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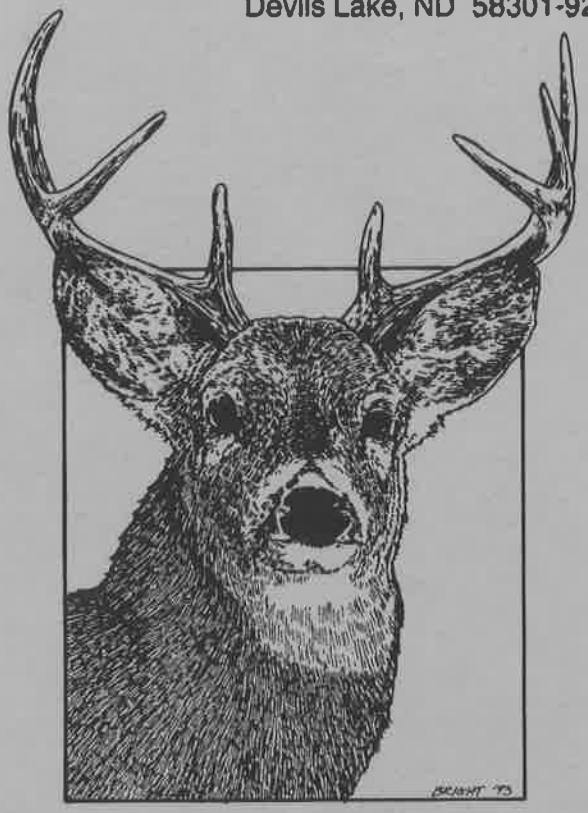
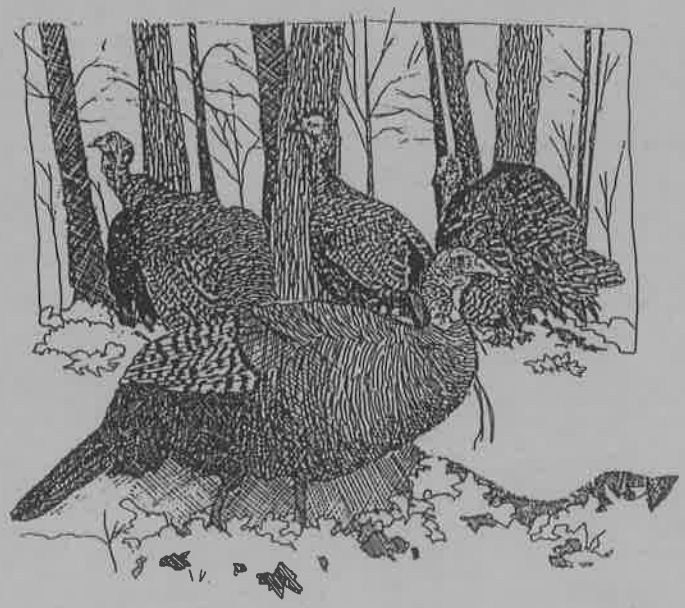


PROCEEDINGS
19th Midwest Deer & Turkey Group
January 15-18, 1995



Eugene T. Mahoney
State Park
Ashland, Nebraska

Midwest Deer and Turkey Group Proceedings

TABLE OF CONTENTS

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PAST MEETING LOCATIONS

Midwest Deer and Turkey Group

Year	State	Location	Date
1977	Missouri	Fountain Grove Wildlife Area	Jan 17-19
1978	Wisconsin	Wyalusing State Park	Jan 16-17
1979	Iowa	Rathburn Fish Hatchery	Jan 15-18
1980	Minnesota	Whitewater State Park	Jan 21-24
1981	Indiana	Harrison-Crawford State Park	Jan 19-22
1982	Ohio	Lake Hope State Park	Jan 18-21
1983	Nebraska	Louisville 4-H Camp	Jan 17-21
1984	Kansas	Camp Aldrich	Jan 16-19
1985	South Dakota	Black Hills	May 7-10
1986	North Dakota	Camp-of-the-Cross	Jan 20-23
1987	Michigan	Kellog Biological Station	Jan 27-29
1988	Illinois	Touch of Nature	Feb 1-4
1989	Missouri	YMCA Camp of the Ozarks	Jan 23-26
1990	Wisconsin	Bethel Horizon Retreat Center	Jan 15-18
1991	Iowa	Conservation Education Center	Jan 14-17
1992	Minnesota	Whitewater State Park	Jan 13-16
1993	Indiana	Harrison-Crawford State Forest	Jan 11-14
1994	Ohio	Canter's Cave 4-H Camp	Jan 30-Feb 2
1995	Nebraska	Mahoney State Park	Jan 15-18

MEETING SUMMARY

Midwest Deer and Turkey Group
January 15-18, 1995

The 19th annual meeting of the Midwest Deer and Turkey Group was held at Mahoney State Park near Ashland, Nebraska. This meeting was dedicated to the memory of Lee Gladfelter, a charter member of the group. Eleven of the 12 member states were represented, with Minnesota the only exception for the second straight year. Guests included James Earl Kennamer, Ron Brennaman, and John Edwards from the National Wild Turkey Federation; Mike Malhiot, turkey biologist, from the Ontario Ministry of Natural Resources; and Jason Ekstein, graduate student, University of Nebraska. Speakers included Dave Oates and Ron Bromley from the diagnostic laboratory of the Nebraska Game and Parks Commission; Kurt VerCauteren, graduate student, University of Nebraska; Gary Garabrandt, naturalist, Fontenelle Forest, Bellevue, NE; and Karl Menzel, big game specialist, Nebraska Game and Parks Commission.

Missouri previewed their movie "Urban Whitetail Challenge" for the group. Field trips were conducted to the Fontenelle Forest, the site of urban deer concerns, the Lied Rain Forest at the Omaha Zoo, and the diagnostic laboratory at the Nebraska Game and Parks Commission headquarters Lincoln, NE. The deer and turkey groups met separately to present their individual state reports.

The meeting concluded with a joint business meeting to discuss the location and topics for next years work shop. Keith Sexon volunteered to look into hosting the meeting at Kansas. Thanks to the staff of Mahoney State Park and the Wildlife Division for making things work so smoothly.

Let me extend my appreciation for the effort that all the attendees put forth to make it to the meeting. See you in Kansas next year.

Bruce Trindle
Meeting Chairman

"Letter to Midwest Game and Fish Agencies"

MIDWEST DEER AND TURKEY GROUP
Mahoney State Park, Ashland, Nebraska
January 15 – 18, By Bruce Trindle

This was the 19th annual meeting of the Midwest Deer and Turkey Group. The first meeting was held in 1977 at Missouri. The group is composed of deer and turkey biologists from 12 member states including Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. These states share the common bond of similar Midwest farmland habitats. The purpose of the group is based on 5 objectives outlined in the organizational guidelines (see attached):

1. Provide a forum for discussion of common management problems concerning white-tailed deer and turkey in farmland habitat typical of the Midwest region.
2. Provide an opportunity to define common problems and goals and formulate priorities for investigation into these problems, to minimize duplication of efforts among the member states.
3. Stimulate an exchange of information between states on survey techniques and results, harvest regulations and results, research projects, and habitat management.
4. Act as a source of detailed information on deer and turkeys in the Midwest for the public and other resource agencies.
5. Formulate long-range guidelines for species management in the Midwest region.

The organizational guidelines were developed and implemented to assure productive meetings with frank and open discussions. Management of deer and turkey populations can call for some difficult and sometimes unpopular decisions to be made. This group serves as a support group of peers for biologists having to make these decisions, through the realization that other states are faced with similar problems. The group is not political and has never created or endorsed any position statements. Information presented at the meetings have helped states avoid costly duplication of research and management efforts.

At a glance it is obvious that member states all approach deer and turkey management with different techniques. However, this group has produced, stimulated, or been responsible for shaping some very common themes throughout the Midwest. For example; youth hunts, muzzleloader hunts, antlerless quotas, computer modeling, animal handling techniques, tagging procedures, landowner surveys, telemetry studies, fall turkey seasons, defining suitable turkey habitat, trapping techniques, and solving depredation problems. This meeting alone brought to attention electronic permit issuance, check station videos, forensic techniques, and DNA research.

In my opinion this is one of the most productive meetings I have had the opportunity to attend. It has served me as a constant source of continuing education for both deer and turkey applied management and what works and doesn't work in research.

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1995 Midwest Deer and Wild Turkey Group Meeting

Mahoney State Park - Ashland, Nebraska
Hosted by Nebraska Game and Parks Commission

Sun., Jan. 15

1:00 p.m. on	Arrival and registration
4:00 p.m. - 6:00 p.m.	Evening meal; snacks only for later arrivals
7:00 - ?	Financial investments Les Rice, SD Game, Fish & Parks

Mon., Jan. 16

7:30 - 8:15 a.m.	Breakfast
8:30 - 11:45 a.m.	Joint meeting of both groups
	Opening remarks - Bruce Trindle and Karl Menzel
	Welcome - Wes Sheets, Asst. Director, NG&PC
	Wildlife forensics - present and future Dave Oates and Ron Bromley, NG&PC
	Home range and movements of female white-tailed deer at DeSoto National Wildlife Refuge Kurt VerCauteren and Scott Hygnstrom University of Nebraska, Lincoln
	Bellevue deer task force - an approach to urban deer management Gary Garabrandt, Fontenelle Forest, Bellevue, NE
	Urban whitetail challenge - Missouri Department of Conservation (film)
	Lack of restraint in identification Karl Menzel, NG&PC
12:00 - 1:00 p.m.	Lunch
1:00 - 5:00 p.m.	Separate deer and turkey groups status reports and selected topics
5:30 - 8:00	Evening meal

Tues., Jan. 17

7:30 - 8:15 a.m.	Breakfast
8:30 - 11:45 a.m.	Separate group status reports and selected topics
12:00 - 1:00 p.m.	Lunch
1:00 - 5:00 p.m.	Field trip(s)
5:30 - 7:00 p.m.	Evening meal
7:00 p.m.	Business meeting

Wed., Jan. 18

7:30 - ?	Breakfast (Eat hearty)
?	Departure

Organizational Guidelines of the Midwest Deer and Wild Turkey Group

Objectives: The Midwest Deer and Wild Turkey Group was formed to:

1. Provide a forum for discussion of common management problems concerning the white-tailed deer and the wild turkey in Farmland habitat typical of the midwest region.

2. Provide an opportunity to define common problems and goals and formulate priorities for investigations into these problems, to minimize duplication of efforts among the member states.

3. Stimulate an exchange of information between states on survey techniques and results, harvest regulations and results, research projects, and habitat management.

4. Act as a source of detailed information on deer and turkeys in the midwest for the public and other resource agencies.

5. Formulate long-range guidelines for species management in the midwest region.

Organization: The Midwest Deer and Wild Turkey Group shall consist of representatives from member states who, as wildlife biologists, are directly responsible for the management of deer and wild turkeys in farmland habitat. States invited to join the group are Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin, and North Dakota.

Officers: The offices of chairman and secretary shall be filled by biologists from the state selected to host the next meeting. Their term of office shall be from their selections until completion of all responsibilities for their group meeting. Officers will be selected by the host state with recommendations made by the group. Their responsibilities will include organizing the meeting to be held in their state, selecting a meeting site and dates, arranging for lodging and meeting rooms, formulating an informal program, publicity and meeting announcement to member states, and publication of a post-meeting Newsletter.

Committee: Committees may be selected to investigate specific problem areas and make recommendations to the entire membership. The important work of the group will be performed by assigned committees. Committees will be selected by the chairman after reviewing requests for committee action submitted by the membership. Possible committees include: research review, information and education, future programs, and position statements.

Meeting: At each group meeting the time and host state for the next meeting will be decided. Group meetings will be held on an irregular basis as determined by the needs of the membership. Meeting sites will be rotated among member states on a volunteer basis. If no volunteer comes forward, the first member state (proceeding alphabetically) that has not yet hosted a meeting, or the member state with the longest elapsed time period since it last hosted a meeting will be chosen (if agreeable to that state). Meetings will generally be of 2-3 days in duration. A general theme shall be selected for each meeting, if possible, with a meeting site chosen to enhance the discussion of the selected topic.

Notice of arrangements for the meeting shall be distributed to member states at least 4 months in advance to allow time for securing out-of-state travel authority and preparation of presentations.

Meeting Agenda: The program shall be as informal as possible with plenty of time allotted for discussion. One aspect of the program should be a report from each state on hunting regulations and harvest, population surveys, new research and management projects, University research, and any other topics the state may feel is important to the group. Also the chairman may invite guest speakers to present reports on the selected theme of the meeting or other topics which may be of interest to the group. Short field trips may be utilized to point out areas of special interest to the group. Better efficiency and exchange of ideas will be realized by breaking down the group. Better efficiency and exchange of ideas will be realized by breaking down the group into separate deer and turkey workshops to discuss pertinent research and management programs. The business meeting and certain topics of interest to the entire group will require a combined meeting of the membership.

Attendance: To enhance an atmosphere of total participation and exchange of ideas, the attendance shall be held to 35 persons. The chairman will be responsible for limiting the size of the meeting to this number. He shall allocate the 35 seats in a manner that allow the 10 non-host member states to send a maximum of 3 individuals apiece, while the host state is allowed 5 seats. If pre-meeting registration indicates that some states will not send their full allotment, the chairman can delegate unfilled seats to the host state or to states requesting extra attendance. Persons invited by the host state to participate in the program would not be counted towards the allotment.

Business Meeting: A short business meeting will be scheduled on the meeting agenda. Topics of discussion will include selection of the next host state, year of the next group meeting, future topic (s) of interest, selection of officers, committee reports, and any other information pertinent to the operation of the group.

Newsletter: The secretary for the group shall be responsible for sending out a Newsletter immediately following each meeting to the Chairman of the Midwest Fish & Game Commissioners, the Director of all member states, persons attending the meeting, and any other organization or agency making a request. This Newsletter shall contain a summary of information presented in the program, discussion, and items covered at the business meeting including committee reports. Any written reports submitted at the meeting shall be included as well as a list of persons attending the meeting and their addresses. Funds for distribution of the Newsletter and other materials will be furnished by the host state of obtained through the charge of a small registration fee.

HOME RANGE AND MOVEMENT CHARACTERISTICS OF FEMALE WHITE-TAILED DEER AT DESOTO NATIONAL WILDLIFE REFUGE

Kurt C. VerCauteren and Scott E. Hygnstrom, Department of Forestry, Fisheries and Wildlife, University of Nebraska, Lincoln, NE 68583-0819.

We examined home range characteristics and movements of female white-tailed deer at DeSoto National Wildlife Refuge (DNWR) relative to mushroom picking season, parturition, crop development and harvest, and the hunting season. Seventy-two deer were captured and marked, 36 were equipped with radio transmitters and located 12,307 times. Fifty-six percent (n = 14) of radio-equipped does were year-round residents of the refuge and 44% (n = 11) were transients. Annual home ranges of residents averaged 170 ha $\pm$ 65 S.D. (n = 14). Mushroom pickers were found to temporarily disturb deer but did not influence the size or location of home ranges. Home range sizes decreased with the onset of parturition and home range centers shifted 299 m $\pm$ 276 S.D. (n = 14) as 80% (n = 10) of the does selected specific fawning areas. Deer damage to corn peaked during mid- to late July. Home range centers shifted 174 m $\pm$ 128 S.D. (n = 14) closer to cornfields at this time. After corn harvest, home range centers shifted deeper into areas of permanent cover and home range sizes increased as deer were forced to use other sources of cover and search for alternative food sources. Resident does, which caused local crop damage during the growing season, were available to be harvested via hunting in the same area as they caused damage. These does had a high degree of fidelity toward their home ranges throughout the year. Over 90% of doe emigrations occurred in the spring. They ranged from 3 km to 56 km and averaged 22 km $\pm$ 18 S.D. (n = 11). Does established home ranges in linear strips of riparian habitat surrounded by row crops and pastures. Thirty-six percent (n = 25) of transients and 19% of residents were legally harvested. Migratory does, which help sustain populations off DNWR, were at greatest risk because they were exposed to state firearm and archery seasons as well as the DNWR hunt. We suggest holding depredation hunts, or disseminating depredation permits, before migratory does return to an area that experienced a high level of crop damage. This way resident deer, those causing the damage, are those most likely to be harvested.

1995 MIDWEST DEER AND WILD TURKEY GROUP MEETING

BELLEVUE DEER TASK FORCE - AN APPROACH TO URBAN DEER MANAGEMENT

Gary Garabrandt, Chief Ranger, Fontenelle Forest Association, 1111 Bellevue Blvd. No., Bellevue, NE. (402) 731-3140

The City of Bellevue, Nebraska is a community of roughly 35,000, and claims to be the fastest growing urban area in the state. Along the Eastern edge of the community, between the urban area and Missouri River, lies a strip of wild and semi-wild land roughly five miles long and covering seven square miles.

Roughly half this land is Missouri River floodplain and the other half is rugged loess bluffs bordering the river bottom. Native deciduous forest covers most of the area, some of it is farmed, and a little over a square mile is new suburbs in which much of the native forest was preserved as greenspace. The entire seven square miles is home to free ranging white tailed deer, turkeys and other native wildlife.

Principal landowners and habitat type are:
Fontenelle Forest - 1300 acres - upland and lowland forest
NE Game and Parks - 1400 acres - lowland deciduous forest
Education Service Unit #3 - 400 acres - Gifford Farm
YWCA Camp Brewster - 100 acres upland deciduous forest
Boy Scout Camp Wakonda - 30 acres - upland deciduous forest
NE Public Power Dist. - 15 acres - lowland deciduous forest
City of Bellevue - 12 acres - two parks, upland and lowland
The remaining 1100 acres is undeveloped woody acreage and wooded suburb. (all acreage given is approximate).

Annual lethal removal of deer by hunting or other means is substantial. An annual hunt has taken place on Gifford Point (Game and Parks land) since 1965. The average number of deer taken on Gifford Point between 1985 and 1994 is 121 per year. Annual high was 193 in 1992, annual lows, 83 in 1985 and 84 in 1994. Hunting on undeveloped acreages may account for an additional 10 to 20 deer killed each year. In addition, an estimated 15 to 25 deer are killed annually by Burlington Northern trains which run along the base of the bluff for the entire five mile length of the area.

A helicopter survey in February 1982, indicated a winter herd of 200. In spite of hunting pressure the population increased dramatically in the late 1980', reaching an estimated peak of 500 to 600 in 1992. (Karl Menzel's est.) The population seems to have been dispersed by extensive long

term flooding in the summer of 1993. In addition, an outbreak of EHD in late summer 1993 killed an estimated 60 to 80 deer. Reduced hunter success and fewer deer sightings in the past year suggest the population has gone down, but this reduction is probably temporary at best.

As the population grew in the late 1980's we noticed deer browse damage to native vegetation, which is now severe in some areas. There were also increased reports by homeowners of damage to landscape plants and gardens. A significant problem was the widespread appearance of deer for the first time in older, urban areas west of the 7 mile habitat region. Collisions between deer and vehicles on Bellevue streets tripled from 8 and 9 in 1984-85, to 26 in 1991. This same phenomenon was observed for entire Sarpy County, however, suggesting the population rise was not limited to Bellevue.

The Bellevue deer situation came into the spotlight in August 1992, via an article in "Natural History", a popular magazine with national distribution. The article entitled "Must We Shoot Deer To Save Nature?", was authored by a well known scientist, Dr. Jared Diamond. The publication touched off a couple weeks of debate in the local media involving the credibility of the article and a good deal of anti-hunting sentiment surfaced. Although the article raised public awareness that too many deer causes problems, it left the impression that all available deer habitat was owned by the Fontenelle Forest Association and that there was no hunting anywhere in the vicinity.

At Fontenelle Forest, we quickly realized that knowing we had a deer problem was not enough. We needed documentation and we had to gain public support through educating people about the problem. Both, unfortunately, are time consuming and potentially expensive undertakings. We also felt that any plan of action had to involve the other major landowners within the 7 square mile habitat area.

In early 1994, I organized the Bellevue Deer Task Force as a means of establishing communication between the principal landowners in the habitat area, as well as other relevant stakeholders in the Bellevue region. The idea stemmed from the "Urban Deer Symposium", which was part of the 55th Annual Midwest Fish and Wildlife Conference held in St. Louis in December, 1993. Several speakers at the symposium reported progress by using a citizen task force approach to resolve the complex social and wildlife management issues caused by urban deer.

The Bellevue Task Force is comprised of representatives of the following:

Fontenelle Forest Association
Papio-Missouri Nat. Resource Dist.
City of Bellevue - Administration
City of Bellevue - Police
U. S. Army Corps of Engineers
Town and Country Humane Society
Educational Service Unit #3
Fontenelle Hills Homeowners Assoc.
Nebraska Game and Parks
YWCA - Camp Brewster
Bow Hunter
Muzzle Loader Hunter
Offutt Air Force Base
Boy Scout - Camp Wakonda
Sarpy Co. Commissioners

The idea behind a task force is not to create a small corps of instant deer experts, but to form a credible group of people whose awareness of deer and deer problems is generally greater than the general populace. The group can then educate others via positive, proactive media exposure, speaking engagements, and more subtly, by taking information back to their respective organizations.

To date the task force has had several concrete accomplishments:

Completed a homeowner phone survey of 220 respondents in eleven Bellevue neighborhoods.

Raised public awareness through newspaper articles and intra-agency newsletters, and received almost no negative feedback.

Raised roughly $45,000 cash commitment to fund a 2.5 year university study which will radio monitor deer movement and habits within the habitat area, develop an accurate deer census, and document browse damage using fenced exclosures.

At the present time task force members are researching methods (or potential methods) of deer control that have been tried in other urban areas. These include: trap and shoot, trap and relocate, hunting, sharpshooting and contraceptives. This research is time consuming and may arrive at conclusions that are already obvious to many wildlife professionals but it is a necessary part of the education and consensus building process.

Ultimately I would like to see the task force view the entire 7 square miles of habitat as a unit in need of deer management, arrive at a figure of how many deer the area can support within biological and cultural carrying capacities, and make recommendations for meeting management goals.

David Oates, "Forensics at NGPC, Past and Present".
Nebraska Game and Parks Commission
2200 N. 33rd St.
Lincoln, NE 68503

Abstract

Wildlife forensics started in Nebraska in 1969. The big concern of officers was to identify deer blood, meat, bones and hair. Several publications were produced in the next several years on the identification of blood, meat and bone from deer. Determination of sex has always been considered an important factor in law enforcement cases and if certain bones are present in the forensic samples, sex can be determined in both deer and turkey. Also, several law enforcement cases regarding the time of death in deer are presented.

Ronald L. Bromley, "Forensics at NGPC, the use of Molecular Biology Techniques".
Nebraska Game and Parks Commission
2200 N. 33rd St.
Lincoln, NE 68503

Abstract

Current forensic analysis at the Nebraska Game and Parks Commission utilizes enzymatic, immunological and polymerase chain reaction techniques for gender identification. Enzyme analysis is performed on the PhastSystem (a self contained electrophoresis unit by Pharmacia). Differentiation of mule deer from white-tailed deer is accomplished using albumin and/or Erythrocyte Acid Phosphatase (EAP).

A novel CIEP (Counter Immunoelectrophoresis) method utilizing the PhastSystem has been developed for immunologic analysis of game animal forensic samples (in prep). Previously in this, and presently in other laboratories, immunological analysis has been performed by the passive double immunodiffusion method developed by Ouchterlony (1973). The Ouchterlony method takes between 24 and 48 hours where the active immunodiffusion CIEP method takes less than one and one-half hours. This decrease in analysis time is also accomplished with greater antigen detection while simultaneously using less sample and reagents.

To determine the sex of a mammal, a method developed by the National Fish and Wildlife Laboratory, Ashland, Oregon was adopted. Polymerase chain reaction (PCR) is used to amplify fragments of both the X and Y chromosomes for males, or both X chromosomes for females.

1994 ILLINOIS DEER HARVEST REPORT

STUDY 1 - POPULATION STUDIES OF WHITE-TAILED DEER

STATE OF ILLINOIS NAME: FOREST WILDLIFE INVESTIGATIONS

PROJECT NO. : W-105-R (6) TITLE: POPULATION DATA FROM DEER HARVEST

OBJECTIVE: To characterize the status of the deer herds as to age/sex ratio and general condition by county, region and statewide from check station data.

ABSTRACT:

Traditional Firearm Deer Season: The 1994 firearm deer season consisted of one 3-day weekend (November 18-20) and a second 4-day weekend (1-4). Harvest information collected at mandatory check stations located in 98 counties open to firearm hunting (Cook, DuPage, Kane and Lake Counties are closed to firearm deer hunting) identified a record harvest of 97,723 deer, which represents an increase of 5,777 (6%) over 1993. A total of 260,302 regular firearm permits were issued; the permit success rate remained constant at 37 percent (permit success was figured utilizing the total number of permits issued -- not to be confused with hunter success which utilizes the number of individual hunters) between 1993 and 1994. Hunters possessing a muzzleloading-only permit accounted for the harvest of an additional 353 deer during the second season of the regular firearm deer season. Tables 1, 2, 3, 4 and Appendix A illustrate permits issued by type, deer harvested by region, age and sex composition of harvest, age composition of the adult male cohort and the county-by-county harvest. To alleviate hunter backlogs at county check stations during the first season, there were an additional eight check stations operated in regions of the state that have had historically high harvests.

Table 1. Illinois Firearm Deer Harvest by Permit Type - 1994

Permit Type *	Permits Issued	Deer Harvested	Permit Success	Percent of Harvest
Full Season E-S	130377	52590	40%	54%
Second Season E-S	18465	4264	23%	4%
Full Season A-O	38511	19113	50%	20%
Second Season A-O	2159	743	34%	**
Free Landowner E-S	31422	7629	24%	8%
Free Landowner A-O	31422	9245	29%	10%
Paid Landowner E-S	5800	2530	44%	3%
Paid Landowner A-O	1717	945	55%	1%

Table 1. Continued.

Permit Type	Permits Issued	Deer Harvested	Permit Success	Percent of Harvest
Non-Resident E-S	286	108	38%	**
Non-Resident A-O	143	60	42%	**
Total	**260,302**	**97,227*** **	**37%**	**100%**

* E-S represents either-sex permits and A-O represents antlerless-only.
** Represents less than 1% of harvest.
*** Difference in "Deer Harvested" (97,227) and the harvest total of 97,723 is attributed to hunters incorrectly checking in deer under various permit types not listed.

Table 2. ILLINOIS FIREARM HARVEST BY REGION - 1994

Region	Permits	Harvest**	Success*	Change In Success Rate
1	25428	8807	35%(38)	-3%
2	23106	7717	33%(34)	-1%
3	38535	14141	37%(37)	0
4	39218	16683	41%(42)	-1%
5	9289	2841	35%(34)	+1%
6	22302	8815	40%(38)	+2%
7	60202	22192	36%(35)	+1%
8	42222	15345	36%(36)	0
State	**260,302**	**96,541**	**37%(37)**	**0**

* Figures in parenthesis represent 1993 success rates.
** Harvest figures do not include special hunt areas.

Table 3. SEX AND AGE COMPOSITION OF THE 1994 FIREARM DEER HARVEST

Age	Males	%Males	Females	% Females	Total*	% Total
Fawn	14710	28%	11347	28%	26057	28%
1 1/2	19258	37%	13019	32%	32277	35%
2 1/2	12218	23%	11390	28%	23608	25%
3 1/3	5134	10%	3962	10%	9096	10%
4 1/2	1022	2%	846	2%	1868	2%
4 1/2+	192	**	282	**	474	**
Total	**52,534**	**100%**	**40,846**	**100%**	**93,380**	**100%**

* Does not include deer harvested with no age or sex recorded (3613).
** Less than one percent.

Table 4. AGE COMPOSITION OF 1994 MALE COHORT HARVEST AGED AS YEARLINGS OR OLDER

Age	Total	Percent of Total*
1 1/2	19258	51% (53)
2 1/2	12218	32% (30)
3 1/2	5134	14% (13)
4 1/2	1022	3% (3)
4 1/2+	192	** (1)
Total	**37,824**	**100%**

* Figures in parenthesis represent 1993 percentages.
** Less than one percent.

Muzzleloading Deer Season: During December 9-11, 1994, the Department provided for the fourth statewide 3-day Muzzleloading Deer Season. Individuals interested in hunting this distinct and separate season were eligible to apply for an either-sex and an antlerless-only muzzleloading permit and could not apply for a regular firearm permit until after the initial lottery and first random daily drawing. Muzzleloading deer permits were legal to use during the second 4-day season of the traditional firearm season but could not be used during the first 3-day season. There were a total of 3,783 either-sex and 382 antlerless-only permits issued during the 1994 season which represents a 20 percent increase in either-sex and a 14 percent increase in antlerless-only permits issued. A total of 461 deer were harvested during the muzzleloading-only season (with an additional 353 deer taken by muzzleloading weapons during the regular firearm seasons). Seventy percent of the total kill were taken by hunters with muzzleloading-only permits, with the remaining 30 percent harvested by hunters with unfilled landowner permits or by non-resident deer hunters. County-by-county muzzleloading harvest results are illustrated in Appendix B. There was no attempt to calculate overall permit success because it is impossible to determine the number of muzzleloading permit holders who hunted during the regular firearm season or how many unsuccessful landowner permit holders utilized their unfilled permits to hunt during the muzzleloading season.

Table 5. 1994 MUZZLELOADING HARVEST RESULTS BY PERMIT TYPE

Permit Type *	Male	Female	Unk.	Harvest	Percent of Total Harvest
E-S Muzzleloading Permit	155	126	7	288	62%
A-O Muzzleloading Permit	30	7	1	38	8%
E-S Free Landowner Permit	32	24	0	56	12%
A-O Free Landowner Permit	26	49	2	77	17%
E-S Non-Resident Shotgun	1	0	0	1	**
A-O Non-Resident Shotgun	0	1	0	1	**
State Totals	**244(53%)**	**207(45%)**	**10(2%)**	**461**	**100%**

* E-S represents either-sex permits and A-O represents antlerless-only permits.
** Represents less than 1% of the harvest.

Handgun Deer Season – Special January Season: A 3-day handgun deer season was held during January (13, 14 and 15), 1995 in 20 counties in Illinois. Definition of a legal handgun and its use consists of the following:

1. A centerfire handgun of 30 caliber or larger with a minimum barrel length of 4 inches. It shall

be unlawful to take or attempt to take white-tailed deer by use of semi-automatic handguns or handguns altered to allow for shoulder shooting.

2. The only legal ammunition is any centerfire handgun cartridge of .30 caliber or larger, that is available as a factory load with the published ballistic tables of the manufacturer showing a capacity of at least 500 foot pounds of energy at the muzzle and whose case length does not exceed 1.4 inches. Full-metal jacket bullets cannot be used to hunt white-tailed deer.

3. Examples of legal handgun cartridges are: 30 Caliber Carbine, 357 Magnum, 10mm, 41 Magnum, 44 Magnum, 45 Magnum and 454 Casull. This is not a complete list, but only examples of the more common legal cartridges.

Counties perceived by landowners as having excessive deer numbers and having historical hunter success that exceeded 40 percent were selected for the January 1995 hunting season. A total of 10,204 antlerless-only permits were issued through a randomized lottery drawing. There were 4,946 remaining for all counties at the close of the allocation period. Statewide hunter success was 11 percent, which is the same hunter success as recorded for the 1994 season. Antlerless male and female harvested consisted of 26 percent and 73 percent, respectively (Table 6.).

Table 6. HANDGUN HARVEST RESULTS - JANUARY 1995

County	Permits Issued*		Total Harvest	Hunter Success**	Antlerless Males	Females	Unk.
Adams	659	(1000)	67	10% (13%)	22	45	
Brown	337	(1000)	47	14% (14%)	16	31	
Calhoun	258	(400)	17	7% (7%)	5	12	
Crawford	349	(500)	47	14% (11%)	12	35	
Fulton	549	(1000)	32	6% (8%)	8	24	
Greene	327	(500)	24	7% (5%)	7	15	2
Grundy	280	(300)	29	10% (8%)	10	19	
Jasper	495	(550)	54	11% (14%)	18	36	
Jefferson	363	(1000)	26	7% (10%)	5	21	
JoDaviess	923	(1000)	116	13% (11%)	31	82	3
Johnson	1197	(1400)	125	10% (11%)	30	95	
Lawrence	201	(250)	25	12% (10%)	9	16	
McLean	370	(500)	44	12% (11%)	19	25	
Ogle	1000	(1000)	53	10% (14%)	12	41	
Perry	583	(1000)	65	11% (11%)	16	46	3
Pike	873	(1000)	161	18% (18%)	30	130	1

Table 6. Continued.

County	Permits Issued*		Total Harvest	Hunter Success**	Antlerless Males	Females	Unk.
Randolph	474	(1000)	59	12% (5%)	16	42	1
Union	738	(1000)	78	11% (7%)	66	12	
Wayne	477	(500)	62	13% (13%)	17	45	
Whiteside	214	(250)	15	7% (7%)	4	11	
Total	**10,204**	**(15,150)**	**1147**	**11% (11%)**	**353 (31%)**	**783 (68%)**	**10(1%)**

* Figures in parenthesis represent county quotas.
** Figures in parenthesis represent hunter success for 1993.
Total includes one female listed as harvested in Jackson County which was not open to handgun hunting.

Archery Deer Season: In counties closed to firearm deer hunting, the 1994-95 archery season consisted of 104 days between 1 October and 12 January. In counties open to firearm deer hunting, the season length consisted of 97 days. Archery hunting hours were from one-half hour before sunrise to one-half hour after sunrise. Archery deer hunting was not allowed during the traditional firearm deer season in counties open to firearm deer hunting. However, archers were allowed to hunt during the muzzleloading season but were required to wear 400 square inches of blaze orange. There were 83,723 unique archers within the state of whom 37,195 desired an additional either-sex permit; 14,030 individuals elected to purchase an additional antlerless-only permit; 13,885 landowners received free combination permits consisting of an either-sex permit and an antlerless-only permit and there were 94 non-resident either-sex permits and 38 non-resident antlerless-only permits issued for a total of 162,850 archery permits allocated (an increase of 7 percent over 1993). Archers were required to check their deer in at an archery check station within 48 hours of harvest. Archery harvest results illustrated in Appendix C identify there were 25,586 deer harvested with a male to female sex ratio of 62 and 37 percent respectively.

Table 7. Issuance of 1994 Archery Deer Permits -- By Type.

Permit Type *	Number
First E-S Permit	83723
Second E-S Permit	37195
First A-O	14030
Free Landowner E-S	13885
Free Landowner A-O	13885

Table 7. Continued.

Permit Type	Number
Non-Resident E-S	94
Non-Resident A-O	38
Total	**162,850**

* E-S represents either-sex permits and A-O represents antlerless-only permits.

APPENDIX A

ILLINOIS FIREARM DEER HARVEST STATISTICS BY COUNTY BETWEEN 1993 AND 1994

COUNTY	1994 PERMITS	1994* HARVEST	1994 PERMIT SUCCESS	1993 PERMIT SUCCESS	CHANGE IN PERMIT SUCCESS BETWEEN 1993-94	PERCENT CHANGE IN PERMIT SUCCESS BETWEEN 1993-1994
Adams	7314	2913	40%	43%	-3%	7
Alexander	1176	344	28%	28%	0%	-4
Bond	2413	824	34%	30%	4%	-14
Boone	991	338	34%	37%	-3%	8
Brown	3736	1706	46%	48%	-2%	5
Bureau	2936	1050	36%	37%	-1%	3
Calhoun	2900	1031	36%	34%	2%	-5
Carroll	3043	1049	34%	36%	-2%	4
Cass	1836	642	35%	40%	-5%	13
Champaign	794	266	34%	31%	3%	-8
Christian	1564	516	33%	31%	2%	-6
Clark	2649	1016	38%	37%	1%	-4
Clay	2994	1079	39%	34%	5%	-14
Clinton	1796	615	34%	24%	10%	-43
Coles	1743	638	37%	29%	8%	-26
Crawford	2749	1141	42%	44%	-2%	6
Cumberland	1887	680	36%	33%	3%	-9
DeKalb	1077	372	35%	37%	-2%	7
DeWitt	1093	408	37%	39%	-2%	4
Douglas	605	227	38%	31%	7%	-21
Edgar	1574	615	39%	37%	2%	-6
Edwards	1130	478	42%	49%	-7%	14
Effingham	2338	772	33%	29%	4%	-14
Fayette	4828	1749	36%	35%	1%	-4
Ford	331	97	29%	40%	-11%	27
Franklin	2658	888	33%	34%	-1%	2
Fulton	5737	1887	33%	34%	-1%	3
Gallatin	1586	602	38%	38%	-0%	0
Greene	3021	1261	42%	43%	-1%	3
Grundy	1800	590	33%	31%	2%	-6
Hamilton	2306	931	40%	38%	2%	-6
Hancock	4001	1674	42%	43%	-1%	3
Hardin	2470	946	38%	36%	2%	-6
Henderson	1813	697	38%	38%	0%	-1
Henry	1845	639	35%	40%	-5%	13
Iroquois	2283	860	38%	34%	4%	-11

APPENDIX A - Continued

COUNTY	1994 PERMITS	1994 HARVEST	1994 PERMIT SUCCESS	1993 PERMIT SUCCESS	CHANGE IN PERMIT SUCCESS BETWEEN 1993-1994	PERCENT CHANGE IN PERMIT SUCCESS BETWEEN 1993-1994
Jackson	7807	2826	36%	36%	0%	-1
Jasper	2931	1183	40%	39%	1%	-3
Jefferson	4234	1740	41%	38%	3%	-8
Jersey	2204	705	32%	27%	5%	-18
JoDaviess	6871	2342	34%	38%	-4%	10
Johnson	6244	2304	37%	38%	-1%	3
Kankakee	979	216	22%	23%	-1%	4
Kendall	495	129	26%	23%	3%	-13
Knox	3103	1155	37%	39%	-2%	5
LaSalle	3508	1167	33%	36%	-3%	8
Lawrence	1569	725	46%	46%	0%	0
Lee	2055	778	38%	36%	2%	-5
Livingston	1352	440	33%	38%	-5%	14
Logan	1101	440	40%	37%	3%	-8
Macon	778	264	34%	31%	3%	-9
Macoupin	5421	1938	36%	30%	6%	-19
Madison	3295	906	27%	25%	2%	-10
Marion	3254	1257	39%	35%	4%	-10
Marshall	1626	595	37%	39%	-2%	6
Mason	1565	530	34%	36%	2%	6
Massac	1189	452	38%	35%	3%	-9
McDonough	2080	804	39%	43%	-4%	10
McHenry	2907	817	28%	29%	-1%	3
McLean	2304	853	37%	39%	-2%	5
Menard	1162	444	38%	39%	-1%	2
Mercer	2118	740	35%	33%	2%	-6
Monroe	2464	751	30%	32%	-2%	5
Montgomery	3342	1292	39%	37%	2%	-4
Morgan	2567	1154	45%	47%	-2%	4
Moultrie	663	208	31%	34%	-3%	8
Ogle	4035	1490	37%	39%	-2%	5
Peoria	3574	1115	31%	30%	1%	-4
Perry	4124	1692	41%	41%	0%	0
Piatt	446	173	39%	34%	5%	-14
Pike	8197	4026	49%	51%	-2%	4
Pope	6691	2557	38%	35%	3%	-9
Pulaski	1806	809	45%	46%	-1%	3

Appendix A - Continued

COUNTY	1994 PERMITS	1994 HARVEST	1994 PERMIT SUCCESS	1993 PERMIT SUCCESS	CHANGE IN PERMIT SUCCESS BETWEEN 1993-94	PERCENT CHANGE IN PERMIT SUCCESS BETWEEN 1993-1994
Putnam	950	378	40%	41%	-1%	3
Randolph	5630	2303	41%	39%	2%	-5
Richland	1818	812	45%	42%	3%	-6
Rock Island	2187	703	32%	32%	0%	0
Saline	2020	800	40%	34%	6%	-16
Sangamon	2351	774	33%	32%	1%	-3
Schuyler	3892	1670	43%	43%	-0%	0
Scott	1359	655	48%	52%	-4%	7
Shelby	3433	1088	32%	34%	-2%	7
Stark	503	198	39%	40%	-1%	2
St. Clair	3201	990	31%	32%	-1%	3
Stephenson	2916	1135	39%	44%	-5%	12
Tazewell	2206	741	34%	32%	2%	-5
Union	6068	2081	34%	36%	-2%	5
Vermilion	2903	982	34%	33%	1%	-3
Wabash	744	318	43%	42%	1%	-2
Warren	1372	537	39%	40%	-1%	2
Washington	3112	1171	38%	35%	3%	-8
Wayne	2959	1293	44%	43%	1%	-2
White	2021	851	42%	45%	-3%	6
Whiteside	2140	797	37%	42%	-5%	11
Will	1638	328	20%	21%	-1%	5
Williamson	5165	1624	31%	34%	-3%	8
Winnebago	2525	839	33%	35%	-2%	5
Woodford	2311	915	40%	41%	-1%	3
Cty. Totals	**260,302**	**96,541**	**37%**	**37%**	**0%**	**0%**

* Harvest figures do not include 1,182 deer harvested on special hunt areas.

APPENDIX B

1994 ILLINOIS MUZZLELOADING DEER HARVEST

COUNTY	PERMITS ISSUED				HARVEST			
	Quota*	E-S	A-O	TOTAL	MALE	FEMALE	UNK.	TOTAL
Adams	(113)	78	12	90	3	3	1	7
Alexander	(24)	17	0	17	1	1	0	2
Bond	(36)	31	2	33	0	3	0	3
Boone	(20)	20	3	23	3	0	0	3
Brown	(63)	52	9	61	4	10	0	14
Bureau	(47)	47	10	57	3	4	0	7
Calhoun	(44)	34	1	35	3	5	1	9
Carroll	(50)	50	4	54	4	4	0	8
Cass	(27)	30	3	33	3	1	0	4
Champaign	(20)	20	3	23	2	3	0	5
Christian	(26)	26	4	30	2	2	0	4
Clark	(39)	33	4	37	2	2	0	4
Clay	(35)	35	3	38	2	2	0	4
Clinton	(26)	20	0	20	0	0	0	0
Coles	(26)	26	2	28	0	2	0	2
Crawford	(39)	39	5	44	5	1	0	6
Cumberland	(29)	29	0	29	1	1	0	2
DeKalb	(20)	22	7	29	0	2	0	2
DeWitt	(20)	20	1	21	0	2	0	2
Douglas	(20)	20	0	20	1	0	0	1
Edgar	(26)	26	5	31	2	2	0	4
Edwards	(21)	14	0	14	0	2	0	2
Effingham	(30)	30	2	32	2	3	0	5
Fayette	(60)	60	5	65	4	4	0	8
Ford	(20)	20	0	20	0	0	0	0
Franklin	(38)	38	3	41	3	1	0	4
Fulton	(81)	81	4	85	5	5	0	10
Gallatin	(27)	25	4	29	4	2	0	6
Greene	(39)	39	2	41	3	1	1	5
Grundy	(28)	24	7	31	1	0	0	1
Hamilton	(36)	28	0	28	4	1	0	5
Hancock	(60)	49	3	52	1	1	0	2
Hardin	(53)	29	0	29	0	7	0	7
Henderson	(42)	17	0	17	2	0	0	2
Henry	(26)	27	3	30	1	0	0	1
Iroquois	(35)	35	5	40	1	2	0	3

Appendix B - Continued

COUNTY	PERMITS ISSUED Quota*	E-S	A-O	TOTAL	HARVEST MALE	FEMALE	UNK.	TOTAL
Jackson	(117)	117	15	132	5	6	0	11
Jasper	(36)	36	2	38	1	1	0	2
Jefferson	(60)	39	3	42	3	6	0	9
Jersey	(31)	31	2	33	0	0	0	0
JoDaviess	(111)	111	19	130	7	6	1	14
Johnson	(93)	93	11	104	9	7	0	16
Kankakee	(20)	20	0	20	1	1	0	2
Kendall	(20)	18	0	18	0	0	0	0
Knox	(49)	49	7	56	1	3	0	4
LaSalle	(59)	59	9	68	0	3	0	3
Lawrence	(26)	26	5	31	4	3	0	7
Lee	(35)	35	4	39	1	1	0	2
Livingston	(20)	20	1	21	0	1	0	1
Logan	(20)	20	3	23	1	1	0	2
Macon	(20)	20	0	20	3	2	0	5
Macoupin	(68)	68	14	82	2	4	3	9
Madison	(54)	54	4	58	0	3	0	3
Marion	(45)	45	1	46	5	5	0	10
Marshall	(29)	29	4	33	2	1	0	3
Mason	(29)	29	1	30	0	2	0	2
Massac	(20)	19	2	21	1	1	0	2
McDonough	(30)	28	3	31	4	2	0	6
McHenry	(40)	40	14	54	2	2	0	4
McLean	(29)	29	6	35	1	1	0	2
Menard	(22)	22	1	23	1	2	0	3
Mercer	(39)	39	2	41	0	0	0	0
Monroe	(38)	37	0	37	0	2	0	2
Montgomery	(47)	47	2	49	2	2	0	4
Morgan	(36)	36	4	40	2	4	0	6
Moultrie	(20)	20	5	25	0	1	0	1
Ogle	(53)	54	8	62	2	4	0	6
Peoria	(60)	45	2	47	0	1	0	1
Perry	(56)	56	2	58	2	4	0	6
Piatt	(20)	19	1	20	0	0	0	0
Pike	(105)	105	14	119	12	9	1	22
Pope	(149)	100	0	100	6	4	0	10
Pulaski	(30)	12	2	14	0	1	0	1
Putnam	(20)	20	1	21	1	1	0	2

Appendix B - Continued

	PERMITS ISSUED				HARVEST			
COUNTY	Quota*	E-S	A-O	TOTAL	MALE	FEMALE	UNK.	TOTAL
Randolph	(78)	78	8	86	10	4	0	14
Richland	(23)	22	1	23	1	0	0	1
Rock Island	(44)	44	2	46	3	2	0	5
Saline	(39)	39	0	39	4	2	0	6
Sangamon	(35)	35	3	38	1	0	0	1
Schuyler	(53)	52	4	56	0	3	0	3
Scott	(21)	18	0	18	0	0	0	0
Shelby	(42)	42	3	45	0	3	0	3
Stark	(20)	14	2	16	0	0	0	0
St. Clair	(45)	45	3	48	3	2	0	5
Stephenson	(41)	41	2	43	5	3	0	8
Tazewell	(35)	35	4	39	2	1	0	3
Union	(96)	97	16	113	12	13	2	27
Vermilion	(47)	47	7	54	0	1	0	1
Wabash	(20)	13	0	13	1	0	0	1
Warren	(23)	15	1	16	1	3	0	4
Washington	(41)	41	5	46	2	1	0	3
Wayne	(36)	32	2	34	1	2	0	3
White	(27)	17	1	18	0	2	0	2
Whiteside	(39)	39	5	44	1	2	0	3
Will	(29)	29	4	33	3	2	0	5
Williamson	(78)	77	7	84	3	5	0	8
Winnebago	(37)	37	6	43	1	3	0	4
Woodford	(36)	36	6	43	3	0	0	3
Cty. Total		**3,783**	**382**	**4,165**	**210**	**230**	**10**	**450**

* Quota figures (in parenthesis) are for either-sex permits only.

APPENDIX C

1994 ILLINOIS ARCHERY DEER HARVEST

COUNTY	MALE	FEMALE	UNK.	TOTAL
Adams	273	144	6	423
Alexander	52	29	0	81
Bond	109	88	1	198
Boone	102	61	0	163
Brown	176	96	0	272
Bureau	140	85	0	225
Calhoun	129	73	3	205
Carroll	134	56	0	190
Cass	117	69	1	187
Champaign	138	66	5	209
Christian	124	81	1	206
Clark	141	81	9	231
Clay	113	69	1	183
Clinton	97	62	5	164
Coles	107	63	1	171
Cook	71	20	0	91
Crawford	225	141	0	366
Cumberland	85	52	0	137
DeKalb	141	85	5	231
DeWitt	109	92	7	208
Douglas	44	33	1	78
DuPage	85	34	1	120
Edgar	102	69	0	171
Edwards	82	39	3	124
Effingham	111	54	0	165
Fayette	170	118	1	289
Ford	16	14	0	30
Franklin	182	114	4	300
Fulton	260	141	0	401
Gallatin	70	40	0	110
Greene	145	70	0	215
Grundy	154	82	0	236
Hamilton	72	41	2	115
Hancock	118	56	0	174
Hardin	114	58	2	174
Henderson	69	37	0	106
Henry	108	62	2	172

Appendix C - Continued

COUNTY	MALE	FEMALE	UNK.	TOTAL
Iroquois	164	137	3	304
Jackson	303	175	7	485
Jasper	159	98	1	258
Jefferson	274	218	3	495
Jersey	97	39	3	139
JoDaviess	271	100	0	371
Johnson	282	176	4	462
Kane	254	128	3	385
Kankakee	97	47	0	144
Kendall	54	27	1	82
Knox	192	96	0	288
Lake	332	157	1	490
LaSalle	312	209	1	522
Lawrence	141	94	1	236
Lee	156	98	0	254
Livingston	91	59	0	150
Logan	106	50	0	156
Macon	100	101	0	201
Macoupin	257	183	1	441
Madison	237	123	3	363
Marion	200	143	11	354
Marshall	71	35	0	106
Mason	147	85	1	233
Massac	116	55	0	171
McDonough	93	60	0	153
McHenry	405	204	3	612
McLean	215	151	2	368
Menard	91	45	0	136
Mercer	40	22	1	63
Monroe	78	34	3	115
Montgomery	133	127	8	268
Morgan	161	85	1	247
Moultrie	70	36	0	106
Ogle	303	129	0	432
Peoria	252	148	1	401
Perry	214	126	3	343
Piatt	63	47	1	111
Pike	511	287	0	798
Pope	268	172	1	441

Appendix C - Continued

COUNTY	MALE	FEMALE	UNK.	TOTAL
Pulaski	101	70	1	172
Putnam	56	29	0	85
Randolph	248	146	3	397
Richland	117	81	0	198
Rock Island	134	69	1	204
Saline	105	75	0	180
Sangamon	182	110	1	293
Schuyler	103	75	0	178
Scott	48	33	3	84
Shelby	173	118	0	291
Stark	41	24	1	66
St. Clair	177	106	18	301
Stephenson	162	81	0	243
Tazewell	215	122	0	337
Union	251	197	8	456
Vermilion	262	157	1	420
Wabash	71	45	4	120
Warren	71	27	0	98
Washington	139	74	1	214
Wayne	190	99	5	294
White	143	71	10	224
Whiteside	105	62	0	167
Will	394	214	0	608
Williamson	273	194	7	474
Winnebago	255	136	0	391
Woodford	163	108	0	271
Cty. Totals	**15,974**	**9,404**	**193**	**25,571**
CILCO1	3	9	0	1
Michigan *	1	0	0	1
Missouri *	1	0	0	1
Wisconsin *	1	1	0	2
Grand Total	**15,980 (62%)**	**9,414 (37%)**	**193 (1%)**	**25,586**

* Harvest figures listed for Michigan, Missouri and Wisconsin are apparent key punch errors.

APPENDIX D

DEER REMOVAL PERMITS ISSUED AND KILL REPORT
1 JANUARY THROUGH 31 DECEMBER 1994

COUNTY	DEER ALLOWED	DEER TAKEN	PERMITS ISSUED	PERMITS RETURNED
Adams	15	4	4	4
Boone	20	18	2	2
Calhoun	9	0	4	0
Carroll	40	7	4	3
Cass	1	1	1	1
Champaign	48	22	10	8
Christian	4	0	2	2
Clinton	3	1	1	1
Cook/DuPage	6	4	1	1
Crawford	2	0	1	1
DeKalb	19	0	3	3
DeWitt	4	2	1	1
DuPage	10	0	1	0
Fayette	5	0	2	2
Franklin	12	7	3	3
Fulton	3	2	1	1
Grundy	82	29	11	5
Hancock	1	1	1	1
Henderson	3	0	2	2
Henry	5	0	1	1
Jackson	79	50	10	5
Jasper	4	0	1	1
Jefferson	10	3	7	7
Jersey	6	0	2	0
Johnson	52	27	10	7
Kane	55	14	10	4
Kendall	2	0	1	0
Lake	12	3	2	2
LaSalle	27	8	4	4
Lee	7	0	1	0
Macon	2	0	1	1

Appendix D - Continued

COUNTY	DEER ALLOWED	DEER TAKEN	PERMITS ISSUED	PERMITS RETURNED
Macoupin	10	5	5	4
Madison	5	0	1	1
Massac	16	10	3	2
Massac/Pope	10	10	1	1
McHenry	91	6	10	5
McLean	16	10	4	4
Menard	2	0	1	1
Montgomery	10	6	3	3
Ogle	31	10	4	3
Perry	11	4	3	2
Pike	77	42	22	19
Pope	11	10	3	3
Pulaski/Massac	5	0	1	0
Randolph	2	2	1	1
Saline	8	8	3	3
Sangamon	4	0	2	2
Schuyler	31	18	7	6
St. Clair	3	3	1	1
Stephenson	10	4	2	2
Union	55	16	9	7
Union/Jackson	5	0	1	0
Union/Johnson	5	0	1	0
Vermilion	32	17	5	4
Warren	5	0	1	1
White	2	2	1	1
Will	16	0	3	1
Williamson	5	5	1	1
Winnebago	8	3	1	1
Cty. Totals	**1,034**	**394**	**205**	**152**

Appendix E

REGIONAL DEER REMOVAL PERMIT/KILL REPORT - 1994
1 JANUARY THROUGH DECEMBER 31

REGION 1:	DEER ALLOWED	DEER TAKEN	PERMITS ISSUED	PERMITS RETURNED
Boone	20	18	2	2
Carroll	40	7	4	3
DeKalb	19	0	3	3
Fulton	3	2	1	1
Henderson	3	0	2	2
Henry	5	0	1	1
LaSalle	27	8	4	4
Lee	7	0	1	0
Ogle	31	10	4	3
Stephenson	10	4	2	2
Warren	5	0	1	1
Winnebago	8	3	1	1
Sub-total	178	52	26	23
REGION 2:				
DuPage	10	0	1	0
Grundy	82	29	11	5
Kane	55	14	10	4
Kendall	2	0	1	0
Lake	12	3	2	2
McHenry	91	6	10	5
Will	16	0	3	1
Sub-total	268	52	38	17
REGION 3:				
Champaign	48	22	10	8
DeWitt	4	2	1	1
Macon	2	0	1	1
McLean	16	10	4	4
Vermilion	32	17	5	4

Appendix E - Continued

REGION 3:	DEER ALLOWED	DEER TAKEN	PERMITS ISSUED	PERMITS RETURNED
Sub-total	102	51	21	1
REGION 4:				
Adams	15	4	4	4
Calhoun	9	0	4	0
Cass	1	1	1	1
Christian	4	0	2	2
Clinton	3	1	1	1
Hancock	1	1	1	1
Jersey	6	0	2	0
Macoupin	10	5	5	4
Madison	5	0	1	1
Menard	2	0	1	1
Montgomery	10	6	3	3
Pike	77	42	22	19
Randolph	2	2	1	1
Sangamon	4	0	2	2
Schuyler	31	18	7	6
St. Clair	3	3	1	1
Sub-total	183	83	58	47
REGION 5:				
Crawford	2	0	1	1
Fayette	5	0	2	2
Franklin	12	7	3	3
Jackson	79	50	10	5
Jasper	4	0	1	1
Jefferson	10	3	7	7
Johnson	52	27	10	7
Massac	16	10	3	2

Appendix E - Continued

REGION 5:	DEER ALLOWED	DEER TAKEN	PERMITS ISSUED	PERMITS RETURNED
Perry	11	4	3	2
Pope	11	10	3	3
Saline	8	8	3	3
Union	55	16	9	7
White	2	2	1	1
Williamson	5	5	1	1
Sub-total	272	142	57	45
REGION O:				
Cook/DuPage	6	4	1	1
Massac/Pope	10	10	1	1
Pulaski/Massac	5	0	1	0
Union/Jackson	5	0	1	0
Union/Johnson	5	0	1	0
Sub-total	31	14	5	2
STATE TOTALS	**1,034**	**394**	**205**	**152**

WILDLIFE MANAGEMENT AND RESEARCH NOTES

INDIANA DIVISION OF FISH & WILDLIFE

No.	Title: 1993 Farm Operator Survey	Date
	Author: Lou Cornicelli, Wildlife Research Biologist	

BACKGROUND

According to population estimates, the deer herd was 282,000 in 1987 and peaked in 1991 at around 350,000 animals. A liberalization of antlerless permits has subsequently reduced the deer herd to a pre-hunt 1994 estimate of 292,000 (17% lower than 1991). The current permitting system appears to be having an impact on the statewide deer population.

In late-1993, a comprehensive survey was conducted of all known farm operators to evaluate their opinions towards deer. This survey was essentially a repeat of one conducted by IDNR in 1987. The objective was to assess farm operators' opinions towards the deer population, deer-related crop damage, and deer hunting and compare present attitudes with the 1987 survey. Data are organized primarily by Deer Management Zones (DMZ; Fig. 1).

METHODS

As in the previous survey, the Indiana Agricultural Statistics Service (IASS) at Purdue University was contacted for assistance. IASS estimates there are 63,000 farm operators, of which they maintain an active database of approximately 48,600. Every farm operator within the database was sent a self-administered questionnaire, cover letter, and postage-paid return envelope. A follow-up was not sent to non-respondents.

RESULTS

Most farmers appeared to appreciate the presence of deer on their land. Thirty percent (n = 5,873) believed deer had "aesthetic value" and an additional 52% (n = 10,264) "enjoyed deer but were concerned about crop damage". Only 14% considered deer a "nuisance" and 4% had no particular feeling about deer on their land. Despite an estimated 11% statewide reduction in the deer population from 5 years ago, only 26% of respondents perceived deer trends in accordance with population models. Most people (62%) believed deer numbers had increased over the previous 5 years.

Seventy-four percent (n = 14,731) of farm operators indicated they had incurred deer-related damage within the previous 12 months. Of these, only 65% (n = 9,576) actually listed specific crops; 35% of

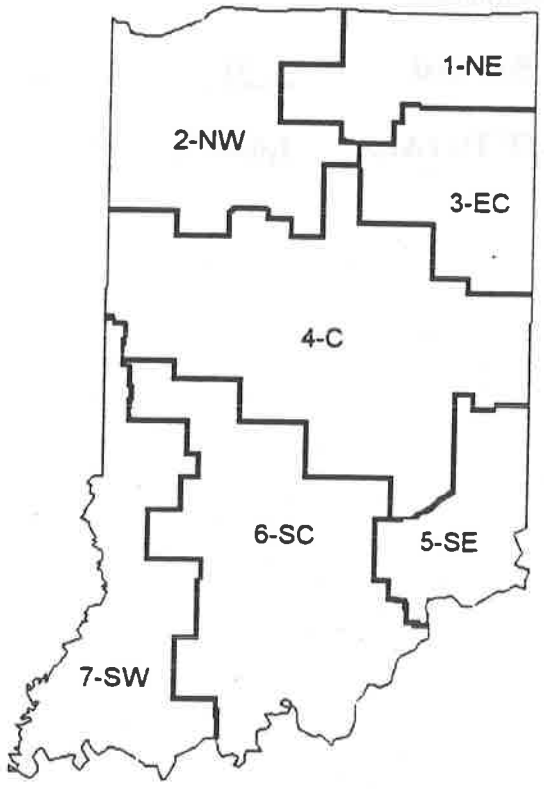


Figure 1. Indiana deer management zones.

These management and research notes are issued periodically to provide a quick source of information on wildlife surveys and investigations and various wildlife programs prior to more formal reports. Any information provided is subject to further analysis and therefore is not for publication without permission.

respondents did not indicate which crops were damaged. Crop damage complaints were most prevalent in DMZ-2 (80%) and least common in DMZ-4 (34%) (Fig. 2). Statewide, respondents characterized their damage as: none (26%), light (35%), moderate (25%), substantial (11%), or severe (3%). Farmers in DMZ-5 were most likely to describe their damage as moderate to severe, while farmers in DMZ-4 tended to describe their damage as none to light (Fig. 3). While nearly three-fourths of all respondents had incurred some level of deer damage, only 28% (n = 4,036) of those farmers indicated their damage was unreasonable. Most farmers described their damage as either negligible (25%; n = 3,528) or tolerable in exchange for having deer (47%; n = 6,770). Weighted responses within DMZ showed that farmers in the northeast (DMZ-1) were least likely to accept damage; while farmers in the central zone (DMZ-4) were most tolerant of deer damage.

Although most respondents appreciated deer and described their damage as "negligible" or "tolerable", statewide 61% desired a population reduction in the county they lived. Thirty-one percent wanted populations stabilized and 8% wanted more deer. In all 7 DMZs, >55% of respondents indicated that they wanted a reduction in the deer population, of which >20% wanted a substantial reduction in the deer herd. Weighted responses showed that farmers in DMZ-5 wanted the largest decrease and DMZ-1 the smallest.

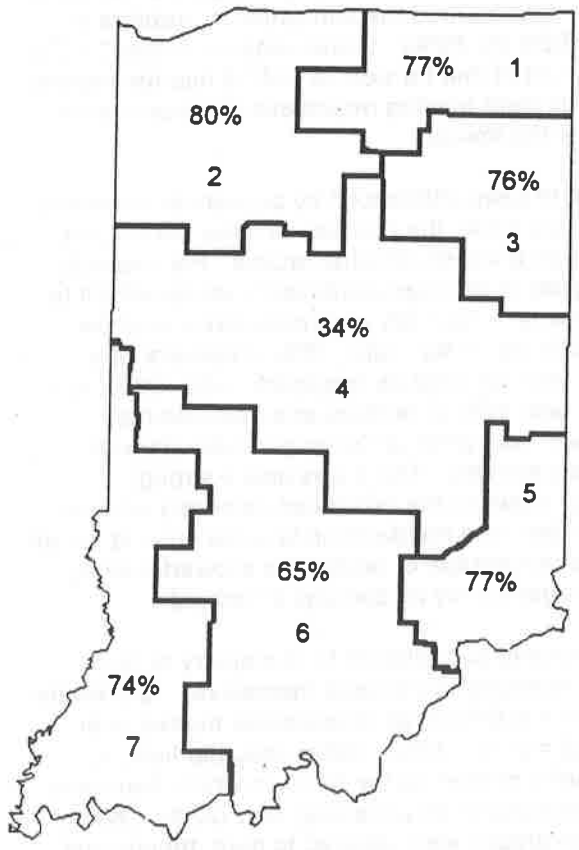


Figure 2. Percentage of farm operators in Indiana that indicated they had deer-related damage during 1993, by deer management zone.

Degree of deer damage had an adverse effect on the desired population trend. As crop damage intensity increased (light,...,severe), respondents were more likely to want a decrease in the deer population. Similar relationships were observed when the desired population was compared against opinions about deer and feelings regarding damage. As expected, farmers who perceived deer as a "nuisance" were more likely (98%) to want fewer deer than were people who believed deer had "aesthetic value" (15%). Likewise, farmers who described their damage as "unreasonable" were more likely to want fewer deer than people whose damage was "negligible" (97% vs. 62%)

Participants were asked to describe the monetary loss attributable to deer on their farms. Comparing historical records of field investigations with the present data suggested (1) damage was a subjective estimate and it probably reflects farmers perceptions of deer damage, rather than quantified losses, and (2) damage by other wildlife species may be attributed to deer. For all respondents, 77% reported damage less than $250, 7% reported damage in the range of $251-$500, and 16% believed their damage was >$500. Statewide, the average reported loss was $322 per farm and $443 for those farms where damage was reported. Of the other species that commonly cause crop losses (raccoon, squirrel, groundhog, blackbirds), 9% of respondents

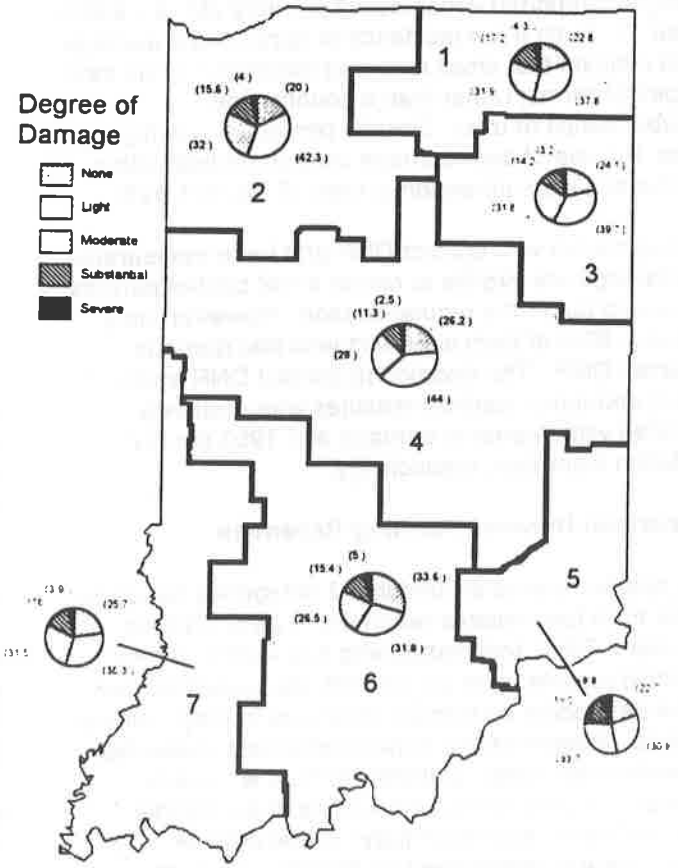


Figure 3. Farm operator estimates of deer-related damage (%) in Indiana during 1993, by deer management zone.

indicated that 1 of these species in addition to deer had caused damage, and 6% believed 2 or more species along with deer had caused crop damage. Fifty-one percent believed deer were responsible for all of their crop damage.

As expected, there was a strong relationship between reported monetary losses and feelings towards damage, degree of damage, and desired population trend. The average dollar losses for those who considered their damage "negligible", "tolerable", or "unreasonable" was $187, $357, and $866, respectively. For individuals who subjectively characterized their losses as "light", "moderate", "substantial", or "severe", they lost an average of $193, $563, $854, $1,103, respectively. Estimated losses were also related to desired population trends, although people who wanted the population to stabilize lost slightly less than those who wanted the population to increase. The average loss for people who wanted substantial and slight increases was $227 each. People who felt the deer population should be stabilized lost $217, and individuals who wanted slight and substantial decreases lost $430 and $640, respectively.

Farm operators reported corn (74%) and soybeans (52%) as the most frequently damaged crop, although the average loss/acre was comparably low. Horticultural crops (e.g., fruit trees, plantations and nurseries) were grown infrequently and not often damaged, but incurred the highest reported dollar losses per acre ($114 - $360) (Table 1). Such a low incidence of horticultural damage would indicate that small localized overpopulations exist on specific farms, rather than a county-wide overabundance of deer. Despite perceptions of high losses, the use of deer damage control methods other than hunting were infrequently used (5.7%; n = 817).

Farm operators who contact DNR and have measurable crop damage are eligible to obtain lethal control permits, both in and out of the regular season. However, only 5.6% (n = 833) of farm operators who had damage contacted DNR. The decision to contact DNR and/or employ non-lethal control measures was positively correlated with degree of damage and 1993 county population estimates, respectively.

Comparison Between Farming Revenues

Farm operators were divided into 3 categories based on income from farm-related revenues: < 25%, 25% to 75%, and > 75%. Individuals who had < 25% of total household income were considered "part-time" farmers and not dependent on farming revenues to meet annual expenses. People whose farming revenues exceeded 75% were considered "full-time" farmers who were dependent on their farms. Individuals in the middle were considered "supplementary" in that outside earnings were supplemented by farming revenues.

Households with < 25% farm-related income appreciated the presence of deer at higher than expected proportions. Supplemental farmers appreciated and disliked deer in expected proportions, while full-time farmers were least likely to appreciate deer and most often considered them a "nuisance". Full-time farmers were most likely to indicate that deer had caused damage (86%), followed by supplemental farmers (82%) and part-time farmers (61%). Full-time farmers also perceived their damage as "substantial" or "severe" more often than any other group. Similar trends were apparent for farm operators' feelings toward deer damage ("negligible", "tolerable", or "unreasonable"). Supplemental and full-time farmers tended to characterize their damage as "tolerable" or "unreasonable", while part-time farmers tended to characterize their damage as either "negligible" or "tolerable". Additionally, 83% of full-time and 81% of supplemental farmers allowed hunting compared to 70% of part-time farmers.

Deer Hunting

Statewide, 77% of all respondents indicated that some deer hunting occurred on their property. Among DMZ's, the percentage who reported some hunting ranged from 65% in DMZ-4 to 87% in DMZ-5. Farmers who had observed more deer now than 5 years ago were more likely to allow hunting than individuals who had seen the same or fewer (80% vs. 73%). Farmers who wanted lower populations allowed hunting in higher proportions than those who wanted the population to stabilize or increase (82% vs. 69%). Some variation within DMZ's was observed in that farmers in DMZ-5 had the highest incidence of deer hunting regardless of circumstance, and DMZ-4 the lowest.

In addition to being influenced by population estimates and observed trend, the decision to allow hunting was influenced by a variety of other factors. For example, as the degree of damage increased from none/light to moderate/severe, farmers were more likely to allow hunting (68% vs. 91%). Also, 76% of farmers who described their damage as "negligible" allowed hunting, while 85% and 91% of farmers who believed their damage was "tolerable" or "unreasonable" allowed hunting, respectively. There was also a strong relationship between the perceived monetary amount lost due to deer and the decision to allow hunting. In all DMZ's, the percentage of farms who allowed hunting increased significantly as damage increased.

Although hunting was allowed by a majority of farm operators, relatively few hunted themselves. Statewide, only 30% (n = 5,895) of all respondents hunted deer (DMZ range = 20% - 40%). When they did hunt, a majority (84%) hunted on the farms in which they lived and were successful at harvesting deer (52%). When asked which groups were allowed to hunt, friends and neighbors were given permission most often (62%), followed by family (52%), and finally the public with permission (41%). Farmers in DMZ-2 were least likely

to give permission to the public (39%) while farmers in DMZs-5 and 7 gave permission most often (45%) (Table 2). When asked why they limited access to the general public, the largest group (64%) indicated they liked to know who was using their land. Other responses included concerns over liability (54%), past problems with hunters (45%), a desire to reserve the property for family (34%), and opposition to hunting (5%). "Other" was listed 13% of the time and appeared to primarily be a concern about the safety of livestock. When asked what the single most important reason why access was limited, the results followed similar trends.

Despite a high incidence of hunting and a high percentage of farmers with past problems with hunters (45%), only 8% indicated they had major problems. The largest group (55%) indicated they had no problems with hunters in the last 2 years and 37% indicated minor problems. Farmers in DMZs-5 and 6 reported substantial problems most often (11%) and farmers in DMZ-3 had the lowest percentage of substantial problems (6%).

Comparison with the 1987 Survey

Attitudes towards deer.-- Although sample size was substantially larger in 1993 (n = 20,396 vs. 6,556), the present questionairre was nearly identical to 1987, therefore many questions were directly comparable.

Overall opinions of farm operators regarding deer in Indiana have become less favorable from 1987 to 1993. In 1987, 46% of all respondents believed deer had "aesthetic value", 41% "enjoyed deer, but worried about crop damage", 9% considered them a "nuisance", and 4% "had no particular feelings". In 1993, the percentage of individuals who thought favorably of deer ("aesthetic") had dropped to 30%. A higher percentage (52%) indicated they still enjoyed deer, but worried about damage. Similarly, a higher percentage (14%) believed deer had become a "nuisance". Four percent of the sample still had no particular feelings toward deer. This indicated that although fewer farmers unequivocally enjoyed deer, a high percentage still enjoyed seeing them on their land.

The percentage of farm operators who believed they had incurred deer damage increased from 58% in 1987 to 74% in 1993. Not surprisingly, as incidence of damage increased, ratings of and feelings about damage also increased. In 1987, farm operators were likely to characterize their damage as none (42%) or light (35%). In 1987, only 16%, 6%, and 2% felt their damage was moderate, substantial, or severe, respectively. In 1993, farm operators tended to characterize their damage as either light (35%), moderate (25%), or substantial (11%). An additional 3% claimed their damage was severe and only 24% indicated they had incurred no damage. In contrast to 1993 where 25%, 47%, and 28% believed their damage was "negligible", "tolerable", and "unreasonable", respectively, farm operators in 1987 rated their feelings about deer damage as negligible-31%, tolerable-51%, and unreasonable-18%.

Further evidence that negative attitudes towards deer had increased was that in 1987 farm operators had higher monetary losses before they considered their damage "substantial" or "severe". In 1993, farmers who considered their damage as "severe" lost an average of $1,103, while in 1987 $1,926 was lost before damage was considered "severe" (Fig. 4).

Deer hunting.--The most obvious indicator of perceived increases in deer populations and damage is the percentage of farm operators who allowed hunting on their farms. In 1987, 57% of farm operators indicated that hunting occurred on their farms. In 1993, the percentage who allowed hunting increased to 77%. Also the percentage of individual groups who were allowed to hunt increased drastically from 1987 to 1993 (Table 3). Although the incidence of hunting had increased, the percentage of farm operators who had problems with hunters remained stable. In 1987, 34% and 10% indicated they had minor and substantial problems, respectively; while in 1993, 45% and 8% had minor and substantial problems. Reasons for limiting access to the public were similar between surveys.

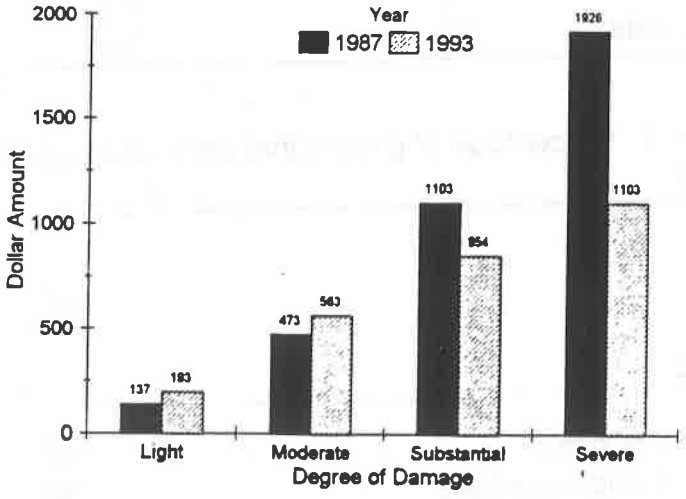


Figure 4. Comparison of average dollar losses and rating of damage between the 1987 and 1993 farm operator surveys.

Table 1. Crop damage reported by Indiana farm operators during 1993.

Crop	% with Crop	% with Damage	Avg. dollar loss per farm[1]	Avg. dollar loss/acre[1]
Corn	74.1	52.3	638.0	7.3
Soybeans	67.6	39.8	533.2	6.5
Wheat	35.0	19.5	207.3	5.2
Hay/Alfalfa	55.3	9.9	359.6	7.8
Other Small Grains	6.7	7.4	267.2	14.2
Fruit Trees	3.8	23.3	370.5	98.6
Small Fruits/Berries	1.8	8.2	659.3	360.2
Vegetables/Melons	4.9	13.6	457.6	144.2
Nursery	5.3	14.0	617.2	114.0

[1]For those people indicating they had damage.

Table 2. Where hunting was allowed, percentage of groups that were allowed to hunt on Indiana farms in 1993, by deer management zone.

	Percentage that was allowed to hunt		
Zone	Family	Friends and Neighbors	Public with Permission
1-NE	54	62	40
2-NW	49	64	36
3-EC	51	61	41
4-C	46	63	39
5-SE	57	61	45
6-SC	58	62	42
7-SW	54	61	45
Statewide	52	62	41

Table 3. Percentage of groups that were given permission to hunt on Indiana farms, 1987 vs. 1993.

	Year	
	1987	1993
Group	%	
No one or family	40	54
Friends and neighbors	38	62
People who ask permission	34	39

The Results from the 1993 Deer Season in Iowa.

A total of 76,430 deer were killed during the 1993 season, a decrease of just 2% from 1992. Higher success rates during most seasons made up for having 10% fewer hunters in the field. The decline in hunter numbers was partly due to restrictions forcing shotgun and muzzleloader hunters in the northern counties to taking only antlered deer. Another change required landowners to get their free licenses through the county recorders office. Although this allowed landowners a much longer period to obtain their license, about 30% fewer of these licenses were issued.

The kill during the shotgun seasons was nearly identical to 1992 (Table 1.1). This was primarily due to higher success rates which made up for fewer hunters. Success rates for hunters with any-sex licenses was about 64%, while about 40% of hunters with buck-only licenses were successful.

Seven of the top 10 counties for total kill were either in the northeast or southeast corner of the state. Allamakee was the top county for total take, with 3,126 deer or about 4.9 per square mile of area. Grundy county had the lowest kill with an estimate of 19 deer or only about 1 deer per 25 square miles.

The relative precision of the harvest estimates from the 8 separate postcard surveys ranged from ±2% for shotgun hunters with any-sex licenses to ±13% for the youth season. The relative precision for the doe harvest ranged from ±5% for shotgun hunters to ±30% for nonresidents. The relative precision of county estimates averaged ±37% for total kill and ±57% for doe kill for the shotgun season. The relative precision of the county estimates is a function of the number of hunters sampled from each county. Thus, confidence intervals for counties with a higher sample size are smaller relative to the point estimate than are intervals for counties with lower sample size (eg. the harvest estimate for the shotgun season for Allamakee county (n_i= 445) was 2,757 with a confidence interval of ±340 which is within ±12% of the estimate, while the estimate for Grundy county (n_i=5) was 19 with a confidence interval of ±17 which is within ±90% of the estimate).

Shotgun Season

The number of deer killed was nearly identical to 1992. Antlered bucks made up about 44% of the total kill, while does made up 41% and the rest were buck fawns. There were nearly 62,900 hunters in the field during the first season and they killed about 35,000 deer while just less than 45,000 hunters tagged about 26,000 deer during the second season. This translates to a 56% success rate for first season hunters and 58%

for second season hunters. Antlered deer made up the largest proportion (54%) of the kill during the first season while does made up the largest proportion (51%) of the deer tagged during the second season.

Hunting pressure (Fig 1.1) was generally higher during the first season, especially in those counties where regulations allowed hunters to obtain any-sex tags. Pressure was more evenly distributed between first and second season in those counties where hunters were restricted to buck-only tags during the first season.

Deer kill (Fig 1.2) was highest in northeast and southern Iowa during the first season and in the eastern half of the state during the second season. More deer were taken during the first season in counties where hunters could obtain any-sex licenses. The kill was higher during the second season in the counties that were buck-only during the first season.

As would be expected success rates (Fig 1.3) were highest in the any-sex areas during the first season and second seasons. However, success rates were fairly high even in the buck-only counties for first season hunters. Second season hunters had low success rates in the buck-only area.

Does made up less than 50% of the kill in most counties during the first season (Fig 1.4). Does made up over 60% of the harvest in only a few counties during the second season. First season hunters with any-sex tags averaged 4.3 days in the field, while those with buck-only licenses averaged 3.3 days. During the second season hunters with any-sex tags averaged 6.7 days in the field, while those with buck-only licenses averaged 4.9 days.

Although the lack of precision of the county estimates makes it difficult to evaluate individual counties and determine whether management objectives are being meet, it is possible to make some generalizations. Overall, last year's regulations appeared to be effective in restricting the number of deer, especially does, taken in northern Iowa. The doe harvest was significantly reduced, particularly in those counties that were buck-only during both seasons.

It appears that the bonus antlerless zone was effective in adding pressure on the does as does made up over 50% of the kill in many of the counties in this area. This area will have to be watched carefully in the next year or two, as doe harvests this high may begin to reduce the deer population. Once the numbers start to decline, maintaining extra pressure on the does could cause the population to decline rapidly.

Archery

The kill during the 1993 archery season was about 5% higher than in 1992, despite fewer hunters. The number of licenses issued and the number of hunters in the field declined by about 10% from 1992. Success rates, however increased substantially to 32%. About 64% of the deer taken by archers were antlered bucks.

Archers averaged about 17 days in the field in 1993, 15 days before the shotgun season and 2 days after. The timing of the harvest was similar to that reported during the past 3 years. About 60% of the bowhunters reported shooting their deer in November. Nearly a 40% of the harvest occurred between November 6th and 23rd.

Muzzleloader

After 7 years of record harvests, early season muzzleloader hunters killed about 10% fewer deer in 1993. The decline is the result of fewer hunters and lower success rates. The new management system restricted hunters in 65 counties to buck-only licenses. About 34% of the hunters were successful and about 64% of the deer tagged were antlered bucks. Hunters averaged about 4.7 days in the field.

The kill during the late season was 11% lower than in 1992, again mostly because of fewer hunters in the field. Regulation changes restricted hunters in 34 counties in the northwest part of the state to taking antlered deer only. The success rate was about 39%, which is average for this season. Hunters with bonus antlerless licenses were more successful than last year and 38% tagged a deer. About 37% of the deer killed by hunters with regular tags were antlered bucks. Hunters averaged about 7.5 days in the field which is the same as in 1992.

Nonresident

Of the 1,199 licenses issued, 709 went to hunters during the shotgun season, 427 to bowhunters, and 63 to late season muzzleloader hunters. About 64% of the shotgun hunters, 28% of the muzzleloader hunters and 37% of the archers were successful. Nonresidents spent an average of 6 days in the field. About 63% of the nonresidents reported that they were hunting with an Iowa resident.

Special Youth Season

This year was the second year for the special youth season. It was restricted to youths who were 12 through 15 years old. The young hunter had to pass a hunter safety course and had to be accompanied into the field by an adult. About 40% of the estimated 1,674 hunters were successful in bagging a deer.

About 46% of the youths were on their first hunt. This is down from 61% last year, probably due to repeats from last year. Although most hunted with a parent, 22% spent at least part of the time in the field with either a friend or relative. These young hunters spent an average of 3.7 days in the field, with the time fairly evenly split between all 3 weekends.

Hunter Opinion

Hunters were asked to rate the quality of their hunt and the number of deer in the area where they hunt (Table 1.2). The proportion of hunters that were either satisfied or very satisfied ranged from a low of 52% for hunters with buck-only licenses to a high of 90% for non-resident hunters. The proportion of hunters who felt the number of deer in their area was too low was about the same as last year. Most hunters still think the number of deer is about right, although twice as many would like to see more deer than think there are too many.

Population Surveys

Three techniques are used to monitor deer population trends in Iowa. These are 1) an aerial survey conducted in January and February after the deer seasons are complete; 2) a spotlight survey conducted in April and 3) a record of the number of deer killed on Iowa's rural highways. All of these surveys correlate well with the reported harvest over the last 16 years and seem to provide reliable long term trend indices. However none of these surveys can be considered reliable predictors of annual changes in the population because of high variability.

Deer populations for the state as a whole appear to be fairly stable over the last 3 to 4 years. All three surveys showed slight increases during the past year. The aerial survey conducted after the 1993 season was up about 21% from last year. Survey conditions were close to ideal for this survey and nearly all of the surveys were completed. The number of deer killed on highways were up about 5% in 1993. Most of the increase took place in northern Iowa. Spotlight surveys were down about 10% from the all-time high recorded in 1993.

Changes for 1994

Hunters did not see many changes in the 1994 deer seasons. There were only a few changes in which counties are buck-only and any-sex counties for each season. The most significant change was the switch to a statewide license for shotgun and muzzleloader hunters. Hunters in these seasons will receive a license for the season they choose which will be valid for the entire state. This gives hunters the option to hunt their usual areas even if part are in the buck-only area and part are in the any-sex area. Hunters would still be restricted to only taking antlered deer in the buck-only counties

Other changes included moving the early muzzleloader season back 1 week. This puts it nearer to the middle of October and should improve success rates a little. Also, the youth season was expanded to include weekdays. It still ran through 3 weekends. Another change allowed hunters to use a bow to take a deer during the late muzzleloader season.

Table 1.1 A summary of the number of licenses issued, the number of hunters, the number of deer harvested and success rates for 1993.

Season	License Type	Licenses Issued	Number of Hunters	Harvest	Success Rate
REGULAR GUN					
Paid	Any–sex	66,307 (– 9%)a	63,241 (– 10%)	40,757 (– 1%)	64%
	Buck–only	28,054 (+ 16%)	26,642 (+ 16%)	10,586 (+ 30%)	40%
	Antlerless	2,216 (–27%)	1,906 (–28%)	1,281 (–17%)	67%
	Total	96,577 (– 4%)	91,789 (– 4%)	52,624 (+ 4%)	
Landowner	Any–sex	21,887 (– 27%)	16,067 (– 24%)	8,354 (– 20%)	52%
Nonresident	Any–sex or Buck–only	709 (+ 10%)	658 (+ 9%)	422 (+ 33%)	64%
GUN SEASON TOTAL		119,173 (– 9%)	108,514 (– 8%)	61,400 (NC)	
MUZZLELOADER					
Early	Any–sex	7,306 (– 12%)a	6,582 (–11%)	2,219 (–33%)	34%
Late	Any–sex	6,114 (– 5%)	5,268 (–4%)	2,066 (–6%)	39%
	Antlerless	2,749 (–40%)	2,126 (–38%)	801 (–23%)	38%
Nonresident	Any–sex	63 (+ 11%)	57 (+14%)	16 (–6%)	28%
MUZZLELOADER TOTAL		16,232 (–16%)	14,033 (–14%)	5,102 (–22%)	
YOUTH SEASON		1,674 (– 5%)	1,578 (–6%)	637 (–1%)	40%
ARCHERY					
	Any–sex & Antlerless	30,511 (– 9%)	29,001 (–8%)	9,144 (+6%)	32%
Nonresident	Any–sex	427 (–15%)	399 (–13%)	147 (+1%)	37%
ARCHERY TOTAL		30,938 (–9%)	29,400 (–8%)	9,291 (+5%)	
TOTAL		168,017 (–10%)	153,525 (–8%)	76,430 b (– 2%)	

a – the percent change from 1992, NC = No Change
b – the 95% confidence interval for the total harvest would be from

Table 1.2 The results of the hunter opinion surveys on the quality of the hunt and the number of deer in the area the hunter hunted in 1993.

		Rating of Quality of Hunt				Number of deer in area		
Season	License Type	Very Satisfied	Satisfied	Unsatisfied	Very Unsatisfied	Too Few	About Right	Too High
Shotgun	Any–sex	18%	57%	17%	8%	22%	62%	17%
	Buck–only	10%	42%	28%	20%	39%	45%	16%
	Antlerless	18%	58%	16%	8%	16%	62%	22%
Nonresident	Varies	45%	45%	6%	4%	16%	77%	7%
Youth	Any–sex	37%	43%	13%	7%			
Muzzleloader								
Early	Any–sex	14%	44%	23%	19%	33%	58%	9%
Late	Any–sex	14%	54%	20%	11%	31%	59%	10%
	Antlerless	13%	55%	20%	11%	25%	60%	15%
Archery	Any–sex	16%	54%	22%	8%	37%	56%	7%
Weighted Total		16%	53%	20%	11%	28%	58%	14%

Figure 1.1 The average number of hunters per square mile in each county during the shotgun season in 1993.

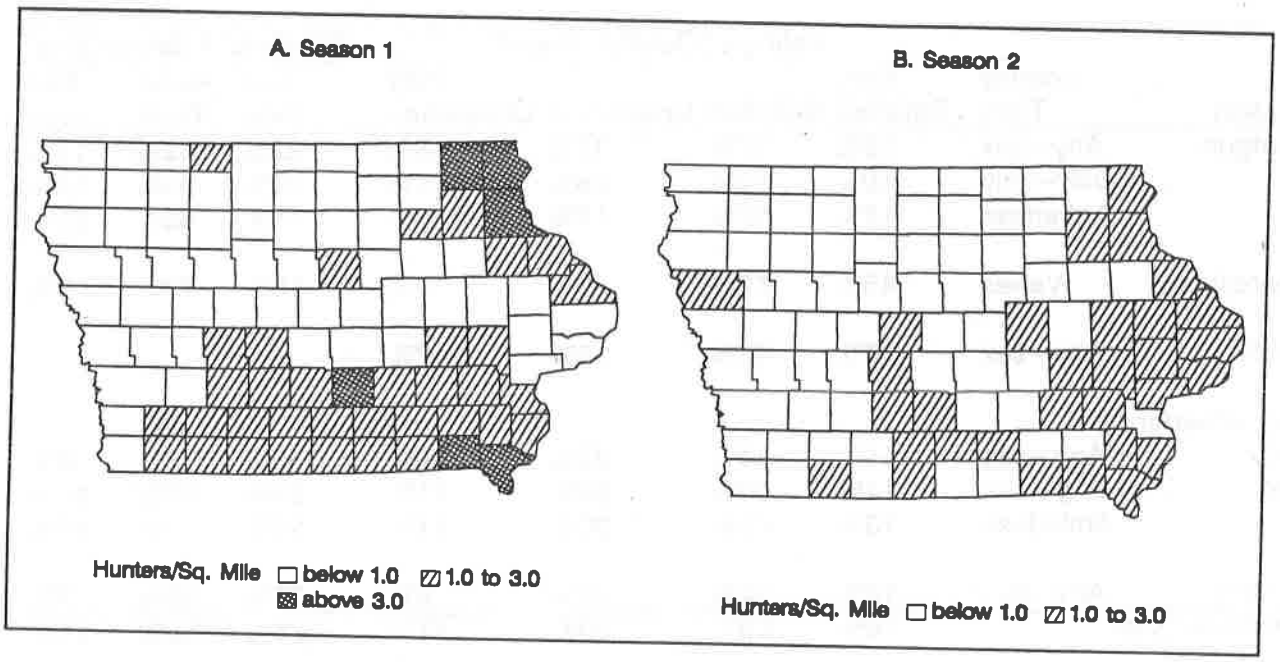


Figure 1.2 The average number of deer killed per square mile in each county during the shotgun season in 1993.

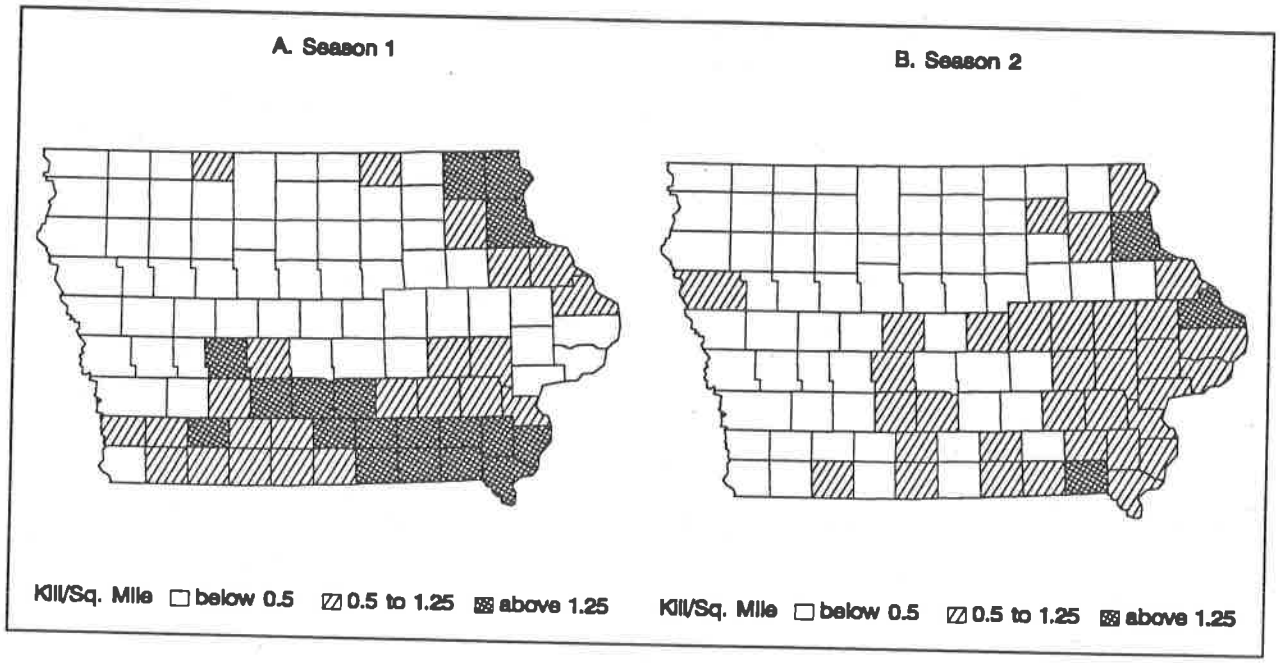


Figure 1.3 The average success rate for hunters in each county during the 1993 shotgun season.

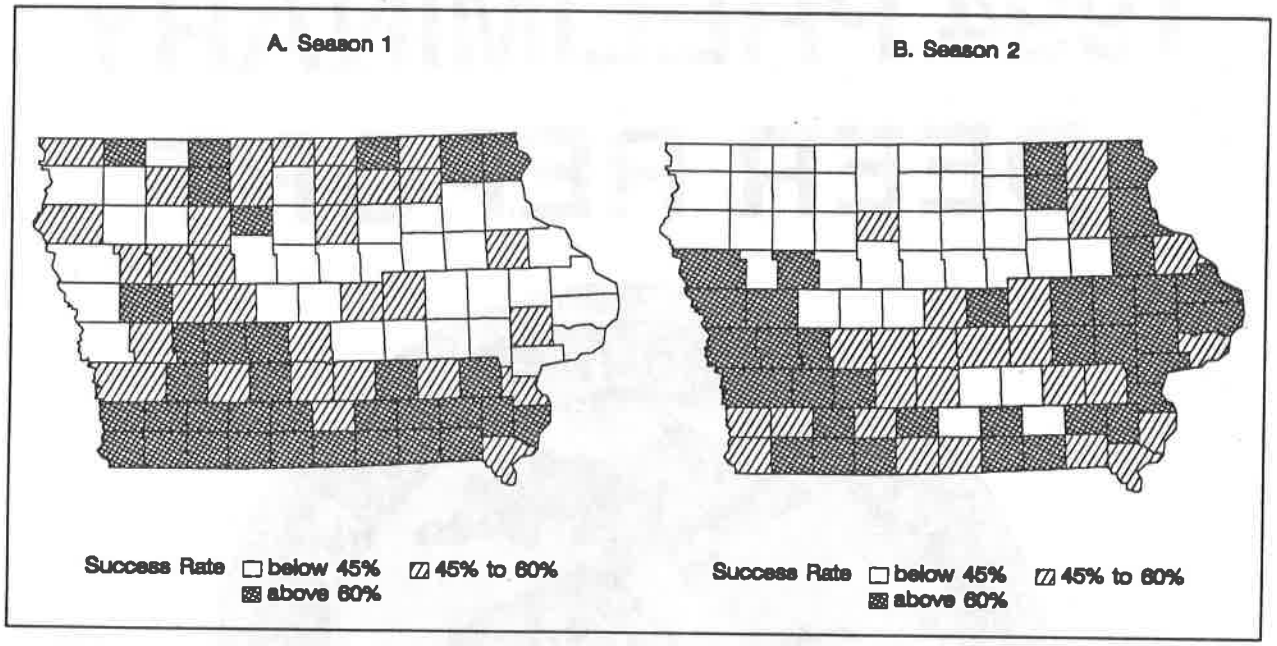
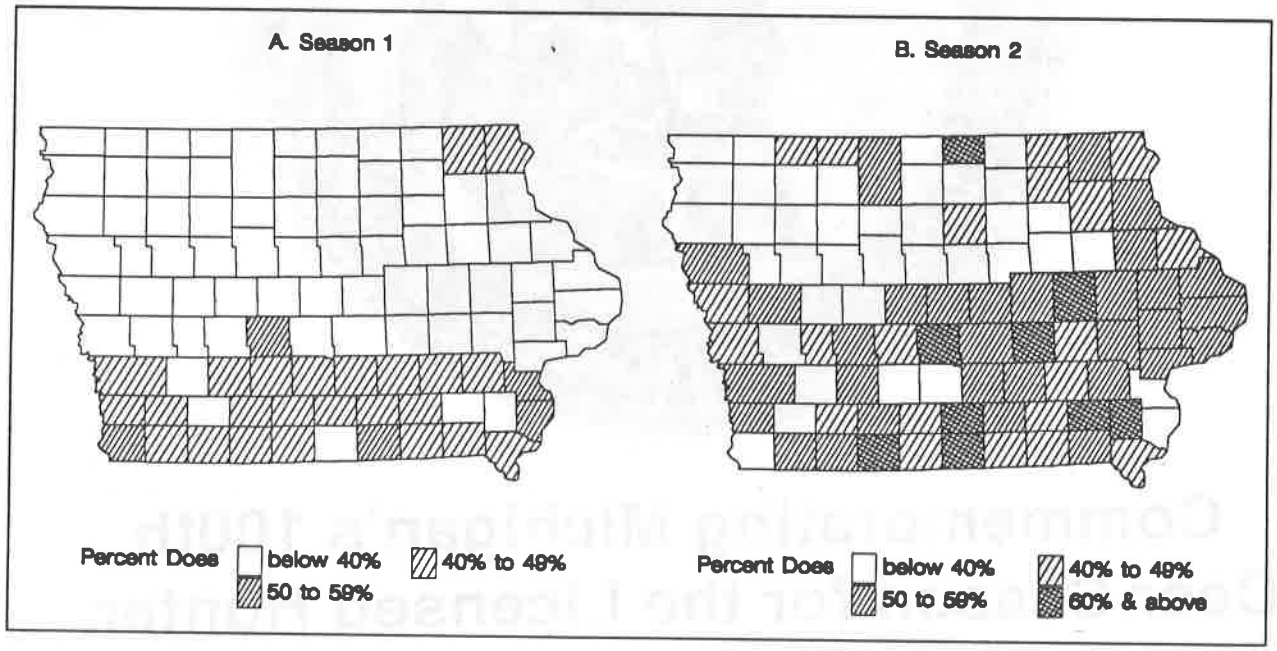
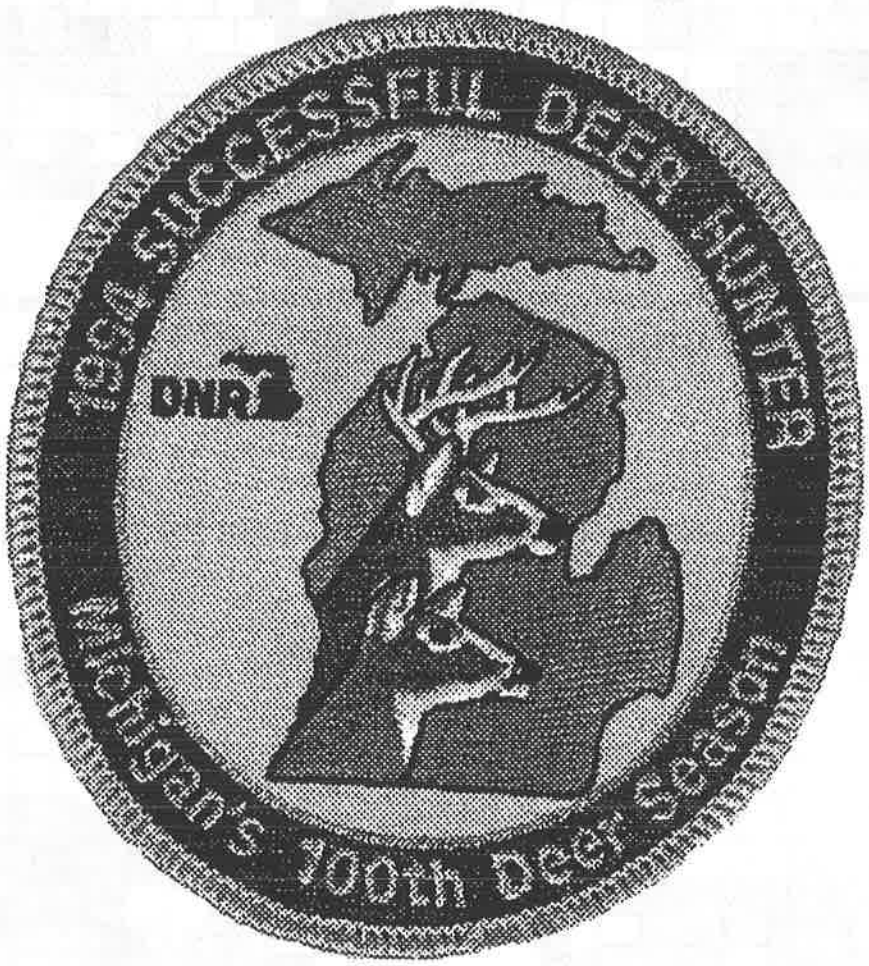


Figure 1.4 The percentage of the harvest in each county that consisted of does during the 1993 shotgun season.



1994 PRELIMINARY DEER REPORT



Commemorating Michigan's 100th Deer Season for the Licensed Hunter.

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WILDLIFE DIVISION
BOX 30444
LANSING MI 48909-7944

1994 PRELIMINARY DEER REPORT

This report contains a preliminary analysis of the 1994 deer hunting season based on data collected from highway deer check stations, field reports, and highway counts of deer being transported on vehicles. The Michigan Department of Transportation and the Mackinac Bridge Authority assisted in providing data. Final harvest figures will be available in the summer of 1995. This report is a contribution from Federal Aid in Wildlife Restoration, Pittman-Robertson Project W-127-R.

STATUS OF THE DEER HERD

On October 1, 1994, there were an estimated 1.6 to 1.8 million deer in Michigan.

Upper Peninsula

Pellet surveys in the Upper Peninsula indicated a spring herd that was 22% higher than in 1993. The herd in this Region was far above population objectives.

Northern Lower Peninsula

Pellet surveys in the Northern Lower Peninsula showed a spring herd that was 23% lower than the spring herd of 1993. The herd in this Region was slightly below our population objective.

Southern Lower Peninsula

The October 1, 1994 deer herd in Southern Michigan was estimated to be about 10% higher than the October 1993 herd. There were still areas within the Region where field biologists thought the herd could be increased without excessive crop damage or deer-vehicle accidents.

1994 DEER HUNTING SEASONS

Archery deer hunting season began on October 1 and continued through November 14, 1994. The regular firearm deer hunting season was November 15 through 30, 1994. Archery deer hunting resumed from December 1, 1994, through January 1, 1995. Muzzleloading deer hunting season was split (December 2 through 11 in the Upper Peninsula and December 9 through 18 in the Lower Peninsula).

The antlerless deer hunting license was continued. Antlerless-only licenses were first tested in Barry, Huron, and Menominee counties and expanded to 15 deer management units in 1987, to 62 units in 1988, and statewide in 1989. Hunters could apply for an antlerless license with either an archery or firearm license. Also, antlerless licenses not used during the firearm season were valid during the muzzleloading season or during the December 1 through January 1 archery season with an archery license.

The number of antlerless deer hunting licenses issued in 1994 was reduced in attempting to rebuild the herd in lower Michigan. There were several deer management units where an increase in deer numbers was desired. A total of 153,558 antlerless licenses was issued, which was 19 percent fewer than the 190,482 that were issued in 1993. Applications for antlerless licenses also dropped in 1994 (from 342,676 in 1993 to 267,094 in 1994).

Those property owners with a documented history of significant crop damage were invited to work with district wildlife supervisors to establish harvest quotas for antlerless deer to be taken on their property. Landowners paid a $3 application fee for each crop damage block permit. These tags were only for antlerless deer and only valid for the land where issued and on adjoining property with permission of appropriate landowners. An estimated 1,000 landowners were issued about 17,000 crop damage block permits in 1994 for distribution to hunters on their property for use during archery, firearm, or muzzleloading seasons.

Block permits provided flexibility to landowners for controlling nuisance deer without having to reduce the herd in an entire deer management unit. Block permits also caused a reduction in the number of deer taken on crop damage control permits outside the regular hunting season. Where possible, nuisance deer should be harvested through recreational hunting during the open hunting season.

HUNTING CONDITIONS

Bowhunters had good hunting weather in 1994. They reported that the rut started early and appeared to increase as the season progressed. Acorns were plentiful in some areas. **Firearm deer** season opened with moderate weather and excellent hunting conditions, which allowed hunters to stay in the field longer than usual and to disperse well into deer range. Some tracking snow arrived late in firearm season.

HUNTER NUMBERS

Hunter participation appeared to be higher this year than in 1993. The preliminary forecast of 350,000 bowhunters, 750,000 firearm deer hunters, and 175,000 muzzleloading hunters seemed reasonable. Final license sales figures will be available in the summer of 1995.

RECREATIONAL BENEFITS

Hunters spent an estimated 12 1/2 million days afield. Bowhunting effort increased to an estimated six million days. Hunting effort during firearm season was about 5 1/2 million days. Firearm deer hunting appeared to increase the most in the Upper and Southern Lower Peninsulas. Muzzleloading deer hunting season provided an additional one million days of hunting recreation.

ECONOMIC IMPACT

Hunters were estimated to have spent more than $400 million in Michigan during all three deer hunting seasons in 1994 for food, lodging, transportation, licenses, and hunting equipment.

REPORT ALL POACHING (RAP)

Michigan's citizens continued to report poaching during the 1994 deer hunting seasons. During October and November, thousands of complaints were taken and referred to conservation officers for investigation and follow-up. The continued cooperation of concerned citizens was welcomed by all Department of Natural Resources (DNR) employees during this busy season.

AGE DISTRIBUTION OF DEER

Early results indicated that about 64 percent of the antlered bucks checked from the Upper Peninsula in 1994 were yearlings (1 1/2 years of age), which was higher than in 1993 (52%). Yearlings comprised 69 percent of the antlered bucks in the northern Lower Peninsula, compared to 62 percent in 1993. Seventy-three percent of antlered bucks were yearlings in the southern Lower Peninsula harvest, up from 69 percent in 1993.

Young-of-the-year comprised 42 percent of the antlerless deer harvest which compared to 43 percent last year. Of the known-age adult does, 38 percent were yearlings; 24 percent were 2 1/2-year-olds; 18 percent were 3 1/2; and 20 percent were 4 1/2 years of age or older.

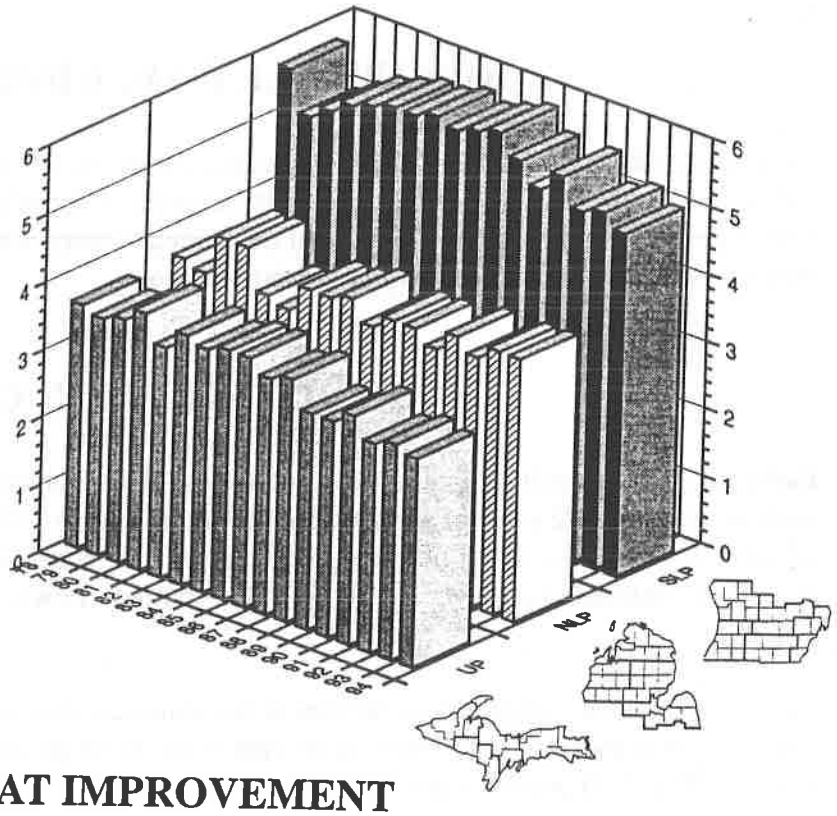
Deer physical condition, as measured by antler beam diameter of yearling (1 1/2-year-old) bucks, dropped slightly in all regions. Percentage of spikes among yearling bucks increased in the Upper Peninsula, remained the same in the northern Lower Peninsula and increased slightly in the southern Lower Peninsula.

Area	Percentage of Spikes among Yearling Bucks		Average Beam Diameter (mm) of Yearling Bucks	
	1993*	1994**	1993*	1994**
Upper Peninsula	49	52	17.2	17.0
Northern Lower Peninsula	34	34	18.7	18.5
Southern Lower Peninsula	13	14	21.4	20.9

* Final Data
** Preliminary Data

ANTLER MEASUREMENT

Average number of antler points on 1 1/2-year-old bucks.



DEER HABITAT IMPROVEMENT

A special initiative was begun in 1990 under the Deer Range Improvement Program to focus on northern deeryards. These wintering areas are spruce, fir, hemlock, and, most importantly, cedar. Northern white cedar is a slow-growing conifer that usually occurs in lowland swamps or is sometimes found in upland sites on soils with a high PH. Cedar is an old-growth species that is considered young until 100 years of age; cedar may live for 700 years. There are about 1.2 million acres of cedar in Michigan, representing about 7 percent of the commercial forest.

Cedar swamps are of special value for winter thermal cover for white-tailed deer in northern Michigan and may winter as many as 200 deer per square mile. Large concentrations of deer may move as far as 50 miles to winter in cedar swamps. These traditional wintering grounds may represent an area of about 10 percent the size of the summer range of whitetails. Cedar is also important for bobcat, black bear, blackburnian warblers, and more than 100 other wildlife species.

The DNR earmarked funds for the 1993/94 fiscal year that were specifically devoted to deeryard management. A special project was completed this year to map lowland conifers in the Upper Peninsula with satellite imagery. Special on-the-ground projects were undertaken in select northern areas to encourage the regeneration of deeryards. Traditional deeryards that currently have low deer numbers were targeted for special silvicultural treatments such as liming, prescribed burning, scarification, drainage, fertilization, and fencing. A total of 153 acres was treated in the 1993/94 fiscal year.

This deeryard management is in addition to the usual habitat work done under the Deer Range Improvement Program. During the 1992/93 fiscal year, 224 acres of forest openings were created; 3,554 acres of openings were maintained; 2,057 acres of herbaceous planting were undertaken; 46,532 acres of timber cutting were completed on state forests; and planning work was done on about 380,000 acres. These forest openings and timber cuttings are important for providing browse and forage for deer. The participation of wildlife personnel in forest management planning results in better wildlife habitat on our state forests.

DEER HUNTING - A SAFE OUTDOOR SPORT

While the 1994 firearm deer season was one of the safest on record, even one accident is too many. Preliminary reports indicated a total of 19 accidents occurred during the 1994 firearm deer season, resulting in the death of three hunters. In contrast, there were 23 accidents in 1993; three of which were fatal.

WEAR BLAZE ORANGE WHEN HUNTING!
IT'S THE LAW, AND IT WORKS!

For more information on becoming a safer hunter, contact your local conservation officer or the Law Enforcement Division Recreational Safety Education Unit at 517-335-3417.

1994 FIREARM DEER HARVEST

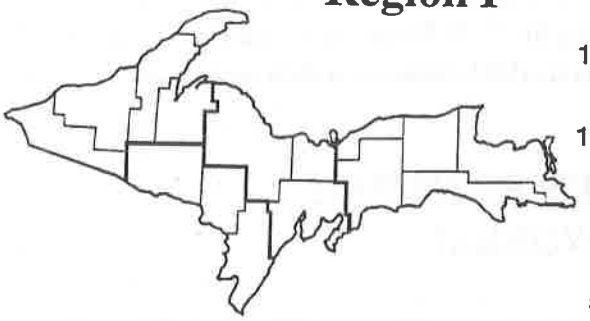
An estimated 226,000 deer were taken during the firearm deer hunting season. This was a five percent increase from the harvest in 1993. The estimate for firearm season was made from roadside counts of deer being transported by southbound traffic. No early estimates are possible for archery or muzzleloading seasons. Harvest figures for those seasons, as well as the final firearm harvest, will be available in early summer from mail surveys.

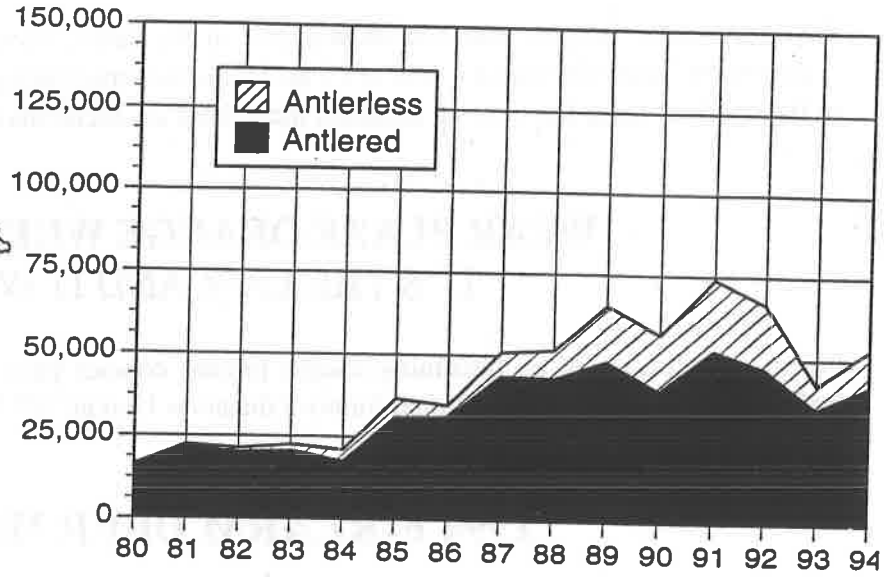
FIREARM DEER HARVEST IN MICHIGAN
PRELIMINARY 1994 COMPARED TO FINAL 1993

REGION	YEAR	ANTLERED	ANTLERLESS	TOTAL
I	**1994**	**42,000**	**11,000**	**53,000**
	1993	35,010	7,320	42,330
II	**1994**	**61,000**	**14,000**	**75,000**
	1993	59,610	23,130	82,740
III	**1994**	**65,000**	**33,000**	**98,000**
	1993	59,940	30,660	90,600
TOTAL	**1994**	**168,000**	**58,000**	**226,000**
	1993	154,560	61,110	215,670

DEER HARVEST BY REGIONS
FIREARM SEASON

Region I





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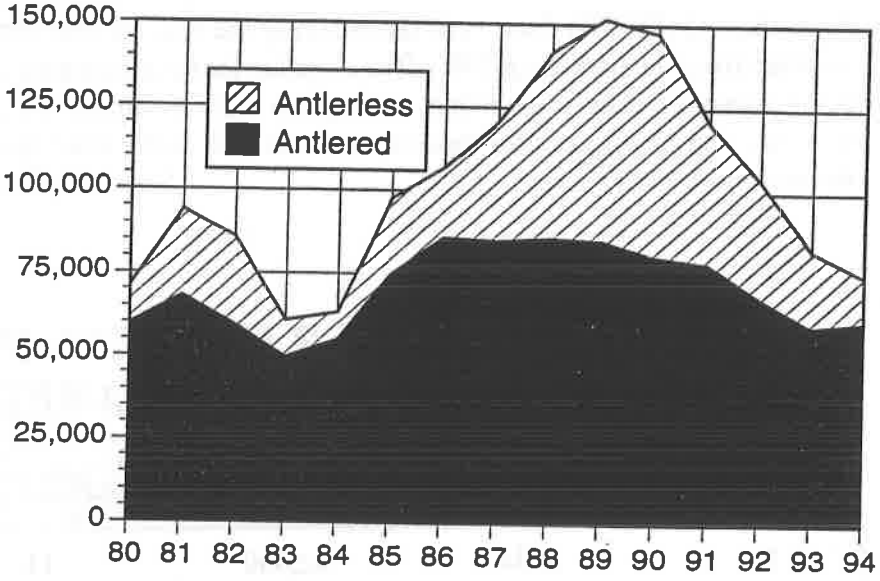
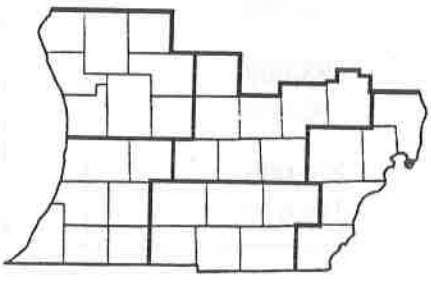
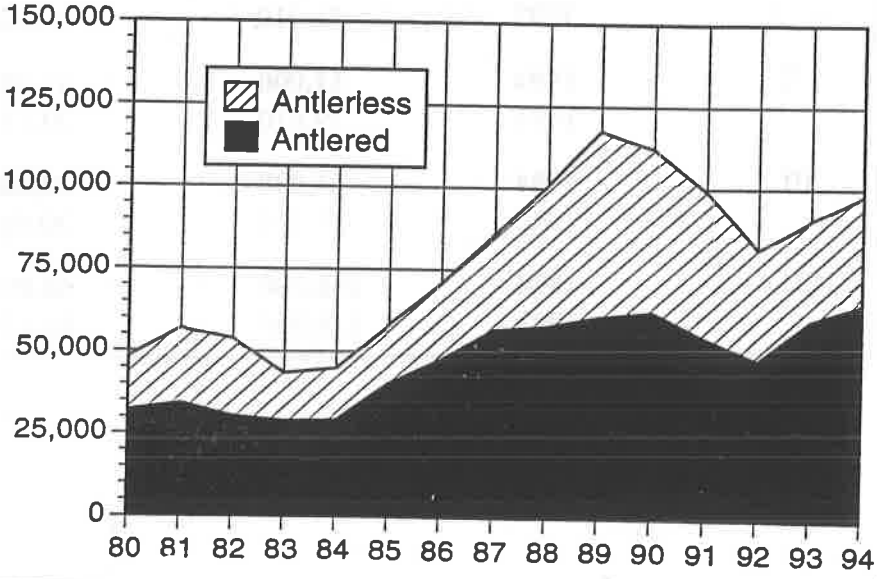


Region III





NOTE: 1994 Figures are preliminary.

1995 MIDWEST DEER AND TURKEY GROUP
MINNESOTA DEER SUMMARY
DAVE SCHAD, FOREST WILDLIFE PROGRAM LEADER
JANUARY, 1995

1993 Season Summary: Total harvest in 1993 was 203,000 deer, down 16% from the previous record of 243,000 set in 1994. This included a harvest of 188,000 by 450,000 firearms hunters, 14,000 deer by 71,000 archers, and 1,000 deer by about 3,000 muzzleloader hunters during a late, 16-day season. Harvest totals were close to expected harvest in most of the state with the exception of the northern forest, where buck harvest declined more than expected. Possible reasons for this decline include reduced hunter effort as a result of snow and cold on the opening weekend of the firearms season, and lingering effects of severe winter weather during the winter of 1991-92 following the Halloween Storm.

1993-94 Winter: The winter of 1993-94 was at least moderately severe in some areas of western and northeastern Minnesota. Temperatures were below normal throughout the state for much of the early part of winter, but moderated for a brief time in mid-February and again in early March, resulting in an earlier than normal snow melt in most of the state. In the forested part of the state, snow depths gradually accumulated throughout the winter, with greatest depths occurring in the extreme northeast along the north shore. Cold temperatures during most of the winter prevented crusting from occurring, and managers reported that snow depths did not hinder deer movements in most areas of the state. Winter Severity Index values, based on the sum of days with more than 15" of snow and days with a temperature below 0 degrees F, exceeded 100 at eight sites, which generally indicates at least a moderate winter.

In farmland areas the extreme western and southwestern areas of the state had deep snows which covered the ground starting in late November. Snow cover persisted until a mid-February thaw, which opened up many of the fields in the south, and an early March thaw which opened up additional fields to the north. In addition, cool, wet growing conditions during the summer and early fall resulted in failure of many food plots, flooding of food and cover, early destruction and harvest of crops, and more fall plowing than normal as farmers prepared fields for the spring, 1994 planting season. Managers reported that deer remained mobile throughout the winter in most agricultural areas, but that food shortages resulted in depredation on stored grain and hay crops, excessive movements by deer, and isolation of some deer far from food sources.

Deer were fed corn and hay by managers in 14 areas in the western part of the state. Most corn used for feeding came from stored crops salvaged from farming operations on state Wildlife Management Areas, and most hay was purchased. Some food was also donated by local groups and individuals. Feeding took place at 103 different sites, of which 75 sites were in response to depredation complaints. An estimated 6,731 deer were fed. The earliest feeding started on December 10, 1993, and feeding continued as late as April 20. Mean starting date was January 12, and mean ending date was March 10. A total of 12,634 bushels of corn and 155 round bales of hay were fed.

1994 Populations: Deer populations peaked in 1991, and have declined since that time. The number of management units with populations above goal levels have been reduced through

aggressive antlerless permit quotas and a return to more normal winter weather after a series of very mild winters in the late 1980s (Figure 1). Fawn recruitment was very low throughout farmland areas in 1994, probably due to the abundant snow, cold weather, and scarcity of food over winter. For the first time in several years, most permit areas in the farmland are at or below goal levels. Very deep snows in the northeast also likely impacted fawn production. Lower antlerless permit quotas were prescribed throughout the state. A total of 199,650 antlerless permits were offered, down 15 percent from 1993, but still the third highest total ever. Compared to 1993, permit numbers were down 34 percent in Zone 1 (northeastern Minnesota), down 17 percent in Zone 2 (northwestern to east-central transition areas), down 20 percent in Zone 3 (southeastern Minnesota), and down 3 percent in Zone 4 (southern and western Minnesota).

Season Frameworks: Archery and firearms season frameworks are shown in Figure 2. Shooting hours for all big game are 1/2 hour before sunrise to sunset. Although hunters may purchase both an archery and a firearms license, only one deer may be taken, except in some situations where additional antlerless deer are authorized to be taken with 1/2 price permits. Resident licenses cost $22, and non-resident license cost $110. Firearms hunters are required to select one of six zone and time options (with seasons varying from two to sixteen days), or the 16-day, either-sex muzzleloader season. A relatively new $44 license allows hunters to hunt for bucks-only during more than one zone and time option. The regular firearms license is a buck-only license, and hunters may apply for an antlerless permit in one of 115 antlerless permit areas, or for a special area permit in one of about 40 special hunt areas (such as state parks and other refuge areas where hunting is not normally allowed and where the number of hunters must be limited for safety or to prevent over-harvest of deer). However, youth under age 16 may take antlerless deer without applying for an antlerless permit. Use of bait and permanent stands over 16 feet is prohibited. Deer must be tagged at the site of the kill with a tag issued with the hunters license, and all deer must be registered at registration stations run by private businesses. Party hunting is allowed, whereby members of the party may tag deer taken by other party members who are in the field and hunting together at the same time.

Preliminary 1994 Season Results: Firearms deer hunters harvested approximately 176,000 deer in 1994, a 6% decline from 1993 but still the fourth highest harvest on record. As a result of a 15% decrease in antlerless permits, a lower harvest was expected in 1994, but in forest and transition areas the harvest was better than expected, likely due to an increase in buck harvest that is being attributed to the mild weather during the season, and possibly to a carryover of bucks as a result of poor weather and reduced buck harvest in 1993. One exception was the extreme northeast where managers believe winter weather the past few years has impacted deer populations. Antlerless harvest declined in most areas proportional to reductions in antlerless permits.

Deer harvests declined 6% in the northwest, 2% in the northeast, 8% in the central and east-central portion of the state, and 5% in the west and southwest. The only region showing an increase was the southeast (up 3%). The metro region was stable. Archery and muzzleloader season results are not yet available, but it is expected that archery harvests will be stable, and muzzleloader harvests will likely increase as a result of a new, statewide season.

Through mid-January, the winter of 1994-95 has been one of the mildest on record. Very little snow has fallen anywhere in the state, and mild temperatures during most of November and December should be of benefit to deer. WSI values do not exceed 20 anywhere in the state, and managers have observed that deer are widely scattered and able to move freely and find abundant food.

New Regulations: The most significant regulation changes for 1994 included:

- Blaze orange was required for all hunters and trappers in areas open by law or ordinance for firearms deer hunting. Previously, red was a legal color.

- The muzzleloader season was changed to a 16-day statewide season, except for areas closed to protect yarding deer. Previously, the muzzleloader season was restricted to scattered large blocks of public lands and some surrounding private lands. Because of blaze orange requirements for other hunters and trappers during this season, there has been some backlash against the new statewide season.

- New "Intensive Harvest Permits" allowed taking of up to 4 additional deer in some urban and special areas. This is an attempt to authorize the relatively few hunters who have access to legal hunting in urban areas to take as many deer as possible to help communities achieve deer management objectives.

- Archery deer licenses no longer had to be purchased before the firearms season, and archers were no longer restricted to bucks-only during the firearms deer season.

- Persons with disabilities issued permits to shoot from motor vehicles were allowed to take antlerless deer, without having to apply for antlerless permits. This resulted in a large increase in the number of disabled permits requested and issued. There is currently a task force comprised of enforcement officials, disabled individuals, and doctors that is developing more stringent guidelines for issuing permits to disabled hunters.

Current Issues: The following are some of the current issues Minnesota deer managers are dealing with:

- Urban Deer Management: Currently, the Department has issued shooting permits to Twin Cities metro area municipalities to take 915 deer. Methods include shooting over bait and trap and shoot. Court actions have been brought by citizens groups in two communities in an attempt to halt both a sharpshooting operation and a trap and kill operation, and both efforts have been rejected by district court. Further court actions are anticipated in light of recent Freedom Of Information Act requests for data and information related to deer management programs throughout the metro area by an animal welfare organization.

- Baiting: There continue to be efforts to legislatively over-turn the ban on use of bait that was implemented in 1991. The Department and most deer hunters, including the 20,000 member Minnesota Deer Hunters Association, continue to strongly support the ban.

- Quality Deer Management (QDM): QDM is becoming a more important issue to deer hunters in many areas of the state, and the Department is developing strategies to respond to this initiative. Of primary concern is the effect that QDM will have on DNR's ability to manage deer numbers and the potential for QDM to result in decreased access to private lands by deer hunters. There is also much interest in restricting antlerless permit-holders from taking legal bucks in a mis-guided effort to protect bucks, as a way to produce more "quality" deer.

- Shooting Hours: Unless the 1995 state legislature addresses the issue, shooting hours for archery deer hunting will change to 1/2 hour after sunset as a result of 1994 legislation, while hours for firearms hunting will close at sunset. A recent survey of 41 state big game regulations showed that 32 states close big game shooting hours after sunset, and archery hunting interests strongly support the change.

- Indian Treaty Issues: The state is involved in several court cases that are defining the extent of hunting, fishing, and gathering rights by various Indian Bands. Generally, the courts have been finding that the rights exist, and determination of how resources will be allocated is being discussed. Results of these lawsuits will likely complicate deer management and quota-setting within ceded territories.

- Ecosystem Management: The Department is accelerating a move towards ecosystem management, and managers of traditional programs such as deer management are being asked to consider new approaches towards habitat, population, and recreation management. There is also concern with potential diversion of dedicated sportsman's dollars from traditional programs to fund ecosystem management proposals.

- Regulation Simplification: There is interest from conservation officers and some hunters to simplify deer hunting regulations by identifying those aspects of regulations that are not necessary from a safety, conservation, or hunter equity standpoint. A legislative package is being planned for 1996.

- Albino Deer: As a result of widespread publicity and criticism of several albino deer that were shot during the 1994 season, legislation is expected to protect albinos from harvest. This promises to be an emotional and controversial issue, and the Department will likely oppose the measure.

Research: Summaries of farmland and urban deer research activities are attached to this report. Other research initiatives include: 1) a long-term study of forested deer conducted by Glenn DelGiudice, which is in the fifth year of a ten year project. The intent of this project is to investigate the relationship of the thermal cover value of conifer stands to winter distribution, movements, and survival of female deer; 2) evaluation of sex/age/kill data collection at registration stations in farmland areas. Collection of accurate sex and age data by DNR staff at selected stations is being used to correct inherently inaccurate registration data and to refine and verify population models; and 3) evaluation of snow urine analysis to monitor effects of winter on deer in both agricultural and forested areas, as an alternative to use of WSI or other methods of measuring winter severity.

Permit Areas Above Goal, 1991-1994

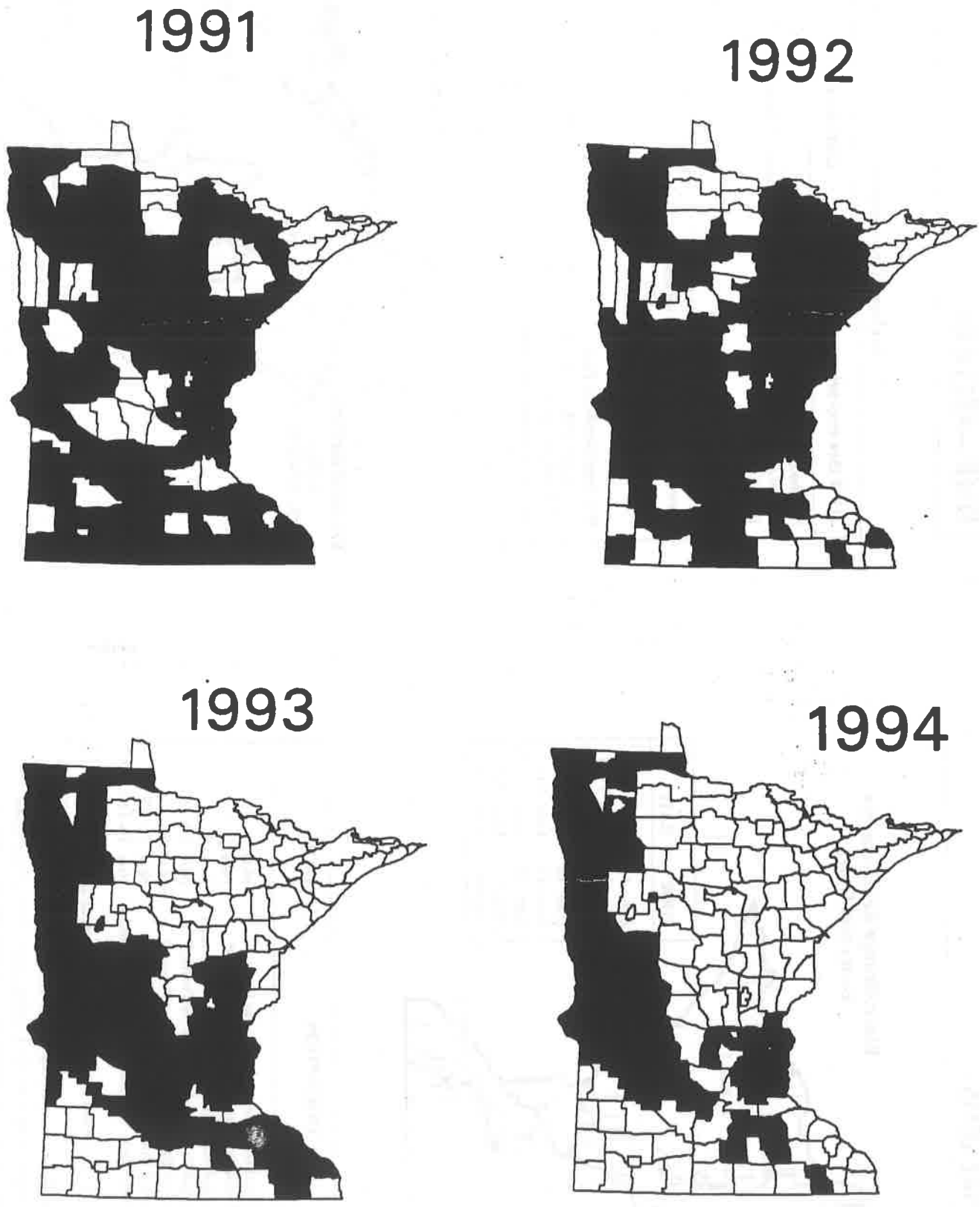
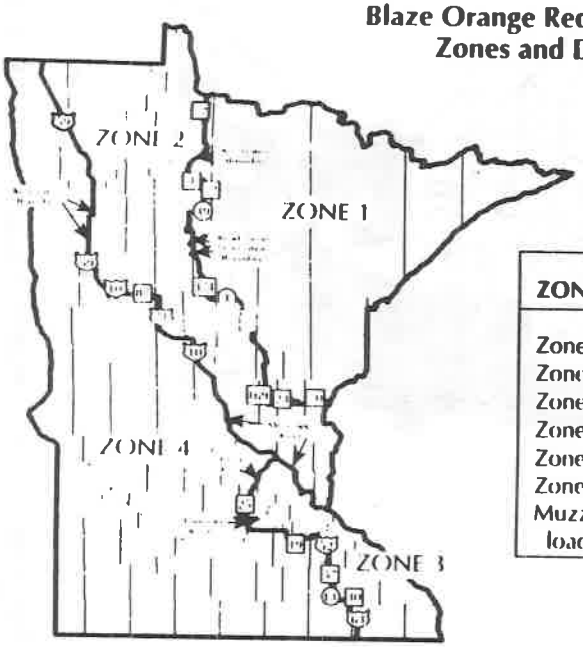


Figure 1. Deer permit areas with pre-fawn deer populations above goal levels, 1991-1994.

DEER—FIREARMS

Blaze Orange Requirements Zones and Dates



ZONE	DATE
Zone 1	Nov. 5–20
Zone 2	Nov. 5–13
Zone 3A	Nov. 5–13
Zone 3B	Nov. 19–25
Zone 4A	Nov. 5-6
Zone 4B	Nov. 12–15
Muzzle-loader	Nov. 26–Dec. 11

ZONE/TIME OPTION	DESCRIPTION	DATES
1A	Legal Buck or Antlerless by Permit*	Nov. 5–20
2A	Legal Buck or Antlerless by Permit*	Nov. 5–13
3A	Legal Buck only. No Antlerless Permits	Nov. 5–13
3B	Legal Buck or Antlerless by Permit*	Nov. 19–25
4A	Legal Buck or Antlerless by Permit *	Nov. 5-6
4B	Legal Buck or Antlerless by Permit*	Nov. 12–15
Muzzleloader	Either Sex, Statewide except closed areas	Nov. 26–Dec. 11

* Youth hunters under age 16 may take deer of either sex without an antlerless permit.

- Hunters who choose any of the zones 1A, 2A, 3A, 3B, 4A, or 4B options may hunt using muzzle-loading guns, but must follow regular firearms rules and cannot hunt during the Muzzleloader Season.

DEER—ARCHERY

Archery Deer Season

ZONE (See map below)	DAYS OPEN
Northeast Border Zone Registration Blocks 115-118, 127, 130, and 194	Sept. 17–Nov. 20
East-Central/Southeast Zone All of firearms Zone 3 and that part of Zones 1 and 2 south of, and including, registration blocks 246, 172, 173, 174, 182, 156, and 159.	Sept. 17–Dec. 31
Western/Northern Zone Remainder of the state not in the Northeast Border or East-Central/Southeast zones	Sept.17–Dec. 4

Archery Zones

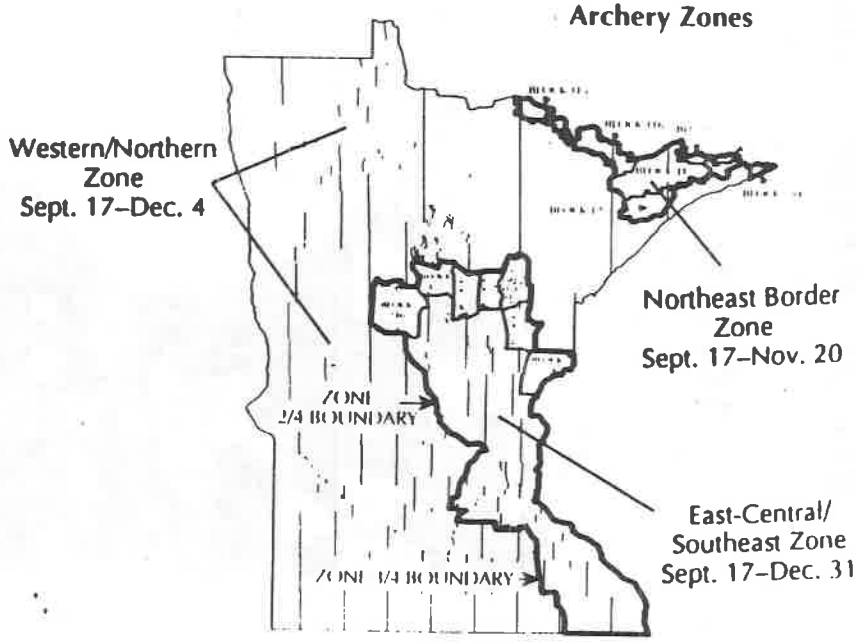


Figure 2. Minnesota firearms and archery season frameworks, 1994.

A FACILITATED APPROACH TO MANAGING URBAN DEER

Jay B. McAninch and Jon M. Parker

Implementation of urban deer management programs has been hindered by disagreements over the significance of the problems caused by deer, the methods for removing deer, the lack of emphasis on nonlethal programs, and the degree of confidence of stakeholders in wildlife professionals to objectively conduct management programs. In 1991, we reported on the adoption of a facilitated urban deer management program by 4 cities in the lower Minnesota River Valley (Bloomington, Burnsville, Eagan, Mendota Heights) (McAninch and Parker 1991). The program was developed and issued by a Deer Management Task Force (DMTF) composed of city, county, state and federal agency staff and animal protection, conservation and hunting supporters. Consensus was reached by the DMTF on recommendations for setting deer density goals, the use of deer population management methods, techniques to reduce deer/vehicle collisions, control of vegetation damage, and artificial feeding of deer. The DMTF approved use of the urban deer management recommendations on a 3-year basis with an annual program review and discussion conducted by the DMTF.

In 1991, Bloomington adopted a deer density goal of 15-25 deer per mi^2 and implemented several of the DMTF recommendations to manage deer. The program included use of an Alternative Deer Control Program (ADCP) (a deer removal method using qualified firearm hunters), sharpshooting by police and conservation officers and public information sessions on reducing deer/vehicle collisions, damage to vegetation, and deer feeding.

In 1991-92 and 1992-93, 335 and 342 deer, respectively, were removed from the city and public lands. Review meetings of the DMTF in 1992 and 1993 focused on deer density determination methods, concerns over violations committed by ADCP participants, public information describing the DMTF work, and deer/vehicle collision information from the 4 cities. Considerable discussion centered on the potential use of contraception for controlling deer and on the willingness of the DMTF to consider use of these methods.

To date, all members of the DMTF have adhered to the recommendations and process adopted in 1990. Completion of the first 3-year management program in 1994 will provide the first opportunity to test the strength of the groups resolve. In addition, we feel gradual changes in the membership of the DMTF have resulted in the addition of individuals with less committment to the original agreements. Prospects for the long-term viability of this approach to deer management are unknown.

MN DNR Wildl. Pops. and Res. Unit 1993 report

LITERATURE CITED

McAninch, J.B., and J.M. Parker. 1991. Urban deer management program: a facilitated approach. Trans. N.A. Wildl. & Nat. Resour. Conf. 56:428-436.

POLICE SHARPSHOOTING AS A METHOD TO REDUCE URBAN DEER POPULATIONS

Michelle L. Stradtmann, Jay B. McAninch, Ernie P. Wiggers[1], and Jon M. Parker

In 1991, the city of Bloomington, Minnesota developed a deer management plan which included a program to reduce deer populations using police officers as sharpshooters. Our task was to determine and report on the efficiency and cost of the sharpshooting programs implemented in 1991 and 1992.

To qualify as a sharpshooter, officers were required to pass a shooting test and attend an orientation on program objectives and safety standards. Officers shot deer over 4-6 baited sites from 15 November to 15 March in 1991-92 and 1992-93. Sharpshooting activities began at sunset and continued for 3-5 hours. Officers shot from vehicles or stands but could only shoot within predetermined shooting lanes.

During 1991-92, 21 officers killed 95 deer in 27 nights (0.41 deer/hour) During 1992-93, 16 officers killed 167 deer in 44 nights (0.62 deer/hour). Time required to kill a deer included travel time between the police station and bait sites, time at bait sites, and time to file reports. Cost per deer killed was $195.00 and $168.14 in 1991-92 and 1992-93, respectively. Costs included equipment, administration, overtime wages for officers and wages for staff to maintain bait sites and process deer. No citizen complaints or concerns about safety were received by the Bloomington Police Department.

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MANAGING LOCAL DEER POPULATIONS WITH SUBAREA PERMITS

Steven B. Malchow, Brian S. Haroldson and Jay B. McAninch

Deer damage has long been a major problem in the portion permit area (PA) 346 (Winona and Houston Counties) which includes a number of fruit orchards. Past efforts to reduce damage problems by increasing the number of deer management permits for the entire PA have not been considered effective by orchard owners. To reduce deer densities and damage problems, a 3-year program (1991, 1992, 1993) to increase the antlerless deer kill was implemented in a 44 mi^2 subarea which contained the majority of the orchard property within the 374 mi^2 PA 346 (Haroldson and McAninch, 1992). The mechanism to increase the kill was to offer antlerless permits during the early season (3A) (which is normally buck-only hunting) to supplement the antlerless kill during the late (3B), any-sex season.

We determined the number and distribution of the antlerless kill in the subarea during the 3A and 3B seasons by monitoring selected registration stations in PA 346. Age, sex, and location of the deer killed within the subarea were collected. Our preliminary assessment found the total antlerless kill was approximately 3-4 deer per mi^2 higher in the subarea than in the rest of PA 346 for all years of the program.

To monitor landowner impressions on the impacts of subarea permits, we surveyed landowners residing within the subarea prior to the 1991 and 1993 firearms deer hunting seasons. Our preliminary comparison of program effects indicate the number of landowners experiencing damage has changed ($X^2 = 5.339$, 2df, $p = 0.069$). A significant number who had reported experiencing acceptable damage were now reporting no damage, while the number reporting unacceptable damage did not change.

Although it appears that damage from deer has been reduced somewhat, landowners perceptions of the number of deer in the area has not changed. Nearly 50% of the landowners thought deer numbers had remained the same during the program while the remaining 50% were split equally between those who thought numbers had increased and those who thought numbers had decreased. Also, over one-third of the respondents felt the number of deer harvested from their property during the program period had decreased; this belief is contradicted by the 62% increase in the number of antlerless deer registered in the subarea in 1992 as compared to 1991.

At least 85% of landowners who hunted thought the number of deer seen while hunting, the number of opportunities for a shot, and the overall hunt were the same or worse than in recent years. Even so, 50% or more rated the number of deer seen, their opportunity for a shot and their total 1992 deer season as fair to excellent.

LITERATURE CITED:

Haroldson, B.S., and J.B. McAninch. 1993. Evaluation of subarea permit use for localized deer population management - Progress Report 1992. Pages 20-32 in B. Joselyn Ed. 1993. Summaries of Wildlife Research Findings 1992. 154pp.

EFFECTIVENESS OF THREE COMMERCIAL DEER REPELLENTS

Michael J. Osterberg and Jay B. McAninch

White-tailed deer in Minnesota have caused damage to orchards, nurseries, crop farms, tree farms, and ornamental plantings. The Minnesota Department of Natural Resources provides technical assistance to people experiencing deer damage in all areas of the state. To facilitate the development of better methods of deer control, studies are conducted to test new products that might alleviate deer movement or feeding activity in areas of intense pressure. As part of this continual search for solutions to such problems, a comparative test of 3 commercial deer repellents was initiated in the winter of 1992-93. This testing was made possible by funding from IntAgra, Inc., 8500 Pillsbury Ave. S., Minneapolis, MN 55420-2291 and NorTech Forest Technology, 7887 Fuller Road, Suite 106, Eden Prairie, MN 55344.

STUDY AREA

Repellent trials were conducted in Brown and Watonwan County in south central Minnesota. The area is characterized by flat cropland with woody cover found along river corridors and in scattered stands mostly associated with farm sites. Deer wintering areas located along the Watonwan, Cottonwood, and Minnesota Rivers were selected as test sites due to the high concentrations of deer. Aerial counts conducted in February, 1993 indicated populations of 40-75 deer were within 1 mile of each site. Several sites contained corn food plots which had been consumed by late December to early January.

METHODS

Repellent Application

Three repellents were tested against untreated controls in this study. Repellents were obtained directly from the manufacturer. Each repellent was prepared according to label directions. Hinder® (15% ammonium soaps of higher fatty acids) was tested in 2 concentrations in all trials (1/1 and 1/10, Hinder to water ratios), Deer-Away® (37% putrescent whole egg solids) was used at 3 parts water/1 part of each of the formula components and Tree Guard® (8% denatonium benzoate) was not diluted. A total of 4 treatments and a control were used in all tests

Ear corn obtained from a local farmer had been stored in an open corn crib. Ears were broken into sections weighing 50-200 g each. Each ear was marked with a 1 cm^2 vinyl tag attached to the cob pith with a 4 cm paneling nail. Color coded tags were used to

identify each repellent treatment and the control. Racks were constructed by placing 8 pd nails in plywood at approximately 10 cm intervals. The corn was "skewered" on the nails to facilitate uniform repellent application and curing.

The repellent treatments were poured into 2000 ml beakers and each cob was immersed in repellent for 15 seconds by inverting the racks. After all cobs had been dipped, the ears were allowed to air dry at room temperature for at least 12 hours.

Plot Design

Test plots measuring 0.5 m x 2.0 m were cleared of snow and established along areas of heavy deer activity including trails, beds, and feeding yards. Plots were established during the afternoon hours to minimize interference by squirrels. One cob of each treatment was randomly placed in a row at consistent intervals within the plots. All cobs were weighed with a Pesola® 300 g spring scale (2 g increment) as they were placed in plots. Plots were checked during the following morning (1 night of exposure) for deer activity. Cobs were retrieved from plots where deer activity occurred (i.e. deer tracks in plots) while cobs from remaining plots were left in the field 1 additional day. Retrieved cobs were placed in separate plastic bags, brought back to the lab and weighed.

"Weathered Trials"

Trials were conducted to test the effectiveness of repellents after exposure to 0, 5, and 14 days of weathering. Cobs used in the 5 and 14 day trials were prepared, dipped, and dried as previously described. After drying, cobs were placed on 4 ft x 8 ft chicken-wire platforms inside wire enclosures. The enclosures protected cobs from mammals and birds while allowing exposure to weather conditions. Cobs were spaced on the platform to allow sun, air, and moisture to affect all cobs equally. Cobs were checked and respaced as necessary throughout the weathering period.

Trial Dates

Repellent trials were conducted from 18 February through 11 March, 1993. Trial 1 (weathered 0-days) occurred from 18 February through 22 February, trial 2 (weathered 5-days) from 2 March through 4 March, and trial 3 (weathered 14 days) from 11 March through 13 March.

Data Analysis

Data were analyzed using Analysis of Variance, Univariate analysis, and Wilcoxon Rank Sum Analysis (SAS Inst., Inc. 1987). ANOVA and NPAR1WAY procedures were used to test for differences between treatments (control plus repellents) and between the repellents exclusively.

RESULTS

In all trials, the control cob effectively established a baseline for deer consumption within the study areas (Table 1). Definitive evidence of deer actually visiting each plot was established by both consumption of kernels on the control cob and the presence of deer tracks within the plots. Plots without either of these signs of activity were eliminated from the trials. This protocol ensured that all plots included in the trial experienced deer pressure since many experiments incorrectly assume all experimental treatments are "tested" by deer.

Nonparametric analyses were selected to test for differences since relatively few repellent-treated cobs were consumed by deer. Wilcoxon Rank Sum Scores for each trial found mean weight change of the control to be significantly different from each repellent application ($p < 0.0001$) (Table 1).

Wilcoxon tests were run without the control for each trial to compare repellent effectiveness. In no case were differences in the mean change in weight significantly different among treatments (Table 1). In the unweathered trial, the mean rank values for Tree Guard were greater than those of Hinder 1/1, Hinder 1/10, and Deer-Away (Table 1). Although the Tree Guard values reflected twice the consumption of the other repellents, differences were considered statistically only marginally important ($p<0.2028$). In the 5-day trial, the differences among treatments ($p < 0.46$) were non-significant. Results from the 14-day trial, however, were considered important ($p < 0.0742$) with Tree Guard treated corn being consumed at a greater rate than the other treatments.

DISCUSSION

The three trials demonstrated the effects of weather on deer activity. Trial 1 was characterized by greater snow depths and lower ambient temperatures and heavy feeding activity. A rise in temperature and subsequent loss of snow depth was reflected in the diminished deer activity within the plots during trial 2. In trial 3, a return to colder temperatures and greater snow depth coincided with an increase in deer activity within the test plots.

Tree Guard is a non-toxic repellent which consists of latex (45%), water (37%), surfactant (10%), and denatonium benzoate (8%). The active ingredient, denatonium benzoate, is a substance which is claimed to be bitter when tasted or ingested. The compound must be provided in a sufficient concentration to produce a bitter taste when the coated articles are chewed. The latex is used to adhere the active ingredient to the object on which it is applied. Additional components may include a dispersing agent and a surfactant.

Tree Guard has been previously evaluated in apple orchards, ornamental plantings, and windbreaks. Preliminary results in these studies verify effectiveness of Tree Guard under certain conditions and on certain plant species. In some cases Tree Guard appeared ineffective in deterring deer feeding activity. We note that in many of these test studies,

variations in Tree Guard formulation were used and results may not be indicative of the effectiveness of the product we tested.

Our results indicate Tree Guard significantly reduces feeding activity compared to untreated controls. In limited comparisons with Hinder and Deer-Away, Tree Guard was slightly less effective under both fresh and weathered conditions. We believe Tree Guard appears worthy of continued research particularly under controlled experimental conditions. Additional management trials on planted stock will allow cost and compatibility assessments to be completed.

LITERATURE CITED

SAS Institute Inc. SAS/STAT™. 1987. Guide for personal computers, Version 6 Edition. Cary, NC:SAS Institute Inc. 1028 pp.

Table 1. Consumption of repellent-treated ear corn by free-ranging white-tailed deer in south- central Minnesota, 1993.

Treatment	Trial 1 (n=50)			Trial 2 (n=45)			Trail 3 (n=48)		
	Weight Change (g)		Mean Rank Score	Weight Change (g)		Mean Rank Score	Weight Change (g)		Mean Rank Score
	Mean	Range		Mean	Range		Mean	Range	
Control	42.5	0-132	190.3	16.9	0-99	136.1	26.4	0-114	151.3
Tree Guard	7.2	0-120	136.6	1.2	0-36	107.4	7.2	0-96	121.2
Deer-away	3.6	0-90	132.9	0.3	0-9	107.2	2.6	0-94	108.9
Hinder 1/1	2.9	0-34	135.1	0.2	0-6	107.1	0.9	0-22	110.3
Hinder 1/10	2.2	0-12	132.7	0.4	0-13	107.2	1.4	0-43	110.8

ASPECTS OF WOUNDING OF WHITE-TAILED DEER BY BOWHUNTERS

Jay McAninch, Wendy Krueger, and David Samuel[1]

Controversy regarding bowhunting has steadily increased since the early 1970's. The disagreements have primarily concerned animal protectionists claims regarding the reported number of deer wounded and left in the field. Because data on the topic is limited and of poor quality we decided to produce information useful in assessing and understanding wounding rates of deer by bowhunters.

In the past, wounding data has been taken from hunter responses to questions about their hunting experiences. These studies used interviews or mail surveys and found that wounding rates ranged from 7% to 62% of the number of deer bowhunters reportedly hit. In 2 studies where data were obtained by ground searching for deer left in the field, Lohfeld (1979) in New Jersey and Herron (1984) in Wisconsin found 11% and 9%, respectively, of the deer reportedly hit by bowhunters were unretrieved. In a mail survey in Minnesota, Landwehr (1982) and Schultz (1983) found that 54% and 49%, respectively, of the deer reportedly hit by bowhunters were wounded and not retrieved. Other than these limited data, little information is available on the hunting behavior of bowhunters and aspects of wounding in particular.

From 1991 through 1993, we collected data on the number of deer hit and retrieved by hunters, the number of deer reportedly hit, not retrieved and left in the field after hunts, and the number of deer wounded and retrieved (or tagged) by another bowhunter using hunter interviews at Camp Ripley, Minnesota. In addition, we developed information on the hunting behavior and characteristics of the bowhunters interviewed.

The key feature of our 1993 research was the use of aerial infrared video techniques to locate unrecovered deer in the field. We developed the infrared procedures to give us the best possible evidence that our estimated wounding rates were accurate. Our preliminary wounding rates for 1992 and 1993 range from 1% to 9%. These rates were not adjusted for unrecovered deer since our aerial surveys were suspended in November due to heavy snows. We will complete our aerial work this spring and the final wounding rate calculations will be released at that time.

Another aspect of our study will be a comparison of exit interviews and mail surveys as methods for developing data on hunters. We mailed surveys to all hunters who hunted at Camp Ripley in 1993 and, to date, have achieved a 70% response rate. By cross referencing mail survey responses with the interviews, we will be determining the bias in the mail survey. Our work in 1994 will be to contrast the characterization of the data obtained by these 2 methods and to discuss the implications of the methods for future studies of hunters and hunting behavior.

ACKNOWLEDGEMENTS

The following organizations have provided funding for this project: Save Our Heritage Committee of the Archery Manufacturers and Merchants Organization, American Archery Council, International Bowhunting Organization, Safari Club International, Pope and Young Club, Colorado Bowhunters Association, Illinois Bowhunters Society, Indiana Bowhunters Association, Iowa Bowhunters Association, Kansas Bowhunters Association, Maine Bowhunters Association, Maryland Bowhunters Society, Michigan Bowhunters, Minnesota Bowhunting Chapter - Safari Club, Minnesota Bowhunters Incorporated, Retail Archery Manufacturers of Minnesota, Minnesota State Archery Association, Missouri Bow Hunters, United Bowhunters of New Jersey, North Carolina Bowhunters Association, Bowhunting Council of Oklahoma, Wapiti Bowmen of Oregon, United Bowhunters of Pennsylvania, Saskatchewan Bowhunters, West Virginia Bowhunters Association, and Bowhunters of Wyoming.

LITERATURE CITED

Herron, J.S.C. 1984. Deer harvest and wounding loss associated with bowhunting white-tailed deer. Master thesis, Univ. of Wisconsin, Madison. 34 pp.

Landwehr, T.J. 1982. Archery deer hunter survey, 1982 season. Minn. Dep. Nat. Resour. Rep. 19 pp.

Lohfeld, M.L. 1979. Crippling loss and illegal kill of white-tailed deer (*Odocoileus virginianus*) during controlled hunt in a New Jersey State Park. Masters thesis, Rutgers Univ., New Brunswick, New Jersey. 25 pp.

Schultz, D. 1983. Archery deer hunter survey, 1983 season. Minn. Dep. Nat. Resour. Rep. 19 pp.

[1]Div. of Forestry, West Virginia Univ., Morgantown, WV.

MIDWEST DEER STUDY GROUP
MISSOURI - 1994 REPORT

JEFF BERINGER AND LONNIE HANSEN

1994 DEER SEASON

FIREARMS

The 1994 firearms season was 9 days in length (November 12-20) and shooting hours were between 6:30 A.M. and 5:00 P.M. EST. Regulations were based on 57 management units (Figure 1) and two season types; buck-only and an any-deer quota system. Missouri continued with the system in which bonus antlerless-only permits were distributed in deer management units that had undersubscribed quotas of any-deer permits. Bonus tags allowed hunters to harvest additional antlerless deer. The statewide quota of any-deer permits in 1994 was 339,350, a decrease of 6,300 permits from the 1993 quota. We received 220,632 applications for any-deer permits and issued 216,829 any-deer and 95,193 bonus permits to these applicants. Landowners received 40,923 any-deer permits and 27,328 bonus permits. For the first time some hunters received 2 bonus antlerless-only permits. These were issued in areas that were remained undersubscribed after bonus permits were issued. Most of these areas were in northwest and west central units, we issued less than 5,000 second bonuses in 11 management units.

The landowner permit system remained unchanged in 1994. Landowners who applied for an any-deer permit in 1993 were sent abbreviated forms for 1994 to facilitate the application process. Landowners with 5 or more acres could hunt antlered deer without a permit on their own property. Landowners with 75 acres were eligible for 1 free any-deer

permit; landowners with 300 acres could receive 2 any-deer permits; landowners with 1,000 acres could receive 3 any-deer permits; co-owners of 150 acres could receive 1 any-deer permit each. Landowners received preference for the bonus antlerless-only permits.

Preliminary figures indicated a harvest of 162,120 deer during the firearms season in 1994, an increase of 6,299 over 1993. We had decent weather during the 9 day season; this coupled with a poor mast crop and lots of deer resulted in a record harvest.

MUZZLELOADING FIREARMS SEASON

Hunter participation in the muzzleloading firearms season is increasing but numbers and harvest are still low when compared with modern firearms statistics. The basic design remained the same as in 1993. Although the muzzleloading firearms permit holder had a longer season (18 vs. 9 days), he/she was restricted to the use of a muzzleloading firearm thus limiting the amount of participation.

ARCHERY

Archers in 1994 were again allowed to take 1 deer prior to the firearms season (October 1 - November 11) and 1 after (November 21 - December 31) or 2 deer after. We do not yet know the results of the archery season but expect the harvest to exceed 15,000. We continue to see increases in archery permit sales and deer harvest and expect the trend to continue.

MANAGED DEER HUNTS

In 1994 there were 46 managed hunts on 21 areas (MDC land, DNR State Parks and

federal refuges). Participants were determined by random drawing. The purpose of the managed hunts is to provide a unique hunting experience while, at the same time, controlling local deer population problems. Most of the managed hunts occur on areas where control over hunter numbers and weapon types is desired. Fifteen of the 1994 hunts were archery only, 17 were muzzleloading firearms only, 12 were modern weapons only, and 2 were historic weapons (muzzleloading firearms, archery, or crossbow).

POPULATION TRENDS

Trend and harvest information and population modeling indicate a stabilization of deer numbers in many parts of the state. This is especially true in north-central, northeastern and west-central units. Previously low deer numbers are increasing in most east-central management units but remain low in some southwestern units due to high quotas and a 1988 hemorrhagic disease outbreak. Quotas have been cut in recent years in response to letters and petitions from hunters concerned about reduced deer numbers in these areas.

DEER/VEHICLE ACCIDENTS

Road-killed deer, adjusted for miles traveled, decreased from 78.3 deer killed/billion miles in 1992 to 71.4 in 1993 (Table 1). Road-kill rates have been slowly declining in recent years. We suspect the steady decline, at least in part, occurred because reporting road-killed deer has become less of a priority for those handling them. Also public cooperation in reporting road-killed deer seems to have waned, perhaps due to our relaxed attitude in

dealing with them.

SIMULATED DEER POPULATIONS AND POPULATION GOALS

Deer populations in each management unit were simulated prior to setting deer regulations for the 1994 season (Table 2). The simulations indicated stabilized or reduced populations in some units and increasing populations in others. Deer population goals were based on results of landowner and hunter attitude surveys conducted in 1991 and 1990, respectively (Table 2). Deer management units were ranked according to a score derived from landowner and hunter responses to the question "Do you feel you have: Too many deer, About the right number of deer, Too few deer, No opinion:". Overall our population goals call for higher deer populations in the Ozarks, southeastern and east-central Missouri, stable populations in north-central, northeastern and west-central Missouri and lower populations in northwestern Missouri.

AGENT QUESTIONNAIRE

Conservation agents in each county annually respond to a deer status questionnaire in which they report trends in deer populations and the number of crop damage complaints. They also are given the opportunity to make quota recommendations. The results of the survey indicated a slowly growing deer herd (Table 3).

ARCHERY HUNTER INDEX

A survey, initiated by our furbearer biologist to determine trends in furbearers, enlists the aid of several thousand cooperating archery hunters. Each cooperator maintains a diary

in which he/she records the number of deer and furbearers seen during each hunting trip. The archer notes the location (county and deer management unit) and number of hours hunted for each trip. Sightings per hunting effort are tallied and broken down by unit and geographic region.

Overall this year's archery index indicates stable deer populations in most parts of the state (Table 4). This is consistent with other trend data.

RESEARCH PROJECTS

MORTALITY STUDY

The goal of this study is to determine annual variability in deer mortality. Results are being used as input into our deer population models. The fall of 1994 was the last year we monitored deer for survival rates and causes of mortality.

Mortalities of radioed deer that occurred during 1993-94 are shown in Table 5. Annual survival (Kaplan-Meier estimation) of adult does and fawn does averaged 0.860 and 0.869, respectively. Annual ~~mortality~~ Survival with hunting censored exceeded 90%. We found no significant annual variation in mortality.

We hope to produce two primary papers out of this study: one on annual rates and causes of mortality and another on hunting pressure and harvest. We have recently completed drafts of 2 spin-off manuscripts, one entitled *"Factors affecting capture myopathy in White-tailed deer"*, the other entitled *"Role of refuges in regional deer population dynamics in the agricultural midwest"*.

RECRUITMENT STUDY

In conjunction with the mortality study, we also have a project designed to evaluate potential methods of determining annual recruitment. We are looking for a simple and cost effective method of determining annual and regional recruitment of deer. The techniques being considered include a survey conducted in September and October in which landowner cooperators record their observations of fawns and does during routine farm operations. We also have recruited archer cooperators to record their observations of fawns and does while archery hunting prior to the firearms season. Other potential sources of fawn to doe ratios that will be tested include harvest data, inspection of road-killed does and observations of deer while flying transects of deer habitat with a helicopter.

The number of fawns recruited by transmittered does will serve as the "known value" to which the values obtained by various techniques are compared. Recruitment by transmittered does is being determined by repeated observations of the does. We make observations of these does by locating and flushing them, by observing them at feeding areas in the morning and evening, and by observing them from a low-flying helicopter. This started as a graduate student project and has been extended through the fall 1994 to increase sample sizes. Some preliminary results suggest that there may be some annual variation in recruitment.

USE OF INFRARED SCANNERS TO COUNT DEER

A new generation of thermal infrared scanners show promise for use in censusing deer. Currently a number of states are using scanners to count deer on "high visibility" sites, such as urban wildlife areas, to facilitate and support management recommendations.

Although the companies that sell this product profess high accuracy in these censuses, we do not have any idea how good these counts are.

We began a study in 1994 to evaluate the accuracy and precision of infrared scanners for counting deer. We currently have fitted over 100 deer on a southern Missouri study area with metal-backed transmitter collars that can be seen with an aerial born infrared scanner. We will locate the marked deer using telemetry techniques immediately prior to the infrared census so that we know how many deer are on the study area, their locations, and the cover type in which they are located. When the census is conducted, observed deer will be classified as marked or unmarked and located on an aerial photograph. Subsequently, we will compare the telemetered locations with the observed locations to determine the percentage detected and the cover in which they were located. This will allow us to determine overall accuracy and, also, cover types in which the deer were hardest/easiest to count. We plan to compare deer counts obtained using helicopter mounted infrared scanners, fixed wing mounted infrared scanners, and daytime helicopter flights over snow. Ultimately, we plan on testing various flight patterns to determine which produces the most reliable results.

DEER GENETICS

In conjunction with the infrared study, we have a graduate student using DNA fingerprinting techniques to try to determine parentage of deer produced on the study area. We are collecting tissue, hair, and blood samples from all captured and harvested deer on our study area. Thus far we have samples from over 200 deer and are constructing a pedigree of the deer herd in our study area. Hopefully, we will sample a large enough

proportion of the population to determine who successfully mates with whom. This study began last winter and the field aspects will continue at least through this winter.

1993 SEASON SUMMARY

Included in this report is a summary of the 1993 deer season in Missouri (Table 6).

Deer Management Units

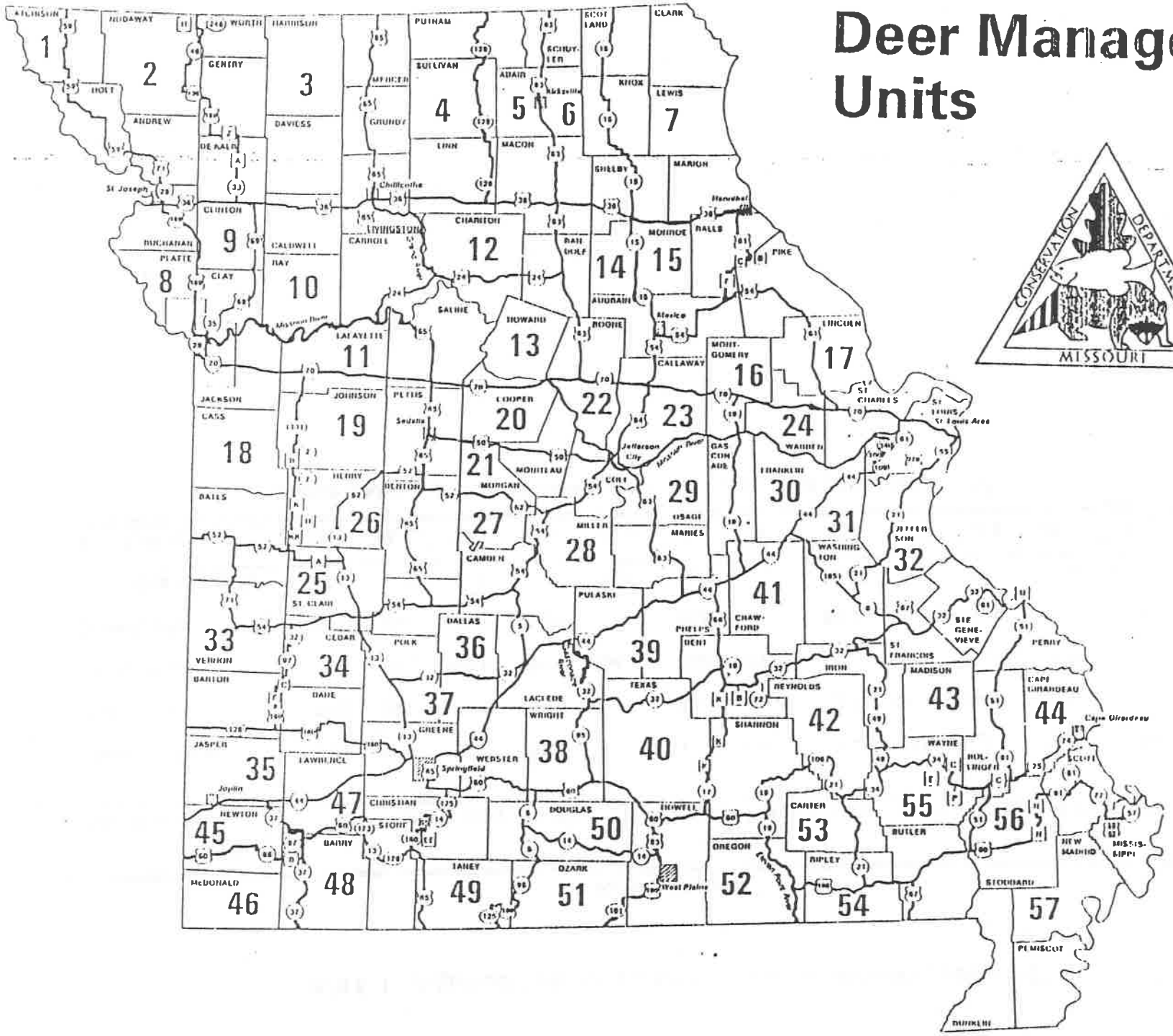

TABLE 1. Adjusted Roadkill Data Using Natural Divisions, 1981-1993

	Adjusted Roadkill[1]												
Natural Division	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Glaciated Plains	72.9	82.7	90.0	122.5	112.5	131.3	141.7	131.2	117.6	103.5	104.1	98.6	92.1
Ozark	74.3	109.1	125.5	136.3	119.1	120.6	160.4	126.4	126.1	101.6	108.8	101.2	84.1
Osage Plains	70.7	74.1	100.4	118.9	124.8	138.0	172.2	168.1	144.2	151.9	184.9	142.3	145.3
Ozark Border	37.1	43.7	51.2	64.8	62.1	65.8	65.5	58.3	56.6	54.0	48.3	50.2	45.3
Mississippi Lowlands	7.7	9.0	11.1	11.7	13.5	12.4	18.3	18.8	27.7	25.4	27.5	19.7	23.9
STATEWIDE	**55.6**	**68.4**	**78.6**	**96.2**	**89.4**	**96.9**	**110.7**	**98.6**	**92.0**	**81.9**	**83.5**	**78.3**	**71.4**

[1] Adjusted roadkill = (number of roadkilled deer/total daily vehicle miles traveled) x 10^6

TABLE 2. **Simulated growth of the deer herd and population goals in quota deer management units.**

MGMT. UNIT	SIMULATED PRESEASON POPULATION SIZE[1]			Population Goal	Percent From Goal
	1992	1993	1994		
1	8,568	9,054	9,497	7,995	16
2	17,312	17,889	17,399	15,217	13
3	36,796	38,841	39,191	35,151	10
4	25,412	25,284	23,562	20,834	12
5	20,632	20,845	20,810	21,429	-3
6	18,463	18,848	18,250	17,793	3
7	31,056	31,861	31,153	30,662	2
8	6,603	6,811	7,084	7,206	-2
9	6,693	6,932	6,855	7,556	-10
10	23,151	23,881	23,365	21,612	8
11	5,373	5,537	5,499	6,052	-10
12	14,596	14,777	14,352	14,703	-2
13	20,894	21,972	22,345	21,752	3
14	13,329	13,526	13,453	14,026	-4
15	13,498	13,752	13,949	15,251	-9
16	14,824	15,126	14,969	16,639	-11
17	19,808	20,221	20,119	22,182	-10
18	12,954	13,801	14,249	13,277	7
19	17,225	18,001	18,111	17,731	2
20	9,226	9,252	9,281	10,427	-12
21	6,945	6,991	6,973	7,900	-13
22	9,008	9,203	9,503	10,206	-7
23	9,500	10,033	11,216	11,488	-2
24	7,597	8,094	9,159	9,462	-3
25	10,728	11,023	10,989	10,483	5
26	18,970	19,125	18,906	18,513	2
27	23,831	22,680	22,270	23,995	-8
28	19,265	18,653	19,095	22,122	-16
29	20,304	21,772	24,805	25,539	-3
30	12,340	13,021	14,847	15,677	-6

MGMT. UNIT	SIMULATED PRESEASON POPULATION SIZE[1]			Population Goal	Percent From Goal
	1992	1993	1994		
31	7,070	6,861	6,974	8,158	-17
32	11,010	10,347	10,462	12,152	-16
33	14,107	14,782	14,991	15,861	-6
34	13,701	14,654	15,118	16,251	-7
35	9,123	9,689	10,379	11,191	-8
36	12,164	12,080	12,052	13,832	-15
37	4,601	4,666	4,515	5,422	-20
38	13,701	13,429	13,226	15,376	-16
39	14,009	12,464	11,975	14,870	-24
40	17,968	17,054	17,264	19,817	-15
41	12,696	11,658	11,288	14,095	-25
42	8,206	8,165	8,403	9,888	-18
43	23,409	21,725	20,638	25,527	-24
44	8,427	8,288	8,362	9,830	-18
45	3,228	3,302	3,405	3,758	-10
46	8,867	8,647	8,739	10,178	-16
47	2,231	2,338	2,328	2,794	-20
48	8,350	7,985	7,698	9,598	-25
49	9,089	8,936	8,878	10,643	-20
50	8,331	8,117	7,956	9,278	-17
51	14,023	14,259	14,435	16,369	-13
52	23,587	24,263	24,232	27,126	-12
53	9,548	9,280	9,034	11,303	-25
54	3,053	3,112	3,086	3,762	-22
55	13,551	13,625	13,401	16,037	-20
56	3,223	3,749	4,185	4,255	-2
TOTAL	752,174	760,281	764,280	810,251	-6

[1]Simulated population sizes are the number of deer needed to sustain estimated mortality and harvest rates given estimated natality rates.

TABLE 3. Agent responses to deer status questionnaire.

DEER POPULATION TRENDS	% OF RESPONSES		RECOMMENDED QUOTAS	% OF RESPONSES	
	1992	1993		1992	1993
Increasing	17	12	Increase	12	7
Stable-Increasing	40	38	Same-Increase	37	35
Stable	37	30	Same	44	39
Stable-Decreasing	5	16	Same-Decrease	7	12
Decreasing	0	4	Decrease	0	7

TABLE 4. Archery hunter index of white-tailed deer populations.

Year	Glaciated Plains	Ozark	Osage Plains	Ozark Border	Mississippi Lowlands	Statewide
1983 Hours	18,332	17,015	4,086	14,540	857	55,374
Index	514	612	572	501	268	543
1984 Hours	10,684	9,116	2,990	9,168	743	32,746
Index	611	473	724	551	260	598
1985 Hours	10,867	8,670	2,380	8,509	565	30,990
Index	653	480	589	386	223	519
1986 Hours	14,835	16,445	4,503	14,443	815	51,727
Index	647	522	782	487	291	566
1987 Hours	12,381	10,912	3,288	11,333	731	38,645
Index	687	543	752	526	364	617
1988 Hours	26,101	25,462	7,102	24,094	1,316	84,526
Index	728	472	678	479	353	569
1989 Hours	21,756	22,050	6,143	21,663	1,256	72,992
Index	664	482	637	451	493	539
1990 Hours	24,075	20,714	6,796	18,751	1,413	72,227
Index	644	504	692	470	484	559
1991 Hours	20,667	19,216	5,664	17,349	1,140	64,006
Index	803	552	973	539	1,001	675
1992 Hours	21,902	17,888	5,394	17,816	1,232	64,230
Index	676	490	670	557	567	589
1993 Hours	19,087	15,830	4,578	13,278	604	53,376
Index	714	456	696	571	1,195	606

Table 5. Mortality of radio-marked deer on Thomas Hill Study Area, 1988-1994.

	CAUSE OF DEATH OR LOSS						
Year	Legal Harvest	Illegal Harvest	Crippling Loss	Vehicle	Capture Related	Slipped Collar	Unknown
1988-89							
Male	0	0	0	1	2	0	0
Female	0	2	0	1	12	3	4
TOTAL	0	2	0	2	14	3	4
1989-90							
Male	10	0	0	0	0	0	0
Female	2	4	0	0	6	7	1
TOTAL	12	4	0	0	6	7	1
1990-91							
Male	10	0	0	1	2	0	0
Female	8	0	1	1	9	3	2
TOTAL	18	0	1	2	11	3	2
1991-92							
Male	9	0	0	2	0	2	1
Female	9	1	2	1	4	2	5
TOTAL	18	1	2	3	4	4	6
1992-93							
Male	18	0	2	1	0	3	1
Female	11	1	0	4	1	1	1
TOTAL	29	1	2	5	1	4	2
1993-94							
Male	11	0	2	0	0	1	0
Female	13	0	1	1	0	1	3
TOTAL	24	0	3	1	0	2	3
GRAND TOTAL	101	8	8	12	36	23	18

TABLE 6. 1993 Deer Season Summary

HARVEST

SEASON	ANTLERED DEER			BUCK FAWNS			DOES			TOTAL[1]		
	1992	1993	% Change	1992	1993	% Change	1992	1993	% Change	1992	1993	% Cha
Firearms	68,497	69,051	+1	20,647	21,700	+5	59,273	63,065	+6	148,444	154,159	+
Muzzleloading firearms	942	1,002	+6	373	423	+13	1,114	1,135	+2	2,429	2,566	+
Archery	6,078	6,459	+6	3,143	2,797	-11	5,808	5,327	-8	15,029	14,696	-
Managed hunts	491	366	-25	--	--	--	536	354	-34	1,027	720	-3
TOTAL	75,517	76,878	+2	24,190	24,920	+3	66,195	69,881	+6	166,929	172,141	+

HUNTER SUCCESS RATES

PERMIT TYPE	NUMBER OF PERMITS		% OF HUNTERS SUCCESSFUL AT HARVESTING A DEER		NUMBER OF DEER HARVESTED	
	1992	1993	1992	1993	1992	1993
Antlered-only[2]	157,817	155,191	18	17	28,146	26,674
Any-deer	252,572	250,730	32	31	80,392	78,318
Bonus antlerless-only	107,020	128,320	37	38	39,616	48,939
Archery	94,809	93,575	16	16	15,029	14,696

DEER LICENSE SALES

	NUMBER OF PERMITS SOLD		ESTIMATED REVENUE	
	1992	1993	1992	1993
Resident firearms	429,859	436,341	$4,298,590	$4,363,410
Non-resident firearms	9,885	10,390	988,500	1,039,000
Muzzleloading firearms	11,429	13,116	114,290	131,160
Resident archery	93,338	92,031	1,120,056	1,104,372
Non-resident archery	1,497	1,544	112,275	115,800
TOTAL	545,748	553,422	$6,633,711	$6,753,742

ANY-DEER AND BONUS PERMIT DISTRIBUTION

	ANY-DEER PERMITS				BONUS ANTLERLESS-ONLY PERMITS			
	LANDOWNER		PERMITTEE		LANDOWNER		PERMITTEE	
	1992	1993	1992	1993	1992	1993	1992	1993
No. of permits distributed	35,293	39,101	217,125	211,629	20,835	25,809	86,185	102,511
% of applicants that received permit	100	100	97	98	78	78	45	55

[1]Includes deer of unknown sex or age. [2]Does not include landowner antlered-only hunters.

DEER IN NEBRASKA 1994

Bruce Trindle

GENERAL

Deer populations in eastern Nebraska continue to increase in response to a conservative antlerless harvest. Only one unit remains slow to respond, and it is speculated that EHD was probably more severe than first estimated. Deer populations in the central and western parts of the state are approaching levels where control may be necessary. Our trophy management in the Sandhills unit continues to be popular. Whitetail yearling bucks constituted 45%, and mule deer yearling bucks 47% of the harvest. As predicted, antlerless only permits were needed this year to continue reduced buck hunting pressure in the unit.

Strategic planning has begun in Nebraska, with a big-game plan due to be completed by April 1995. These plans will be available upon request. The 5 year update of our landowner survey has been completed and the results are available upon request. This survey continues to give us information upon which management decisions are made. Only scattered reports of EHD were received this year.

HUNTING SEASONS

Regular firearm season was held November 12 through November 20. Success was 60 percent, with 55,431 hunters taking 33,885 deer. License sales increased by 1,015 and harvest by 3,176 compared to 1993. A total of 26,299 either-sex permits was issued, 9 percent above that of 1993. Antlerless deer harvest was 7,072, 32 less than in 1993. Harvest and success by management unit are presented in Table 1. Relative success by permit type is presented in Table 2.

Archery season was held September 15 through November 11, and November 21 through December 31. Archers had a success rate of 27% with 15,104 archers taking 4,150 deer. Permit sales increased by 1,306 (9%) compared to 1993. The statewide muzzleloading rifle season was held December 3 through December 18. Muzzleloaders were 43% successful, with 7,045 hunters taking 3,050 deer. This season's popularity continues to increase as witnessed by a license sales increase of 1,344 (24%) compared to 1993 (see attached graph).

The DeSoto National Wildlife Refuge muzzleloader hunt was held December 10 through December 12. A total of 98 hunters, harvested 55 deer.

Two special firearm late seasons were also held January 7 through January 15. One was located along the lower Missouri River and the other along the lower Platte River. Season formats are designed to reduce whitetail deer populations along these river courses. Results from these seasons are not yet available.

DEER IN NORTH DAKOTA - 1994

by
Roger Johnson

Firearms Season Structure - Regulations for the 1994 firearms deer season were established for all 38 hunting units (Figure 1.) Deer licenses are normally issued through a lottery except for landowner permits. In 1993, a weighted priority lottery system was initiated. The priority system is similar to South Dakota's in which unsuccessful applicants have their name entered more times in the drawing the longer they have been unsuccessful. The weighted priority system was continued in 1994. The utilized permits are issued for specific deer types (antlered or antlerless white-tailed deer, antlered or antlerless mule deer and antlered or antlerless any deer). The gratis landowner permits allow any deer to be taken, but are restrictive in that the holders may only hunt on their own land. A total of 86,119 permits were issued for the 1994 deer gun season. This was a decrease of 2,167 permits from the record high 88,286 permits issued in 1993. In 1994, second deer licenses were issued through a lottery rather than a first come basis as in the past. The second deer licenses were all antlerless licenses not sold during the lottery drawing. The white-tail antlerless licenses were left over in the eastern part of the state and the mule deer antlerless licenses were left over in the badlands. The distribution of the deer permits was 10,987 gratis landowner, 65,597 resident, 822 nonresident and 8,713 second deer licenses. The season length options were not changed in 1994. The season across the state was 16½ days in length except for the split season areas. The split season (early and late) was again offered in 1994 near the population centers along the extreme eastern edge of the state and the Missouri River unit south of Bismarck (hunting units 2B, and 3C) (Figure 1).

The deer gun season started at noon CST November 4 for all season lengths including the early season in split season areas. In split season areas, the early season lasted 6½ days. The late season started November 11 and ran for 10 days. This type of split allowed for both the early and late seasons to be held within the 16½ day season framework. The daily hunting hours are from one-half hour before sunrise to one-half hour after sunset.

1994 Deer Gun Season Harvest - The results from the 1994 Deer Gun season is unknown at this time. The preliminary results from the questionnaires returned indicate about 75% success which will result in a harvest of approximately 65,000 deer.

1993 Deer Gun Harvest - After the season a harvest questionnaire was sent to 23,850(26.9%) of the 88,286 deer gun licenseholders in 1993. The response rate was 64%. The sample information was projected to represent all hunters during the 1993 deer gun season. Expanding the data revealed that 95.3% of the licensees actively attempted to harvest a deer. This resulted in 65,375 ± 558 deer harvested for an overall success of 77.6%(Table 1).

Muzzleloading Long Gun Season Structure - For the seventh time in the recent history of North Dakota, a muzzleloading long gun season was proclaimed. The season was mandated by the 1986-87 legislature. The season allowed for 700 any sex white-tailed deer licenses. The season was from noon CST November 25, 1994 and from one-half hour before sunrise to one-half hour after sunset each day thereafter through November 28, 1994 and December 2 (noon) through December 5, 1994. The season was proclaimed for all of North Dakota. The licenses were issued by lottery. A priority system has been initiated for the drawing of these permits in 1994. Legal weapons were muzzleloading long guns of 45 caliber or larger fired by black powder or pyrodex with flint or percussion ignition. Telescopic sights are illegal but in-line type percussion locks were legal for the second year in 1994.

1994 Muzzleloading Long Gun Harvest - All muzzleloading hunters were sent a questionnaire. The results of the muzzleloading harvest questionnaire is not completed, but results are expected to be similar to the 46% success experienced in 1993.

1993 Muzzleloading Long Gun Harvest - All 696 muzzleloading hunters were sent a questionnaire. The response rate to the questionnaire was 57.6%. The respondents indicated that 92.8% of the licensees actually went hunting and 46.3% of the hunters harvested a deer. This projected a harvest of 299 white-tailed deer (127 antlered and 172 antlerless). The hunters hunted an average of 4.00 days.

Archery Season Structure - Archery deer licenses are issued over the counter through license vendors and county auditors with no restrictions on species or sex. The 1994 archery deer season started at noon, September 2 and continued from one-half hour before sunrise to one-half hour after sunset each day until December 31, 1994. The deer bow season is left open during the whole deer gun season with the only restriction being that the bow hunters have to wear blaze orange during the deer gun season. Any deer was legal, with no unit restrictions.

1994 Archery Harvest - The results of the 1994 deer archery season is unknown at this time. The success is expected to be similar to 1993 when 11,373 archery hunters harvested 4,525 deer for 39.8% success.

1993 Archery Harvest - The 1993 archery season began on September 3 and continued until December 31, 1993. The season resulted in the sale of 11,824 licenses. After the season, 1,962 questionnaires were sent to resident license holders from the 1992 season. Nine hundred twenty two questionnaires were returned. Expanding the sample results projected that 11,373 deer bow hunters experienced 39.8% success for a total deer harvest of 4,525 ± 419 deer, with 4,006 white-tailed deer and 519 mule deer.

Youth Deer Gun Season - An experimental youth deer gun season was initiated in 1994. The season is a one time opportunity for youths 14 and 15 years of age at the application deadline of June 6. All regular deer gun season regulations and weapon restrictions applied. This includes a half price ($10.00) license for all youths under sixteen. In addition, each youth licensee must be accompanied by at least one unarmed parent, guardian, or adult authorized by their parent or guardian. Any deer regardless of sex or species was legal. The season started on September 16 (12 noon) and continued through September 25, 1994 with the option that they could also hunt during the regular deer gun season if they were unsuccessful in the youth season.

1994 Youth Deer Gun Season Harvest -The 1994 statewide youth deer gun season began on September 16 (12 noon) and continued through September 25th. The season resulted in the sale of 1,519 licenses. After the youth season questionaires were sent to all 1,519 licensees. Eleven hundred seventy nine questionaires were returned for a respnse rate of 77.8%. Expanding the sample results projected that 1,236 youths participated in the youth season. They experienced 39.1% success, harvesting 483 ± 19 deer. The composition of the harvest was 304 white-tailed deer (159 antlered & 145 antlerless) and 179 mule deer (138 antlered & 41 antlerless).

1994 Special Herd Reduction Deer Bow Season - There are two areas in North Dakota open for special herd reduction seasons. In the city of Bismarck, the chief of police will issue 600 antlerless white-tailed deer permits for portions of the city as the need arises. The season runs from September 2, 1994 through January 31, 1995. Graham's Island State Park in hunting unit 2L will issue 200 antlerless white-tail deer permits for the park. The season will run from September 2, 1994 through December 31, 1994. The special hunt permits are above the allotted number of permits allowed by the state during normal seasons. All the information and paperwork for these hunts are handled by the entity in charge, so it requires a minimum effort by the Game & Fish Department. The harvest from these special hunts has been minimal, 50-70 animals, but it does help to disperse the deer.

Population Trend - White-tailed deer are distributed throughout North Dakota. Population densities vary by region and are influenced by land use, human population densities, habitat types and climatological regions. In 1958, the state was divided into 41 subunits with permanent boundaries that most nearly coincide with the environmental influences, thus permitting deer management on a utilized basis. Permanent deer population study areas have been established within each of the 41 subunits to provide comparative annual population trend information. The main range of mule deer in North Dakota is the region of the state southwest of the Missouri River. The utilized system of management for white-tailed deer is also used as a basis for mule deer management. The Badlands region is considered the primary mule deer range and permanent deer population study areas have been established.

Population trend data in North Dakota for both white-tailed deer and mule deer is obtained by aerial survey of permanent study areas. In 1993-94, fairly heavy accumulations of snow in late November, 1993 made it possible to survey 73% of the permanent aerial survey blocks. The deer counts indicated high populations in all areas of the state except the Missouri River west of Garrison Dam, which is still recovering from EHD losses of the late 1980's. The spring mule deer survey was flown during the period of April 18 - May 5, 1994. The area involves 291 square miles of Badlands habitat. The counts indicated a mule deer population index of 5.7 deer per square mile. This is below the 1992 population index of 6.2 and above the long term averaged data of 4.9 mule deer per square mile.

Research - A white-tail deer research proposal has been initiated in the pothole region of North Dakota. Currently, North Dakota's winter white-tailed deer survey is an aerial survey of winter deer concentration areas. The counts of these areas are considered a trend count. The research is designed to explain shifts in deer concentration areas that may have developed because of CRP and the North American Waterfowl

Plan (added public land) in the pothole region of North Dakota. The approach is to count concentration areas and large block areas (1200 sq. mi.) with fixed wing aircraft as well as with an infrared photographic survey for sightability modeling. The approach for 1993-94 was limited to flying one 41 sq. mi. concentration area three times with a fixed wing aircraft and once with the infrared photographic equipment. The cost was $208.33 per sq. mi. and required 15 hours for the infrared survey versus the fixed wing survey which cost $16.50 per sq. mi. and took one and one-half hours to complete. The fixed wing surveys averaged 95% of the infrared survey count. At the present the current technology used for infrared surveys has very limited applications in North Dakota.

FIG. 1

1994 DEER GUN HUNTING UNITS

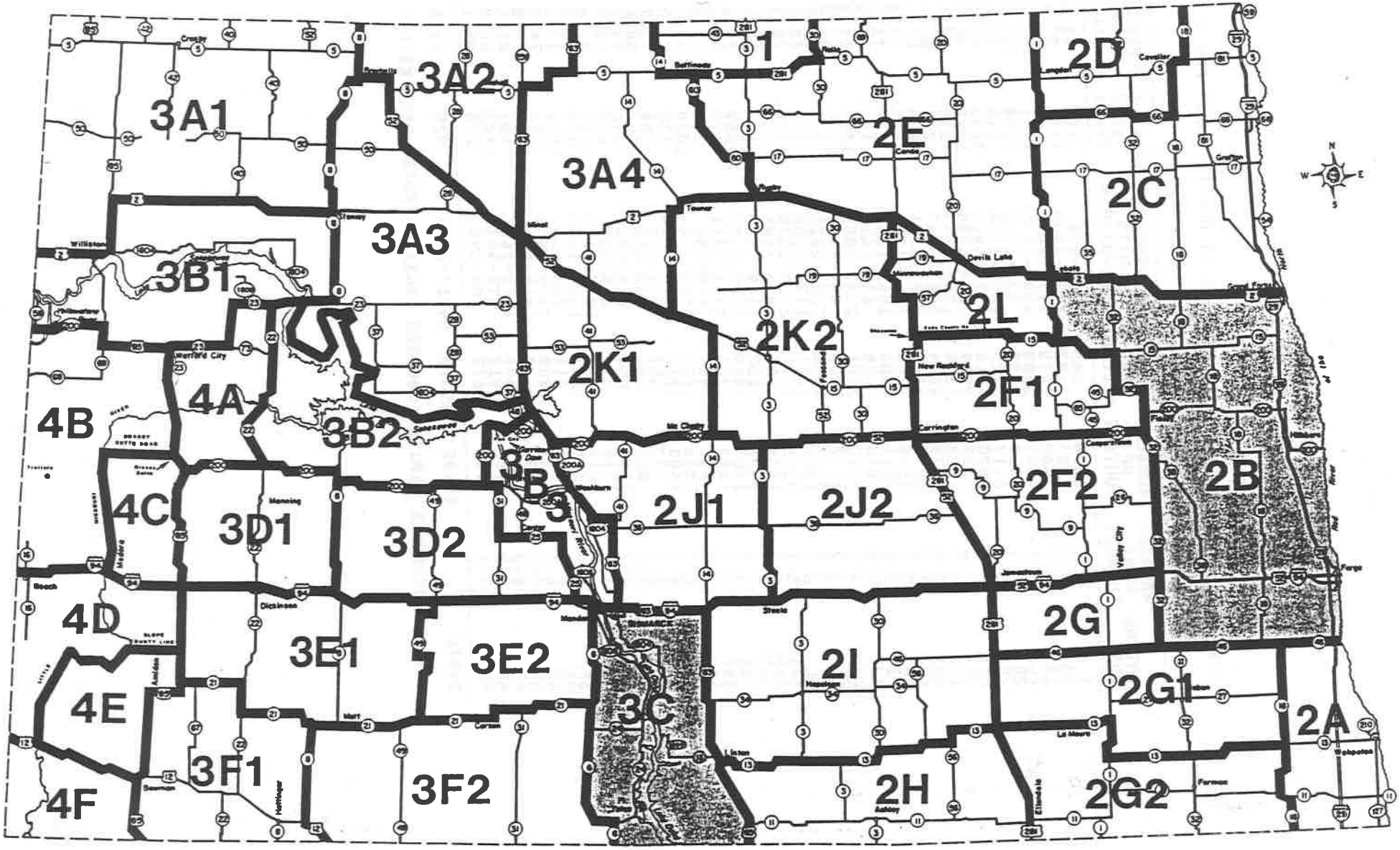

TABLE 1. 1993 DEER HUNTER SUCCESS BY HUNTING UNIT FOR ALL LICENSES (BOTH SEASONS).

HUNTING UNIT	MANAGE-MENT SUBUNIT	NUMBER OF HUNTERS	TOTAL DEER KILLED	CONFIDENCE LIMITS (LOW-HIGH)*	DEER KILL /1000 SQ.MI.	PERCENT HUNTER SUCCESS
1	5-1	1008	665	604-726	1127	66.0
2A	9-3	1587	1382	1320-1444	1161	87.1
2B	9-2	7400	6475	6277-6673	1405	87.5
2C	9-1	4649	3689	3500-3878	1171	79.4
2D	8-1	1969	1037	932-1142	1235	52.7
2E	3-4	4117	3120	2936-3304	714	75.8
2F1	7-1	5028	4310	4123-4497	3193	85.7
2F2	7-2	3366	2919	2804-3034	1520	86.7
2G	7-3	1522	1348	1303-1393	1532	88.6
2G1	7-4	5079	4084	3881-4287	2269	80.4
2G2	7-5	3875	3142	2983-3301	1904	81.1
2H	3-7	1546	1133	1062-1204	619	73.3
2I	3-6	2311	1686	1562-1810	539	73.0
2J1	3-5	1014	688	635-741	357	67.9
2J2	3-5	3496	2701	2547-2855	1375	77.3
2K1	3-3	1777	1088	985-1191	544	61.2
2K2	3-3	3327	2458	2293-2623	801	73.9
2L	6-1	1554	1221	1154-1288	1327	78.6
3A1	3-1	3355	2372	2169-2575	628	70.7
3A2	4-1	1539	1104	1023-1185	646	71.7
3A3	?-?	1831	1252	1149-1355	394	68.4
3A4	4-?	1983	1499	1389-1609	559	75.6
3B1	2-?	1693	1246	1181-1311	623	73.6
3B2	2-3	631	467	448-486	399	74.0
3B3	2-?	2305	1652	1560-1744	2040	71.7
3C	2-?	1503	1213	1170-1256	632	80.7
3D1	1-1	502	357	341-373	266	71.1
3D2	1-2	880	605	578-632	365	68.8
3E1	1-3	1163	853	816-890	416	73.3
3E2	1-4	1118	849	814-884	663	75.9
3F1	1-5	1319	1079	1045-1113	662	81.8
3F2	1-6	1319	1041	1002-1080	427	78.9
4A	0-4	1056	819	785-853	1011	77.6
4B	0-3	2437	1808	1713-1903	981	74.2
4C	0-3	1106	883	849-917	1411	79.8
4D	0-2	1907	1546	1475-1617	1487	81.1
4E	0-2	1140	912	877-947	1140	80.0
4F	0-1	790	672	649-695	960	85.1
STATE		84202	65375	64817-65933	925	77.6

* 95% CONFIDENCE LIMITS (COCHRAN 1963) ON TOTAL DEER KILLED.

DEER IN OHIO - 1994

(Bob Stoll)

Ohio's deer management goal is to strive for a deer population which provides maximum recreational opportunity within the context of minimal conflicts with agriculture, motor travel, and other areas of human endeavor. The suitability of this deer management goal has been checked numerous times with groups representing a broad range of interests. Most recently, over 90% of farm and non-farm rural landowners and 88% of the deer hunters surveyed agreed with this management approach.

Based on our deer management goal, a minimum conflict deer population objective is established for each of Ohio's 88 counties. The population objective is derived by comparing deer abundance (buck gun kill/mi^2) with farmer preference and deer-vehicle accidents. Public desires for recreational opportunity are determined from hunter attitude surveys and included in harvest management objectives.

License/Permit Requirements

Residents not exempted from purchasing licenses were required to buy a $15.00 general hunting license and a $20.00 statewide deer permit; non-residents needed a $91.00 non-resident license in addition to a $20.00 deer permit. Special Management Antlerless Deer permits (SMADPs), which entitled the holder to an additional deer, were available over-the-counter at regular license vendors throughout the state for 62 of the state's 88 counties. A limited number of SMADPs were issued for each of the remaining 26 counties from applications received in at the Division headquarters beginning in July. Additionally, urban deer zones were established around 5 of the state's largest metropolitan areas in an effort to encourage additional deer hunting opportunity. Hunters in these urban zones were entitled to a third deer which, like the SMADPs, had to be antlerless. SMADPs and the urban permits were $20.00 each. Landowners hunting on their own property, tenants hunting on those lands where they resided and were actively involved in its management, and free license recipients (primarily those 66 years old or older) were exempt from all license and permit requirements; they were required to apply for a free SMADP if they wanted a second-deer opportunity in any of the 26 limited-permit counties. All permits were valid for the entire October through January deer season; any hunting device (longbow, crossbow, shotgun, handgun, and muzzleloader) legal for the individual season (archery, gun, and primitive) could be used. A 1 deer per permit regulation was in effect.

The number of deer permits sold for 1993 totalled 327,586 - up nearly 4% from 1992. Sales figures for 1994 are unknown at this time. Of the 1993 deer permit buyers, 57,482 purchased an SMADP compared with 43,485 in 1992. The total number of SMADPs issued in 1993 (84,756) was nearly 42% more than in 1992.

Harvest Results

Preliminary results for the 1994 gun season indicate that 129,943 deer were harvested during the 6-day either-sex season; 104,540 deer were harvested in the 1993 season. A summary of the 1993 season is presented in Inservice Note 699 (appended). Early reports for the 1994 archery season are also better than last year with final figures expected to exceed the 23,160 harvested in 1993. Except

for Sundays, archery season was open from October 1, 1994 through January 31, 1995 (105 days). The 6-day buck-only primitive season [Oct. 24-29 (315 bucks)] and the 3-day primitive season for deer of either sex [Jan. 5-7 (9,962 deer)] complete the deer hunting options available to hunters in Ohio (Fig. 1). Increased hunting opportunity due to over-the-counter SMADPs and more abundant deer populations are expected to result in a harvest of more than 160,000 deer for the 1994 season.

Age, sex, and antler beam diameters were collected from a sample of 7,316 deer registered at mandatory checking stations during the 1993 gun season (see attached Ins. Note 692). Yearling bucks comprised 64-66% of the antlered buck kill and had average beam diameters of 22-25 mm. The estimated preseason adult sex ratios ranged from 1.4 to 1.5 females per male and the number of fawns per adult doe in the harvest ranged from 1.1 to 1.4. Sex/age/condition information obtained from over 8,700 deer this year is presently being summarized.

Present Status

Deer populations continue to increase in Ohio. Going into the 1994-95 season, deer populations in 85 of Ohio's 88 counties exceeded population objectives. The bonus antlerless permit system was liberalized by implementing over-the-counter sales for 62 counties; limited numbers of SMADPs were issued in the other 26. Creation of 5 urban deer zones, where a third deer could be harvested, further liberalized harvest regulations in urban/metropolitan areas. Despite the increased opportunity offered for the 1994 season, deer populations are expected to increase. Consequently, proposals for the 1995 hunting season are being further liberalized as noted below.

1995-96 Season Proposals

- A 2 week either-sex gun season in 67 of 88 counties vs 1 week statewide last year.
- A 2-deer (one must be antlerless) bag limit statewide (vs 62 counties last year). Hunters must purchase a 2-deer permit to take 2 deer.
- A 3-deer bag limit (vs 1 deer last year) in urban deer zones. These deer must be antlerless and may be in addition to the 2 deer permitted statewide

Preliminary Observations Based on 1994 Season Results

- 1994 statewide gun kill up 24% over 1993; up 5% in 26 counties where SMADPs were limited and 29% in 62 counties where SMADPs were unlimited (Table 1).
- 1994 gun kill in urban zone counties up 33% (range: 18-69%; Table 1).
- 1994 statewide estimated antlerless kill (all seasons) is projected to fall 13% or 16,000 deer short of the estimated 127,000 needed to stabilize the population. Deer populations are expected to continue to increase in our major deer counties in eastern Ohio.

- The gun season kill was up 9% in 1993, 18% in 1991 and 58% in the 11 SMADP counties in 1988 (many of these 11 counties were among the harvest leaders in 1994) (Table 2).

- While SMADPs have been successful in increasing the antlerless harvest, total antlerless harvests have continued to fall short of levels required to achieve harvest objectives (Table 3).

Odds and Ends

- A total of 436 deer-crop damage complaints were investigated in 1993 resulting in the issuance of 387 out-of-season kill permits; 1,370 deer were reported destroyed. Comparable figures for 1992 are 412 complaints, 351 kill permits issued, and 1,085 deer reported destroyed. Management of out-of-season kill permits is taking more time each year.

- We evaluated rural mail carrier (RMC) deer observations as an index of annual deer abundance. We concluded that RMC deer observations were correlated with deer density but showed high year-to-year variability and were poor indicators of county deer population trends. The survey is being discontinued.

- An analysis of deer condition data collected at aging stations throughout Ohio since 1973 is being conducted. Preliminary indications are that deer condition, at least in some southeastern counties, is declining.

- Deer-vehicle accidents (DVAs) from 1989 through 1993 totalled 102,778 and accounted for more than 5% of all highway accidents in Ohio during this 5-year period (up about 2% over the previous 5-years). A report is being prepared that assesses DVAs as an indicator of county deer population trends ($\underline{r} \geq 0.90$ with buck gun kill in 59 of 88 counties). Current information on the chronology, location, and severity of DVAs is also being compiled.

- A county-based population dynamics model is being developed through an ms project with the Ohio Coop. Wildl. Res. Unit. The model uses historical harvest, age-sex, and reproductive data to reconstruct county deer populations. The accuracy of model estimates of present and next year's herd size is currently being tested.

- A phone survey of farmer attitudes is being conducted this winter. Results will be used to update county deer population objectives.

Table 1. 1993 vs 1994 gun season comparisons (preliminary).

Category	1993*	1994**	% Change
Statewide			
26 Limited SMADP counties	21,759	22,845	+5%
62 Unlimited SMADP counties	82,781	107,098	+29%
88 Counties combined	104,540	129,943	+24%
Urban Zones			
Columbus	893	1,228	+38%
Cleveland-Akron	3,444	4,691	+36%
Toledo	176	297	+69%
Youngstown	1,790	2,116	+18%
Cincinnati-Dayton	2,805	3,756	+34%
Zones Combined	9,108	12,088	+33%

*Final kill
**Radio report

Table 2. Comparison of gun season kill in some previous years.

Year	Percent Change in Kill	Herd Growth Following Fall*
1992 vs 1993	+9%	?
1990 vs 1991	+18%	+10%
1987 vs 1988 (11 SMADP counties)	+58%	-10%

*Based on change in deer-vehicle accidents and buck gun kill.

Table 3. Effect of Special Management Antlerless Deer Permits (SMADPs or 2-deer permits) on the total antlerless harvest and the status of the antlerless kill relative to the harvest needed to achieve management objectives.

Year	SMADPs Issued	% Increase in Total Antlerless Kill	Proportion of Antlerless in Total Kill	% Below Desired Antlerless kill
1990	None	4.8	57.4	18
1991	42,868	31.0	61.8	4
1992	59,778	4.9	61.2	24
1993	84,756	11.8	61.7	34

Fig. 1. 1994-95 Ohio deer seasons.

1994-95 DEER SEASONS

Methods	Opening Date	Closing Date	Special Regulations, Hours
Archery Season: Longbow: minimum draw weight 40 lb. Crossbow: draw weight not less than 75 lb., nor more than 200 lb.	October 1	January 31	Buck or antlerless deer statewide. Hours 1/2 hour before sunrise to 1/2 hour after sunset. During gun season, hours are the same as for gun hunting. Holder of Special Management Antlerless and/or Urban Deer Hunting permit(s) see Deer Hunting Section on page 13. Deer must be checked by 8:00 p.m. of the day after harvest; but a deer taken Jan. 31, 1995, must be checked by 8 p.m. the same day. If the deer is antlerless and was taken using a Special Management Antlerless Deer Hunting Permit or an Urban Deer Hunting Permit, it must be checked in the county where taken.
Special primitive season: longbow, crossbow (draw weight limitations same as above), muzzleloading rifle .38 caliber or larger, or muzzleloading shotgun of 10, 12, 16 or 20 gauge using one ball per barrel.	October 24	October 29	Buck only. Special primitive hunting areas only. Hours 1/2 hour before sunrise to sunset. Deer must be checked by 8 p.m. on the day taken at the check station on the primitive area; (1) Salt Fork—Salt Fork Wildlife Area HQ; (2) Shawnee —Shawnee State Forest Office; (3) Wildcat Hollow—Wolf Creek Wildlife Area HQ.
Gun Season: 10, 12, 16, or 20 gauge shotgun using one ball or one rifled slug per barrel (rifled shotgun barrels are permitted when using standard shotgun slug ammunition); or muzzleloading rifle .38 caliber or larger; or handgun with 5-in. minimum length barrel, .357 magnum, .41 magnum, .44 magnum, .45 Long Colt, or .357 maximum; or longbow, crossbow (draw weight limitations same as above).	November 28	December 3	Buck or antlerless deer statewide. Hours 1/2 hour before sunrise to sunset. Holders of Special Management Antlerless and/or Urban Deer Hunting permit(s) see Deer Hunting Section on page 13. (Kelleys Island closed to gun hunting.) Deer must be checked by 8:00 p.m. of the day after harvest; but a deer taken on Dec. 3 must be checked by 8 p.m. on that day. All deer taken must be checked in the county where taken or in an adjacent county. If the deer is antlerless and was taken using a Special Management Antlerless Deer Hunting Permit or an Urban Deer Hunting Permit, it must be checked in the county where taken.
Statewide primitive season: same as above.	January 5	January 7	Buck or antlerless deer statewide. Hours 1/2 hour before sunrise to sunset. Holders of Special Management Antlerless and/or Urban Deer Hunting permit(s) see Deer Hunting Section on page 13. (Kelleys Island closed to gun hunting.) Deer must be checked by 8:00 p.m. of the day after harvest, but a deer taken on Jan. 7 must be checked by 8 p.m. that day. If the deer is antlerless and was taken using a Special Management Antlerless Deer Hunting Permit or an Urban Deer Hunting Permit, it must be checked in the county where taken.

HUNTING OF ALL WILD ANIMALS EXCEPT DEER, WATERFOWL, AND COYOTE DURING DAYLIGHT HOURS IS PROHIBITED DURING DEER GUN SEASON, JANUARY STATEWIDE PRIMITIVE DEER SEASON, AND PRIMITIVE DEER SEASON ON THREE SPECIAL AREAS.

Deer Hunting

Bag Limits and Permits Required

To hunt deer, you must have a hunting license and a Deer Hunting Permit. A Special Management Antlerless Deer Hunting Permit, OR **an Urban Deer Hunting Permit** can also be obtained to take additional deer. The permits each cost $20.00, which includes a $1.00 writing fee, for residents and nonresidents, but in some cases the permits may not be sold separately. With the proper permits and when taken in accordance with Ohio regulations, a hunter can take up to one antlered deer and two antlerless deer during the 1994-95 hunting season. A nonresident may not hunt antlerless deer if an Ohio resident is not permitted to do so in the nonresident's state.

Tagging Requirements

Every person who kills a deer must immediately attach a tag to the deer bearing the name and address of the hunter and date and time killed. The tag must be attached before the deer is moved and must remain on the deer until it is taken to an official deer check station (see Deer Check Station Locations, page 22) for permanent tagging. Once a temporary ownership tag is separated from the permit, it is illegal to hunt or pursue deer with a hunting device. For **multiple tag holders, the first deer taken in the day must have been permanently tagged at a check station before you may pursue another deer.** The location for permanently tagging your deer is as follows:

- **Deer Hunting Permit...** County or adjacent county of kill.
- **Special Management Antlerless Deer Hunting Permit...** County of kill.
- **Urban Deer Hunting Permit... County of kill.**

The person who kills the deer must transport it to the check station. It is unlawful to attach a temporary tag to a deer taken by another person.

Hunters with deer permits must use the tag on the permit. Landowners and tenants who take a deer on their land and any other person not required to purchase a deer permit must provide their own tag with their name, address, and date and time killed.

Deer must be checked by 8:00 p.m. of the day after harvest, but a deer taken on the last day of the archery season (Jan. 31), the special primitive season (Oct. 29), the statewide primitive season (Jan. 7), and the gun season (Dec. 3) must be checked by 8:00 p.m. that day.

Deer Bag Limit Summary

Up to three deer may be taken with any of the following combinations of valid permits:

1 DEER LIMIT Deer Hunting Permit - valid for one deer of either sex.

2 DEER LIMIT Deer Hunting Permit - valid for one deer of either sex. Special Management Antlerless Deer Hunting Permit - valid for an antlerless deer.

2 DEER LIMIT Deer Hunting Permit - valid for one deer of either sex. One Urban Deer Hunting Permit - valid for one antlerless deer in an Urban Deer Zone or Division of Wildlife controlled hunt.

3 DEER LIMIT Deer Hunting Permit - valid for one deer of either sex. Two Urban Deer Hunting Permits - each permit valid for one antlerless deer in an Urban Deer Zone or Division of Wildlife controlled hunt.

3 DEER LIMIT Deer Hunting Permit - valid for one deer of either sex. One Special Management Antlerless Deer Hunting Permit - valid for an antlerless deer. One Urban Deer Hunting Permit - valid for one antlerless deer in an Urban Deer Zone or Division of Wildlife controlled hunt.

SPECIAL MANAGEMENT ANTLERLESS DEER HUNTING PERMITS:

(These permits must be purchased in conjunction with an either sex deer hunting permit.)

A limited number of Special Management Antlerless Deer Hunting Permits will be issued for these 26 counties.*

An unlimited number of permits are available for these 62 counties at most license vendors.

*Permits are available only by mail from the Division of Wildlife, 1840 Belcher Dr. Columbus, Ohio 43224. Permits issued for any of the 26 counties are also valid in any of the 62 counties where unlimited numbers of permits are issued by license agents.

URBAN DEER HUNTING PERMIT ZONES:

These zones include several of the larger metropolitan areas throughout Ohio. Boundaries of all zones with the boundaries of these areas is available from Division of Wildlife district offices and Division headquarters.

Division of Wildlife
Ohio Department of Natural Resources

Inservice Note 699
August 1994

LEGAL DEER HARVEST, 1993-94[1]

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For the 1993-94 season, deer abundance was projected to equal or exceed population objectives in 84 of Ohio's 88 counties. For this reason, more liberal hunting opportunities were in place than in previous years (Fig. 1). Special Management Antlerless Deer Permits (SMADPs) were issued in all 88 counties. SMADPs entitled hunters to take an additional, antlerless-only deer in the county specified on the permit. They were issued only in conjunction with a regular, statewide either-sex hunting permit from applications received at Division headquarters through August 13. In an effort to issue all available SMADPs, those remaining after August 13 were issued on a first come, first served basis from applications received between August 16 and October 15. As in previous years, those hunters not applying for a SMADP could purchase a regular, either-sex permit from license vendors statewide. An estimated 327,586 hunters purchased a regular, either-sex permit in 1993 compared to 315,456 in 1992 and 84,756 SMADPs were issued in 1993 compared with 59,778 in 1992 (B. Page, personal communication).

The 1993 deer season harvest of 138,752 was up 10% over the 126,113 deer registered through Ohio's mandatory checking system in 1992 (Table 1). This year's record harvest is largely attributed to thriving deer populations, generally fair weather conditions throughout the fall, and increased hunting opportunity afforded by the SMADPs. The 1993 deer harvest, however, still fell short of that desired. The more liberal opportunities provided in 1993 (i.e., issuing SMADPs in all 88 counties and extending the SMADP application period to October 15) provided a harvest increase, but not of the magnitude desired.

Typically, the 6-day gun season accounts for about 75% of the total deer harvest. The 1993 gun season was no exception, as a total of 104,540 deer (75.3%) were reported harvested. A 95-day archery season and 3-day statewide primitive season accounted for another 23,160 deer and 10,637 deer, respectively. Of those deer taken during the archery season, 10,155 were harvested with a longbow and 13,005 with a crossbow. The remaining harvests occurred during the 6-day, buck-only primitive hunt on 3 special areas (241) and at Ravenna Arsenal (415).

A county-by-county summary of the 1993-94 deer season harvest, excluding those harvested at Ravenna Arsenal, is presented by season of harvest in Table 2 and in Table 3 by sex and male age class. Each of the top 5 deer producing counties for the 1993-94 season recorded harvests in excess of 4,100 animals and collectively accounted for more than 15% of the statewide total. The leading counties were Guernsey (4,471), Muskingum (4,412), Coshocton (4,139), Jefferson (4,125), and Gallia (4,108). An increase in the deer harvest was registered in all but 6 counties (Ashtabula, Carroll, Holmes, Miami, Monroe, and Washington).

Except for the last day, the weather during the 6-day gun season was good and hunting conditions favorable. The opening day harvest of 40,809 deer (Table 4) accounted for 39% of the total gun season harvest, an increase of 4,162 deer over the 36,647 harvested on opening day of the 1992 gun season (Culbertson and Mountz 1993). An all-day rain on Saturday resulted in reduced hunting effort and a harvest which was about half of that expected. For example, in 1992 the Saturday harvest accounted for 16.5% (15,886 deer) of the gun season take compared to only 9.5% (9,872 deer) this year.

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[1]Contribution from Federal Aid in Wildlife Restoration Act, Project W-134-P, Wildlife Management in Ohio.

Despite an extended application period for the SMADPs, a substantial number went unissued (Table 5). The 84,756 permits that were issued, however, resulted in the harvest of an estimated 25,972 additional antlerless deer (Table 6). Clearly, SMADPs can be effective in increasing the antlerless harvest but their effectiveness appears limited by permit accessibility, hunter acceptance or both.

Private land, which comprises more than 95% of Ohio's land base, produced approximately 90% of the 1993-94 deer harvest; the remaining harvest (nearly 10%) occurred on public land (Table 7). This highlights two important considerations for deer hunters and the future of deer hunting in Ohio. First, hunters need to cultivate and maintain good relations with landowners on whose land they hunt or desire to hunt. Second, public land is an important and productive asset for individuals who are unable to secure access to private land for their recreational pursuits.

Acknowledgments

Appreciation is extended to the check station proprietors for the use of their facilities in checking deer and to the Division of Wildlife employees who conscientiously assisted with the many details associated with the deer season. Editorial comments were provided by R. Stoll and L. Smith. T. Kranyik assisted with data entry and typing.

LITERATURE CITED

Culbertson, W.L. and G.L. Mountz. 1993. Legal deer harvest, 1992-93. Ohio Dept. Nat. Resour., Div. Wildl., Inserv. Note 679. 6pp.

1993-94 DEER SEASONS

DEFINITIONS: Buck: Deer with antlers at least 5 inches long. Antlerless deer: Deer without antlers or with antlers less than 5 inches long.

BAG LIMIT: One deer per hunter in a license year (Sept. 1 - Aug. 31), no matter how the deer is taken; EXCEPT a person with a Special Management Antlerless Deer Permit may take an additional ANTLERLESS deer in the county specified on the permit. Hunters may take only one deer in any one day.

Methods	Legal Deer and Locations	Dates	Hours
Longbow: minimum draw weight 40 lb.	Buck or antlerless deer statewide, ADDITIONALLY, holder of Special Management Antlerless Deer Permit may take only an ANTLERLESS deer and only in county specified on permit. (NOTE: buck only during primitive season on special areas.)	October 2, 1993, through January 31, 1994.	1/2 hour before sunrise to 1/2 hour after sunset, except during deer gun season when 1/2 hour before sunrise to sunset.
Crossbow: draw weight not less than 75 lb., nor more than 200 lb.			
Special primitive season: longbow, crossbow (draw weight limitations same as above), muzzleloading rifle .38 caliber or larger, or muzzleloading shotgun of 10, 12, 16 or 20 gauge using one ball per barrel.	Buck only, special primitive hunting areas only.	October 25, 1993, through October 30, 1993.	1/2 hour before sunrise to sunset.
Statewide primitive season: same as above.	Buck or antlerless deer statewide, ADDITIONALLY, holder of Special Management Antlerless Deer Permit may take only an ANTLERLESS deer and only in county specified on permit. (Kelleys Island closed to gun hunting.)	January 6, 1994, through January 8, 1994.	
Gun Season: 10, 12, 16, or 20 gauge shotgun using one ball or one rifled slug per barrel (rifled shotgun barrels are permitted when using standard shotgun slug ammunition); or muzzleloading rifle .38 caliber or larger; or handgun with 5-in. minimum length barrel, .357 magnum, .41 magnum, .44 magnum, .45 Long Colt, or .357 maximum; or longbow, crossbow (draw weight limitations same as above).	Buck or antlerless deer, statewide, ADDITIONALLY, holders of Special Management Antlerless Deer Permit may take only an ANTLERLESS deer and only in county specified on permit. (Kelleys Island closed to gun hunting.)	November 29, 1993, through December 4, 1993.	

Fig. 1. 1993-94 Ohio deer seasons.

License and Permit Requirements

To hunt deer, you must have a hunting license and either a Special Deer Hunting Permit (cost $15.00 plus $1.00 writing fee) OR a Special Management Antlerless Deer Permit (cost $15.00 plus $1.00 writing fee). The Special Deer Hunting Permit may be purchased from license vendors statewide. A limited number of Special Management Antlerless Deer Permits will be issued for all counties. This permit will be valid for the entire deer season, but only for an antlerless deer and only in the county designated on the permit. Applicants are requested to indicate their first and second county choice. There will be two application periods. **Period one:** Applications were accepted until August 13, 1993. Permits were issued by random selection from all applications received. Permits and refund checks were mailed prior to the start of the archery deer season. Permits were issued for all 88 counties. **Period two:** Individuals whose applications are received after August 13, 1993 and by October 15, 1993 will be issued permits on a first-come, first-served basis until the supply of permits for each county is exhausted. The permits will be mailed by November 19, 1993. All requested information must be provided or the application will not be accepted. Applications are available at all license outlets.

Tagging Requirements

Only the person who kills a deer is allowed to take that deer to an official check station for permanent tagging. Deer killed using a Special Deer Hunting Permit must be tagged in the county where killed or in an adjacent county. Deer killed while using a Special Management Antlerless Deer Permit must be tagged in the county where killed. It is not legal to hunt deer with someone else's Special Management Antlerless Deer Permit or to take an antlerless deer on any piece of land not listed on the Special Management Antlerless Deer Permit.

As soon as a deer is killed, the hunter must attach a tag to the deer at the place where it fell. If the hunter is a landowner taking a deer on their own land or anyone else not requiring a deer permit (See Exemptions) they must provide their own tag. If the hunter is required to have a deer permit, he or she must detach the temporary tag from his or her permit and attach it to the deer (once this tag is separated from the permit, it is illegal to hunt or pursue deer with a hunting device).

All tags must include the hunter's name, address, and the date and time killed. Tags must remain attached to the deer until final inspection and tagging have been completed at an official deer check station.

It is unlawful to attach a temporary tag to a deer taken by another person.

Table 1. Ohio's legal deer harvest, by sex and male age class, 1993-94.

	Bucks	Does	Button Bucks	Unk.	Totals 1993-94	Totals 1992-93	Percent Change
GUN SEASON							
Shotgun	36,469	46,723	17,390	363	100,945	93,272	+ 8.2
Handgun	720	912	387	4	2,023	1,717	+17.8
Muzzleloader	546	680	257	6	1,489	1,190	+25.1
Longbow	17	16	8	0	41	38	+ 7.9
Crossbow	19	16	6	1	42	33	+27.3
Total	37,771	48,347	18,048	374	104,540	96,250	+ 8.6
BOW SEASON							
Longbow	5,398	3,295	1,431	31	10,155	8,899	+14.1
Crossbow	7,021	4,165	1,770	49	13,005	10,678	+21.8
Total	12,419	7,460	3,201	80	23,160	19,577	+18.3
PRIMITIVE SEASONS							
Salt Fork[1]	123	-	-	-	123	117	+ 5.1
Shawnee[1]	33	-	-	-	33	49	-32.7
Wildcat Hollow[1]	85	-	-	-	85	73	+16.4
Statewide[2]	2,113	6,117	2,121	45	10,396	8,528	+21.9
Total	2,354	6,117	2,121	45	10,637	8,767	+21.3
SPECIAL HUNTS							
Ravenna	114	209	91	1	415	664	-37.5
NASA[3]	-	-	-	-	-	762	-
Total	114	209	91	1	415	1,426	-70.9
UNKNOWN SEASON							
Total	-	-	-	-	-	93	-
STATE TOTAL	52,658	62,133	23,461	500	138,752	126,113	+10.0

[1]Buck-only, special primitive hunting area.
[2]Either-sex, statewide.
[3]No hunt at the NASA facility, 1993-1994.

Table 2. Ohio's 1993-94 deer harvest by season and county (Ravenna Arsenal harvest not included in totals). Refer to Fig. 1 for season regulations.

County	Gun Season	Archery Season		Primitive Season		Total
		Longbow	Crossbow	Statewide	Sp. Areas	
Adams	1,223	89	142	117	0	1,571
Allen	369	88	63	32	0	552
Ashland	1,129	113	157	127	0	1,526
Ashtabula	1,709	210	233	119	0	2,271
Athens	2,642	152	163	280	0	3,237
Auglaize	378	77	56	33	0	544
Belmont	2,468	113	220	277	0	3,078
Brown	1,004	106	158	131	0	1,399
Butler	469	115	141	78	0	803
Carroll	1,846	139	224	210	0	2,419
Champaign[1]	806	101	113	78	0	1,098
Clark	371	93	87	44	0	595
Clermont	921	223	226	104	0	1,474
Clinton	486	44	100	42	0	672
Columbiana	1,586	148	253	162	0	2,149
Coshocton	3,282	226	337	294	0	4,139
Crawford	460	61	50	49	0	620
Cuyahoga	35	29	69	8	0	141
Darke	428	64	71	61	0	624
Defiance	816	70	64	53	0	1,003
Delaware	651	165	167	86	0	1,069
Erie	250	71	93	23	0	437
Fairfield	1,241	153	231	115	0	1,740
Fayette	416	27	52	25	0	520
Franklin	242	59	107	34	0	442
Fulton	470	89	44	27	0	630
Gallia	3,376	186	228	318	0	4,108
Geauga	743	179	213	80	0	1,215
Greene	441	114	95	55	0	705
Guernsey	3,435	202	279	432	123	4,471
Hamilton	341	162	174	81	0	758
Hancock	460	98	87	51	0	696
Hardin	647	57	65	54	0	823
Harrison	3,109	144	281	346	0	3,880
Henry	405	46	33	26	0	510
Highland	1,289	110	162	129	0	1,690
Hocking	2,649	192	289	226	0	3,356
Holmes	1,498	232	252	186	0	2,168
Huron	1,130	74	113	75	0	1,392
Jackson	2,397	233	208	201	0	3,039
Jefferson	3,218	213	305	389	0	4,125
Knox	2,113	249	218	166	0	2,746
Lake	203	53	113	28	0	397
Lawrence	1,782	195	153	146	0	2,276
Licking	2,262	269	314	212	0	3,057
Logan	1,032	138	125	120	0	1,415
Lorain	610	109	160	61	0	940
Lucas	176	62	58	22	0	318

Table 2. (Cont.)

County	Gun Season	Archery Season		Primitive Season		Total
		Longbow	Crossbow	Statewide	Sp. Areas	
Madison	443	57	63	39	0	602
Mahoning	575	121	144	86	0	926
Marion	487	57	63	46	0	653
Medina	482	72	165	69	0	788
Meigs	2,987	143	210	302	0	3,642
Mercer	336	63	36	27	0	462
Miami	353	83	91	43	0	570
Monroe	2,741	91	172	203	0	3,207
Montgomery	164	61	78	17	0	320
Morgan	2,192	68	116	163	42	2,581
Morrow	867	108	109	60	0	1,144
Muskingum	3,556	207	288	361	0	4,412
Noble	2,500	104	127	255	0	2,986
Ottawa	165	31	46	19	0	261
Paulding	516	62	55	24	0	657
Perry	2,315	159	175	179	43	2,871
Pickaway	698	62	101	78	0	939
Pike	1,467	93	149	119	0	1,828
Portage	648	113	206	101	0	1,068
Preble	482	83	126	67	0	758
Putnam	311	57	44	18	0	430
Richland	1,131	180	227	91	0	1,629
Ross	2,617	176	351	241	0	3,385
Sandusky	429	71	75	24	0	599
Scioto	1,006	113	154	116	33	1,422
Seneca	742	78	111	60	0	991
Shelby	535	74	108	29	0	746
Stark	493	72	189	61	0	815
Summit	230	79	215	63	0	587
Trumbull[2]	1,215	149	233	228	0	1,825
Tuscarawas	2,930	244	371	341	0	3,886
Union	530	52	87	47	0	716
Van Wert	277	29	52	28	0	386
Vinton	2,912	212	162	226	0	3,512
Warren	428	97	114	55	0	694
Washington	2,749	109	104	232	0	3,194
Wayne	471	65	93	63	0	692
Williams	1,253	168	124	61	0	1,606
Wood	403	65	56	23	0	547
Wyandot[3]	890	85	69	118	0	1,162
State Total	104,540	10,155	13,005	10,396	241	138,337

[1]County total includes 17 deer harvested in controlled hunts on the Urbana Propagation Unit.
[2]County total includes 221 deer harvested in controlled hunts on the Mosquito Creek Wildlife Area.
[3]County total includes 80 deer harvested in controlled hunts on the Killdeer Plains Wildlife Area.

Table 3. Ohio's deer harvest for all hunting seasons by county, sex, and male age class, 1993-94 (Ravenna Arsenal harvest not included).

County	Bucks	Does	Button Bucks	Unk.	Total
Adams	674	682	206	9	1,571
Allen	192	262	96	2	552
Ashland	556	722	246	2	1,526
Ashtabula	851	1,000	411	9	2,271
Athens	1,334	1,443	451	9	3,237
Auglaize	180	261	102	1	544
Belmont	1,238	1,394	440	6	3,078
Brown	571	608	212	8	1,399
Butler	341	343	118	1	803
Carroll	846	1,137	426	10	2,419
Champaign[1]	340	519	236	3	1,098
Clark	227	263	101	4	595
Clermont	642	594	230	8	1,474
Clinton	246	290	131	5	672
Columbiana	779	962	403	5	2,149
Coshocton	1,448	1,911	768	12	4,139
Crawford	216	268	136	0	620
Cuyahoga	59	53	27	2	141
Darke	216	286	120	2	624
Defiance	328	489	186	0	1,003
Delaware	412	443	210	4	1,069
Erie	163	197	75	2	437
Fairfield	712	717	300	11	1,740
Fayette	218	228	73	1	520
Franklin	195	175	69	3	442
Fulton	261	271	95	3	630
Gallia	1,601	1,957	532	18	4,108
Geauga	457	534	219	5	1,215
Greene	269	296	140	0	705
Guernsey	1,659	2,037	766	9	4,471
Hamilton	321	333	102	2	758
Hancock	280	280	136	0	696
Hardin	293	376	134	20	823
Harrison	1,345	1,869	643	23	3,880
Henry	193	225	84	8	510
Highland	605	803	279	3	1,690
Hocking	1,221	1,575	548	12	3,356
Holmes	756	982	423	7	2,168
Huron	424	680	287	1	1,392
Jackson	1,212	1,375	441	11	3,039
Jefferson	1,612	1,866	640	7	4,125
Knox	1,052	1,151	532	11	2,746
Lake	171	164	60	2	397
Lawrence	1,038	949	284	5	2,276
Licking	1,192	1,303	549	13	3,057
Logan	458	660	284	13	1,415
Lorain	333	434	166	7	940
Lucas	124	151	43	0	318

Table 3. (Cont.)

County	Bucks	Does	Button Bucks	Unk.	Total
Madison	237	249	115	1	602
Mahoning	335	413	176	2	926
Marion	222	311	118	2	653
Medina	316	306	161	5	788
Meigs	1,399	1,718	501	24	3,642
Mercer	150	228	80	4	462
Miami	196	259	115	0	570
Monroe	1,270	1,428	496	13	3,207
Montgomery	127	134	59	0	320
Morgan	1,060	1,101	417	3	2,581
Morrow	458	479	203	4	1,144
Muskingum	1,703	1,916	774	19	4,412
Noble	1,137	1,345	491	13	2,986
Ottawa	103	100	58	0	261
Paulding	216	320	121	0	657
Perry	1,081	1,262	523	5	2,871
Pickaway	380	391	163	5	939
Pike	743	792	288	5	1,828
Portage	383	460	220	5	1,068
Preble	273	352	133	0	758
Putnam	159	188	83	0	430
Richland	588	739	298	4	1,629
Ross	1,338	1,499	541	7	3,385
Sandusky	192	277	127	3	599
Scioto	672	585	159	6	1,422
Seneca	372	427	184	8	991
Shelby	241	363	140	2	746
Stark	336	335	142	2	815
Summit	293	198	93	3	587
Trumbull[2]	602	862	355	6	1,825
Tuscarawas	1,368	1,769	743	6	3,886
Union	287	274	150	5	716
Van Wert	142	164	80	0	386
Vinton	1,351	1,629	517	15	3,512
Warren	264	288	140	2	694
Washington	1,315	1,392	468	19	3,194
Wayne	275	293	124	0	692
Williams	536	769	301	0	1,606
Wood	212	237	97	1	547
Wyandot[3]	351	554	256	1	1,162
State Total	52,544	61,924	23,370	499	138,337

[1]County total includes 2 bucks, 12 does, and 3 button bucks harvested in controlled hunts on the Urbana Wildlife Propagation Unit.

[2]County total includes 48 bucks, 125 does, 46 button bucks, and 2 deer of unknown age/sex harvested in controlled hunts on the Mosquito Creek Wildlife Area.

[3]County total includes 22 bucks, 35 does, and 23 button bucks harvested in controlled hunts on the Killdeer Plains Wildlife Area.

Table 4. Ohio's 1993 deer gun season harvest by date.

Date	Bucks	Does	Button Bucks	Unk.	Total	Percent
11/29	16,836	17,329	6,515	129	40,809	39.0
11/30	7,711	10,243	3,808	78	21,840	20.9
12/01	4,336	6,448	2,343	45	13,172	12.6
12/02	2,947	4,476	1,724	42	9,189	8.8
12/03	2,648	4,230	1,567	30	8,475	8.1
12/04	2,851	5,069	1,910	42	9,872	9.5
Unk.	442	552	181	8	1,183	1.1
Total	37,771	48,347	18,048	374	104,540	100.0

Table 5. Number of Special Management Antlerless Deer Permits (SMADPs) allocated and issued by county. Second choice applications were issued to counties not filled by first choice applications.

County	SMADPs Allocated	SMADPs Issued	County	SMADPs Allocated	SMADPs Issued
Adams	5,155	1,045	Logan	2,880	951
Allen	975	350	Lorain	3,335	975
Ashland	1,805	739	Lucas	615	274
Ashtabula	6,485	2,195	Madison	2,555	332
Athens	6,315	1,714	Mahoning	2,415	881
Auglaize	750	242	Marion	2,300	410
Belmont	2,775	1,553	Medina	1,405	705
Brown	1,960	871	Meigs	6,355	2,180
Butler	3,600	768	Mercer	460	304
Carroll	2,485	1,668	Miami	1,580	550
Champaign	4,100	667	Monroe	6,025	2,228
Clark	1,660	545	Montgomery	1,175	301
Clermont	2,245	1,045	Morgan	2,755	1,234
Clinton	1,875	457	Morrow	1,090	612
Columbiana	4,645	1,659	Muskingum	8,455	1,767
Coshocton	7,925	2,631	Noble	5,500	1,868
Crawford	975	260	Ottawa	390	176
Cuyahoga	All received	108	Paulding	675	396
Darke	570	375	Perry	3,850	1,258
Defiance	175	175	Pickaway	2,330	488
Delaware	3,340	700	Pike	2,500	970
Erie	380	304	Portage	3,095	1,134
Fairfield	2,560	951	Preble	2,660	632
Fayette	1,580	254	Putnam	500	202
Franklin	1,205	272	Richland	2,470	901
Fulton	655	362	Ross	6,615	1,735
Gallia	4,800	2,003	Sandusky	800	389
Geauga	3,075	1,393	Scioto	2,775	866
Greene	1,365	538	Seneca	1,000	400
Guernsey	7,625	2,770	Shelby	1,305	493
Hamilton	2,680	618	Stark	1,195	452
Hancock	1,040	331	Summit	2,105	456
Hardin	1,925	476	Trumbull	3,355	1,791
Harrison	5,445	2,175	Tuscarawas	4,550	2,236
Henry	490	242	Union	1,700	427
Highland	2,180	1,012	Van Wert	350	158
Hocking	4,515	1,953	Vinton	4,905	2,320
Holmes	3,505	1,519	Warren	1,825	627
Huron	1,305	594	Washington	5,725	1,967
Jackson	5,300	1,859	Wayne	1,335	427
Jefferson	6,050	2,155	Williams	1,360	991
Knox	5,945	1,448	Wood	855	311
Lake	1,165	388	Wyandot	1,150	454
Lawrence	2,980	1,299			
Licking	6,540	1,844	State Total	244,400	84,756

Table 6. Additional antlerless deer harvest attributed to the Special Management Antlerless Deer Permits (SMADPs).

Applications Issued				Est. Antlerless Harvest Due to SMADPs	No. SMADPs per Antlerless Deer Harvested
Paid	Free	Land-owner	Total		
57,482	5,519	21,755	84,756	25,972	3.3

Table 7. Percent distribution of the 1993-94 deer harvest according to land ownership.

Season	Not Given	Hunter's Own Land	State or Federal	Private
Gun	0.2	20.7	9.8	69.3
Bow	0.2	17.9	7.2	74.6
Primitive	0.4	12.4	9.2	78.0

Division of Wildlife
Ohio Department of Natural Resources

Inservice Note 692
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DEER AGE, SEX, AND CONDITION DATA, 1993

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Division of Wildlife personnel operated 16 aging stations throughout the state during the 1993 deer gun season (Fig. 1). Information regarding age, sex, and condition was collected from 7,316 deer checked at these facilities. This sample amounted to 7% of the reported deer harvest of 104,540. The number of deer from which information was collected is shown according to sex and age for each geographic region in Table 1. Various population parameters (Table 2) are calculated from the aging station data which, when combined with the registered deer harvest for each county, provide an index to deer abundance.

The condition of Ohio's deer herd, based on antler characteristics (Figs. 2, 3) and productivity (Table 3) is typical of a healthy herd which is within the biological carrying capacity of its habitat. Average antler beam diameter for 1.5-year-old bucks in 1993 was lower than that in 1973, 1980, and 1985 in the northeast and east central-southeast (EC-SE) regions but not in the western region (Fig. 2). Also the percent spike (2 points) bucks in the antlered sample (Fig. 3) was high, suggesting below average condition in 1993. The increasing popularity of deer hunting has resulted in increased pressure on the antlered buck segment of the population. The result has been a slight to moderate decline in the proportion of older ($\geq$ 2.5 years) aged bucks in the harvest since 1973 (Fig. 4). This decline has been more than offset by increases in the size of Ohio's deer herd. Thus, the opportunity for quality buck hunting is good, as evidenced by the number of bucks harvested each year that qualify for entry into the Buckeye Big Buck Club (Fig. 5).

Acknowledgments. The collection of these data was possible through the effort and cooperation of numerous individuals. We would like to thank the proprietors of the various stations for making their facilities available for this work and to the many Division of Wildlife employees who worked the long hours necessary to collect this vital information. Appreciation is also extended to T. Kranyik for computer entry of these data and for typing this note.

Table 1. Age and sex composition of the 1993 gun season sample.

	Female Age (Years)						Male Age (Years)					
Region	0.5	1.5	2.5	3.5	4.5	4.5+	0.5	1.5	2.5	3.5	4.5	4.5+
Western	424	328	244	88	21	13	543	556	250	52	6	1
Northeast	114	98	66	34	7	1	125	151	56	25	1	0
EC-SE	588	546	398	189	71	38	736	1,023	337	147	28	11
State	1,126	972	708	311	99	52	1,404	1,730	643	224	35	12

Table 2. Deer population parameters calculated from 1993 deer aging station information.

Region	Estimated Harvest Mortality of Adult Bucks (%)	Estimated Preseason Adult Sex Ratio (Females/Male)
Western	59	1.4
Northeast	60	1.4
EC-SE	61	1.5

Table 3. Number of fawns per doe (≥ 1.5 years old) in the 1993 harvest sample compared with in-utero fetal counts from 1982-83.

Region	Fetuses per Doe 1982-83	Fawns per Doe In 1993 Harvest
Farmland	1.47	1.34
Western		1.39
Northeast		1.16
EC-SE	1.40	1.07

Fig. 1. Location of the 1993 aging stations according to their geographic region.

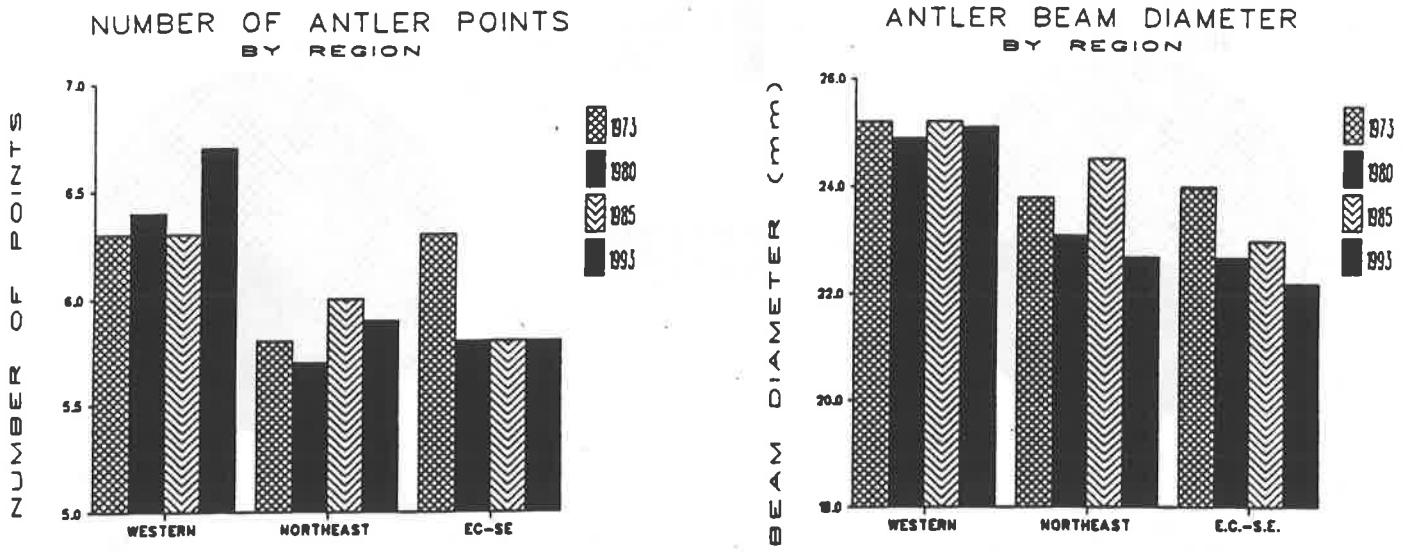


Fig. 2. Average number of points and antler beam diameter for yearling (1.5 years old) bucks in Ohio, 1973, 1980, 1985, and 1993.

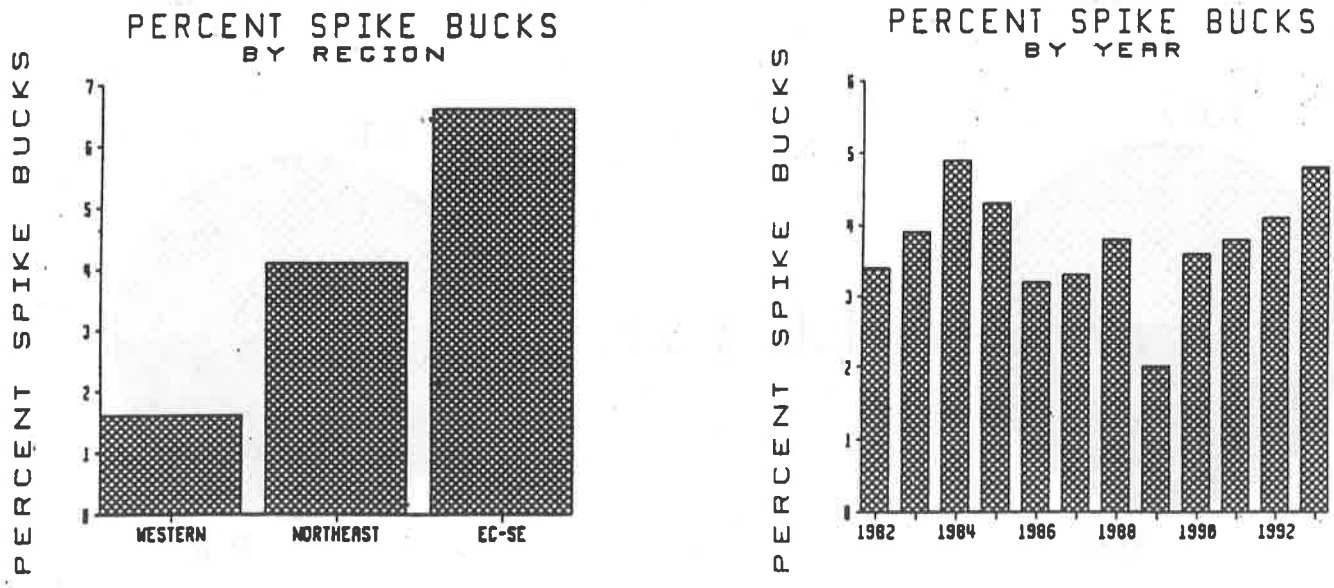


Fig. 3. Percent spike bucks in the antlered population by region for 1993 and statewide by year, 1982-1993.

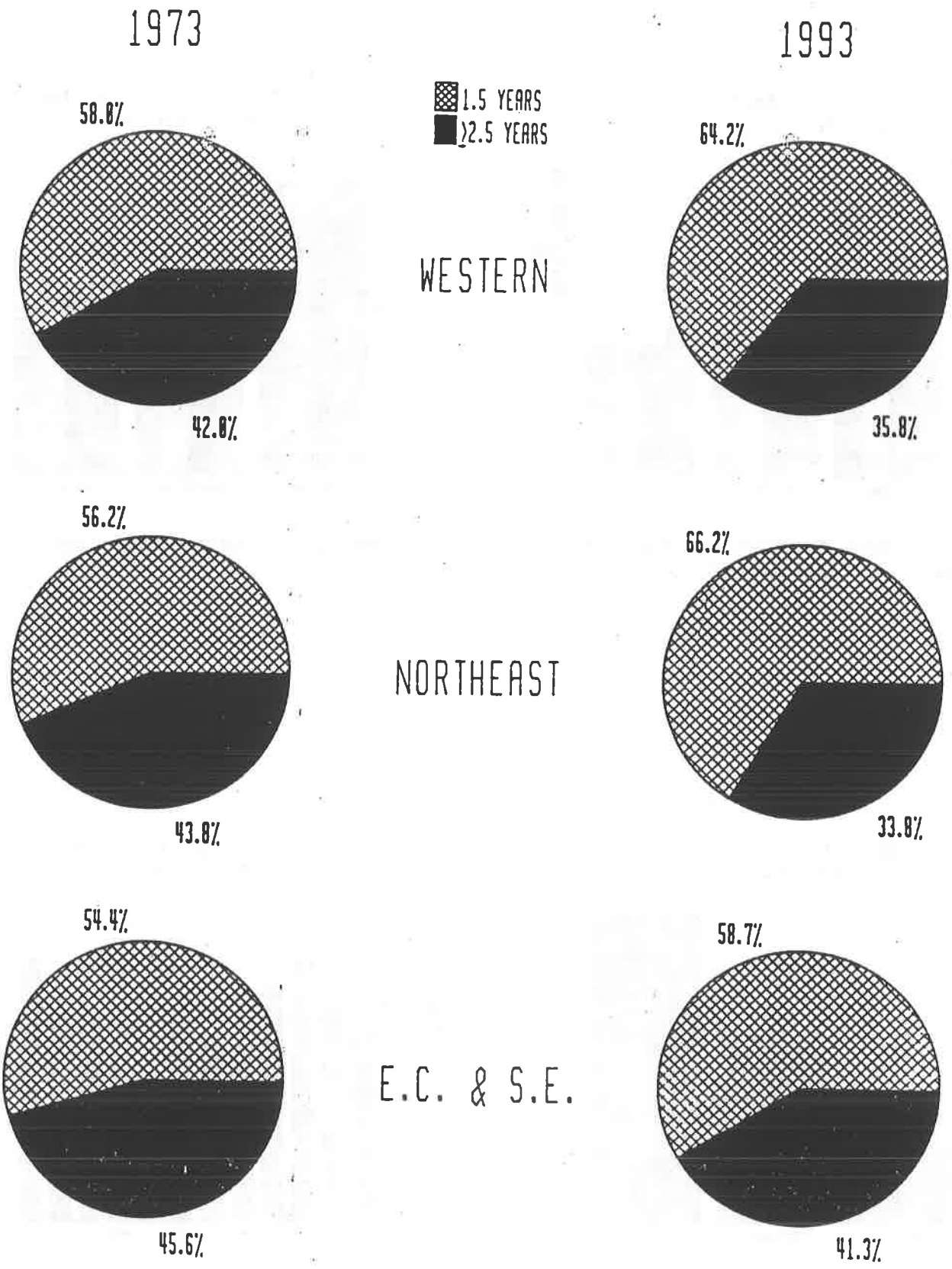


Fig. 4. Age composition of the 1973 and 1993 antlered buck gun harvests.

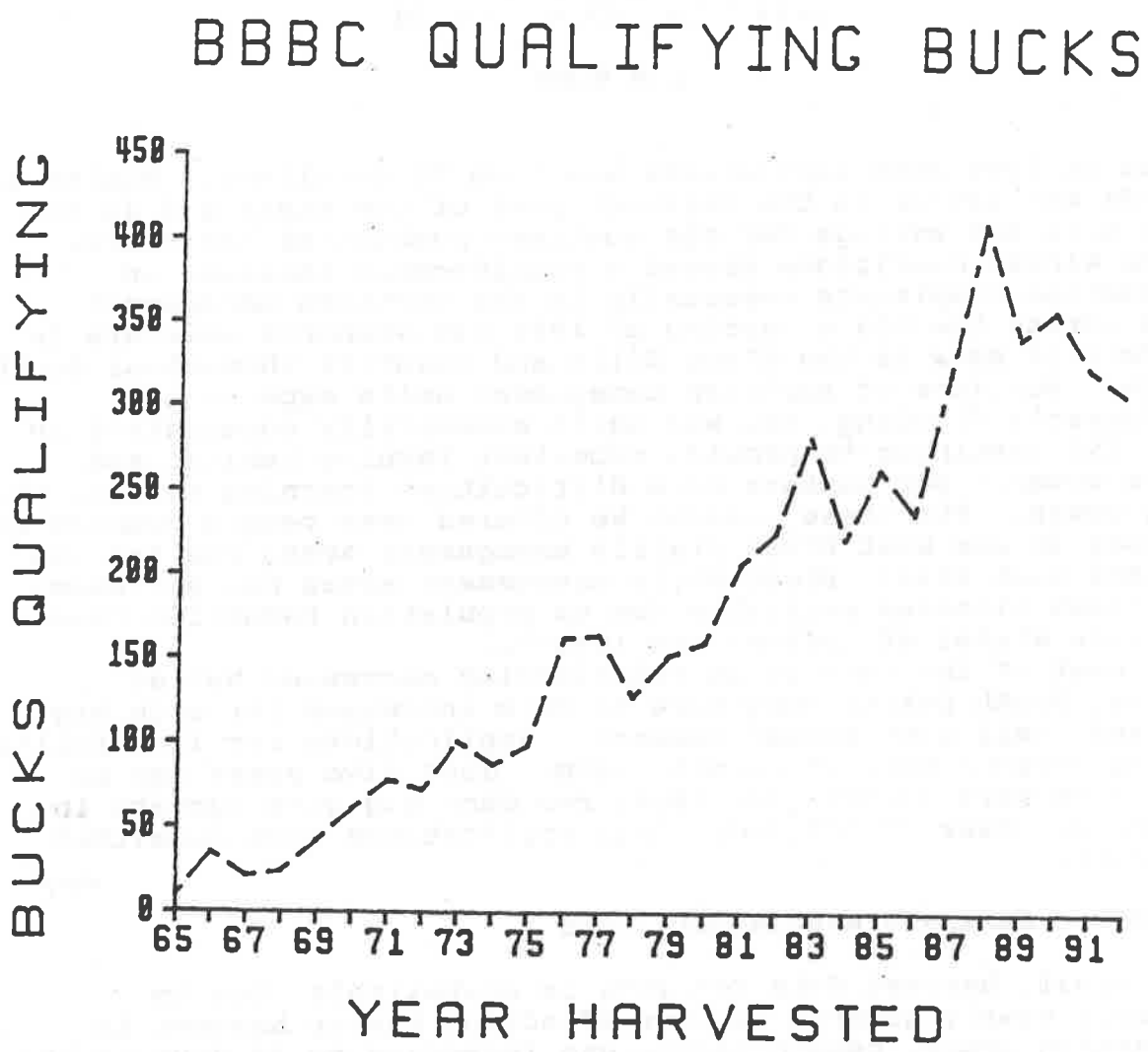


Fig. 5. Number of bucks entered into the Buckeye Big Buck Club according to the year of harvest. Minimum Boone and Crockett score for eligibility: Typical = 140 points, Nontypical = 160 points.

SOUTH DAKOTA
1994 DEER STATUS REPORT

LES RICE

Status of 1994 deer populations was good to excellent. Winter of 1993-94 was severe in the northern part of the state and in the Black Hill but average for the southern portion of the state. Severe winter conditions caused a considerable increase in depredation complaints especially in the northern management units across the state. Spring of 1994 saw abundant moisture in the form of snow in the Black Hills and rainfall throughout South Dakota. Portions of northern management units experienced considerable flooding. EHD was again essentially nonexistent in 1994. CRP continues to provide excellent fawning habitat and escape cover. Our hunters have difficulties learning to hunt the thick cover. For these reasons We offered near record numbers of licenses in our West River Prairie management areas and for the farmland East River. Black Hills management areas had decreased antlerless licenses available due to population reduction caused by severe winter of 1992-93 and 1993-94.
While most of the country is experiencing decreased hunter numbers, South Dakota continues to have increases for both big game and small game hunter numbers. Applications for last fall's hunting seasons were at record highs. Just five years ago we felt there were 40,000 individual resident big game hunters in the state. Over 88,000 individual applications were submitted last fall.

East River Farmland Management areas

As is usual, harvest data for 1994 is unavailable. Due to seemingly yearly adverse weather affecting hunter harvest in depredation areas, season length was increased to 16 days in the northern half of the management area in 1994. Longer season was generally well accepted except for a few complaints that more "buck only" hunting occurred. Opening weekend for the southern part of the unit, which had the traditional nine day season, had tough hunting conditions the second day when a blizzard came through. I expect there will be pressure to go to the 16 day season for the entire management area this fall. One thing was accomplished with the longer season. We did not have to have our annual emergency season extension last fall.

Total licenses authorized in 1994 was 34,730. These license included 29,930 single tag permits and 7,650 two-tag permits. In 1993, 34,680 licenses were authorized (40,130 tags). Harvest was 26,525 deer for an overall success rate of 66 percent

Winter of 1993-94 probably caused reduced doe fawn reproduction in northern portions of the management area. At the same time depredation complaints have again increased so management direction will probably be for reduced herds.

West River Prairie Management Areas

Due to depredation complaints during winter of 1993-94 management direction in northern units of the management area was for herd reduction. Fall rifle season had near record numbers of licenses issued with large numbers of antlerless licenses. In addition, in an attempt to insure antlerless harvest met goals and to reduce hunter numbers, we continued unique season design structure in two select units. Regular season length was 16 days while the two special units have split seasons. The split seasons have one season starting the weekend before the regular opening. These hunters have an initial four days to hunt but if they are unsuccessful, their season reopens for seven days at the end of the regular 16 day season. The second season hunters have the regular 16 day hunt.
We also offered 1800 antlerless deer permits that were valid during the antelope season. This was somewhat successful and some hunters took advantage of the opportunity to hunt two species. These deer permits were valid on private land only.
In 1994, regular season licenses authorized totaled 23,720. Of the total, 10,015 were single tag licenses and 13,705 were two-tag licenses (37,425 tags total).
In 1993, 39,320 tags were issued. Harvest was 25,763 for a success rate of 63 percent.

Black Hills Management Areas

Winter of 1993-94 was severe especially for the northern Black Hills. However, even a normal winter had a detrimental affect on deer numbers. Yearling buck harvest was again poor last fall when considered as percent of antlered deer harvested. This is not unusual for the Black Hills. In all likelihood fawn mortality last winter increased when compared to rates present during a mild winter.
The US Forest Service is in the final process of their second 10 year management plan. It should prove interesting to see if wildlife resources get some consideration or if it will be the same old ball game.
For 1994 hunting seasons, buck only licenses were again unlimited for residents and nonresidents. Antlerless White-tail permits totaled 1,350. No two-tag licenses were issued.
In 1993, 14,736 buck only hunters harvested 4,165 deer for a success rate of 28 percent. Antlerless licenses totaled 4,101 with success at 64 percent. Total tags were 4,304.

National Wildlife Refuge Management Areas

Most Refuge seasons are recreation hunts with small license quotas except for Sand Lake National Wildlife Refuge. Depredation problems around this refuge are extreme and management efforts have been directed at reducing herd numbers. In the past efforts

were by and large unsuccessful due to hunter numbers allowed on the refuge and by fantastic escape cover present. However, after the last two winters runoff and summer rainfall flooded large portions of the Refuge. Escape cover was inundated and deer were forced off the Refuge. This created increased availability to hunters and herd reduction has resulted. We continue to cooperate in an intensive study with South Dakota State University on the Refuge. Study methods involve radio-collared deer,infrared remote sensing, tagged deer, etc. The infrared technology may prove to be of great help in determining deer numbers on this limited land area.
In 1994, five seasons were offered. All licenses were two-tag. One set of licenses were good for any deer plus antlerless deer. The other set were for two-tag antlerless only. Licenses totaled 680 with 1360 tags. Unsuccessful hunters could return for a 16 day hunt in January. All such hunter licenses converted to "antlerless only" for this late hunt. We kill deer this way but data analysis is a nightmare when one license type is converted to another type.

In 1993, all refuge harvest combined totaled 1052 deer. Success rates were 41 percent.

Special Youth Management Areas

As has been reported for the past several years, the youth deer hunt has been an extremely popular concept. Licenses continue to be for antlerless deer only and limited quota. In 1994, 3830 licenses were authorized. In 1993, harvest was 1477 deer by 2366 hunters.

Archery Deer Seasons

Archery deer hunters again had several choices for licenses available. Regular season licenses were all single tag. A hunter could purchase a statewide permit or two permits which were restricted to one east of the Missouri River and one west. In addition, limited quota antlerless deer licenses were also available. In 1993, 11,663 hunters took 3365 deer (2016 bucks and 1349 does).

Muzzleloader Deer Seasons

As with youth licenses and the special archery licenses, all muzzleloader permits were limited quota and good for only antlerless deer. In 1994, 1620 permits were authorized. Harvest in 1993 was 217 deer by 541 hunters. Hunters numbers are slowly increasing.

WISCONSIN DEER STATUS REPORT, 1994-95

Midwest Deer & Turkey Group - Ashland, NE
Robert E. Rolley, Keith R. McCaffery, and Tom Hauge

HUNTING SEASON

The gun deer season in Wisconsin has traditionally been 9-days beginning the Saturday before Thanksgiving. Most of the state is open to bucks-only (>3" antler) hunting plus prescribed quotas of antlerless deer. The exception is a limited any-deer hunt in some units adjacent to the Mississippi River. Nearly 3 million hunter days of recreation are provided by the 9-day hunt (5.0 days/hunter). A 7-day muzzleloader season immediately following the usual gun season was begun in 1991, but is limited to hunters with unused antlerless tags.

The archery deer season begins the 3rd Saturday of September and continues through 31 December with a break beginning 5 days before the gun deer season until 5 days after. The season normally provides about 83 days of bowhunting for any deer. Archers exercise about 2.7 million hunts (15 hunts/archer). Firearm and archery deer licenses cost $18 (Res.) and $120 (Non-res.) and generate about $20 million in revenue.

POPULATION AND HARVEST TRENDS

Deer density goals have been established for 116 management units in the state (not including 6 state park units). In forested zones (Fig. 1) goals were set relative to carrying capacity and have not changed much since 1962. In farmland regions, goals were set relative to human tolerance and have gradually increased. Overwinter goals range by unit from 10 to 35 deer/mi^2 and total over 700,000 deer. Normal recruitment should produce fall populations near 1,000,000 when the population is at goal and an annual gun and bow harvest of about 275,000.

Deer herds reached a fall population in excess of 1.3 million in 1990, but were subsequently reduced. While population goals in the farmland region have more than doubled since 1962, the farmland deer herd increased nearly 6 fold in that time, and has exceeded goal levels in 4 of the past 5 years. The 5 Central Forest units have had a fall herd numbering near 100,000. Recently, the greatest concern was in our Northern Forest where the winter goal would produce a fall herd of about 330,000. A dramatic herd increase occurred in the north in the late-1980's as a result of a record sequence of mild winters. This herd exceeded 500,000 in 1989 and 1990, but the population was reduced in part by liberal antlerless harvests and the locally severe winter of 1991-92. Conservative harvests in 1993 and 1994 have resulted in many herds throughout the state that are above goals going into the 1994-95 winter.

The combined gun and archery harvest has been near or above 300,000 deer since 1984 (Table 1). In addition, we have 30,000 to 40,000 recorded vehicle-killed deer annually.

HERD STATUS AND SEASON SUMMARY -1994

The reduction of the Northern Forest herd from the high levels during 1989 and 1990 generated considerable criticism of the DNR. In 1992, populations in 12 of 44 northern units were more than 20% below goal. Conservative harvests during 1993 permitted herd growth in the north, only 2 northern units were more than 20% below goal following the 1993 season. While antlerless quotas were established for most northern units in 1994, permit levels were set relatively low.

Herd population status is assessed each year based on information on fawn production, aging samples of the deer kill and Wisconsin's mandatory deer registration program. This year, DNR personnel and cooperating volunteers observed over 22,000 does and fawns across the state. These observations suggest very good fawn production in the northern forest. DNR fawn observations for this region were the second highest since we began keeping track in 1960.

Wildlife staff and trained volunteers aged over 20,000 deer at 90 registration stations during the 1994 gun deer season. The percentage of yearlings bucks and does in the harvest provides a double-check on our fawn production estimates of the previous year. Yearling percentages were very high in the Northern and Central Forest regions of the state, consistent with a strong fawn crop in 1993.

The aging stations also provide data on antler development that serves as an index to body condition. In 1994, yearling antler development was above average statewide and much above average in the forested regions suggesting that last year's buck fawns came through the winter in good physical condition. Additionally, because of the close correlation between yearling antler development and fawn production, the above normal antler development in 1994 provides additional evidence of a strong fawn crop in 1994.

The final piece of evidence of herd growth is the harvest totals from the early bow and the gun deer seasons. Preliminary analysis of registrations during our early bow season indicates that archers have taken nearly 55,000 deer, surpassing their 1993 total of 53,008 for both seasons and achieving their 3rd highest harvest ever. In addition, they appear to have set a new record for buck harvest. The preliminary gun season registration total stands at 301,555,with the most notable component being the record and near record yearling buck harvest in the northwest and northeast, respectively. The Chippewa harvest is currently at 2,245 which is up from 1993 where 1,680 deer were harvested during the same reporting period. The combined gun and bow season harvests appear at this time to have set an all time record buck harvest.

Considering all these indicators (fawn production,aging data, antler development and harvest), we feel 1993 and 1994 have produced strong herd growth. Unless we have a severe winter across the Northern Forest and at this time that appears unlikely, the 1995 harvest will be even higher than this year.

Due to conservative harvests in 1993, populations in many of the farmland units were over goal in 1994. Consequently relatively large antlerless quotas were prescribed for these units. Statewide, the 1994 antlerless harvest objective was 177,340 deer. Based upon recent seasons, we anticipated an average success rate of 40% and had a total of 442,000 permits available in 1994, 401,000 were actually issued. At this time, the statewide antlerless harvest is at least 167,454 deer, for a success rate of 42%. The 41,000 unissued permits affect 23 deer management units primarily in the farmland region. Using the original 40% success rate, those unissued permits would have added another 16,500 antlerless deer to the 9-day gun season totals.

This year, antlerless permits were issued through mail-in, phone-in and walk-in distribution systems. Through the September 20 mail-in process, we had 342,800 applications and issued 286,599 Hunter's Choice and 114,310 bonus antlerless permits. We followed that with a 1-800 phone ordering process from Nov 7-13. Over 46,000 phone calls were placed and we issued 17,207 antlerless permits. At this point, we thought we were done. However, an AP press article on left-over permits got front page headline news on Sunday and Monday. DNR phones across the state began ringing with hunters asking where they could get permits. By Monday noon, we decided to reopen permit sales at 22 DNR offices around the state. We began selling in some offices as early as Tuesday morning. By Friday evening, we issued an amazing 17,300 additional

antlerless permits. A tremendous effort was put forth many DNR employees to provide this excellent customer service.

Despite the speculation in some newspaper editorials, the extra efforts to issue antlerless permits, did not result in a "financial bonus" for DNR. Every penny of the $12 bonus-permit fee is earmarked for use in the wildlife damage programs and is not for DNR use.

A possible down-side to last-minute permit sales is that some hunters bought permits even though they didn't have a place to hunt. Law enforcement officials noted an increase in trespass complaints in some units this year that appeared directly related to bonus permit issuance.

We believe we are seeing changes in buck mortality rates in some of our southern farmland units . Yearling buck percentages in the harvest were lower than expected. These yearling percents were believed to have been depressed in 1992 and 1993 by the blizzard in 1991 and by rain and standing corn in 1992. In 1993, most of the corn was harvested prior to gun season and wetlands were much more accessible. A high buck harvest resulted and expectations were for most yearling percents to return to the mid-80% range in 1994. Instead, many remain in the upper 70% range. A possible explanation may be the growing interest in Quality Deer Management. Many hunters have indicated that they are pleased to see the increased number of older bucks and we feel we may see this trend continue. From a management perspective, we will need to assess how these changing mortality rates will affect our ability to make population estimates.

We had forecast the gun season harvest to be 285-300,000 depending on the hunter interest in antlerless permits and cooperative hunting weather. Our permit sales indicate that hunter interest was strong with nearly 401,000 Hunter's Choice or antlerless-only permits being issued. Weather conditions during the 9-day season were generally considered to be good. The northern part of the state was snowless for all but the last weekend, but the lack of snow enabled hunters to venture farther into the woods and stay for longer periods of time as daytime temperatures stayed in the 40's. This increased accessibility may have helped account for the high harvest seen across the north.

MANAGEMENT UNIT GOAL REVIEW

Wisconsin's deer herd is managed by setting overwinter population goals for deer management units. Population goals are based on both biological carrying capacity (the habitats ability to support deer) and social carrying capacity (the public's tolerance for deer). As part of a periodic review of population goals, the DNR conducted a series of 17 regional task force meeting following the 1994 deer season. Regional task forces consisted of 5-10 members drawn from various constituencies that use or are affected by the deer resource including hunters, farmers, foresters, transportation officials, etc. Prior to the meeting, task force members were provided with a publication describing the factors to consider in setting population goals and a set of graphs, maps, and tables depicting trends in deer population size, harvest, and damage complaints for management units in their region. Analysis of task force recommendations is continuing. Pending approval by the Natural Resources Board, revised population goals will be used in formulating harvest recommendations for 1995.

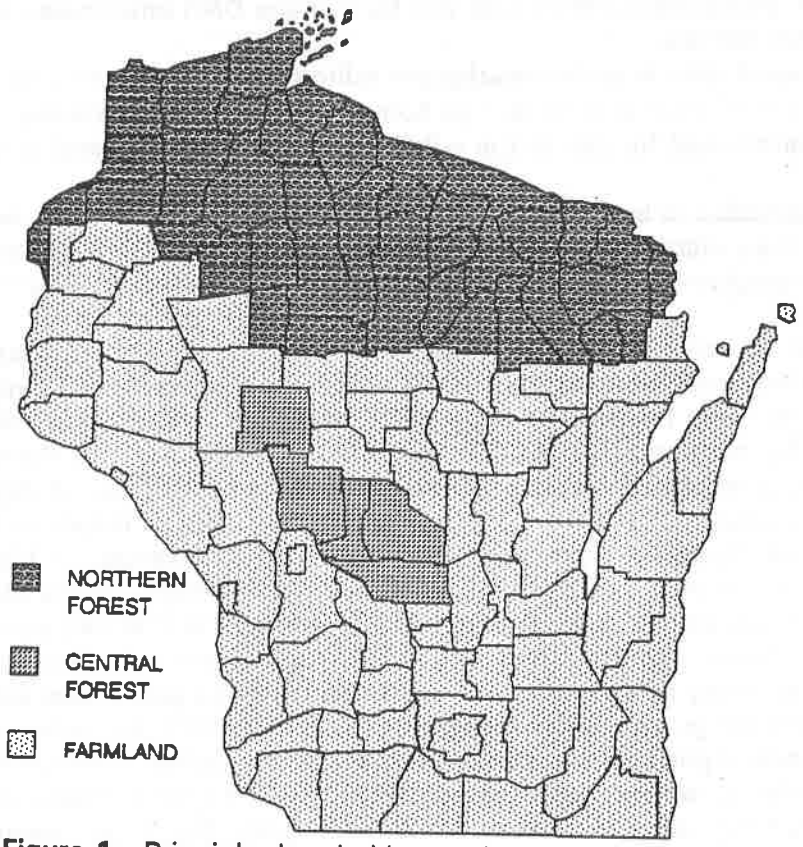


Figure 1. Principle deer habitat regions in Wisconsin.

Table 1. Recent deer harvests and license sales (x 1,000) in Wisconsin.*

	Gun Season			Archery Season		
Year	Adult Bucks	Total Harvest	Licensed Hunters	Adult Bucks	Total Harvest	Licensed Hunters
1989	139.7	310.2	661.7	25.2	46.4	210.9
1990	140.7	350.0	696.6	26.3	49.3	217.0
1991	120.0	352.5	674.4	29.7	67.1	216.6
1992	111.5	288.8	666.6	30.0	60.5	220.8
1993	116.5	217.6	652.5	30.7	53.0	224.0
1994	134.0p	301.6p	n/a	33.0p	54.9p	n/a

* Harvests based on mandatory registration. p = preliminary. n/a = not available.

MIDWEST WILD TURKEY GROUP REPORT
ILLINOIS - 1994
JARED K. GARVER

RESTORATION

During 1994, a total of 191 hens and 101 gobblers were trapped and transplanted to 18 sites in Illinois. An additional 8 birds were shipped to Minnesota to complete a trade agreement for prairie chickens. We also shipped 83 birds to Kentucky in trade for 50 river otters.

Since 1959, a total of 1,957 hens and 1,036 gobblers have been stocked at 201 release sites in Illinois. We still have about 1 more year to go in our restoration efforts.

POPULATION SURVEYS

- Landowner Brood Survey

Statewide reproduction in 1994 was below average. Our landowner brood survey resulted in reports of 5,760 poults and 1,682 hens for a poults/hen index of 3.42 in 1994. This compares to 1993 when the index was 3.51. The average over the last 10 years is 3.90. This is the third straight year with below average reproduction.

The total numbers of hens and poults reported in 1994 is approximately twice as high as in previous years. Therefore, while the poults/hen index is below average, I believe that we had more hens that nested successfully.

- Firearm Deer Hunter Survey

All successful firearm deer hunters are questioned about wild turkey sightings made while deer hunting. All successful hunters must check their deer at county check stations. Total numbers seen and their locations are recorded on county highway maps.

Since data from the 1994 Firearm Deer Season has not been analyzed, I am reporting on the 1993 season. A total of 5,411 hunters reported seeing 64,572 wild turkeys in 94 counties of the state in 1993. This represents an increase of 19 percent in numbers of hunters seeing turkeys and an increase of 33 percent in numbers of turkey seen over 1992.

Six percent of the successful deer hunters in these 94 counties reported seeing turkeys in 1993. On a county basis, it varied from a low of 0.4 percent to a high of 23.9 percent.

- Archery Deer Hunter Survey

As in 1992, successful archery deer hunters were required to check their deer at archery check stations. In 1993, a total of 2,313 archers reported seeing 29,926 wild turkeys in 99 counties of the state. 10.1 percent of the successful archers in these 99 counties reported seeing an average of 12.9 birds each. On a county basis, the percentage of archers reporting turkeys varied from a low of 0.6 percent to a high of 42.6 percent.

HARVEST

In 1994, we had 4 separate spring seasons totaling 31 days that started on April 4 and ended May 11. The state was divided into Northern and Southern Zones which opened one week apart. The first season was 5 days in length (Monday through Friday); the second season was 6 days in length (one weekend); the third season was 8 days in length (one weekend); the fourth season was 12 days in length (two weekends). This format was used in an attempt to spread the applications and the harvest equitably between the 4 seasons. After the lottery drawing, remaining permits were made available as second and third permits.

A new record harvest of 5,520 birds were taken in the 50 open counties. This is an increase of 19% over 1993 when 4,632 birds were bagged. Hunter success averaged 19.9% (based on the 27,726 permits issued).

Illinois just completed its 11th fall archery turkey season which started on October 1 and ran through, January 12, 1995. There was no quota on the number of $5 permits. Hunters are allowed to take 1 turkey of either sex. The total harvest will be about 175 birds with a hunter success rate of about 2.7 percent.

Illinois had its 6th Fall Shotgun Turkey season from October 15-23, 1994. This was an either-sex season in 22 counties of the state. A total of 4,092 permits were issued for this 9 day season. A total of 1,001 birds were checked at our mandatory check stations. This is an increase of 46% over 1993 when hunters bagged 684 birds. Based on the number of permits issued, hunter success was 24.5% in 1994 as compared to 20.3% in 1993. The remaining data from this season hasn't been tabulated and analyzed.

We had no reported hunting accidents during our spring or fall turkey seasons in 1994.

RESEARCH

We currently have one ongoing wild turkey research project which is being carried out by Western Illinois University

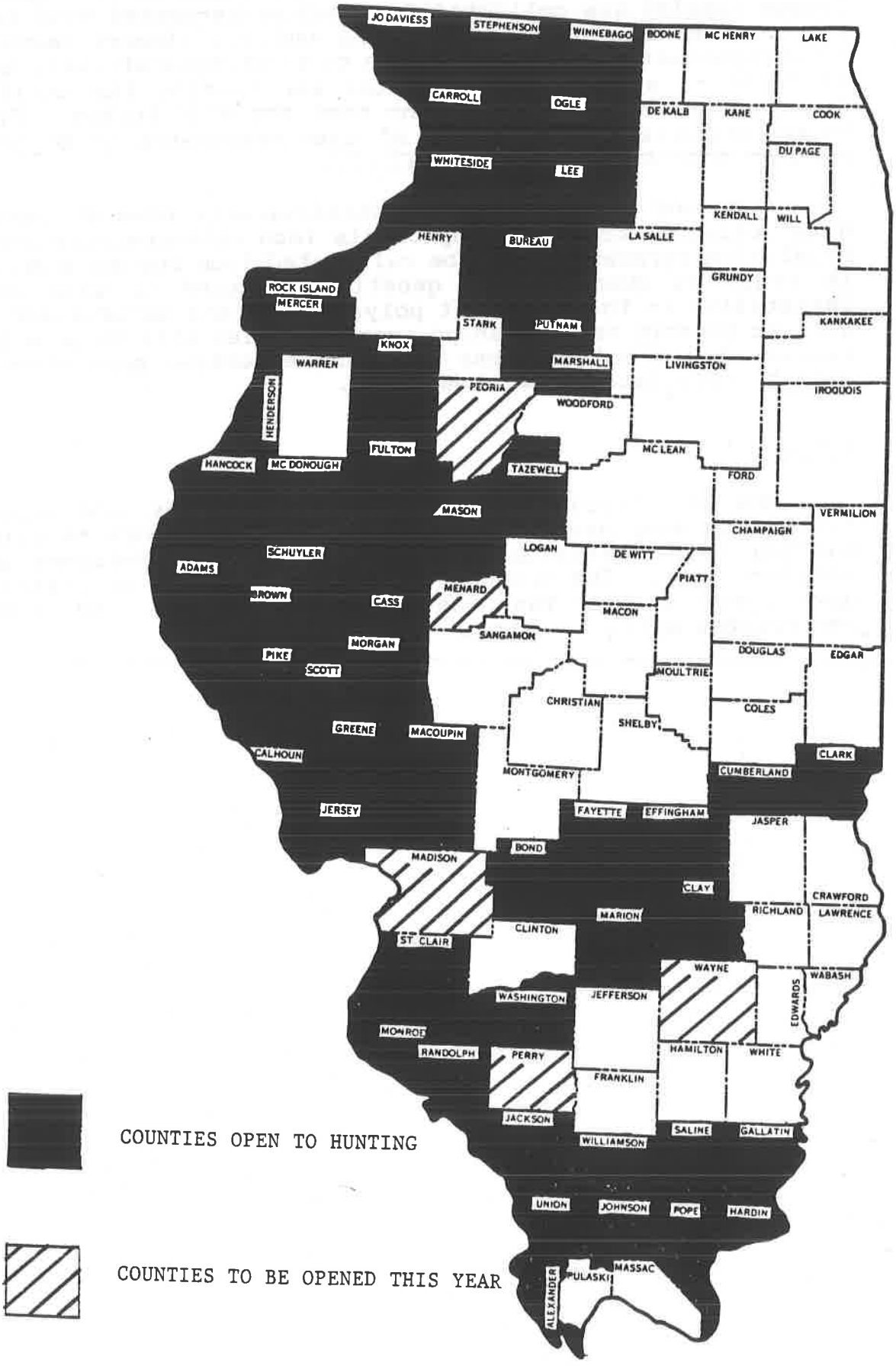
("Genetic Analysis of Wild Turkey in Illinois"). Necessary tissue samples are collected from hunter-harvested wild turkeys at check stations during the spring and fall firearm seasons for electrophoresis. One objective is to electrophoretically analyze 25 counties specifically selected for testing the utility of electrophoresis as a management tool for wild turkey. Data is being collected in the form of electrophoretic genotypes for further population genetic analysis.

A second objective is to statistically convert genotypic data collected from electrophoresis into interpretable results. Population parameters will be calculated from the genotypic data in order to quantify the genetic structure of each county. Variability in the degree of polymorphism and heterozygosity as well as genetic relationships among counties will be determined. Levels of inbreeding, gene flow and effective population size will be calculated from these data.

FUTURE

The near future is bright. Populations are expanding rapidly in many areas. We will be opening 5 more counties to hunting this spring and have established a Northern and a Southern Zone. The Southern Zone (southern 1/3 of state) will open 1 week earlier than the Northern. We still have about 25 new release sites to stock.

FIGURE 1. ILLINOIS TURKEY HUNTING



Illinois Department of Conservation
life and land together

1995 RESIDENT SPRING WILD TURKEY HUNTING APPLICATION AND INFORMATION

APPLICATION INFORMATION

- Applications will be accepted January 3 through January 17. Applications postmarked after January 17 will not be included in the drawing. In-person and mail applications will receive equal treatment in the drawing.
- A SPRING WILD TURKEY PERMIT ALLOWS THE HOLDER TO HUNT WITH EITHER A SHOTGUN OR BOW AND ARROW.
- A permit is valid for only one of the four seasons.
- Permits are not transferable and no refunds will be made unless your county, hunt area or season choices are not available.
- If more than one application per hunter is received for the computerized drawing, all applications will be rejected, or permits revoked, and fees forfeited.
- Non-residents should contact the Permit Office for non-resident fee information. Non-resident applications are not processed until February 15.

PERMIT ALLOCATION

- Permits will be allocated in a computerized drawing. How your county and season choices are selected is explained under application instructions numbers 1 and 2.
- Permits not issued during the computerized drawing will be available in a random daily drawing beginning February 15. All hunters not receiving a permit in the computerized drawing, hunters that did not apply in the computerized drawing, or non-residents may apply at this time for the available permits. Applications received before February 15 for the random daily drawing will be processed with mail received February 15 (Group hunt procedure does not apply.)
- Applicants* may apply as of the second Monday in March for up to two additional permits ($15 each), issued in a random daily drawing, from any permits left over from the county quotas. The group hunt procedure **does not** apply for these permits — applications are processed individually. You **MUST** check the box in #7 and print "March 13 – Additional Permits" on the outside of the envelope if you are applying for a second or third permit.

*Applicants may be anyone that (a) is applying for their first permit; (b) was previously issued one permit.

HUNTING ZONES

There are north and south turkey hunting zones WITH DIFFERENT SEASON DATES in each zone.

Northern Zone includes that portion of Illinois north of Crawford, Jasper, Effingham, Fayette, Bond, and Madison Counties. **Southern Zone** includes the remainder of the state.

NORTHERN ZONE SEASON DATES, OPEN COUNTIES & SPECIAL HUNT AREAS

1st Season: Mon., April 10 – Friday, April 14
2nd Season: Sat., April 15 – Thursday, April 20
3rd Season: Fri., April 21 – Friday, April 28
4th Season: Sat., April 29 – Wednesday, May 10

Adams
Beaver Dam State Park
Big Bend State Fish & Wildlife Area
Big River State Forest
Brown
Bureau
Calhoun
Carroll
Cass
Castle Rock State Park
Clark
Cumberland
Fulton
Greene
Hancock
Henderson
Jersey
Jo Daviess
Knox
Lee
Lowden Miller State Forest
Mackinaw River Fish & Wildlife Area
Macoupin
Marshall-Putnam**
Mason
McDonough
Menard
Mercer
Mississippi Palisades State Park
Morgan
Ogle
Panther Creek Conservation Area
Peoria
Pere Marquette State Park (Piasa, Quotoga, Potawatomi Camp Areas)
Pike
Rock Island
Sand Ridge State Forest
Sangamois Conservation Area (Squirrel Timber Unit)
Schuyler
Scott
Siloam Spring State Park
Site M
Stephenson
Tapley Woods State Natural Area
Tazewell
Whiteside
Winnebago
Witkowsky State Wildlife Area (JoDaviess County; 7 mi. NW of Hanover)

** Hunting area for Marshall–Putnam is east of Illinois River, north of State Highway 17 and south of the McNabb Blacktop (County Road 500 N) only.

SOUTHERN ZONE SEASON DATES, OPEN COUNTIES & SPECIAL HUNT AREAS

1st Season: Monday, April 3 – Friday, April 7
2nd Season: Saturday, April 8 – Thursday, April 13
3rd Season: Friday, April 14 – Friday, April 21
4th Season: Saturday, April 22 – Wednesday, May 3

Alexander
Bond
Clay
Effingham
Fayette
Ferne Clyffe State Park
Gallatin-Hardin
Jackson
Johnson
Madison
Marion
Monroe
Perry
Pope
Pyramid State Park
Ramsey Lake State Park
Randolph
Randolph County Conservation Area (RCCA)
Saline
St. Clair
Stephen A. Forbes State Park (SAFSP)
Union
Washington
Wayne
Williamson

APPLICATION INSTRUCTIONS

- You must use an official 1995 Department of Conservation Spring Wild Turkey application form. If you use a previous year's application form, it will be **RETURNED.**
- The fee for a Spring Wild Turkey Permit is $15. You must enclose an individual check or money order with your application. **Do not send cash.**
- Applicants submitting applications within three weeks of the season will not be guaranteed receipt of permit by start of season.
- Please call 217 782–7305 if you have any questions.

Department of Conservation information is available to the hearing impaired by calling DOC's Telecommunications Device for the Deaf: 217 782–9175. The Ameritech Relay Number is 800 526–0844.

TO COMPLETE APPLICATION

Read each numbered instruction before completing the application. The numbers listed below refer to the numbers on the other side.

You must enter the information requested on the application or it will be **RETURNED.**

1. COUNTY OR SPECIAL HUNT AREA(S) CHOICE. Enter the county, counties or special hunt area(s) in which you wish to hunt. (Enter Gallatin if you select Gallatin–Hardin; Marshall if you select Marshall–Putnam; if you select a special hunt area, enter the first six letters except for Randolph County Conservation Area; enter RCCA and for Stephen A. Forbes State Park; enter SAFSP. For more information regarding locations and requirements of special hunt areas **only**, call the Division of Wildlife at 217 782-6384.
2. HUNTING SEASON CHOICE. Check one box to indicate your **First Choice** of hunting seasons, either 1st, 2nd, 3rd or 4th season. Your **Second, Third and Fourth Choice** of hunting seasons is optional. If you indicate two county choices and four different season choices, then you may receive one of eight different possible permits. If you indicate two county choices and only one season choice, then you may receive one of only two possible permits. All of your season choices will be considered for your first county choice before considering your second county choice. For example, your first, second, third and fourth choices of seasons will be considered in your first county choice before your first choice of season in your second county choice.
3. Your name and complete address.
4. County in which you reside.
5. Your date of birth (month, day, year).
6. GROUP HUNT. This section must be completed by those applicants who intend to hunt as a group. Up to **six** individuals may apply to hunt as a group. All individuals in the group **must** pre-select a group leader and each application for the group must have sections 1, 2 and 6 filled out **identically**, indicating the same county, same hunting season choices, and same group leader's name and date of birth. ALL APPLICATIONS FOR THE GROUP MUST BE SENT TO THE DEPARTMENT IN THE SAME ENVELOPE. (The group hunt procedure **does not** apply for permits applied for as of February 15.)
7. APPLICANT'S SIGNATURE / PHONE NUMBER. The application must be signed by the individual whose name is on the application. PLEASE GIVE US A PHONE NUMBER where you may be reached mornings or afternoons on weekdays. If you are applying for additional permits (see permit allocation section) you **MUST** check this box **AND** print "March 13 – Additional Permits" on the outside of the envelope.
8. APPLICATION RETURN ADDRESS. Applications must be returned to the Springfield Permit Office, either via mail or in person on the second floor of Lincoln Tower Plaza, 524 South Second Street. See mailing address on reverse side.

INDIANA

STATUS REPORT TO MIDWEST TURKEY GROUP

1995

Forest Wildlife Hdqts.
R.R. # 2 Box 477
Mitchell, IN 47446
TX: 812-849-4586
(Fax 812-849-6013)

Submitted by: Steven E. Backs
Carl H. Eisfelder
Date: 1/11/95

RESTORATION

1992-93 Wild Turkey Restoration

A total of 88 wild turkeys was released in Indiana at 9 sites from December 1993 through February 1994. Eight sites were supplemental/interplanting type releases in an attempt to bolster existing, low level populations. All birds were trapped in Indiana. Wild turkeys restocked in Indiana since 1956 total 2,376 (160 sites). Wild turkeys now exist in 68 counties. Established (huntable) populations are found in 52 counties.

POPULATION SURVEYS

1994 Gobbling Counts

Gobbler counts are conducted annually to determine the relative density, dispersal, and population trends of wild turkeys in the areas surveyed. Roadside gobbling indices were determined on 13 routes covering portions of 17 counties during the spring of 1994. Indices ranged from 0 to 1.67 gobblers heard per stop . Area gobbling counts were conducted on 18 areas covering portions of 17 counties. Nine of areas were recently established populations ($\leq$ 5 reproductive seasons) . Gobblers heard per mi^2 ranged from 0.4 to 4.8. Inherent biases existed due to the limited size of some areas censused. Birds were either heard or seen at all recent release areas surveyed with some increase in birds observed over the previous year on most release areas.

Production - 1994

In 1994, wildlife biologists and conservation officers recorded observations of wild turkey hens and poults during July and August on modified cards traditionally used by personnel to report raccoon "road-kills". Based on 229 observations during July and August, the average brood size was 9.0 birds with an average of 3.9 poults per hen. In 1993 (first year of data collection), the average brood size was 9.3 with 4.9 poults per hen. It would appear production was down in 1994, but general observations by DNR personnel indicated otherwise. The limited sample size from the brood observation cards may be a problem. The recorded trend will be compared to the trend in the proportion of juveniles in the 1995 spring harvest.

SPRING HARVESTS

1993 Turkey Hunter Questionnaire Results

The 24th wild turkey hunt was held 28 April to 16 May 1993 (19 days; 4 days added in 1993). Hunting occurred in 48 counties **(Figure 1)**. Regular turkey license holders made up the largest portion (68%) of the hunters afield and accounted for the largest proportion of the harvest followed by the lifetime license holders . Nonresidents made up only 2% of the nonlicensed hunters and accounted for 3% of the harvest. Initial questionnaire response rate for all license types was 47%. Overall response rate after the second mailing was 65%. A total of 2,916 questionnaire responses, of which 2,098 (72%) hunted, was used for the analysis. Nonhunters comprised 28% of the response sample primarily due to the low proportion of lifetime and youth license holders who hunt wild turkeys. The reported number of successful hunters in the sample was 664 or 19% of the known successful hunters (n = 3,500). After correcting for the non-response bias, an estimated 18,542 licensed hunters harvested 2,255 birds for 17.6% success. Assuming similar success rates, an estimated 1,323 nonlicensed hunters (resident active military or resident landowners hunting on their own land) harvested 245 birds (7% of the total harvest). The overall estimated success rate for 19,865 hunters was 17.6%.

The estimated 19,865 turkey hunters was a 26% increase over 1992 **(Table 1)** . The estimated 17.6% success rate increased slightly from the 16.1% in 1992. Total hunt efforts increased 42% due to increased season length and increased hunter numbers. The amount of effort to harvest a turkey increased slightly. There was a substantial increase in hunter efforts on private lands in 1993. Private lands continue to support more of the hunter effort (62%) as the proportion of private land within the turkey hunting range continues to increase. Public lands are still used proportionally more (four times) than their availability and the number of turkey hunters on the limited public land continues to increase. Hunters heard and saw more birds compared to 1992 due primarily to the large proportion (60%) of active 2-year old gobblers in the 1993 harvest.

The 3,500 bird harvest represented the eleventh consecutive record harvest Counties with high kills (>100 birds harvested) were Switzerland, Jefferson, Parke, Dearborn, Ripley, Orange, Perry, Franklin, Martin, Ohio, and Crawford **(Table 2)**. Hunter effort was high (>3,000) in Switzerland, Parke, Perry, Jefferson, Orange, Dearborn, Brown, Martin, Ripley, Jackson, Franklin, Crawford, Washington, and Pike counties. Counties harvesting >100 birds with less than average (≤27) efforts/turkey harvested were Jefferson (21), Ripley (21), Dearborn (21), Ohio (21), Franklin (24), Switzerland (26), and Parke (27). Johnson County had the greatest effort/turkey harvested at 132. An average of 5,228 hunters was afield per day during the 19-day season. The cumulative hunter effort during the 1993 season was 7.1 efforts/mi^2 of hunting range (20.2 efforts/mi^2 forestland) with a daily mean of 0.4 hunter/mi^2 of hunting range (1.1 hunters/mi^2 forestland). The cumulative hunter effort increased slightly over the 15-day 1992 season (6.6 efforts/mi^2 hunting range; 16.3 efforts/mi^2 forestland) but the average daily effort remained unchanged. The proportion of forestland in the 1993 turkey hunting range was 35% compared to 39% in the 1992.

1994 Check Station Harvest Results

The 25th wild turkey hunt was held 27 April to 15 May, 1994. Hunters harvested 3,741 wild turkeys in the 48 counties open to hunting during the 19-day season. This was the twelfth

consecutive year of increased harvests. Counties with high kills (≥200 birds harvested) were Switzerland, Jefferson, Parke, Dearborn, Orange, Perry, and Ripley (**Table 3**). The 1994 turkey hunting range was roughly 13,981 mi^2 (approximately 35% forested). A mean of 0.7 birds was harvested/mi^2 hunting range (0.19 birds/mi^2 forestland).

The 1994 season was characterized by poor-good weather conditions. Early morning thunderstorms occurred frequently the first five days of the season. Spring green-up phenology appeared a "little early to just right" based on hunter comments received in the field. Approximately 48% of the kill occurred during the first 5 days of the season with 36% occurring on the 3 weekends. The 4 days added to the hunting season in 1993 accounted for 15% of the harvest total. Eighty-seven percent of the kill occurred by 1000 with 65% occurring between 0530-0800 EST. There was a slight shift (~5%) in the day and time of kills compared to previous years, probably due to the frequent inclement weather during the early part of the 1994 season. Non-licensed hunters (landowners/military personnel on leave) and nonresidents, respectively, accounted for 7% and 2% of the harvest.

Based on spur measurements taken at check stations, juvenile gobblers (1 yr-old birds commonly referred to as "jakes") made up 41% of the 1994 harvest; 2 yr-olds (37%); 3 yr-olds (17%); and 4+ yr-olds (5%) (**Table 4**). Jakes averaged 15.2 pounds while the average weights of adults ranged from 21.2 to 22.8 lbs, with older birds weighing slightly more. The proportion of jakes in the harvest was considerably more than last year but only slightly greater than the mean for the previous 10-years (**Table 4; Figure 2**). There was a considerable decline in the proportion of 2 yr-old birds from 1993 but it was only slightly below the 10-year mean.

Reasons for the increased harvest in 1994 include the continued increase in hunter numbers, increased hunter opportunities, and the continued growth of the turkey flock. Inclement weather during the turkey season probably reduced hunter success in some areas of the state.

Twenty-five Summary, 1970-94.

A summary of Indiana's 25 wild turkey hunting seasons shows progressive growth in harvests as more counties and days were open to hunting following the accelerated restoration program of the 1980's (**Table 5**). Hunter numbers increased as the hunter opportunities increased. During 1989-1993 (previous 5 years), the number of turkey hunters increased at an average annual rate of 34% or 227% in total. In the last decade, the expanded hunting range led to an increased harvest and an average hunter success of 20% (r = 16-28%) (**Figure 3**). Success rates up through 1984 were less than 10% but have remained above 16% since 1985. The average hunter effort per bird harvested was 24 (r = 19-28). Hunter success has dropped off slightly the last couple of years due primarily to the influx of new turkey hunters (**Figure 4**). Hunter effort and success data for 1994 are not presently available, but projected estimates are that 24,000 individuals hunted for an estimated success of 15.6%. A 25-year summary of wild turkey hunting in Indiana is being prepared for the 7th National Wild Turkey Symposium in 1995.

REGULATION CHANGES FOR 1994-95

Season Dates (>1995): Starting date will be the first Wednesday after the 20 April (instead of April 21) and extend 19 days. Doesn't change much except keep Indiana in synchrony with the seasons of neighboring states. Under this change the earliest we'll open is April 21 and the latest is

April 27. Dates for 1995 are April 26 to May 14. Shooting hours were modifiec slightly, going from 0530 -1200 EST to 1/2 hour before sunrise to 1200 EST.

Hunting Range Expansion: The hunting range will be expanded to include all or portions of 4 new counties (total 52 of 92 counties) pen to spring hunting) with additional range opened in 8 other counties in the current hunting range. The spring hunting range will be 16,300 mi^2, an increase of 17% (2,342 mi^2) over the 1993-94 range. The proportion of forest cover will decrease from 35% to 32%. Further additions to the hunting range in subsequent years will generally support lower densities of wild turkeys, contain less turkey habitat and contain little public hunting land.

Proposed Fall Hunting Seasons (Bow and/or Gun): Attempts by a couple of individuals to force a fall archery season through the 1993 &1994 legislatures created several debacles. The legislature was originally asked to approve a fall turkey license. Controversy between various sporting interests along with perceived turkey depredation by some local farmers stirred a frenzy of legislative activity leading to a resolution to have the DNR study options for a fall hunting season in Indiana taking into account the various fall hunting options available in other states. A white paper was ordered by the Director and it was prepared this summer for the Natural Resources Legislative Study Committee. No action has been taken so far. This whole debacle was pretty much instigated by one or a couple individuals and it became a big snowball! In December, 1994, the same individual ignited lit another match in anticipation of the 1995 legislative session which began in early Jauary.

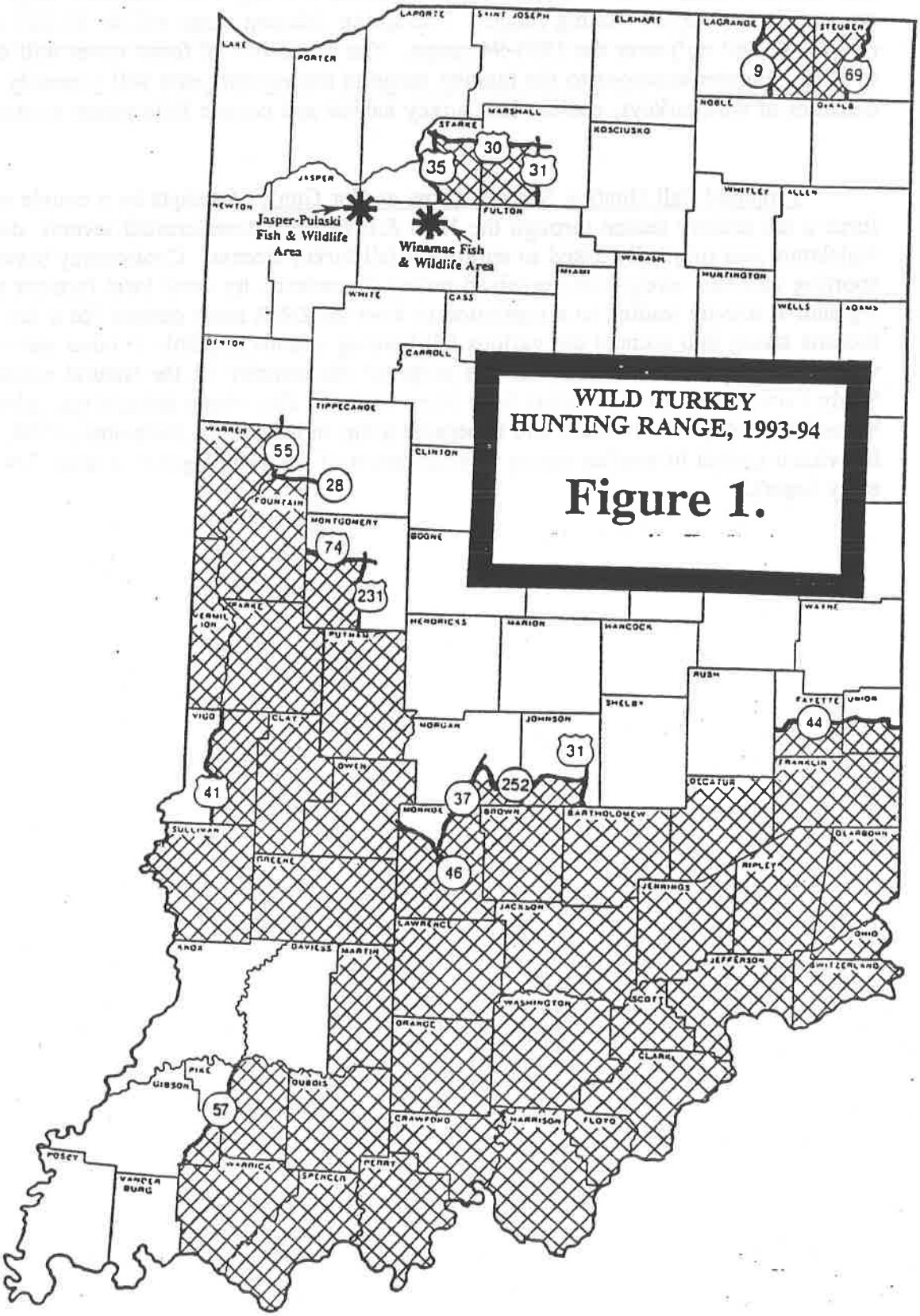

WILD TURKEY
HUNTING RANGE, 1993-94
Figure 1.
Jasper-Pulaski
Fish & Wildlife
Area
Winamac Fish
& Wildlife Area
LAPORTE
SAINT JOSEPH
ELKHART
LAGRANGE
STEUBEN
LAKE
PORTER
NOBLE
DEKALB
STARKE
MARSHALL
KOSCIUSKO
JASPER
NEWTON
FULTON
WHITLEY
ALLEN
MIAMI
WABASH
HUNTINGTON
WHITE
CASS
WELLS
ADAMS
DEKALB
CARROLL
TIPPECANOE
WARREN
CLINTON
FOUNTAIN
MONTGOMERY
BOONE
VERMILLION
PUTNAM
HENDRICKS
MARION
HANCOCK
WAYNE
RUSH
SHELBY
FAYETTE
UNION
VIGO
CLAY
MORGAN
JOHNSON
FRANKLIN
OWEN
DECATUR
SULLIVAN
MONROE
BROWN
BARTHOLOMEW
GREENE
DEARBORN
RIPLEY
JENNINGS
JACKSON
LAWRENCE
OHIO
KNOX
DAVIESS
MARTIN
JEFFERSON
SWITZERLAND
WASHINGTON
SCOTT
ORANGE
CLARK
PIKE
GIBSON
DUBOIS
CRAWFORD
HARRISON
FLOYD
POSEY
WARRICK
SPENCER
PERRY
VANDERBURG
55
28
74
231
31
30
35
9
69
44
31
252
37
41
46
57

Table 1 Indiana spring wild turkey hunting statistics from hunter questionnaires (1992 & 1993) *

Category	1992 No.	1992 % **		1993 No.	1993 % **	
Turkey Hunter Effort and Success						
No. of Hunters	15,745	+63.3		19,865	+26.2	
Success	2,531	16.1		3,500	17.6	
Total Hunter Effort	70,054	+59.9		99,325	+41.8	
Efforts/Hunter	4.4	-2.1		5.0	+13.6	
Efforts/Bird Killed	27.7	+46.4		28.4	+2.5	
Efforts by Land Ownership						
USFS	9,738	13.9	*[3.2] #*	10,846	10.9	*[3.2] #*
State	11,979	17.1	*[2.5]*	14,750	14.9	*[2.5]*
Other Federal	2,172	3.1	*[1.8]*	1,568	1.6	*[1.8]*
Private Only	38,320	54.7	*[92.4]*	61,379	61.8	*[92.4]*
Private/Public	7,846	11.2	–	10,778	10.9	–
Total Public Land	27,461	39.2	*[7.6]*	31,287	31.5	*[7.6]*
Wild Turkey Observation Indices						
Turkeys Heard/Hunter	7.8	-16.3		10.3	+32.1	
Days Heard a Turkey	3.5	-5.8		4.1	+17.1	
Turkeys Seen/Hunter	6.1	+4.7		6.2	+1.6	
Days Saw a Turkey	2.3	-3.7		2.6	+13.1	

* Figures adjusted for non-respondents, "non-licensed" military and landowners, and reported kills from check stations.

** Percents with prefixes (+,-,=) indicate proportional changes from previous year. Percents without prefixes indicate category proportion.

Approximate percent [%] available within hunting range

Table 2. Indiana wild turkey harvest and effort comparisons by county, spring 1993.

County	Total * Hunter Efforts	Percent of Effort	Reported* Harvest	Percent of Harvest	Efforts/ Turkey Harvested
Bartholomew	695	0.7%	30	0.9%	23
Brown	4,370	4.4%	93	2.7%	47
Clark	1,887	1.9%	59	1.7%	32
Clay	397	0.4%	12	0.3%	33
Crawford	3,278	3.3%	110	3.1%	30
Dearborn	4,569	4.6%	217	6.2%	21
Decatur	199	0.2%	4	0.1%	50
Dubois	1,490	1.5%	67	1.9%	22
Fayette	99	0.1%	1	0.0%	99
Floyd	0	0.0%	1	0.0%	0
Fountain	596	0.6%	21	0.6%	28
Franklin	3,476	3.5%	146	4.2%	24
Gibson	99	0.1%	0	0.0%	–
Greene	2,582	2.6%	86	2.5%	30
Harrison	2,582	2.6%	60	1.7%	43
Jackson	3,675	3.7%	73	2.1%	50
Jasper	596	0.6%	12	0.3%	50
Jefferson	5,463	5.5%	264	7.5%	21
Jennings	1,391	1.4%	49	1.4%	28
Johnson	397	0.4%	3	0.1%	132
Lagrange	99	0.1%	50	1.4%	2
Lawrence	1,689	1.7%	92	2.6%	18
Marshall	795	0.8%	31	0.9%	26
Martin	3,973	4.0%	142	4.1%	28
Monroe	2,086	2.1%	54	1.5%	39
Montgomery	993	1.0%	29	0.8%	34
Morgan	397	0.4%	4	0.1%	99
Ohio	2,384	2.4%	111	3.2%	21
Orange	5,165	5.2%	166	4.7%	31
Owen	894	0.9%	18	0.5%	50
Parke	7,151	7.2%	263	7.5%	27
Perry	5,960	6.0%	150	4.3%	40
Pike	3,079	3.1%	54	1.5%	57
Pulaski	99	0.1%	21	0.6%	5
Putnam	1,291	1.3%	65	1.9%	20
Ripley	3,774	3.8%	181	5.2%	21
Scott	795	0.8%	22	0.6%	36
Spencer	894	0.9%	38	1.1%	24
Starke	10	0.0%	37	1.1%	0
Steuben	20	0.0%	23	0.7%	1
Sullivan	1,589	1.6%	49	1.4%	32
Switzerland	9,436	9.5%	360	10.3%	26
Union	10	0.0%	3	0.1%	3
Vermillion	1,490	1.5%	70	2.0%	21
Vigo	199	0.2%	5	0.1%	40
Warren	1,391	1.4%	27	0.8%	52
Warrick	2,582	2.6%	62	1.8%	42
Washington	3,178	3.2%	61	1.7%	52
Unknown	99	0.1%	4	0.1%	25
TOTALS	99,325	100.0%	3,500	100.0%	28

* Hunter efforts estimated from questionnaire sample; harvest totals from check station reports.

Table 3. Indiana wild turkey harvest by county, Spring 1993 and 1994.

County	1993 Reported* Harvest	Percent of Harvest	1994 Reported* Harvest	Percent of Harvest
Bartholomew	30	0.9%	29	0.8%
Brown	93	2.7%	116	3.1%
Clark	59	1.7%	37	1.0%
Clay	12	0.3%	17	0.5%
Crawford	110	3.1%	140	3.7%
Dearborn	217	6.2%	212	5.7%
Decatur	4	0.1%	4	0.1%
Dubois	67	1.9%	87	2.3%
Fayette	1	0.0%	4	0.1%
Floyd	1	0.0%	1	0.0%
Fountain	21	0.6%	28	0.7%
Franklin	146	4.2%	148	4.0%
Gibson	0	0.0%	1	0.0%
Greene	86	2.5%	89	2.4%
Harrison	60	1.7%	107	2.9%
Jackson	73	2.1%	77	2.1%
Jasper	12	0.3%	12	0.3%
Jefferson	264	7.5%	235	6.3%
Jennings	49	1.4%	55	1.5%
Johnson	3	0.1%	3	0.1%
Lagrange	50	1.4%	36	1.0%
Lawrence	92	2.6%	78	2.1%
Marshall	31	0.9%	29	0.8%
Martin	142	4.1%	130	3.5%
Monroe	54	1.5%	50	1.3%
Montgomery	29	0.8%	31	0.8%
Morgan	4	0.1%	7	0.2%
Ohio	111	3.2%	102	2.7%
Orange	166	4.7%	204	5.5%
Owen	.18	0.5%	21	0.6%
Parke	263	7.5%	229	6.1%
Perry	150	4.3%	202	5.4%
Pike	54	1.5%	75	2.0%
Pulaski	21	0.6%	20	0.5%
Putnam	65	1.9%	32	0.9%
Ripley	181	5.2%	200	5.3%
Scott	22	0.6%	17	0.5%
Spencer	38	1.1%	42	1.1%
Starke	37	1.1%	24	0.6%
Steuben	23	0.7%	27	0.7%
Sullivan	49	1.4%	46	1.2%
Switzerland	360	10.3%	436	11.7%
Union	3	0.1%	6	0.2%
Vermillion	70	2.0%	55	1.5%
Vigo	5	0.1%	7	0.2%
Warren	27	0.8%	44	1.2%
Warrick	62	1.8%	90	2.4%
Washington	61	1.7%	87	2.3%
Unknown	4	0.1%	12	0.3%
Totals	3,500	100.0%	3,741	100.0%

* Harvest totals from check station reports.

Table 4. Composition of Indiana's spring gobbler harvests, 1970-94.

Year	Reported Harvest	Sample Size	Age Class Percentages* and Mean Weights (lbs)							
			1Yr	Wt.	2Yr	Wt	3Yr	Wt	4+Yr	Wt
1970	6	6	0%		33%		17%		50%	
1971	11	11	9%		9%		64%		18%	
1972	12	12	0%		17%		67%		17%	
1973	27	27	4%		37%		41%		19%	
1974	26	26	15%		27%		38%		19%	
1975	15	15	7%		20%		27%		47%	
1976	32	32	22%		19%		31%		28%	
1977	46	46	17%		26%		37%		20%	
1978	33	33	33%		18%		39%		9%	
1979	48	48	47%		29%		25%		0%	
1980	54	24	33%		38%		17%		13%	
1981	90	77	29%		20%		30%		22%	
1982	73	57	21%		19%		28%		32%	
1983	93	86	34%		38%		15%		13%	
1984	104	100	32%		39%		19%		10%	
1985	255	233	40%		39%		13%		7%	
1986	293	274	29%		41%		24%		6%	
1987	741	641	24%		44%		22%		10%	
1988	905	864	45%	15.4	39%	20.7	13%	21.4	3%	22.6
1989	1,359	1,314	20%	15.5	63%	20.7	14%	21.8	3%	22.3
1990	1,505	1,463	31%	15.2	41%	21.0	21%	21.3	7%	22.8
1991	2,318	2,266	25%	15.5	53%	21.1	18%	22.1	4%	22.6
1992	2,531	2,467	38%	15.1	43%	20.8	15%	21.8	4%	22.4
1993	3,500	3,396	18%	15.9	60%	20.9	17%	22.2	5%	22.8
Previous Years' Means **			*30%*	*15.4*	*41%*	*20.9*	*19%*	*21.8*	*10%*	*22.6*
1994	3,741	3,626	41%	15.2	37%	21.2	17%	22.3	5%	22.8

* Based on longest spur measurement

** Mean percents based on previous 10 years; mean weights from previous 6 years

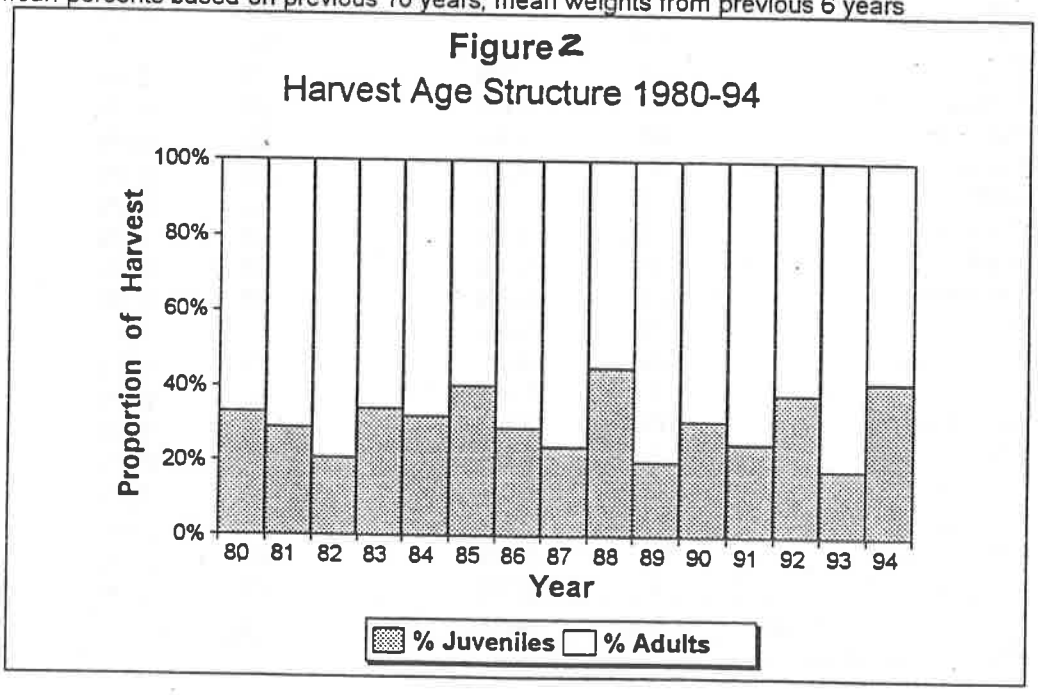


Table 5. Summary of Indiana's wild turkey hunting seasons, 1970-94.

Year	Regular Season Dates	Season Length (Days)	No. of Counties	No. of Permits Sold*	Est. No. of Hunters**	Reported Harvest	Hunter Success
1970	5/2-5/5	4	3	75	62	6	9.7%
1971	5/1-5/5	5	9	298	224	11	4.9%
1972	4/26-4/30	5	9	585	422	12	2.8%
1973	4/25-4/29	5	11	625	503	27	5.4%
1974	4/24-4/28	5	11	665	496	26	5.2%
1975	4/29-5/5	7	11	722	501	15	3.0%
1976	4/29-5/5	7	13	666	500	32	6.4%
1977	4/28-5/5	8	16	668	520	46	8.8%
1978	4/26-5/7	12	18	852	619	33	5.3%
1979	4/25-5/6	12	19	932	860	48	5.6%
1980	4/23-5/4	12	17	706	670	54	8.1%
1981	4/22-5/3	12	18	922	814	90	11.1%
1982	4/21-5/2	12	18	1,125	696	73	10.5%
1983	4/20-5/1	12	18	1,218	984	93	9.5%
1984	4/25-5/6	12	18	1,320	1,205	104	8.6%
1985	4/24-5/5	12	25	1,882	1,302	255	19.6%
1986	4/23-5/4	12	25	2,523	1,648	293	17.8%
1987	4/22-5/6	15	33	3,348	2,619	741	28.3%
1988	4/27-5/11	15	33	10,894	4,677	905	19.4%
1989	4/26-5/10	15	39	11,442	6,068	1,359	22.4%
1990	4/25-5/9	15	39	14,379	7,860	1,505	19.1%
1991	4/24-5/8	15	43	16,387	9,643	2,318	24.0%
1992	4/22-5/6	15	43	21,012	15,745	2,531	16.1%
1993	4/28-5/16	19	48	26,479	19,865	3,500	17.6%
1994	4/27-5/15	19	48	29,000	24,000	3,741	15.6%
1995	4/26-5/14	19	52				

* Since 1987 totals include lifetime licenses and since 1988 youth licenses sold from Jan-May.

** No. of hunters includes those permit holders who hunted >= 1 day and since 1986 has been adjusted for non-licensed landowners or military hunters.

= preliminary estimates based on projecting previous years' trends or means.

Figure 3
Wild Turkey Harvests & Hunter Success

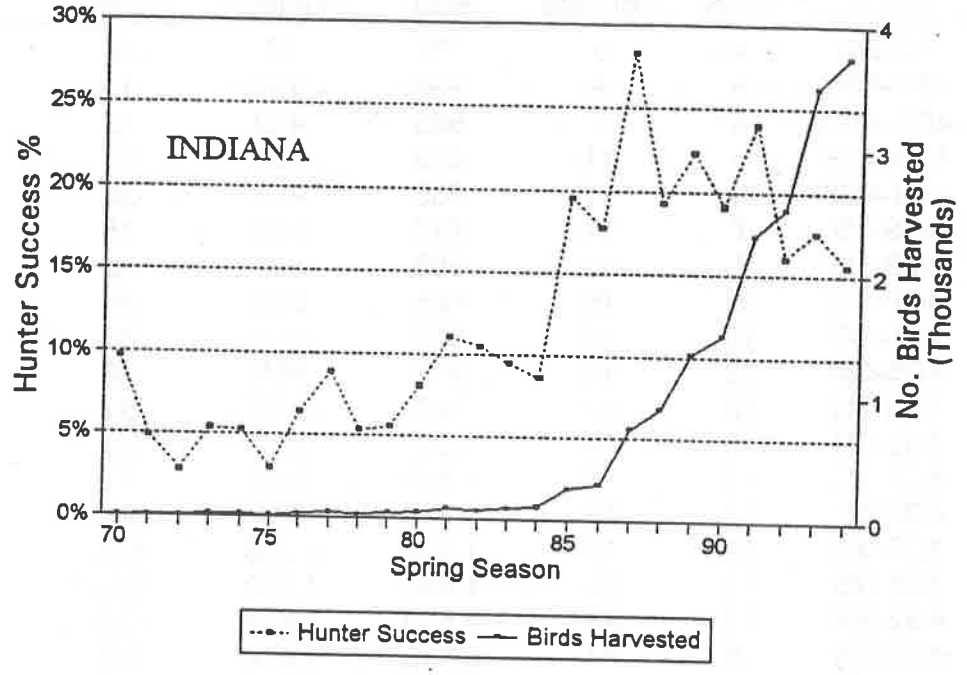
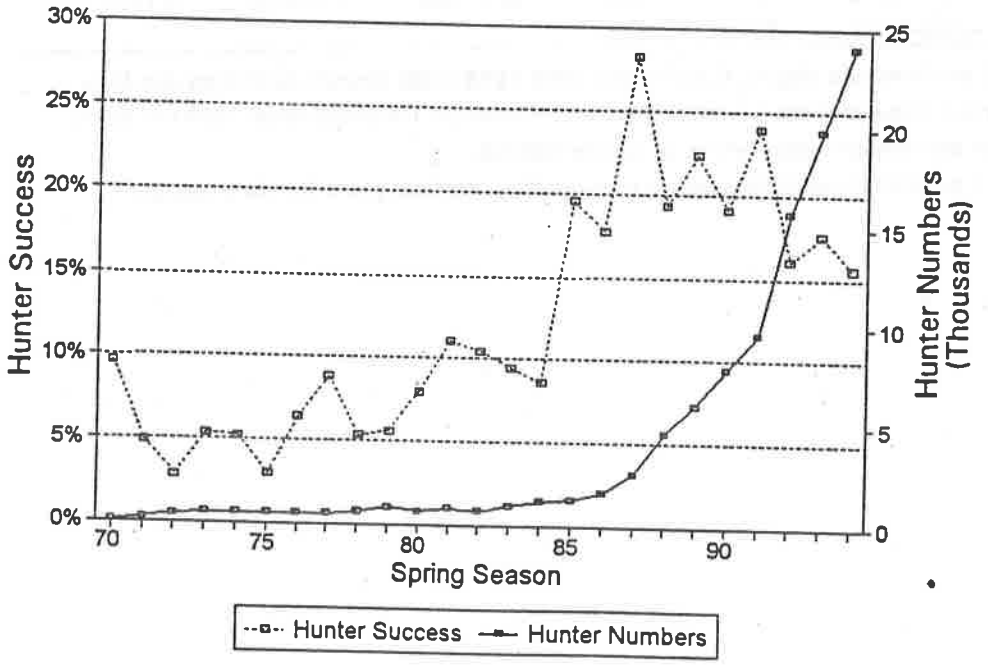


Figure 4.
Indiana Wild Turkey Hunter Growth



MIDWEST TURKEY GROUP REPORT - IOWA

1994

DALE L. GARNER

SEASON FORMAT

Fall 1993 - Residents: Fall 1993 was the third year of reduced fall turkey hunting quotas in Iowa. Paid gun license quota for fall 1993 was 1,530 at a cost of $22.00 per license. This quota represented a 40% reduction from 1991. Resident fall gun-hunters that received a permit had a 49 day season (October 11 - November 28). Of the 3,148 gun-permits issued, 1,531 (48.6%) were paid licenses and 1,617 (51.4%) were free landowner licenses.

An additional 488 archery permits were issued for a season that ran from 1 October - 3 December 1993 and from 20 December 1993 - 10 January 1994 (concurrent with Iowa's archery deer season) and were valid statewide. Archers could purchase a license throughout the season at a cost of $22.00. Of the 488 archery turkey permits issued, 203 were paid licenses and 285 were free landowner licenses.

Non-residents: Non-residents were not allowed to hunt turkeys in Iowa during fall 1993.

Spring 1994 - Residents: Spring of 1994 marked the sixth year that the entire state of Iowa was open to spring turkey hunting since the initial release of Eastern wild turkeys 27 years ago. Gun-hunters had to choose 1 of 4 zones during 1 of 4 seasons. Seasons ran consecutively and were 4, 5, 7, and 12 days in length, with the first season beginning on April 18 and the fourth season ending on May 15. A quota of 4,420 shotgun licenses were available for each of the first three seasons and there was no quota on the number of shotgun licenses issued during the fourth season. An unlimited number of archery only licenses were also available and were valid statewide for all seasons. In addition, landowners could also obtain a license to hunt turkeys on their own land. Both shotgun and archery licenses cost $22.00 for residents while landowners were allowed to hunt free on their own land. Second licenses (for under-subscribed zone/season combinations and for the fourth season) were available late in the application period.

Total number of licenses issued for Iowa's spring turkey season in 1994 was 33,746. The number of paid gun-licenses issued for spring 1994 was 31,808. The number of paid archery licenses issued for spring 1994 was 1,336 and free landowner licenses numbered 5,315. Over 47% of the resident licenses issued were for the fourth season and nearly 18% of the licenses issued were for an additional bird. Current management philosophy is to provide for a quality turkey hunting experience while maximizing the use of the turkey resource. Hunt quality is evaluated primarily through interference rates with 33% representing the allowable maximum rate.

Non-residents : Spring 1994 was the fifth year for non-resident spring turkey hunting in

Iowa. Six-hundred licenses were available to non-resident hunters at a cost of $55.00 per license. A total of 602 permits was issued in 4 zones during 3 seasons. Non-residents were not allowed to hunt during the second gun season (April 22-26).

HARVEST

Fall 1993 - Residents: Despite another year of poor production by wild turkeys, 42% of Iowa's gun-hunters were successful in harvesting a turkey during the fall 1993 season. Shotgun hunters harvested an estimated 914 ± 120 wild turkeys. Although 3,148 licenses were issued, only 2,169 hunters actually hunted for turkeys. Hunter effort on public land averaged 1.68 days per turkey killed. Hunter effort on private land was considerably higher and averaged 10.2 days per turkey killed.

Non-residents: No non-resident hunting was allowed in Iowa during fall 1993.

Spring 1994 - Residents: Iowa hunters harvested a record number of wild turkeys during April and May 1994. Resident wild turkey gun harvest was estimated at 10,598 ± 579 bearded birds, up 16% from 1993. Of the 31,808 resident gun licenses issued, 27,300 active hunters had a 38.8% success rate statewide. Success rates varied from a high of 49.5% in season 1 to 35.8% in season 4. The average number of days hunted by Iowa turkey hunters was 2.7. The average number of days hunted per turkey killed, however was 6.9.

Although success rates were high during spring 1994, the DNR's arbitrary acceptable hunter interference level of 33% was exceeded on public land in season 4, zone 4. All other seasons in all other zones, on both public and private land, were under the acceptable rate. As in previous years, interference rates statewide were lower on private land (17.7%) than on public land (32.9%). If interference rates continue to exceed acceptable levels, further management options will need to be considered.

Non-residents: Of 602 licenses issued, 527.5 ± 87.1 active non-resident hunters harvested 229.6 ± 87.7 bearded turkeys during spring 1994. Non-resident success rate was 43.5% with the majority of turkeys being harvested on private land.

ADDITIONAL INFORMATION

Adult gobblers accounted for 51% of the harvest statewide during spring 1994 based on 2,049 hunter responses. Jakes accounted for 23% of the statewide harvest and an additional 26% was of unknown age. Five percent of hunters reported crippling a turkey in spring 1994. In addition, 10% of surveyed hunters flushed hens from their nest with 68% of the flushes occurring before noon.

RESTORATION

Some in-state translocations continue, but the majority of trapping effort is to assist other states in their restoration efforts. During the 1993-94 season we shipped 400 turkeys to Texas , 204 to Kentucky, and 4 to Michigan.

PRODUCTION SURVEY

Iowa's wild turkey poult production per hen during 1994 was slightly better than 1993. Regional weather patterns were favorable for production in 1994 and both the average number of poults per hen and the percentage of hens with brood increased over 1993 statewide estimates. The number of poults produced per hen in 1994 still remains 16% below the average production for the last 18 years. However, the 1994 statewide production of 5.1 poults per hen is 7.6% higher than the average for the last 5 years and the hens with brood was nearly 4% above the 5-year average (Table 1).

Table 1. 1994 Iowa turkey brood survey results (% change from 5-year average 1989-93).

REGION	REPORTS	TURKEYS PER FLOCK	POULTS PER HEN	% HENS WITH BROOD
Northeast	403	13.1 (-5.8)	5.3 (10.4)	53 (-12.3)
South	425	11.6 (22.9)	5.1 (8.5)	49 (3.8)
Central	56	10.0 (5.7)	4.1 (11.4)	61 (31.5)
West	95	16.9 (42.0)	5.1 (-4.5)	62 (53.5)
East-Central	338	11.5 (-5.6)	4.9 (0.4)	56 (12.4)
Northwest	35	11.0 (NR)[a]	5.1 (NR)	42 (NR)
North-Central	36	11.6 (NR)	6.2 (NR)	46 (NR)
Statewide	**1388**	**12.3 (3.7)**	**5.1 (7.6)**	**53 (3.9)**

[a] NR = new region, <5 years of data.

EVALUATION OF SURVIVAL-RATE ESTIMATION METHODOLOGY FOR WILD TURKEY POULTS

1994 STUDY UPDATE, DEWAINE JACKSON, IOWA DNR

INTRODUCTION

Recent research suggests that the flush count method commonly used to estimate poult survival may be producing biased estimates. Based on flush counts from previous research, poult survival in Iowa was estimated at 34%, but modeling suggests 55% survival is necessary to support observed turkey densities. The inability to observe all poults at each flush and determining the prevalence of gang brooding produce too low or too high survival estimates, respectively. Unreliable survival estimates for turkey poults 0-4 weeks of age makes it impossible to scientifically manage for optimal wild turkey populations. Specific objectives are to:

1) Examine wild turkey poult survival and cause-specific mortality from 0-4 weeks post-hatch in a Midwest oak/hickory habitat. H_0: survival rates for turkey poults in central Iowa are less than 34% (a value previously obtained for this region).
2) Compare survival rate estimates of radio-marked turkey poults to estimates obtained by the flush count technique. H_0: poult survival estimates obtained by radio-telemetry do not differ from estimates obtained by flush counts. If H_0 is rejected, a correction factor will be developed that allows both methods to produce similar estimates.
3) Determine home range and habitat use by hens and broods 0-4 weeks post-hatch.
4) Determine nest site habitat characteristics, nesting and renesting rates, hen and nest success rates and mean clutch size of turkeys in a Midwest oak/hickory habitat.

STUDY AREA

Stephens State Forest (SSF) located in Lucas county Iowa is a 1,340 ha public, multiple-use area open to turkey hunting. Habitat characteristics of SSF are typical of hardwood forests in Iowa: approximately 45% oak-hickory timber and 55% crops and natural openings. Turkey densities on the study area are estimated at 7.5-11.5 turkeys per km^2.

METHODS

Wild turkeys were captured using cannon nets and alpha chloralose-laced corn during December - March 1992-93 and 1993-94. Additionally, baited walk-in wire traps were placed near known roost sites. All captured hens were fitted with back-mounted radio transmitters and gobblers were leg-banded. All radio-marked hens were monitored $\geq$ 3 times/week (more frequently during nesting). Compass bearings were obtained at several flagged locations within 50 m of nests to allow locating nests after hatch. Within 3 days

post-hatch, hens were flushed, the number of poults counted and as many poults as possible (maximum of 3) were captured. Captured poults were fitted with 3 g transmitters attached to a surgical tube backpack and immediately returned to the hen in 1993. Transmitters were surgically implanted and the poults held for 2-4 hrs for post-surgery recovery before being returned to the hen during 1994. Survival-rate estimates (0-4 weeks) were determined by daily monitoring radio-marked poults. Additionally, each brood was flushed at 2 and 4 weeks post-hatch to compare the accuracy of flush count survival rate estimates to the survival rate of radioed poults. Primary survival rate and cause-specific mortality rates for hens and poults were calculated using methods of Heisey and Fuller (1985) and the Kaplan-Meier product limit estimator.

RESULTS

CAPTURE

We began the spring 1994 nesting season with 64 radio-marked hens (45 adults, 19 juveniles). The few juvenile hens captured verifies the suspected poor reproduction at SSF during 1993. Our annual goal of radio-marking 100 hens may be difficult, since best estimates obtained during this trapping period indicate SSF turkey populations are only 33% of 10 years ago.

HEN SURVIVAL

Hen survival has been around 80% during the last 2 years (Table 1). The 1993 juvenile hen survival was dramatically different than the overall average and from the 1994 juvenile hen survival estimate; probably due to the very small sample size. Nesting survival rates during 1994 were not different than the annual survival has been thus far (1/1 - 9/1/94) since most of the annual mortality occurs during the nesting period.

NESTING

We documented 48 nesting attempts (nests that reached incubation) and 14 successful nests . Sixty-four percent of the marked hens had at least 1 nest reach incubation, but 70% of the viable nests were destroyed prior to hatch. Predation by fox, coyote and raccoon accounted for 91% of the destroyed nests.

POULTS

We marked 35 poults from 12 hens. The first 3 poults we marked were returned to the hen immediately after marking and died from exposure and/or surgery trauma prior to re-establishing contact with the hen. Thereafter, all poults were held and monitored to avoid post-surgery mortality. The remaining 32 poults were monitored for 4 weeks post-marking and flushed at 2-weeks and 4-weeks of age. Only 11 poults (potentially 15) survived 4 weeks. Radio contact was lost with 4 poults that could potentially be alive. Poult mortality was due to predation (15 poults) or related to the research (5 poults). Predators included mink, fox, weasel and red-tailed hawk.

TECHNIQUE COMPARISON

Poor poult survival and a small number of broods made comparison of flush-count survival and radio-estimates difficult. Flush counts were conducted on 11 broods that had 100 poults present when they were initially captured. Based on flush counts, between the initial capture and 2 weeks, 30% of the poults survived (30 of 100, Figure 2). This is a maximum estimate since three brood flushes documented the presence of other hens. This is similar to the 34% crude survival estimate generated by radio-telemetry at 2 weeks (11 survived of 32 marked). This, on the other hand, is a minimum survival estimate since radio contact was lost with 3 poults that could have been alive but were assumed dead.

Interestingly, at 4 weeks, the flush counts indicated 40% of the poults survived (40 of the initial 100). This was obviously influenced by the formation of at least 4 gang broods at the 4-week period or we had not observed all the poults at 2 weeks. Crude estimates from radio-telemetry indicated 34% survival at 4 weeks (11 poults still remained of the 32 marked). Based on just this year's data, the 2 techniques gave similar estimates at 2 weeks but flush counts estimates were inaccurate at 4 weeks.

Since our concern was poult survival at 2 and 4 weeks, regardless of the calendar date the poults were marked, we entered all marked poults simultaneously at the beginning of the Kaplan - Meier analysis. (This assumes all poults were marked at the same time, experienced the same risks and mortality covariates throughout the 4 weeks and that individuals within broods are independent observations.) This produced estimates of (44 $\pm$ 0.1) and (40 $\pm$ 0.3)% survival at 2 weeks and 4 weeks, respectively, for 31 poults radio-marked during 1994 (1 poult was predated 8 hrs after marking and was censured from the analysis). This spring, 94% of the radio-marked poult mortality occurred in the first 2 weeks of life, obviously a very critical period for poult survival. An additional analysis that examined poult survival between 2 and 4 weeks for those poults that were alive after 2 weeks indicated 91% survival. Thus, it appears once poults reach 2 weeks of age their probability of future survival increases dramatically. This probably is related to the poults acquiring flight and possibly the additional safety associated with gang brooding.

Regardless of the technique or analytical method used, 1994 poult survival estimates remain below what population models indicate survival must be to have our present turkey densities. Additional data collection, analysis, and model validation will be necessary to resolve these discrepancies. Data analysis continues on this year's data and additional information on all project objectives will be forth-coming.

Table 1. Kaplan-Meier survival estimates (% survival ± S.E.) for radio-marked turkey hens at Stephens State Forest during 1993 - 94.

	All Hens	Adult Hens	Juvenile Hens
1993 Survival 2/23 - 12/31	81 ± 8.5 N = 22	83 ± 8.8 N = 18	66 ± 27 N = 4
1994 Survival 1/1 - 9/1	78 ± 4.8 N = 73	76 ± 6 N = 50	82.6 ± 7.9 N = 23
1994 Nesting 4/1 - 7/31	84 ± 4.4 N = 69		

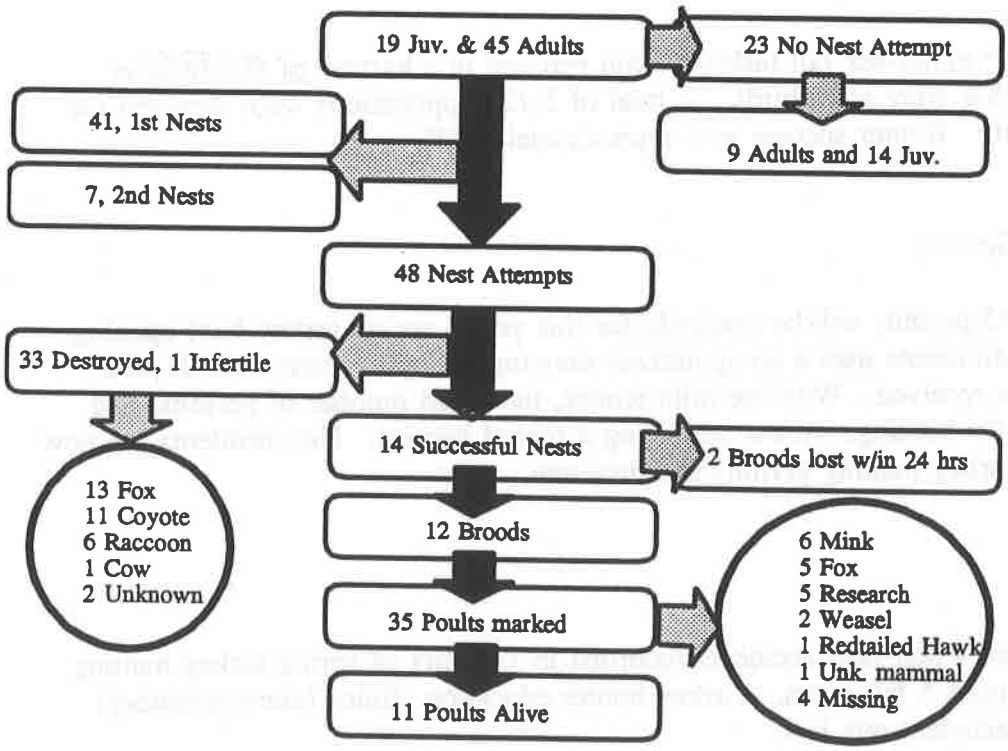


Figure 1. Flowchart of radio-marked wild turkey hen nesting, nest success and poult survival at Stephens State Forest, spring 1994.

Minnesota Wild Turkey Status Report

Gary Nelson, Dick Kimmel, and Kurt Haroldson

Midwest Deer/Turkey Group Meeting, 1995

HUNTING SEASONS:

1994 Spring Turkey Season:

The total 1994 spring harvest was 1,975 turkeys, of which approximately 29% were juvenile gobblers. The 1994 harvest was down 107 birds from 1993 (Table 1). Several factors, such as the extremely wet breeding season in 1993, may have contributed to the low juvenile harvest this year. The total number of applications received for the 1994 spring hunt (19,853) was higher than any previous year. Hunter success for 1994 (23%) was down slightly from 1993 (25%).

1994 Fall Turkey Season:

Minnesota's 5th either-sex fall turkey season resulted in a harvest of 601 turkeys (Table 1), of which 48% were adult birds. A total of 3,124 applications were received for 2,500 available permits. Hunter success was approximately 32%.

1995 Spring Turkey Season:

A total of 9,975 permits will be available for this year's spring turkey hunt opening on April 12, 1995. Minnesota uses a computerized drawing. Slightly more than 21,000 applications have been received. With the mild winter, increased number of permits, and additional areas open for hunting, we are predicting a record harvest. Non-residents are now allowed to apply for turkey hunting permits in Minnesota.

Accidents:

There have been 4 non-fatal accidents recorded in 17 years of spring turkey hunting in Minnesota and 2 during 5 fall hunts. Turkey hunter education clinics (non-mandatory) have helped keep the accident rate low.

RESTORATION:

Restoration efforts are continuing with 394 turkeys captured and relocated in-state last winter. In addition, 8 turkeys were received from Illinois. Blood samples taken from a sample of live-trapped turkeys showed no evidence of disease. A reduced budget will hamper our restoration efforts this year. Wildlife exchanges for wild turkeys have been developed with two states: Missouri exchanged wild turkeys for Minnesota ruffed grouse, and Illinois is to receive 20 prairie chickens for 20 wild turkeys.

POPULATION SURVEY:

Minnesota Department of Natural Resources (DNR) surveys wild turkeys with a postcard survey of wild turkey sightings from a random sample of hunters of antlerless deer. Population indices are developed from turkey observation data collected by antlerless deer hunting permit area. Approximately 15,000 questionnaires are mailed annually with an approximate 60% return for 2 mailings. Eight years of data have resulted in improved analysis and interpretation procedures, which will be described in a manuscript for the 1995 Wild Turkey Symposium.

We have developed spatial handling procedures using geographic information system (GIS) mapping techniques. Hunters are surveyed to indicate number of turkeys observed and the approximate location of the sighting relative to the nearest town using miles and a 16-point compass direction. Menu-driven data entry routines convert locational information to both Universal Transverse Mercator (UTM) and Public Land Survey (township-range-section-forty) geocodes. Geocodes can be downloaded to GIS files for printing maps with locations of turkey observations (Fig. 1). Range maps are developed using locations of all turkey observations. Maps filtered by number of turkeys observed are used to provide relative density information. GIS maps of turkey locations layered with maps depicting land use, landownership, and habitat quality are used to develop wild turkey range expansion plans and set hunting season structure.

RESEARCH:

During severe winters, northern populations of wild turkeys with limited food availability have experienced malnutrition and high mortality. Information on energy expenditure by wild turkeys under winter conditions was needed to predict winter survival. We measured the effects of ambient temperature (+22 to -40 C) on metabolic rates of 9 adult and 7 juvenile female wild turkeys during winter with indirect calorimetry. The standard metabolic rate was 200 kcal/day for adult hens (mean body weight = 4.567 kg) and 185 kcal/day for juvenile hens mean body weight = 3.680 kg). Below the lower critical temperature of 11 C, metabolic rates increased linearly for both adult and juvenile hens. The cost of thermoregulation was 58 kcal/day for adults and 63 kcal/day for juveniles for every 10 C decrease in ambient temperature below 11 C.

We used predictive models to estimate winter food requirements of wild turkeys. Each bird would consume an estimated 11.310 kg during a winter with mean temperature $\geq$11 C. Winter food requirements increased by 2.407 kg/bird for every 10 C drop in mean winter temperature. Because corn food plots are used to supplement natural foods in northern climates during winter, we estimated size of food plots needed to sustain wild turkeys based on average winter temperature. Results of this study will be presented at the 1995 Wild Turkey Symposium.

Table 1. Spring and fall wild turkey application numbers, permits, and harvest in Minnesota, 1978-95.

Year	Spring Applications	Spring Permits	Spring Harvest	Fall Applications	Fall Permits	Fall Harvest
1978	10740	420	94			
1979	11116	840	116			
1980	9613	1200	98			
1981	8398	1500	113			
1982	7223	2000	106			
1983	8153	2100	116			
1984	7123	3000	178			
1985	5662	2750	323			
1986	5715	2500	333			
1987	6361	2750	520			
1988	8402	3000	674			
1989	13007	4000	930			
1990	14326	6600	1709	4521	1000	326
1991	15918	9170	1724	2290	2200	552
1992	16401	9310	1691	2782	2200	588
1993	17800	9625	2082	3186	2400	605
1994	19853	9940	1975	3124	2500	601
1995	21345	9975			2500	

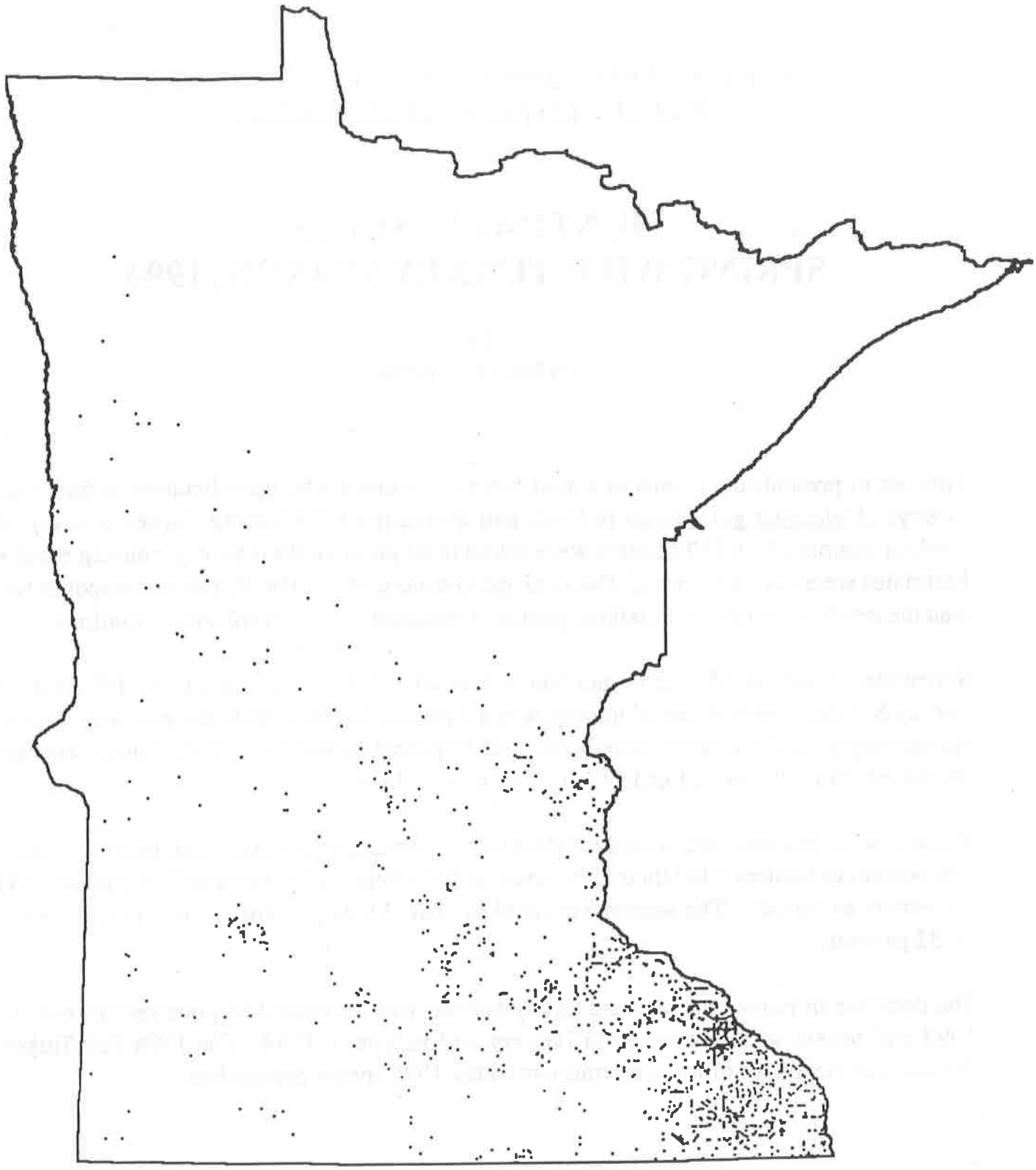


Figure 1. Locations of turkey sightings from survey of antlerless-deer hunters, Minnesota, November-December, 1993.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
WILDLIFE DIVISION REPORT NO. 3221

HUNTING RESULTS
SPRING WILD TURKEY SEASON, 1994

by
William E. Moritz

This report presents the results of a mail survey to hunters who were licensed to hunt wild turkeys (*Meleagris gallopavo*) in Michigan during the 1994 Spring Turkey Season. A random sample of 14,237 hunters were asked to summarize their turkey hunting results. Estimates were derived from 12,804 returned questionnaires. The 90 percent response rate was the result of an original mailing, postcard reminder, plus two follow-up mailings.

Statewide, an estimated 48,354 individuals hunted 221,874 days during the 1994 Spring Turkey Season. The number of hunters was a 8 percent increase from the previous season. An estimated 11,429 turkeys were harvested, 11 percent fewer than 1993. Hunter success decreased from 29 percent in 1993 to 24 percent in 1994.

Hunters were less satisfied with their 1994 turkey hunting experience than previous years. Ten percent of hunters rated their experience as "excellent", 13 percent as "very good", and 23 percent as "good". The season was rated as "fair" by 21 percent of hunters and "poor" by 32 percent.

The decrease in hunter success and turkey harvest was attributed to poor recruitment in 1993 and severe winter weather in January and February, 1994. The 1994 Fall Turkey Season was closed to improve recruitment to the 1995 spring population.

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DNR
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HOW RECENT SPRING TURKEY SEASONS COMPARE

	1987	1988	1989	1990	1991	1992	1993	1994
UPPER PENINSULA UNIT								
Licenses available	1,300	1,425	2,050	2,075	3,075	3,075	3,275	3,375
Licenses issued	1,035	1,308	1,819	2,075	2,436	2,789	3,149	2,980
Hunters *	884	1,100	1,656	1,852	2,213	2,528	2,677	2,668
Turkey Harvest	334	393	709	735	746	842	875	761
Hunter days	3,115	4,058	5,643	7,184	8,350	10,985	12,882	11,176
Hunter success	38%	36%	43%	40%	34%	33%	33%	29%
NORTHERN UNIT								
Licenses available	15,940	18,235	21,830	27,150	32,600	36,650	43,550	46,194
Licenses issued	15,261	18,235	21,830	27,150	32,600	36,649	42,772	46,194
Hunters *	13,144	16,120	19,558	24,715	30,010	33,545	38,174	41,055
Turkey Harvest	2,883	4,136	5,352	7,532	8,554	10,250	10,964	9,376
Hunter days	53,449	64,985	77,692	101,263	123,782	163,693	192,959	188,116
Hunter success	22%	26%	27%	30%	29%	31%	29%	23%
SOUTHERN UNIT								
Licenses available	400	600	1,200	1,350	2,205	4,055	4,850	5,611
Licenses issued	400	564	1,200	1,350	1,653	3,242	4,364	5,214
Hunters *	350	443	985	1,161	1,456	2,877	3,818	4,631
Turkey Harvest	43	38	134	189	336	775	1,092	1,292
Hunter days	1,550	1,787	3,900	4,660	6,270	15,848	21,787	22,582
Hunter success	12%	9%	14%	16%	23%	26%	29%	28%
TOTAL STATE								
Licenses available	17,640	20,260	25,080	30,575	37,880	43,780	51,675	55,180
Licenses issued	16,696	20,107	24,849	30,575	36,689	42,680	50,285	54,388
Hunters *	14,378	17,653	22,199	27,728	33,679	38,950	44,669	48,354
Turkey Harvest	3,260	4,567	6,195	8,456	9,636	11,847	12,931	11,429
Hunter days	50,114	70,830	87,235	113,107	138,402	190,526	227,628	221,874
Hunter success	23%	26%	28%	30%	29%	30%	29%	24%

* Number of license holders actually hunting.

HOW TURKEY HUNTERS RATED THEIR HUNTING EXPERIENCE UNIT MEANS

Unit	Excellent	Very Good	Good	Fair	Poor	Number of Respondents
M	10	10	18	26	36	450
N	10	17	23	21	29	418
O	18	17	26	20	19	259
A	12	12	22	21	33	375
AA	7	9	17	21	46	841
B	7	15	18	23	37	166
C	4	7	17	23	49	670
D	6	6	20	22	46	249
E	9	13	23	22	33	651
F	6	10	18	23	43	750
G	3	4	13	22	58	761
H	10	11	23	22	34	505
J	9	12	22	24	33	337
K	12	17	28	19	24	537
V	6	7	17	23	47	619
W	9	14	23	21	33	638
L	25	28	29	10	8	193
P	19	23	27	16	15	119
PA	15	13	29	18	25	104
PB	22	23	29	14	12	110
PC	24	27	19	17	13	83
PD	35	20	20	20	5	46
Q	18	14	22	21	25	120
QA	33	27	21	10	9	69
QB	37	19	11	10	23	41
R	29	18	22	17	14	122
S	13	15	25	20	27	310
T	10	16	31	23	20	275
TA	13	15	29	21	22	188
U	17	18	32	23	10	284
X	14	18	21	19	28	361
Y	23	23	33	13	8	167
YA	20	21	26	17	16	193
Z	17	18	21	22	22	116
ZA	31	19	27	9	14	141
State mean	**10**	**13**	**23**	**21**	**32**	**11,268**

1994 Spring Turkey Season
ESTIMATED NUMBER OF HUNTERS, HARVEST AND HUNTING EFFORT BY AREA

Unit	Licenses Issued	Number of Hunters	Harvest	Licensees Hunting %	Licensees Successful %	Hunters Successful %	Hunter Days	Days Hunted per Hunter
M	813	744	150	92	19	20	3,179	4.3
N	1,642	1,458	469	89	29	32	6,041	4.1
O	525	466	142	89	27	31	1,956	4.2
U.P. Unit	**2,980**	**2,668**	**761**	**90**	**26**	**29**	**11,176**	**4.2**
A	2,558	2,210	510	86	20	23	11,268	5.1
AA	2,465	2,178	292	88	12	13	9,156	4.2
B	914	799	207	87	23	26	3,961	5.0
C	2,100	1,807	269	86	13	15	7,813	4.3
D	3,708	3,222	552	87	15	17	16,817	5.2
E	3,200	2,878	635	90	20	22	12,646	4.4
F	2,700	2,398	404	89	15	17	10,213	4.3
G	1,175	1,028	81	87	7	8	4,489	4.4
H	1,450	1,306	256	90	18	20	5,852	4.5
J	6,097	5,356	1,345	88	22	25	31,176	5.8
K	16,000	14,559	4,163	91	26	29	60,403	4.1
V	1,405	1,250	202	89	14	16	5,440	4.4
W	2,422	2,063	460	85	19	22	8,882	4.3
Northern Unit	**46,194**	**41,054**	**9,376**	**89**	**20**	**23**	**188,116**	**4.6**
L	270	240	106	89	39	45	978	4.1
P	146	134	38	92	26	28	605	4.5
PA	180	156	38	87	21	25	724	4.6
PB	150	134	51	90	34	38	542	4.0
PC	120	95	26	79	22	28	389	4.1
PD	75	66	24	88	32	36	280	4.2
Q	175	154	39	88	22	25	856	5.5
QA	90	87	25	97	28	29	424	4.9
QB	75	54	22	72	29	41	194	3.6
R	206	184	63	89	30	34	817	4.4
S	593	513	114	87	19	22	2,112	4.1
T	475	433	99	91	21	23	2,611	6.0
TA	270	253	46	94	17	18	1,603	6.3
U	450	424	136	94	30	32	2,416	5.7
X	844	706	129	84	15	18	3,390	4.8
Y	225	205	66	91	30	32	914	4.4
YA	435	401	135	92	31	34	1,686	4.2
Z	240	216	64	90	27	30	1,284	5.9
ZA	195	177	71	91	37	40	757	4.3
Southern Unit	**5,214**	**4,632**	**1,292**	**89**	**25**	**28**	**22,582**	**4.9**
STATE TOTAL	**54,388**	**48,354**	**11,429**	**89**	**21**	**24**	**221,874**	**4.6**

MIDWEST DEER AND TURKEY STUDY GROUP MEETING

WILDLIFE HARVEST AND POPULATION STATUS REPORT - WILD TURKEY

January 15-18, 1995

Larry D. Vangilder
Wildlife Research Biologist

1993 FALL FIREARMS TURKEY SEASON

The 1993 fall firearms turkey harvest of 13,418 birds was down 21% from last year's fall harvest and was down 52% from 1987's record harvest (Table 1). Permit sales were also down 4.6% (Table 1). In 1993, 34,379 fall firearms permits were sold. In 1987, when a record number of turkeys were killed, permit sales numbered 52,922 (Table 1).

1994 SPRING TURKEY SEASON

Despite a late spring and delayed nesting season, excellent weather during the first week and a half of the season resulted in a record turkey harvest of 37,918 birds. I can't remember a season with better weather for turkey hunting. I'm sure a higher than average proportion of the permittees were out hunting during the first week of the season. The first week's harvest was 26,537 birds. Because the first week harvest usually comprises 65% of the total harvest, after the first week totals were in, I expected the harvest to exceed 40,000 with continued good weather. However, bad weather during the last 4 days of the season reduced the harvest. The proportion of jakes in the harvest was 27%. Based on the brood survey I expected around 20%. The brood survey either underestimated production somewhat or jakes were killed at a higher rate than normal because of a relative lack of adults. Unfortunately, the 2 hypotheses are indistinguishable right now.

The 1994 harvest exceeds the previous record harvest by almost 3,000 birds. The previous record harvest was in 1987 when 35,951 birds were killed. The fact that turkey hunters can take a record harvest after 6 poor hatches in a row is, in part, a result of our very conservative turkey season. However, the record harvest is also a consequence of regional variation in turkey populations. If one compares the data from the checked harvest in 1987 (the previous record) with the 1994 checked harvest, one sees a substantial change in the distribution of the harvest among regions. The harvests in the Northwest, West Central and Southwest protection regions are 105, 55% and 64% greater, respectively, in 1994 than in 1987.

Comparison of the 1994 checked harvest and the 1987 checked harvest by Protection Region.

Protection Region	1994 Spring Harvest	1987 Spring Harvest	Difference	Percent Change
Northeast	5,136	5,404	- 268	- 5.0
North Central	6,115	5,804	+ 311	+ 5.4
Northwest	3,220	1,568	+1,652	+105.4
East Central	4,954	7,188	-2,234	-31.1
Central	5,590	5,236	+354	+6.8
West Central	4,299	2,775	+1,524	+54.9
Southeast	2,347	2,380	-33	-1.4
Ozark	4,528	4,622	-94	-2.0
Southwest	1,729	1,056	+673	+63.7

On the other hand, the 1994 checked harvest in the East Central region is 31% lower than in 1987. The 1994 harvest in the Ozark region was only slightly lower than in 1987, but the harvest has shifted among counties within the Ozark region. These shifts in the distribution of harvest are generally consistent with regional brood survey and archery indices. We've had fewer poor hatches and increasing archery indices in the Northwest and West Prairie regions of the state. On the other hand, archery indices in the Lindley Breaks, Union Breaks, and Ozarks East were down substantially. My conclusion from all this is that although a record harvest came as somewhat of a surprise, especially given the stage of the breeding season, the

distribution of the harvest was not inconsistent with the data we have. Turkey populations were down in certain regions of the state but up in others, and the 1994 harvest reflects that.

1994 BROOD SURVEY

The statewide poult to hen ratio was 2.6 poults per hen; below the 35-year average of 2.8 poults per hen (Figure 1). A poult to hen ratio of 2.6 poults per hen is also below the last 10-year average (2.7:1), but not below the last 5-year average (2.2:1) poult to hen ratio. The best production was observed in the Western Prairie region of Missouri (3.5:1) (Figure 2). Production in the Ozarks East and Ozarks West regions were 2 and 9% respectively, above the previous 8-year average (brood survey results were not tabulated by region until 1986). The poult to hen ratios in the Northeast, Northwest, and Union Breaks regions were also above the previous 8-year average. The Ozark Border, and Mississippi Lowlands regions were well below the previous 8-year average.

Overall, the 1994 brood survey indicated a better hatch than Missouri has experienced for the previous 4 years. Although the 1994 was not outstanding, it helped bolster populations in areas of the state where populations were down.

1994 FALL FIREARMS TURKEY SEASON

The 1994 fall firearms turkey season resulted in a harvest of 19,842 birds, up 48% from last year's fall harvest (Table 1). Juvenile birds composed 59% of the harvest. The increased harvest and number of hunters (permit sales were up 16% over 1993) was a reflection of the best hatch Missouri has seen in 4 years. The pattern of permit sales and harvest (Table 1) indicate that Missouri's fall firearms season is "self regulating". When turkey numbers go up, permit sales go up, and the harvest increases; when turkey numbers go down, permit sales go down, and the harvest decreases.

POPULATION STATUS

After 6 average or below average hatches (1988-1993) (Figure 1), wild turkey populations indices in 1993 were down when compared with those in 1985 and 1987. Since 1983, volunteer archers have recorded the number of wild turkeys, deer, and furbearers seen while bowhunting in October and November. On a statewide basis, the number of wild turkey sightings per 1,000 hours of bowhunting in 1993 was 31% below the record number observed in 1987 and 15% below the 10-year average (1983-1992) (Figure 3). On a regional basis, the 1993 indices for the Northeast, Union Breaks, Mississippi Lowlands, Ozarks East, and Ozarks West regions showed declines of 25% or greater from the 10-year average while the Northwest and West Prairie region showed increases of 16 and 40%, respectively (Figure 4). Given the 1994 hatch, however, I expect population levels and the 1994 archer indices to increase substantially in most regions of the state.

ACCIDENTS

There were 3 non-fatal and 1 fatal accident during the 1993 fall firearms season (Table 3). The fatality during the 1993 fall season was caused by the illegal use of a center-fire rifle. An 80-year old grandfather mistook his grandson for a turkey. There were 7 non-fatal and 1 fatal accident during the 1994 spring season. The fatality resulted from the victim climbing into or out of a tree stand with a loaded shotgun which went off. During the 1994 fall firearms season, there were 6 non-fatal accidents. Mistaken-for-game is still the primary cause of these accidents. Although turkey hunting accidents seem to be on the decline in Missouri, the need to stress turkey hunting safety continues.

TABLE 1. Fall firearms turkey season harvest and permit sales, 1985-1994.

Year	Fall Firearms Harvest	% Change From Previous Year	Fall Permit Sales	% Change From Previous Year
1994	19,842[a]	+47.9	39,773[a]	+15.7
1993	13,418[a]	-21.4	34,379	-4.6
1992	17,061	-13.8	36,033	-3.8
1991	19,788	+23.6	37,469	+1.0
1990[b]	16,015	-27.6	37,080	-21.0
1989	22,131	-4.1	46,946	-7.4
1988	23,080	-18.0	50,715	-4.2
1987	28,139	+33.9	52,922	+13.4
1986[c]	21,019	+72.6	46,688	+28.9
1985	12,181	-	36,218	-

[a]Preliminary data.
[b]Permit fee increase.
[c]Bag limit was increased from 1 to 2 birds.

TABLE 2. Spring turkey season harvest and permit sales, 1985-1994.

Year	Spring Harvest	% Change From Previous Year	Percent Success[c]	Spring Permit Sales	% Change From Previous Year
1994	37,918[a]	+10.4	33	90,810	0.0
1993	34,354	+4.0	30	89,899	+0.1
1992	33,035	+2.5	30	89,803	+0.8
1991	32,237	+7.3	29	89,077	-3.3
1990[b]	30,056	-15.6	27	92,093	-0.9
1989	35,618	+7.3	31	92,901	-1.5
1988	33,187	-7.7	29	94,301	+10.0
1987	35,951	+16.1	33	85,723	+9.9
1986	30,965	+25.0	31	77,972	+10.3
1985	24,770	-	25	69,945	-

[a]Preliminary data.
[b]Permit fee increase.
[c]Percent of permittees who hunted who killed at least 1 bird.

TABLE 3. Number of injuries during spring and fall firearms turkey season, 1986-1994. New regulations pertaining to safety were enacted beginning with the 1987 spring season.

Year	SPRING SEASON		FALL FIREARMS SEASON	
	Non-fatal Injuries	Fatal Injuries	Non-fatal Injuries	Fatal Injuries
1994	7	1[b]	6	0
1993	7	0	3	1[a]
1992	9	0	6	0
1991	16	0	4	0
1990	13	1	9	0
1989	21	0	9	0
1988	24	1	11	0
1987	15	0	15	0
1986	29	2	13	0

[a]Fatality due to illegal use of centerfire rifle in a case of the victim being mistaken for game.

[b]Fatality resulted from victim climbing into our out of a tree stand with a loaded shotgun which went off.

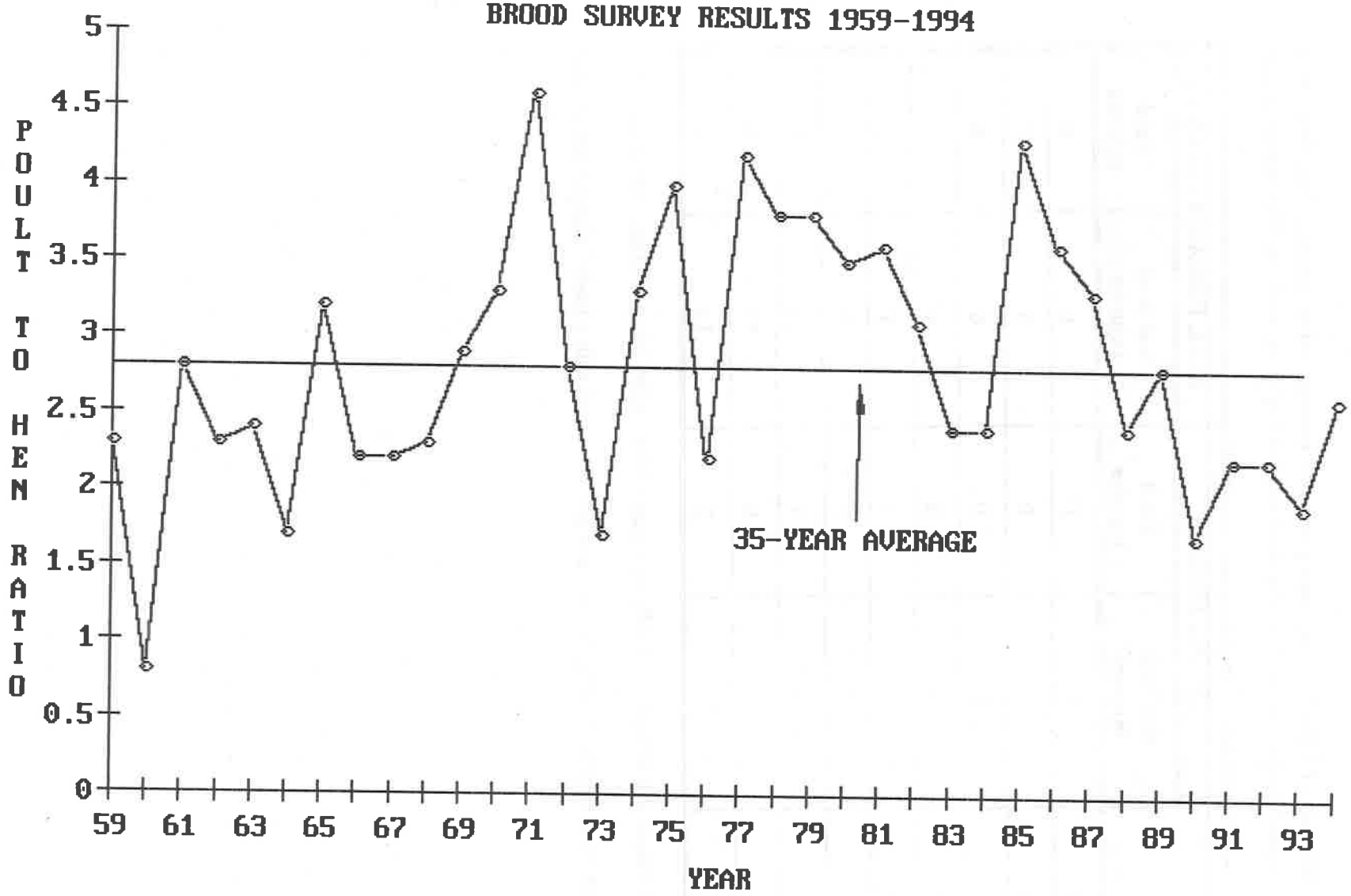


Figure 1. Poult to hen ratios from the annual brood survey, 1959-1994. The 35-year average poult to hen ratio is 2.8 poults per hen.

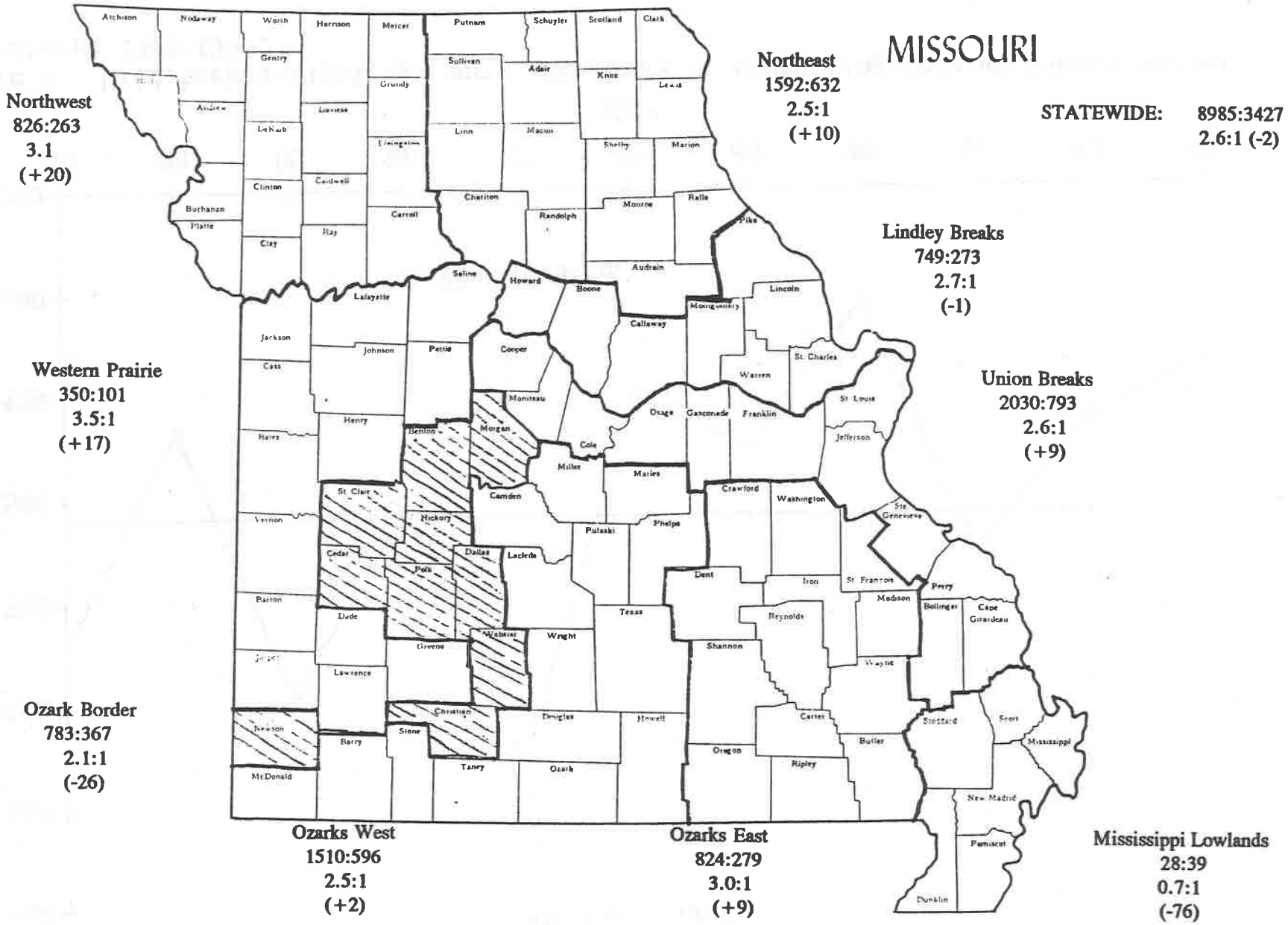


FIGURE 2. Wild turkey productivity indices by region for 1994 (final as of September 16, 1994). The values shown for each region are the number of poults observed: the number of hens observed, the poult to hen ratio, and the percent change of the 1994 poult to hen ratio from the previous 8-year average.

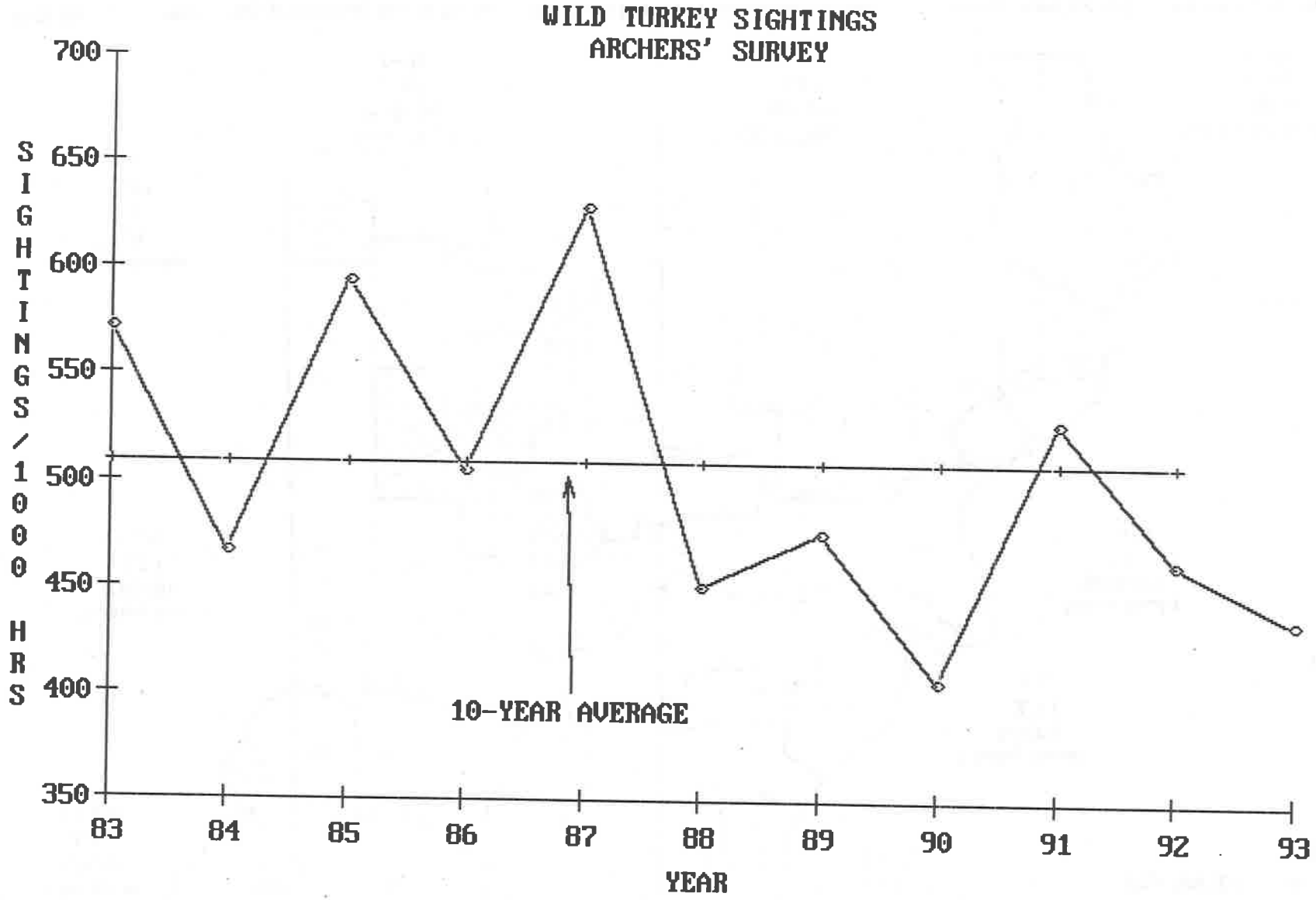


Figure 3. Wild turkey sightings per 1,000 hours of bowhunting from an annual survey of archers, 1983-1993.

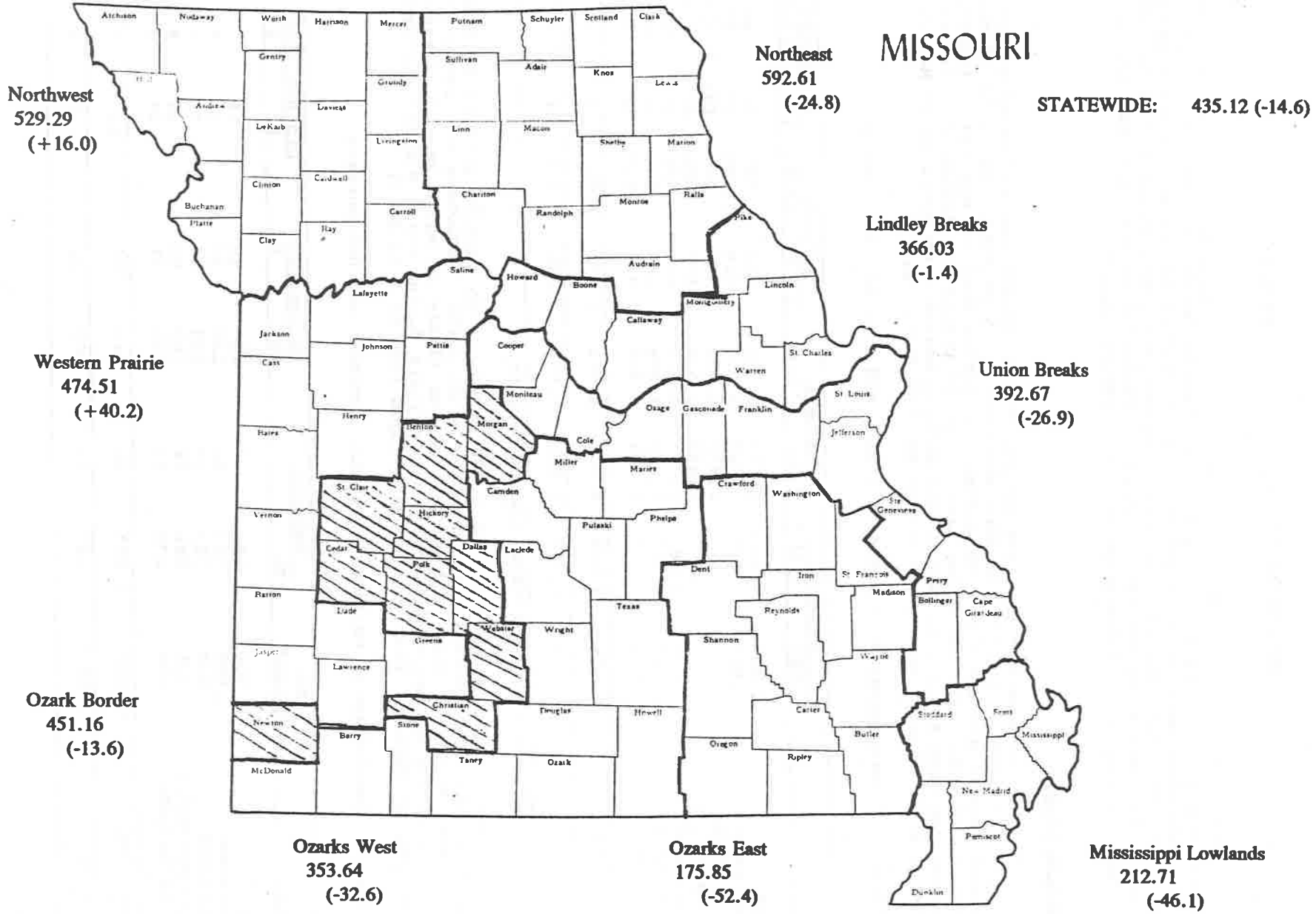


FIGURE 4. The 1993 archers' index for wild turkeys (sightings/1000 hours of bowhunting) by region. The percent change of the 1993 index from the 10-year average index (1983-1992) is shown in parentheses. The survey of archers was begun in 1983.

NEBRASKA TURKEY HARVEST REPORT

Turkey harvest and hunters are determined from mail questionnaires sent to permit buyers. A single mailing for each season results in returns of 56% to 67%. Estimated success rates and hunting activity of non-respondents are based on double mailings from 1987 to 1990: persons who answered the second mailing were 0.789 times as successful as those who responded to the first mailing, and nonhunters were 1.709 times greater in the second mailing.

Spring Season

Permit success for the 1994 spring shotgun season was estimated at 40%, with 3,917 turkeys taken by persons who held 9,815 permits. About 9% of the permit buyers did not hunt, so success of active hunters was 44%. Archery success was 20%, with 352 birds taken by 1,737 permittees (Table 1). Archery season ran from April 1 to May 15 and shotgun season from April 16 to May 15. The Verdigre "Early" season was 9 days and the "Late" was 21.

Table 1. Turkey permits, hunters, harvest, and success, 1993 and 1994.

Unit	Permits		Hunters		Harvest		% Success	
	1993	1994	1993	1994	1993	1994	1993	1994
East	1,655	1,689	1,539	1,541	641	741	39	44
Northwest	3,844	3,777	3,560	3,523	1,419	1,385	37	37
Niobrara	--	--	1,892	1,924	749	805	40*	42*
Panhandle	--	--	1,668	1,599	670	580	41*	36*
Southwest	1,658	1,680	1,542	1,517	664	696	40	41
Ver. Early	1,117	1,232	1,029	1,098	460	565	41	46
Ver. Late	1,500	1,437	1,306	1,268	488	530	33	37
Total Gun	9,774	9,815	8,987	8,945	3,672	3,917	38	40
Archery	1,563	1,737	1,520	1,676	246	352	16	20

*Success based on hunters rather than on permits

Questionnaires were mailed to 1,000 persons with regular permits in the Northwest and to 500 persons in each of the other units. Responses were received for 1,956 (55.9%) of the 3,500 surveys mailed (Table 2) which was the lowest return rate for a single mailing for the 6 years during which similar surveys have been conducted. Previous returns ranged from 57.9 to 66.8%.

Table 2. Questionnaire mailings, returns, success, and non-hunters.

Unit	No. Mailed	Returns		Successful		Did not Hunt	
		No.	%	No.	%	No.	%
East	500	284	57	137	48	19	7
Northwest	1,000	564	56	228	40	29	5
Southwest	500	283	57	129	46	21	7
Verdigre Early	500	288	58	145	50	24	8
Verdigre Late	500	270	54	110	41	24	9
Total Gun	3,000	1,689	56	749	44	117	7
Archery	500	267	53	60	22	7	3

The 1994 spring season provided about 41,000 man days of recreation (Table 3). The number of man days required to bag a bird was 17% less for shotgun hunters than in 1993, or, conversely, the bag per day was about 21% more.

Table 3. Average and total days hunted by unit.

	Average Days Hunted				Total Days Hunted		Hunter Days per Bird	
	Successful		Unsuccessful					
Unit	1993	1994	1993	1994	1993	1994	1993	1994
East	4.89	3.83	5.71	5.15	8,268	6,963	12.9	9.4
Northwest	3.17	2.73	3.54	3.03	12,101	10,271	8.5	7.4
Southwest	4.16	3.31	4.94	4.90	7,100	6,327	10.7	9.1
Verdigre Early	1.89	1.77	2.59	2.47	2,354	2,317	5.2	4.1
Verdigre Late	2.91	2.91	3.14	3.21	3,989	3,924	8.2	7.4
All shotgun	3.46	2.93	3.97	3.64	33,812	29,802	9.2	7.6
Archery	7.94	6.12	7.42	6.89	11,406	11,276	46.4	32.0

Envelopes for submission of wing feathers were included with each permit and 1,198 were returned, which represented 31% of the estimated harvest (Table 4). Thirty-eight percent of the usable shotgun samples were from juveniles (hatched in 1993), compared to 26% in 1989, 25% in 1990, 37% in 1992, 36% in 1992 and 24% in 1993.

Table 4. Age determined from wing feather samples.

	No.	% of	Age		Wrong	% Juvenile	
Unit	Returned	Harvest	Juvenile	Adult	Feathers	1993	1994
East	233	31	81	128	24	25	39*
Northwest							
Niobrara	221	27	80	121	20	22	40*
Panhandle	161	28	29	112	20	23	21
Southwest	258	37	83	149	26	26	33*
Verdigre Early	177	31	75	80	22	24	48*
Verdigre Late	148	28	54	76	18	27	42*
Total Gun	1,198	31	402	666	130	24	38*
Archery	79	22	26	45	8	42	37

*Significantly different from 1993

Fall Season

Estimated permit success for the 1994 fall shotgun season was 53%, with 2,911 turkeys taken by persons who held 5,478 permits. About 7% of the permit buyers did not hunt, so success of active hunters was 57%. Archery success was 19%, with 117 birds taken by 616 permittees (Table 5). Archery season ran from October 1 to November 11 and shotgun season from October 22 to November 11.

Table 5. Turkey permits, hunters, harvest, and success, 1993 and 1994.

Unit	Permits		Hunters		Harvest		% Success	
	1993	1994	1993	1994	1993	1994	1993	1994
East	569	587	515	536	241	258	42	44
Northwest	2,333	2,299	2,190	2,148	1,114	1,128	48	49
Niobrara	--	--	1,257	1,161	731	627	58*	54*
Panhandle	--	--	933	987	383	501	41*	51*
Southwest	1,058	1,074	990	997	523	621	49	58
Verdigre Early	909	1,518	810	1,441	534	894	59	59
Verdigre Late	649	--	573	--	352	--	54	--
Total Gun	5,518	5,478	5,078	6,022	2,764	2,911	50	53
Archery	550	616	468	540	85	117	16	19

*Based on hunters, not permits

Questionnaires were mailed to 1,000 persons with regular permits in the Northwest and to 500 in each of the other units. Responses were received for 1,731 (57.7%) of the 3,000 surveys mailed (Table 6). Rate of return from a single mailing was 62.0%, 62.2%, 61.1%, 59.9%, and 58.3% for 1989 through 1993, respectively.

Table 6. Questionnaire mailings, returns, success, and non-hunters.

Unit	No. Mailed	Returns		Successful		Did Not Hunt	
		No.	%	No.	%	No.	%
East	500	293	59	141	48	20	7
Northwest	1,000	575	57	310	54	29	5
Southwest	500	303	61	191	63	17	6
Verdigre	500	284	57	184	65	11	4
Total Gun	2,500	1,455	58	826	57	77	5
Archery	500	276	55	58	21	26	9

The 1994 fall season provided about 15,300 man days of recreation (Table 7). The kill per man day of gun hunting was up 3%, while permit success increased 6% and success of active hunters was up 4%.

Table 7. Average and total days hunted by unit.

Unit	Average Days Hunted				Total Days Hunted		Hunter Days per Bird	
	Successful		Unsuccessful					
	1993	1994	1993	1994	1993	1994	1993	1994
East	2.72	2.65	3.83	4.20	1,718	1,851	7.1	7.2
Northwest	2.05	1.88	2.46	2.74	4,961	4,863	4.4	4.4
Southwest	2.20	2.39	3.96	3.37	2,854	2,751	4.9	4.4
Verdigre*	1.80	1.68	2.21	2.76	2,703	3,012	3.1	3.4
Total Gun	2.06	2.00	3.06	3.04	12,236	12,477	4.5	4.3
Archery	4.65	3.97	5.91	5.66	2,582	2,874	30.4	24.4

* Combined Early and late for 1993

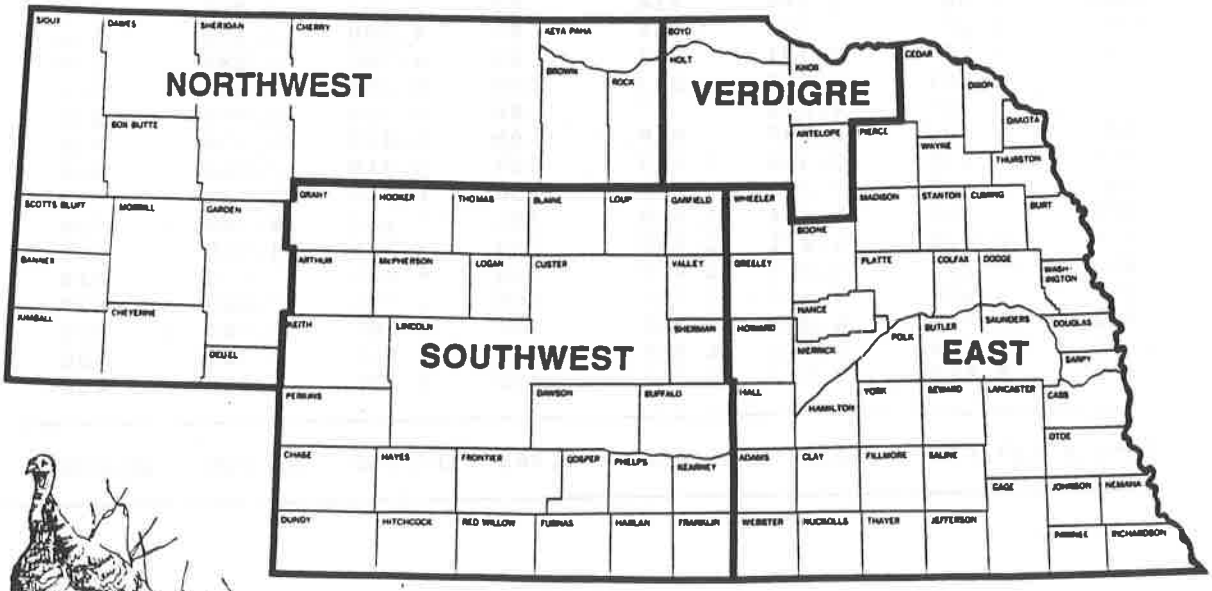
An envelope for submission of wing and breast feathers was included with each permit and 735 were returned by shotgun hunters (Table 8), which represented 25% of the estimated harvest. Ten percent of the samples were unusable, and only

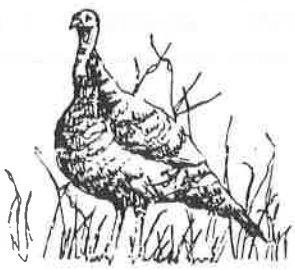
53% allowed determination of both sex and age. Sixty-six percent of the ageable samples were from juveniles compared to 54% in 1989, 64% in 1990, 71% in 1991, 50% in 1992, and 68% in 1993.

Table 8. Sex and age composition, fall turkey harvest.

	Juvenile			Adult			Unk. Age			
Unit	Male	Female	Unk.	Male	Female	Unk.	Male	Female	Unk.	Total
East	25	6	10	8	4	3	11	10	6	83
Niobrara	29	18	14	10	10	9	6	10	11	117
Panhandle	40	24	11	11	10	3	14	16	12	141
Southwest	33	19	34	16	16	14	15	16	15	178
Verdigre	42	22	28	13	33	20	19	23	26	216
Total Gun	169	89	97	58	73	49	65	75	70	735
Archery	8	1	4	1	1	2	5	2	4	28

TURKEY HUNTING UNITS





Permits and harvest for Nebraska turkey seasons

	Spring Gun		Spring Bow		Fall Gun		Fall Bow	
	Perm.	Harv.	Perm.	Harv.	Perm.	Harv.	Perm.	Harv.
1962	--	--	--	--	500	281	--	--
1963	--	--	--	--	1,000	555	--	--
1964	750	130	--	--	1,704	781	--	--
1965	768	188	--	--	2,261	1,094	--	--
1966	1,239	296	--	--	2,320	1,190	--	--
1967	1,231	243	--	--	2,072	807	--	--
1968	930	236	--	--	824	427	--	--
1969	1,185	323	--	--	1,994	860	--	--
1970	1,189	184	--	--	1,699	770	--	--
1971	1,192	269	--	--	1,700	835	--	--
1972	1,324	286	--	--	1,700	979	--	--
1973	1,335	363	--	--	1,700	692	--	--
1974	1,575	449	--	--	2,000	889	--	--
1975	1,875	490	289	21	2,011	1,138	170	47
1976	1,985	447	332	23	2,113	863	305	61
1977	1,852	482	168	14	1,799	988	164	35
1978	2,096	626	200	19	2,215	1,224	201	47
1979	2,468	947	319	48	2,808	1,556	348	85
1980	2,963	1,094	514	59	3,209	2,056	398	111
1981	4,200	1,729	755	84	4,298	2,199	616	130
1982	4,907	1,701	800	62	4,700	2,296	488	85
1983	5,087	1,693	823	102	5,274	2,805	461	91
1984	5,460	1,672	757	80	5,324	2,905	437	106
1985	6,230	2,287	828	99	5,393	2,908	495	106
1986	6,258	2,364	1,173	164	5,319	2,846	604	118
1987	6,652	3,020	1,270	236	6,015	3,910	663	197
1988	7,590	3,914	1,468	301	7,132	4,398	794	221
1989	8,645	4,271	1,560	323	7,736	4,018	868	180
1990	10,147	4,017	1,447	214	6,455	3,601	614	117
1991	9,678	3,982	1,447	165	6,570	3,815	630	151
1992	10,278	4,345	1,801	353	6,361	2,945	573	83
1993	9,774	3,672	1,563	246	5,518	2,764	550	85
1994	9,815	3,917	1,737	352	5,478	2,911	616	117
Totals	130,678	49,637	19,251	2,965	117,202	62,306	10,008	2,171

NORTH DAKOTA WILD TURKEY REPORT - 1994

Lowell A. Tripp

TRAP/TRANSPLANT PROGRAM

During the winter of 1993-1994, 250 wild turkeys were trapped and 136 of them were released at 4 different sites in 4 counties of North Dakota. In addition, 94 wild turkeys were sent to Idaho in a trade agreement. The turkeys released in North Dakota consisted of 22 adult gobblers, 44 adult hens, 31 juvenile gobblers, and 39 juvenile hens.

This year our trap/transplant program is continuing. We only trap and move birds from complaint areas. So far, about 150 birds have been trapped and released at 7 sites within the State.

SPRING HUNTING SEASON

During 1994, 18 hunting units were open for wild turkey gobbler hunting. All or part of 28 counties were open to hunting from April 16 to May 8. Shooting hours were from ½ hour before sunrise to sunset each day.

Permits were issued to 1,500 hunters (170 gratis and 1,330 general). Hunter questionnaire data indicated that 88.5 percent of the permittees hunted and harvested 555 bearded turkeys for a hunter success of 41.8 percent. Age data obtained from the tips of the primary feathers submitted by the hunters showed that 12.2 percent of the harvest were sub-adults and 87.8 percent were two years or more old. The 1994 spring hunters averaged 3.3 days afield.

A recommendation for 1,315 permits has been submitted for the 1995 spring season. This is a decrease of 185 permits from last year. The season will run from April 15 through May 7.

FALL HUNTING SEASON

Permits were issued to 3,546 hunters in the fall of 1993. Of those, 2,735 hunted and harvested 1,331 turkeys for a hunter success of 48.7 percent. We had two fall seasons with the early split opening on October 9 and closing on November 7. The late fall season started on November 8 and ended on December 5. Our 1993 fall hunters averaged 2.5 days afield hunting wild turkeys.

Feather samples obtained from 469 birds harvested during the 1993 fall season showed that 10.2 percent of the harvest were juvenile hens, 18.2 percent were juvenile males, 30.8 percent were adult hens and 40.8 percent were adult males.

In 1994, we opened the early season on October 8 and the late fall season ran from November 7 through December 4. Permits were issued to 3,154 hunters for the two fall seasons combined.

NORTH DAKOTA FALL WILD TURKEY HUNTING SEASONS

Year	Number of Permits Issued	Number of Hunters	Number of Birds Bagged	Percent Success
1958	376	376	88	23.4
1959	NO SEASON			
1960	NO SEASON			
1961	309	246	174	70.7
1962	426	392	241	61.5
1963	306	298	171	57.4
1964	404	386	198	51.3
1965	350	290	109	37.6
1966	NO SEASON			
1967	200	183	103	56.3
1968	200	178	97	54.5
1969	197	186	117	62.9
1970	197	180	131	72.8
1971	201	185	134	72.4
1972	227	205	129	62.9
1973	203	195	151	77.4
1974	307	285	213	74.7
1975	359	308	186	60.4
1976	500	466	353	75.8
1977	650	513	411	80.1
1978	844	737	540	73.3
1979	961	881	583	66.2
1980	1,135	1,029	736	71.5
1981	1,514	1,310	976	74.5
1982	1,501	1,361	975	71.6
1983	1,678	1,488	1,181	79.4
1984	1,707	1,521	1,197	78.7
1985	1,946	1,631	1,269	77.8
1986	2,126	1,861	1,324	71.1
1987	2,417	2,177	1,668	76.6
1988	5,938	5,098	3,607	70.8
1989	5,760	4,818	3,233	67.1
1990	4,735	3,845	2,556	66.5
1991	4,593	3,683	2,236	60.7
1992	3,605	2,938	1,830	62.3
1993	3,546	2,735	1,331	48.7

NORTH DAKOTA SPRING WILD TURKEY HUNTING SEASONS

Year	Number of Permits Issued	Number of Hunters	Number of Gobblers Bagged	Percent Success
1976	30	22	9	40.9
	NO SPRING WILD TURKEY HUNTING SEASONS 1977 THROUGH 1981			
1982	70	57	18	31.6
1983	160	146	61	41.8
1984	258	231	94	40.7
1985	283	257	130	50.6
1986	325	290	155	53.4
1987	455	387	232	59.9
1988	600	527	331	62.8
1989	843	753	502	66.7
1990	1,188	998	547	54.8
1991	1,490	1,319	658	49.9
1992	1,717	1,533	746	48.7
1993	1,807	1,605	696	43.4
1994	1,500	1,328	555	41.8

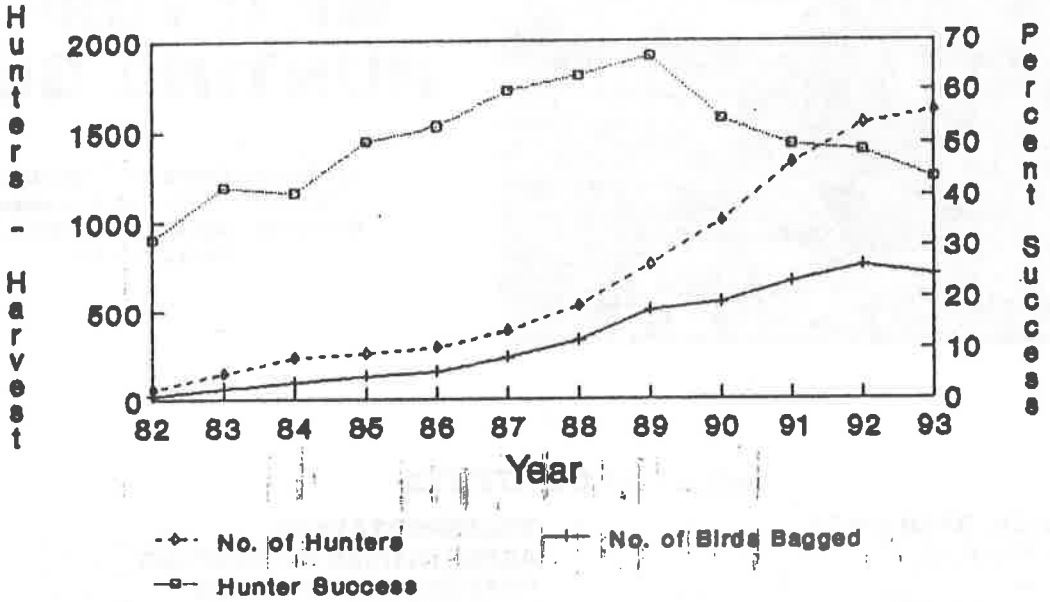
SPRING WING SURVEY

Year	Sample Size	Number of Adults	Number of Sub-Adults	Percent Sub-Adults
1985	50	38	12	24.0
1986	87	58	29	33.3
1987	102	67	35	34.3
1988	130	81	49	37.7
1989	240	182	58	24.2
1990	242	196	46	19.0
1991	222	182	40	18.0
1992	312	232	80	25.6
1993	338	264	74	21.9
1994	246	216	30	12.2

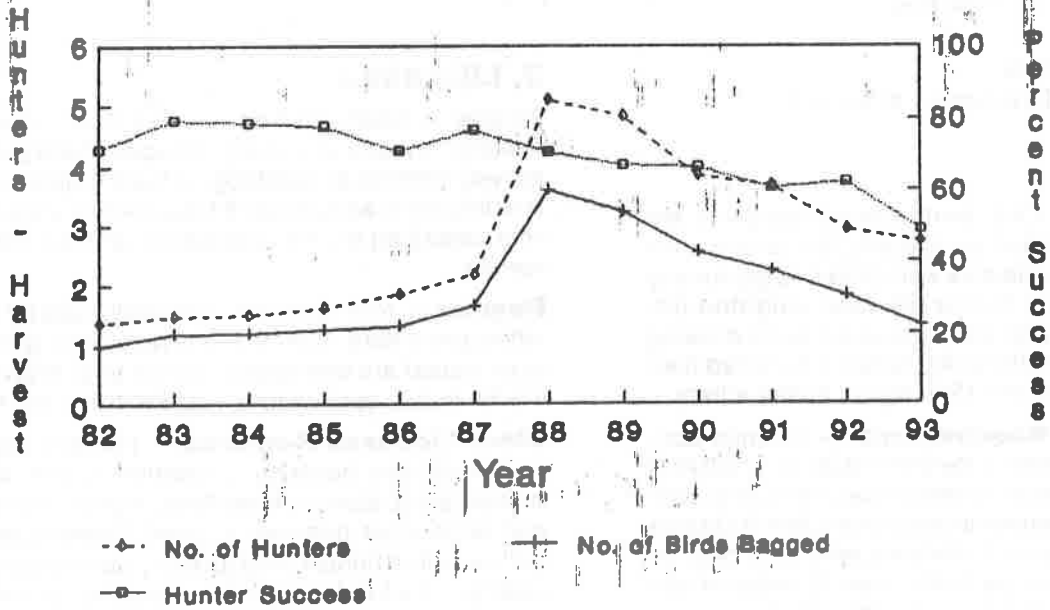
FALL WING SURVEY

Year	Sample Size	Percent of Total				Young per Ad. Female	Mean Hatch Date
		Juv.	Ad.	Male	Female		
1983	588	41.4	58.6	53.2	46.8	1.44	June 21
1984	643	47.7	52.3	57.4	42.6	2.14	June 14
1985	560	51.1	48.9	61.1	38.9	2.46	June 5
1986	562	47.7	52.3	58.8	41.2	2.15	June 15
1987	682	52.9	47.1	65.6	34.4	2.80	June 5
1988	925	35.7	64.3	62.7	37.3	1.50	June 3
1989	977	44.4	55.6	59.4	40.6	1.81	June 13
1990	744	46.1	53.9	61.3	38.7	2.19	June 13
1991	635	42.8	57.2	59.5	40.5	1.96	June 10
1992	647	41.5	58.5	62.6	37.4	1.78	undetermined
1993	469	27.8	72.2	59.7	40.3	0.96	undetermined

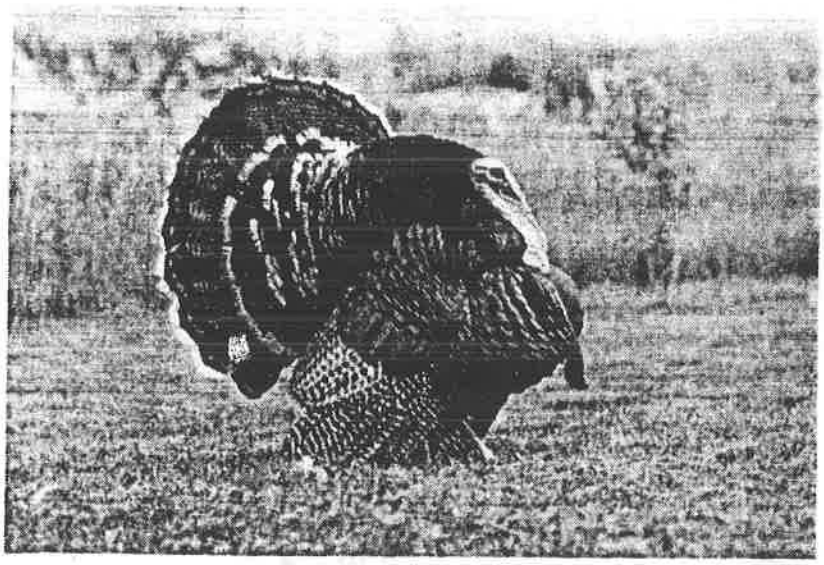
NORTH DAKOTA
Spring Wild Turkey Harvests



NORTH DAKOTA
Fall Wild Turkey Harvests



No. of hunters and harvest in thousands



1994 SPRING WILD TURKEY HUNTING GUIDE

North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, North Dakota 58501-5095
(701) 221-6300

TABLE OF CONTENTS

1. 1994 SPRING SEASON DATES, TIMES, OPEN AREAS:

SEASON	OPENS	CLOSES	AREAS	RESTRICTIONS
SPRING	APRIL 16	MAY 8	All units*	Restricted to spring season dates and unit described on license.

*See backside with map for unit boundaries.

HOURS OF HUNTING:

One-half (1/2) hour before sunrise to sunset.

2. ELIGIBILITY

Who May Apply — Only North Dakota residents are eligible. The waiting period on applying for certain units has been eliminated. Applicants were able to apply for any open turkey hunting unit. **Under the new weighted lottery system**, anyone who was unsuccessful in drawing their first choice in the 1993 spring turkey lottery had their name submitted twice in the 1994 spring turkey lottery.

Hunter Education Requirement — Persons born after 1961 must complete a certified state or provincial hunter education course and present the certification card earned to the license vendor to purchase a North Dakota hunting license. Exemptions: Persons who hunt only on land they own or operate; persons under 12 years of age (those under 12 may hunt if they have appropriate license and are accompanied by parent or guardian).

Minimum Age — Persons under 15 afield with firearms must be accompanied by parent, guardian, or adult authorized by their parent or guardian.

3. LICENSES

Gratis — Gratis licenses are available to North Dakota residents owning or leasing, for agricultural purposes and actively farming or ranching, at least a quarter-section of land located in an open hunting unit and are valid only upon land described on the application, and subsequently the license.

Regular — Non gratis licenses are issued by a weighted lottery procedure, after the total number of gratis licenses to be issued are deducted from the total available. Deadline for lottery applications was February 16, 1994.

Other Licenses Required — Hunters, regardless of age must also possess a General Game and Habitat license ($6.00 stamp). In addition, hunters 16 years of age and older must possess a Small Game license ($6.00 stamp) before hunting wild turkeys. (Gratis license holders exempt.) If you don't already have these 1993 hunting licenses, you may purchase them only through the Bismarck office of the North Dakota Game and Fish Department. The turkey license is issued in the form of a tag. All stamps must be signed in ink and affixed to the back of a fishing, hunting and furbearer certificate.

4. WEAPONS

Rifles — Muzzleloading long guns are legal.

Shotguns — Shotguns no larger than 10 gauge and capable of holding not more than three shells in the magazine and chamber are legal. Minimum barrel length is 18 inches. Fully automatic weapons are illegal.

Bows and Arrows — Bows must be pulled and released by hand and must be capable of casting a hunting arrow a distance of 130 yards. Electronic range finding devices or electronic sighting devices and stationary lighted sight pins cannot be possessed while hunting. Optical range finding devices are legal. Arrows must be at least 24 inches long, tipped with hunting points at least 3/4 inch wide and 1 1/2 inches long, and have at least two cutting edges.

OTHER WEAPONS RESTRICTIONS

* Crossbows are not legal, except with a permit from the game and fish director. (Arrow length limitations do not apply to crossbows.)
* It is unlawful to go afield with a firearm or bow and arrow while intoxicated.
* Firearms must be unloaded and encased within the boundaries of any national park.
* It is unlawful to hunt upon the premises of another within one-quarter mile (440 yards) of any occupied building, without the consent of the person occupying such building. **Note:** this restriction is not meant to prohibit persons from hunting upon their own land.

5. AIRCRAFT AND MOTOR VEHICLES

* Aircraft may not be used to drive, concentrate, rally, raise, stir up, spot, or disturb game.
* Motor vehicles may not be used to pursue game.
* It is unlawful to shoot with bow and arrow or firearm while in or on a motor vehicle.
* It is unlawful to carry a firearm in or on a motor vehicle with a shell in the chamber. For a muzzleloading long gun this means with a percussion cap on the nipple or powder in the flash pan.
* Motor vehicles may only be used on established roads or trails. Established roads or trails do not include temporary trails made for agricultural purposes.
* The use of all motor vehicles on wildlife management areas is restricted to those constructed roads, well worn trails, and parking areas normally used by passenger cars.

6. BAG LIMIT

Each license holder may take and possess one bearded wild turkey.

7. TAGGING REQUIREMENTS

Immediately after the turkey has been killed, the hunter must indicate the date of kill by cutting out the appropriate month and day from the tag provided with the license, and attach it around the leg of the turkey in an exact manner as described on the tag backing to prevent its removal. In no case is it legal to possess or transport a turkey unless it is properly tagged. The tag shall remain with the carcass until it is packaged as food.

8. TRANSPORTATION

License holders must accompany their wild turkey during transportation, except that it may be shipped by licensed public carrier in receipt of proper bill of lading.

9. AREAS CLOSED TO HUNTING

Federal or state properties such as refuges, sanctuaries, military installations, parks, and historic sites posted to trespassing or hunting are closed to the hunting of wild turkeys.

Exception: Use of firearms will be allowed to hunt wild turkeys during the spring wild turkey hunting season on those state wildlife management areas (located within open hunting units) which are posted as closed to firearms after May 1.

State School Land is open to public access including hunting unless posted with State Land Department signs. Contact the State Land Department for additional information regarding State School Lands.

10. POSTING AND TRESPASS

* It is unlawful to hunt on posted lands without permission from the owner or tenant. Trespass is a criminal violation punishable by suspension of hunting, fishing, and trapping privileges for a period of at least one year.
* Any person may enter upon legally posted land (without a weapon) to recover game shot or killed on land where he/she had a lawful right to hunt.
* It is unlawful to hunt in unharvested cereal crops and sunflowers without the owner's consent. Such crops also include alfalfa, clover, and other grasses grown for seed.
* It is unlawful for anyone but the owner or tenant to post land.
* It is unlawful to deface, take down, or destroy posting signs.
* Legal signs shall give notice that no hunting is permitted and shall give name of owner or tenant. Signs must be posted every one-half mile (880 yards) on unfenced areas and at the gates only on fenced areas.
* Failure to close gates upon exit or entry is a criminal violation, punishable by forfeiture of hunting licenses.

ROAD RIGHT OF WAYS

Do not hunt on road right of ways unless you are certain that they are open to public use. Most road right of ways are under the control of the adjacent landowner and are closed to hunting when the adjacent land is posted closed to hunting.

11. LICENSES AVAILABLE BY UNIT AND SEASON

UNIT	SPRING
02	35
10	75
13	50
15	35
17	75
19	125
21	35
23	20
25	200
27	175
34	75
37	35
40	50
45	40
50	200
70	50
98	25
99	200
Total	1,500

12. SUNRISE AND SUNSET TIMES

The time of sunrise and sunset at Bismarck is given below. The sun rises and sets one minute later for each 12 1/2 miles westward of Bismarck and one minute earlier for each 12 1/2 miles eastward of Bismarck.

DATE	SUNRISE	SUNSET	DATE	SUNRISE	SUNSET
APRIL			MAY		
16	6:54	8:31	1	6:28	8:51
17	6:52	8:32	2	6:27	8:53
18	6:50	8:34	3	6:25	8:54
19	6:49	8:35	4	6:24	8:55
20	6:47	8:37	5	6:22	8:57
21	6:45	8:38	6	6:21	8:58
22	6:43	8:39	7	6:19	8:59
23	6:42	8:41	8	6:18	9:01
24	6:40	8:42			
25	6:38	8:43			
26	6:37	8:45			
27	6:35	8:46			
28	6:33	8:47			
29	6:32	8:49			
30	6:30	8:50			

13. HUNTING UNIT DESCRIPTIONS

Unit 02 — An area in Barnes County starting at the junction of ND No. 32 and Interstate 94, then south on Hwy. 32 to ND No. 46, then west to ND No. 1, then north on ND No. 1 to Barnes County road No. 11 (at Rogers), then east on Barnes County road No. 11 five miles, then straight east 9 miles across Lake Ashtabula to Barnes County road No. 25, then south to Interstate 94 and then east on I-94 to the point of origin at the junction of ND No. 32 and Interstate 94.

Unit 10 — An area in Cavalier and Pembina counties starting at the west junction of N.D. No. 5 and N.D. No. 32, then north on N.D. No. 32 to the U.S.-Canadian border, then west to N.D. No. 1, then south to N.D. No. 5, and then east to the point of origin.

Unit 13 — Dunn County.

Unit 15 — That portion of Emmons County that lies west of US Highway 83.

Unit 17 — Those portions of Billings and Golden Valley counties north of Interstate 94.

Unit 19 — Grant County and that portion of Sioux County that lies west of ND No. 6.

Unit 21 — Hettinger County and Adams County.

Unit 23 — An area in LaMoure and Stutsman counties starting at the junction of ND No. 46 and LaMoure County road No. 61, then south on LaMoure County road No. 61 to LaMoure County road No. 34, then west to US Highway 281, then north to Stutsman County road No. 38, then east to Stutsman County road No. 62, then south on Stutsman County road No. 62 to ND No. 46 and then east on ND No. 46 to the point of origin at the junction of ND No. 46 and LaMoure County road No. 61.

Unit 25 — McHenry County.

Unit 27 — McKenzie County.

Unit 34 — An area in Pembina County starting at the junction of ND No. 32 and the U.S.-Canadian border, then south to ND No. 5, then east to the Minnesota-North Dakota border, then north to the U.S.-Canadian border, then west to point of origin.

Unit 37 — An area in Ransom, Richland, and Sargent counties starting at the east junction of ND No. 32 and ND No. 46, then east on ND No. 46 to the Minnesota-North Dakota border, then south to ND No. 13 at Wahpeton, then west on ND No. 13 to ND No. 32 at Gwinner, then north to the junction of ND No. 32 and ND No. 46 (the point of origin).

Unit 40 — Those portions of Bottineau and Rolette counties starting at Dunseith, then west on N.D. No. 5 to N.D. No. 14, then north to the U.S.-Canadian border, then east to N.D. No. 30, then south to Rolette County Highway No. 43, then west to U.S. Highway 281, then south to Dunseith (the point of origin).

Unit 45 — Stark County.

Unit 50 — Those parts of Cavalier, Pembina, Ramsey, and Walsh counties starting at the junction of N.D. No. 1 and N.D. No. 5 at Langdon, then east on N.D. No. 5 to N.D. No. 18, then south to N.D. No. 17, then west on N.D. No. 17 to N.D. No. 1, then north to N.D. No. 5 (the point of origin).

Unit 70 — Those parts of LaMoure and Ransom counties bounded by N.D. No. 46 on the north, N.D. No. 32 on the east, N.D. No. 27 on the south and N.D. No. 1 on the west.

Unit 98 — Those parts of Burleigh and McLean counties west of US Highway 83 and south of the Snake Creek Embankment. Turkey calls must be used while hunting turkeys in Unit 98.

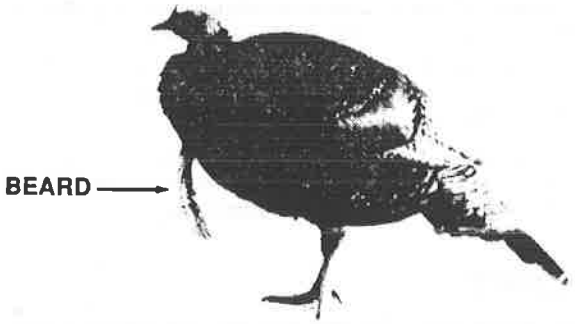
Unit 99 — Mercer, Morton and Oliver counties.

Indian Reservations — Portions of some units are located on Indian Reservations. Contact reservation tribal offices for more information.

- **Fort Berthold.** Department of Natural Resources, Box 460, New Town, ND 58763, (701) 627-3627.
- **Standing Rock.** Game and Fish Department, Box D, Fort Yates, ND 58538, (701) 854-7236.

14. WILD TURKEY IDENTIFICATION

Only bearded wild turkeys are legal. See the beard before you shoot. (Some hen turkeys grow beards, and these by definition may legally be taken.)

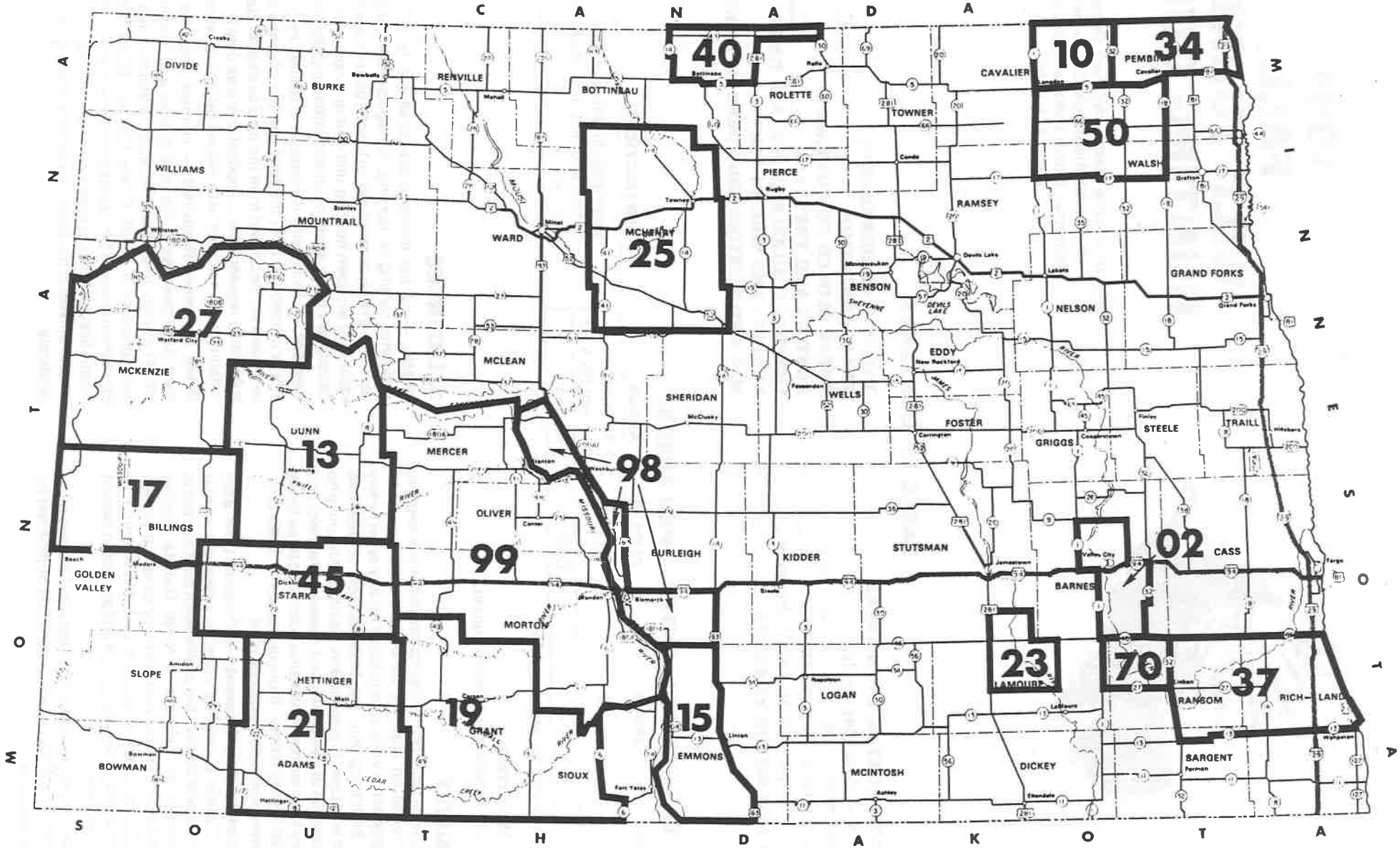


RAP Program (REPORT ALL POACHING). This program provides people the opportunity to report wildlife violations, remain anonymous if they prefer and to receive monetary rewards for convictions based on their information. Anonymous callers will be given a special code number and are not required to give their name. Rewards range from $50 to several hundred dollars depending upon the nature and seriousness of the crime.

Call 1-800-472-2121

The reward fund is supported by private donations. If you wish to donate to the RAP program, tax deductible contributions can be sent to R.A.P., Box 601, Casselton, ND 58012.

15. 1994 SPRING WILD TURKEY HUNTING UNITS



The North Dakota Game and Fish Department does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in employment or the provision of services.

1994 FALL WILD TURKEY HUNTING GUIDE

North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, North Dakota 58501-5095
(701) 221-6300

TABLE OF CONTENTS

1. 1994 TIME PERIODS, DATES, OPEN AREAS:

TIME PERIOD	OPENS	CLOSES	AREAS	RESTRICTIONS
EARLY	OCT. 8	NOV. 6	All units* except 98 & 99	Restricted to dates of time period and unit described on license.
LATE	NOV. 7	DEC. 4	All units*	

*See backside with map for unit boundaries.

HOURS OF HUNTING:
One-half (1/2) hour before sunrise to sunset.

2. ELIGIBILITY

Who May Apply — Only North Dakota residents are eligible. The waiting period on applying for certain units has been eliminated. Applicants were able to apply for any open turkey hunting unit. Beginning with the 1993 season, a weighted lottery system was used to issue turkey licenses. Anyone who was unsuccessful in drawing their first choice in the1992 and 1993 fall turkey lotteries had their name submitted three times in the 1994 fall turkey lottery. If unsuccessful in 1993 only, their names were submitted twice in 1994.

Hunter Education Requirement — Persons born after 1961 must complete a certified state or provincial hunter education course and present the certification card earned to the license vendor to purchase a North Dakota hunting license. Exemptions: Persons who hunt only on land they own or operate; persons under 12 years of age (those under 12 may hunt if they have appropriate license and are accompanied by parent or guardian).

Minimum Age — Persons under 15 afield with firearms must be accompanied by parent, guardian, or adult authorized by their parent or guardian.

3. LICENSES

Gratis — Gratis licenses are available to North Dakota residents owning or leasing, for agricultural purposes and actively farming or ranching, at least a quarter-section of land located in an open hunting unit and are valid only upon land described on the application and subsequently the license.

Regular — Nongratis licenses are issued by a weighted lottery procedure, after the total number of gratis licenses to be issued are deducted from the total available. Deadline for submitting regular lottery applications was July 6, 1994. Any remaining licenses are also issued by lottery procedure.

Other Licenses Required — Hunters, regardless of age must also possess a General Game and Habitat license ($6.00 stamp). In addition, hunters 16 years of age and older must possess a Small Game license ($6.00 stamp) or a Sportsmen license ($25.00 stamp) before hunting wild turkeys. (Gratis license holders exempt.) All stamps must be signed in ink and affixed to the back of a fishing, hunting and furbearer certificate.

4. WEAPONS

Rifles — Muzzleloading long guns are legal.

Shotguns — Shotguns no larger than 10 gauge and capable of holding not more than three shells in the magazine and chamber are legal. Minimum barrel length is 18 inches. Fully automatic weapons are illegal.

Bows and Arrows — Bows must be pulled and released by hand and must be capable of casting a hunting arrow a distance of 130 yards. Electronic range finding devices, electronic sighting devices and stationary lighted sight pins cannot be possessed while hunting. Optical range finding devices are legal. Arrows must be at least 24 inches long, tipped with hunting points at least 3/4 inch wide and 1 1/2 inches long, and have at least two cutting edges.

OTHER WEAPONS RESTRICTIONS

* Crossbows are not legal, except with a permit from the game and fish director. (Arrow length limitations do not apply to crossbows.)
* It is unlawful to go afield with a firearm or bow and arrow while intoxicated.
* Firearms must be unloaded and encased within the boundaries of any national park.
* It is unlawful to hunt upon the premises of another within one-quarter mile (440 yards) of any occupied building, without the consent of the person occupying such building. **Note:** This restriction is not meant to prohibit persons from hunting upon their own land.

5. AIRCRAFT AND MOTOR VEHICLES

* Aircraft may not be used to drive, concentrate, rally, raise, stir up, spot, or disturb game.
* Motor vehicles may not be used to pursue game.
* It is unlawful to shoot with bow and arrow or firearm while in or on a motor vehicle.
* It is unlawful to carry a firearm in or on a motor vehicle with a shell in the chamber. For a muzzleloading long gun this means with a percussion cap on the nipple or powder in the flash pan.
* Motor vehicles may only be used on established roads or trails. Established roads or trails do not include temporary trails made for agricultural purposes.
* Motor vehicles may not be used off established roads and trails on State Wildlife Management Areas, Federal Waterfowl Production Areas, and any areas where motor vehicles are restricted.

RAP PROGRAM (REPORT ALL POACHING)

This program provides people the opportunity to report wildlife violations, remain anonymous if they prefer and to receive monetary rewards for convictions based on their information. Anonymous callers will be given a special code number and are not required to give their name. Rewards range from $ 50 to several hundred dollars depending upon the nature and seriousness of the crime.

Call 1-800-472-2121

The reward fund is supported by private donations. If you wish to donate to the RAP program, tax deductible contributions can be sent to R.A.P., Box 601, Casselton, ND 58012.

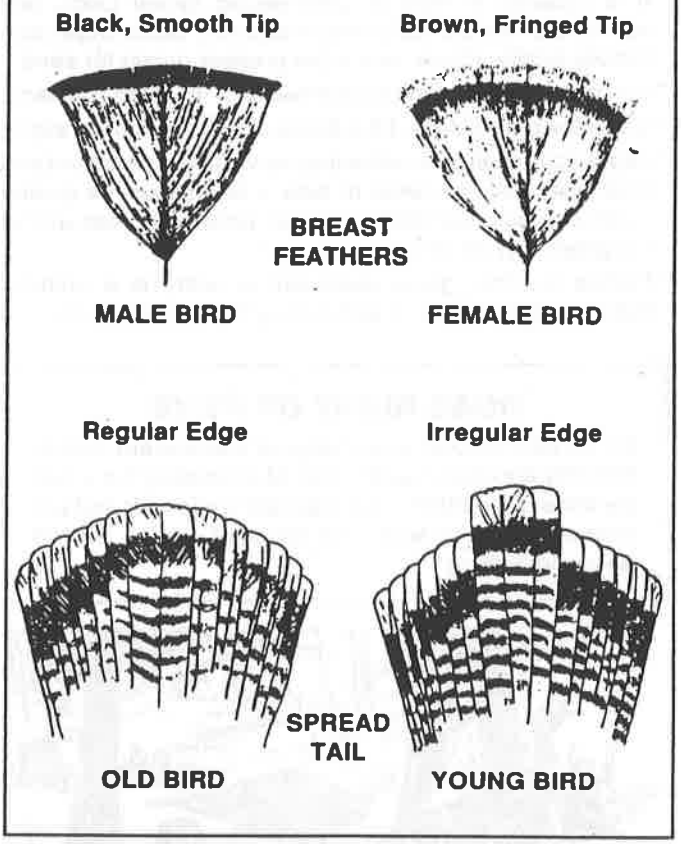
BE SAFE—WEAR ORANGE CLOTHING

It is recommended that turkey hunters wear a head covering and an outer garment above the waistline of solid daylight fluorescent orange color, totaling at least 400 square inches while hunting in an area where any big game gun hunting season is in progress.

6. BAG LIMIT

Each license holder may take and possess one wild turkey of any sex or age.

KNOW YOUR WILD TURKEY



7. TAGGING REQUIREMENTS

Immediately after a turkey has been killed, the hunter must indicate the date of kill by cutting out the appropriate month and day from the tag provided with the license, and attach it around the leg of the turkey in an exact manner as described on the tag backing, to prevent its removal. In no case is it legal to possess or transport a turkey unless it is properly tagged. The tag shall remain with the carcass until it is packaged as food.

8. TRANSPORTATION

License holders must accompany their wild turkey during transportation, except that it may be shipped by licensed public carrier in receipt of proper bill of lading.

9. AREAS CLOSED TO HUNTING

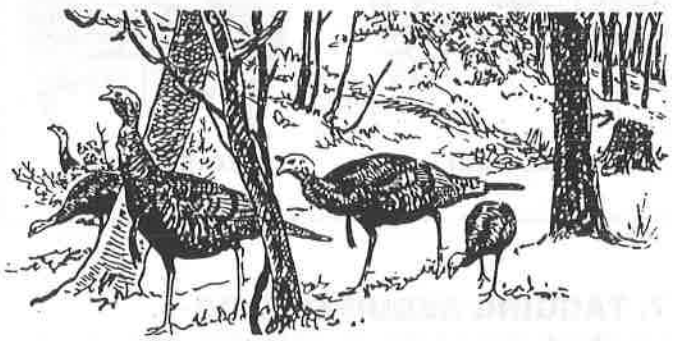
* Federal or state properties such as refuges, sanctuaries, military installations, parks, and historic sites posted to trespassing or hunting are closed to the hunting of wild turkeys.
* State School land is open to public access including hunting unless posted with State Land Department signs. Contact the State Land Department for additional information regarding State School lands.

10. POSTING AND TRESPASS

* It is unlawful to hunt on posted lands without permission from the owner or tenant. Trespass is a criminal violation punishable by suspension of hunting, fishing, and trapping privileges for a period of at least one year.
* Any person may enter upon legally posted land (without a weapon) to recover game shot or killed on land where he/she had a lawful right to hunt.
* It is unlawful to hunt in unharvested cereal crops and sunflowers without the owner's consent. Such crops also include alfalfa, clover, and other grasses grown for seed.
* It is unlawful for anyone but the owner or tenant to post land.
* It is unlawful to deface, take down, or destroy posting signs.
* Legal signs shall give notice that no hunting is permitted and shall give name of owner or tenant. Signs must be posted every one-half mile (880 yards) on unfenced areas and at the gates only on fenced areas.
* Failure to close gates upon exit or entry is a criminal violation, punishable by forfeiture of hunting licenses.

ROAD RIGHT OF WAYS

Do not hunt on road right of ways unless you are certain that they are open to public use. Most road right of ways are under the control of the adjacent landowner and are closed to hunting when the adjacent land is posted closed to hunting.



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- **Standing Rock.** Game and Fish Department, Box D, Fort Yates, ND 58538, (701) 854-7236.

11. LICENSES AVAILABLE BY UNIT AND TIME PERIOD

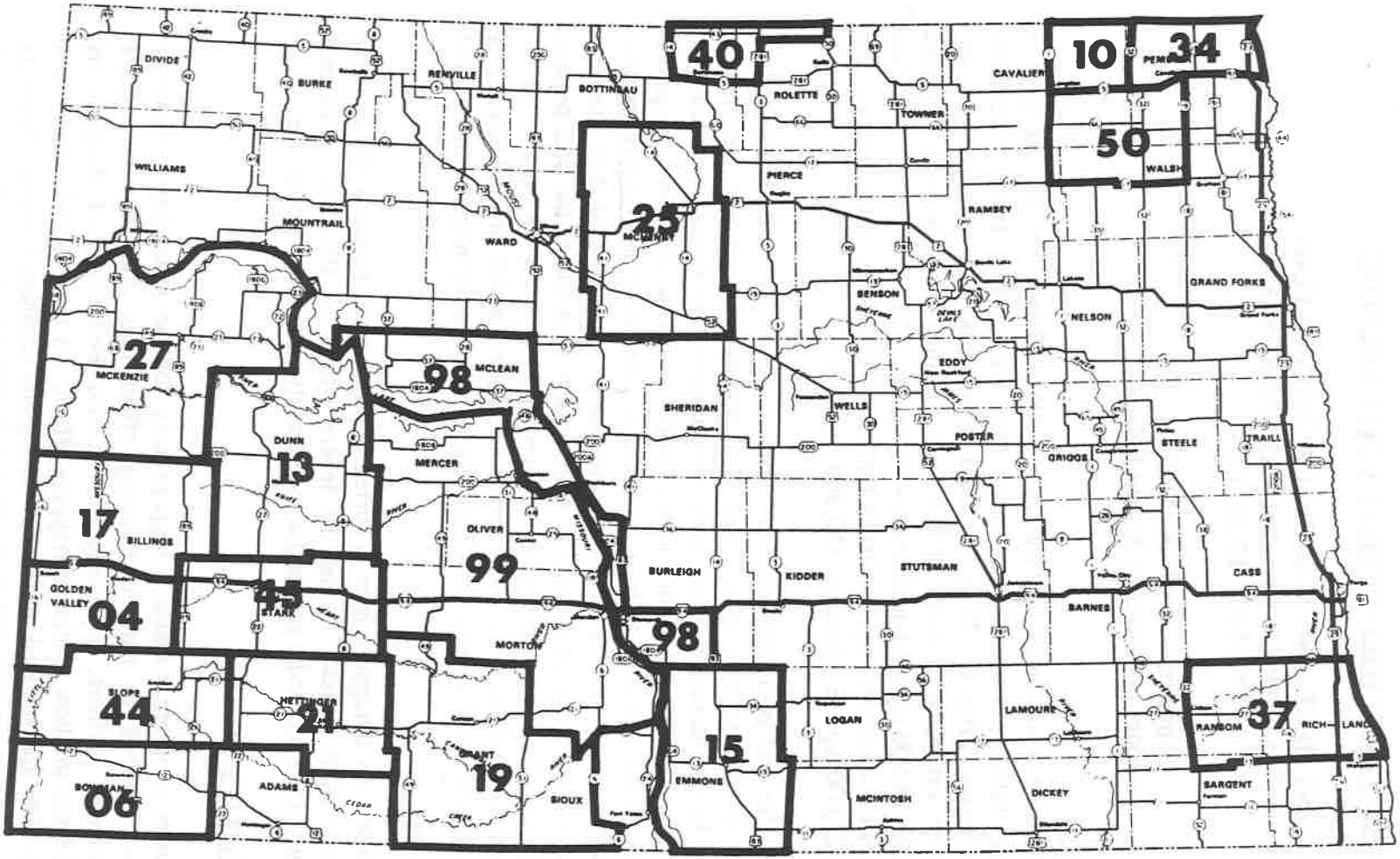
UNIT	TIME PERIOD EARLY	LATE
04	125	75
06	30	30
10	20	20
13	150	125
15	50	50
17	350	150
19	150	100
21	20	20
25	50	50
27	225	200
34	25	25
37	125	50
40	15	15
44	50	50
45	75	60
50	20	20
98	CLOSED	250
99	CLOSED	450
TOTAL	1480	1740

12. SUNRISE AND SUNSET TIMES

The time of sunrise and sunset at Bismarck is given below. The sun rises and sets one minute later for each 12 1/2 miles westward of Bismarck and one minute earlier for each 12 1/2 miles eastward of Bismarck.

CENTRAL DAYLIGHT TIME OCTOBER			NOVEMBER			DECEMBER		
DATE	SUNRISE	SUNSET	DATE	SUNRISE	SUNSET	DATE	SUNRISE	SUNSET
8	7:51	7:11	1	7:25	5:28	1	8:07	4:57
9	7:52	7:09	2	7:27	5:26	2	8:08	4:57
10	7:54	7:07	3	7:28	5:25	3	8:09	4:56
11	7:55	7:06	4	7:30	5:23	4	8:10	4:56
12	7:56	7:04	5	7:31	5:22			
13	7:58	7:00	6	7:32	5:21			
14	7:59	6:58	7	7:34	5:19			
15	8:01	6:56	8	7:35	5:18			
16	8:02	6:54	9	7:37	5:17			
17	8:03	6:53	10	7:38	5:15			
18	8:05	6:51	11	7:40	5:14			
19	8:06	6:49	12	7:41	5:13			
20	8:07	6:47	13	7:43	5:12			
21	8:09	6:46	14	7:44	5:11			
22	8:11	6:44	15	7:46	5:09			
23	8:12	6:42	16	7:47	5:08			
24	8:13	6:40	17	7:48	5:07			
25	8:15	6:39	18	7:50	5:06			
26	8:16	6:37	19	7:51	5:05			
27	8:18	6:36	20	7:53	5:04			
28	8:19	6:34	21	7:54	5:04			
29	8:21	6:32	22	7:55	5:03			
CENTRAL STANDARD TIME			23	7:57	5:02			
30	7:22	5:31	24	7:58	5:01			
31	7:24	5:29	25	7:59	5:00			
			26	8:01	5:00			
			27	8:02	4:59			
			28	8:03	4:59			
			29	8:05	4:58			
			30	8:06	4:58			

13. 1994 FALL TURKEY HUNTING UNITS



Unit 04 Those portions of Billings and Golden Valley counties south of I-94.

Unit 06 Bowman County.

Unit 10 An area in Cavalier and Pembina counties starting at the west junction of N.D. No. 5 and N.D. No. 32, then north on N.D. No. 32 to the U.S.-Canadian border, then west to N.D. No. 1, then south to N.D. No. 5, and then east to the point of origin.

Unit 13 Dunn County.

Unit 15 Emmons County.

Unit 17 Those portions of Billings and Golden Valley counties north of I-94.

Unit 19 Grant County and that portion of Sioux County that lies west of N.D. No. 6.

Unit 21 Hettinger County.

Unit 25 McHenry County.

Unit 27 McKenzie County.

Unit 34 An area in Pembina County starting at the junction of ND No. 32 and the U.S.-Canadian border, then south to ND No. 5, then east to the Minnesota-North Dakota border, then north to the U.S.-Canadian border, then west to the point of origin.

Unit 37 An area in Ransom, Richland and Sargent counties starting at the east junction of N.D. No. 32 and N.D. No. 46, then east to the Minnesota border, then south to N.D. No. 13 at Wahpeton, then west on N.D. No. 13 to N.D. No. 32 at Gwinner, then north on N.D. No. 32 to the point of origin.

Unit 40 Those portions of Bottineau and Rolette counties starting at Dunseith, then west on N.D. No. 5 to N.D. No. 14, then north to the U.S.-Canadian border, then east to N.D. No. 30, then south to Rolette County Highway 43, then west to U.S. Highway 281, then south to Dunseith (the point of origin).

Unit 44 Slope County.

Unit 45 Stark County.

Unit 50 Those parts of Cavalier, Pembina, Ramsey and Walsh counties starting at the junction of ND No. 1 and ND No. 5 at Langdon, then east on ND No. 5 to ND No. 18, then south to ND No. 17, then west on ND No. 17 to ND No. 1, then north to ND No. 5 (the point of origin).

Unit 98 Those parts of Burleigh and McLean counties west of U.S. Highway 83.

Unit 99 Mercer, Morton, and Oliver counties.

1994 ONTARIO WILD TURKEY STATUS REPORT

MIDWEST DEER AND TURKEY GROUP MEETING
EUGENE MAHONEY STATE PARK, NEBRASKA
JANUARY 15-18, 1995

presented by Mike Malhiot
report prepared by Karen Bellamy

POPULATION STATUS

Wild turkeys were extirpated from Ontario by the early 1900's. Between 1984 and 1987, a total of 274 birds were transferred into Ontario from New York, New Jersey, Vermont, Michigan, Missouri, and Iowa (Table 1). These introductions have been extremely successful, with the 1994 population estimated at over 10,000 birds (Table 2). The area of range occupied is approximately 14,000 square kilometers (5469 sq. mi.) (Fig. 1), about 15% of the 89,000 square kilometers of suitable turkey habitat in Ontario. Ontario's historic range has been estimated at about 27,000 square kilometers (10,500 sq. mi.).

Estimates of population size and occupied range are "best guesses" by field staff based on brood reports, expected nesting success, public and staff observations, hunter reports and mortality rates reported in the literature. Post card style observation forms, distributed to rural households are frequently used to monitor the success of new releases. Reported observations of wild turkeys by deer hunters have also been a valuable source of information. In the fall of 1992 and 1993 all deer hunters who participated in controlled deer hunts in southern Ontario were asked to record the number of wild turkeys seen during the deer season, on their mandatory report. Controlled deer seasons cover approximately 78 percent of the occupied range of turkeys in Ontario. We hope that these reports which are collected in a similar manner each year, will serve as an annual indicator of wild turkey population size and distribution.

Significant winter mortality was thought to have occurred in populations found at the northern edge of the turkey range (Barrie area), during the severe winter of 1993/94. This was reflected in a reduced spring harvest and a predominance of adult birds taken in this area.

RESTORATION ACTIVITIES

Ontario's trap and transfer program remains a high priority for the near future, however, budget constraints have resulted in reduced trapping effort over the past few years. Fortunately, non-government partners, especially the Ontario Federation of Anglers and Hunters, have provided funds to allow continued trapping efforts. A total of 210 turkeys were trapped last winter (1993/94) and released at 18 sites throughout southern Ontario (Table 3). A total of 804 birds have been trapped within the Province and released at 68 sites, since 1987.

In 1992, Ontario's Wild Turkey Working Group developed a set of broad criteria for ranking and categorizing potential release areas in Ontario (Table 4). Our objective was to use this criteria to help guide our trap and transfer efforts to stock birds on a priority basis in the best habitats first. The criteria are intended to be applied on a wildlife management unit (WMU) basis. Wildlife management units in Ontario are generally 1000 to 4000 square kilometers in size. Three main factors were identified as being critical to wild turkey habitat in Ontario. These include the percent of the total area in forest cover, the mean number of days with greater than 5 centimeters of snow on the ground, and ecoregion. Each ecoregion in Ontario is characterized by landforms and topography, hydrology, soils, vegetation and climate. For each factor (forest cover, snow, ecoregion) categories were established for what we felt constituted excellent turkey habitat down to poor or unacceptable conditions. Class 1 is considered our best habitat, class 2 areas contain adequate habitat to support turkey populations and class 3 areas are considered poor wild turkey habitat. Preliminary testing of the criteria in WMUs where wild turkeys were originally released and are thriving, suggest that the criteria are useful in assessing the quality of habitat for wild turkeys.

Table 5 shows those WMUs by class, which contain habitat suitable for turkeys. (The area of the WMU includes non-turkey habitat such as urban areas and waterbodies.) All of the fifteen WMUs identified as class 1, and 7 of the 14 WMUs identified as class 2, now support populations of wild turkeys. The total area of class 1 habitat is 39974 km2 which is 50% larger than the area identified as historical range.

The trap and transfer program will remain a high priority for the near future to hasten the spread of wild turkey and increase the benefits derived from the birds. In the winter of 1995, 8 trapping crews are active and attempting to capture birds for 12 new releases. A concerted effort is being made to have each release comprised of birds from a combination of the available genetic stocks.

HARVEST DETAILS

Spring wild turkeys seasons have taken place in early May of each year since 1987. From 1987 to 1990, the hunt consisted of two six day seasons (Monday to Saturday) during the first two weeks of May. In 1991, the hunt was expanded to a continuous 19 day season with a slightly earlier opening date (April 29). The changes in 1991 allowed hunters to hunt in any WMU with an open season (Figure 2). Prior to this, hunter numbers had been controlled by WMU and hunters were limited to hunting only in the WMU for which they had been selected. The changes to the season in 1991 also made participation by non-residents possible for the first time in Ontario. Since the 1991 changes to our season, bow hunting is permitted on Sundays during the open season.

Our season now begins on the first Monday following the last Saturday in April and ends on the Friday preceding the Victoria Day weekend in May. The season dates for each year since 1987 are identified in Table 6. The 1993 spring season was the longest to date (26 days). The 1994 season dates were from May 2nd to 20th.

The bag limit is one bearded wild turkey taken with archery equipment or a shotgun. Only shot sizes 4, 5, or 6 may be used. Hunting hours are from a half hour before sunrise to noon each day. It is mandatory for all hunters to check their bird. Artificial decoys were permitted for the first time in 1992. As in previous years, all hunters require a valid small game hunting licence and a wild turkey licence. Prior to purchasing a licence, hunters require a certificate verifying that they attended a wild turkey seminar and passed the required examination. To date approximately 13,350 people have attended the wild turkey hunter education seminars. This mandatory hunter training program is one of the key factors why there have been no hunting accidents during Ontario turkey seasons.

Table 6 compares the 1994 season with hunts in the previous seven years. Hunter success rates have increased in the past few years, with the exception of 1994, likely as a result of larger wild turkey populations, longer seasons, more experienced hunters and greater flexibility to hunt in more areas of southern Ontario. The total harvest in 1994 was 528 birds, similar to the 1993 harvest of 513. Over 3500 licences were sold in 1994, an increase of 21% from 1993. The severe winter of 1994 may have been a factor in causing the reduced success rate in the 1994 season.

Harvest data and other hunt information is collected from two sources. Biological data (eg. weight, beard length and spur length, age and sex - see Table 7) is recorded at the mandatory check stations. Information on other aspects of the hunt including when and where hunting occurred, numbers of turkeys seen and heard, number of other turkey hunters encountered and amount of money spent for turkey hunting, is collected from a voluntary questionnaire that is given to all turkey hunters who purchase a wild turkey licence. Return rates for the questionnaire ranged from 92% in 1987 to 39% in 1993.

RESEARCH AND MANAGEMENT ACTIVITIES

No research projects are being undertaken in Ontario at the present time.

The future of the wild turkey in southern Ontario continues to look good with a large area of suitable habitat still unpopulated. To date, the birds have proven to be adaptable and continue to expand their range. A provincial Wild Turkey Management Plan was completed recently, with the goal of providing long term direction for the wild turkey program. Included in the plan are operational tactics to help guide the continued welfare and spread of wild turkeys over the next five years.

UPCOMING HUNTING SEASON DATES

The spring season dates for 1995 are May 1 to 19. There are no fall seasons for wild turkey in Ontario at the present time.

TABLE 1

RELEASE SITE, DATE NUMBER OF BIRDS BY AGE & SEX, AND ORIGIN OF WILD TURKEYS RELEASED IN ONTARIO FROM AMERICAN SOURCES, 1984-1987

	RELEASE SITE Name(Lot,Con.,Twp.)	RELEASE DATE (M/D/Y)	NUMBER OF BIRDS RELEASED MALES Juv.	MALES Adult	FEMALES Juv.	FEMALES Adult	TOTAL	ORIGIN OF BIRDS
S - 1	Backus Woods (Lot 16,Con3, S. Walsingham)	03/03/84	0	0	2	9	11	Peck Ranch, Osark Mts.,S.Missouri
		03/06/84	0	3	0	0	3	Peck Ranch, Osark Mts.,S.Missouri
							14	
S -2	Big Creek(Lot 15, Con7, 8 N. Walsingham)	03/03/84	0	0	2	9	11	Peck Ranch, Osark Mts.,S.Missouri
		03/06/84	0	2	0	0	2	Peck Ranch, Osark Mts.,S.Missouri
		01/16/85	0	1	1	8	10	S. Iowa
		01/23/85	0	2	0	2	4	S. Iowa
		02/12/86	2	3	1	9	15	S. Iowa
							42	
NA - 1	Old Wooler Road(Lot 14, Con3, Murray)	03/16/84	5	2	17	1	25	N. Michigan
		03/21/84	1	0	16	2	19	N. Michigan
		03/22/84	3	0	0	0	3	N. Michigan
							47	
NA - 2	Sager Conservation Area Lot 19, Con 7, Sydney)	03/23/85	3	0	10	2	15	N. Michigan
		03/27/85	1	0	5	5	11	N. Michigan
							26	
NA - 3	Harrington Property	03/27/85	0	0	18	5	23	N. Michigan
H - 1	Kuepers(Lot 18,Con 1, Tosorontio)	01/11/86	8		27		35	NW. New York
NI - 1	Short Hills Provincial Park	01/13/86	0		12		12	Steuben Co., New York
		01/30/86	3		0		3	Steuben Co., New York
		02/11/86	0		7		7	Steuben Co., New York
		02/14/86	1	0	1		2	Steuben Co., New York
		02/16/86	1	0	0	2	3	Steuben Co., New York
		02/06/86	0	0	3	2	5	Vermont
		02/28/86	1	0	0	0	1	Vermont
							33	
C - 1	South Dumfries (Lot 1, Con. 4 S.Dumfries)	02/06/86	1	0	16		17	Vermont
		02/11/86	3	0	7		10	New York
		02/28/86	2	2	0	0	4	Vermont
							31	
L - 1	Manvers (Lot 15, Con 5, (Manvers)	01/24/87	0	2	5	4	11	Sussex Co. New Jersey
		02/11/87	2	4	0	0	6	Sussex Co., New Jersey
		02/25/87	0	0	0	6	6	Sussex Co., New Jersey
							23	

274 Birds from 6 States

TABLE 2

POPULATION STATUS OF WILD TURKEYS IN ONTARIO IN THE SPRING 1994

MNR District/Area	WMU	Estimated Number of Birds	Estimated Occupied Range (km^2)
Aylmer	91B	125	100
	92	400	200
Brockville	67	30	30
Cambridge	79	100	120
	87	1400-1900	1000
Chatham	93A	45	40
Cornwall	65	22	27
Lindsay	72	300-420	1400
	73	200-280	1200
	74	23	25
Maple	78	1500-2000	520
Midhurst	76	350	1900
	77	750	1200
	81	350	1100
Napanee	68	1000	840
	70	250	250
	71	850	560
Niagara	88	500	150
	89	700	800
Owen Sound	82	100	100
Simcoe	90	1500	2500
Wingham	85	150	100
TOTALS		10645 - 12845	14162

Figure 1

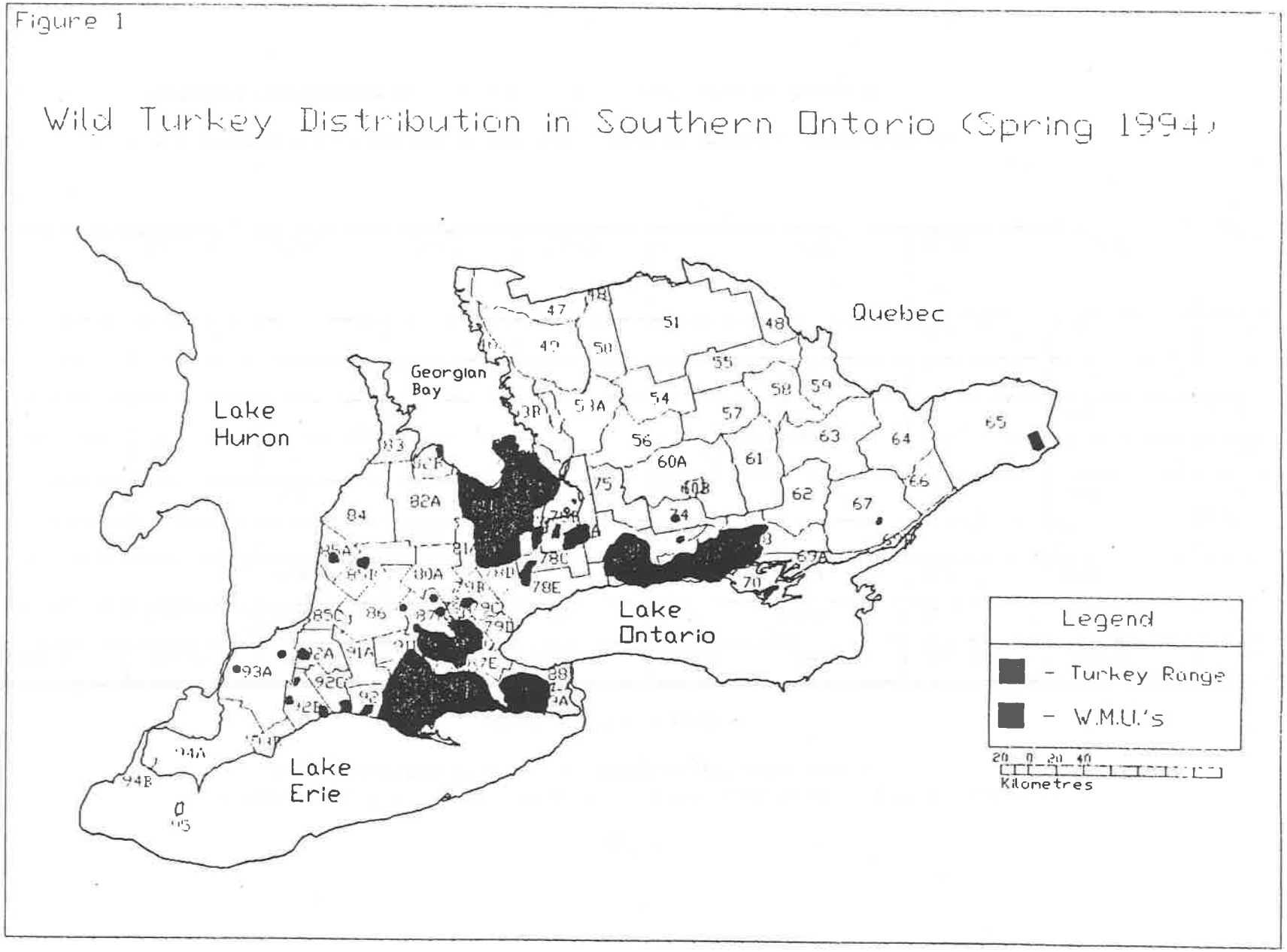

Wild Turkey Distribution in Southern Ontario (Spring 1994)
Lake Huron
Georgian Bay
Quebec
Lake Ontario
Lake Erie
Legend
- Turkey Range
- W.M.U.'s
20 0 20 40
Kilometres

TABLE 3

SUMMARY OF THE NUMBER OF WILD TURKEYS TRAPPED AND TRANSFERRED AND THE NUMBER OF RELEASE SITES, IN ONTARIO , 1986/87 - 1993/94

BIRDS (#SITES) PER SEASON

DISTRICT/AREA	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	TOTAL(1)
Simcoe	7(1)	37(6)	8(3)	40(5)	31(3)	74(7)	20(8)	43(6)	260(31)
Huronia	---	35(4)	37(5)	42(3)	17(2)	44(4)	44(9)	60(6)	279(30)
Lindsay	---	---	27(2)	13(2)	---	---	---	43(3)	83(7)
Cambridge	---	7(1)	3(1)	7(1)	---	20(3)	5(1)	29(4)	71(9)
Niagara	1(1)	3(1)	29(2)	19(3)	---	---	---	---	52(7)
Napanee	---	---	---	---	---	9(1)	---	17(1)	26(2)
Wingham	---	---	---	---	---	---	---	13(2)	13(2)
Maple	---	---	---	---	---	---	15(1)	5(1)	20(2)
TOTALS (2)	8(2)	82(11)	104(11)	121(11)	48(5)	147(13)	84(18)	210(18)	804(68)

TOTAL (1) - Total number of sites per district may not add across the seasons as some sites received birds in more than one year.

TOTAL (2) - Total number of sites may not add across the districts as some sites received birds from more than one district.

TABLE 4
ASSESSMENT OF WILD TURKEY RELEASE AREAS IN ONTARIO

Factor	Category	Score
% of total area in forest cover	> 75%	10
	41 to 75%	20
	26 to 40%	30
	16 to 25%	20
	10 to 15%	10
	< 10%	0
Mean # of days with > 5 cm of snow on the ground	< 60	30
	60 to 90	20
	90 to 120	10
	> 120	0
Ecoregion	southern agricultural	15
	central agricultural	10
	eastern midlands	5
	other	0

Class	Classification of WMUs Total Score and Additional Conditions
1	51 to 75
2	26 to 50
3	0 to 25 **OR** < 10% forest cover **OR** > 120 days with more than 5 cm of snow on the ground

TABLE 5
CLASSIFICATION OF WILD TURKEY HABITAT IN WMUs OF SOUTHERN ONTARIO

WMU	Class 1 Area(km^2)	turkeys present	WMU	Class 2 Area(km^2)	turkeys present	WMU	Class 3 Area(km^2)	turkeys present
65	6356	Y	63	3181	N	59	1767	N
68	2499	Y	64	2959	N	60	13800	N
70	994	Y	66	1465	N	61	9780	N
71	652	Y	67	3149	Y	62	2028	N
72	1416	Y	69	3540	Y	86	1200	N
73	2452	Y	74	2670	Y	88	540	Y
77	1603	Y	75	3060	N	93B	859	N
78	4998	Y	76	7500	Y	94	3662	N
79	1517	Y	80	1410	N			
81	1566	Y	82	7560	Y			
87	3248	Y	83	3840	N			
89	1907	Y	84	2850	N			
90	3726	Y	85	3720	Y			
92	4218	Y	91	2284	Y			
93A	2822	Y						
	39974			49188			33636	

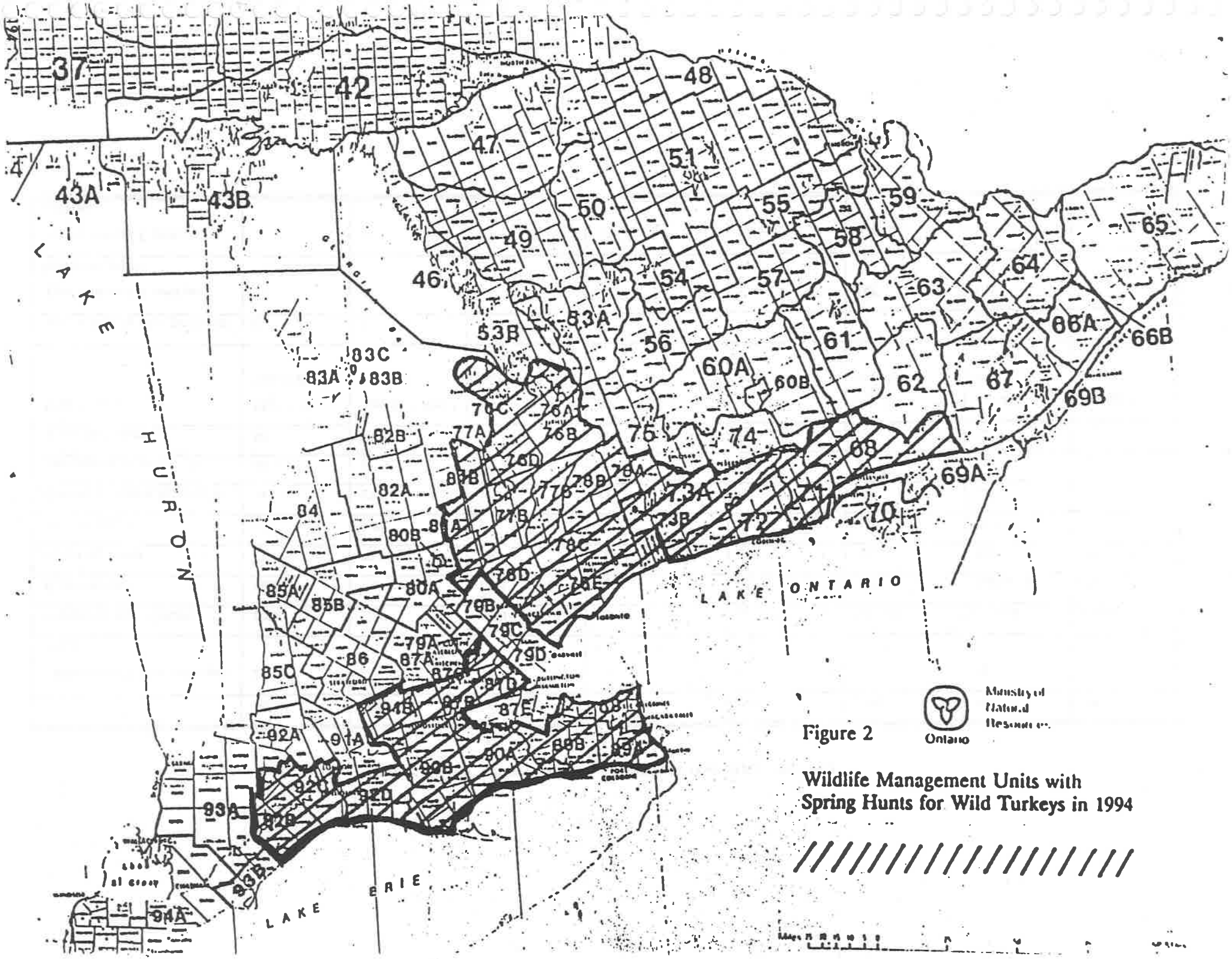


Figure 2

Wildlife Management Units with Spring Hunts for Wild Turkeys in 1994

TABLE 6

SUMMARY OF WILD TURKEY HARVESTS IN ONTARIO, 1987 - 1994

	1987	1988	1989	1990	1991	1992	1993	1994
#WMUs/sub-WMUs with open season	2	2	6	10	13	13	18	22
#Validation tags available	1000	1200	2600	4000	no limit	no limit	no limit	no limit
#Licences sold	1000	754	1466	2008	2153	2497	approx. 2800	3561
#Birds harvested	63	73	120	213	339	416	513	528
Success rate (%)	6.3	9.7	8.2	10.6	15.7	16.9	18.3	14.8
Gobbler portion of harvest (%)	54	63	57	53	67	56	---	60
Jake portion of harvest (%)	46	37	43	47	33	46	---	40
% novice hunters	94	50	61	47	60	46	---	---
Season dates	May 4 - 9 May 11-16	May 2 - 7 May 9 - 14	May 1 - 6 May 8 - 13	Apr30-May 5 May 7 -12	Apr 29 - May 17	Apr 27 - May 15	Apr 26 - May 21	May 2-20
Max. # hunting days per hunter	6	6	6	6	19	19	26	19
Total estimated $ spent per hunter in Ontario	---	---	---	---	$146	$98	$118	---
Total estimated $ spent in Ontario	---	---	---	---	$262,804	$222,013	$300,588	---

TABLE 7

CHECK STATION DATA SUMMARY 1988 - 1994

YEAR	AVERAGE WEIGHT (KG)	AVERAGE BEARD LENGTH (CM)	AVERAGE SPUR LENGTH (MM)
ADULTS (HENS EXCLUDED)			
1988	8.4	20.6	18.1
1989	9.1	22.9	22.5
1990	8.8	23.7	23.3
1991	8.6	21.5	21.4
1992	8.6	20.9	20.2
1993	---	---	---
1994	8.8	22.6	22.3
JUVENILES (HENS EXCLUDED)			
1988	6.4	10.0	6.8
1989	6.7	10.6	6.1
1990	6.5	9.8	5.8
1991	6.5	9.5	5.5
1992	6.5	9.8	6.1
1993	---	---	---
1994	6.5	9.8	5.4

WILD TURKEYS IN OHIO - 1994

(Bob Stoll)

1994 Season Results

Participants of the 1994 wild turkey season had the opportunity to harvest two gobblers during the April 25 - May 14 three week season. Paid permit hunters could purchase either one ($20.00) or two ($40.00) permits; a regular hunting license (resident = $15.00, nonresident = $91.00) was also required. Free permit recipients (≥66 yrs. old) and landowners/tenants hunting on their own land were exempt from license and permit requirements and were also permitted to take two birds. The second gobbler could only be taken during the third week of the season.

An estimated minimum of 40,459 (-1%) hunters participated. Total harvest reported through the mandatory check stations was 9,098, up 22% over the 7,470 reported in 1993. Jakes made up 48% of the harvest, up from 24% in 1993. Rangewide productivity was above the 10-year average for 1993; preliminary figures for 1994 are slightly lower than the 10-year average.

Paid hunters totaled 34,521 of which 5,187 (15%) purchased both permits. The one bird permit holders reported a 20.5% success rate and hunted 4.4 days. Twenty-eight percent of the 2-bird permit holders reported harvesting only one bird and 10% reported taking two; they hunted an average of 6.7 days.

The 2-bird season obviously increased hunting opportunity for 2-bird hunters as they averaged 1.7x more days hunted than the 1-bird hunters. This increased hunting opportunity does not appear to have increased hunting pressure during the third week of the season. Before implementation of a second bird regulation, 20% of the total season pressure occurred during the third week. After offering hunters this increased opportunity, hunting pressure during the third week was 24% of total pressure in 1993 and 26% in 1994. A more complete report of the 1994 season results is provided in the attached Wildlife Inservice Note.

Trap and Transfer

After stocking the last remaining sites in eastern Ohio, the focus of the 1994 trapping efforts was directed towards suitable watersheds in western Ohio's predominantly agricultural region. In total, 520 turkeys were relocated to 24 different sites. Suitable watersheds were >20,000 acres in size and approximately 15% forested. Viable turkey populations can now be found in 60 counties. Stocking will continue in other suitable western farmland areas where 39 release sites have been identified.

Odds & Ends

Hunting Accidents. Nine hunting accidents involving a total of 10 hunters were recorded during the 1994 season; no fatalities were recorded. The rate of 2.22 accidents and 2.47 victims per 10,000 hunters is well above the 1.22 accident rate (5 accidents) recorded in 1993 and is Ohio's fourth highest since 1984 (see attached report for accident history). To help promote safe turkey

hunting, the Division of Wildlife initiated an advanced turkey hunter education course in 1991. To date, 2,446 turkey hunters have received instruction through this program.

Fall Population Index. Division field personnel, while conducting personal interviews of early squirrel hunters on the opening day and first two Saturdays of the season, also obtain reports of the number of turkeys seen while squirrel hunting. The index, turkeys seen per 1000 hrs squirrel hunting, is correlated ($r = 0.90\pm$) with spring gobbling counts and turkey kill/mi^2 and appears to hold potential as a predictive index to upcoming fall and spring turkey abundance.

Gobbling Counts. The 1994 turkey gobbling index was 20% below 1993 levels. A 22% increase in the 1994 harvest, coupled with a 9% decline in total hunter effort, indicated that turkeys were more abundant than gobbling count results indicated. We think this apparent contradiction was the result of extremely poor productivity in 1992 followed by well above average productivity in 1993. This translated to a low number of adult and high number of juvenile gobblers in the 1994 spring population. Gobbling counts reflected the lower number of vocal adults, but hunter harvest and success was buffered by the high (48% in the kill) number of jakes.

Brood Observations. Brood observation results for June, July, and August, 1994 were 4.1 poults/hen, slightly lower than the 10-year average of 4.4.

Table 1. Ohio brood observations based on all June, July, and August hen and young observations, 1977-1994.

Year	Total Obs.	Total Hens	Total Young	Young Per Hen	10-Year Average
1977	16	26	94	3.6	-
1978	23	21	166	7.9	-
1979	11	9	93	10.3	-
1980	29	44	263	6.0	-
1981	28	38	119	3.1	-
1982	29	46	359	7.8	-
1983	19	36	85	2.4	-
1984	53	72	416	5.8	-
1985	50	66	370	5.6	-
1986	38	50	213	4.3	5.3
1987	81	107	381	3.6	5.0
1988	47	60	220	3.7	4.8
1989	66	101	474	4.7	4.7
1990	70	102	347	3.4	4.4
1991	60	77	459	6.0	4.7
1992	59	103	357	3.5	4.3
1993	118	227	1,087	4.8	4.6
1994[a]	152	260	1,064	4.1	4.4

[a]Preliminary results.

Safety Stickers. Hunters receive a safety sticker with their turkey permit, but its use is not mandatory. Voluntary compliance is about 40-50%. Wildlife officers also carry a supply and, as a safety reminder, hand them to hunters not using the one supplied with their permit.

Turkey Range Update. Wild turkey now occupy 14,000 mi^2 in 60 of Ohio's 88 counties (Table 1). This is more than 34% of the land area of the state.

Table 2. Distribution, occupied range, and estimated abundance of wild turkeys in Ohio.

	1982[a]	1988[b]	1994
Number of counties	32	46	60
Number of townships	229	395	689
Occupied range (mi^2)	2,964	5,845	14,000
Estimated population	7,677	28,100	95,000

[a]Donohoe et al. 1983
[b]Donohoe 1990.

1995 Spring Season. The 2-bird bag limit initiated in 1993 is being expanded to include the last two weeks rather than the last week of our three week season. In addition, the cost of turkey permits will increase from $16.00 to $20.00 and resident hunting licenses from $12.00 to $15.00.

1996 Spring Season. Two proposed changes for the 1996 spring season currently being considered are a 3-week, 2-bird bag limit and the opening of 2 counties to spring turkey hunting. The latter change will bring the number of counties open to spring gobbler hunting in 1996 to 46.

DRAFT

Division of Wildlife
Ohio Department of Natural Resources

Inservice Note
November 1994

TURKEY MANAGEMENT, 1994[1]

Robert J. Stoll, Jr., Forest Wildlife Research and Management Project, New Marshfield, OH 45766

W.L. Culbertson, Forest Wildlife Research and Management Project, New Marshfield, OH 45766

The Ohio Division of Wildlife's Wild Turkey Project involves four management elements: (1) population inventory, including annual updates of occupied range, (2) harvest management, (3) turkey population expansion through stocking, and (4) technical support and guidance for the Ohio State Chapter, National Wild Turkey Federation (NWTF). Information on population status has been previously reported (Culbertson 1994, Div. Wildl. 1994). This report summarizes harvest management, stocking, and NWTF technical guidance efforts in 1994 and is a supplement to "Ohio Wildlife Population Status and Hunting Forecast, 1994" (Div. Wildl. 1994).

Harvest Management

Hunters and Regulations. For the first time in Ohio's 29-year modern day turkey hunting history, permits for the 1994 turkey season (April 25-May 14) were available over-the-counter at regular license vending outlets. Permits could be purchased beginning in February through April 11. This departure from the traditional procedure of applying for a permit through the Columbus Headquarters affected only those hunters purchasing either one or two permits for the 1994 season. Hunting licenses and turkey permits for those individuals eligible for a free license and permit, primarily because they were 66 years old or older, were still issued through the Columbus office. Landowners and tenants hunting on land

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[1]Contribution from Federal Aid in Wildlife Restoration Act, W-134-P.

they owned or where they resided were exempt from all license and permit requirements. As in 1993, a basic 1-bird bag limit was in effect, however landowners, tenants, free license recipients, and those hunters purchasing a 2-bird bonus turkey permit were eligible to harvest an additional turkey. Hunting license and permit fees remained unchanged from a year earlier (license= $12.00 for residents and $81.00 for nonresidents, turkey permit= $16.00 each). For the 1994 season, a total of 29,334 individuals purchased 1 permit, 5,187 purchased 2 permits, and 46,428 were issued free permits (Table 1). The 80,949 permit holders for the 1994 season was up only slightly from the 1993 total of 79,481. Hunters purchasing a turkey permit received two "Be Safe" stickers which were attached to the permit and a turkey hunting safety brochure listing the turkey check station locations. The "Be Safe" stickers and safety brochure were a cooperative effort between the Division of Wildlife and the Ohio Chapter, NWTF as part of an ongoing turkey hunting safety awareness program. Individuals exempt from purchasing a permit could obtain a safety sticker and brochure from any district office or the Columbus Headquarters.

All hunters could take one bearded turkey anytime during the 3-week season. Those hunters eligible for the 2-bird bonus opportunity were restricted to the third week of the season for the second turkey. Legal shooting hours were one-half hour before sunrise until noon. As in previous years, turkeys could be hunted with shotgun, longbow, and crossbow. Successful hunters had until 2 p.m. on the day of harvest to register their bird at an official check station for permanent tagging. Forty-four counties were open to turkey hunting in 1994 and viable populations were present in 16 others (Fig. 1).

Harvest and Hunting Pressure. The 1994 harvest of 9,098 was 1,628 gobblers, or 21.8%, more than the 1993 total of 7,470 (Table 1). Second turkeys made up 7% (639 birds) of the total harvest. More than 93% of the successful turkey hunters used a call to bring their bird into effective range and 71.4% reported harvesting their turkey before 9 a.m. Juveniles comprised 48.3% of the 1994 harvest, well above the 23.5% recorded in 1993 and the 1979-94 average of 37.8%.

Factors contributing to this year's record harvest included overall good weather conditions during the season, a thriving turkey population, and the opening of 2 new counties to turkey hunting in 1994. Gallia County (589 birds) led the harvest, surpassing traditional leaders, Vinton (569), and Hocking (502); Jackson (386), and Coshocton (385) counties rounded out the top five (Table 2). Collectively, these counties accounted for nearly 27% of the statewide harvest. Wayne County and Morrow County were added to the list of counties open to turkey hunting in 1994, and harvests of 57 and 19 birds, respectively, were recorded. Nine turkey hunting incidents resulting in non-fatal injuries to 10 victims were reported in 1994 compared with 5 nonfatal incidents, each involving a single victim, in 1993 (Table 3). A 29-year summary of modern day turkey hunting in Ohio is presented in Table 4.

An estimated 40,459 individuals of the 80,949 who received either a paid or a free permit pursued a turkey during the 1994 season. This was down slightly from the 40,854 estimated hunters in 1993 (Table 1). Fewer hunters and less effort expended per hunter in 1994 resulted in an estimated 182,161 days hunted (Table 5), down more than 9% from the 200,750 days in 1993. Because landowners and tenants are exempt from license and permit requirements when hunting on their own land or on land where they reside, the estimated number of hunters and the projected number of days afield are considered minimum estimates. Based on check station information, hunter success rates in 1994 were generally equal to or slightly better than those in 1993 with those hunters purchasing two permits considerably more successful in harvesting their first bird than were either paid 1-bird or free hunters (Table 6). Results from mail surveys conducted in 1993 and 1994 were fairly similar to check station information. The obvious exception occurred in the percent of 1994 paid 2-bird hunters harvesting their first bird (Table 6). Overall, more than 46% of the hunting pressure (Fig. 2) and 60% of the harvest (Fig.3) occurred during the first week of the season in 1994 compared with 47% and 52%, respectively in 1993. Hunting effort and harvest for the second and third weeks were about equal. The weekly distribution of the 1994 and

1993 harvest was similar to that in 1992 when the bag limit was 1 bird. Among the various permit holder types, hunting pressure for both the 1-bird permit buyers and the free permit recipients declined as the season progressed (Fig. 4). The 2-bird permit buyers accounted for more than 17% of the total hunting pressure (Table 5) and hunted nearly as much the last week of the season as they did the first (Fig. 4).

Public land in Ohio remains important to both turkeys and the sport of turkey hunting. In 1994, more than 18% of the harvest occurred on public land (Fig. 5) which comprises less than 5% of the state's land base in those counties open to turkey hunting (ODNR 1991). Hunter density surveys conducted on a 4,893-acre portion of the Zaleski State Forest in Vinton County and on the 1,361-acre Waterloo Wildlife Area in Athens County averaged 9.6 and 9.4 hunters per square mile per day, respectively, for the first week of the 1994 season (Table 7). Pressure on the Zaleski study area was more than 3 times higher than in 1980. Hunting pressure on both areas declined by more than half during the last 2 weeks of the season. Hunter density on these 2 public areas during the third week of the 1994 season was comparable to that in 1992 and 1993 (Stoll and Culbertson 1992 and 1993), suggesting that the second turkey opportunity during the third week of the season did not materially increase hunting pressure on these areas.

Weights, Age and Hunting Devices. Whole body weights were obtained from 7,199 of the 9,098 turkeys harvested during the 1994 season (Fig. 6). Average weights for adults and juveniles were 20.4 and 15.3 pounds, respectively, compared with 18.9 and 14.1 pounds in 1993 (Stoll and Culbertson 1993) and 19.0 and 14.2 pounds in 1992 (Stoll and Culbertson 1992). Overall, mean body weights in 1994 equaled or exceeded those from previous years. This was surprising considering the record cold temperatures and heavy, but not persistent, snows that occurred during the winter.

Data collected from successful hunters checking their birds at the Waterloo Research Station in Athens County indicate that the 12 gauge continues to be the

most popular shotgun with 93.3% of the hunters reporting its use (Table 8). More than 57% of the hunters reported using a 3-inch shell, up from 47% in 1993. Nearly 52% of the turkeys registered were harvested with no.6 shot; 86.3% were harvested with no.4 shot or smaller. Reported decoy use was 19.7%, up from 13.1% in 1993, and 45.2% of the hunters used a "Be Safe" sticker compared with 53.6% in 1993. More than 52% of the hunters reported that they shot their birds between 20 and 35 yards (Fig. 7). Two-year-old birds comprised only 22% of the birds checked at Waterloo versus 59% the previous year; birds aged at 3 years (24%) were more numerous than 2-year-old birds (Fig. 8). Juveniles comprised a significant proportion of the harvest at Waterloo (38%) and rangewide (48%).

Stocking

A total of 24 sites had been aerially inspected and approved for wild turkey stocking entering the 1993-94 trapping period. Division of Wildlife trapping crews, aided by favorable trapping conditions (snow and cold temperatures), captured and stocked a record 520 birds covering all 24 approved sites (Table 9). Block stocking of the Tuscarawas-Carroll-Holmes-Stark-Columbiana County area was completed, wrapping up stocking efforts in Ohio's primary turkey range. Stocking efforts were then directed toward more marginal habitats in northwestern and western Ohio. Here, watersheds that were 15% or more forested and fairly well connected by brushland-woodland travel corridors had been previously identified in Defiance, Franklin, Fulton, Huron, Paulding, and Williams counties.

NWTF Technical Guidance

The Ohio State Chapter, NWTF raised approximately $100,000 from fund raising events in 1994. This money was deposited in the NWTF administered Ohio Super Fund and earmarked for in-state projects to benefit wild turkeys. Written guidelines have been cooperatively developed by the Division of Wildlife and the Ohio State Chapter, NWTF which designate that 70% of project expenditures go toward land acquisition and 30% toward management projects. A formal procedure

for approval of individual Super Fund projects and technical guidance provided by the Division help ensure that funds are spent on priority projects. Nearly $203,872 have been spent on projects to benefit wild turkeys from 1986 through July 1994 (Table 10). Several land acquisition projects are planned for 1994 and 1995 which will raise land acquisition from its current 59% to over 70% of Super Fund expenditures.

Discussion and Recommendations

An increase of nearly 22% in the 1994 harvest coupled with a 9% decline in total hunter effort indicate that turkey abundance was greater in 1994 than in 1993. This does not agree with the 20% decline observed in rangewide gobbling counts (Culbertson 1994). A possible explanation for this contradiction is the low proportion of 2-year-old birds in the spring population due to extremely poor production in 1992 (Culbertson 1993). This hypothesis is supported by the fact that only 22% of the 300 turkeys checked at the Waterloo Research Station were 2-year-old birds compared with 24% for 3-year-old birds (Fig. 8). Consequently, the abundance of adult males, which are the most vocal, may have been lower than in 1993 resulting in a decline in the gobbling counts. Lower adult male abundance, however, was buffered by bumper juvenile abundance resulting from above average productivity in 1993 (Culbertson 1994). This was reflected in increased hunter harvest with less overall effort and a harvest skewed to a well above average juvenile component (48%). This exemplifies the importance of annual production to turkey hunting success and the influence of population age structure on gobbling counts.

Turkey hunter numbers in 1994 remained essentially unchanged from 1993. This was unexpected, as hunter numbers had been increasing about 15% annually. April 11 was the cut off for purchasing turkey permits from license vendors. Some hunters were unaware of this cut off date and failed to obtain a permit. This may, in part, explain why hunter numbers did not increase in 1994. Interest in the sport of turkey hunting is expected to increase in subsequent

years.

The hunting incident rate of 2.2 per 10,000 hunters in 1994 is the highest since 1987 when a rate of 2.6 incidents per 10,000 hunters was recorded and the 4th highest since Ohio recorded its first incident in 1984 (Table 3). This reinforces the need for continued turkey hunter education. Currently, the Division of Wildlife includes a section on turkey hunting in the Ohio Hunter Safety Education Student Handbook which is the manual used in Ohio's hunter education program. This training is required of all first-time hunters in Ohio before a hunting license can be issued. Additionally, the Division offers an advanced turkey hunter education program. A total of 2,446 turkey hunters have received safety training through this program since its inception in 1991 (D. Brown, personal communication). The Ohio Chapter, NWTF has been assisting the Division in reaching even more hunters by providing "Be Safe" gun stickers and hunting safety brochures with each turkey permit sold. The Division in partnership with NWTF has also initiated a pilot project using interactive video in turkey hunter education (Wisse 1994). As the popularity of turkey hunting continues to grow, cooperation among individuals, sportsman's groups, and the Division of Wildlife will become even more important in preserving safe and ethical turkey hunting in Ohio.

In 1994, 15% of the paid-permit hunters purchased a 2-bird turkey permit, up from 12.2% in 1993 (Table 1). Despite an overall reduction in total hunter effort in 1994, the total number of recreational days for 2-bird permit holders increased nearly 3% over 1993. Additionally, hunting effort per person for the 2-bird hunters was 6.7 days compared to 4.4 days per hunter for 1-bird permit buyers in 1994 (Table 5). Restricting the second bird opportunity to the third week of the season appeared to result in a fairly even distribution of pressure during the last two weeks (Fig. 2). The additional harvest (639 birds) produced by the 2-bird opportunity accounted for only 7% of the total harvest, down from 7.5% in 1993. In 1995, regulations will be liberalized so that hunters may take their second turkey during either the second or third week of the season.

Potential stocking sites in western and southwestern Ohio were aerially inspected during the summer of 1994. A total of 40 release sites, primarily along watersheds, were selected and recommended for stocking in 1995 and beyond.

Acknowledgments. We thank the following: (1) S. Miller and G. Mountz, Information Management Section for key entry and summary of harvest data and conducting the postcard survey of turkey permit recipients; (2) Division of Wildlife personnel who collected the names of permittees for the mail survey and who serviced the check stations; (3) check station proprietors who generously contributed their time and facilities to check turkeys; (4) T. Kranyik for assistance with tabulation of data and typing this paper; and (5) D. Risley and L. Smith for editorial comment.

LITERATURE CITED

Culbertson, W.L. 1993. Wild turkey cooperative observation results, 1992. Ohio Dept. Nat. Resour., Div. Wildl. Inserv. Note 675. 12pp.

_____. 1994. Wild turkey cooperative observation results, 1993. Ohio Dept. Nat. Resour., Div. Wildl. Inserv. Note 686. 15pp.

_____. 1994. Grouse-turkey survey results, 1994. Ohio Dept. Nat. Resour., Div. Wildl. Inserv. Note 695. 6pp.

Division of Wildlife. 1994. Ohio wildlife population status and hunting forecast, 1994. Div. Wildl. report. Columbus.

Ohio Department of Natural Resources. 1991. Land inventory. Office of Real Estate and Land Manage. Columbus. 161 pp.

Stoll, R.J. and W.L. Culbertson. 1992. Turkey harvest management, 1992. Ohio Dept. Nat. Resour., Div. Wildl. Inserv. Note 666. 9pp.

_____ and _____. 1993. Turkey harvest management, 1993. Ohio Dept. Nat. Resour., Div. Wildl. Inserv. Note 682. 13pp.

Wisse, J. 1994. Hunt simulator developed. Turkey Call, 21(5):57.

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Table 1. Turkey gobbler hunting season statistics for 1994 compared with those for 1993.

	1994 Season	1993 Season
Number of applicants and turkey permits issued.		
Paid, 1-bird	29,334	29,538
Paid, 2-bird bonus	5,187	4,106
Free	46,428	45,837
Total	80,949	79,481
Estimated total number of permittees who hunted[1]		
Paid, 1-bird	26,401	25,993
Paid, 2-bird bonus	4,772	3,860
Free	9,286	11,001
Total	40,459	40,854
Total harvest by permit holder type		
Paid, 1-bird	4,398	3,995
Paid, 2-bird bonus	2,581	2,160
Paid, unknown permit type	124	--
Free	785	505
Landowner w/o permit	1,207	810
Unknown hunter type	3	--
Total	9,098	7,470
Number of hunters who harvested a bonus gobbler	639	559
Percent of successful hunters who used a turkey caller	93.5	93.7
Percent of harvest before 9:00 a.m.	71.4	82.7
Percent juvenile gobblers in harvest	48.3	23.5

[1]Participation rates based on mail survey results in Stoll and Culbertson (1993) and Table 5, this report.

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Table 2. Results of Ohio's 1994 spring turkey harvest, by county, compared with the 1993 spring harvest.

County of Harvest	1993 Apr.26-May 15	1994 Apr.25-May 14	29-Year Total (1966-1994)	County of Harvest	1993 Apr.~~27~~26-May ~~16~~15	1994 Apr.~~26~~25-May ~~15~~14	29-Year Total (1966-1994)
Adams[1]	278	270(-8)[2]	2,224	Licking[3]	107	129(+22)	453
Ashland[3]	105	141(+36)	693	Logan[4]	29	33(+4)	147
Ashtabula[3]	129	195(+66)	462	Lorain[5]	13	13(0)	26
Athens[1]	316	334(+18)	2,345	Medina[5]	15	11(-4)	26
Belmont[6]	127	213(+86)	525	Meigs[7]	305	348(+43)	2,150
Brown[4]	109	123(+14)	469	Monroe[1]	270	383(+113)	1,498
Carroll[8]	68	110(+42)	426	Morgan[9]	220	186(-34)	1,146
Clermont[4]	80	130(+50)	363	Morrow[10]	--	19(+19)	19
Columbiana[3]	106	180(+74)	602	Muskingum[3]	319	350(+31)	1,478
Coshocton[11]	325	385(+60)	1,723	Noble[12]	127	191(+64)	538
Fairfield[3]	51	49(-2)	234	Perry[7]	294	307(+13)	1,770
Gallia[7]	446	589(+143)	2,592	Pike[1]	206	219(+13)	1,690
Geauga[13]	27	40(+13)	105	Portage[5]	26	31(+5)	57
Guernsey[8]	202	338(+136)	1,015	Richland[4]	118	129(+11)	529
Harrison[3]	164	256(+92)	866	Ross[1]	189	201(+12)	1,864
Highland[9]	30	30(0)	186	Scioto[1]	138	131(-7)	965
Hocking[1]	581	502(-79)	4,354	Trumbull[3]	75	124(+49)	340
Holmes[8]	188	221(+33)	1,376	Tuscarawas[3]	92	183(+91)	456
Jackson[7]	301	386(+85)	2,071	Vinton[1]	583	569(-14)	5,429
Jefferson[8]	125	256(+131)	850	Warren[5]	28	27(-1)	55
Knox[3]	215	274(+59)	1,145	Washington[1]	184	245(+61)	1,257
Lawrence[7]	159	190(+31)	1,042	Wayne[10]	--	57(+57)	57
				Total	7,470	9,098 (+1,628)	47,618

[1]Open for hunting 1966-1994 (29 yrs.)
[2]( ) Change, 1993-1994.
[3]Open for hunting 1984-1994 (11 yrs.)
[4]Open for hunting 1989-1994 (6 yrs.)
[5]Open for hunting 1993-1994 (2 yrs.)
[6]Open for hunting 1990-1994 (5 yrs.)
[7]Open for hunting 1970-1994 (25 yrs.)
[8]Open for hunting 1978-1994 (17 yrs.)
[9]Open for hunting 1980-1994 (15 yrs.)
[10]Open for hunting 1994 (1 yr.)
[11]Open for hunting 1983-1994 (12 yrs.)
[12]Open for hunting 1987-1994 (8 yrs.)
[13]Open for hunting 1991-1994 (4 yrs.)

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Table 3. Ohio's turkey hunting incident history.

Year	Estimated Hunters	Number of Hunting Incidents Fatal	Nonfatal	Number of Incidents per 10,000 Hunters
1966-82	-	0	0	0
1983	4,402	0	0	0
1984	5,824	0	1	1.72
1985	8,849	1	3	4.52
1986	10,209	0	4	3.92
1987	11,521	0	3	2.60
1988	19,492	0	2	1.03
1989	24,740	0	3	1.21
1990	26,739	0	2	0.75
1991	32,431	1	3/4[1]	1.23/1.54
1992	33,906	1	5	1.77
1993	40,854	0	5	1.22
1994	40,459	0	9/10[1]	2.22/2.47

[1]In both 1991 and 1994, one hunting incident involved 2 victims. Consequently, the data are shown as: No. of incidents/No. of victims.

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Table 4. Ohio's turkey season dates and harvest success, 1966-1994.

Year	Season Dates	Number of Counties Open	Bag Limit	Permit Fee	Permits Sold	Estimated Number of Permittees Who Hunted[1]	Total Harvest[2]	Percent Successful[3]
1966	05/04-05/07	9	1	Free	500	321	12	3.7
1967	05/03-05/06	9	1	Free	898	706	18	2.5
1968	05/08-05/11	9	1	Free	914	765	20	2.6
1969	05/07-05/10	9	1	Free	945	815	37	4.5
1970	04/29-05/02	14	1	Free	909	774	30	3.9
	05/06-05/09				896	732	36	4.9
1971	04/28-05/01	14	1	Free	1,000	797	37	4.6
	05/05-05/08				1,000	790	17	2.2
1972	05/03-05/06	14	1	$5.35	917	824	32	3.9
	05/10-05/13				881	787	25	3.2
1973	05/02-05/05	14	1	$5.35	1,034	897	39	4.3
	05/09-05/12				1,034	884	32	3.6
1974	05/01-05/04	14	1	$10.50	999	900	61	6.8
	05/08-05/11				184	167	10	6.0
1975	04/28-05/03	14	1	$10.50	996	893	75	8.4
	05/05-05/10				267	242	19	7.9
1976	04/26-05/08	14	1	$10.50	1,471	1,296	139	10.7
1977	05/02-05/14	14	1	$10.50	1,751	1,504	137	9.1
1978	05/01-05/13	18	1	$10.50	2,000	1,711	147	8.6
1979	04/30-05/12	18	1	$10.50	2,000	1,714	265	15.5
1980	04/21-05/03	20	1	$10.75	2,097	1,882	387	20.6
1981	04/27-05/09	20	1	$10.75	3,458	2,954	577	19.5
1982	04/26-05/08	20	1	$10.75	4,262	3,636	651	17.9
1983	04/25-05/07	21	1	$10.75	5,141	4,402	764	17.4
1984	04/23-05/12	31	1	$10.75	6,935	5,824	1,233	19.9
1985	04/22-05/11	31	1	$10.75	10,084	8,849	1,583	17.3
1986	04/28-05/17	31	1	$10.75	11,913	10,209	1,816	17.0
1987	04/27-05/16	32	1	$10.75	13,396	11,521	2,268	18.9
1988	04/25-05/14	32	1	$11.00	16,208	19,492	2,629	16.0
1989	04/24-05/13	36	1	$11.00	18,887	24,740	3,171	15.6
1990	04/23-05/12	37	1	$16.00	19,613	26,739	4,096	20.2
1991	04/22-05/11	38	1	$16.00	22,898	32,431	5,009	21.1
1992	04/27-05/16	38	1	$16.00	28,974	33,906	5,678	19.4
1993	04/26-05/15	42	1	$16.00	29,538	40,854	7,470	15.4
			2	$32.00	4,106			42.1(12.4)
1994	04/25-05/14	44	1	$16.00	29,334	40,459	9,098	16.6
			2	$32.00	5,187			43.4(10.7)
				Total	252,627	285,417	47,618	14.9

[1]Includes free permit recipients (mainly hunters ≥66 years old).

[2]Total recorded harvest reported by all hunter types, paid, free and exempt (landowner/tenant).

[3]Success rates for paid permit holders only. Beginning in 1993, the success rates shown for 2-bird bonus permit holders are percent successful in harvesting one bird and, in parentheses, percent successful in harvesting two birds.

Table 5. Results of a random mail survey of 1994 turkey permit recipients. A sample of non-respondents was contacted by phone and adjustments were made in participation and success rates to reflect their responses.

	Permit Type			
	Paid 1-Bird	Paid 2-Bird	Free	Total
Questionnaires mailed	650	350	850	1,850
Usable responses	497	296	738	1,531
% who hunted	90	92	20	–
% who harvested				
1 bird only	20.5	27.5	6.8	–
2 birds	–	9.5	0.7	–
Average days hunted	4.4	6.7	3.7	–
Estimated days hunted				
Week 1	55,381	13,062	16,142	84,585
Week 2	33,092	7,358	9,285	49,735
Week 3	27,997	11,368	8,476	47,841
Season Total	116,470	31,788	33,903	182,161

Table 6. Comparison of hunter success rates, in percent, obtained from the mail survey and from the mandatory check stations, by permit type.

	Mail Survey		Check Station Harvest Data	
	1993	1994	1993	1994[1]
Paid 2-bird bonus permit holder harvesting:				
1 bird only	43.1	27.5	42.1	43.1
2 birds	11.1	9.5	12.4	10.6
Paid 1-bird permit holder harvesting:				
1 bird	19.0	20.5	15.4	16.6
Free permit holder harvesting:				
1 bird	6.7	6.8	4.0	7.3
2 birds	0.0	0.7	1.5	0.6

[1]Excludes 124 first turkeys for which paid permit status (1 or 2 bird permittees) was unknown and 48 turkeys taken by free permittees which were not identified as "first" or "second" turkey on harvest records.

Table 7. A comparison of hunting pressure and harvest by day of week between the 1980 and 1994 spring seasons, Vinton (Zaleski State Forest) and Athens (Waterloo Research Station) counties.

Day of Week	County	Hunters Per Square Mile[1] 1980	Hunters Per Square Mile[1] 1994	Harvest Per Square Mile[2] 1980	Harvest Per Square Mile[2] 1994
Week one					
Monday	Vinton	3.75	14.3	0.18	0.73
	Athens	-[3]	11.9	0.48	0.0
Tuesday	Vinton	3.55	11.3	0.13	0.70
	Athens	-	13.7	0.0	0.0
Wednesday	Vinton	3.36	5.7	0.13	0.23
	Athens	-	7.1	0.0	0.0
Thursday	Vinton	1.97	6.0	0.18	0.39
	Athens	-	5.5	0.0	0.48
Friday	Vinton	2.37	6.9	0.05	0.18
	Athens	-	9.2	0.0	1.43
Saturday	Vinton	2.17	13.3	0.03	0.16
	Athens	-	8.8	0.0	0.95
Week two					
Monday	Vinton	0.59	3.8	0.0	0.08
	Athens	-	4.6	0.0	0.0
Tuesday	Vinton	0.99	3.2	0.0	0.13
	Athens	-	4.8	0.0	0.48
Wednesday	Vinton	1.18	1.7	0.0	0.05
	Athens	-	2.9	0.0	0.0
Week two (cont.)					
Thursday	Vinton	0.79	3.6	0.0	0.13
	Athens	-	8.2	0.0	0.0
Friday	Vinton	1.58	3.1	0.08	0.16
	Athens	-	4.3	0.0	0.0
Saturday	Vinton	2.37	5.6	0.29	0.10
	Athens	-	5.1	0.0	0.0
Week three					
Monday	Vinton		1.8		0.13
	Athens		3.0		0.0
Tuesday	Vinton		2.0		0.18
	Athens		3.4		0.0
Wednesday	Vinton		2.9		0.08
	Athens		2.3		0.0
Thursday	Vinton		2.6		0.21
	Athens		3.0		0.48
Friday	Vinton		4.6		0.10
	Athens		2.4		0.0
Saturday	Vinton		5.9		0.13
	Athens		4.9		0.0

[1]Hunters per square mile calculations for each area were based on the number of vehicles recorded in a 7.65 mi^2 survey area in Zaleski State Forest and on the 2.1 mi^2 Waterloo Research Station multiplied by the average number of hunters per vehicle reported by successful hunters checking their turkeys at the Waterloo Research Station in 1994.

[2]Harvest per square mile calculations were based on the number of turkeys harvested in Vinton County on state or federal land divided by 38.4 mi^2 of public land in Vinton County and the number of turkeys harvested on the Waterloo Research Station divided by 2.1 mi^2.

[3]Dashes indicate that this information was not collected.

Table 8. Shotgun gauge, shell size, and shot size used by 298 successful turkey hunters who checked their birds at the Waterloo Wildlife Research Station, Athens County, Ohio, 1994.

Hunting Devices Decoy and Safety Sticker Use	Number of Hunters	Percent of Hunters
Shotgun gauge		
20	7	2.4
16	0	-
12	278	93.3
10	13	4.4
Shell size (in.)		
2 3/4	100	33.6
3	171	57.4
3 1/2	27	9.0
Shot size		
2	4	1.4
4	59	19.8
5	40	13.4
6	154	51.7
7 1/2	4	1.4
2 x 6	12	4.0
4 x 6	19	6.3
other	6	2.0
Used a decoy	59	19.7
Used a safety sticker	126	45.2

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Table 9. Wild turkeys stocked in Ohio, 1993-94.

Release site	Adult Male	Adult Female	Juvenile Male	Juvenile Female	TOTAL
Carroll County					
Brown Twp.	2	7	4	4	17
Columbiana County					
Butler Twp.	2	10	8	1	21
Defiance County					
Highland Twp.	2	12	5	2	21
Milford Twp.	3	8	4	5	20
Tiffin Twp.	3	10	6	2	21
Franklin County					
Prairie Twp.	3	8	2	6	19
Fulton County					
German Twp.	2	10	6	3	21
Huron County					
Bronson Twp.	2	9	6	5	22
Fitchville Twp.	2	8	3	11	24
Greenfield Twp.	3	7	3	12	25
Hartland Twp.	3	11	7	11	32
New Haven Twp.	2	11	3	4	20
Wakeman Twp.	3	11	5	5	24
Paulding County					
Crane Twp.	3	9	6	5	23
Emerald Twp.	2	9	6	8	25
Stark County					
Bethlehem Twp.	2	8	4	4	18
Paris Twp.	2	6	5	5	18
Pike/Sandy Twp.	2	6	4	4	16
Tuscarawas County					
Auburn Twp.	3	9	7	2	21
Williams County					
Florence Twp.	3	7	6	6	22
Jefferson Twp.	2	6	8	4	20
Madison Twp.	3	8	4	6	21
Springfield Twp.	2	17	8	1	28
Superior Twp.	3	8	5	5	21
GRAND TOTALS	59	215	125	121	520

Table 10. Ohio State Chapter, National Wild Turkey Federation Super Fund expenditures, 1986 through July 1994. The Division of Wildlife in Cooperation with the National Wild Turkey Federation provides technical guidance for the expenditure of project funds raised at Ohio events.

Project Category	Expenditures	Percent of Expenditures
Land acquisition	$120,907.50	59.3
Management projects		
Habitat	$ 26,136.91	12.8
Restoration	$ 4,747.52	2.3
Education	$ 36,826.06	18.1
Enforcement	$ 3,871.94	1.9
Miscellaneous	$ 11,381.79	5.6
Grand Total	$203,871.72	100.0

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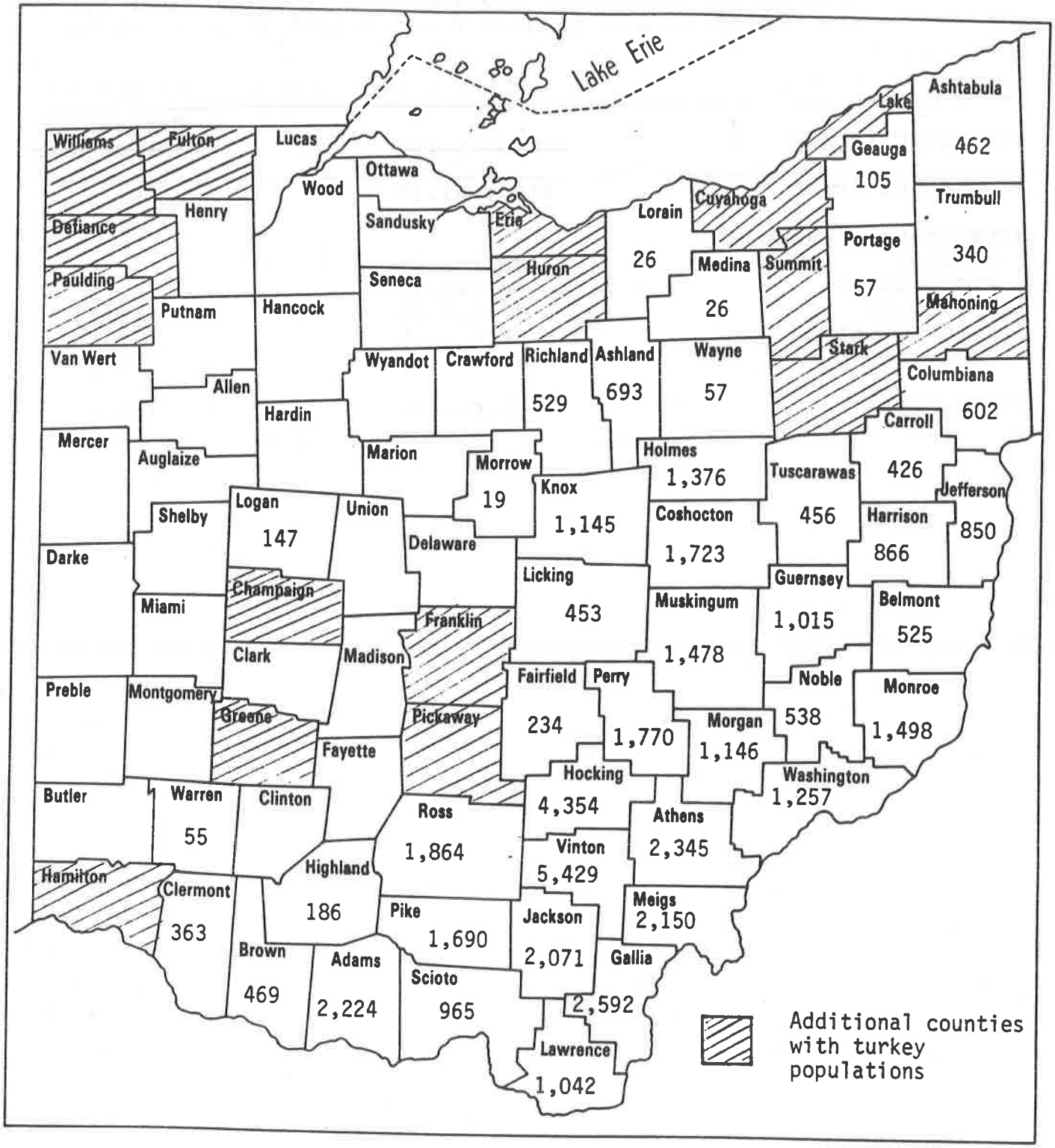


Fig. 1. Total wild turkey harvest (47,618) in 44 counties for 29 spring hunts, 1966-1994.

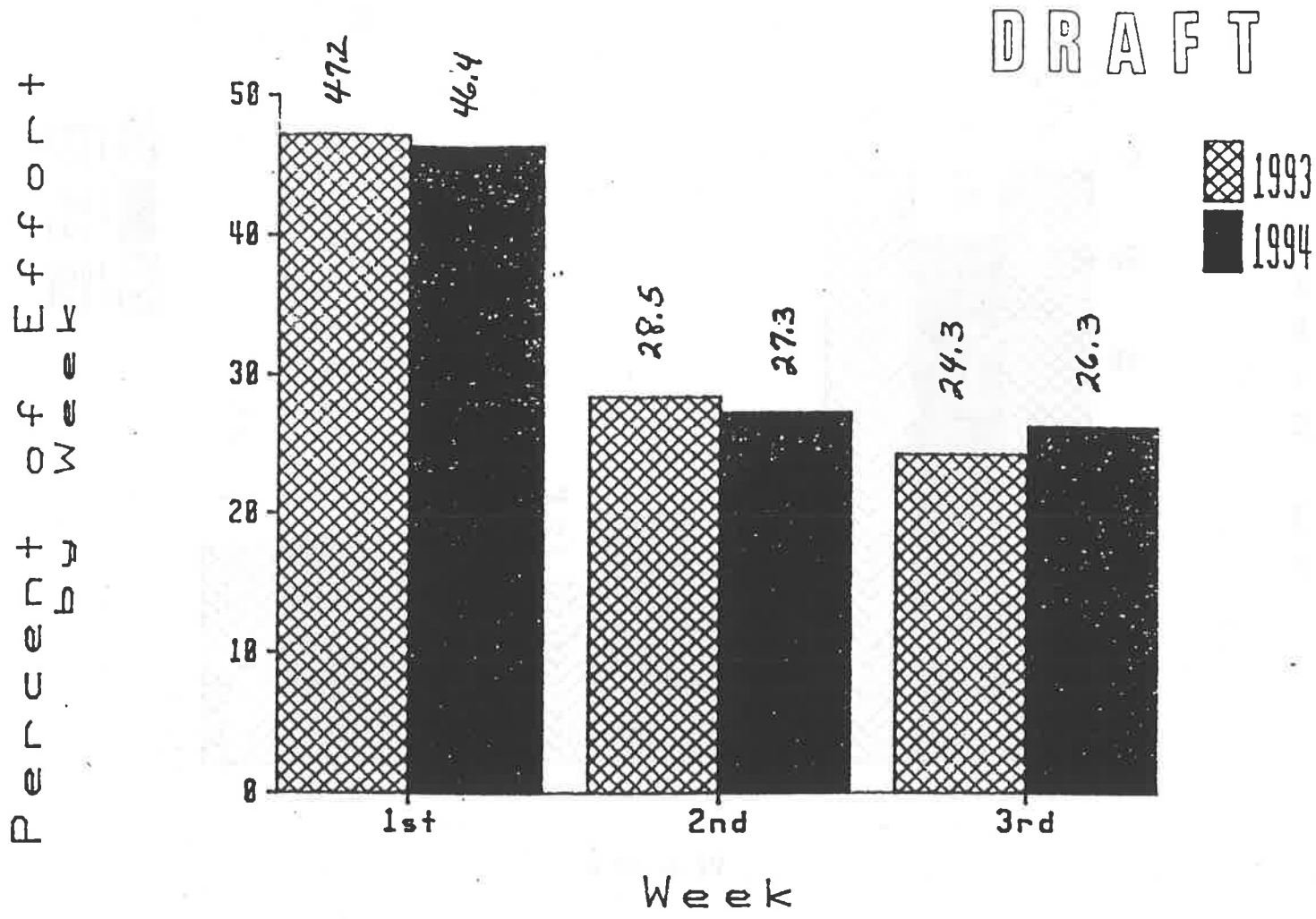


Fig. 2. Weekly distribution of hunting effort as reported by respondents to mailed turkey hunter surveys conducted following the 1993 and 1994 seasons.

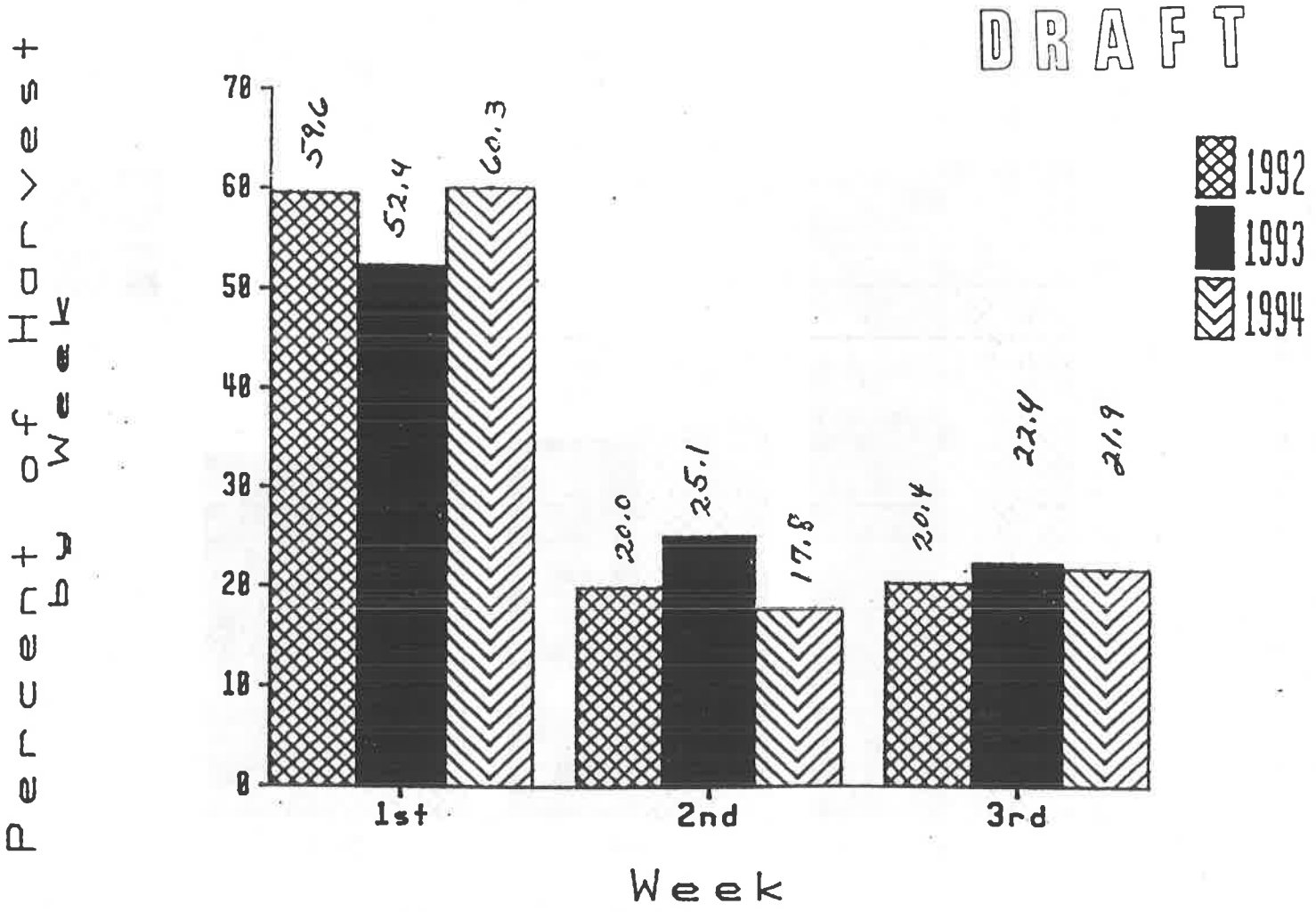


Fig. 3. Percentage distribution of the 1992, 1993, and 1994 wild turkey harvests by week. In 1992, the bag limit was 1 bird; in 1993 and 1994, the bag limit was 2 birds with the additional bird permitted in the third week only.

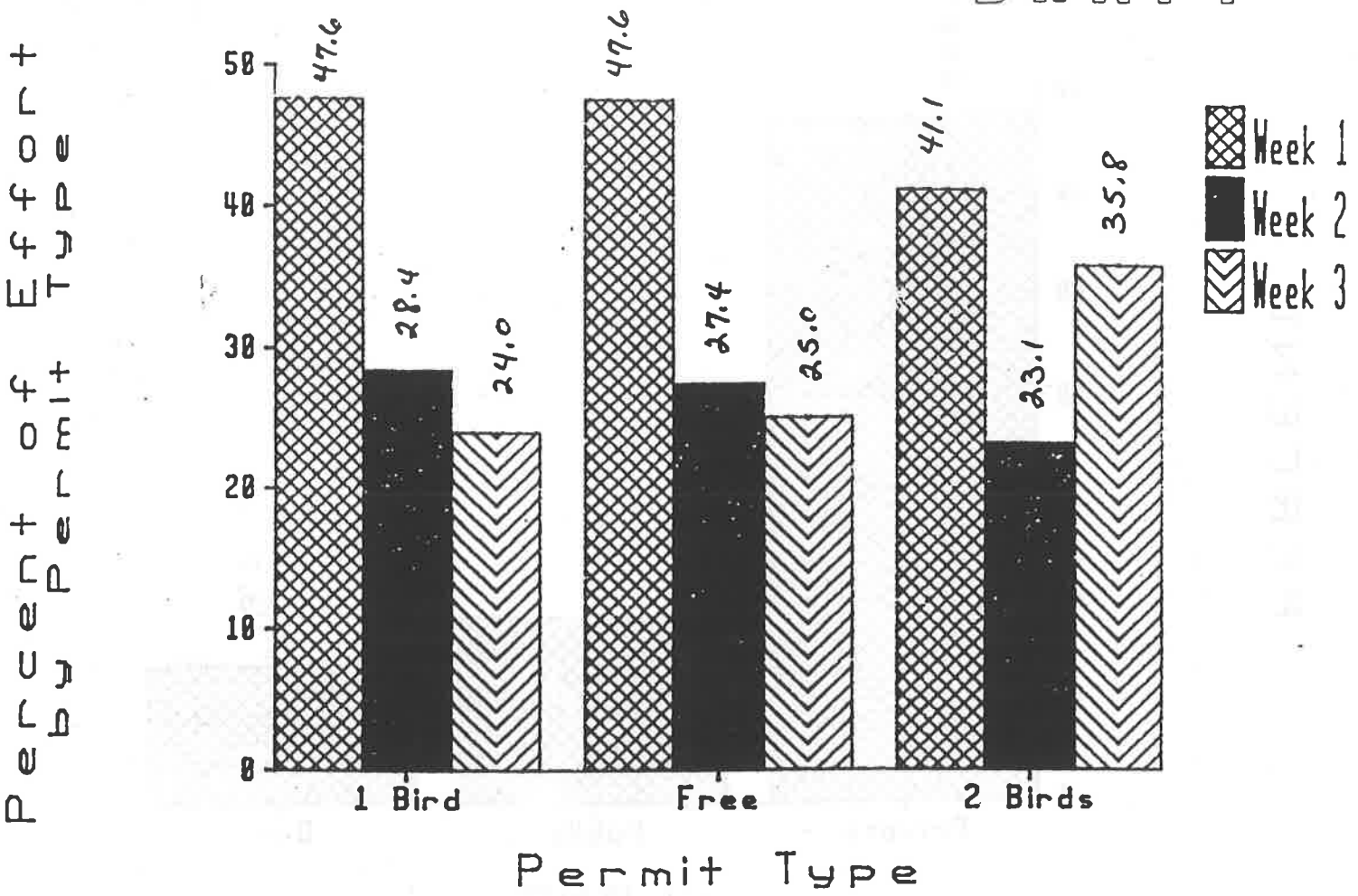


Fig. 4. Weekly distribution of hunting effort by type of permit issued, based on mail survey results from a sample of 1994 turkey permit recipients.

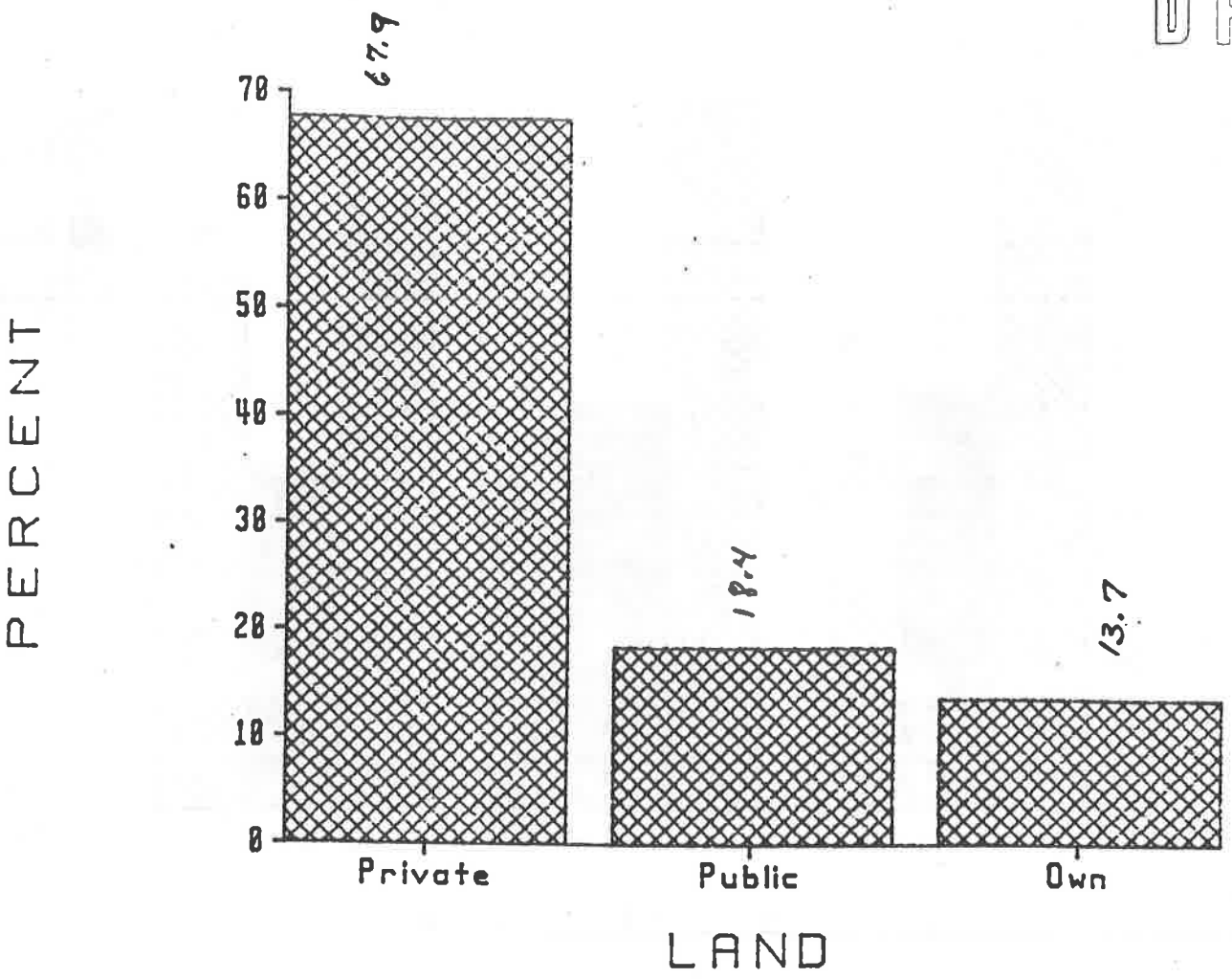


Fig. 5. Percentage distribution of the 1994 turkey harvest according to land ownership.

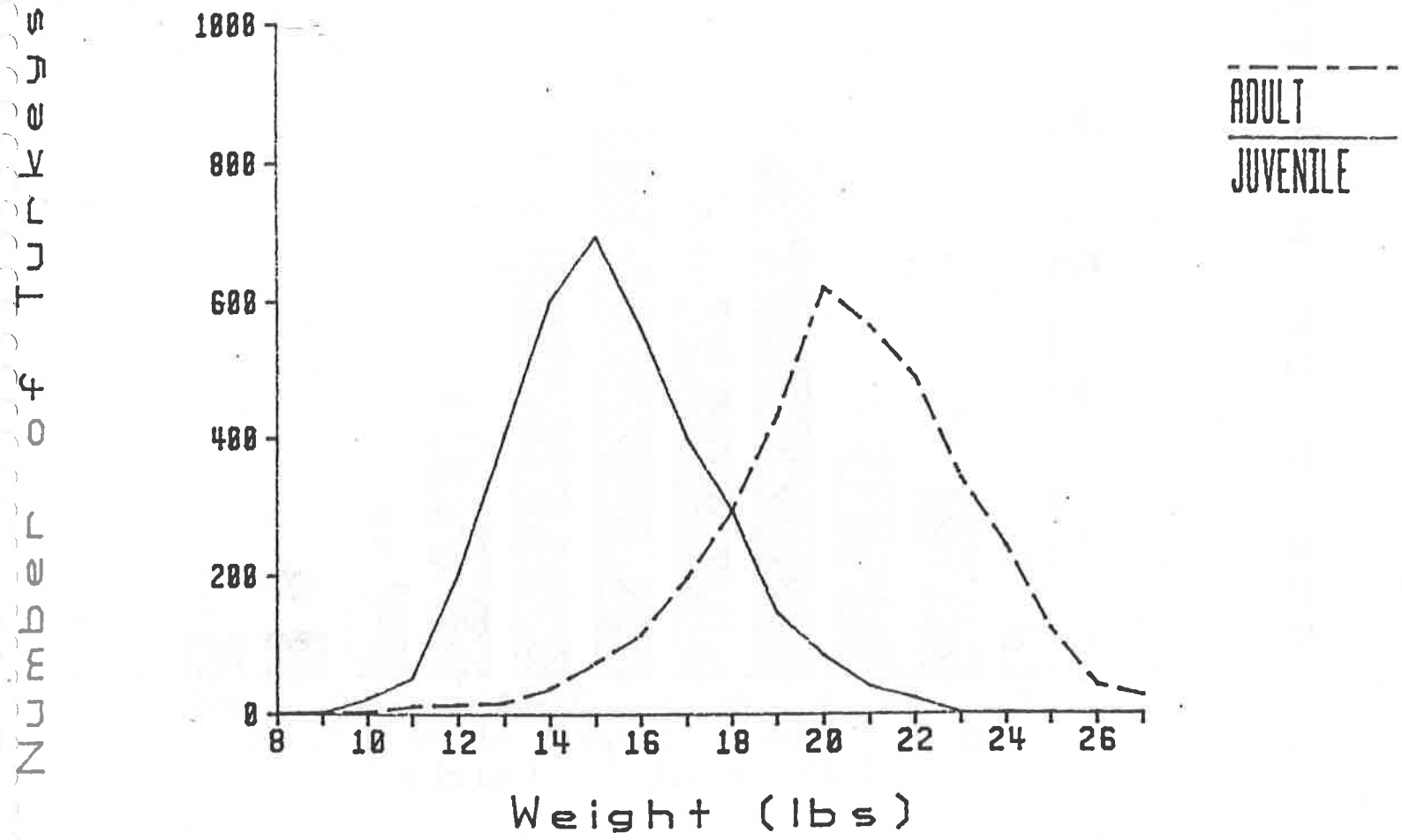


Fig. 6. Whole body weights of 7,199 turkeys harvested in Ohio, 1994.

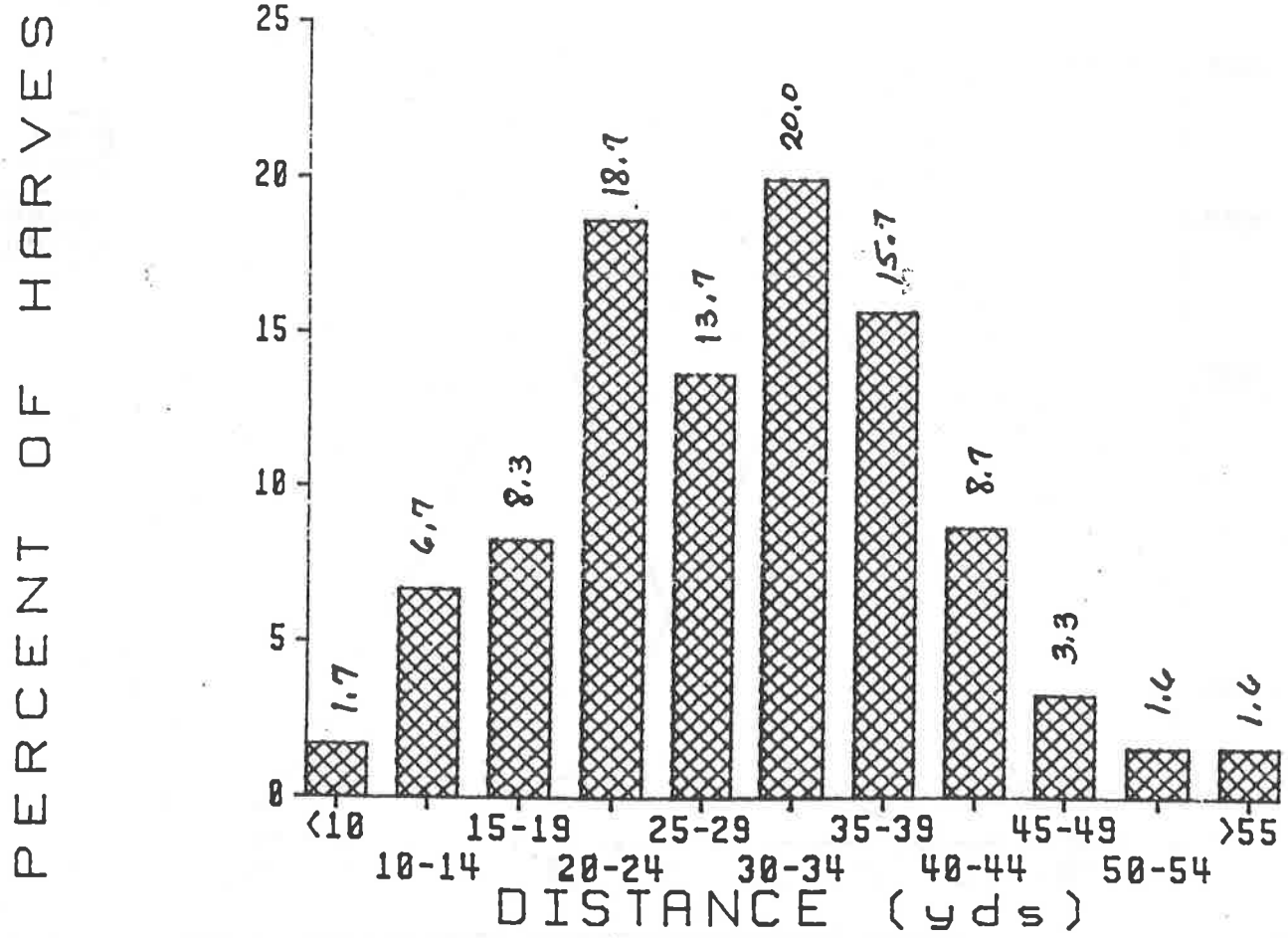


Fig. 7. Percentage distribution of turkeys harvested in relation to the reported distance shot, based on a sample of 300 turkeys checked at the Waterloo Wildlife Research Station, Athens County, Ohio, 1994.

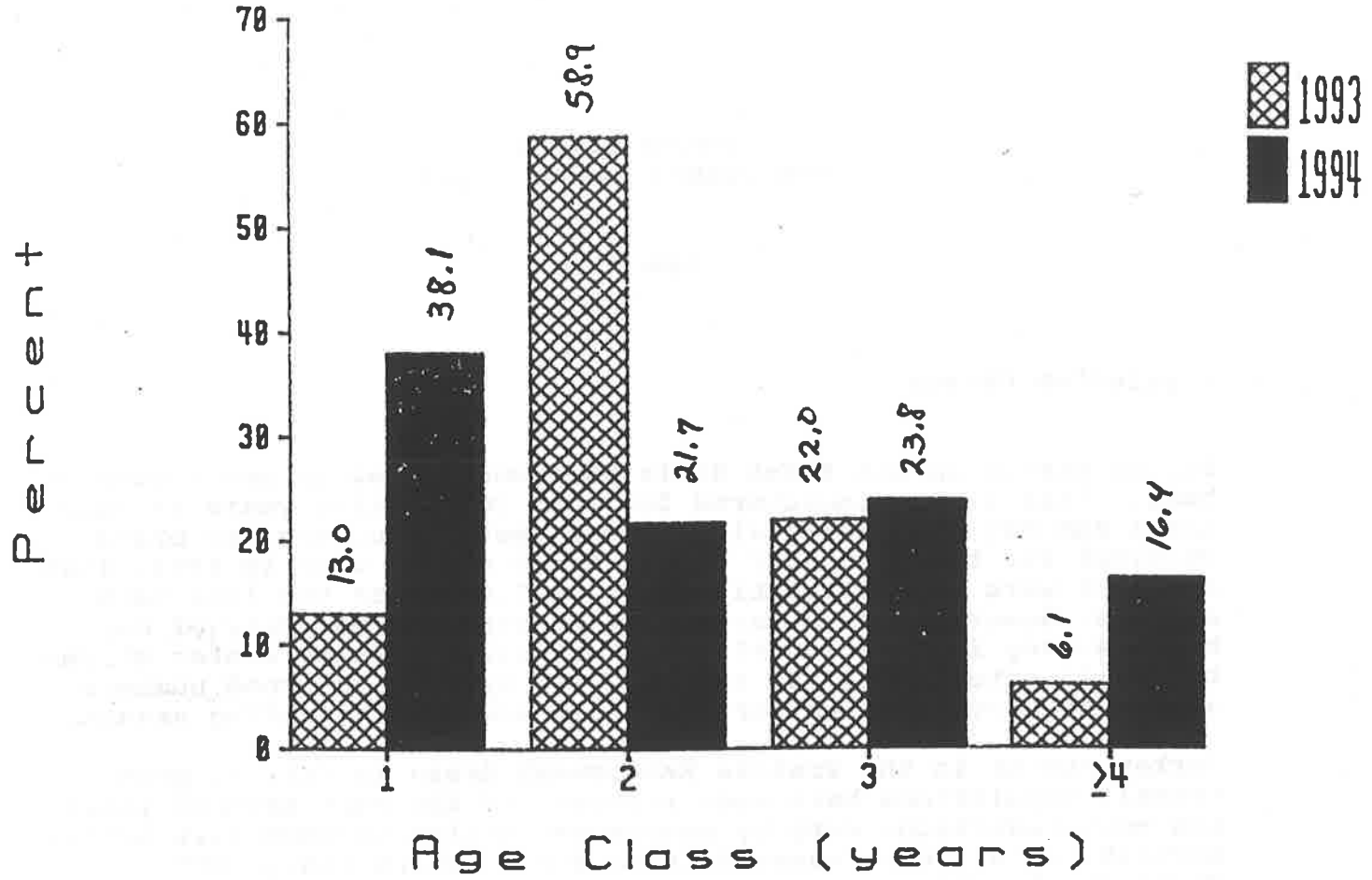


Fig. 8. Age distribution of wild turkeys checked at the Waterloo Wildlife Research Station, Athens County, in 1993 (N = 284) and 1994 (N = 300).

South Dakota
1994 Turkey Status Report

Les Rice

Population Status

Turkey status in the **Black Hills Management Area** is again poor at best. Late winter snowstorms for four consecutive years in late April and May have seriously reduced nesting success and brood survival for the past four years. Brood survey data in 1992, 1993 and 1994 were significantly lower ($p<0.05$) than the long term average. However, for a variety of reasons the validity of our brood survey is questionable. Historically, adverse winter storms that fall after April 15 are followed by reduced brood numbers and lower harvest rates for both fall and spring hunting seasons.

Turkey status in the **Prairie Management Areas** is fair to good. Overall populations have been reduced for the past several years but most reductions were by management design through fall hunter harvest. In all such cases driving force behind management decisions has been depredation complaints. Brood survey data in 1994 indicates brood numbers were again above the long term average. Most management areas have discontinued multiple tags and goals are generally for increased populations.

Hunter Harvest Data

As has been the policy for South Dakota for a number of years, management area licenses can be purchased or applied for irrespective of holding licenses in other management areas. Additionally, if leftover permits exist in limited quote areas, a hunter may legally possess up to three such limited quote licenses. Therefore, up to five licenses may be purchased for the spring seasons and up to four in the fall seasons (no fall archery licenses are available). Tribal licenses are also available in addition to state permits.

Spring Gobbler Seasons

As is usually the case, **Black Hills Management area** 1994 harvest data is not yet available due to the way we license hunters. In 1994 season dates were April 10 through May 16. Licenses were unlimited for resident and nonresident hunters. For the past several years our resident license sales have been steady to decreasing. Nonresident sales continue to increase. The 1993 Data summary is presented on Table 1.
Due to reduced turkey populations and increasing numbers of nonresident hunters, we are getting numerous complaints from resident hunters of competition. In response to these complaints we are making a concerted effort to inform hunters both nationally and within the state of the poor turkey status in the Black Hills. Additionally, nonresident license cost was raised from $45.00 to $65.00, still a bargain.

With standardized seasons 1994 **Prairie Management Areas** season dates were the same as Black Hills. A total of 29 limited quota management units were open in 1994. Harvest data for 1994 in these units was available and is presented in Table 2.

We again offered a statewide **Archery Season** in 1994. Licenses were unlimited and a total of 557 licenses were issued. Success rate was 20 percent with 114 gobblers harvested (Table 3). Both license numbers and success rates are increasing.

Fall Any Turkey Seasons

Data for 1994 is unavailable at this time. **Black Hills Management Area** season length was greatly curtailed to only seven days in response to turkey numbers and as a response to resident hunter demands. **Prairie Management Areas** continued to have season length of approximately 2 1/2 months.

Fall of 1993 **Black Hills Management Area** season dates were Oct. 9-24. License sales numbered over 3000 before cost of license increased from $4 to $10 several years ago. After the fee increase hunter numbers dropped by over 50 percent and have never recovered. Harvest data is presented on Table 4.

The 1993 **Prairie Management Areas** season dates were Oct.1-Dec.19 with 19 units open. Two-tag licenses were offered in 10 of these units. Harvest data is presented on Table 5.

Brood Survey

As stated above **Black Hills Management Area** brood survey data shows 1994 reproduction was poor at best. Number of poults per hen did increase to 4.5 but long term average is 5.4 poults per hen.

Prairie Management Areas brood survey data results were 4.5 poults per hen. Long term average was 3.6

Trapping

During the winter of 1993-94, 165 birds (41 gobblers and 124 hens) were trapped. All birds were released within the state in historic areas with currently low population levels.

Table 1. Black Hills Management Unit Spring Turkey Harvest, 1993.

NUMBER OF LICENSES ISSUED	RESIDENT	2,605
	NONRESIDENT	1,415
	TOTAL	4,020
AVERAGE DAYS HUNTED	RESIDENT	4.1
	NONRESIDENT	3.5
PROJECTED GOBBLER HARVEST	RESIDENT	723
	NONRESIDENT	543
	TOTAL	1266
PROJECTED SUCCESS	RESIDENT	28%
	NONRESIDENT	38%
	OVERALL	31%

Table 2. Prairie Management Unit Spring Turkey Harvest, 1994.

Licenses Issued	Resident	2664
	Nonresident	323
	Total	2987
Projected Gobbler Harvest		1683
Projected Success		55%

Firearm Turkey Hunter Weapon Choice

Weapon Type	Shotgun	Rifle	Bow	Handgun	Unknown
100%	65%	20%	1%	1%	13%

Table 3. Archery Spring Turkey Harvest, 1994.

Licenses Issued	Resident	469
	Nonresident	88
	Total	557
Average Days Hunted		4.7
Projected Gobbler Harvest		114
Projected Success		20%

Table 4. Black Hills Fall Turkey Harvest, 1993

Licenses Issued	Resident	1025
	Nonresident	61
	Total	1086
Average Days Hunted	Resident	3.1
	Nonresident	2.9
Projected Gobbler Harvest	Resident	114
	Nonresident	7
	Total	121
Projected Hen Harvest	Resident	198
	Nonresident	17
	Total	215
Projected Success	Resident	31%
	Nonresident	39%
	Overall	31%

Table 5. Prairie Management Unit Fall Turkey Harvest, 1993.

Licenses Issued	Resident	1978
	Nonresident	144
	Total	2122
Projected Gobbler Harvest		830
Projected Hen Harvest		540
Projected Success		43%

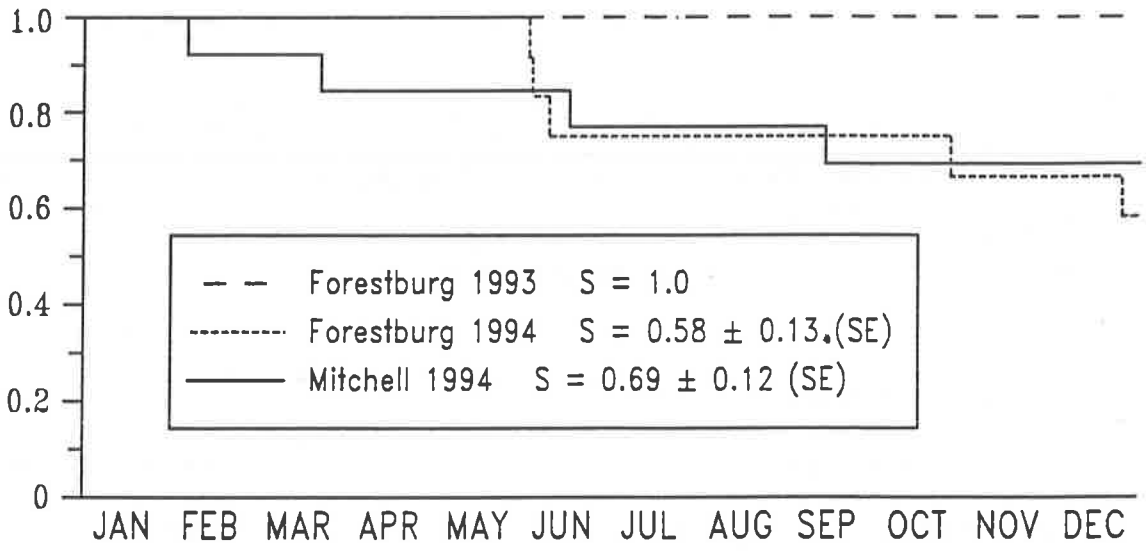
EXPERIMENTAL INTRODUCTION OF EASTERN WILD TURKEYS IN SOUTH DAKOTA

Data collection of wild turkey survival and reproduction continues on 2 study areas along the James River in eastern South Dakota. Five jakes and 15 hens were released on the Forestburg study area (FSA) in 1993, and 4 toms and 15 hens were released on the Mitchell study area (MSA) in 1994.

Survival

Annual survival of hen turkeys ranged from 0.58 to 1.0 (Fig. 1). Two hens were censored on each study area because they survived less than 10 days following release and 1 hen was censored at FSA when we lost radio-contact on 6 Nov 1993. Of 9 hen deaths, 5 (4 on FSA and 1 on MSA) were predated, 1 (FSA) was killed by a swather while incubating a nest in alfalfa, 1 (MSA) died of an infection from an intestinal perforation, and 2 (MSA) died of unknown causes (likely predation). Of 9 male turkeys, 1 (FSA) was predated 1 year and 35 days following release. The remaining 8 males were alive as of 1 Jan 1995.

Fig. 1. Survival of female turkeys released in eastern South Dakota, 1993–94.



Reproduction

Years and study areas combined, 83% of turkey hens nested and 60% of nesting hens were successful in hatching (Table 1). Only 1 hen renested (FSA, 1994) after losing her first nest. By flushing radioed hens, we able to establish that at least 13 of 18 successfully nesting hens raised >1 poult to 8-weeks of age. We flushed all but 1 hen with ≤3 poults although hens hatched an average of 9 eggs. It is probable that we were not always able to flush all young accompanying hens, so poult survival probably is slightly higher than observed. More reliable estimates of poult survival could be obtained by placing radios on young, however this

is beyond the scope of our current research.

Table 1. Nest initiation and success of turkeys released in eastern South Dakota, 1993-94.

YEAR	STUDY AREA	HENS (n)	NUMBER OF HENS THAT NESTED	HATCHED
1993	Forestburg	13	12	5
1994	Forestburg	11	10	7
1994	Mitchell	11	8	6
TOTAL	BOTH	36	30	18

Of 29 turkey nests located, we found 17 in woody cover and 12 in herbaceous cover. Habitats selected most often were buckbrush (9 nests) and wheatgrass/alfalfa planted on land enrolled in the Conservation Reserve Program (7 nests).

Home Ranges

Home ranges and core areas were larger for both males and females during the breeding season (BR, 1 Apr - 31 Jul) than postbreeding (PB, 1 Aug - 30 Nov) or winter (WT, 1 Dec - 31 Mar) (Table 2). Most turkeys moved relatively short distances from release locations, indicating their acceptance of selected sites.

Table 2. Home range (90% utilization) and core areas (50% utilization) of turkeys released in eastern South Dakota, 1993-94.

SEX	YEAR	STUDY AREA	90% UTILIZATION (hectares)			50% UTILIZATION (hectares)		
			WT	BR	PB	WT	BR	PB
F	1993	Forestburg		728	328		118	38
F	1994	Forestburg	404	536	380	37	51	66
F	1994	Mitchell		760	297		94	22
M	1993	Forestburg		961	670		122	97
M	1994	Forestburg	298	475	415	59	114	26
M	1994	Mitchell		512	80		24	18

We plan to integrate home range polygons with cover maps of study areas in order to develop baseline habitat requirements. These data will be used to assist in selection of future release locations.

WISCONSIN WILD TURKEY HUNTING/MANAGEMENT/RESEARCH REPORT TO THE 1994 MIDWEST MEETING GROUP

1994 SPRING SEASON

Wisconsin's 1994 spring wild turkey season set a new harvest record, as it has each year since turkey hunting resumed in 1983. The 1994 success rate of 18% on a total issue of 71,198 permits resulted in the harvest of 12,569 turkeys. There were 68,243 applicants who applied for the 71,298 (includes state parks) available permits. A total of 60,162 and 11,258 applicants received 1 tag and 2 tags, respectively.

Thirty-seven of 40 hunting zones were open in spring 1994, including 6 new zones (Fig 1). Two northwestern zones will be opened in spring 1995, and by 1996, all 40 zones will be open to hunting with one more zone included. Eleven state parks, including 5 restricted to disabled hunters only, have also been open to spring hunting since 1992. State park zones are open for only the first 3 of the 6 Wednesday through Sunday hunting periods to avoid conflict between turkey hunters and other park users. The first hunting period opens on the Wednesday closest to April 13. Turkey zones have been typically opened 2 to 4 years following release of translocated turkeys.

Spring permit levels for each zones are established annually by a DNR Committee composed of wildlife management, research, and law enforcement personnel. These levels are initially established at a conservative level (usually less than 1 permit per square mile of timber within the zone) for each hunting period. Further liberalization of permits (the number of permits issued) are based on harvest success, hunter perceptions of hunting quality, levels of hunter interference, distribution of the harvest by zone, and other information on turkey populations and productivity.

1994 FALL SEASON

Twenty eight hunting zones, including 4 new zones were open to fall hunting in 1994 (Fig. 2). During the 1989 through 1993 fall seasons, hunters were restricted to hunting during 1 of 3 Monday to Sunday hunting periods. Beginning in 1994, hunters holding unused hunting permits and carcass tags were allowed afield throughout the 28-day fall hunt that began October 10 and ended November 6. It was expected that success rates might increase substantially because of the added time available to hunters to fill their permits. Additionally, various surveys indicated depressed turkey production in 1993. The total number of permits available per management zone was reduced considerably to compensate for these factors. Based on harvest results, however, the average permit success rate for the 1994 fall season (21%) did not differ substantially from previous years (20% overall from 1989-1993). The harvest was evenly distributed throughout the 4-week season and 3,799 turkeys were harvested with an issue of 17,650 permits in the 17 zones open. Demand for fall turkey permits continued to increase as there were 43,496 applicants for the 17,650 available permits.

Hunting accidents: Turkey hunting accidents in Wisconsin have been relatively few in number due to hunter education and controlled hunter numbers. From 1983 through the 1994 turkey hunting seasons, there have been 22 turkey hunting accidents including 2 fatalities. Nine of these occurred in fall seasons. The 1994 spring and fall turkey seasons had three turkey-hunting related accidents each.

TURKEY MANAGEMENT

Wisconsin wildlife managers provide advice on forest management plans for private lands and manage public lands to maintain or improve turkey habitat. NWTF's Superfund has provided funding for the purchase of tree planters and other equipment, planting materials, etc., to plant trees, improve timber stands, and plant food plots.

Harvests are regulated by manipulating permit levels after considering various factors specific to each zone. These include the turkey density, productivity, winter severity, weather during spring and summer, amount of forested land and percent publicly owned, degree of fragmentation of forested habitats, and potential conflicts with other resources users on some public lands, among others. Hunters' perceptions of hunting quality and levels of interference are also considered. Reported interference (percentage of hunters definitely interfered with while hunting) has consistently been under 10%. The 1994 spring season had a statewide average of 1.1 permits allocated per square mile of timber per time period, with a range of 4.0 to 0.1.

Fall permit levels consider past adult/juvenile ratios in the prior spring harvest and are set to allow maximum, quality hunting opportunities without negatively impacting established populations or continued growth of populations in newer zones.

Fall hunting permit levels are prescribed to harvest less than 10% of the adults hens in zones with established populations, and less than 5% in zones with lower potential or where turkeys have not fully occupied available habitat. This is based on population models from Missouri and Iowa that indicate the 10% level will not cause a population decline and 5% will allow for continued growth. We assume that no more than 20-25% of the gobblers are shot during the spring hunt (based on helicopter surveys and research using radio-marked birds and other evidence). In addition, radioed gobblers and hens have exhibited equal survival during a period with both spring and fall hunts, so we assume a 1:1 sex ratio in the prehunt spring population. Thus, a harvest of 20-25% of the gobblers should represent about 10-12% of the spring population. If the fall harvest equalled the spring harvest, removals would be about 10-12% of the adult hens, assuming an equal sex ratio in the fall harvest and a stable population. In 1994, permits were set conservatively, recognizing poor recruitment in 1993 and uncertain levels of hunting success under the new season framework of fall 1994. The result was 1994 fall harvests that averaged less than half of the preceding spring harvests in all zones. Ultimately, fall success rates did NOT increase, nor do we have any indications that hunter interference was a problem in the fall of 1994.

Thus, fall permit levels are now established by factoring the spring success rate by the spring permit level by a conservative .5 (in the case of a zone where we wished to allow a greater degree of population growth) or by a conservative .8 (in established zones of high populations) and then by 4 (the inverse of a predicted fall success rate of 25%.....also a conservative measure as success rate is closer to 20%). This fall permit setting process is understandable and acceptable as it is conservative at several levels which is an important consideration in areas of newly established populations.

Information regarding Wisconsin spring turkey harvests from 1983 through 1994 and fall turkey harvests rom 1989 through 1994 including harvests, permit numbers, and success rates are appended to this report.

RESEARCH

1993 Gun Deer Hunter Turkey Observation Survey:

A post-paid turkey observation form with survey objectives and instructions were mailed to 4,972 individuals that purchased a gun deer hunting licenses in deer managements that generally correspond to turkey management zones 1A, 2 (SW Wisconsin) and 17 (central Wisconsin). Respondents (33%) indicated a downward trend in turkey densities in the SW area between 1988 and 1993. In the central units, turkey densities were fewer than in the SW zones. The percentage of deer hunters reporting turkey sightings was strongly correlated ($r = 0.87$, $P < 0.001$) with the subsequent spring turkey harvest density. Similarly, the positive correlation between turkeys seen/hunter day and harvest density was highly significant ($r = 0.75$, $P < 0.001$). Helicopter survey estimates of turkey population density were significantly correlated with the percentage of deer hunters seeing turkeys ($r = 0.64$, $P = 0.02$), but density estimates were not correlated with the turkey-per-day index ($r = 0.35$, $P = 0.26$).

1993 Wild Turkey Landowner Brood Survey:

Post paid cards containing survey objectives and instructions were mailed in June, July, and August to 11,897 landowners. Cooperators were requested to report the number of broods, poults/brood, and adult hens with or without a brood seen during those three months. The mean (SE) ratio of poults to hens observed in Wisconsin's primary turkey range averaged 2.3 +/- 0.1 in 1993 and 3.0 +/- in 1992. Forty percent of the hens were accompanied by poults during 1993 compared to 46% in 1992. The P/H ratio increased from 1.7 in June to 2.6 in August during 1993. Similar trends were observed during 1988-92, and is due in part to greater visibility of the poults as they attained larger size during the summer. It may also be due to 'gang brooding' behavior which is initiated in late June or July.

1993 Spring Turkey Hunter Questionnaire:

A survey was mailed to 10,211 spring turkey hunters after the completion of the spring season which asked specific questions

regarding their spring turkey hunting experience. A second mailing was mailed to 5,000 non-respondents and a total of 5,064 survey forms were returned (42.8%). Approximately 91% of hunters receiving a permit(s) to hunt in the spring of 1993 hunted. The success rate for hunters who received only one harvest permit was 33.2% while those hunters who received two permits had a success rate o 36.6% with their first permit and 11.9% with their second permit. Of the 9% who did not hunt, 63.2% said hey had purchased a 1993 Wild Turkey Stamp. Almost half of all respondents (46.5% said they have attended a D.N.R. or NWTF sponsored turkey hunter education clinic. Sixty-six percent of respondents said they did NOT shoot at the first bird thy could have, with the most stated reason for not shooting was the hunter wanted a better shot. Six percent of respondents said they shot at and hit a turkey that they were unable to retrieve. Respondents indicated that interference from other turkey hunters kept 9% of them from bagging a bird and 12.5% also said that other turkey hunters kept them from hunting in the locations they wanted to hunt in. Spring hunters rated their hunt above average 49% of the tim and most hunters said they would like to see the number of spring turkey permits in the zone they hunted in to stay at their current level. 5.2% of respondents indicated they knew of 1 or more turkeys harvested that spring that were not registered. Those surveys were asked if they felt turkey numbers had increased from last year (26.2%), were the same (34.2%) or had decreased (21.2%). Some respondents to this question (18.4%) hunted different zones than the previous year.

1993 Fall Turkey Hunter Questionnaire:

Survey forms were mailed to 6,026 fall turkey hunters after the completion of the fall season. A second mailing was made to 3,000 non-respondents which resulted in 3,051 usable responses (50.06%). Statewide, 83.8% of respondents hunted turkeys this fall. The success rate for hunters who received only one permit was 30.06%. Hunters who received two permits had a success rate of 27.0% on their first permit and an 8.2% success rate on their second permit. Less than 6% reported hitting but being unable to retrieve a turkey. Sixty-six percent did not shoot at the first bird that presented an opportunity (most reported wanting a better shot). Only 11% of fall hunters reported being interfered with during their hunt with cause of interference equally distributed between Archery, Small Game, and Turkey hunting. Hunting pressure was highest on Saturday, followed by Sunday and Friday. Hunters receiving one tag averaged 3.0 days afield while those receiving two tags for the same time period hunted slightly longer (3.3 days afield). Hunters receiving two tags for two different time periods averaged 5.1 days afield. Most hunters did not like to see the number of permits available in the zone(s) they hunted in changed. The number of hunters rating their hunting experience as "fairly low" or "very low" (36.8%) was greater than the number who rated their hunt as "fairly high" or "very high" (26.5%). Support for mandatory attendance of at least one turkey hunter education clinic for all turkey hunters was indicated 39% of respondents, nearly equal to the number who had attended a clinic sponsored by D.N.R. or NWTF (43%)

FIGURE (1)

SPRING Wild Turkey Hunting Zones

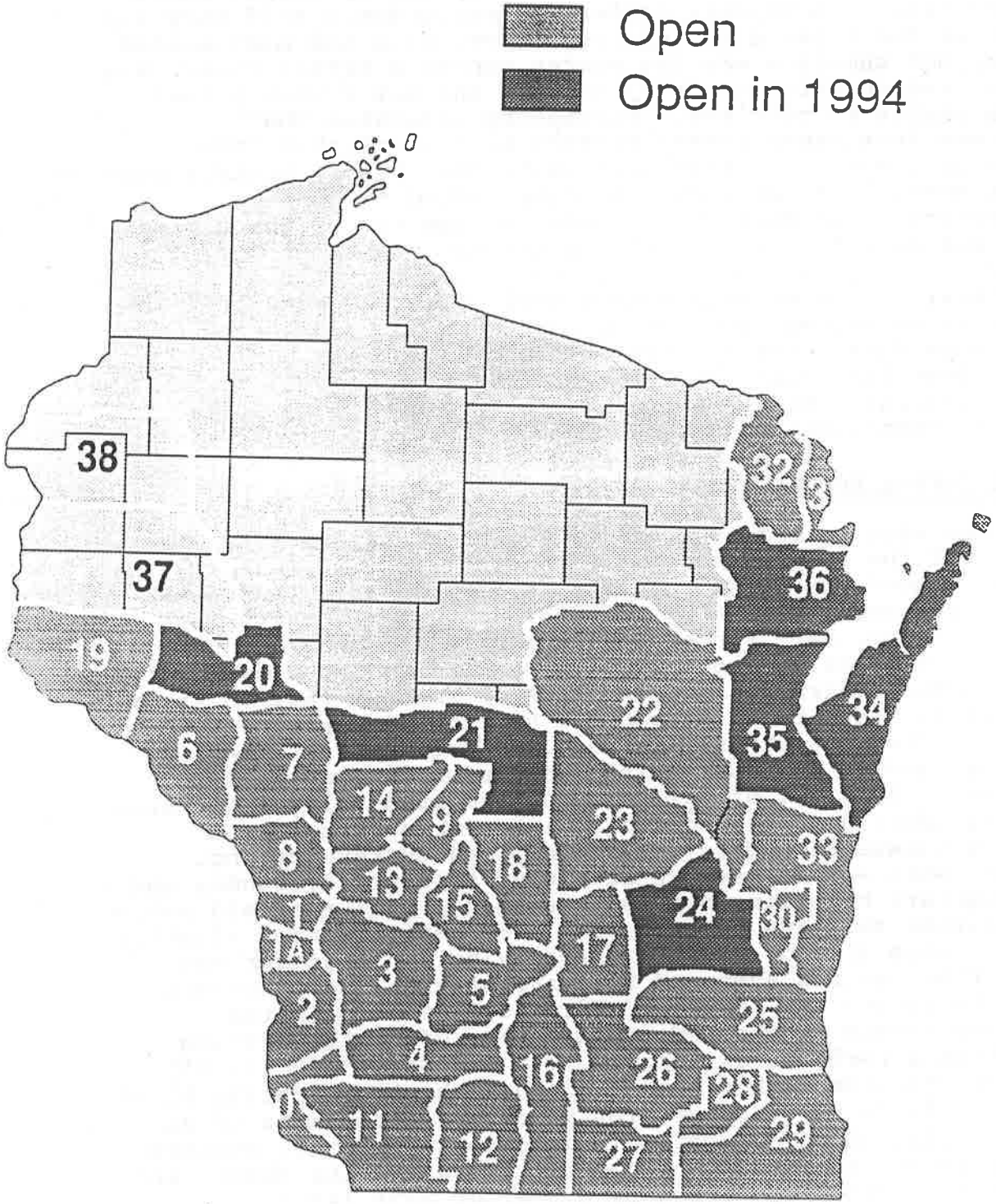
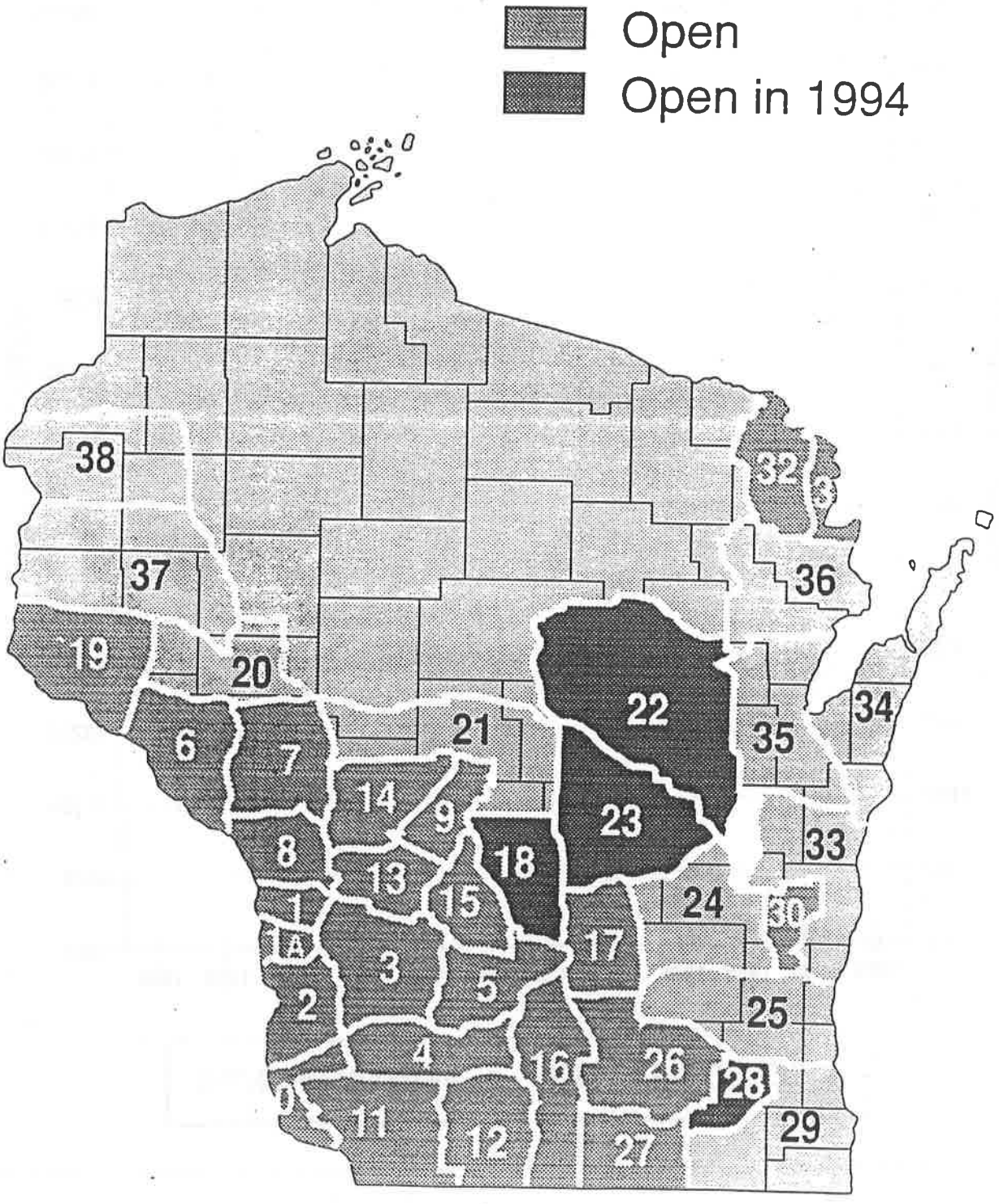
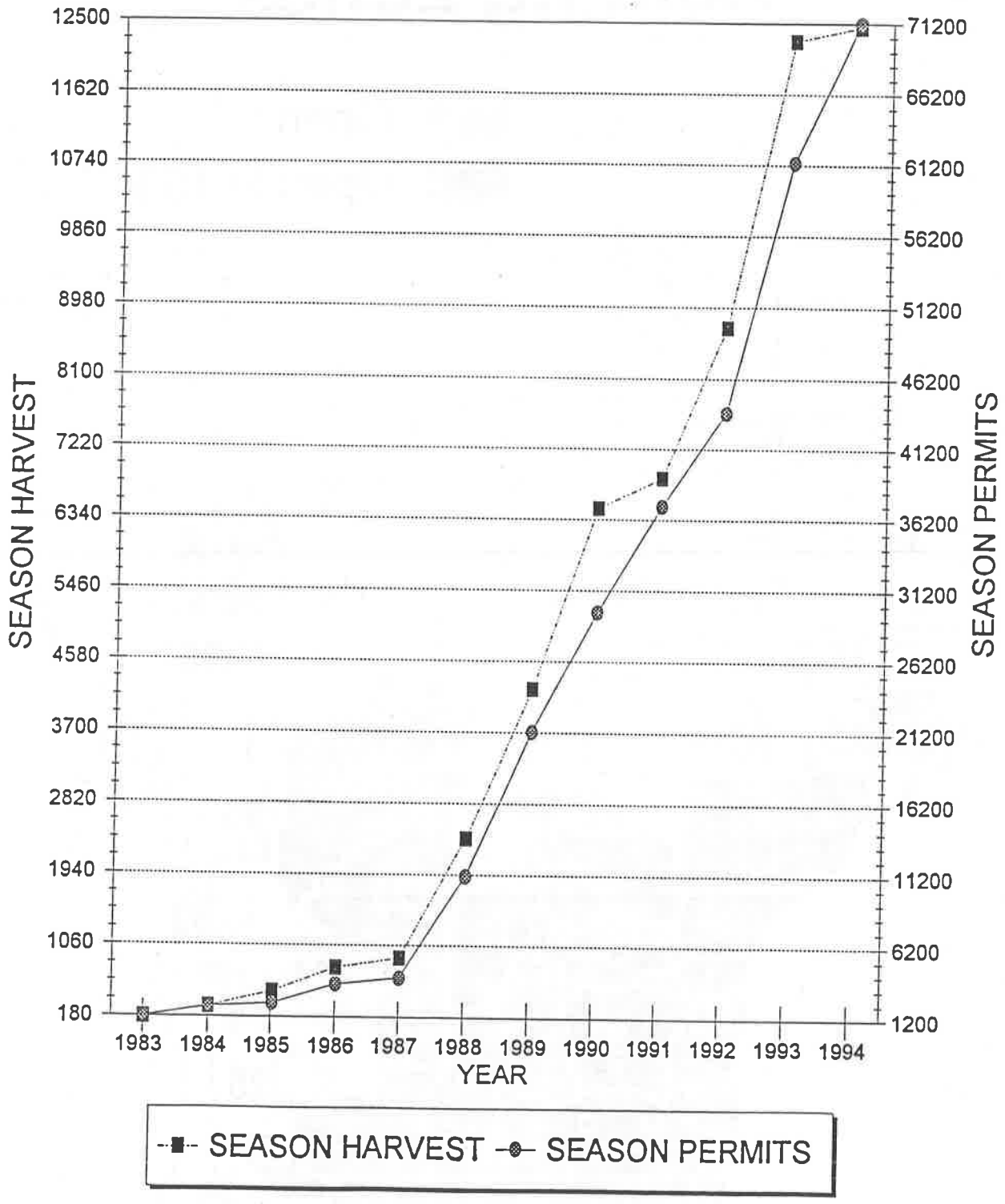


FIGURE (2)

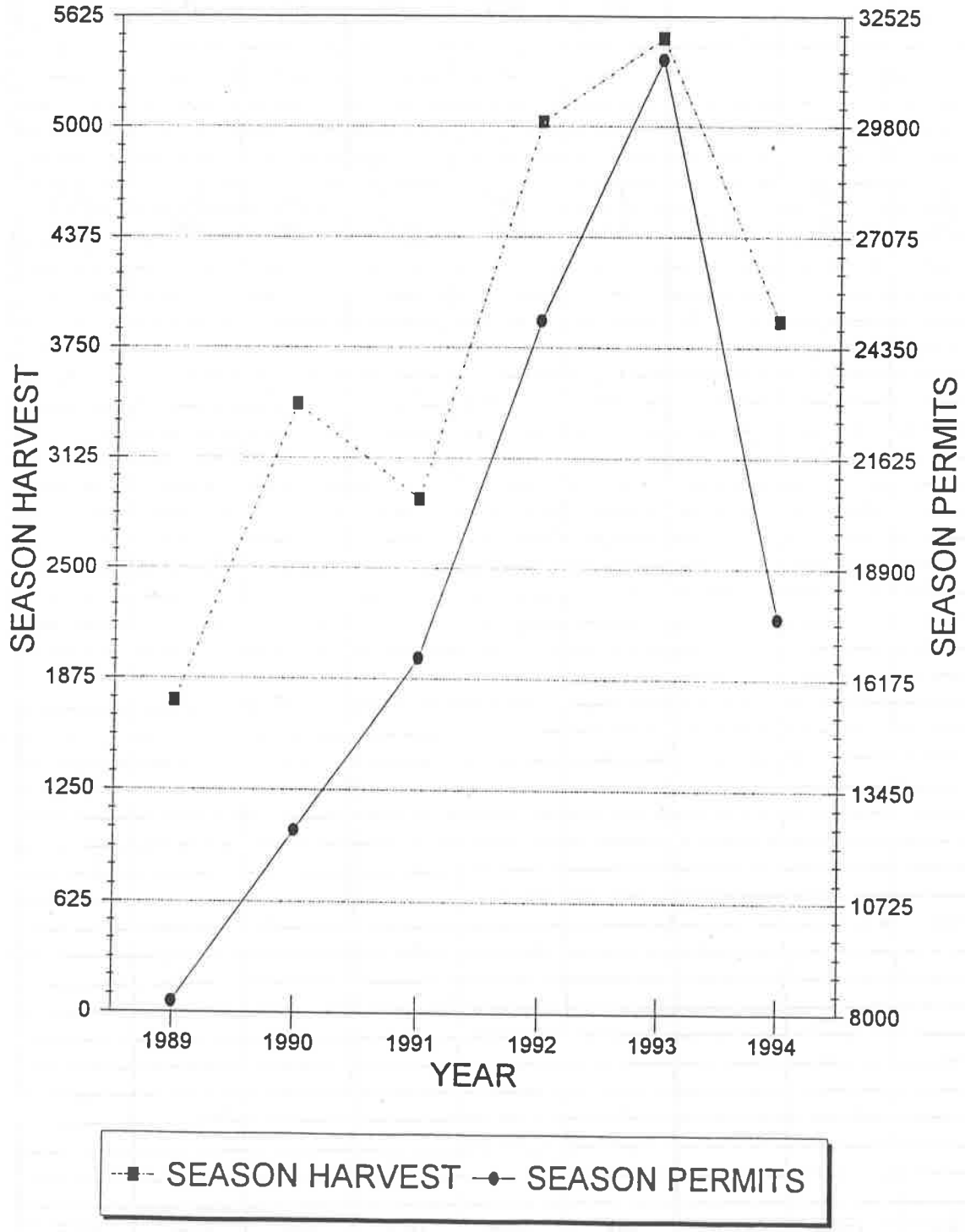
FALL Wild Turkey Hunting Zones



SPRING TURKEY DATA 1983-1994



FALL TURKEY DATA 1989-1994



WISCONSIN SPRING TURKEY HARVEST 1983-1994

H= Total Season Harvest P= Total Season Permits S= Success Rate (H/P)

	1983			1984			1985		
ZONE	H	P	S	H	P	S	H	P	S
01	54	300	18.0	68	450	15.1	120	450	26.7
1A									
02	38	300	12.7	79	450	17.6	147	525	28
03									
04				37	300	12.3	80	450	17.8
4A									
05									
5A									
06									
07									
08									
09	32	300	10.7	41	300	13.7	34	300	11.3
10	56	300	18.7	83	450	18.4	116	450	25.8
10A									
10B									
11									
11A									
12									
12A									
13									
13A									
14									
15									
15A									
15B									
15C									
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26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
*FM									
TOTAL	180	1200	15.0	308	1950	15.4	497	2175	21.9

* FM is not included in the H, P, and S "TOTAL" values because it is a federa program

WISCONSIN SPRING TURKEY HARVEST 1983-1994

H= Total Season Harvest P= Total Season Permits S= Success Rate (H/P)

ZONE	1986			1987			1988		
	H	P	S	H	P	S	H	P	S
01	127	540	23.5	127	540	23.5	288	1200	24.0
1A									
02	228	630	36.2	228	630	36.2	460	1600	28.8
03	84	450	18.7	84	450	18.7	296	1800	16.4
04	156	675	23.1	156	675	23.1	529	2200	24.0
4A									
05	15	300	5.0	15	300	5.0	50	400	12.5
5A									
06							88	500	17.6
07									
08									
09	35	360	9.7	60	480	12.5	87	720	12.1
10	147	540	27.2	243	880	27.6	347	1120	31.0
10A									
10B									
11							163	800	20.4
11A									
12							82	730	11.2
12A									
13									
13A									
14									
15									
15A									
15B									
15C									
16									
17									
18									
19									
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24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
*FM									
TOTAL	792	3495	20.5	913	3955	20.9	2390	11070	19.8

* FM is not included in the H, P, and S "TOTAL" values because it is a federal program

WISCONSIN SPRING TURKEY HARVEST 1983-1994

H= Total Season Harvest P= Total Season Permits S= Success Rate (H/P)

ZONE	1989			1990			1991		
	H	P	S	H	P	S	H	P	S
01	158	960	16.5	149	948	15.7	168	935	18.0
1A	247	1120	22.1	257	1484	17.3	234	1456	16.1
02	857	2640	32.5	1129	3829	29.5	917	3961	23.2
03	558	2800	19.9	1005	4470	22.5	1032	5948	17.4
04	742	2800	26.5	1028	3600	28.6	1065	4204	25.3
4A									
05	159	1200	13.3	278	1674	16.6	329	2130	15.4
5A									
06	144	1200	12.0	205	1462	14.0	263	1801	14.6
07	0	800	0.0	262	1271	20.6	351	1501	23.4
08	157	800	19.6	219	1154	19.0	298	1469	20.3
09	101	1200	8.4	99	1049	9.4	89	1049	8.5
10	428	1360	31.5	525	1881	27.9	465	2099	22.2
10A									
10B									
11	269	1600	16.8	290	1371	21.2	344	1666	20.6
11A									
12	126	1000	12.6	192	1037	18.5	247	1216	20.3
12A									
13	113	800	14.1	152	764	19.9	178	1066	16.7
13A									
14				67	488	13.7	90	734	12.3
15				151	662	22.8	206	1163	17.7
15A									
15B									
15C									
16							175	838	20.9
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30				100	450	22.2	106	603	17.6
31	121	600	20.2	248	1200	20.7	169	1801	9.4
32	61	400	15.3	122	902	13.5	134	1501	8.9
33									
34									
35									
36									
*FM				22	181	12.2	46	243	18.9
TOTAL	4241	21280	17.6	6478	29696	19.7	6860	37141	17.4

* FM is not included in the H, P, and S "TOTAL" values because it is a federal program

WISCONSIN SPRING TURKEY HARVEST 1983-1994

H= Total Season Harvest P= Total Season Permits S= Success Rate (H/P)

ZONE	1992			1993			1994		
	H	P	S	H	P	S	H	P	S
01	176	964	18.3	249	1201	20.7	229	1202	19.1
1A	187	1304	14.3	275	1681	16.4	248	1681	14.8
02	1074	3961	27.1	1117	4504	24.8	932	4500	20.7
03	1217	6001	20.3	1457	6600	22.1	1524	7801	19.5
04	1223	5101	24.0	1282	5701	22.5	1075	6002	17.9
4A	13	38	34.2	15	36	41.7	8	36	22.2
05	452	2372	19.1	621	3000	20.7	751	4501	16.7
5A	8	36	22.2	12	37	32.4	10	36	27.8
06	356	2101	16.9	411	2401	17.1	382	2401	15.9
07	438	2400	18.3	619	2701	22.9	615	3000	20.5
08	370	1724	21.5	509	2700	18.9	455	2701	16.8
09	74	840	8.8	90	1021	8.8	107	1051	10.2
10	514	2137	24.1	477	2702	17.7	368	2702	13.6
10A	4	27	14.8	4	25	16.0	7	26	26.9
10B	0	1	0.0	0	9	0.0	1	2	50.0
11	367	1534	23.9	574	2721	21.1	583	3002	19.4
11A				0	3	0.0	1	1	100.0
12	336	1407	23.9	552	1951	28.3	543	1953	27.8
12A	0	12	0.0	0	2	0.0			
13	230	1204	19.1	377	1897	19.9	381	2100	18.1
13A	4	18	22.2	10	20	50.0	6	18	33.3
14	123	854	14.4	201	1200	16.8	250	1200	20.8
15	256	1330	19.2	338	1762	19.2	394	2401	16.4
15A	0	17	0.0	2	16	12.5	0	15	0.0
15B	0	2	0.0	0	3	0.0	0	1	0.0
15C	0	25	0.0	3	24	12.5	1	25	4.0
16	261	1281	20.4	344	1759	19.6	320	2101	15.2
17	223	1200	18.6	342	2289	14.9	353	2401	14.7
18				264	1052	25.1	400	2100	19.0
19	166	973	17.1	303	1836	16.5	311	1952	15.9
20							183	1026	17.8
21							108	575	18.8
22				244	1203	20.3	183	1776	10.3
23				528	2400	22.0	487	3000	16.2
24							72	300	24.0
25				61	301	20.3	74	300	24.7
26	62	474	13.1	80	600	13.3	97	600	16.2
27	73	301	24.3	110	600	18.3	78	600	13.0
28	102	450	22.7	181	901	20.1	195	1051	18.6
29				29	288	10.1	32	300	10.7
30	138	750	18.4	181	901	20.1	206	1051	19.6
31	166	1501	11.1	202	1501	13.5	107	1201	8.9
32	122	1420	8.6	114	1501	7.6	74	875	8.5
33				102	300	34.0	105	450	23.3
34							72	300	24.0
35							37	300	12.3
36							94	576	16.3
*FM	49	223	22.0	61	212	28.8	66	222	29.7
TOTAL	8735	43760	16.5	12280	61350	18.5	12459	71193	19.6

* FM is not included in the H, P, and S "TOTAL" values because it is a federal program

WISCONSIN FALL TURKEY HARVEST 1989-1994

H= Total Season Harvest P= Total Season Permits S= Success Rate (H/P)

ZONE	1989			1990			1991		
	H	P	S	H	P	S	H	P	S
01	74	540	13.7	103	540	19.1	114	675	16.9
1A	218	840	26.0	195	900	21.7	100	841	11.9
02	344	1200	28.7	534	1500	35.6	346	1500	23.1
03	230	1350	17.0	665	2550	26.1	524	3000	17.5
04	372	1650	22.5	835	2400	34.8	602	3000	20.1
4A									
05	40	300	13.3	133	750	17.7	165	1201	13.7
5A									
06									
07									
08							116	751	15.4
09	77	540	14.3	53	450	11.8	45	451	10.0
10	215	840	25.6	406	1200	33.8	281	1500	18.7
10A									
10B									
11				188	675	27.9	167	900	18.6
11A									
12				89	450	19.8	116	600	19.3
12A									
13							98	750	13.1
13A									
14									
15							59	450	13.1
15A									
15B									
15C									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31	121	600	20.2	138	600	23.0	113	601	18.8
32	61	400	15.3	89	450	19.8	45	450	10.0
33									
34									
35									
36									
*FM									
TOTAL	1752	8260	19.7	3428	12465	24.2	2891	16670	16.0

* FM is not included in the H, P, and S "TOTAL" values because it is a federal program

WISCONSIN FALL TURKEY HARVEST 1989-1994

H= Total Season Harvest P= Total Season Permits S= Success Rate (H/P)

ZONE	1992			1993			1994		
	H	P	S	H	P	S	H	P	S
01	140	675	20.7	129	676	19.1	78	300	26.0
1A	149	841	17.7	149	840	17.7	74	300	24.7
02	536	2250	23.8	485	2251	21.5	315	1200	26.3
03	734	3601	20.4	1109	5400	20.5	669	3000	22.3
04	862	4501	19.2	748	5100	14.7	364	2100	17.3
4A									
05	286	1500	19.1	322	2400	13.4	216	1200	18.0
5A									
06	150	1051	14.3	74	750	9.9	74	500	14.8
07	226	1200	18.8	208	1200	17.3	129	800	16.1
08	158	1052	15.0	199	1202	16.6	122	600	20.3
09	55	450	12.2	38	450	8.4	40	300	13.3
10	423	2100	20.1	262	1800	14.6	121	500	24.2
10A									
10B									
11	354	1425	24.8	322	1425	22.6	251	800	31.4
11A									
12	277	900	30.8	401	1501	26.7	273	1000	27.3
12A									
13	171	900	19.0	209	1050	19.9	124	600	20.7
13A									
14	72	450	16.0	78	450	17.3	66	300	22.0
15	124	600	20.7	143	901	15.9	114	500	22.8
15A									
15B									
15C									
16	100	451	22.2	156	900	17.3	93	450	20.7
17				140	901	15.5	145	500	29.0
18							71	300	23.7
19				99	600	16.5	83	400	20.8
20									
21									
22							50	300	16.7
23							165	700	23.6
24									
25									
26				24	301	8.0	26	150	17.3
27				35	301	11.6	35	150	23.3
28							46	200	23.0
29									
30				56	300	18.7	54	250	21.6
31	130	601	21.6	80	450	17.8	30	150	20.0
32	77	450	17.1	35	300	11.7	14	100	14.0
33									
34									
35									
36									
*FM									
							54	239	22.6
TOTAL	5024	24998	19.7	5501	31449	16.4	3896	17650	21.8

* FM is not included in the H, P, and S "TOTAL" values because it is a federal program

LEE GLADFELTER---- OBITUARY

On Friday, September 30, 1994, while enroute to go bow hunting for deer, Lee Gladfelter, a treasured friend and colleague, was killed in an automobile accident just north of Kirksville, Missouri. Lee was a quality professional and very well respected by those that had the opportunity to work with him. His career has been starred by numerous accomplishments in deer management and wetland protection.

Lee, a Topeka, Kansas, native received his B.S. degree from Kansas State in 1964 and his Master of Science degree from the University of Idaho in 1967. After service in the Army from 1966 to 1969 including a tour in Korea, Lee began his professional career in March 1969 as deer research biologist with the Iowa Conservation Commission. He served in that capacity through 1988. In 1989 he became Special Projects Coordinator for the Wildlife Bureau in Des Moines. Just prior to his death Lee was promoted to Executive Officer 2. Since 1989, Lee was a guiding force in Iowa's portion of the Prairie Pothole Joint Venture, which is a working group of the North American Waterfowl Management Plan. He helped secure funding and guide the acquisition of 5300 acres for wetland and upland restoration and protection from 1989 to 1994. Lee was quite successful in securing grant projects under the North American Wetlands Conservation Act. Recently, Iowa, had 4 projects approved for funding which totaled about $ 4 million of which $ 2 million were federal dollars.

Lee was a valued asset to the Iowa Department of Natural Resources and the Fish and Wildlife Division. He provided valued insight and direction to deer and turkey programs, management of public lands and designing of projects and programs. He served as the coordinator for the National Big Game Trophy Measuring Clubs of Pope and Young and Boone and Crockett, roadside management liaison between the DNR and the Department of Transportation, DNR representative for National Wildlife Disease Control Program, Wildlife Bureau representative to the State Emergency Disaster Program and represented Iowa on the Implementation Committee of the Prairie Pothole Joint Venture as well as being chairman of the State Coordinating Committee for the PPJV.

Lee was very active in the Wildlife Society. He was President-elect in 1970-71 and president in1972-73 of the Iowa Chapter of the Wildlife Society. He went on to serve as president-elect (1983) and president (1984) of the North Central Section of the Wildlife Society.

Lee was best known for his contributions on white-tailed deer research and management. He authored numerous publications on deer including chapters in two collected works on white-tails: *White-tailed Deer Population Management in the North Central States*(published by the Wildlife Society in 1980) and *White-tailed Deer; Ecology and Management* (published by the Wildlife Management Institute in 1984). The success of Iowa's deer program and the great recreational opportunities provided to Iowans is largely attributed to Lee's expertise and guidance. He led the early management program that developed the deer population and hunting recreation that we enjoy today.

Additional special recognition for his outstanding work included Iowa DNR Wildlife Bureau Employee of the Year Award in 1988 and a special award in 1994 for his exceptional contributions to the Prairie Pothole Joint Venture.

Lee was a very good friend and a trusted associate who could always be counted on to stand firm on the side of the wildlife resource. While a consensus was not always reached his input was highly valued. The state of Iowa and its outdoors people do not presently know how much they have lost and probably never will. However, there are some projects in the budding stage and some yet to break the soft earth that will never flower. Those of us that knew him, will miss him . I am to be counted in that light. As I walk the autumn leaf covered deer trails of my future, and with careful observation note the disarrangement of dust and leaves, I will feel his presence and think he is just ahead.

Lee is survived by his wife, Mary, of Madrid; a daughter, Paige Gladfelter Ricco, of St. Charles, Illinois; a son, Todd, of Lisle, Illinois; and a sister, Patrica Reed, of Shreveport, La. The family which has always been a strong supporter of Lee's profession and ideals have created a memorial to acknowledge his recent accomplishments in wetland protection. A wetland will be restored and named in his honor. Memorials can be made to the Eagle Lake Wetlands Restoration Project, Iowa Department of Natural Resources, Wallace Building, Des Moines 50319, attention Terry Little.