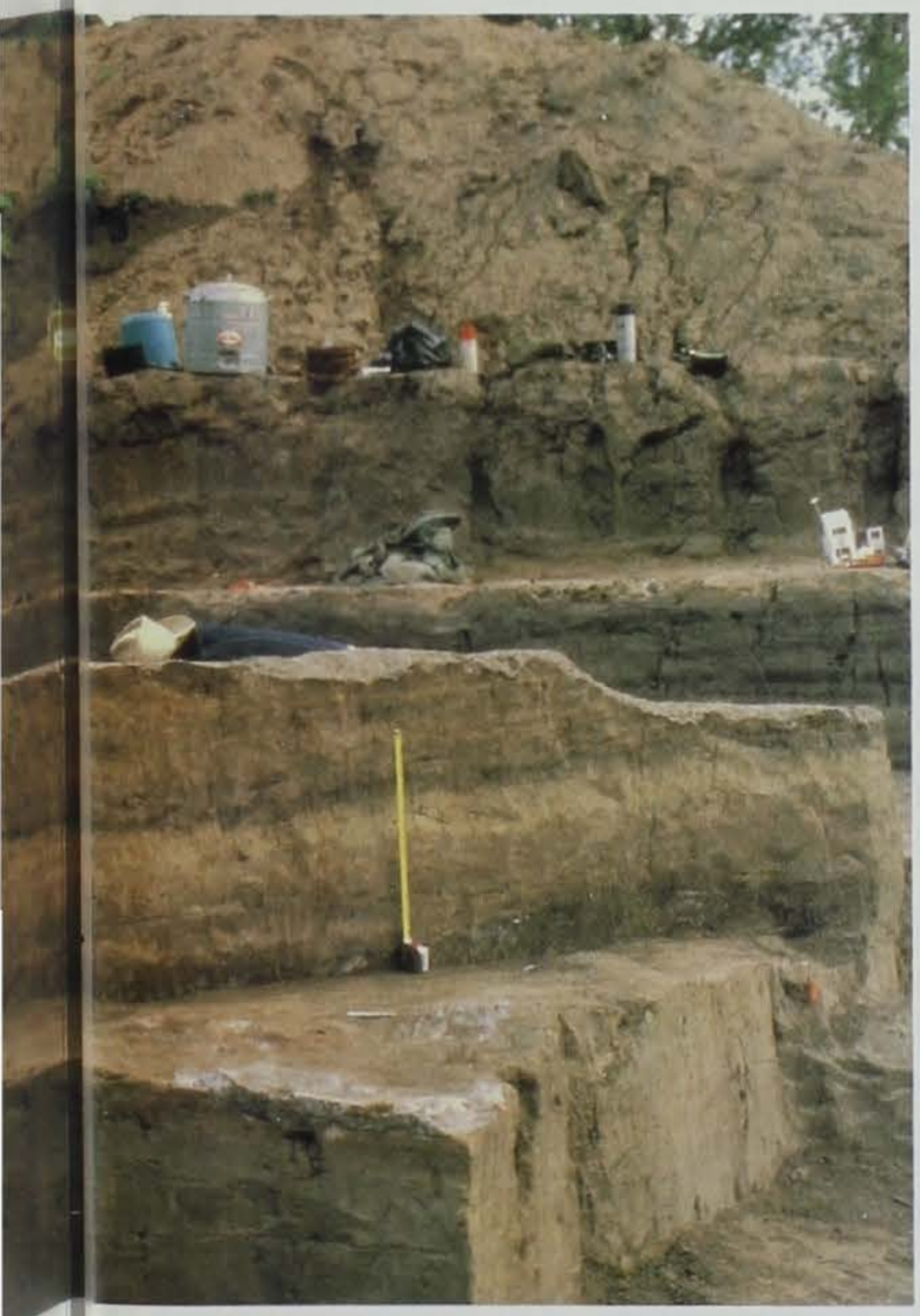
Another example from this rapidly expanding field of archeological geology is the combined archeological and geological investigations of the central Des Moines River valley, undertaken to provide the U.S. Army Corps of Engineers with cultural resource information needed for planning recreational development and interpretive programs in the Saylorville Lake area. Since the 1960s many prehistoric sites have been recorded in this area, but most date from the last 2,000 years. Few deeply buried and stratified sites were recorded prior to the 1984 geologic studies. Stratified sites are especially important to archeologists because they can show successive changes in diagnostic artifacts which can be used to date sites that are not stratified. In addition, bone, ceramics and earthen features such as storage pits are better preserved in buried sites.

Five valley-landform areas were recognized in the Saylorville Lake area; each of these contained deposits that accumulated during a specific portion of the last 11,500 years. Just as in the western Iowa gully fills, archeological associations, and the geologic potential for buried sites from individual culture periods, varied in each landform area. Combining geological mapping with the archeological study revealed that sites older than 2,000 years are not rare, but are rarely evident at the present land surface. Now archeologists know where in the valley these sites are likely to be preserved and that subsurface methods are needed to find them. It was also discovered that even the youngest sites in the valley can be buried and thus "invisible" from the surface using traditional site-locating techniques. Geologic investigations revealed that extensive deposits of historic floodplain alluvium covered previously undiscovered sites of the Oneota culture, the most recent prehistoric occupants of the valley above Des Moines. These studies have improved our understanding of the culture history of the Saylorville Lake area and have pointed toward productive avenues of future research.

Archeological geology continues to grow in its applications and scope in Iowa and elsewhere. It holds promise for unravelling some enigmas of archeological site distribution and culture history. The results of archeological-geology studies benefit archeologists, planners, conservationists, and through more effective use of federal funds, all taxpayers.

Reprint from *Iowa Geology, 1988*, pages 12 through 15.

E. Arthur Bettis III is a geologist with the department's geological survey bureau and is located at Iowa City.



Within the strata revealed in this large excavation pit at the Rainbow Site in Plymouth County were several superimposed house structures. Each dark, organic-rich band indicated a winter-long encampment in this western Iowa gully. Successive occupation sites were buried as the gully continued to fill with silt.

1989-90 Seedling Price List

Application is found on the following page. Send completed application to:

State Forest Nursery
Iowa Department of Natural Resources
2404 South Duff Avenue
Ames, Iowa 50010

Dear Cooperators:

Conservation-minded Iowa citizens have accepted a goal of three million acres of quality woodland. Tree planting is an important component of this goal. We urge you to place your order early to assure sufficient planting stock for your needs.

To make it easier to order trees we encourage you to use the phone. Just call the State Forest Nursery at 515/233-1161 to place your order.

To better serve you we have instituted a new means of payment. For orders over $200 the nursery will bill you for ten percent of the cost with the remainder to be paid by March 1, 1990.

If you are planning to plant over three acres of trees, please contact your district forester for information on the new state cost sharing program.

A word about seed source. To assure success, plants must be grown from seed that is adapted to local conditions. You can be assured the State Forest Nursery uses seed suitable for Iowa conditions.

Please feel free to contact the nursery or your district forester for additional assistance.

Sincerely yours,

Bill Farris

Bill Farris
State Forester

To Help You Order

Phone Orders — For your convenience use our phone order system to order your plants. Just call the State Forest Nursery at 515/233-1161 to place your order.

Payment — For orders over $200 the nursery will bill you for 10 percent of the cost with the remainder to be paid by March 1, 1990. **Do Not** send money with your order.

Spring Delivery — Spring orders are usually sent out during the month of April. As we did last year, plants will be shipped via a state refrigerated truck to a drop-off point in each county.

Claims — Claims for any cause must be made within 10 days after receipt of the plants. We give no warranty expressed or implied as to the productiveness or life of the material, and will not be in any way responsible for results or economic losses incurred or claimed by the customer.

Restrictions — The nursery stock must be planted and used for establishing or improving existing forest, erosion control, game or water conservation. These restrictions apply: These plants can not be resold or given away with roots attached, to any person, firm, corporation, or agency or planted for new windbreak, shade or ornamental purposes. All plantings must be protected from fire and domestic livestock grazing. All trees planted or used in violation of the above restrictions are subject to forfeit for destruction.

Refunds — No refunds after March 1.

For Orders Over $200
10 % Down -- Remainder To Be Paid By March 1, 1990

1. Fill in the number wanted column.

Plants Available

Wildlife and songbird packets can be ordered separately

	Cost/Packet	Code	Number of Packets	Office Use
Wildlife Packet	$30.00	96		
Songbird Packet	$15.00	95		

(Do not order less than 500 plants and order in units of 100)

Species	Height	Cost/Hundred	Code	Number of Plants	Office Use Only
White Pine	8-14"	12.50	30		
Scotch Pine	8-14"	12.50	20		
Red Pine	8-14"	12.50	17		
Ponderosa Pine	6-12"	12.50	15		
Jack Pine	8-14"	12.50	10		
Red Cedar	6-14"	12.50	16		
Norway Spruce	8-14"	12.50	13		
White Spruce	8-14"	12.50	43		
Black Walnut	10-18"	18.00	24		
Green Ash	8-18"	18.00	08		
White Ash	8-18"	18.00	28		
Silver Maple	8-18"	18.00	21		
Red Oak	8-14"	18.00	41		
White Oak	6-12"	18.00	29		
Bur Oak	6-12"	18.00	04		
Mixed Oak	6-14"	18.00	51		
Hybrid Poplar (rooted cutting)	8"	18.00	53		
Russian Olive	8-16"	18.00	19		
Autumn Olive (Cardinal strain)	6-14"	18.00	03		
Tatarian Honeysuckle	8-16"	18.00	23		
Amur Honeysuckle	8-16"	18.00	01		
Redosier Dogwood	8-18"	18.00	18		
Gray Dogwood	6-12"	18.00	07		
Common Lilac	6-12"	18.00	47		
Chokecherry	8-16"	18.00	39		
Wild Plum	10-18"	18.00	31		
Osage Orange	8-18"	18.00	14		
Ninebark	6-14"	18.00	12		
Siberian Crab	6-12"	18.00	46		
Nanking Cherry	8-16"	18.00	79		

1990 ORDER FORM

Spring Planting 1990

2. Address

(Please Print)

(Landowner Name - Please Print)

(Mail Address)

(City) (State) (Zip)

(Area Code / Phone Number0

3. Check One Box

☐ I will pick up my order at the nursery when notified.

☐ Delivery to a drop off point by refrigerated state truck. List county where seedlings are to be delivered.

County

4. Please Answer Each Question

1. These trees are to be planted in _____ County.
2. Are you a tax-exempt government? ☐ Yes ☐ No
3. Did you purchase plants from the Nursery last year? ☐ Yes ☐ No
4. Are you cooperating with a Pheasants Forever chapter? ☐ Yes ☐ No
5. Will some of the trees be used for Christmas trees? ☐ Yes ☐ No

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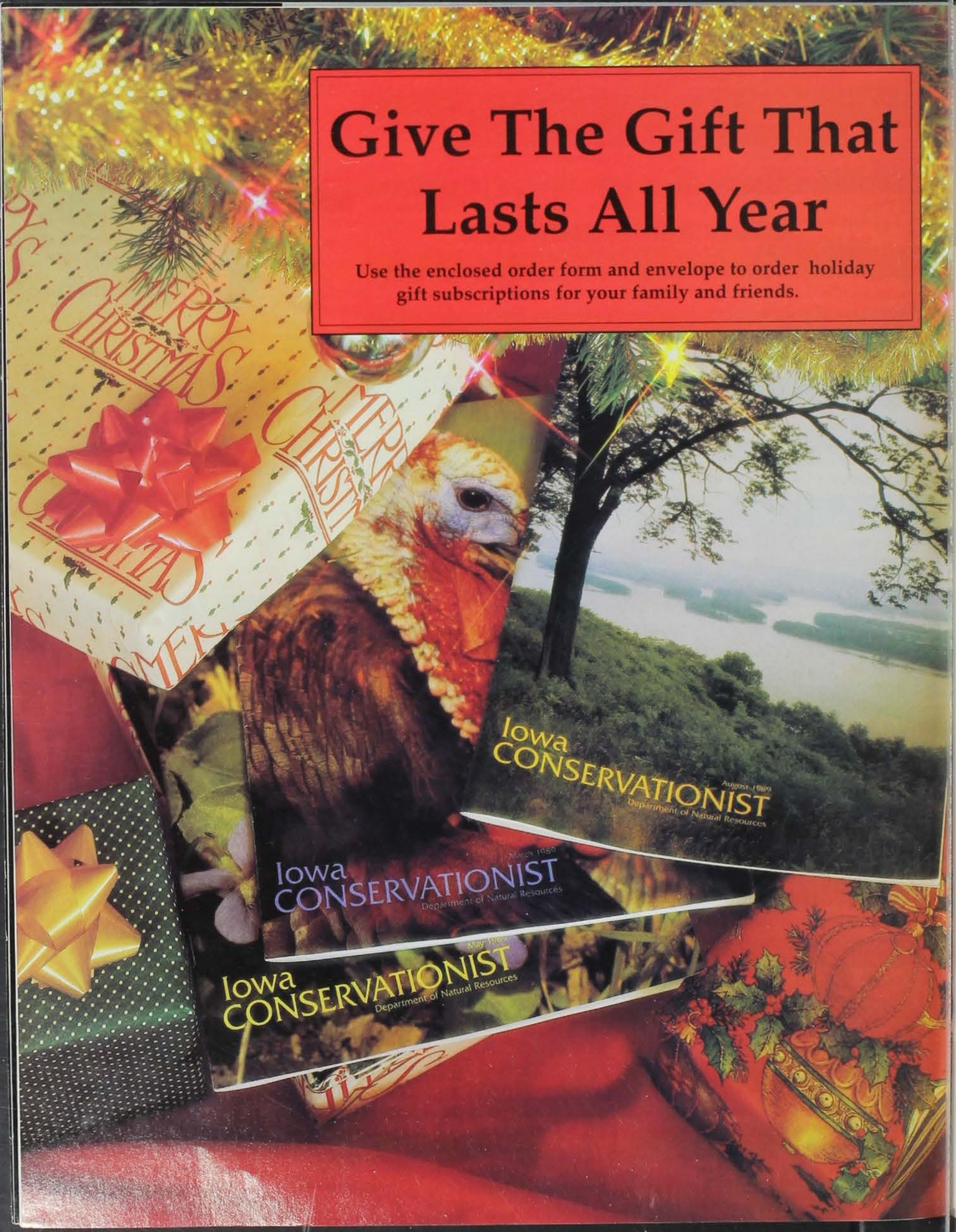
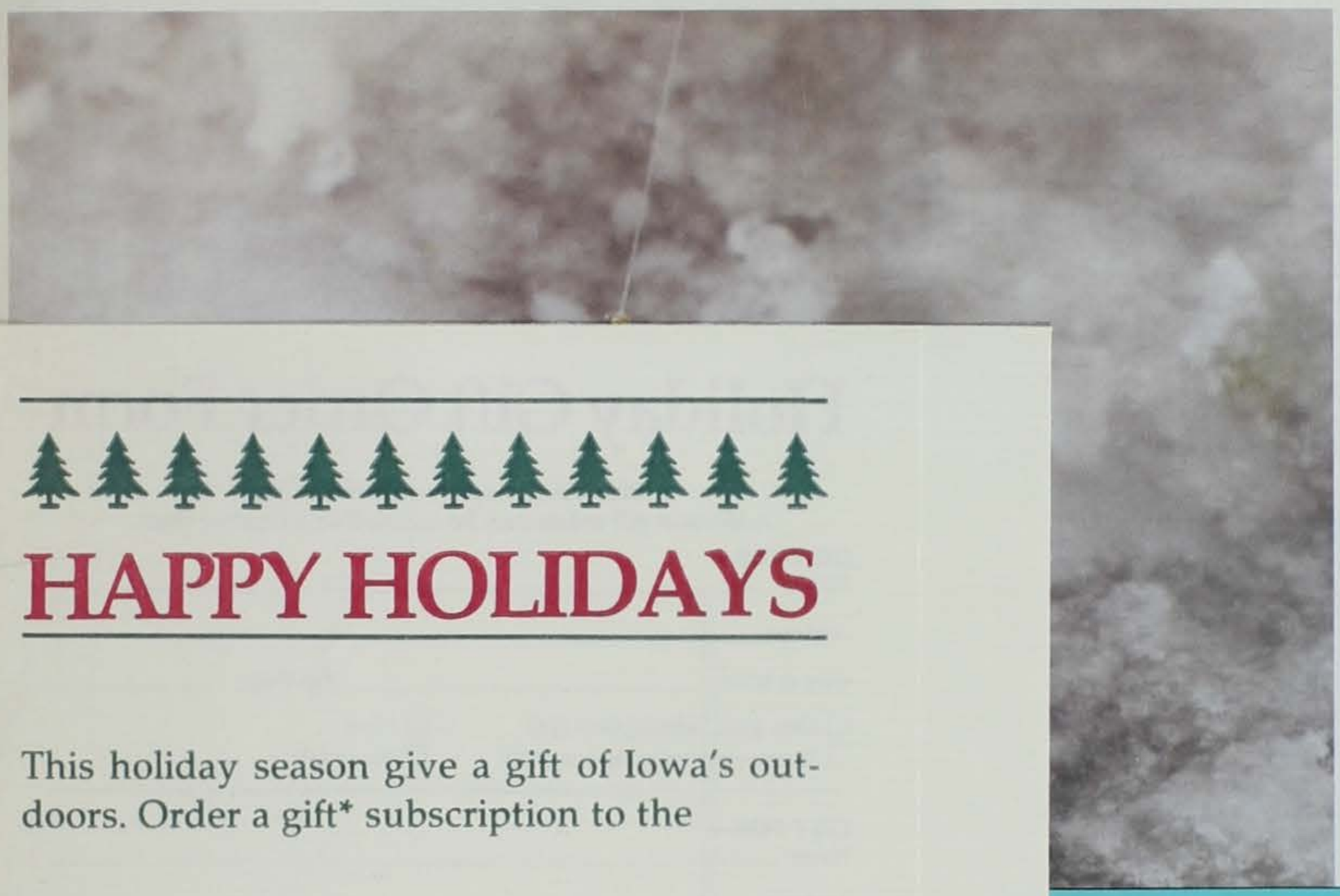
Use the enclosed order form and envelope to order holiday gift subscriptions for your family and friends.





WAYNE LONNING

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This holiday season give a gift of Iowa's outdoors. Order a gift* subscription to the

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*Each magazine recipient will be sent a beautiful, full-color 1990 **Iowa CONSERVATIONIST** Calendar (December 1989 issue) and a gift card notifying them of your thoughtfulness.

Additional calendars may be ordered for $3 each.

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Ed Kocal

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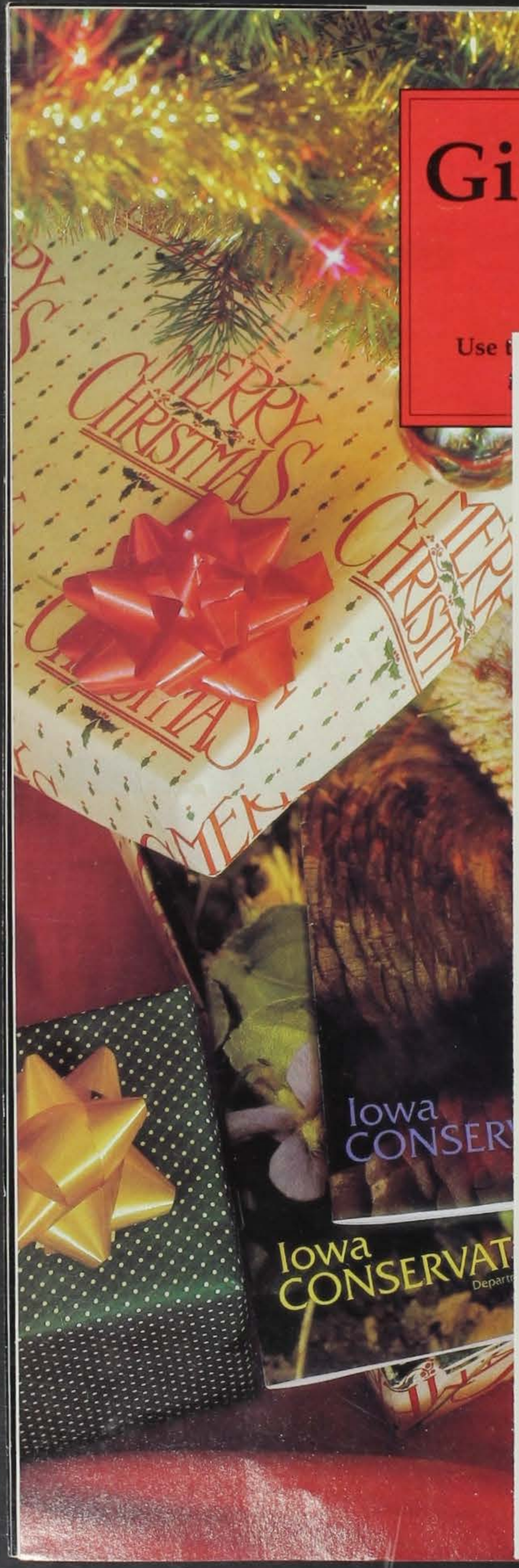

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Holiday Gift Order Form

Please include payment with order.
Additional gift orders may be enclosed on a separate sheet.

GIFT FOR—
Name _____

Address _____

City & State _____ Zip Code _____

☐ One-year subscription ($6) ☐ New
☐ Three-year subscription ($12) ☐ Renewal

GIFT FOR—
Name _____

Address _____

City & State _____ Zip Code _____

☐ One-year subscription ($6) ☐ New
☐ Three-year subscription ($12) ☐ Renewal

GIFT FOR—
Name _____

Address _____

City & State _____ Zip Code _____

☐ One-year subscription ($6) ☐ New
☐ Three-year subscription ($12) ☐ Renewal

GIFT FROM—

Please be sure to fill in this portion.

My name _____

My address _____

City & State _____ Zip Code _____

Enter my own subscription to the **Iowa CONSERVATIONIST.**
If possible, please include your mailing label.

☐ One-year subscription ($6) ☐ New
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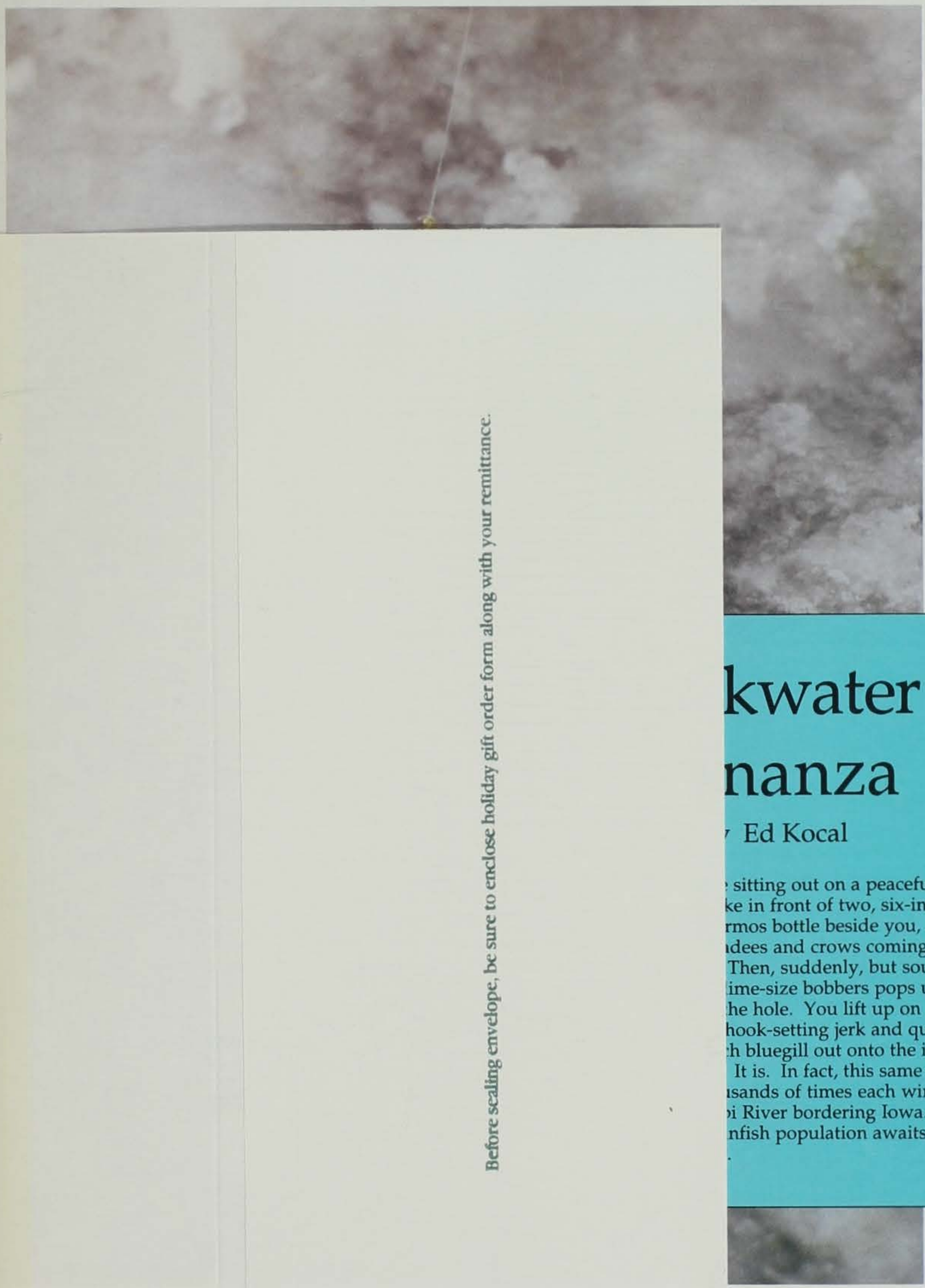
☐ Please send me _____ 1990 **Iowa CONSERVATIONIST** Calendar(s) (December 1989 issue) ($3 each)

Please make checks payable to the Iowa Department of Natural Resources.

Please allow eight weeks for subscriptions to begin and to receive calendars.
Quantities are limited.
Offer expires January 15, 1990.



WAYNE LONNING

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Before sealing envelope, be sure to enclose holiday gift order form along with your remittance.

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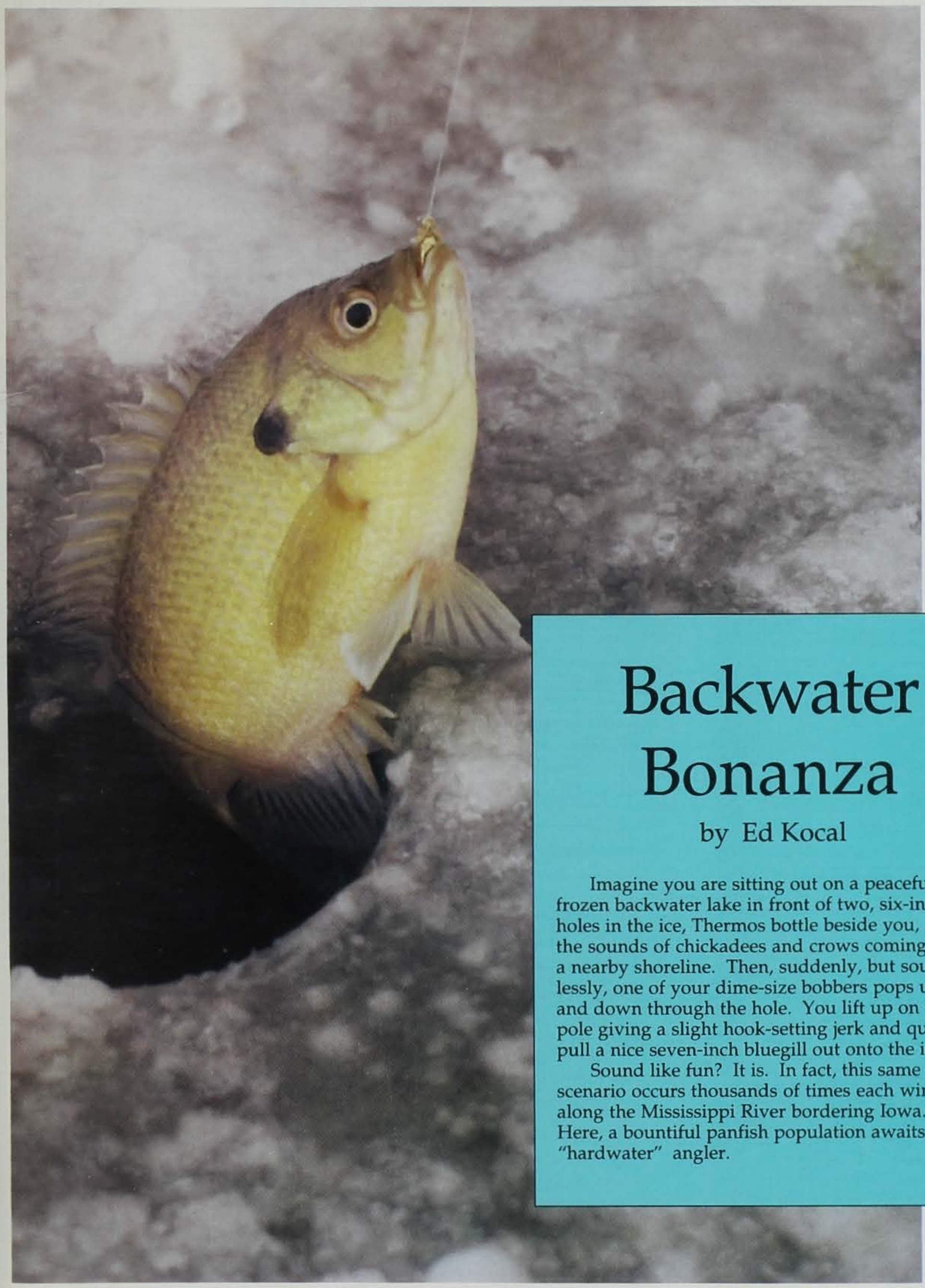


WAYNE LONNING

Backwater Bonanza

by Ed Kocal

Imagine you are sitting out on a peaceful, frozen backwater lake in front of two, six-inch holes in the ice, Thermos bottle beside you, and the sounds of chickadees and crows coming from a nearby shoreline. Then, suddenly, but soundlessly, one of your dime-size bobbers pops up and down through the hole. You lift up on your pole giving a slight hook-setting jerk and quickly pull a nice seven-inch bluegill out onto the ice.

Sound like fun? It is. In fact, this same scenario occurs thousands of times each winter along the Mississippi River bordering Iowa. Here, a bountiful panfish population awaits the "hardwater" angler.

Waxworms are the preferred bait used to tip the jigs or hooks.

KEN FORMANEK

So what's the catch? Well, literally speaking, the catch is roughly 80 percent bluegill, with the remainder comprised of crappies and an occasional large-mouth bass, yellow perch or northern pike. Most of these fish are caught in shallow, two- to six-foot deep, backwaters accessible from the main shoreline. The advantage of fishing these spots is

A Lesson Learned

by Tom Putnam

Friday afternoon, late December was not like any other Friday — it was Christmas time. Driving home from a meeting in Des Moines, my thoughts turned to shopping still undone and good times ahead with friends and relatives.

It was also nearing the start of the ice fishing season and the prospect of checking out the north end of Big Creek Lake for a weekend fishing report piqued my curiosity. Usually, I fished with a buddy, but since I was by myself, what could an hour hurt? Little did I realize that in an hour I would almost end my fisheries career and nearly ruin Christmas for a lot of other people as well.

The new ice on Big Creek looked thin so I drilled several test holes near the shore to convince myself it would support my weight. It appeared to be about one inch thick, but was holding up just fine. The ice creaked and groaned as I advanced the 150 yards to my favorite spot. It also felt a bit spongy which was a good indication I had no business being out there.

While augering my first (and only!) hole, water gushed up as the ice began to sink. I reached for my equipment to make a hasty retreat, but it was too late. One step and the ice gave way, plunging me into seven feet of water so cold it knocked the breath out of me.

After cussing myself out for "being such an idiot," I tried not to panic and surveyed my situation. "Maybe I could frog-kick my way back up onto the ice." Several attempts proved futile, though, as the combined weight of my body and soaked insulated clothing broke the ice away with each lunge. "What about breaking my way to shore by hammering the ice with my elbows?" After a few tries, my elbows were too sore to continue.

I was beginning to realize that there was no easy way out. I had to do something soon, since it was becoming more difficult to remain afloat. "Maybe I should get rid of the boots and coveralls? But, they were probably helping to insulate me from the cold water — best to leave them on."

Then I saw it. Across the now six-foot diameter hole was the five-gallon plastic pail I always use to carry fishing equipment out onto the ice. Dog paddling over there, I dumped my gear, turned the pail upside down, gripped the handle and plunged it into the water beside me. The surprisingly buoyant pail offered plenty of support to keep me on the surface. I clung to this make-shift preserver for nearly one hour, calling for help.

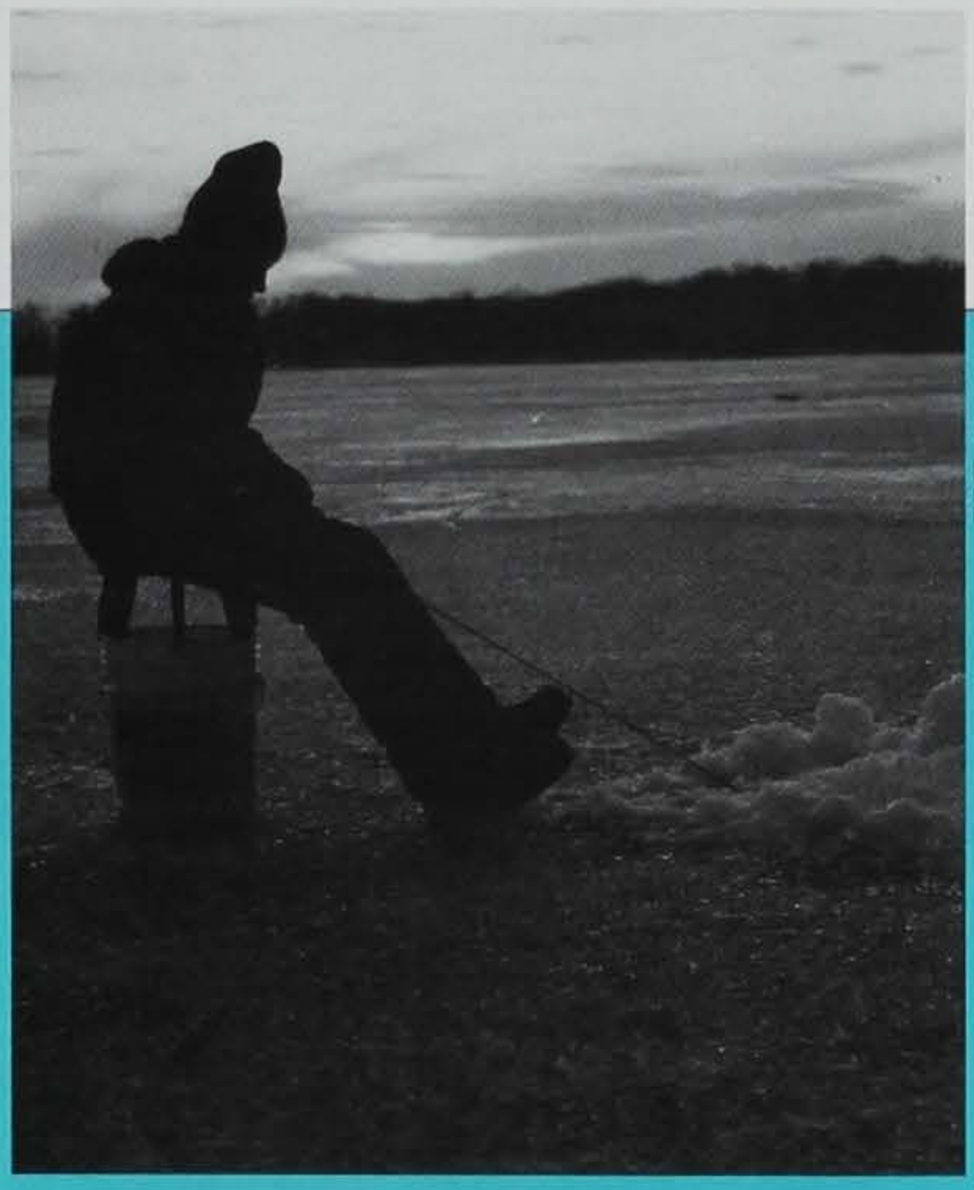
I had nearly given up hope when two rabbit hunters and a fisherman on a nearby pond finally heard my cries for help. With a small boat and the aid of many other volunteers, they were able to drag me to shore. Since I had lost consciousness, Lifeflight attendants

that you do not have to traverse areas with current or open water.

The best fishing success, and consequently the greatest angling pressure, generally takes place during the early part of the season after the first safe ice forms (remember, river ice is weaker and more variable than lake ice) and usually tapers off toward ice out. However, there is often a peak in the action again toward the end of ice season.

As is the case with ice fishing a farm pond or lake, most bluegill are caught in the early morning and again from late afternoon until dark. Crappie, on the other hand, seem to bite best for a couple hours after dusk and again for an hour or two before dawn. A lantern placed away from the hole works well for this time period.

In describing tackle selection, small is the key here. A tiny ice jig with a #8 to #12 hook works best for panfish. Hooks smaller than #12 tend to get swallowed too easily by the fish. A plain fine-wire hook with a BB-size or smaller split-shot placed eight inches or so above it also works well, particularly if a small brightly colored bead or two is slid onto the line above the hook. Waxworms, which are the larvae of wax or bee moths, are the favored bait used to tip the jigs or hooks.



JULIE SPARKS

A five-gallon plastic bucket can save a life. It did for Tom Putnam.

immediately cut away icy clothing and began attempts to reverse my declining body core temperature which had fallen to 81°F. I was flown to the hospital and in 24 hours I was out of intensive care. In three days, I was back home with my family and thankful for celebrating Christmas together. It was the best Christmas we ever had.

Having been given a second chance, I am now acutely aware of the importance of safety equipment and procedures. I cannot emphasize the following safety procedures enough:

- Always go ice fishing with a buddy.

- Examine the ice carefully, looking for openings caused by springs or wind action.

- Avoid fissures where the ice is buckled up. Open water may also be present.

- Check the ice for depth. Two to three inches are mandatory to safely support an average person.

- Do not congregate on thin ice (less than six inches). Spread anglers out over a larger area to better support the weight.

- Do not drive a vehicle onto the ice unless there are 12 to 15 inches of good ice to safely support your vehicle. On artificial lakes, the best advice is to park and walk.

Remember the following safety equipment advice:

- Wear proper clothing consisting of several layers, so articles can be removed or added depending on the weather. Include a hood and stocking cap.

- Use heavy insulated boots to stop the cold infiltrating from the ice. Include a pair of heavy wool socks.

- Bring two pairs of gloves in case one gets wet while handling fish.

- Add a float coat or other approved personal flotation device to your ice fishing gear. A float coat is warm and comfortable apparel that may prove to be cheap insurance.

- Attach ice creepers to your boots, especially on glare ice, to prevent injury from slipping.

- Buy a 100-foot length of 1/4-inch nylon rope, weighted on one end to sling across the ice to someone who has fallen through.

- Make ice picks. A pair of these could be invaluable in helping to pull yourself out of the water. Picks can be as simple as a 16-penny nail driven into a five-inch section of broom handle and sharpened to leave one inch visible.

- Carry a five-gallon plastic bucket! I am positive the bucket saved my life.

Just remember to play it safe. Do not take unnecessary chances when ice fishing. An error in judgment could cost you a lot more than an afternoon's fun. It nearly cost me my life!

Tom Putnam is a fisheries management biologist for the department and is located in Boone.

SONNY SATRE

As with most fishing on the Big River, brightly colored lures are the rule rather than the exception. Bright green, chartreuse, orange and red are the most popular colors of ice jigs, which often have a chrome finish on one side. Spider and ant imitations are also quite productive. Another effective lure is one that is easily made by taking a gold wire hook, bending the barb down, and sliding a few small craft beads onto the shaft, then carefully bending the barb back out. This "trick," which seems to be favorite of Pool 14 anglers, has taken many a crappie. A small minnow fished on a bare hook is another "crappie-getter."

ED KOCAL

Line should be light. Four-pound test will provide all the strength necessary to ice panfish yet allow the angler to give his bait plenty of enticing action. Jigging the bait up and down in small movements will often result in more fish creeled, particularly during the slower mid-day period.

Poles of nearly any type will work, from a single length of dowel rod or the broken end of a fishing pole (we all have a few of those) to the commercially made fiberglass or graphite models. Although you are allowed to fish with two poles, when the action gets hot, one pole may be all you can handle.

Bobber selection seems to be a matter of personal preference. A conventional, tiny, round bobber made from any variety of buoyant materials will work fine. However, floats made of squeezable foam rubber allow you to simply pinch them to remove the buildup of accumulated ice. This sure beats the old "pop it in your mouth" remedy! A variety of "spring type" bobbers are also available which allow the line to run through a guide on a thin piece of flexible metal or wire fastened to the rod tip. These ultra-sensitive devices can also be made from an over-stretched pen spring. Spring bobbers work great, as long as they are sheltered from high winds.

Portable commercial ice shelters, many of which allow for a darkhouse effect inside, seem to be gaining in popularity among Mississippi River ice anglers.

However, homemade huts or lightweight windbreaks are still common. Visit a popular ice fishing spot along the river in northeast Iowa and you will see a myriad of shelter shapes, sizes and materials with the imagination being the only limit. There are, of course, the hardy souls who prefer the cylindrical, unidirectional, multipurpose ice fishing apparatus (also known as the five-gallon bucket). This represents the utmost in simplicity and portability. When action is hot, these fish-carrying devices are often a measure of the day's success.

Tip-up fishing is another option on the Mississippi as well. Anglers may take advantage of the new regulation allowing up to three tip-up fishing devices in use on the Mississippi River and its connected backwaters, in addition to your two lines. What an opportunity to catch big northern pike! This largely under-used resource awaits the cunning angler who desires to go after a real trophy.

Tip-ups vary in style, but all have a brightly colored flag which signals when a fish strikes. Large shinner minnows or chubs are the preferred bait of tip-up anglers. These are often used with a sturdy hook and monofilament leader attached to dacron or braided nylon line in the 20-pound test category. This form of ice fishing should undoubtedly increase in popularity on the Mississippi as more folks become aware of the fun.

So here you have it: an abundant panfish population, a largely under-used northern pike population, and a winter getaway within easy access of many Iowans. It is here for those willing to put forth a little effort. And you never know, that trophy that got away last time may wind up in your creel!

Ed Kocal is a fisheries management technician for the department. He is located at the Fairport Fish Hatchery in Muscatine.

Where To Go

Although there are 313 miles of Mississippi River bordering Iowa, much of the ice angling takes place in selected areas. The following is a list of some of the more productive areas which are easily accessible.

Pool 9
Black Hawk Park, DeSoto Bay, Big Lake Area*, Winneshiek Bottoms, Red Oak Lake.

Pool 10
Gordon's Bay, Ambro-Gremare Lake*, Causeway, Highway 18, McGregor Lake, Sny-Magill Area*, Ferry Lake, State Line Ponds, Duck Lake*, Frenchtown Lake*, Bussey Lake*.

Pool 11
Swift Slough*, Long Slough, Bertram Lake, McCartney Lake Area, Lynn Hollow.

Pool 12
Sunfish Lake, Menominee Slough, Frentress Lake, Harris Slough, Younkers Slough, Wise Lake.

Pool 13
Brown's Lake, Barge Lake, Dead Lake, Spring Lake, Pin Oak Lake, Middle and Lower Sabula lakes.

Pool 14
Cattail Slough, Rock Creek Area, Grant Slough.

Pool 16
Davenport Harbor.

Pool 17
Big Timber, Hidden Acres, Eagle Fill, Lake Odessa. *Note:* These locations contain areas with dep dredge holes which do not always freeze solid. Extra caution must be exercised!

Pool 18
Boston Bay, Lower Burnt Pocket.

Pool 19
Devil's Creek Area, Ortho Access, Triangle Lake.

*Denotes areas which have high potential for northern pike.

Additional information may be obtained by contacting the following three fisheries stations located on the Mississippi River: Bellevue Research Station, Route 3, Bellevue, Iowa 52031; Fairport Fish Hatchery, Route 3, Muscatine, Iowa 52761; Mississippi River Fishery Management Station, 317 River Park Drive South, Guttenberg, Iowa 52052.

CONSERVATION UPDATE

Deer Regulation Changes -- Why?

by Willie J. Suchy, deer management biologist

Several changes have occurred in the deer hunting regulations this year. These changes allow more people more opportunity to harvest more deer. Many hunters will have the opportunity to harvest two deer this year, and in most instances, the second deer must be an antlerless animal, hopefully a doe.

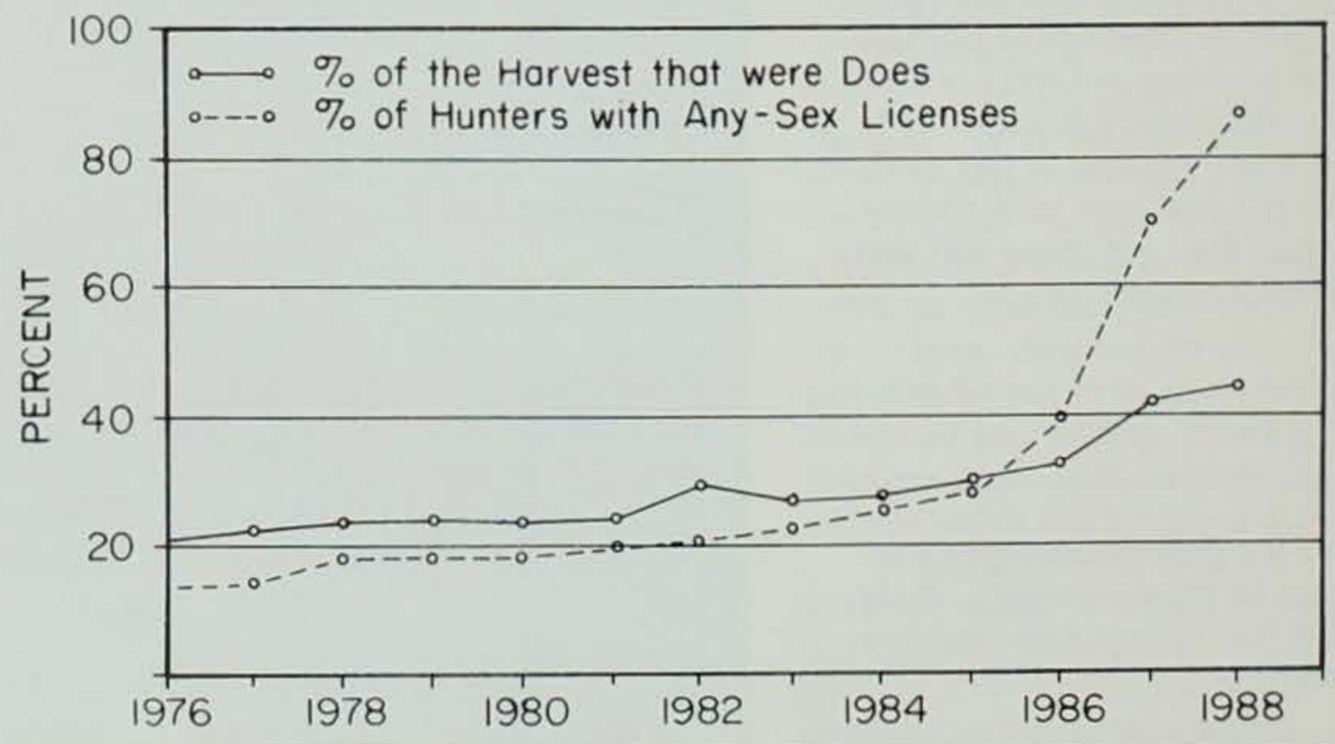
Because Iowa's deer population continues to expand, an unlimited number of any-sex licenses will be issued this year. In addition, many hunters will also have the opportunity to take two deer during this winter's hunting season. DNR management biologists hope the record number of licenses issued will help stabilize the state's deer population.

In the past, the Iowa Department of Natural Resources' deer management objective was to allow the deer population to grow and expand its range. That goal has been met. The record harvests during the last nine years, coupled with the variety of different hunting seasons offered, indicate high hunter success rates.

This growth was accomplished by restricting the number of does that were taken. Various regulations have been used to accomplish this, including closed seasons, limited number and type of licenses issued and the change in length of the season. Since 1972 an unlimited number of deer licenses have been issued but the number that were valid for any-sex deer was restricted. This allowed all hunters the chance to enjoy the sport of deer hunting, yet still limited the number of does that were taken.

In the mid-1980s the deer management objectives began to change. The decision was made that deer populations should be stabilized in areas with adequate deer numbers. To accomplish this, the quota of any-sex licenses was increased in these areas. By 1988 quotas had been eliminated in all hunting zones except one and two. Quotas on these zones were removed this year. Figure 1 (below left) illustrates that the percent of does harvested increased. However, the increase between 1987 and 1988 was not as large as between 1986 and 1987. This indicates that after a certain point, increasing the

Figure 1. The percent of hunters with any-sex licenses compared to the percent of the harvest that were does.



number of hunters with any-sex licenses does not increase the proportion of does in the harvest.

Although the growth rate of the deer population has slowed, it appears that more does need to be harvested to stabilize the population. This need explains the changes in the deer hunting regulations this year.

One change was to make special licenses available in areas with high deer numbers and low hunter numbers. These licenses areavailable to regular season shogun hunters in zones four, five and six. These bonus tags are for antlerless deer only. The intention is to allow hunters already hunting in these zones the opportunity to harvest more deer. The licenses are restricted to the second season to encourage more hunters to try this season instead of the more crowded first season.

Special licenses are also available to archery hunters. For the first time, bow hunters can harvest two deer with a bow. This tag is also for an antlerless deer. The intention of this change is to provide more hours of recreation for these bow hunters as well as to allow them to harvest a few more does.

Hunters are also allowed to buy a second tag for the late muzzleloader season. This tag is not an antlerless tag since close to 60 percent of the deer harvested during this season usually are does. And if we add to this the proportion of the reported buck harvest that are buck fawns, then about 75 percent of the harvest probably already consists of antlerless deer.

Hopefully these changes will result in more does being harvested and in more stabilized populations. If not, more does will need to be harvested in the future to reach deer management objectives.

Although the purpose of these changes has been to harvest more does, an additional benefit is that it should result in a deer herd with a more balanced sex ratio and more mature bucks. This should occur since hunters are no longer forced to keep hunting for a buck to fill their tags. Therefore, many hunters who in the past would have taken a buck will take a doe before this opportunity arises. In fact, hunters who would like to build a better herd in their area might consider passing up yearlings and button bucks and taking a doe when they cannot find a mature buck. If left to mature, these animals will become quite impressive at three to five years of age.

Three conservation organizations in Iowa are participating in a joint fund-raising project for the North American Waterfowl Management Plan (NAWMP) . The Iowa Wildlife Federation will donate two art prints to each Pheasants Forever chapter and Ducks Unlimited group in Iowa to be auctioned at local banquets. Proceeds received from the sale of the art prints will go for wetland habitat acquisition and restoration.

The art prints include a pheasant walking through a snowy underbrush, by Jack Hahn of Amana, and a pair of river otters, by James Landenberger of Cedar Rapids.

Representatives from the organizations participating in the project are Jim Wooley (left), Pheasants Forever regional representative; Loren Forbes (center), Iowa Wildlife Federation president; and Greig Jones (right), Ducks Unlimited regional director.

All-Time Top 10 Racks

*New *Top 10* Entry. See page 6 for the *1989 Record Deer Racks.*

Shotgun Typical

Name	Address	Year	County Taken	Total Score
Harold Dickman, Sr.	Woodbine	1964	Harrison	200 2/8
Wayne A. Bills	Des Moines	1974	Hamilton	199 5/8
Kenneth Tilford	Lamoni	1985	Decatur	198 1/8
George L. Ross	Ottumwa	1969	Wapello	195 1/8
Bob Jackson	Des Moines	1983	Madison	191
* Monty Stark	Mt. Pleasant	1984	Henry	189 3/8
Gregg Redlin	Iowa City	1983	Johnson	187 6/8
Dennis Vaudt	Storm Lake	1974	Cherokee	187 5/8
Roy Metzger	Bloomfield	1985	Davis	186 7/8
Randall Forney	Glenwood	1971	Fremont	186 2/8

Bow and Arrow Typical

Name	Address	Year	Cunty Taken	Total Score
Lloyd Goad	Knoxville	1962	Monroe	197 6/8
Robert Miller	Wyoming	1977	Jones	194 2/8
Richard Swim	Des Moines	1981	Warren	190 5/8
Robert McDowell	Ottumwa	1985	Wapello	183 4/8
Vern Backstrom	Des Moines	1986	Polk	180 1/8
Glen Thompson	West Burlington	1987	Des Moines	177 5/8
Ernie Aronson	Davenport	1985		177 1/8
Gary Wilson	Cherokee	1974	Cherokee	175 4/8
Gordon Hayes	Knoxville	1973	Marion	175 1/8
Don McCullough	Conesville	1980	Muscatine	174 7/8

Shotgun Nontypical

Name	Address	Year	County Taken	Total Score
Larry Raveling	Emmetsburg	1973	Clay	282
Carroll Johnson	Moorhead	1968	Monona	256 2/8
David Mandersheid	Welton	1977	Jackson	253 3/8
* Wendell Prottsman	Mt. Pleasant	1988	Henry	238 1/8
Edgar Shields	Grand River	1986	Decatur	229 6/8
Bob Harding	Pleasantville	1985	Wapello	229 3/8
Duane Fick	Des Moines	1972	Madison	228 2/8
LeRoy Everhart	Sumner	1969	Van Buren	224 4/8
Todd Hawley	Panora	1982	Guthrie	224 2/8
James Fine	Moulton	1987	Davis	222 4/8

Bow and Arrow Nontypical

Name	Address	Year	County Taken	Total Score
Jerry Monson	Clear Lake	1977	Cerro Gordo	220 7/8
* David Propst	Duncombe	1987	Webster	219 3/8
Blaine Salzkorn	Sutherland	1970	Clay	218 1/8
Chris Hackney	Alberton	1983	Wayne	211 6/8
Joe Rettenmeier	Dubuque	1987	Dubuque	204 1/8
Phillip M. Collier	Burlington	1978	Des Moines	203 6/8
Ted Miller	New Virginia	1986	Warren	203 5/8
Bill Erwin	Sioux City	1966	Woodbury	202 5/8
Dorrance Arnold	Oelwein	1977	Clayton	200 5/8
Dennis Ballard	Iowa City	1971	Johnson	197 4/8

Wildlife Quiz

Q. Why do most raptors regurgitate pellets after eating?

A. Hawks, eagles, owls and other birds of prey eliminate undigested parts of their food by forming and casting pellets. This indigestible mass usually consists of fur, feathers, bones, bills, claws and teeth of small mammals and birds but may also include hard exoskeletons of insects and crustaceans.

Besides allowing raptors to eliminate indigestible parts of food, ornithologists speculate that expelling pellets is necessary for their health because of the scouring action produced on the throat and gullet during regurgitation of bones, feathers and fur.

Experimental studies suggest that pellets are formed in the gizzard by muscular action during digestion approximately six to 12 hours after a meal. After digestion is complete, the newly formed pellet passes from the gizzard, which is a muscular stomach to a glandular stomach. Pellets remain in the glandular stomach until the bird receives stimulaus for pellet ejection. Most scientists agree that it is necessary for birds of prey to cast a pellet before eating again.

Most raptors begin forming and casting pellets at an early age. For example, great-horned owls can regurgitate pellets at about one week of age and red-tailed hawks when about three weeks old.

Birds typically eliminate pellets at regular roosting sites such as trees, in marsh or field grasses, at ground-nesting sites or at the bases of cliffs or in barn lofts.

Analysis of pellet contents throughout the year can provide accurate information about the seasonal food habits of many bird species.

Upcoming NRC and EPC Meetings

The dates and locations have been set for the following meetings of the Natural Resource Commission and the Environmental Protection Commission 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, write or call the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034, (515)281-5384.

Natural Resource Commission:
-- Dec. 7, 1989, Des Moines

Environmental Protection Commission:
-- Dec. 11-12, 1989, Des Moines
-- Jan. 16-17, 1990, Des Moines
-- Feb. 19-20, 1990, Des Moines

Donations

Mrs. Jack Douglas Creston	Trophy deer rack, valued at $100, for interpretive programs at Green Valley State Park.
Steve & Warren Clark Drakesville	500 linear feet of sawed oak lumber, value unknown, for Honey Creek State Park.
Nathan Bardole Centerville	31 wood duck and bird houses, value unknown, for Honey Creek State Park.
United Federal Savings Bank Winterset	$100 for playground equipment at Pammel State Park.
Byron Bertelsen Missouri Valley	Wiring labor, valued at $180, for wiring of garage at Springbrook State Park.
IDSO Machine Shop Milford	Two well casings, valued at $180, for gate construction at Gull Point State Park.
Clear Lake Fishing Club Clear Lake	$100 for "Winterfest 89" at McIntosh Woods State Park.
Strike Master, Inc. Minneapolis, MN	Two ice augers, valued at $72, for "Winterfest 89" prizes at McIntosh Woods State Park.
Berkley, Inc. Spirit Lake	100 spools of fishing line, valued at $309, for "Winterfest 89" prizes at McIntosh Woods State Park.
Zebco Corps. Tulsa, OK	12 fishing rods and reels, valued at $144, for "Winterfest 89" prizes at McIntosh Woods State Park.
Great American Fish Supply Sioux City	Fishing lures, valued at $10, for "Winterfest 89" prizes at McIntosh Woods State Park.
Parker Brothers Games Marblehead, MA	Games, valued at $770, for "Winterfest 89" prizes at McIntosh Woods State Park.
Cobbs Mfg. Des Moines	12 deer warning whistles, valued at $120, for "Winterfest 89" prizes at McIntosh Woods State Park.
Best Tackle Mfg. Northport, MI	Lures, valued at $62, for "Winterfest 89" prizes at McIntosh Woods State Park.
Wal-Mart Stores Mason City	$25 in gift certificates and three fishing poles, valued at $58, for "Winterfest 89" prizes at McIntosh Woods State Park.
Mason City Artificial 100 Company Mason City	Ten cakes of ice, valued at $140, for "Winterfest 89" prizes at McIntosh Woods State Park.
Blue Horizon Motel Clear Lake	Two nights lodging, valued at $70, for "Winterfest 89" prizes at McIntosh Woods State Park.
Nelson Petroleum Products Clear Lake	Three portable heaters and propane, valued at $166, for "Winterfest 89" at McIntosh Woods State Park.

Classroom Corner

by Robert P. Rye

Many types of wildlife have perfected the concept of sleeping. This sleep in animals is called "hibernation." It is an inactive state which involves a reduction of metabolic activities and a lessening of the ability to regulate body temperatures. Hibernating animals are in a coma-like state which may take them several hours to awaken from. In Iowa, skunks and opossums are *winter sleepers*, not true hibernators.

The following true/false questions should give you additional information on hibernation.

1. Hibernators are *heterothermal*, meaning they are unable to control their internal body temperatures as completely as some other warm-blooded animals.
2. Hibernators generally have higher normal breathing rates than unhibernating mammals.
3. Hibernating mammals usually depend on foods which are unavailable during the winter.
4. Most mammals that hibernate are *fossorial*, meaning they spend the bulk of their time underground.
5. The blood that is in circulation is very high in red blood cells.
6. Animals will eat heavily up until a week or so prior to hibernation so that the system can be cleaned out before hibernation begins.
7. Moisture content of the food is a factor causing hibernation.
8. High carbon dioxide levels found in the enclosed spaces commonly used by hibernating animals is thought to contribute to the on-set of the hibernating reflex and to deepen their sleep.
9. Some research has pointed to an internal yearly clock called a *circannual rhythm*, which may trigger the desire to hibernate.
10. Awakening from hibernation seems to be largely regulated by the temperature.

ANSWERS:

1. True 2. False 3. True 4. True 5. False (the spleen acts as a reservoir for these cells) 6. True 7. True 8. True 9. True 10. True

COUNTY CONSERVATION BOARD FEATURE

Where the Past Meets the Future by John Stuart

WAPELLO COUNTY CONSERVATION BOARD

Imagine enjoying the beauty and wonder of Iowa's changing seasons in a woodland setting close to home — in a setting much like that experienced by the earliest settlers.

Pioneers in Wapello County experienced nature's changing face first-hand. Vast stands of hickory, oak and linden surrounded them, sheltering the forest animals — wild turkey, black bear, southern flying squirrel, and more — so abundant just 150 years ago.

When the settlers walked out on the prairie, grasses as tall as their heads sighed around them, protecting creatures now unfamiliar to us — the buffalo, the prairie rattlesnake, the prairie chicken. As it pierced the deep silence between the sky and earth, the horned lark's song on a spring evening must have sounded beautiful to the ears of those early settlers.

Today, you can enjoy these natural beauties and much more at the Pioneer Ridge Nature Area, located just six and one-half miles south of Ottumwa on U.S. Highway 63. Here, new generations of Iowans are introduced to the hundreds of grasses, birds and other wildlife our ancestors knew by name and sight. More than 700 acres of rolling wooded hills and meadows in southern Wapello County provide an excellent natural setting for hiking, nature study, picnicking and organized programs — all intended to bring visitors into closer contact with the gifts of nature.

Native Americans and early settlers lived in close contact with nature. They relied on the gifts of the land for their survival. However, after years of farming, grazing and harvesting timber, human impact wore heavy on the land.

And so, today, the primary value of a natural resource such as Pioneer Ridge is simply the fact of its existence. A tract of uninterrupted deciduous forest and open meadow — showing little sign of the work of humans — is a priceless possession.

Here, woodland and open meadow wildlife, including threatened species such as the blue-winged warbler, can survive in freedom and safety. Here, nature continues to reveal its infinite variety as the land unfolds a new identity after a period of human influence. Here, the regrowth of the woodland and prairie tells the fascinating story of the early pioneers' relationship to nature, as well as that of our own relationship to the land.

Here, the Pioneer Ridge Nature Center, scheduled for completion in December 1989, will become the year-round home for many nature interpretation programs and activities. It will provide visitors with displays and exhibits, community groups with space for presentations and workshops, researchers with storage and teaching laboratory space, and the general public with meeting rooms and programs and presentations. Additionally, many trails to other portions of the site will begin at the nature center.

For more information about the Pioneer Ridge Nature Area and other Wapello County Conservation Board areas, contact the Wapello County Conservation Board at 405 South Vine, Ottumwa, Iowa 52501; (515)682-3091.

Become acquainted with Iowa's natural resources. Enjoy the gifts of nature at Pioneer Ridge Nature Area.

John Stuart is the director of the Wapello County Conservation Board.

ROGER HILL

Pheasants have lived with intensive agriculture for thousands of years. This fact is what first encouraged hunters in the early 1900s to introduce them to the Midwest. Native gamebirds like the prairie chicken were unable to adapt to the rapid land use changes which had occurred around the turn of the century. Much of Iowa's prairies and wetlands had been converted to agricultural fields. Although pheasants initially thrived, continued conversion of the last

Pheasants on the Flatlands

by Greg Hanson

"The Harvest," by artist Art Benoit, is this year's Iowa Pheasants Forever Print of the Year. This limited edition print of 600 can be purchased for $103.80 (which includes tax, shipping and handling) by writing Dale Lisle at 2206 South Olive, Sioux City, Iowa 51106, or by calling (712) 276-6343. MasterCard and Visa accepted. Remarques are available for an additional $50.

remnants of idle land to row crops brought populations of even these adaptable birds crashing down. By the late 1960s, they could be counted on one hand where they were once found by the hundreds. The fact that some still remain in even the most intensively used areas shows the pheasant's adaptability.

Nowhere in Iowa is this scenario better illustrated than in Humboldt County. Conversion of wetlands and prairie lands to agriculture occurred very rapidly in Humboldt County due to favorable soils and topography. Things reversed slightly during the Soil Bank years, but during the latest farming boom in the 1970s, the Department of Agriculture reported that nearly 97 percent of the county land area was in crop production. Considering the additional acres in towns, roads, rivers and rural residences, that does not leave much for wildlife. The impact on pheasants shows clearly in results of the DNR's annual August brood surveys for the county. Counts in 1963 showed 88 pheasants per 30 miles of survey route. By 1971, they showed less than five.

These changes occurred so rapidly and over such a large area that many biologists of that era felt that the only way pheasants could be brought back was to put the land back the way it was, which was not very likely to happen. As a result, the habitat situation for pheasants remained bleak until recently when a very persistent group of Humboldt County landowners got together with DNR biologists desperate enough to try anything.

The landowners felt that only

closed hunting seasons and restocking could solve the problem. The biologists knew that without the proper habitat, stocking was like pouring water into a bucket with a hole in the bottom. Discussions between landowners and biologists went on for several months, but finally a compromise was reached. The landowners in a township-sized area agreed to leave at least seven plots of corn, three acres or larger, standing through the entire winter to provide pheasants with protection from winter storms. Farmers also agreed to seed oats or other nesting cover near these plots on a portion of set-aside acres and to not disturb those seedings until after the pheasant nesting season. The DNR agreed to pay the landowners $70 per acre for the standing corn plots. This was to compensate for the potential yield loss due to delaying harvest until spring, and for yield reductions due to delayed seeding of these areas in the following spring. The DNR also agreed to pay the ASCS inspection fee required for delaying the destruction of their set-aside oats seedings. Finally, an agreement was made that if winter counts did not average at least five hens per square mile on the township-sized area within five years, the DNR would live-trap wild pheasants from southern Iowa and restock the area to that level.

Landowners in the area felt that winter pheasant populations prior to the study were less than two hens per square mile. DNR biologists felt that there was not any habitat in the township capable of getting pheasants through a severe northern Iowa winter. To the biologists, this was truly an experiment, as no one had ever really tried to produce pheasants with only temporary cover. Both sides were skeptical of their position. But now, nearly five years later, the results have been promising to both groups.

The project began late enough in 1985 that no nesting cover plots were signed up. A DNR roadside survey set up on the area counted only 14 pheasants on 30 miles of survey route. The project was helped along by a wet fall and some farmers left cornfields standing that were not signed up for payment. A total of 220 acres of corn and sorghum were left standing over winter on the 40-square-mile area.

Flush counts that winter found 213 hens and 80 cocks on the area. The five-hens-per-section count was accomplished the first year. The following spring the first set-aside plots were left for nesting cover. The August roadside survey increased 75 percent to 25 pheasants on 30 miles. Because of normal fall weather, fewer acres of corn were left standing during the winter of 1986-87, but the weather was very mild. Not enough snow fell to force pheasants into the 80 or so acres of temporary winter cover, therefore no counts were completed that year. The spring of 1987 was similar to the previous year, and the August roadside route was nearly the same with 24 pheasants on 30 miles. Very low corn prices and the modest success of the first two years encouraged farmers to beef up the winter cover plots and many left several acres of unpaid corn next to their paid plots. The 12 winter cover plots that year averaged 10.3 acres and ranged in size from three to 50 acres. The larger sizes seemed to pay off as winter flush counts jumped to 407 hens and 160 cocks on 45 square miles. With nine hens per section going into the spring nesting season, brood production improved also. The August roadside survey jumped to 68 pheasants in a 30-mile route. This was an increase of 385 percent from pre-study levels. However, the drought of 1988 elevated corn prices so that farmers did not leave unpaid acres that fall. Confusion over ASCS rules related to food plot size limitations also reduced the size of plots that year and 13 plots averaged less than five acres each. The smaller plots were less attractive to pheasants and winter counts dropped to 249 hens and 68 cocks. The drop from nine to six hens per section lowered production in 1989, and August roadside surveys dropped back to 30 pheasants in 30 miles. This level was more than double the pre-study level, but less than half of what it had been the year before.

So what can we learn from this study? Probably the most significant fact is that, in the absence of permanent cover, pheasants can and will respond to even tempo-

ROGER HILL

rary habitat improvements. The response seems to be almost proportional to the improvement in winter cover, but both overwinter and nesting requirements must be addressed. More research is needed to clarify whether the results of this study were actually increased survival and production of local stock, or whether we simply attracted birds from surrounding areas to nest or overwinter on the study area.

Another important fact learned was that even a small reservoir of wild brood stock can respond quickly to favorable changes in habitat. Therefore, costly stocking programs are probably never necessary where even a few wild birds still exit.

RON JOHNSON

Other important information gleaned from the study has to do with the cover plots themselves. Size and location seemed to be very important. Small three- to five-acre plots were not used by pheasants unless they were next to a farm grove where other cover was available. Plots larger than 15 acres were much more attractive to pheasants even if located out in the open. These larger plots often held 50 or more pheasants, and one 50-acre sorghum patch held nearly 200 pheasants, five deer, two fox, 150 gray partridge, numerous cottontails and jackrabbits, and a short-eared owl through the winter. The shape of the plot was also important. Plots with a four- to eight-row snow catch 50 yards to the west and north of the main plot had much less drifting and more pheasant use. Unprotected plots drifted completely full for 40 or more rows in heavy winters. The protected plots also had very little yield reduction if harvested by farmers the following spring.

What can this study lead to? It has already led to a statewide cost-share program sponsored by the DNR, Pheasants Forever and other conservation organizations. Pheasants Forever alone helped put in nearly 25,000 acres in Iowa in 1988. Again, more research is needed, but if the results of this study would hold up on a larger scale, the addition of 120 acres of winter cover plots per township across the northern half of Iowa, planted in 15-acre or larger blocks, could potentially raise the statewide pheasant harvest by 500,000 roosters or 40 percent above current levels.

Finally and possibly the most important fact that was gained from this project was that farmers, conservation groups and state conservation agencies can work together to improve wildlife populations under a wider range of conditions than was once thought possible.

Greg Hanson is a wildlife research biologist for the department and is located in Northwood.

Convenient New License Named After "Ding"

Iowa outdoor enthusiasts will have the opportunity to begin a new tradition in licensing in 1990.

Called the J.N. "Ding" Darling License, after one of Iowa's most famous conservationists, the new license will be available for purchase by December 1, from the Des Moines office of the Department of Natural Resources.

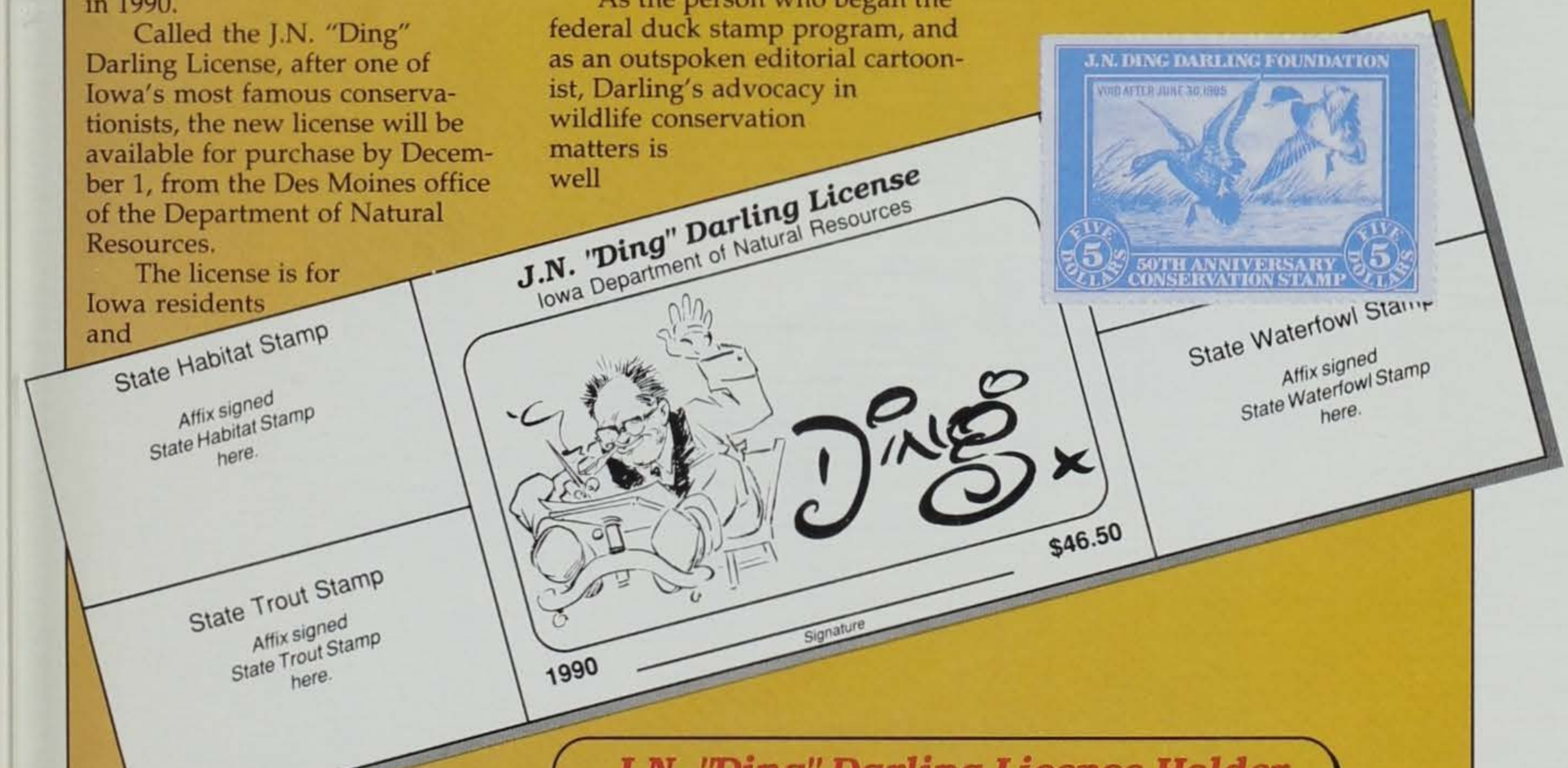
The license is for Iowa residents and covers fishing, hunting and trapping requirements (for furharvesters 16 and over), plus the state stamps for waterfowl, habitat and trout. At $46.50, it is $4 less than if all of these licenses were bought separately.

The first edition of this license features a Ding Darling self-portrait, printed on high-quality, waterproof and tear-resistant.

In addition to being a good value, nicely designed and a convenience to outdoor enthusiasts, purchasers will be given an attractive vehicle decal that is only available with the Ding license purchase. Also, the Darling Foundation has given the DNR 1,000, 50-year anniversary commemorative federal duck stamps, designed by Darling in 1935, to give away with the first 1,000 licenses purchased. The DNR also is providing the first 2,000 first-year license purchasers a hardbound copy of the *Waterfowl in Iowa*, a 130-page book by the late Jack Musgrove with color illustrations by internationally known Iowa artist Maynard Reece.

As the person who began the federal duck stamp program, and as an outspoken editorial cartoonist, Darling's advocacy in wildlife conservation matters is well known among those who care for the outdoors. Much of his professional life was spent with the Sioux City Journal, and Des Moines Register where he won two Pulitzer prizes for his cartoons.

License applications must be obtained from the DNR (4th Floor Wallace Building, E. 9th and Grand, Des Moines, IA 50319-0034; 515/281-5145). The completed application and a check for $46.50 may be mailed or hand delivered to the DNR office. As with all hunting and fishing licenses, the 1990 edition is effective beginning December 15, 1989.



J.N. "Ding" Darling License Holder

Iowa Department of Natural Resources