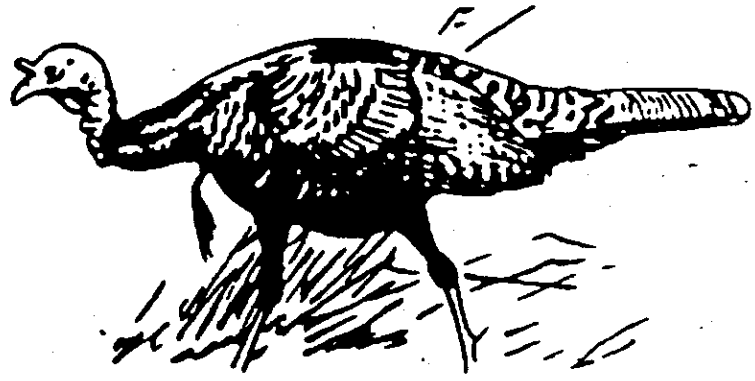
PROCEEDINGS OF THE MIDWEST DEER AND TURKEY STUDY GROUP

SPRINGBROOK CONSERVATION EDUCATION CENTER
GUTHRIE CENTER, IOWA
JANUARY 14-17, 1991



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MIDWEST DEER AND TURKEY GROUP MEETINGS

DATE	LOCATION
January 17-19, 1977	Fountain Grove Wildlife Area in Missouri
January 16-17, 1978	Wyalusing State Park in Wisconsin
January 15-18, 1979	Rathbun Fish Hatchery in Iowa
January 21-24, 1980	Whitewater State Park in Minnesota
January 19-22, 1981	Harrison-Crawford State Forest in Indiana
January 18-21, 1982	Lake Hope State Park in Ohio
January 17-21, 1983	Louisville 4-H Camp in Nebraska
January 16-19, 1984	Camp Aldrich in Kansas
May 7-10, 1985	Black Hills in South Dakota
January 20-23, 1986	Camp-of-the-Cross in North Dakota
January 27-29, 1987	Kellogg Biological Station in Michigan
February 1- 4, 1988	Touch of Nature in Illinois
January 23-26, 1989	YMCA Camp of the Ozarks in Missouri
January 15-18, 1990	Bethel Horizons Retreat Center in Wisconsin
January 14-17, 1991	Conservation Education Center in Iowa

MIDWEST DEER AND TURKEY STUDY GROUP
MEETING SUMMARY

14-17 JANUARY 1991

The fifteenth annual meeting of the Midwest Deer and Turkey Study Group was held at the Iowa DNR Conservation Education Center at Springbrook State Park, Iowa.

State budgets and travel restrictions prevented attendance by individuals from several member states. Still, nearly 30 biologists made the trip to scenic central Iowa.

The first morning opened with a "heated" discussion on animal right activists' demands, perceptions and attitudes. Members from the Humane Society presented their view of hunting, trapping, and lab research and biologists attempts to conceal the true reasons for wildlife management. Additionally, attendees were introduced to a potentially new wildlife infrared census and monitoring device (company) based in Minnesota. The afternoon concluded with state status reports and research updates.

The following morning, the turkey study group left on a grand tour of Iowa's marginal turkey habitat and a presentation by former group member, Greg Hanson. The deer group finished state report updates and a few were able to "get out in the field" and assisted in removing a radio-collar from a doe marked during DeWaine Jackson's park study.

The business meeting was short and concise. Minnesota will host the annual meeting in 1992 and Indiana has already mentioned being the host in 1993. We all look forward to the future meetings: the chance to exchange ideas, present results and discuss regional management problems.

Iowa enjoyed the chance to host the 1991 study group and hopes everyone enjoyed the meeting.

DeWaine Jackson

TO: ATTENDEES OF THE MIDWEST DEER AND TURKEY GROUP MEETING
FROM: DEWAINE JACKSON
SUBJECT: MEETING AGENDA

JANUARY 14, 1991

1:00 - 5:30	Arrive, register, "settle-in", bedding furnished
5:30 - 6:30	Evening meal
6:30 - ?	Selected activities - social mixer

JANUARY 15, 1991

6:30 - 8:00	Breakfast
8:00 - 8:30	Richard Bishop, Bureau Chief, Iowa DNR Welcome to Iowa & Potentials impacts (at the administrative level) of animal right activists' demands on wildlife programs.
8:30 - 9:00	Vickie Eide - Animal rights.
9:00 - 9:30	*Cancelled** Bob Allen, Bob Allen Sporting Clothes, previous ISHA Board Member ISHA (International Shooting & Hunting Alliance) goals & objectives *Substitute* Paul Meenan, ISU Humane Society, joined Vickie Eide for discussion of animal rights
9:30 - 9:50	Lee Gladfelter, Special Program Coordinator, Iowa DNR - Goals & objectives of the Wildlife Management Committee of the American Archery Council
9:50 - 10:15	Coffee Break
10:15 - 11:00	Taped presentation Philosophical views of animal rights
11:00 - 11:30	*Cancelled** Jay McAninch, Minnesota DNR Urban deer controversies *Substitute* Ron Brenneman, NWTF Update
11:30 - 12:00	*Cancelled**Steve Backs, Division of Fish & Wildlife, Indiana National Forest Management (or Mis-management ?) *Substitute* Gary Miller, Wait Inc. Infrared Wildlife Scanning and monitoring
12:00 - 1:00	Noon meal
1:00 - 3:00	State reports & discussion of standardized reporting forms.
3:00 - 3:20	Coffee Beak
3:20 - 5:00	Continuation of state reports
5:00 - 6:30	Evening meal
6:30 - 7:30	*Cancelled** McAninch and Ingebritsen, Minnesota DNR Productivity of Farmland White-tailed Deer in Minnesota
7:30 - ?	Selected personal entertainment

JANUARY 16, 1991

6:30 - 8:00	Breakfast
8:00 - 5:30	Turkey group will have a "grand-tour" of Iowa's marginal turkey habitat and presentation by former turkey group member, Greg Hanson, Rice Lake Wildlife Unit Biologist (sack lunch provided)

	Deer group will have "mini-tour", continue state status reports and discussions
5:30 - 6:30	Evening meal
6:30 - ?	Management and research discussions for both groups

JANUARY 17, 1991

6:30 - 8:00	Breakfast
8:00 - 10:00	Final discussions, business meeting and adjournment

1990 MIDWEST DEER AND TURKEY GROUP MEETING PARTICIPANTS

(Guthrie Center, Iowa)

STATE	ADDRESS	PHONE
Illinois		
Jared K. Garver	IL Dept. of Conservation Union Co. Refuge Rt. 2, Box 628 Jonesboro IL 62952	618/833-5175
Iowa		
Lee Gladfelter	Iowa DNR Wallace State Office Bldg. Des Moines IA 50319	515/281-4815
DeWaine Jackson	Iowa DNR Wildlife Research Station RR 1 Boone IA 50036	515/432-2823
Terry Little	Iowa DNR Wallace State Office Bldg. Des Moines IA 50319	515/281-8660
Willie Suchy	Iowa DNR Chariton Research Station RR 1 Chariton IA 50049	515/774-2958
Michigan		
Ed Langenau	MI DNR Wildlife Division Box 30028 Lansing MI 48909	517/373-1263
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Minnesota		
Gary Nelson	MN DNR Rt 2 Box 333 Altura MN 55910	507/932-4133
Howard Shepperd	MN DNR Rochester MN 55904	507/285-7435

Missouri

Jeff Beringer	MO Dept. Conservation 1110 S. College Ave. Columbia MO 65201	314/882-9880
Lonnie Hansen	MO Dept. Conservation 1110 S. College Ave. Columbia MO 65201	314/882-9880
John B. Lewis(retired)	5500 Hayes Rd., Rt. 1 Columbia MO 65201	
Larry D. Vangilder	MO Dept. Conservation 1110 S. College Ave. Columbia MO 65201	314/882-9880

Nebraska

Karl Menzel	NE Game & Parks Box 508 Bassett NE 68714	402/684-2921
Bruce Trindle	NE Game & Parks Box 934 Norfolk NE 68702	402/370-3374

North Dakota

Roger Johnson	ND Game & Fish Dept. Lunde Bldg. Rugby ND 58368	
Lowell Tripp	ND Game & Fish Dept. PO Box 7 Oakes ND 58474	701/742-2271

Ohio

Bob Stoll	OH DNR Div. Wildl. 9650 St. Rt. 356 New Marshfield OH 45766	

Ontario

Dave Reid	Ontario Min. Nat. Resources 548 Queensway W Box 706 Simcoe Ontario Canada N3Y 4T2	519/426-7650

South Carolina

Ron Brenneman	National Wild Turkey Fed. PO Box 530 Edgefield SC 29824	803/637-3106

South Dakota

Will Morlock	SD Game Fish & Parks 400 W Kemp Watertown SD 57201	605/882-3850
Les Rice	SD Game Fish & Parks 3305 W South St. Rapid City SD 57702	605/394-2391

Wisconsin

Ed Frank (retired)	WI DNR 1205 Ellen Ave. Madison WI 53716	608/222-3386
John Kubisiak	Sandhill Area Hdqtrs. Box 156 Babcock WI 54413	715/884-2437

Organizational Guidelines of the Midwest Deer and Wiid 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 selection 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 elasped 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 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 allows 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 or obtained through the charge of a small registration fee.

DEER STUDY GROUP REPORTS

DEER IN INDIANA - 1990

Lori Pruitt and Jim Mitchell

Deer Hunting Seasons

The 1990 Indiana deer hunting season was composed of 4 segments: early archery (Oct. 6-Nov. 9), firearms (Nov. 10-25), muzzleloader (Dec. 1-9), and late archery (Dec. 1-31). Special hunts were held at 5 military areas and at the Muscatuck National Wildlife Refuge.

The archery bag limit was 2 deer of either sex. Hunters could take 1 deer on a regular archery license and an additional deer on an extra archery license. The gun bag limit was 1 antlered deer during the firearms season or 1 either-sex deer during the muzzleloader season. A shotgun, muzzleloader, or handgun license was required to hunt during the firearms season, and a muzzleloader license was required to hunt during the muzzleloader season. The resident deer license fee was $13.75 and the nonresident fee was $76.75. Resident landowners and tenants who hunted on land they own or lease were exempt from purchasing licenses.

Seventy-two of Indiana's 92 counties were designated "bonus deer counties" during 1990 (an increase of 8 counties over last year). Hunters who applied and were selected in a computerized drawing were issued a permit to take a bonus antlerless deer in the county for which they were drawn during the firearms season. However, successful applicants were required to purchase a "bonus county license" to validate their antlerless permit. Fifty percent of the permits were reserved for applicants who own or lease 40 or more acres in bonus deer counties. This procedure insures that a high percentage of landowner applicants (99.3% during 1990) are drawn for an antlerless permit.

A total of 79,500 bonus antlerless deer permits was offered during 1990, a 34% increase over the 1989 quota. Although 86,085 applications were received, there was an insufficient number of applicants to fill quotas in 39 counties, and 7,391 permits (9% of total) went unissued. We considered various plans to distribute left-over permits, but these plans were not adopted due to anticipated administrative difficulties. A major problem yet to be addressed in Indiana is how to achieve needed antlerless harvests in management units where there is insufficient demand for antlerless permits.

A significant modification to deer hunting regulations will be proposed by the DNR at a public hearing this winter. The proposal would modify the gun bag limit to allow hunters to take 1 antlered deer during the firearms season and 1 either-sex deer during the muzzleloader season.

1990 Deer Harvest

Based on reports obtained by 7 January 1991, the preliminary count of the total statewide deer harvest during 1990 is 87,491 (Table 1), a 11% increase over the 78,779 deer reported for the same period in 1989. Record deer harvests have occurred in Indiana each of the last 8 years. Factors which may have contributed to the increased harvest in 1990 include a 34% increase in the number of bonus antlerless deer permits available, a 40% increase in the number of depredation zone permits issued, and larger deer populations in some counties. Final computerized deer harvest figures will be available in February.

Table 1. Preliminary counts of the number of deer harvested during each segment of the 1990 Indiana deer hunting season. Harvest figures are from reports submitted by 313 mandatory deer check stations.

Season	Number of deer harvested Total	% change from 1989
Early archery (6 Oct.- 9 Nov.)	15,767	+ 6
Firearms (10-25 Nov.)	60,179	+12
Late season[a] (1-31 Dec.)	11,545	+13
Totals	87,491	+11

[a]Late archery and muzzleloader seasons combined.

1990 Deer Depredation Zones

The deer depredation zone is a tool to increase the harvest of antlerless deer on specific farms where deer are damaging crops. If a field inspection by the local district wildlife biologist confirms damage of $250 or more, the landowner is eligible to receive special antlerless deer permits for use during the firearms season. The landowner can issue up to 2 permits to each hunter of his/her choice. Hunters are required to purchase a depredation zone deer license to validate each permit, but depredation zone deer do not count against the hunter's regular bag limit.

As reported last year, Indiana's deer depredation zone program continues to grow at an alarming rate (Table 2). Although the program is popular among landowners, it is very time

consuming for Indiana's 11 district wildlife biologists to administer. Consequently, efforts are being made to encourage landowners to apply for bonus antlerless deer permits, and to grant access to sportsmen who possess bonus permits.

Table 2. Summary of Indiana's deer depredation zone program, 1985-1990.

Year	No. of zones	No. of counties with zones	No. of permits issued	No. of deer harvested
1985		8	578	
1986	109	18	1,161	202
1987	293	45	3,443	635
1988	495	61	5,323	1,051
1989	671	74	7,213	1,494
1990	922	78	10,331	2,564

Biological Data Collection

The collection of biological data continued during 1990 to characterize sex and age structure and physical condition of harvested deer in different regions. Data collected from each deer included sex, age, weight, number of antler points, and antler beam diameter of yearlings. State fish and wildlife areas collected much of our biological data because they are official deer check stations, and property managers are usually present to examine deer. District wildlife biologists, wildlife research biologists, and other personnel collected biological data on the opening weekend of the firearms season in selected counties.

DNR personnel usually examine about 12% of the total statewide deer harvest. Although physical condition measurements are of general interest to biologists and hunters, our primary reason for collecting biological data is to obtain ages. Age data are being used in a population model to reconstruct the size of county deer populations and to determine appropriate antlerless permit quotas.

Physical condition of deer is usually excellent throughout Indiana. During 1990, the average field-dressed weight of 1.5-year-old bucks was 128 pounds. Two-thirds of Indiana's antlered buck harvest was comprised of 1.5-year-old deer.

1989 Deer Damage Reports

During 1989, 532 deer damage complaints were investigated and documented by district wildlife biologists. Corn was cited as the primary crop damaged on 55% of all complaints. Soybeans

accounted for an additional 34% (Table 3).

The average value of loss which the complainant associated with damage was $580. Biologists' average damage estimate was $500. Deer damage reports were filed from 68 of Indiana's 92 counties during 1989.

Farm operators experiencing damage were asked in which month damage was first observed. July, the peak month, accounted for 44% of reports filed.

Fifty-seven percent of the reports filed indicated that damage occurred at crop/woodland borders. The remaining reports indicated that damage occurred throughout the crop (20%), was sporadic (12%), or occurred at a border with other cropland (7%).

District biologists were asked if cultural practices or environmental conditions contributed to deer damage on those farms where damage was reported (e.g., drought conditions or lack of weed control compounded damage caused by deer). Biologists indicated the presence of confounding factors for 7% of the reports filed.

Biologists were also asked if there was a particular cover type or adjoining land ownership associated with the damage. Cover was associated with damage for 85% of the reports filed. The cover type most often associated with damage was deciduous woodlands which accounted for 84% of reports associated with cover. Biologists indicated that adjoining land ownership was associated with 24% of the damage reports filed. State parks accounted for 33% of the damage situations associated with adjoining land ownerships. Other state-owned lands, forests and fish and wildlife areas, each accounted for 2% of these damage situations. Federal government lands (national forest or military areas) accounted for 4%. Unhunted privately owned land accounted for 23%. The remainder of these reports were categorized as "other government lands" (18%) or "other property" (18%).

The majority of damage complaints (94%) came from farm operators who had a previous history of deer damage on their farm; 46% of these individuals had contacted the IDNR previously concerning the damage. Deer hunting was permitted on 97% of the areas on which damage was reported. The average farm operator had allowed hunting for at least 8 years. Archery hunting occurred on 82% of the farms, firearms season hunting on 96%, and muzzleloader season hunting on 72%. Most farm operators (74%) restricted hunting privileges to family members and invited guests. People who asked permission could hunt on 23% of the lands and anyone could hunt (no advance permission needed) on 3% of the areas. During 1987, 16% of farm operators who reported damage indicated that people who asked permission could hunt on their land and 2% indicated their land was open to hunting without permission. The 1988 and 1989 reports indicate a more

liberal attitude toward deer hunting access among those farm operators who report damage. From a deer damage control perspective, this trend will be encouraging if it continues in future years.

District biologists were asked to indicate all harvest strategies and other deer damage control techniques used on the land for which a complaint was filed. They were also asked to comment on whether or not positive results were obtained from the control efforts. Increased hunter access or hunting pressure, used on 45% of the farms, was the most common deer damage control measure. District biologists indicated that this strategy showed positive results on 10% of the areas where implemented. In general, only "intensive" damage control techniques (fencing, repellents, scare devices) were highly rated by district biologists for effectiveness. However, these methods were infrequently used (Table 4).

Table 3. Summary of 1989 damage reports by crop. Average number of acres damaged, landowner dollar estimate of loss, and investigating biologist dollar estimate of loss are reported for each crop.

Crop	No. of reports filed and (%)	Mean no. of acres damaged	Mean estimated loss (dollars)	
			Landowner	Biologist
Corn	291 (55)	3	576	500
Soybeans	179 (34)	4	573	495
Hay	17 (3)	10	500	275

Table 4. Deer damage control techniques used by Indiana farm operators reporting damage during 1989.

Technique	Percent using technique	Percent with positive results
Increased hunting pressure	45	10
Depredation zone	31	31
Deer damage control permit	4	18
Fencing	1	25
Repellents	3	27
Scare devices	2	27
Cultural practices	1	0

1989 Deer-Vehicle Accidents

Indiana State Police records are used to monitor the number of deer-vehicle collisions occurring in each county. A total of

11,430 deer-vehicle collisions was recorded in Indiana during 1989. This figure is 12% greater than during 1988. Deer-vehicle accidents typically comprise about 4% of the total traffic accidents occurring each year. Indiana's accident rate is approximately 1 reported deer-vehicle accident per 4.9 million miles of travel and has remained constant during 1987-89.

During the past 3 years, the DNR has issued a statewide news release during October to alert motorists to deer hazards and present tips for safe driving. The purpose of this annual news release is to show our awareness of the deer-vehicle accident problem and demonstrate our desire to minimize accident risks. It is not clear, however, whether the news release has been helpful or actually hurtful to our cause. Deer-vehicle accidents continue to be a highly publicized concern in many regions of the state.

1989 Hunter Distribution and Success Survey

A survey of licensed deer hunters was conducted following the 1989 season to determine the amount and distribution of hunting pressure and hunter success rates. During 1989, there were an estimated 148,000 licensed deer hunters in Indiana who expended 2,334,000 hunter efforts. Success rates for each season segment were early archery 16%, firearms 33%, muzzleloader 14%, and late archery 3%. Reported success rates for hunters using a single firearm type during the firearms season were 46% for shotgun, 40% for muzzleloader, and 41% for handgun.

WHITE-TAILED DEER

HISTORICAL PERSPECTIVE

White-tailed deer were reported to be quite abundant when settlers arrived in Iowa in the early 1800's. Although the initial clearing and cultivating of the land for settlement may have initially improved the suitability of the habitat for deer, uncontrolled exploitation for food and hides rapidly reduced deer numbers. By 1880 deer were a rare sight in much of Iowa and in 1898 the deer season was legally closed. Unfortunately, by this time deer had been nearly eliminated from all areas of the state.

Reestablishment of deer into the state can be traced to escapes and releases from captive herds, transplantations and immigration from Minnesota, Wisconsin and Missouri. A conservative estimate of the deer population in 1936 placed the statewide numbers at between 500-700 animals. By the early 1950's deer were reported to be found in most counties in Iowa and the estimated statewide population had topped 10,000. Localized concentrations had begun to cause problems by damaging agricultural crops. The first modern deer season was conducted in December of 1953 and 4,000 were reported killed. Since then, deer numbers and harvests have steadily increased to the present. In 1989, the post-season population estimate exceeded 200,000 deer statewide and nearly 100,000 deer were legally harvested.

Although deer are normally associated with forested areas, cover requirements can be met by brushy draws or fencelines, marshes, tall weeds, grassy areas or other secluded spots. For example, standing corn provides excellent cover, a source of food and travel lanes. Deer utilize many sources of food including agricultural crops, mast, forbs and woody browse.

Deer numbers in Iowa have increased through careful management of hunting regulations. The white-tail's ability to thrive in Iowa is the result of many factors, although 2 are probably key to their success. First, deer in Iowa have high reproductive rates. A high proportion of each year's doe fawns have a single fawn themselves the following year. Most will have 2 or occasionally 3 fawns each subsequent year. High productivity in white-tails is directly correlated to high quality and readily available food. Additionally, the absence of harsh winters or prolonged periods of deep snow allow deer to come through the winter "bottleneck" in excellent shape.

The second reason deer do so well in Iowa is that they are very mobile. Studies have shown that individual deer may typically travel over several miles between different types of habitats during the course of the year. Much dispersal occurs in the spring prior to fawning. During this movement, deer can easily pioneer into previously unoccupied areas.

HUNTING SEASON AND HARVEST INFORMATION

Harvest results are reported for the 1989 season and were obtained from post-season hunter questionnaires. Sampling is designed to provide doe harvest estimates for each zone with a

95% confidence interval within 10% of the estimate. Although some county level estimates are reported, they should be interpreted with caution since they are usually made from a relatively small number of returns.

For 1989 the hunting season framework was unchanged from last year (Table 1.1). The number of licenses issued, the number of hunters in the field and the reported harvest all increased from 1988 (Table 1.2 & 1.3). The 1989 season produced the 10th year in a row of a record harvest (Table 1.4).

Regular Gun Season

Hunters during both shotgun seasons faced adverse weather conditions in 1989. First season hunters awakened to below freezing temperatures with high winds on opening day. Second-season hunters had to brave sub-zero temperatures during most of the week. Despite these conditions, hunters killed about 1,000 more deer than in 1988. Increased license sales, despite lower participation rates, produced hunter numbers about 4% higher than last year. Additionally, about 3,300 hunters had bonus tags for Zones 4, 5 & 6. Almost 2/3 of these hunters bagged antlerless deer. About 700 nonresidents also hunted during the gun season in Iowa for the first time in 1989. Seventy percent of these hunters reported hunting with an Iowan. They had slightly lower success rates than did other paid shotgun hunters. Hunters averaged about 3 days hunting during the first season and 4 days during the second season. Deer hunting provided Iowans over 376,000 persondays of recreation during the regular shotgun season. Persondays are calculated by multiplying the average number of days reported hunting by the number of hunters in the field.

The number of free landowner/tenant licenses issued during the 1989 shotgun season increased by 21%. Had they been purchased, these licenses would have been worth $675,960. Less than 70% of hunters with these licenses reported that they went hunting during the season.

Iowa is divided into 10 zones for management purposes (Fig. 1.1). Zones 7, 4, 5 and 9 had the highest total harvests (Table 1.5 & 1.6). Zones 9, 6 and 5 had the highest harvest/mile^2 of land when the results are adjusted for the difference in size of the zones (Table 1.7). Success rates for paid gun hunters ranged from 58% in zone 8 to 70% in Zone 4 (Table 1.8). About 2/3 of all hunters were successful, down somewhat from 1988 (Table 1.9). Almost 54% of the deer killed were bucks (antlered bucks and buck fawns).

An additional 555 deer were killed during 2 gun seasons at the Iowa Army Ammunition Plant (IAAP) near Burlington (Table 1.10). Hunters were required to take one antlerless deer before they could go back for a deer of either sex.

Archery Season

A record number of archers killed a record number of deer during 1989. Over 1/3 of Iowa's archers were successful last year and over 70% of the deer killed were bucks (Table 1.11).

About 2,000 of these archers purchased a bonus license and half were successful in bagging an antlerless deer. The average archer spent over 25 days afield in 1989 or almost 70 days in the field per deer bagged. Archery-deer hunting provided about 784,000 persondays of recreation.

Special Muzzleloader Seasons

Interest in the special muzzleloader seasons continues to increase rapidly. Total hunters in the field and the number of deer harvested more than doubled over 1988. Part of this increase was due to an increase in the number of early muzzleloader licenses available. However, the biggest increase came in the late season where hunters were allowed to hunt in both the late muzzleloader and shotgun seasons for the first time. Success rates and percent of bucks in the harvest were similar to last year (Table 1.12). Hunters during the early season averaged 4.5 days afield while late season hunters averaged 8.5 days. Deer hunting with a muzzleloader provided over 104,000 persondays of recreation to Iowans.

County Harvest Estimates

Harvest estimates and rankings for the shotgun, archery and muzzleloader seasons for each county are made in an attempt to obtain a better understanding of how harvest is distributed within individual zones (Table 1.13 and Fig. 1.2). Figure 1.3 shows the percent of does reported being harvested in each county during the regular shotgun season.

Hunter Opinions

Most hunters reported being satisfied or very satisfied with their hunt and deer numbers in the area that they hunt were about right (Table 1.14).

POPULATION SURVEYS

Three techniques are used to monitor deer population trends in Iowa. These are 1) an aerial survey conducted after the close of the hunting season; 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 appear to provide long-term trend indices to Iowa's deer population, but each survey is highly variable on an annual basis.

On a statewide basis, aerial surveys conducted after the 1989 season (Jan-Mar 199) were 34% lower than 1988 (Table 1.15). Poor survey conditions due to the warm, dry weather in January and February were noted on the majority of surveys completed. The spotlight survey (April 1990) declined by 19% from the previous spring. This somewhat offsets the 30% increase recorded last year. The number of deer killed per billion vehicle miles was 6% lower in 1989 (Table 1.15). It appears from these surveys that the size of the herd was stable to slightly down from 1988.

THE 1990 SEASON

For the most part, the 1990 deer season should be fairly similar to last year. The one major change for next year is that all paid shotgun licenses issued for the first season in Zones 1, 2 and 10 will be buck-only. Also, shotgun licenses issued for the first season in Zone 7 will be restricted to bucks only north of Highway 30. Other changes include a small increase in the number of nonresident licenses that will be issued, part of Zone 3 will have bonus antlerless tags available for the second shotgun season, and archers who choose to purchase the bonus archery license will be able to shoot either sex of deer during the late bow season (after the shotgun seasons are over).

Table 1.1 The dates, hours and zones for shotgun, archery and muzzleloader seasons (1953 – 1971).

		Shotgun		Archery		Muzzleloader	
Year	Zones	Dates	Hours	Dates	Hours	Dates	Hours
1953	45 Counties	Dec 10-14	9am-4pm	Dec 10-14 a	9am-4pm		
1954	51 1/2 Counties	Dec 10-12	9am-4pm	Dec 10-12 b	9am-4pm		
1955	Statewide	Dec 3-5	9am-4pm	Oct 29-Nov 20 c	6:30am-4pm		
1956	Statewide	Dec 8-9	8am-4pm	Oct 13-Nov 12	6:30am-5pm		
1957	Statewide	Dec 7-8	8am-4pm	Oct 26-Nov 25	6:30am-5pm		
1958	Statewide	Dec 13-14	8am-4pm	Nov 1- Nov 30	6:30am-5:30pm		
1959	Statewide	Dec 12-13	8am-4pm	Oct 31-Nov 30	6:30am-5:30pm		
1960	Statewide	Dec 17-19	8am-4pm	Oct 15-Nov 27	6:30am-5:30pm		
1961	Statewide	Dec 16-18	8am-4pm	Oct 14-Nov 30	6:30am-5:30pm		
1962	Statewide	Dec 15-17	8am-4pm	Oct 13-Dec 1	6:30am-5:30pm		
1963	Long	Dec 14-16	8am-4pm	Oct 12-Dec 1	1/2 hr before		
1963	Short	Dec 14-15	8am-4pm		sunrise to		
1964	Long	Dec 12-15	8am-4pm	Oct 17-Dec 6	1/2 hr after		
1964	Short	Dec 12-13	8am-4pm		sunset		
1965	Long	Dec 11-14	8am-4pm	Oct 16-Dec 5	"		
1965	Short	Dec 11-12	8am-4pm				
1966	Long	Nov 19-22	8am-4pm	Oct 15-Nov 13&	"		
1966	Short	Nov 19-20	8am-4pm	Nov 26-Dec 16	"		
1967	1-3	Dec 2-4	8am-4:30pm	Sep 30-Nov 30	"		
1967	4-6	Dec 2-3	8am-4:30pm				
1968	1-2	Dec 7-9	8am-4:30pm	Sep 28-Nov 28	"		
1968	3-4	Dec 7-8	8am-4:30pm				
1969	1,2,4	Dec 6-8	8am-4:30pm	Sep 27- Nov 27	"		
1969	3,5	Dec 6-7	8am-4:30pm				
1970	1,2,4	Dec 5-7	8am-4:30pm	Sep 26-Nov 26	"		
1970	3,5	Dec 5-6	8am-4:30pm				
1971	1-5	Dec 4-5	8am-4:30pm	Oct 16-Nov 28&	"		
1972	1,2,4	Dec 2-3	8am-4:30pm	Oct 6-Nov 26	1/2 hr before		
1972	3,5 d	Dec 2-5	8am-4:30pm		sunrise to		
1973	1-5 e	Dec 1-5	Sunrise to	Oct 13-Nov 25&	1/2 hr after		
			Sunset	Dec 8-16	sunset		
1974	1-5	Dec 7-11	"	Oct 12-Dec 1	"		
1975	1-5	Nov 22-25	"	Oct 11-Nov 21&	"		
1975	1-5	Dec 6-12	"	Nov 26-Dec 5			
1976	1-10	Nov 27-30	"	Oct 2-Nov 26	"		
1976	1-10	Dec 4-10	"				
1977	1-10	Dec 3-6	"	Oct 8-Dec 2	"		
1977	1-10	Dec 10-16	"				
1978	1-10	Dec 2-5	"	Oct 7-Dec 1	"		
1978	1-10	Dec 9-15	"				
1979	1-10	Dec 1-4	"	Oct 6-Nov 30	"		
1979	1-10	Dec 8-14	"				

Table 1.1 The dates, hours and zones for shotgun, archery and muzzleloader seasons (1953 - 1971).

		Shotgun		Archery		Muzzleloader	
Year	Zones	Dates	Hours	Dates	Hours	Dates	Hours
1980	1-10	Dec 6-9	"	Oct 11-Dec 5	"		
1980	1-10	Dec 13-19	"				
1981	1-10	Dec 5-8	"	Oct 10-Dec 4	"		
1981	1-10	Dec 12-18	"				
1982	1-10	Dec 4-7	"	Oct 9-Dec 3	"		
1982	1-10	Dec 11-17	"				
1983	1-10	Dec 3-6	"	Oct 8-Dec 2	"		
1983	1-10	Dec 10-16	"				
1984	1-10	Dec 1-4	"	Oct 6-Nov 30	"	Dec 15-21	Sunrise to
1984	1-10	Dec 8-14	"				Sunset
1985	1-10	Dec 7-11	"	Oct 12-Dec 6	"	Dec 21-27	"
1985	1-10	Dec 14-20	"				
1986	1-10	Dec 6-10	"	Oct 11-Dec 5	"	Oct 11-17	1/2 hr before
1986	1-10	Dec 13-19	"			Dec 20-Jan 4	sunrise to
1987	1-10	Dec 5-9	"	Oct 1-Dec 4 &	"	Oct 10-18	1/2 hr after
1987	1-10	Dec 12-20	"	Dec 21-Jan 10		Dec 21-Jan 10	sunset
1988	1-10	Dec 3-7	"	Oct 1-Dec 2 &	"	Oct 15-23	"
1988	1-10	Dec 10-18	"	Dec 19-Jan 10		Dec 19-Jan 10	"
1989	1-10	Dec 2-6	"	Oct 1-Dec 1 &	"	Oct 14-Oct 22	"
1989	1-10	Dec 9-17	"	Dec 18-Jan 10		Dec 18-Jan 10	"
1990	1-10	Dec 1-5	"	Oct 1-Nov 30 &	"	Oct 13- Oct 21	"
1990	1-10	Dec 8-16	"	Dec 17-Jan 10		Dec 17-Jan 10	"

a - Open for same counties as shotgun
b - Same counties as shotgun plus 5 1/2 counties from Dec 1-12 bow-only
c - Open statewide in all following years
d - Modified bucks-only, license quota
e - Unlimited bucks-only statewide in all following years

Table 1.2 A summary of the number of licenses issued, the number of hunters, the number of deer harvested and success rates for 1989.

Season	License Type	Licenses Issued	Number of Hunters (a)	Harvest	Success Rate
REGULAR GUN					
Paid	Any-sex	98,231	93,687	63,091	67
	Buck-only	5,599	5,205	2,719	52
	Antlerless	3,341	2,796	1,796	64
	Total	107,171	98,892	67,606	
Landowner	Any-sex	33,798	23,122	12,963	56
Nonresident	Any-sex	701	662	397	60
IAAP	Antlerless/ Any-sex			555	
GUN SEASON TOTAL		141,670 (+10)c	122,676 (+4)	81,521 (+1)	
MUZZLELOADER					
Early	Any-sex	5,995	5,362	2,619	49
Late	Any-sex	12,201	9,459	3,715	39
MUZZLELOADER TOTAL		18,196 (+154)	14,821 (+125)	6,334 (+102)	
ARCHERY					
	Any-sex	32,564	30,815	11,009	36
	Antlerless	1,952	1,672	790	47
Nonresident	Any-sex	229	218	58	26
ARCHERY TOTAL		34,745 (+16)	31,033 (+10)	11,857 (+20)	
TOTAL		194,611 (+17)	168,530 (+10)	99,712 b (+6)	

a - total for all categories except second antlerless tags

b - the 95% confidence interval for the total harvest would be from 98,323 to 101,101

c - the percent change from 1988

Table 1.3 Historical data on deer license issue by license type (1953 – present). Totals include special IAAP licenses (1985–present) and 4074 special late season AS licenses for zone 6 (1985).

		Regular Gun		Muzzleloader			Archery	Grand
Year	Paid	Landowner	Total	Early	Late	Total		Total
1953	3772	a	3772				10	3782
1954	3778	3368	7146				92	7238
1955	5586	a	5586				414	6000
1956	5440	a	5440				1284	6724
1957	5997	a	5997				1227	7224
1958	6000	a	6000				1380	7380
1959	5999	a	5999				1627	7626
1960	7000	a	7000				1772	8772
1961	8000	a	8000				2190	10190
1962	10001	a	10001				2404	12405
1963	12001	a	12001				2858	14859
1964	15993	a	15993				3687	19680
1965	17491	a	17491				4342	21833
1966	20811	a	20811				4576	25387
1967	20812	21121	41933				4413	46346
1968	20485	24796	45281				5136	50417
1969	18000	23476	41476				5465	46941
1970	18000	21697	39697				5930	45627
1971	18000	10522	28522				6789	35311
1972	19000	11205	30205				6916	37121
1973	27530	9686	37216				10506	47722
1974	33772	16329	50101				12040	62141
1975	56003	17821	73824				12296	86120
1976	60196	17818	78014				12522	90536
1977	58715	16289	75004				12994	87998
1978	51934	15699	67633				12809	80442
1979	55718	10504	66222				13378	79600
1980	64462	12858	77320				15398	92718
1981	69530	14068	83598				17258	100856
1982	74331	15431	89762				18824	108586
1983	75918	15067	90985				19945	110930
1984	79697	16777	96474		1644	1644	21648	119766
1985	82218	20674	102892		1522	1522	22830	127244
1986	84858	25432	110290	2246	1973	4219	26521	141030
1987	91804	26780	118584	3091	2710	5801	28910	153295
1988	101338	28002	129340	3565	3618	7183	30020	166543
1989	107171	33798	141670	5995	12201	18196	34745	194611

a – license not required

Table 1.4 Historical data on deer harvest by license type (1953–present). Totals include IAAP harvest and 1059 deer harvested in special late season (1985).

		Regular Gun		Muzzleloader			Archery	Grand
Year	Paid	Landowner	Total	Early	Late	Total		Total
1953	2401	1606	4007				1	4008
1954	1827	586	2413				10	2423
1955	2438	568	3006				58	3064
1956	2000	561	2561				117	2678
1957	2187	480	2667				138	2805
1958	2141	588	2729				162	2891
1959	1935	541	2476				255	2731
1960	3188	804	3992				277	4269
1961	4033	964	4997				367	5364
1962	4281	1018	5299				404	5703
1963	5595	1017	6612				538	7151
1964	7274	1750	9024				670	9694
1965	6588	1322	7910				710	8620
1966	9070	1672	10742				579	11321
1967	7628	2764	10392				791	11183
1968	9051	3890	12941				830	13771
1969	6952	3779	10731				851	11582
1970	8398	4345	12743				1037	13780
1971	7779	2680	10459				1232	11691
1972	7747	2738	10485				1328	11813
1973	10017	2191	12208				1822	14030
1974	11720	4097	15817				2173	17990
1975	15293	3655	18948				2219	21167
1976	11728	2529	14257				2350	16607
1977	10737	2051	12788				2400	15188
1978	12815	2353	15168				2957	18125
1979	14178	1971	16149				3305	19454
1980	16511	2346	18857				3803	22660
1981	19224	2354	21578				4368	25946
1982	19269	2472	21741				4720	26461
1983	27078	3297	30375				5244	35619
1984	29912	3537	33449		307	307	5599	39355
1985	32613	5344	37957		457	457	5805	44219
1986	41352	10378	51730	349	728	1077	9895	62702
1987	53230	10270	63500	1509	1027	2536	9722	75758
1988	66757	13298	80055	1835	1294	3129	9897	93756
1989	67606	12963	80966	2619	3715	6334	11857	99712

Table 1.5 A summary of the deer harvest during the regular shotgun season (1976 - present). Does not include harvest at Burlington IAAP.

	Paid Gun			Landowner/Tenant			Total		
Year	Does	Bucks	Total	Does	Bucks	Total	Does	Bucks	Total
1976	2457	9271	11728	392	2137	2529	2849	11408	14257
1977	2368	8369	10737	321	1730	2051	2689	10099	12788
1978	3023	9792	12815	418	1935	2353	3441	11727	15168
1979	3380	10798	14178	384	1587	1971	3764	12385	16149
1980	3848	12663	16511	468	1878	2346	4316	14541	18857
1981	4564	14660	19224	593	1761	2354	5157	16421	21578
1982	5593	13676	19269	708	1764	2472	6301	15440	21741
1983	7150	19928	27078	928	2369	3297	8078	22297	30375
1984	8118	21794	29912	1101	2436	3537	9219	24230	33449
1985	9352	22202	31554	2513	2831	5344	11865	25033	36898
1986	13249	28103	41352	6331	4047	10378	19580	32150	51730
1987	21495	30826	52321	5712	4558	10270	27207	35384	62591
1988	29175	37582	66757	7207	6091	13298	36382	43673	80055
1989	31965	36039	68004	6995	5967	12962	38960	42006	80966

Table 1.6 A summary of the 1989 deer harvest by management zone. Archery and muzzleloader estimates adjusted from county of kill.

			Shotgun			Overall
Zone	Archery	Muzzleloader	Paid	Landowner	Total	Total
1	1203	619	5240	812	6052	7875
2	743	425	3493	508	4001	5169
3	562	376	3598	477	4075	5013
4	1367	687	9727	2271	11998	14052
5	1298	708	9509	2470	11979	13986
6	887	464	6278	1131	7409	8760
7	2196	1320	11849	2090	13939	17455
8	1185	431	4324	735	5059	6675
9	1291	744	9531	1691	11222	13257
10	1151	549	4454	777	5231	6931
Statewide	11884	6324	68004	12962	80965	99173

Table 1.7 Harvest per square mile for each management zone in 1989.

Zone	Sq. Miles of Area	Archery	Muzzle-loader	Shotgun Paid	Shotgun Landowner	Shotgun Total	Overall Total
1	7193	0.17	0.09	0.73	0.11	0.84	1.09
2	5328	0.14	0.08	0.66	0.10	0.75	0.97
3	4362	0.13	0.09	0.82	0.11	0.93	1.15
4	7960	0.17	0.09	1.22	0.29	1.51	1.77
5	5612	0.23	0.13	1.69	0.44	2.13	2.49
6	2711	0.33	0.17	2.32	0.42	2.73	3.23
7	11184	0.20	0.12	1.06	0.19	1.25	1.56
8	3250	0.36	0.13	1.33	0.23	1.56	2.05
9	3415	0.38	0.22	2.79	0.50	3.29	3.88
10	5017	0.23	0.11	0.89	0.15	1.04	1.38
Statewide	56032	0.21	0.11	1.21	0.23	1.44	1.77

Table 1.8 A summary of the deer harvest by paid gun hunters during the 1989 season in each management zone. Nonresident harvest included in totals. Antlerless shotgun harvest included in results for the second season.

	Harvest			Success Rate			Percent does in Harvest		
Zone	First Season	Second Season	Total	First Season	Second Season	Both	First Season	Second Season	Both
1	3982	1230	5240	72	57	68	48	65	52
2	2569	906	3493	73	57	68	47	58	50
3	2837	738	3598	68	50	63	42	50	43
4	6380	3257	9727	73	64	70	38	50	42
5	6058	3380	9509	71	64	68	42	53	46
6	4261	1959	6278	72	56	66	40	55	45
7	8543	3295	11849	64	57	62	47	58	50
8	3238	1067	4324	59	52	58	47	54	48
9	7817	1667	9531	74	67	72	45	60	48
10	3368	1055	4454	70	64	69	44	58	47
Statewide	49053	18554	68003	69	59	66	44	56	46

Table 1.9 A summary of the deer harvest for paid gun hunters (1976 to present). Nonresident harvest included in the totals. Antlerless shotgun harvest included in the second season results.

	Harvest			Success Rate			Percent does in Harvest		
Year	First Season	Second Season	Total	First Season	Second Season	Both	First Season	Second Season	Both
76	5949	5779	11728	20	23	21	13	29	21
77	5502	5235	10737	20	23	21	15	29	22
78	6053	6762	12815	26	29	27	13	33	24
79	6983	7195	14178	26	28	27	14	33	24
80	8667	7844	16511	27	28	27	15	33	23
81	11345	7879	19224	30	29	30	16	35	24
82	10358	8911	19269	24	35	28	18	42	29
83	15568	11510	27078	38	41	40	14	44	26
84	16693	13219	29912	38	43	40	15	43	27
85	18830	12724	31554	42	47	44	18	46	30
86	25671	15681	41352	51	56	52	23	46	32
87	33983	18338	52321	60	60	60	37	49	41
88	47039	19718	66757	72	62	69	40	52	44
89	49053	18554	68004	69	60	66	44	56	47

Table 1.10 A summary of deer harvest results from the Iowa Army Ammunition Plant at Burlington (1961 – present).

Year	Number Harvested Archery	Shotgun	Total	Percent Does	Total Hunters	Winter Counts	Survey Conditions and Comments
1961	0	19	19				
1962	2	17	19				
1963			0				
1964	1	64	65				
1965	26	131	157				
1966	21	226	247 b				
1967	14	105	119				
1968	15	98	113				
1969	19	112	131				
1970	20	108	128	56 c			
1971	29	109	138	53			
1972	30	93	123	61			
1973	40	98	138	36		187	Dec 72, 80% of timber
1974	47	110	157	32	450		
1975	59	98	157	36	430	183	Feb, 40% of timber
1976	10 a	97	10	32	348	211	Feb, 80% of timber
1977	65	62	127	39	379		
1978	67	112	179	34	457	729	Jan, 100% of timber
1979	129	115	244	34	621	665	Mar, Not good conditions
1980	138	153	291	29	713	697	Feb, 3 inch snow
1981	134	176	310	36	700		
1982	138	210	348	32	760		
1983	178	225	403	30	777	979	Mar, 1 in. snow (marginal)
1984	241	532	773	44	1189	1598	Jan, 2–4 in. snow
1985	545	1298	1843	61	1388	1917	Jan, 4–8 in. snow (ideal)
1986	498	1296	1794	60	1407	1240	Feb, 3–4 in. snow (ideal)
1987	250	909	1159	59	1096	1086	Apr, No snow (poor)
1988	177	675	852	63	892	1101	Feb, 4–8 in. snow (ideal)
1989	102	555	657	62		455	Feb, 1–2 in. snow, melting
1990						500	Feb, 1–2 in. snow, melting

a – plant strike curtailed hunting
b – includes crippling losses
c – shotgun harvest only in 1970, combined in all following years

Table 1.11 A summary of archery season dates, hours, success rates and other information, 1953–present.

Year	Dates	Hours	Percent Bucks in Harvest	Success Rate	Mean Days/Hunter	General Comments
1953	Dec 10-14	9am-4pm		10		Open for same counties as shotgun. 40 lb draw limit.
1954	Dec 10-12	9am-4pm		11		$15 fee. Limit 1/day
1955	Oct 29-Nov 20	6:30am-4pm		14		Open for same counties as shotgun plus 5 1/2 others.
1956	Oct 13-Nov 12	6:30am-5pm		10		Open statewide 1955 – present. Limit 1/season. $10 fe
1957	Oct 26-Nov 25	6:30am-5pm		11		Seperate archer cense.
1958	Nov 1- Nov 30	6:30am-5:30pm		12		
1959	Oct 31-Nov 30	6:30am-5:30pm		16		
1960	Oct 15-Nov 27	6:30am-5:30pm		16		
1961	Oct 14-Nov 30	6:30am-5:30pm		17		
1962	Oct 13-Dec 1	6:30am-5:30pm		17		
1963	Oct 12-Dec 1	- 1/2 hr before sunrise to		19		
1964	Oct 17-Dec 6	1/2 hr after sunset		19		
1964	Oct 17-Dec 6	"				30 lb minimum limit on draw weight.
1965	Oct 16-Dec 5	"		17		
1966	Oct 15-Nov 13&	"		13		
	Nov 26-Dec 16	"				No draw limit.
1967	Sep 30-Nov 30	"		19		
1968	Sep 28-Nov 28	"		17		
1969	Sep 27- Nov 27	"		16		
1970	Sep 26-Nov 26	"		18	14	
1971	Oct 16-Nov 28&	"		19	13.2	
	Dec 6-12	"				
1972	Oct 6-Nov 26	"	66	20	13	
1973	Oct 13-Nov 25&	"	59	18	10.6	
	Dec 8-16	"				
1974	Oct 12-Dec 1	"				
1975	Oct 11-Nov 21&	"				Licenses issued by county recorder.
	Nov 26-Dec 5	"				
1976	Oct 2-Nov 28	"	60	20	14.2	
1977	Oct 8-Dec 2	"	64	20	15.6	
1978	Oct 7-Dec 1	"	62	25	15.4	$ 15 fee.
1979	Oct 6-Nov 30	"	63	26	16.1	
1980	Oct 11-Dec 5	"				
1981	Oct 10-Dec 4	"	68	26	16.9	
1982	Oct 9-Dec 3	"	67	26	15.6	
1983	Oct 8-Dec 2	"	69	28	15.8	
1984	Oct 6-Nov 30	"	69	27	16.1	
1985	Oct 12-Dec 6	"	68	26	15.4	$ 20 fee.
1986	Oct 11-Dec 5	"	72	38	16.7	Limit 1/Bow and 1/Gun

Table 1.11 A summary of archery season dates, hours, success rates and other information, 1953–present.

Year	Dates	Hours	Percent Bucks in Harvest	Success Rate	Mean Days/Hunter	General Comments
1987	Oct 1-Dec 4 &	"	68	35.4		Added late season.
	Dec 21-Jan 10	"				
1988	Oct 1-Dec 2 &	"	71	35.1	16.4	
	Dec 19-Jan 10	"				
1989	Oct 1-Dec 1 &	"	73	36	25.3	Bonus 2nd tag for antlerless deer
	Dec 18-Jan 10	"				
1990	Oct 1-Nov 30 &	"				Bonus tag for antlerless early or
	Dec 17-Jan 10	"				anysex late.

Table 1.12 A summary of muzzleloader season dates, hours, success rates and other information (1984–present).

Year	Dates	Hours	Percent Bucks in Harvest	Success Rate	Mean Days/Hunter	General Comments
1984	Dec 15–21	Sunrise to Sunset	45	22	6.3	1500 A–S Quota. $15 fee.
1985	Dec 21–27	"	44	34	3.6	2000 A–S Quota. $20 fee.
1986	Oct 11–17	1/2 hr before	100	17	4.1	2500 B–O Quota.
	Dec 20–Jan 4	sunrise to	43	40	6.4	Unlimited A–S Quota.
1987	Oct 10–18	1/2 hr after	55	52	8.3	3000 A–S Qouta
	Dec 21–Jan 10	sunset	46	42	6.1	Unlimited A–S Quota.
1988	Oct 15–23	"	55	55.4	4.2	3500 A–S Qouta
	Dec 19–Jan 10	"	41	39.4	5.7	Unlimited A–S Quota.
1989	Oct 14–22	"	55	49	4.5	5000 A–S Quota
	Dec 18–Jan 10	"	28	39	8.5	Unlimited A–S Quota. Could hunt during shotgun & late muzzleloader seasons.
1990	Oct 13–21	"				5000 A–S Quota
	Dec 17 –Jan 10	"				Could hunt shotgun & late muzzleloader season.

Table 1.13 Estimates of the harvest during the shotgun, archery and muzzleloader seasons for each county during the 1989 deer season. Counties are ranked by harvest in each season.

County		Shotgun			Percent		Muzzle	Overall	Rank					
									Shotgun				Muzzle-	Overall
Number	County	Does	Bucks	Total	Does	Bow	loader	Total	Does	Bucks	Total	Bow	loader	Total
22	Clayton	1858	1910	3768	49.3	343	241	4352	1	1	1	5	1	1
3	Allamakee	1412	1457	2869	49.2	228	227	3324	2	2	2	11	2	2
33	Fayette	846	850	1696	49.9	423	77	2196	5	6	5	1	29	3
89	Van Buren	916	1004	1920	47.7	123	125	2168	4	3	3	40	5	4
96	Winneshiek	927	952	1879	49.3	115	121	2115	3	4	4	41	6	5
56	Lee	735	871	1607	45.8	106	109	1822	7	5	6	45	9	6
49	Jackson	766	716	1481	51.7	152	75	1708	6	10	8	27	32	7
4	Appanoose	729	804	1533	47.5	85	85	1703	8	7	7	58	21	8
26	Davis	649	766	1415	45.9	154	52	1621	9	8	9	24	58	9
63	Marion	619	729	1348	45.9	171	86	1605	10	9	10	21	20	10
92	Washington	580	654	1234	47.0	176	112	1522	14	12	12	18	8	11
91	Warren	486	619	1105	44.0	323	85	1513	22	14	20	6	22	12
53	Jones	593	624	1218	48.7	154	100	1472	12	13	13	26	14	13
39	Guthrie	536	700	1237	43.4	154	68	1459	18	11	11	25	41	14
31	Dubuque	508	513	1021	49.8	354	77	1452	21	26	24	4	28	15
52	Johnson	601	575	1176	51.1	164	94	1434	11	19	14	22	17	16
57	Linn	480	454	934	51.4	266	159	1359	24	34	29	7	3	17
29	Des Moines	424	513	938	45.3	357	64	1359	32	25	28	3	45	18
86	Tama	584	546	1130	51.7	92	64	1286	13	23	18	51	46	19
12	Butler	561	573	1134	49.5	89	59	1282	15	20	16	56	49	20
44	Henry	513	618	1130	45.4	64	81	1275	20	15	17	79	24	21
68	Monroe	552	592	1145	48.2	44	52	1241	16	18	15	88	59	22
97	Woodbury	470	556	1026	45.8	135	69	1230	25	21	23	32	40	23
48	Iowa	540	510	1050	51.5	85	94	1229	17	27	21	60	16	24
27	Decatur	513	601	1115	46.1	62	47	1224	19	17	19	82	65	25
61	Madison	430	614	1044	41.2	90	77	1211	29	16	22	55	30	26
59	Lucas	481	507	988	48.6	106	75	1169	23	28	26	46	33	27
78	Pottawattamie	361	481	842	42.9	176	130	1148	46	29	37	17	4	28
90	Wapello	430	550	979	43.9	111	43	1133	30	22	27	43	68	29
23	Clinton	450	437	887	50.7	177	65	1129	27	39	32	16	44	30
51	Jefferson	462	542	1004	46.0	82	27	1113	26	24	25	63	87	31
58	Louisa	424	463	887	47.8	125	79	1091	33	32	31	35	26	32
50	Jasper	418	418	836	50.0	179	69	1084	34	42	39	15	38	33
28	Delaware	362	420	782	46.3	198	99	1079	45	41	43	13	15	34
18	Cherokee	440	401	841	52.3	154	76	1071	28	45	38	23	31	35
88	Union	400	456	856	46.8	125	34	1015	39	33	34	38	77	36
42	Hardin	425	410	835	50.8	139	37	1011	31	43	40	30	73	37
80	Ringold	417	472	889	46.9	65	52	1006	35	30	30	76	60	38

Table 1.13 Estimates of the harvest during the shotgun, archery and muzzleloader seasons for each county during the 1989 deer season. Counties are ranked by harvest in each season.

County		Shotgun							Rank					
					Percent		Muzzle	Overall	Shotgun				Muzzle-	Overall
Number	County	Does	Bucks	Total	Does	Bow	loader	Total	Does	Bucks	Total	Bow	loader	Total
34	Floyd	373	374	746	49.9	171	86	1003	43	49	48	20	19	39
54	Keokuk	405	449	854	47.4	64	60	978	37	36	35	80	47	40
70	Muscatine	403	403	806	50.0	92	72	970	38	44	41	50	34	41
82	Scott	248	243	491	50.5	359	108	958	71	74	73	2	10	42
64	Marshall	375	354	729	51.4	125	101	955	42	59	49	36	13	43
25	Dallas	279	384	663	42.1	231	44	938	67	47	60	10	67	44
2	Adams	378	470	848	44.6	64	24	936	41	31	38	77	91	45
21	Clay	332	293	625	53.1	239	70	934	56	66	64	9	35	46
8	Boone	342	357	699	49.0	151	84	934	51	58	53	28	23	47
87	Taylor	413	453	865	47.7	21	37	923	36	35	33	96	75	48
69	Montgomery	350	423	772	45.2	70	58	900	49	40	44	68	53	49
94	Webster	391	363	754	51.8	77	67	898	40	54	47	64	43	50
15	Cass	323	438	761	42.5	90	39	890	58	38	46	52	71	51
66	Mitchell	337	327	664	50.8	125	88	877	54	63	59	37	18	52
20	Clarke	368	393	761	48.4	65	40	866	44	46	45	74	70	53
9	Bremer	337	349	686	49.1	103	69	858	53	60	55	48	37	54
45	Howard	351	368	718	48.8	84	51	853	48	52	51	62	61	55
1	Adair	345	448	794	43.5	26	31	851	50	37	42	92	83	56
24	Crawford	281	368	648	43.3	65	112	825	66	53	62	75	7	57
16	Cedar	352	373	725	48.5	48	48	821	47	50	50	84	64	58
7	Black Hawk	270	272	542	49.9	174	103	819	69	71	68	19	12	59
19	Chickasaw	333	333	665	50.0	113	33	811	55	61	58	42	78	60
62	Mahaska	315	372	688	45.9	67	49	804	60	51	54	72	63	61
6	Benton	342	327	669	51.1	46	79	794	52	62	57	87	25	62
67	Monona	297	363	659	45.0	92	42	793	62	55	61	49	69	63
55	Kossuth	253	285	538	47.0	124	104	766	70	68	69	39	11	64
93	Wayne	316	361	678	46.7	44	32	754	59	56	56	89	82	65
79	Poweshiek	292	275	567	51.5	110	60	737	64	70	66	44	48	66
43	Harrison	279	359	639	43.7	69	27	735	68	57	63	70	86	67
73	Page	324	377	702	46.2	0	33	735	57	48	52	99	79	68
10	Buchanan	303	285	588	51.5	65	37	690	61	69	65	73	72	69
60	Lyon	286	250	536	53.3	89	30	655	65	73	70	57	84	70
74	Palo Alto	293	261	554	53.0	72	25	651	63	72	67	67	90	71
85	Story	149	173	322	46.2	246	59	627	93	87	93	8	51	72
77	Polk	154	170	323	47.5	221	69	613	92	90	92	12	39	73
40	Hamilton	227	202	429	52.9	125	59	613	75	82	78	34	50	74
17	Cerro Gordo	218	207	425	51.2	135	52	612	78	79	80	31	57	75
98	Worth	188	200	388	48.5	190	18	596	84	83	84	14	94	76

Table 1.13 Estimates of the harvest during the shotgun, archery and muzzleloader seasons for each county during the 1989 deer season. Counties are ranked by harvest in each season.

County Number	County	Shotgun Does	Shotgun Bucks	Shotgun Total	Shotgun Percent Does	Bow	Muzzle loader	Overall Total	Rank Shotgun Does	Rank Shotgun Bucks	Rank Shotgun Total	Rank Bow	Rank Muzzle-loader	Rank Overall Total
83	Shelby	216	297	513	42.1	49	24	586	79	64	71	83	92	77
5	Audubon	213	295	509	41.9	62	9	580	80	65	72	81	97	78
95	Winnebago	185	170	355	52.1	141	79	575	86	89	87	29	27	79
65	Mills	199	289	487	40.8	23	58	568	82	67	74	95	52	80
35	Franklin	232	233	465	49.9	90	11	566	73	75	75	54	96	81
71	O'Brien	228	198	426	53.4	70	53	549	74	84	79	69	56	82
37	Greene	162	186	348	46.5	126	70	544	91	86	88	33	36	83
99	Wright	219	202	421	51.9	69	46	536	77	80	81	71	66	84
76	Pocahontas	186	196	382	48.6	106	37	525	85	85	85	47	74	85
81	Sac	235	229	464	50.6	48	13	525	72	76	76	86	95	86
75	Plymouth	209	202	411	50.8	85	20	516	81	81	82	61	93	87
11	Buena Vista	223	212	435	51.3	24	54	513	76	78	77	93	55	88
36	Fremont	184	218	402	45.7	72	32	506	87	77	83	66	81	89
32	Emmet	189	173	362	52.2	90	50	502	83	88	86	53	62	90
30	Dickinson	181	162	344	52.8	48	67	459	88	93	89	85	42	91
84	Sioux	174	156	330	52.7	75	35	440	89	94	91	65	76	92
14	Carroll	148	167	314	47.0	64	32	410	94	91	94	78	80	93
41	Hancock	167	164	330	50.5	24	29	383	90	92	90	94	85	94
46	Humboldt	85	95	179	47.1	85	55	319	98	98	98	59	54	95
72	Osceola	135	114	249	54.3	43	25	317	96	96	96	90	89	96
47	Ida	105	113	218	48.0	33	25	276	97	97	97	91	88	97
13	Calhoun	138	124	263	52.7	2	5	270	95	95	95	97	99	98
38	Grundy	33	33	66	49.8	0	9	75	99	99	99	98	98	99

Table 1.14 The results of hunter opinion surveys on the quality of the hunt and the number of deer in the area hunted in 1989. The percent of responses in each category is reported.

		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	No Opinion
Regular Shotgun	Any-sex	20	57	16	7	17	56	19	8
	Buck-only	19	56	16	9	25	60	11	5
	Antlerless	22	57	13	9	10	51	31	8
	Nonresident	49	42	6	3	9	70	14	7
Muzzleloader									
Early	Any-sex	29	50	15	6	17	65	8	9
Late	Any-sex	20	54	19	8	26	57	10	7
Archery	Any-sex	21	55	17	6	27	62	6	5
	Antlerless	24	50	16	9	37	54	6	4
OVERALL TOTAL		22	55	16	7	19	58	16	7

Table 1.15 The results of the deer population surveys (1976 – present).

	Spotlight Survey		Aerial Survey			Traffic Kill Per Billion Vehicle Miles	
Year	Mean Count	Percent Change	Weighted Count	Percent Change	Traffic Kill	Number	Percent Change
1976					2537	225	– 1
1977					2929	252	+12
1978	6.9				2872	241	– 4
1979	6.8	– 1			3005	259	+ 8
1980	7.6	+ 12			3743	335	+29
1981	5.9	– 22			4164	365	+ 9
1982	12.0	+103			4805	412	+13
1983	13.4	+ 12	5903		5335	448	+ 9
1984	17.0	+ 27	5702 a	– 12	6177	500	+12
1985	15.5	– 8	7022 a	+ 27	5925	495	– 1
1986	18.9	+ 22	9059	+ 23	7225	593	+20
1987	19.4	+ 3			8440	678	+14
1988	22.4	+ 15	9924	+ 10 b	9248	707	+ 4
1989	30.0	+ 34	8799	– 11	8914	661	– 6
1990	24.3	– 19	5815 a	– 34			

a – adjusted for zones where all counts were missing

b – change form 1986 to 1988

Figure 1.1 Iowa's shotgun hunting zones 1989

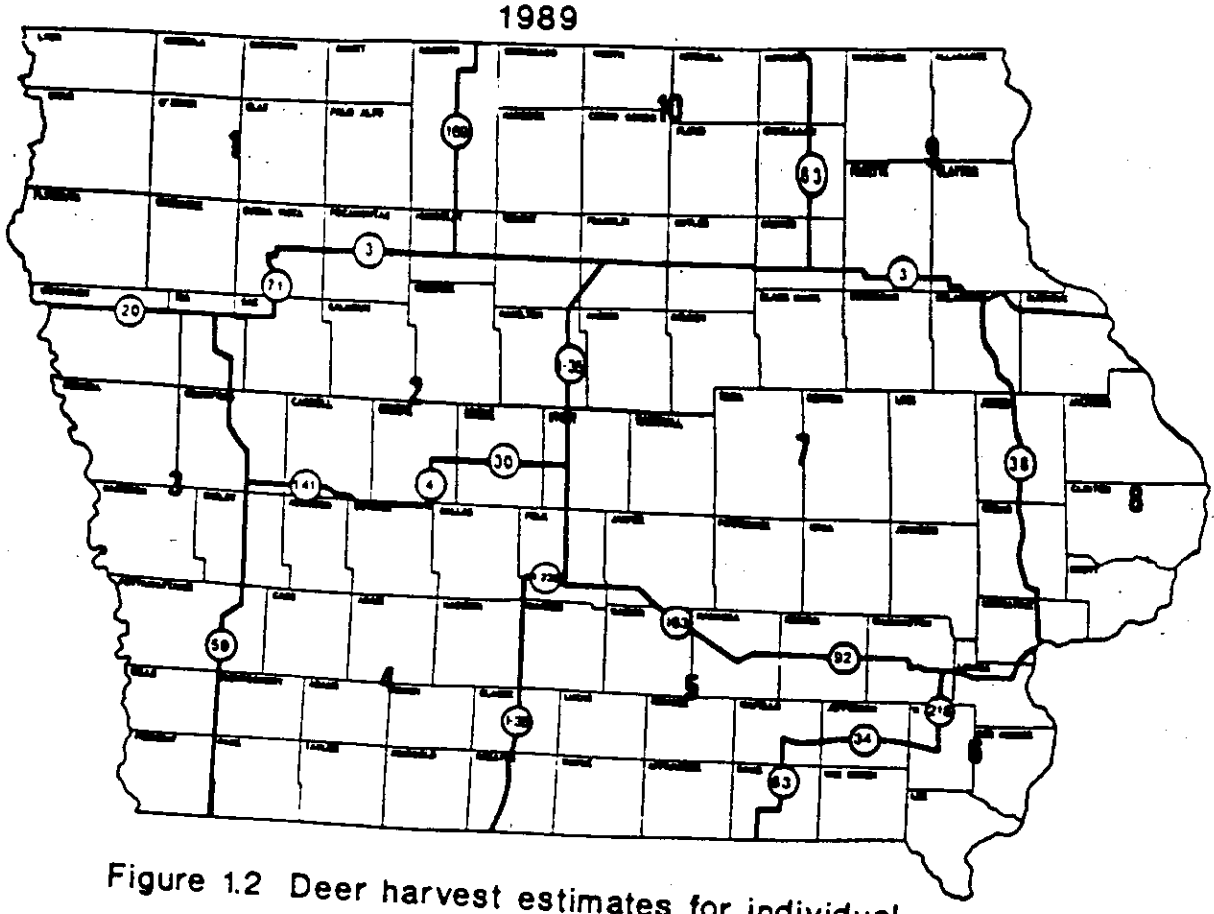


Figure 1.2 Deer harvest estimates for individual counties during the 1989 season

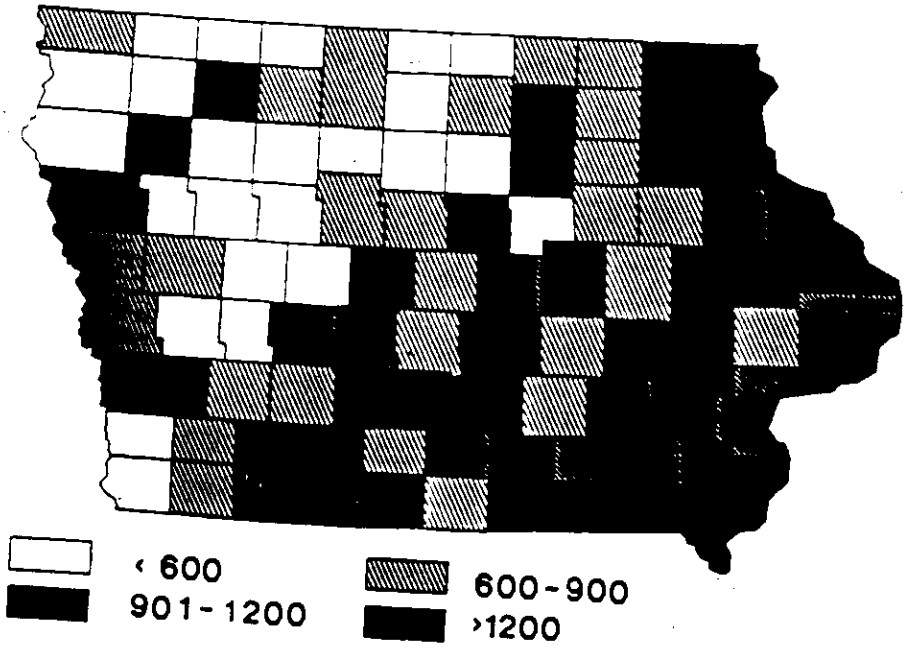


Figure 1.3 Percent of the harvest during the 1989 shotgun season that was does

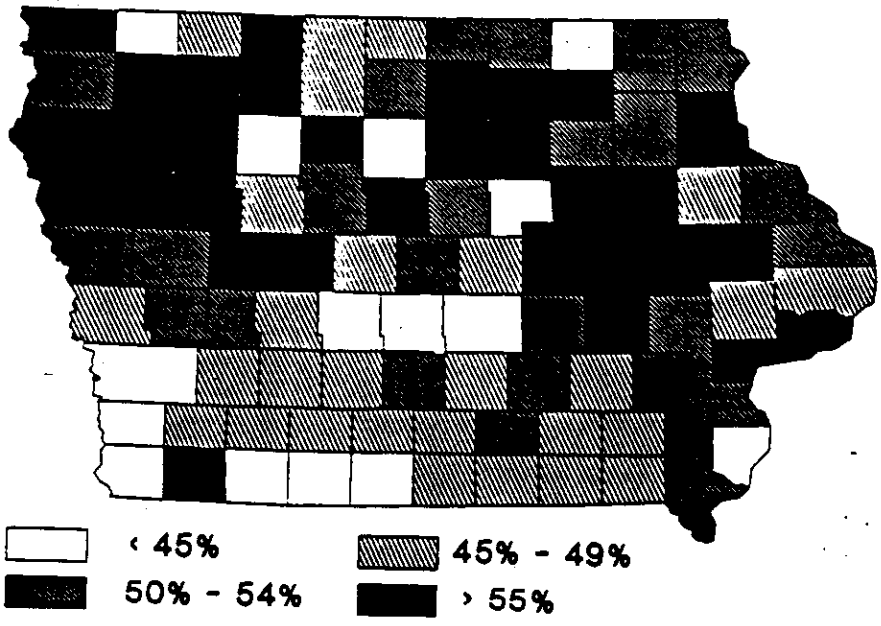
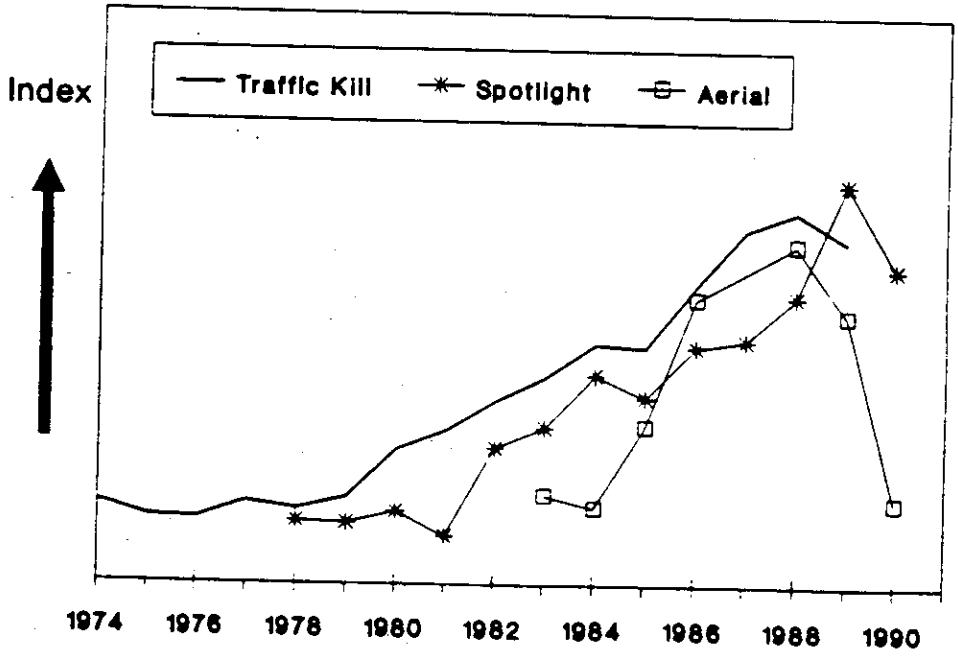


Figure 1.4 Deer survey results, 1974 to the present



1990 DEER SEASON
PRELIMINARY REPORT

DNR
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Wildlife and Law Enforcement Divisions
P.O. Box 30028, Lansing, MI 48909

1990 DEER SEASON PRELIMINARY REPORT

This report contains a preliminary analysis of the 1990 deer hunting season based on data collected at highway deer check stations, from field reports, from counts of deer being transported on vehicles, and from highway traffic counters. The Michigan Department of Transportation and the Mackinac Bridge Authority assisted in providing data. Final harvest figures will be available in the summer of 1991. This report is a contribution from Federal Aid in Wildlife Restoration, Pittman-Robertson Project W-127-R.

STATUS OF THE DEER HERD

The winter of 1989/90 started early and ended early. Record cold temperatures and snow depths occurred in December, but record mild temperatures occurred in February and March. Had it not been for the mild temperatures in late winter, winter mortality of deer would have been even higher than the estimated loss of 98,800 deer in seven northern districts. For the first time since 1982, the number of deer in the fall population decreased. There were about 10-20% less deer in Michigan in the fall of 1990, compared to fall of 1989.

Upper Peninsula

Deer were yarded in the U.P. by mid-December. The thaws in late winter were associated with a noticeable increase in deer-vehicle accidents. Winter mortality of deer from starvation was pronounced. Spring pellet surveys showed an 11% drop in the U.P. deer herd. The herd decreased most in the eastern end of the U.P.

Northern Lower Peninsula

Attempts in former years to target antlerless harvest of deer on private land appear to have been successful. The spring herd in Northern Lower Michigan was estimated by pellet surveys to be about 19% lower in 1990 than in 1989. Some herds on public lands responded to habitat improvement and reduced hunting of antlerless deer. Deer distribution within this region was still very spotty in the fall of 1990.

Southern Lower Peninsula

Southern Michigan deer suffered a winter of extremes - it was the coldest December since 1876, but the warmest January, February and March since 1921. Former antlerless harvests, along with a probable decrease in fawn productivity, produced a smaller herd in 1990, except for select areas with deer population irruptions.

1990 DEER HUNTING SEASONS

Archery deer hunting opened on October 1, 1990, and continued through November 14, 1990. The regular firearm deer hunting season was November 15 through 30, 1990. Archery deer hunting resumed from December 1, 1990 to January 1, 1991. Muzzleloading deer hunting season was split (December 7 through 16 in the Upper Peninsula and December 14 through 23 in the Lower Peninsula).

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

A total of 322,890 antlerless deer licenses were issued, which was up slightly from the 317,747 that were issued in 1989. Applications for antlerless licenses were up 7 percent in 1990 (408,113 eligible applicants, compared to 383,734 in 1989).

	General Antlerless Licenses		Private Land Antlerless Licenses	
Year	*Applicants*	*Licenses Issued*	*Applicants*	*Licenses Issued*
1989	245,111	183,515	138,623	134,232
1990	270,979	189,178	138,134	133,712

Block permits were issued experimentally this year to select landowners throughout the state with severe crop damage. This was the second year for block permits. In 1989 block permits were issued in three Districts. Block permits were issued in all Districts in 1990. Those property owners with a documented history of serious crop damage were invited to work with district wildlife biologists to establish harvest quotas for antlerless deer to be taken on their property. These landowners then paid a $3 application fee for each crop damage block permit. These tags were only for antlerless deer and only for the land where issued and adjoining property with permission of appropriate landowners. A total of about 1,300 landowners were issued about 25,000 crop damage block permits in 1990 for issuance to hunters on their property for use during archery, firearm, or muzzleloading seasons.

Block permits were envisioned as a way to provide flexibility to the landowner for controlling nuisance deer without having to reduce the herd in an entire deer management unit of several hundred square miles. Also, block permits were envisioned to reduce the number of deer taken on crop damage control permits outside the regular hunting season. Nuisance deer should be harvested through recreational hunting during the open hunting season, where possible. The social, biological, and economic impacts of the experimental block permit program are being thoroughly evaluated prior to formulation of 1991 deer hunting regulations.

HUNTING CONDITIONS

Bowhunters had fair hunting weather in 1990, with many rainy and windy weekends. Bowhunters reported that the rut started early but waned with high temperatures in late October and early November. Acorns were plentiful in many areas of the state, which reduced the effectiveness of bait.

Firearm deer hunting season opened with mild weather that allowed hunters to disperse well and to remain in the field for long periods of time. Yet, deer movement was reduced by warm temperatures in some parts of the state and there was little tracking snow. Although hunting pressure was up for the opening few days, interest in late-season hunting was lower than it was in 1989. The wet fall resulted in a late corn harvest, which reduced deer sightings and harvest in areas with standing corn, which served as refuges for deer.

There was some snow for muzzleloading season, but not enough to concentrate deer. Roads and trails were accessible and temperatures moderate. Bucks did not drop their antlers early this year. Deer fed on green grasses and forbs, as well as on acorns, throughout December.

HUNTER NUMBERS

About 275,000 bowhunters, 735,000 firearm deer hunters, and 130,000 muzzleloading hunters went deer hunting in 1990.

RECREATIONAL BENEFITS

Bowhunting effort decreased about 5 percent from 1989 to an estimated 4.5 million hunter days. Hunting effort during firearm season increased 10 percent to 5.7 million hunter days. About 0.8 million days of hunting recreation occurred during the muzzleloading deer hunting season.

ECONOMIC IMPACT

Deer hunters were estimated to have spent more than $350 million in Michigan during all three hunting seasons of 1990.

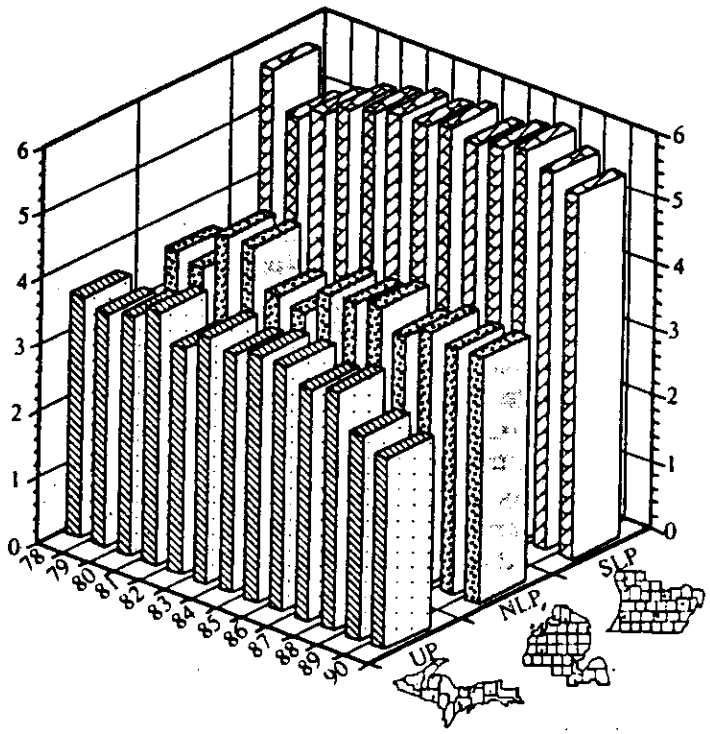
AGE DISTRIBUTION OF DEER

About 49 percent of the antlered bucks checked from the Upper Peninsula in 1990 were yearlings (1 1/2 years of age), compared to 64 percent in 1989. Yearlings comprised 70 percent of the antlered bucks in the northern Lower Peninsula compared to 76 percent in 1989. Seventy five percent of antlered bucks were yearlings in the southern Lower Peninsula harvest, which was the same as in the 1989 season.

Young-of-the-year comprised 39 percent of the antlerless deer harvest compared to 38 percent in 1989. Of the known-age does, 35 percent were yearlings, 25 percent were 2 1/2 years old, 21 percent were 3 1/2, and 19 percent were 4 1/2 years of age or older.

ANTLER MEASUREMENTS

AVERAGE NUMBER OF ANTLER POINTS ON 1 1/2-YEAR-OLD BUCKS



Deer physical condition, as measured by antler beam diameter of yearling (1 1/2-year-old) bucks, was not as favorable this year as in 1989, especially in the Upper Peninsula.

Area	*Percentage of Spikes among Yearling Bucks*		*Average Beam Diameter (mm) of Yearling Bucks*	
	1989*	***1990*** **	***1989****	***1990*** **
Upper Peninsula	51.0	54.0	17.0	16.6
Northern Lower Peninsula	41.0	36.0	18.2	18.4
Southern Lower Peninsula	12.0	10.0	22.0	21.6

* Final Data
** Preliminary Data

REPORT ALL POACHING (RAP)

Cooperation from Michigan's citizens has continued in reporting poaching during the Fall 1990 hunting seasons. During October and November, over 1300 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.

The toll-free RAP Hotline (1-800-292-7800) was again operated by experienced Conservation Officers during the Fall 1990 deer seasons. Seasoned officers are more effective at screening incoming complaints and better able to gather vital information from persons witnessing on-going poaching incidents. An added benefit of the program was the utilization of field officers on temporary light duty status. For the first time, dispatch officers at the Report All Poaching Headquarters in Lansing were given near direct radio communications with patrol officers in the field throughout the state. This increased their ability to dispatch poaching incidents in a timely manner and also ensure that field officers were given the most reliable information available. The veteran dispatchers also were able to provide valuable support to field officers needing LEIN, DNR arrest records, and other support and emergency services.

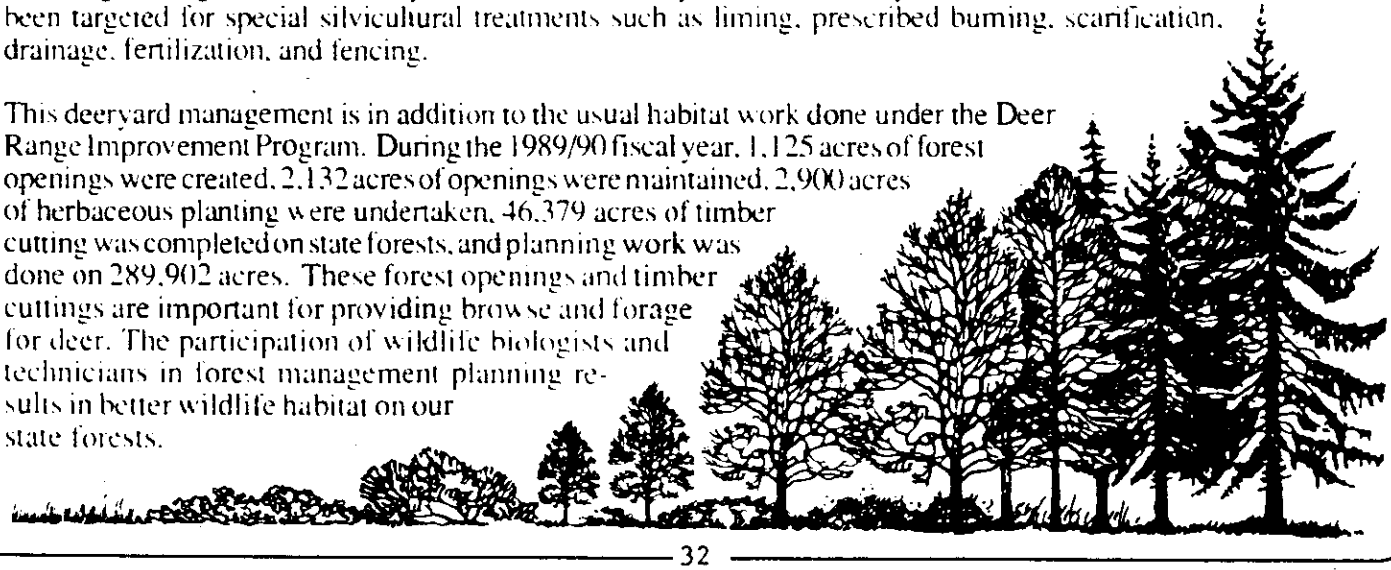
DEER HABITAT IMPROVEMENT

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% of the commercial forest. In 1986, cedar harvest represented $6.5 million in delivered wood and helped support more than 1,600 jobs. Cedar is used primarily for fence posts, log homes, and wood shingles. Cedar swamps are of special value for thermal cover to white-tailed deer in Northern Michigan, where they 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 about 10% 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.

Natural resource managers have been reluctant to harvest cedar on public lands because of difficulty in getting cedar to regenerate. The absence of regrowth in areas where cedar has been cut may be due to high numbers of deer that eat the young sprouts, economic costs of scarifying the seed bed in swampy areas, and a reluctance to use prescribed burning in coniferous cover. The policy of not cutting cedar on public lands for fear of losing regeneration has increased demand for cedar on private land, where timber values have increased and harvest has in some cases exceeded growth. There has also been concern that the lack of cedar regeneration today may mean a shortage of wood products, jobs, deer, and wildlife cover in the next century.

The Department of Natural Resources earmarked $200,000 for the 1990 fiscal year that is specifically devoted to deeryard management. Special on-the-ground projects will be undertaken in 5 northern districts to encourage the regeneration of deeryards. Traditional deeryards that currently have low deer numbers have been targeted for special silvicultural treatments such as liming, prescribed burning, scarification, drainage, fertilization, and fencing.

This deeryard management is in addition to the usual habitat work done under the Deer Range Improvement Program. During the 1989/90 fiscal year, 1,125 acres of forest openings were created, 2,132 acres of openings were maintained, 2,900 acres of herbaceous planting were undertaken, 46,379 acres of timber cutting was completed on state forests, and planning work was done on 289,902 acres. These forest openings and timber cuttings are important for providing browse and forage for deer. The participation of wildlife biologists and technicians in forest management planning results in better wildlife habitat on our state forests.



DEER HUNTING - A SAFE OUTDOOR SPORT

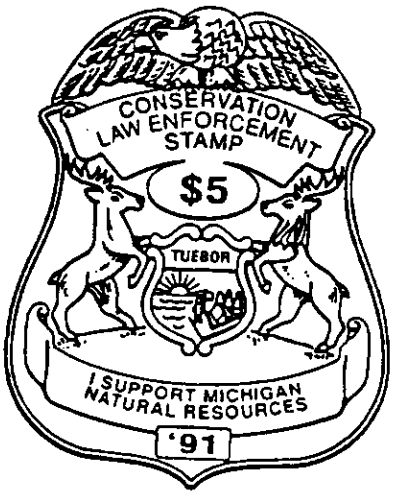
Preliminary reports indicate a total of 39 accidents occurred during the 1990 firearm deer season, resulting in the death of 2 hunters. Thirteen of these accidents were self inflicted, eleven were caused by the victim being in the line of fire (usually by someone in the victim's hunting party), two resulted from a malfunctioning firearm, six were caused by the shooter firing at sound or a flash of movement and the remaining seven resulted from a variety of violations of the most basic safety rules. While 1990 firearm deer accidents were up over 1989, hunting continues to be one of the safest outdoor recreational activities. Hunting accidents can be prevented if each hunter follows the firearm safety rules listed below and refuses to hunt with relatives, friends and acquaintances who violate these basics.

- ALWAYS TREAT ALL GUNS AS IF THEY ARE LOADED.
- ALWAYS WATCH THAT MUZZLE. Be able to control its direction even during a fall.
- ALWAYS MAKE CERTAIN THE BARREL AND ACTION ARE CLEAR OF OBSTRUCTIONS.
- ALWAYS IDENTIFY THE INTENDED TARGET AND BEYOND BEFORE PULLING THE TRIGGER.
- ALWAYS UNLOAD ALL GUNS WHEN NOT IN USE.
- NEVER POINT A GUN AT ANYTHING WITHOUT THE INTENT TO SHOOT IT.
- NEVER CLIMB UPON OR JUMP OVER AN OBSTRUCTION WITH A LOADED GUN.
- NEVER SHOOT A BULLET AT A FLAT HARD SURFACE OR WATER.
- ALWAYS STORE GUNS AND AMMUNITION SEPARATELY.
- NEVER CONSUME ALCOHOL OR MOOD ALTERING DRUGS BEFORE AND DURING THE HUNT.

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

Although even one accident is too many, hunting continues to be one of the safest outdoor sports nationwide. For more information on becoming a safer hunter, contact your local Conservation Officer or the Law Enforcement Division Recreational Safety Education Unit at 517-373-6250.

SUPPORT CONSERVATION LAW ENFORCEMENT



Now all of Michigan's citizens will be given the opportunity to support conservation law enforcement in Michigan. Beginning with the coming license year, silver and gold 1991 Conservation Law Enforcement Stamps will be available for sale to the public. The stamps, which may be purchased at any of Michigan's license agents or Department Offices statewide, represent the first in a collector's series to be produced annually. The stamps sell at $2.00 (silver) and $5.00 (gold) each, with the proceeds being placed in Michigan's Wildlife Resource Protection Fund to help prevent the illegal poaching of protected species in Michigan.

Take pride in Michigan's conservation law enforcement efforts, and help support the protection of valuable wildlife species through the purchase of Conservation Law Enforcement Stamps when you obtain your 1991 hunting or fishing license.

DEER HARVEST STATISTICS

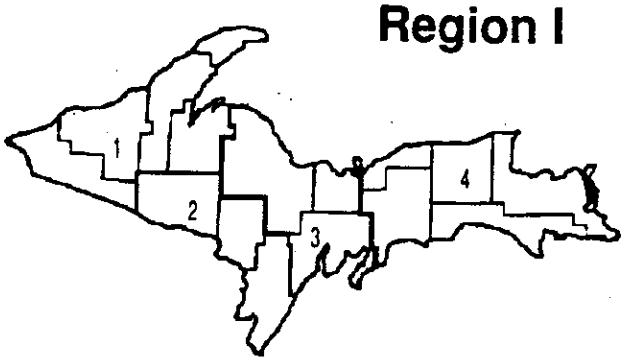
Deer Hunting Season	Estimated Number of Hunters	Estimated Harvest of Deer		
		Antlered	*Antlerless*	*Total*
Archery	275,000	40,000	35,000	75,000
Firearm	735,000	161,000	139,000	300,000
Muzzleloading	130,000	7,000	18,000	25,000

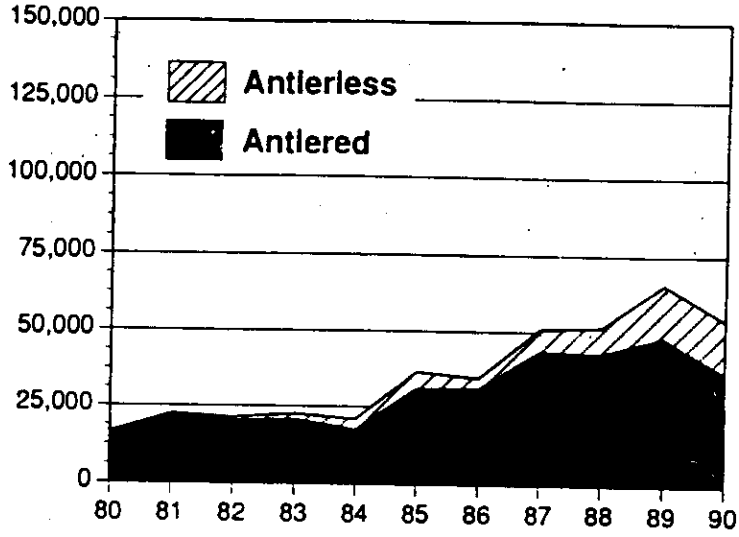
DEER HARVEST IN MICHIGAN: PRELIMINARY 1990, COMPARED TO FINAL 1989

REGION		ARCHERY		FIREARM		MUZZLELOADER	
		ANTLERED	OTHER	ANTLERED	OTHER	ANTLERED	OTHER
I	1990	5,000	5,000	37,000	17,000	1,500	1,500
	(1989)	(6,260)	(5,530)	(48,560)	(16,980)	(1,750)	(1,380)
II	1990	20,000	20,000	68,000	66,000	3,000	9,000
	(1989)	(25,100)	(25,570)	(85,330)	(66,420)	(3,900)	(5,500)
III	1990	15,000	10,000	56,000	56,000	2,500	7,500
	(1989)	(19,070)	(15,560)	(60,930)	(56,710)	(2,310)	(5,630)
TOTAL	1990	40,000	35,000	161,000	139,000	7,000	18,000
	(1989)	(50,430)	(46,660)	(194,820)	(140,110)	(7,960)	(12,510)

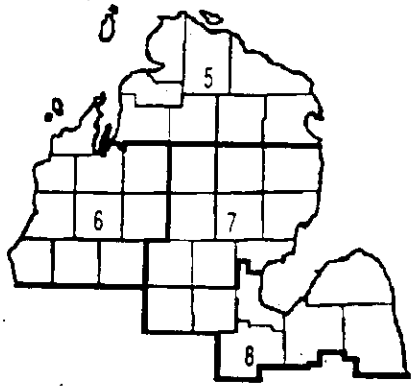
DEER HARVEST BY REGIONS
FIREARM SEASON

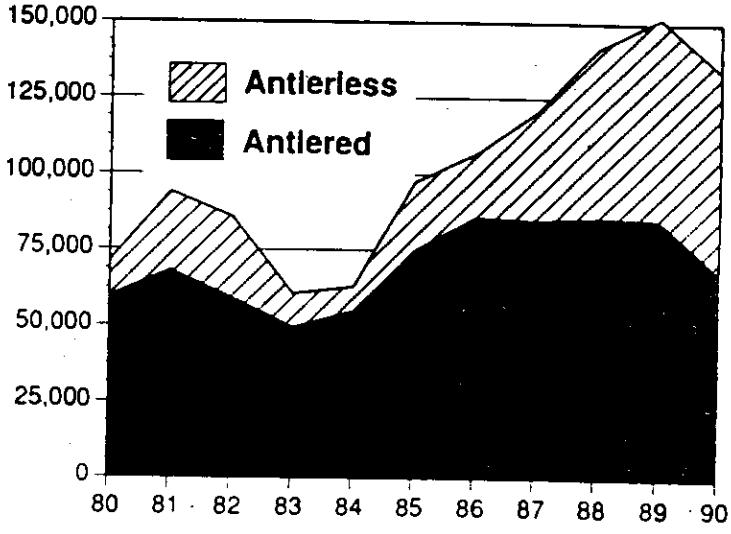
Region I



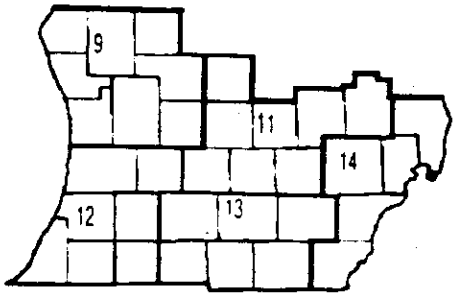


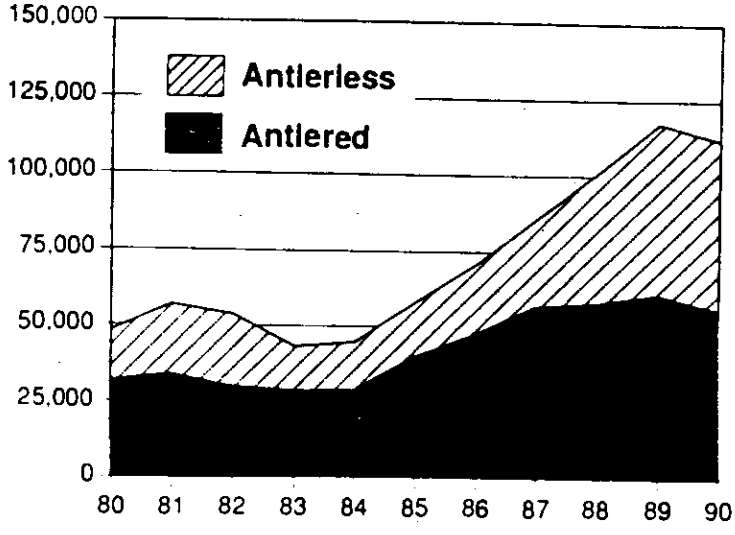
Region II





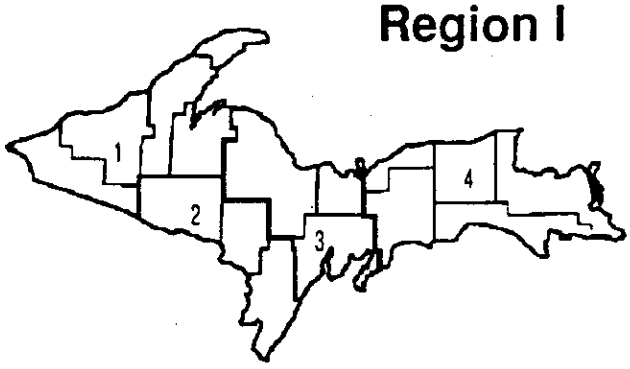
Region III

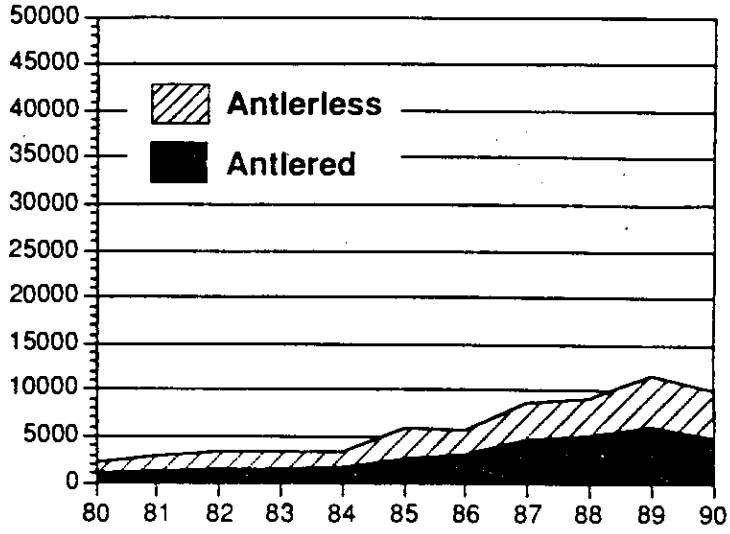




DEER HARVEST BY REGIONS
BOW AND ARROW

Region I





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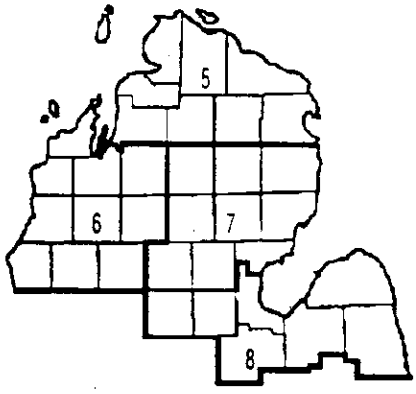

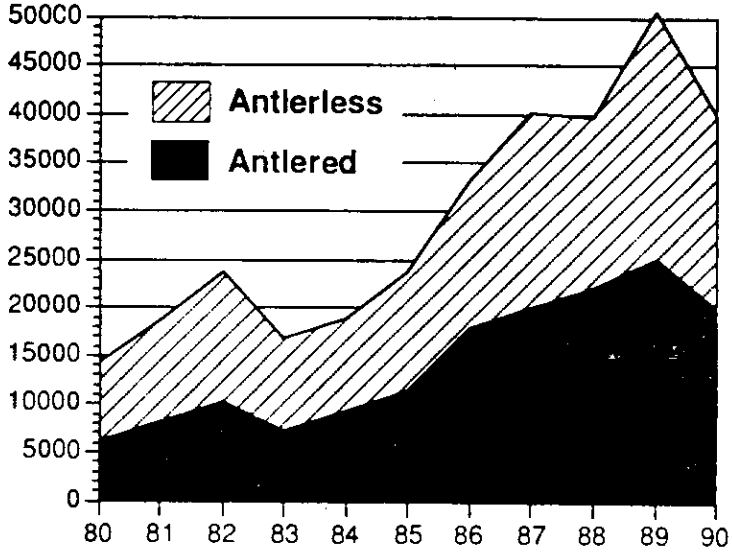

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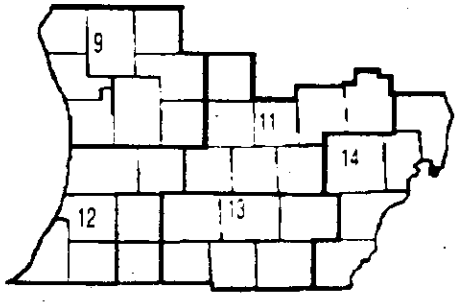
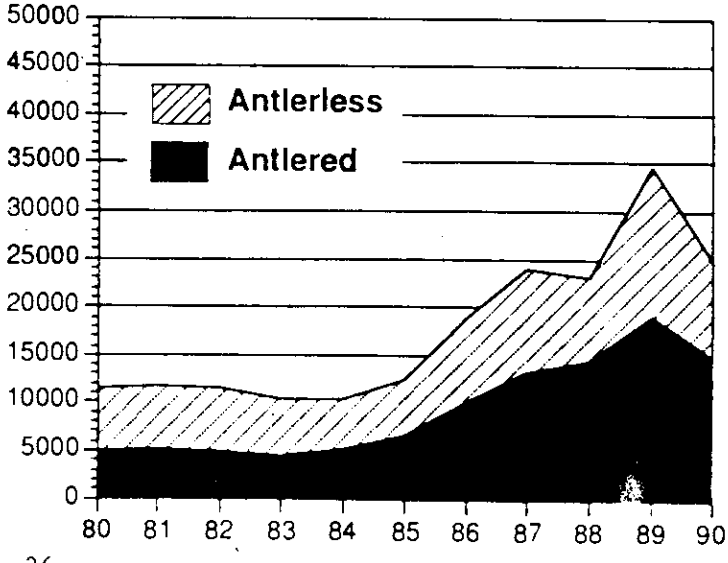
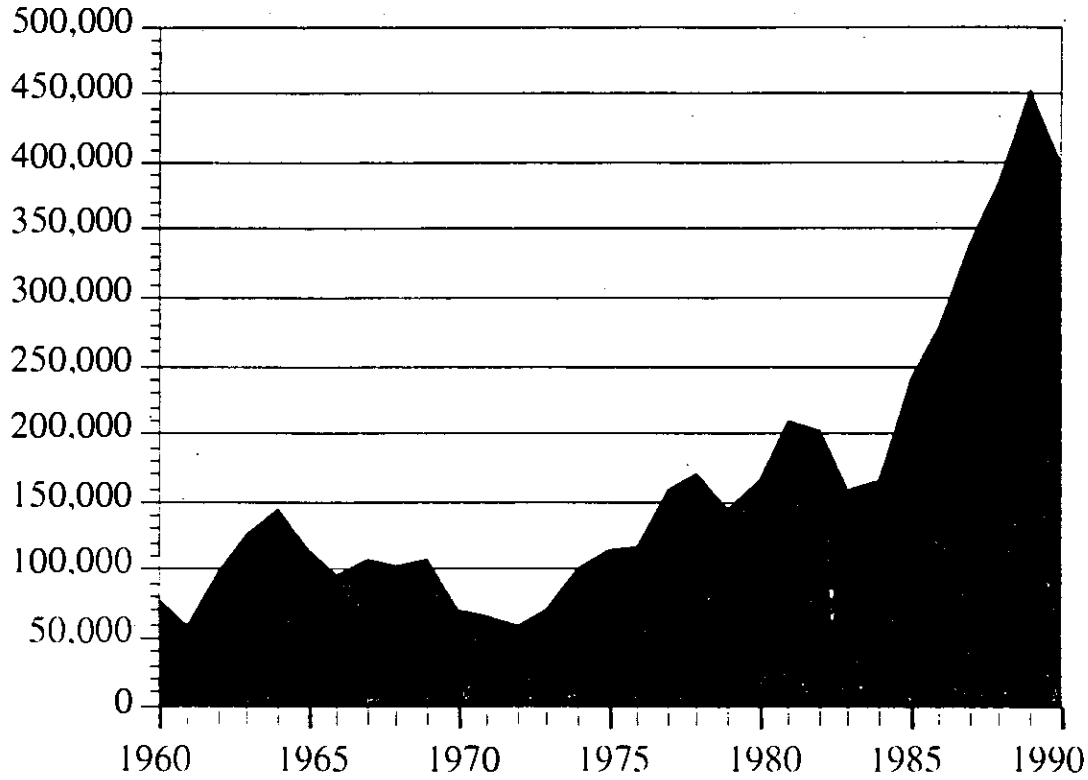




1990 PRELIMINARY MICHIGAN DEER HARVEST

(All Hunting Seasons)



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MIDWEST DEER STUDY GROUP
MISSOURI - 1990 REPORT

LONNIE HANSEN, WILDLIFE RESEARCH BIOLOGIST
JEFF BERINGER, WILDLIFE BIOLOGIST

1990 DEER SEASON

FIREARMS

The 1990 firearms season was 9 days in length (November 10-18) and shooting hours were between 6:30 and 5:00 p.m. EST. Regulations were based on 57 management units (Figure 1) and two season types; bucks-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 the hunter to harvest a second antlerless deer. The statewide quota of any-deer permits in 1990 was 327,650, a 12% increase over the 1989 quota (Figure 1). We received 203,596 applications for any-deer permits and issued 202,120 any-deer and 99,684 bonus permits to these applicants. Landowners received 32,542 any-deer permits and 22,326 bonus permits.

The landowner permit system remained unchanged in 1990. 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 161,141 deer during the firearms season in 1990, a 2% increase over the 1989 harvest. We had ideal conditions for killing deer; mild and dry. Throw on top of this an abundance of any-deer and bonus permits and you have a record harvest. Actually, we should have harvested more deer than we did if deer densities this year were similar to last year. The fact that we did not suggests stabilized or reduced deer numbers in many parts of the state.

MUZZLELOADING FIREARMS SEASON

The muzzleloading firearms season in Missouri saw increased but still low hunter participation. The basic design remained the same as in 1989. 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 1990 were allowed to take 1 deer prior to the firearms season (October 1 - November 9) and 1 after (November 19 - December 31) or 2 deer after. The only change this year was the opportunity for archers to take 2 deer after the firearms season if they had not already taken one before the firearms season. We do not yet know the results of the archery season but expect a harvest similar to that in 1989 when 10,966 deer were taken.

MANAGED DEER HUNTS

In 1990 there were 26 managed hunts on 11 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. Seven of the 1990 hunts were archery only, 10 were muzzleloading firearms only, 5 were modern weapons only, and 5 were historic weapons (muzzleloading firearms, archery, or crossbow).

POPULATION TRENDS

Trend and harvest information and the population models indicate a stabilization of deer numbers in many parts of the state. This is especially true in east central, north central, and northeastern sections. Deer numbers appear to be growing in southeastern Missouri but densities remain low because of a lack of habitat. We attribute the stabilization to increased doe harvests (tripled in 4 years) and in a few areas the 1988 outbreak of hemorrhagic disease.

DEER/VEHICLE ACCIDENTS

Road-killed deer, adjusted for miles traveled, decreased from 96.8 deer killed/billion miles in 1989 to 92.0 in 1990; a 5% decrease (Table 1). This is the second year in a row that road-kill indices have declined. Declines occurred everywhere but in the southeastern part of the state.

SIMULATED DEER POPULATIONS

Deer populations in each management unit were simulated prior to setting deer regulations for the 1990 season (Table 2). The simulations indicated stabilized or reduced populations in some units and increasing populations in others. Statewide, the simulations indicate a growing deer population but at a slower rate than in past years.

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 slowing of the growth of the deer herd in 1989 compared to 1988 (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 index indicated downward trends in deer populations in most parts of the state (Table 4).

RESEARCH PROJECTS

GROSS NATALITY

We completed our second year of a survey to determine gross natality of deer in Missouri. We recruited Protection and Wildlife Division personnel to collect information from road-killed does from 1 February - 31 May. Fetuses were sexed and measured and two incisors were pulled from the dam for aging. Information from a total of 500 does was collected in 1990. As expected, fawn reproduction was lower than that of yearlings or adults (Table 5). Fawn natality continued to be surprisingly low across northern Missouri and did not differ significantly from that in the Ozarks. Statewide reproductive rates and mean conception dates were nearly identical in 1990 compared to 1989.

MORTALITY STUDY

The goal of this study is to determine causes of and annual variability in deer mortality. Results will be used as input into the deer population models. The winter of 1989-90 was the second field season. As in 1988-89, conditions for trapping deer were poor but we managed to capture 115 deer and by the end of the trapping period (13 April) had a total of 80 does with transmitters. We had less trouble the second year with capture-related mortality of rocket-netted deer than in 1988-89 (Table 6). Refinement of techniques so that the deer were processed and released rapidly may explain the reduced mortality.

Of the transmittered does, 8 were killed by firearms deer hunters, 1 died of complications related to old age and 1 died of what appeared to be kidney failure. Of the bucks marked, 8 were taken during the firearms season. A

survival analysis indicated that survival of does from 3/1/89 - 2/28/90 was 0.868. This high rate of survival suggested that non-hunting mortality is very low and that hunting pressure on some areas that held many of our does was low. This year we began measuring hunting pressure on farms where our deer were located to get a better handle on mortality in relation to hunting pressure.

Trapping thus far in 1991 has been very productive with over 40 captures already made. Around 85 does are now transmittered. We expect to have in excess of 120 does "on-the-air" by April.

RECRUITMENT STUDY

In conjunction with the mortality study, we also have a graduate student project through the University of Missouri in which some potential methods of determining annual recruitment are being evaluated. We are looking for a simple and cost-effective method of determining annual and regional recruitment of deer. The potential techniques we are considering include a survey where landowner cooperators record, during routine operations in September and October, their observations of fawns and does. 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, fetus counts of road-killed does, and observations of deer from a helicopter.

The number of fawns recruited by transmittered does will serve as the "known value" to which the values obtained by the above techniques will be 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.

POST-SEASON SURVEYS

We recently conducted post-season firearms, archery, and muzzleloading firearms surveys. A comparison of the various seasons from the standpoint of participation and impact is interesting (Table 7). Copies of these reports will be provided to those interested.

1989 SEASON SUMMARY

Included in this report is a summary of the 1989 deer season in Missouri (Table 8).

Table 1. Adjusted Roadkill Data Using Natural Divisions, 1980-1989.

Natural Division	Adjusted Roadkill[1]									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Glaciated Plains	78.5	72.9	82.7	90.0	122.5	112.5	131.3	141.7	131.2	117.6
Ozark	76.0	74.3	109.1	125.5	136.3	119.1	120.6	160.4	126.4	126.1
Osage Plains	68.7	70.7	74.1	100.4	118.9	124.8	138.0	172.2	168.1	144.2
Ozark Border	40.0	37.1	43.7	51.2	64.8	62.1	65.8	65.5	58.3	56.6
Mississippi Lowlands	7.7	7.7	9.0	11.1	11.7	13.5	12.4	18.3	18.8	27.7
Statewide	**58.6**	**55.6**	**68.4**	**78.6**	**96.2**	**89.4**	**96.9**	**110.7**	**98.6**	**92.0**

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

TABLE 2. Simulated growth of **white-tailed deer** herds in the quota deer management units.

Mgmt. Unit	SIMULATED PRESEASON POPULATION SIZE* 1989	1990
1	8,105	8,558
2	19,968	24,283
3	32,455	34,595
4	26,063	28,864
5	18,512	18,276
6	19,078	18,987
7	30,279	29,089
8	6,350	7,533
9	6,156	7,247
10	21,349	23,105
11	5,214	5,541
12	12,173	12,945
13	17,326	18,318
14	10,609	10,222
15	13,671	15,085
16	13,562	14,274
17	16,618	17,891
18	10,641	12,120
19	14,823	16,774
20	8,712	9,005
21	5,423	5,362
22	7,898	8,426
23	10,390	9,779
24	6,524	6,134
25	8,968	8,844
26	17,446	17,207
27	24,499	25,921
28	18,855	20,167
29	22,268	19,993
30	14,476	13,804
31	9,319	11,302
32	15,141	16,863
33	13,406	14,210
34	13,419	14,509
35	8,733	9,589
36	11,804	12,879
37	6,417	7,639
38	13,510	16,183
39	19,174	21,940
40	17,734	18,498
41	16,778	18,194
42	6,958	8,550
43	27,671	31,492
44	8,504	8,416
45	2,888	2,908
46	9,438	9,269
47	1,751	1,928
48	12,233	13,156
49	17,783	19,516
50	9,226	9,112
51	19,751	20,234
52	20,685	19,769
53	11,111	12,785
55	15,705	17,976
56	1,895	1,996
TOTAL	759,445	807,262

*Simulated population sizes are the number of deer that must be present to sustain estimated mortality. These figures should be used with caution because limited information was available for some of the input parameters.

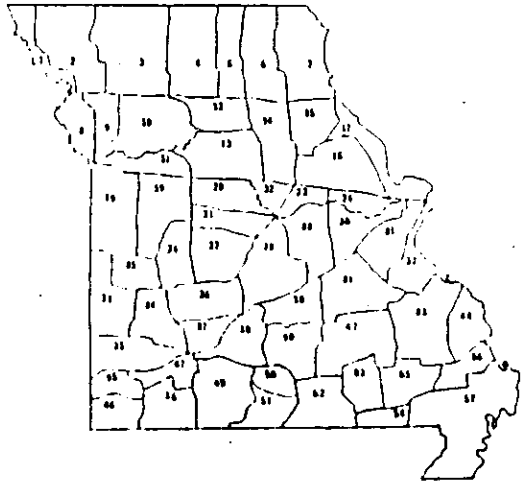


TABLE 3. Agent responses to deer status questionnaire.

Deer Population Trends	% OF RESPONSES 1988	1989	Recommended Quotas	% OF RESPONSES 1988	1989
Increasing	44	35	Increase	24	16
Stable-Increasing	30	47	Same-Increase	37	49
Stable	18	12	Same	30	28
Stable-Decreasing	7	4	Same-Decrease	7	5
Decreasing	2	2	Decrease	2	2

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

TABLE 5. REGIONAL BREAKDOWN OF GROSS NATALITY

Natural Division	Age of Deer	N		% Pregnant		Fetuses Per Doe		Sex Ratio of Fetuses (% Males)	
		1989	1990	1989	1990	1989	1990	1989	1990
Glaciated Plains	Fawn	96	70	31	27	0.39	0.33	39	50
	Yearling	58	54	95	89	1.79	1.70	55	57
	Adult	76	50	96	92	1.88	1.84	47	57
Mississippi Lowlands	Fawn	3	1	67	100	1.00	2.00	100	100
	Yearling	1	0	100	-	2.00	-	0	-
	Adult	5	1	100	100	2.20	2.00	67	50
Ozark Border	Fawn	41	26	29	50	0.32	0.73	54	40
	Yearling	29	16	97	88	1.69	1.63	49	48
	Adult	39	30	90	93	1.56	1.80	51	45
Osage Plains	Fawn	17	10	65	40	0.94	0.50	56	80
	Yearling	11	3	83	100	1.73	2.00	36	25
	Adult	14	11	100	100	2.07	1.64	52	50
Ozarks	Fawn	53	26	25	23	0.36	0.22	53	63
	Yearling	32	19	84	100	1.47	1.68	36	67
	Adult	72	51	95	92	1.76	1.80	51	46
Statewide	Fawn	210	133	32	32	0.42	0.41	49	52
	Yearling	131	92	91	91	1.69	1.69	48	56
	Adult	207	143	94	93	1.80	1.80	50	47

MEAN CONCEPTION DATES

	1988	1989
Fawns	December 12	December 12
Yearling-Adults	November 17	November 18

TABLE 6. Mortality of Marked Deer on Thomas Hill Study Area, 1988-1990.

Year	Legal Harvest	Illegal Harvest	Vehicle	Capture Related	Unknown
1988-89					
Male	10	0	1	2	0
Female	2	2	1	12	4
1989-90					
Male	8	0	0	0	0
Female	8	0	0	7[a]	6[b]

[a] Includes 1 death from this trapping season.

[b] One age related mortality and 1 a result of kidney failure.

TABLE 7. Comparison of 1988 Archery, Muzzleloading Firearms and Firearms Seasons.

	HUNTING SEASON		
	Archery	Muzzleloading Firearm	Firearm
Number of Participants	77,562	4,195	331,096
Years Experience with Weapons	7.1	4.7	---
% Hitting but Not Retrieving a Deer	13.3*	4.9	--
Mean Number of Days Hunted	16.4	5.9	4.1
% Successful at Harvesting at least one deer	15.5	32.5	42.0
% Successful at Harvesting two deer	0.6	3.0	8.0
SEX/AGE OF DEER HARVESTED:			
Doe	33.9	45.2	42.6
Button Buck	13.4	19.1	15.4
Antlered Buck	52.8	35.7	42.0
PERCENT OF HUNTERS IN FIELD:			
November 12 (opening Saturday)	--	86.2	89.8
November 16		28.9	25.5
November 20		51.1	45.2
PERCENT OF HUNTING ACTIVITY:			
First Weekend	--	28.0	41.3
Second Weekend		18.5	23.7
Percent Applying for an Any-Deer Permit	--	81.9	75.0

*1987 season.

TABLE 8. **Deer Season Summary**

HARVEST

Season	ANTLERED DEER 1988	ANTLERED DEER 1989	ANTLERED DEER % Change	BUTTON BUCKS 1988	BUTTON BUCKS 1989	BUTTON BUCKS % Change	DOES 1988	DOES 1989	DOES % Change	TOTAL[1] 1988	TOTAL[1] 1989	TOTAL[1] % Change
Firearms	64,670	73,171	13	19,496	20,708	6	53,598	61,382	15	138,033	155,516	13
Muzzleloading firearms	675	780	16	298	250	-16	720	864	20	1,693	1,899	12
Archery	4,003	4,426	11	2,180	2,252	3	3,980	4,259	7	10,183	10,966	8
Managed hunts	689	498	-28	—	—	—	769	582	-24	1,458	1,080	-26
TOTAL	70,037	78,875	13	21,974	23,210	6	59,067	67,067	14	151,367	169,461	12

HUNTER SUCCESS RATES

Permit Type	Number of Permits 1988	Number of Permits 1989	% of Hunters Successful at Harvesting a Deer 1988	% of Hunters Successful at Harvesting a Deer 1989	Number of Deer Harvested 1988	Number of Deer Harvested 1999
Antlered-only[2]	186,119	164,595	16	20	26,051	32,977
Any-deer	211,763	228,511	36	37	76,333	83,738
Bonus antlerless-only	80,280	91,642	41	41	32,567	37,598
Archery	82,612	83,440	12	13	10,183	10,966

DEER LICENSE SALES

	Number of Permits Sold 1988	Number of Permits Sold 1989	Estimated Revenue 1988	Estimated Revenue 1989
Resident firearms[3]	398,511	414,376	$3,188,099	$3,315,008
Non-resident firearms	10,250	11,198	768,750	839,100
Resident archery	81,213	82,099	974,556	995,188
Non-resident archery	1,389	1,341	104,925	100,575
TOTAL	491,373	509,004	$5,036,319	$5,239,871

ANY-DEER AND BONUS PERMIT DISTRIBUTION

	ANY-DEER PERMITS Landowner 1988	ANY-DEER PERMITS Landowner 1989	ANY-DEER PERMITS Permittee 1988	ANY-DEER PERMITS Permittee 1989	BONUS ANTLERLESS-ONLY PERMITS Landowner 1988	BONUS ANTLERLESS-ONLY PERMITS Landowner 1989	BONUS ANTLERLESS-ONLY PERMITS Permittee 1988	BONUS ANTLERLESS-ONLY PERMITS Permittee 1989
No. of permits distributed	29,252	31,555	182,511	196,956	15,054	18,900	65,226	72,742
% of applicants that received permit	100	100	99	98	84	84	54	44

[1]Includes deer of unknown sex or age.

[2]Does not include landowner antlered-only hunters.

[3]Includes muzzleloading firearms permits.

FIGURE 1

Deer Management Units

	OPEN SEASON
ARCHERY	Oct. 1 thru Nov. 9 Nov. 19 thru Dec. 31
FIREARMS	Nov. 10 thru Nov. 18
MUZZLELOADING FIREARMS	Nov. 10 thru Nov. 18 Dec. 1 thru Dec. 9

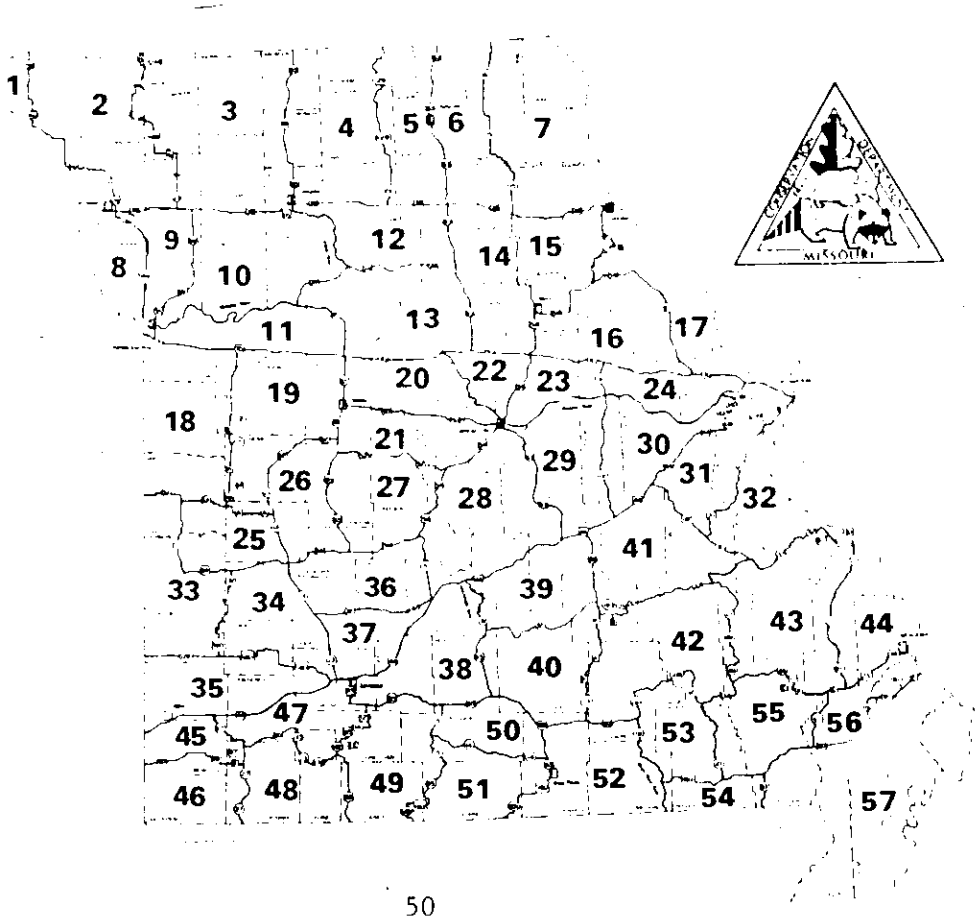
QUOTA UNITS & NUMBERS OF ANY-DEER PERMITS

Antlered bucks only except for holder of Any Deer Permits or Bonus Antlerless-Only Deer Permits)

Unit 1	3,200	Unit 20	4,500	Unit 39	8,000
Unit 2	6,500	Unit 21	3,500	Unit 40	9,000
Unit 3	11,000	Unit 22	4,000	Unit 41	5,000
Unit 4	8,500	Unit 23	7,000	Unit 42	1,000
Unit 5	11,000	Unit 24	5,000	Unit 43	8,600
Unit 6	8,000	Unit 25	5,000	Unit 44	5,500
Unit 7	16,000	Unit 26	10,500	Unit 45	2,000
Unit 8	2,200	Unit 27	10,500	Unit 46	6,000
Unit 9	2,000	Unit 28	7,500	Unit 47	800
Unit 10	8,000	Unit 29	1,000	Unit 48	7,000
Unit 11	3,000	Unit 30	16,000	Unit 49	7,500
Unit 12	5,500	Unit 31	2,500	Unit 50	5,000
Unit 13	7,000	Unit 32	7,000	Unit 51	2,500
Unit 14	6,500	Unit 33	6,000	Unit 52	9,000
Unit 15	5,500	Unit 34	2,000	Unit 53	2,000
Unit 16	5,500	Unit 35	4,000	Unit 54	250
Unit 17	6,500	Unit 36	6,000	Unit 55	3,000
Unit 18	5,000	Unit 37	2,000	Unit 56	400
Unit 19	5,000	Unit 38	2,500		

BUCKS ONLY UNITS
(Antlered bucks only for all hunters)

Unit 57



1989 DEER SUMMARY FROM MIDWESTERN STATES - QUESTIONNAIRE

STATE:_____ REPORT BY:_____

LAND AREA (MI2):
TOTAL_____ DEER HABITAT_____ FORESTED_____
% OF SUITABLE DEER RANGE OCCUPIED_____

LAND AREA OPENED TO PUBLIC HUNTING (MI2)_____

HARVEST/POPULATION INFORMATION

1989 DEER SEASON:

FIREARMS: BUCKS_____ DOES_____ TOTAL_____ ANTL. BUCKS_____
% OF HUNTERS SUCCESSFUL_____

MUZZLELOADING FIREARMS: BUCKS_____ DOES_____ TOTAL_____ ANTL. BUCKS_____
% OF HUNTERS SUCCESSFUL_____

ARCHERY: BUCKS_____ DOES_____ TOTAL_____ ANTL. BUCKS_____
% OF HUNTERS SUCCESSFUL_____

TOTAL: BUCKS_____ DOES_____ TOTAL_____ ANTL. BUCKS_____

TOTAL HARVEST/MI2 OF OCCUPIED HABITAT_____
METHOD OF HARVEST DATA COLLECTION_____

NUMBER OF HUNTING ACCIDENTS:
ALL HUNTING: TOTAL #_____ # FATAL_____
DEER HUNTING: TOTAL #_____ # FATAL_____

PRE-SEASON DEER POPULATION SIZE_____
METHOD OF DETERMINATION_____

POPULATION TREND INDICES USED_____

AGENCY PREHUNT DEER POPULATION GOAL_____
FACTORS ON WHICH GOAL IS BASED_____

REPORTED HIGHWAY KILL IN 1989_____

DEER HUNTING REGULATIONS/PARTICIPATION

MODERN FIREARMS:

SEASON LENGTH_____ BAG LIMIT _____
LICENSE FEES: $_____RESIDENT $_____NON-RES.

ARE THERE A LIMITED NUMBER OF BUCK PERMITS? ____YES ____NO

DOE HARVEST REGULATED BY:
ANY-DEER DAYS____ QUOTA____ BONUS____ OTHER_____

MANDATORY HUNTER EDUCATION ____YES ____NO

MANDATORY BLAZE ORANGE ____YES ____NO

ORANGE CAMO LEGAL? ____YES ____NO

MANDATORY DEER REGISTRATION ____YES ____NO

HANDGUNS LEGAL? ____YES ____NO CROSSBOWS LEGAL? ____YES ____NO

FIREARMS RESTRICTIONS:
CALIBER _____ # OF SHELLS_____
OTHER: _____

MUZZLELOADING FIREARMS:

SEASON LENGTH:_____ BAG LIMIT_____

CAN ALSO PARTICIPATE IN FIREARMS SEASON?____YES ____NO

LICENSE FEES $_____RESIDENT $_____NON-RES.

ARE THERE A LIMITED NUMBER OF BUCK PERMITS? ____YES ____NO
DOE HARVEST REGULATED BY:
ANY-DEER DAYS____ QUOTA____ BONUS____ OTHER_____

MANDATORY HUNTER EDUCATION ____YES ____NO

MANDATORY BLAZE ORANGE____YES ____NO

MANDATORY DEER REGISTRATION ____YES ____NO

MUZZLELOADING FIREARMS RESTRICTIONS:
CALIBER_____
EQUIPMENT _____

ARCHERY:

SEASON LENGTH:_____ BAG LIMIT_____

LICENSE FEES $_____RESIDENT $_____NON RES.

MANDATORY HUNTER EDUCATION ____YES ____NO

MANDATORY DEER REGISTRATION? _____ YES _____ NO

EQUIPMENT RESTRICTIONS:
CROSSBOWS PERMITTED ____YES ____NO
MINIMUM DRAW WEIGHT _____
BROADHEAD SPECS _____
ACCESSORIES (E.G. LIGHTED SIGHT PIN) _____

DEER IN NEBRASKA 1990

Bruce Trindle

GENERAL

Whitetail populations have finally responded to the hunting pressure directed at them. They have been reduced throughout much of the state. Hunters have noticed this decline as a reduction in their success during the seasons in 1990.

Nebraska was the focus of three anti-hunting protests directed at deer hunting. The Fund For Animals rallied members from the Greater Nebraska Animal Welfare Society to demonstrate at the archery and muzzleloading rifle deer hunts held at the Desoto Bend National Wildlife Refuge. Both demonstrations were small and basically ineffective due to poor organization and participation. For instance, most of the muzzleloaders arrived at the area and were admitted before sunrise with the demonstrators showing up at 8:00 AM to taunt them. This same group also picketed a state area during the regular firearm season. Again, this demonstration was small and poorly organized.

The Commission approved a deer management plan that will hopefully provide direction to those concerned for the next 10 years. The plan was subjected to 14 public meetings with only minor changes to the content. However, the plan does include a section on the review of public comments received at these meetings. Copies of the plan are available to those interested.

HUNTING SEASONS

Regular firearm season was held November 10 through November 18. Success was 56 percent, with 54,653 hunters taking 30,867 deer. Licenses increased by 342 and harvest decreased by 3,198 compared to 1989. A total of 25,385 either-sex permits was issued, 21 percent below that of 1989. Antlerless deer harvest was 9,197, a decrease of 20 percent compared to 1989. Of the total license sales 7,053 were half-priced limited landowner permits. The popularity of these licenses increased only slightly (43) compared to 1989. Harvest and success by management unit is presented in Table 1. Composition of harvest and relative success by permit type are present in Tables 2 and 3.

Archery season was held September 15 through November 9, and November 19 through December 31. Results from the 1990 season are unavailable at this time. However, during the 1989 season success was 25 percent, with 12,701 archers taking 3,117 deer. License sales decreased by 45 and harvest decreased by 131 compared to the 1988 season.

Nebraska's first statewide muzzleloading season was held December 9 through December 24, 1989. Success was 33 percent with 2,478 hunters taking 822 deer. Results from the 1990 muzzleloading season are unavailable at this time.

The Desoto Bend National wildlife Refuge muzzleloader hunt was held December 15 through December 17. A total of 94 hunters, harvested 45 deer.

A special late river firearm season, designed to increase the antlerless whitetail kill in the Frenchman and Republican management units, was held January 5 through January 15. Results from this season are unavailable at this time.

TABLE 1 PERMITS, HARVEST, AND SUCCESS DURING THE 1990 FIREARM SEASON

MANAGEMENT UNIT	TOTAL PERMITS ISSUED	** MULE DEER ** NUMBER	PERCENT AD MALE	* WHITETAIL DEER * NUMBER	PERCENT AD MALES	NUMBER UNKNOWN SPECIES	* * * * * TOTAL NUMBER	PERCENT AD MALE	* * * * * SUCCESS	PERCENT WHITETAILS	MULE DEER PER WHITETAILS
BLUE	7026	14	71.43	3774	72.97	7	3795	73.01	54.01	99.63	0.00
BUFFALO	3929	804	63.56	1458	70.18	3	2265	67.87	57.65	64.46	0.55
CALAMUS EAST	1793	36	65.71	712	66.20	1	749	66.09	41.77	95.19	0.05
CALAMUS WEST	2083	435	63.57	805	72.28	1	1241	69.26	59.58	64.92	0.54
ELKHORN	4201	11	90.91	2125	63.92	3	2139	64.07	50.92	99.49	0.01
FRENCHMAN	3445	1830	70.32	737	74.05	6	2573	71.32	74.69	28.71	2.48
KEYA PAHA	2877	406	65.27	1374	65.96	0	1780	65.80	61.87	77.19	0.30
LOUP EAST	2951	68	51.47	1205	65.56	2	1275	64.78	43.21	94.66	0.06
LOUP WEST	2518	520	62.17	763	68.49	2	1285	65.97	51.03	59.47	0.68
MISSOURI	3586	136	70.59	1551	72.52	2	1689	72.33	47.10	91.94	0.09
PINE RIDGE	3101	1296	72.32	519	68.15	2	1817	71.15	58.59	28.60	2.50
PLAINS	1560	680	80.80	298	85.52	1	979	82.26	62.76	30.47	2.28
PLATTE	2660	904	68.78	884	74.66	7	1795	71.72	67.48	49.44	1.02
REPUBLICAN	3616	574	57.64	1651	66.06	3	2228	63.91	61.62	74.20	0.35
SANDHILLS	2988	1142	70.36	864	73.23	2	2008	71.60	67.20	43.07	1.32
UPPER PLATTE	1282	551	78.95	218	85.32	2	771	80.75	60.14	28.35	2.53
WAHOO	5037	2	100.00	2471	72.27	5	2478	72.30	49.20	99.92	0.00
TOTALS	54653	9409	69.29	21409	70.26	49	30867	69.97	56.48	69.47	0.44

NOTE.. ONLY KNOWN AGE *AND* SEX ANIMALS INCLUDED IN PERCENT ADULT MALE CALCULATIONS....

TABLE 2. SPECIES,SEX,AND AGE COMPOSITION OF 1990 HARVEST BY UNIT.

	----------MULE DEER----------					*-------WHITE-TAILED DEER------*					*-------UNKNOWN SPECIES--------*				
	ADULT		FAWN		UNK.SEX	ADULT		FAWN		UNK.SEX	ADULT		FAWN		UNK.SEX
	MALE	FEMALE	MALE	FEMALE	AGE	MALE	FEMALE	MALE	FEMALE	AGE	MALE	FEMALE	MALE	FEMALE	AGE
BLUE	10	3	1	0	0	2748	847	97	74	8	6	0	0	0	1
BUFFALO	504	253	21	15	11	1019	335	51	47	6	2	0	0	0	0
CALAMUS EAST	23	9	0	3	1	47D	182	37	21	2	0	1	0	0	0
CALAMUS WEST	274	134	11	12	4	579	157	35	30	4	1	0	0	0	0
ELKHORN	10	1	0	0	D	1355	599	84	82	5	1	0	0	0	0
FRENCHMAN	1282	480	34	27	7	545	151	19	21	1	1	3	0	0	2
KEYA PAHA	265	119	9	13	0	901	294	97	74	8	0	0	0	0	0
LOUP EAST	35	28	3	2	0	788	316	53	45	3	1	1	0	0	0
LOUP WEST	309	146	22	20	23	513	161	42	33	14	0	0	0	0	1
MISSOURI	96	36	2	2	0	1124	320	53	53	1	1	1	0	0	0
PINE RIDGE	930	304	33	19	10	353	104	40	21	1	2	0	0	0	0
PLAINS	547	114	8	8	3	254	34	4	5	1	I	0	0	0	0
PLATTE	619	252	20	9	4	657	166	24	33	4	5	1	0	0	1
REPUBLICAN	328	217	15	9	5	1086	412	63	83	7	1	0	0	0	1
SANDHILLS	800	295	27	15	5	632	159	41	31	1	0	0	0	0	0
UPPER PLATTE	435	101	8	7	0	186	30	1	1	0	0	0	0	0	2
WAHOO	2	0	0	0	0	1780	521	99	63	8	1	0	0	0	1
TOTALS	6469	2492	214	161	73	14990	4788	840	717	74	23	7	0	0	9

Table 3 COMPOSITION OF 1990 HARVEST AND RELATIVE SUCCESS BY TYPE OF PERMIT

MANAGEMENT UNIT	TOTAL PERMITS ISSUED	NUMBER E-SEX PERMITS	* * EITHER SEX PERMIT HARVEST * * ** ANTLERLESS ** NUMBER	PERCENT	* * TOTAL * * NUMBER	PERCENT	TOTAL HARVEST	* * PERCENT SUCCESS * * E-SEX PERMITS	BUCK PERMITS	TOTAL	ANTLERLESS KILL/ 100 E-SEX PERMITS
1/ BLUE	7026	2810	1008	54.40	1853	48.83	3795	65.94	46.06	54.01	35.87
2/ BUFFALO	3929	1964	728	55.03	1323	58.41	2265	67.36	47.94	57.65	37.07
3/ CALAMUS EAST	1793	717	253	67.29	376	50.20	749	52.44	34.67	41.77	35.29
4/ CALAMUS WEST	2083	1041	385	55.16	698	56.24	1241	67.05	52.11	59.58	36.98
5/ ELKHORN	4201	2100	761	58.81	1294	60.50	2139	61.62	40.22	50.92	36.24
6/ FRENCHMAN	3445	1722	730	52.07	1402	54.49	2573	81.42	67.96	74.69	42.39
7/ KEYA PAHA	2877	2013	606	46.29	1309	73.54	1780	65.03	54.51	61.87	30.10
8/ LOUP EAST	2951	1180	443	64.48	687	53.88	1275	58.22	33.20	43.21	37.54
9/ LOUP WEST	2518	1007	447	69.73	641	49.88	1285	63.65	42.62	51.03	44.39
10/ MISSOURI	3586	1434	463	54.41	851	50.38	1689	59.34	38.94	47.10	32.29
11/ PINE RIDGE	3101	1240	528	61.75	855	47.06	1817	68.95	51.69	58.59	42.58
12/ PLAINS	1560	468	168	48.98	343	35.04	979	73.29	58.24	62.76	35.90
13/ PLATTE	2660	1330	503	52.51	958	53.37	1795	72.03	62.93	67.48	37.82
14/ REPUBLICAN	3616	2169	792	52.21	1517	68.09	2228	69.94	49.14	61.62	36.51
15/ SANDHILLS	2988	1792	566	45.17	1253	62.40	2008	69.92	63.13	67.20	31.58
16/ UPPER PLATTE	1282	384	144	53.53	269	34.89	771	70.05	55.90	60.14	37.50
17/ WAHOO	5037	2014	672	54.50	1233	49.76	2478	61.22	41.18	49.20	33.37
TOTALS	54653	25385	9197	54.54	16862	54.63	30867	66.43	47.85	56.48	36.23

DEER IN NORTH DAKOTA - 1990

by
Roger Johnson

Firearms Season Structure - Regulations for the 1990 firearms deer season were established for all 40 hunting units (Figure 1.) Deer licenses are normally issued through a lottery except for landowner permits. 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 owner permits allow any deer to be taken, but are restrictive in that the holders may only hunt their own land. A total of 66,475 permits were allocated for the 1990 deer gun season. This was a decrease of 6,275 permits from the 72,750 permits allocated in 1989. In 1990, second deer licenses were issued on a first come basis through the state office. The second deer license were all antlerless licenses not sold during the lottery drawing. The licenses were left over in the eastern part of the state. The distribution of the permits was 10,237 gratis landowner permits, 55,279 first lottery deer permits and 966 second deer licenses. The season length options were the same in 1990. The season across the state was 16 ½ days in length except for the split season areas. The split season (early and late) was again offered in 1990 near the population centers along the extreme eastern edge of the state and the Missouri River unit south of Bismarck (hunting units 2B, 2C, 2C1, and 3C) (Figure 1). The deer gun season started at noon CST November 9 for all season lengths including the early season in split season areas. In split season areas, the early season lasted 6 ½ days. The late season started November 16 and ran for 10 days. This type of split allowed for both the early and late seasons to be held within the 16 ½ day season framework.

Deer Gun Season Harvest - The results from the 1990 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 50,000 deer.

Muzzleloading Long Gun Season Structure - For the fourth 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 30, 1990 and from one-half hour before sunrise to sunset each day thereafter through December 3, 1990 and December 7 (noon) through December 10, 1990. The season was proclaimed for all of North Dakota. The licenses were issued by lottery. Legal weapons were muzzleloading long guns of 45 caliber or larger fired black powder or pyrodex with flint or percussion ignition.

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 43% success experienced in 1989.

Archery Season Structure - The 1990 archery deer season started at noon, August 31 and continued until sunset the day before the deer gun season started, November 8. It opened again one-half hour before sunrise November 13 and continued through sunset, December 31. Any deer was legal, with no unit restrictions.

Archery Harvest - The 1989 archery season began on September 1 and continued until December 31, 1989, with a 4-day closure (November 10 - 13) during the opening of deer gun season. The season resulted in the sale of 10,009 residents and 327 nonresident licenses. After the season, 1,661 questionnaires were sent to license holders from the 1988 season. 668 questionnaires were returned. Expanding the sample results projected that 9,948 deer bow hunters experienced 33% success for a total deer harvest of 3,281 ± 347 deer, with 2,934 white-tailed deer and 347 mule deer. The 1990 archery license sales and success is unknown at this time, but is expected to be similar to 1989.

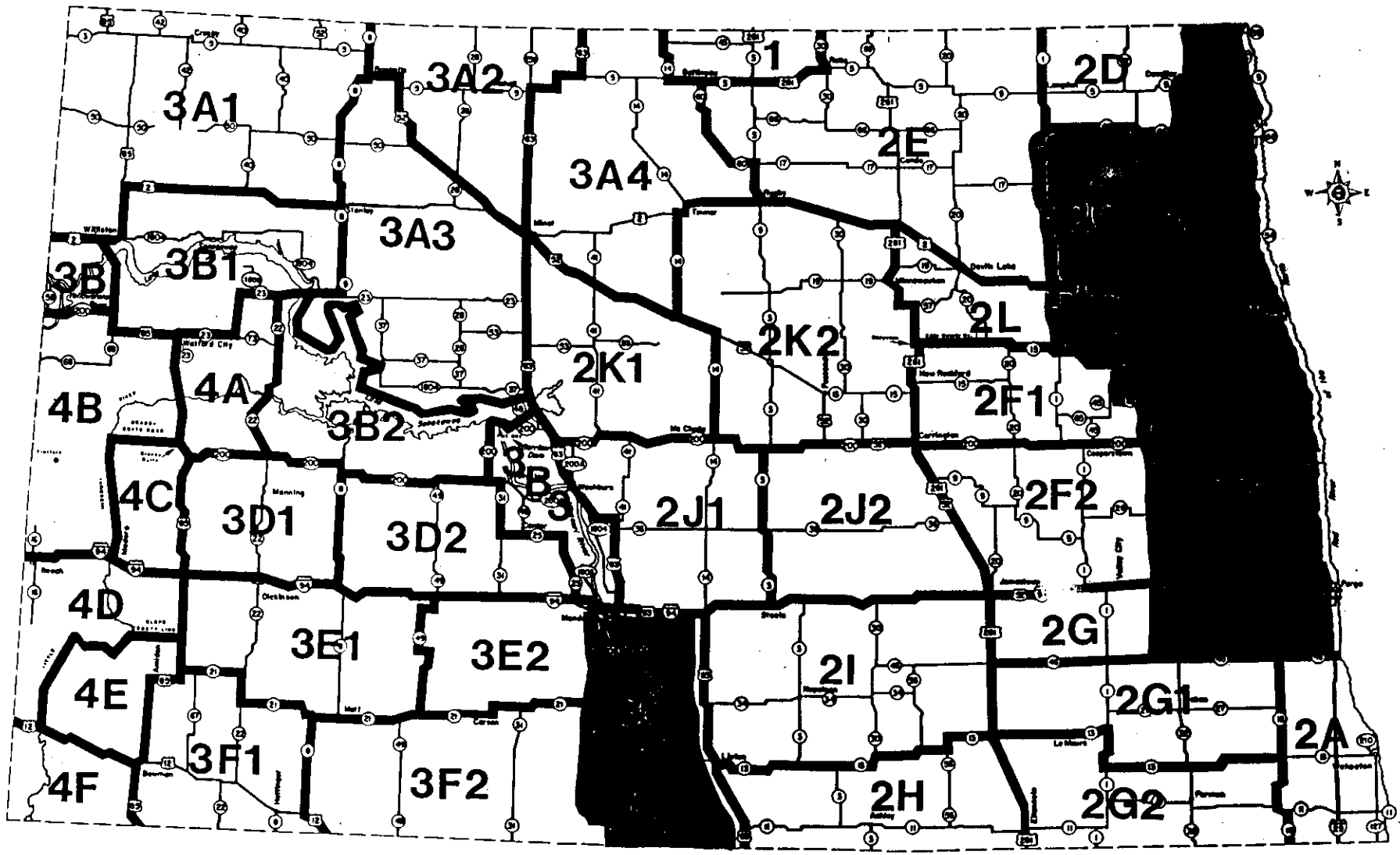
Population Trend - White-tailed deer are distributed throughout North Dakota. Population densities vary by region and are influenced by land use, human population densities, habitat types and climatological regions. In 1958, the state was divided into 41 subunits with permanent boundaries that most nearly 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 1989-90, one of the mildest winters on record and the almost complete lack of snow made it impossible to survey any of the permanent white-tailed deer study areas.

The deer population has been doing real well, especially in the eastern half of the state and the fall hunter success appears to reflect increasing populations. The spring mule deer survey was flown during the period of March 10 - April 6, 1990. The 24 study areas involve 291 square miles of Badlands habitat. The counts indicated a mule deer population of 5.4 deer per square mile. This is an increase of 5.5% from 1989 and 20% above past years averaged data of 4.3 mule deer per square mile.

Research - Currently, as well as for the past few years, the most emphasized deer research has been working with the Epizootic Hemorrhagic Disease (EHD). The work is being carried out by Rex Sohn, the full time disease biologist for the Game and Fish Department. EHD has caused several major die offs in the western portion of the state. The previous outbreaks were in 1962, 1970, 1971, 1976, 1981, 1987 and 1988. There has been no disease outbreak this year, but we continued collecting blood samples from deer and antelope through hunter check stations in the southwest corner of the state. The deer and antelope blood collection has been supplemented with cattle blood samples. Current information indicates that cattle may be a major reservoir for the disease.

FIGURE 1

1990 DEER GUN HUNTING UNITS



Ohio Department of Natural Resources
Division of Wildlife

Wildlife
Inservice Note 619
March 1990

DEER AGE, SEX, AND CONDITION DATA - 1989

W.L. Culbertson, Wildlife Technician
and
Robert J. Stoll, Jr., Project Leader

Forest Wildlife Research and Management Project
New Marshfield, OH 45766

Division of Wildlife personnel operated 17 aging stations throughout the state during the 1989 deer gun season. Their efforts resulted in the collection of age, sex, and condition information from 6,007 animals, which is about 8% of the approximately 76,000 deer harvested. This sample of the total gun harvest consisted of 2,318 antlered bucks, 1,172 button bucks, 940 fawn does, and 1,577 adult does. The age and sex composition of this harvest sample is shown by region in Table 1.

Five aging stations were operated in the Western farmland region, two in the Northeast region, and ten in the EC and SE Hill Country of Ohio to provide information on the status of the deer herd throughout the state. The information on antler characteristics (Figs. 1 and 2), and productivity (Table 2) is typical of deer on a good nutritional plane and a deer herd that is well within the capacity of the habitat to support it. The proportion of older ($\geq$ 2 1/2 years) aged bucks in the harvest (Fig. 3) has decreased as hunting pressure and exploitation rates have increased, but is sufficiently high to offer quality buck hunting opportunity. Various population parameters (Table 3) are calculated from the aging station information that, when combined with the registered deer harvest, provide an index to deer abundance by county.

We thank the aging station proprietors for their cooperation and for the use of their facilities. Appreciation is also extended to the Division personnel who worked long hours necessary to gather this information and to Steve Miller, Survey and Inventory Section, for providing a summary of the results.

Table 1. Age and sex composition of 1989 gun harvest sample.

Region	Female						Male					
	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	334	238	184	52	20	10	389	558	170	48	3	1
Northeast	123	107	76	20	2	2	165	191	93	22	2	0
EC & SE	483	408	268	130	35	25	618	817	255	130	24	4
State	940	753	528	202	57	37	1,172	1,566	518	200	29	5

Table 2. Number of fawns per doe (≥ 1 1/2 years old) in the harvest compared with in-utero fetal counts from 1982-83.

Region	Fetuses per Doe 1982-83	Fawns per Doe in Harvest 1989
Farmland	1.47	1.42
Western		1.43
Northeast		1.39
EC & SE	1.40	1.27

Table 3. Deer population parameters calculated from 1989 deer aging station information.

Region	Estimated Harvest Mortality of Adult Bucks (%)	Estimated Preseason Adult Sex Ratio (Females/Male)	Fawns Per Adult Doe in Harvest
Western	65	1.5	1.4
Northeast	57	1.2	1.4
EC & SE	61	1.4	1.3

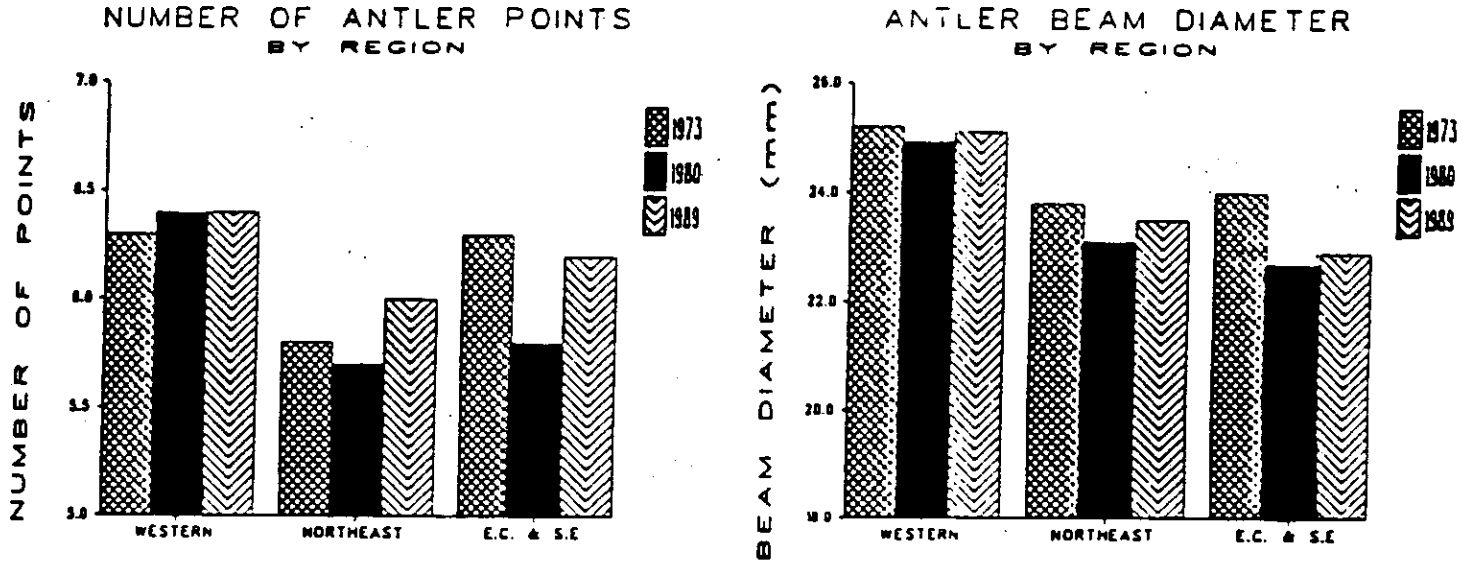


Fig. 1. Average number of points and antler beam diameter for yearling (1 1/2 years old) bucks in Ohio, 1973, 1980, and 1989.

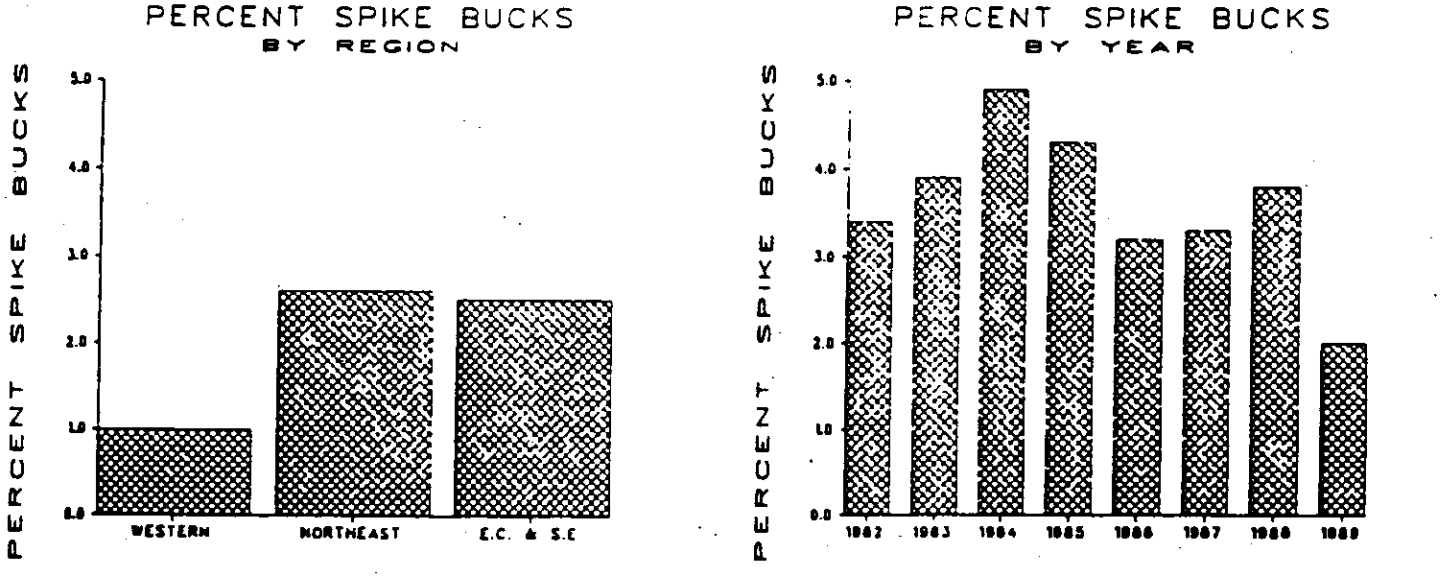


Fig. 2. Percent spike bucks in the antlered population by region for 1989 and statewide by year, 1982-89.

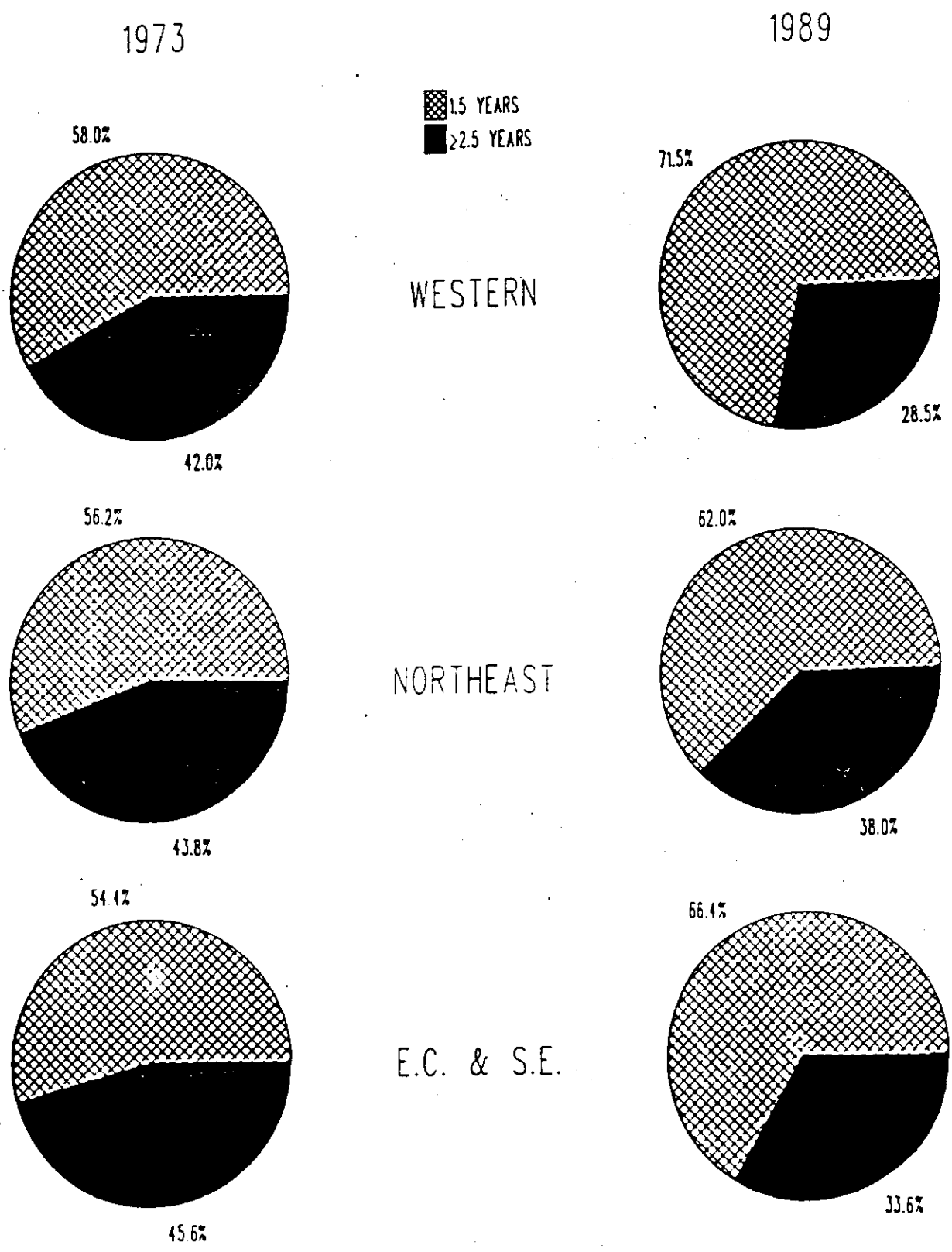


Fig. 3. Age composition of the 1973 and 1989 adult buck gun harvests.

DEER IN OHIO - 1990

(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 4,327 farm and non-farm rural landowners who responded to a 1989 survey 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.

Harvest Results

For the 1990 shotgun season, 21 counties had a 2-day either sex and 4-day buck-only hunt and 67 counties had a 6-day either sex hunt. Except for 1988, the bag limit in Ohio has traditionally been one deer per hunter per year. Preliminary harvest results from the 1990 gun season were 79,143 deer, up 4% over that in 1989 (Table 1). Antlerless deer typically comprise 60% or more of the either sex gun harvest.

In addition to the shotgun season, Ohio also offered 1990-91 deer hunters a 92-day longbow and crossbow season, 6-day primitive weapons hunt on 3 special areas, and a 3-day statewide primitive hunt (Fig. 1). The 1990-91 archery results are not available, as that season is still in progress; results are expected to be similar to the 4,690 longbow and 4,747 crossbow kills obtained in 1989-90. The 6-day buck-only primitive hunt on the 3 special areas totaled 131 compared with 179 in 1989. The 3-day either sex statewide primitive hunt resulted in a preliminary take of 6,067 deer, about 28% more than in 1989-90. The total harvest for the 1990-91 season is expected to exceed 95,000 deer which is about 5,000 more than in 1989-90.

Age, sex, and antler beam diameters were collected from a sample of 6,000 deer registered at mandatory checking stations during the 1989 gun season (see attached Ins. Note 619). Yearling bucks comprised 62-72% of the antlered buck kill and had average beam diameters of 23-25 mm. The estimated preseason adult sex ratios ranged from 1.2 to 1.5 females per male and the number of fawns per adult doe in the harvest ranged from 1.3 to 1.4.

In 1989-90, 285,406 deer hunting permits were sold. The 1990-91 permit sales are expected to be similar. Residents not exempted from purchasing licenses are required to buy a $12.00 general hunting license and $16.00 deer permit; non-residents an $81.00 non-resident license in addition to a deer permit.

Present Status

Deer populations in most of Ohio's 88 counties equal or exceed population objectives. An evaluation of gun hunting regulations indicated that deer population growth averaged about 10% annually under the antlerless permit system and about 5% annually under the 6-day either sex system. Thus, presently employed gun hunting regulations have not resulted in harvests sufficient to hold deer populations within county population objectives.

Proposed Change for 1991-92

It is proposed that in possibly all of the 67 counties that had a 6-day, either sex regulation during the 1990 gun season a limited number of "Special Antlerless Deer Hunting Permits" be randomly issued by county. These permits will allow the successful applicant to take an additional antlerless deer during the archery, gun, or primitive hunting seasons in the county designated on the permit. The issuance of a limited number of antlerless-only permits by county to take a second deer represents the major change from the 1990 hunting regulations. This change is being proposed for the following reasons:

1. Deer populations in these counties equal or exceed population objectives.

2. Antlerless harvests obtained under the 6-day either sex gun regulation have been insufficient to halt deer population growth. Under the 6-day either sex regulation, deer populations have been increasing at an average annual rate of 5-6% in most counties.

3. The restricted 2-deer regulation employed in 11 counties in 1988 resulted in an increase in hunter numbers that was unacceptable to residents and landowners in some of the 11 counties.

4. A 1989 survey indicated that rural landowners preferred an increase in the bag limit over increasing the gun season length, adding a new season, or increasing the number of gun hunters as a harvest strategy to control deer population growth.

5. Issuing a limited number of Special Antlerless Permits per county will hopefully accomplish the following: (a)

a controlled increase in the harvest of antlerless deer, (b) a minimal increase in hunting pressure because permits will be limited and distributed over a large area, (c) a minimal increase in the harvest of antlered bucks -- the buck segment of the population is already subjected to 60-70% harvest mortality, (d) equal opportunity for archery, gun, and primitive hunters because permits will be randomly selected from all applications received, (e) allow sufficient time to analyze harvest results and determine population status so permit allocations can be tailored to specific county management needs, and (f) maintain county deer populations at levels consistent with minimal agricultural crop damage and deer-vehicle accidents.

Odds and Ends

A survey of rural landowners was conducted during the summer of 1989. Results are available, but the full write-up has yet to be completed. Among other things, survey results will be used to update county deer population objectives.

This was the seventh year for conducting the October-November rural mail carrier deer survey in 26 of Ohio's primary deer counties. We're hoping the survey will provide an additional index to county deer abundance. Preliminary results suggest that the survey performs no better than other population trend indicators.

A strategic plan for deer was completed.

Deer-vehicle accidents were 16,039 in 1989, 17,540 in 1988, and 16,391 in 1987. Comparable statistics for 1990 are not yet available.

We hope to initiate a population modeling project with the Ohio Cooperative Wildlife Research Unit in the near future. The objective will be to evaluate the usefulness and practicality of available population models for deer management in Ohio.

Table 1. Final results of the 1989-90 and preliminary results of the 1990-91 Ohio deer hunting seasons.

Year and Regulation	Shotgun Permits Issued	Shotgun Harvest	Long-bow	Cross-bow	Spec. Areas Prim. Hunt	State Prim. Hunt	Season Totals
1989-90							
24 Antlerless Permit Cos.	20,337	7,540	-	-	-	-	-
64 Either Sex Cos.	-	68,556	-	-	-	-	-
State	20,337	76,117	4,690	4,747	179	4,718	90,451
1990-91							
State[a]	0	79,143	?[b]	?	131	6,067	?

[a]For shotgun season, 21 counties had a 2-day either sex and 4-day buck only hunt; the remaining 67 counties had a 6-day either sex hunt.

[b]Season still in progress.

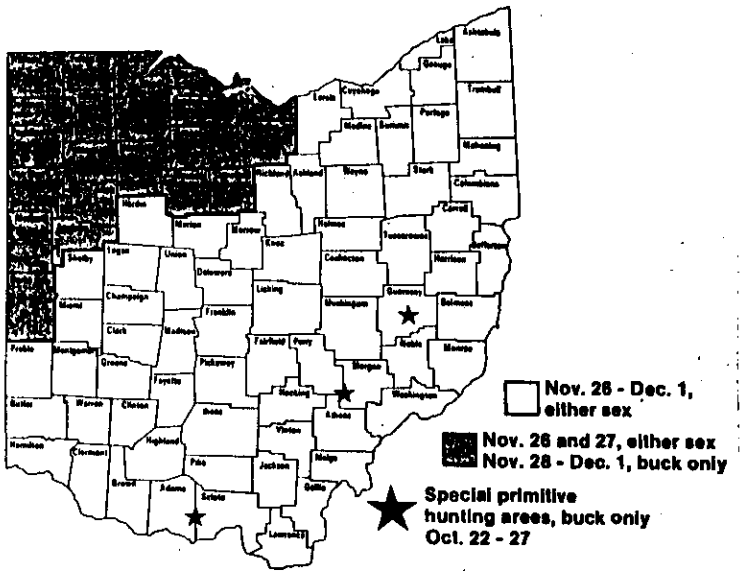
1990-91 DEER SEASONS

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

BAG LIMIT: One deer per hunter per license year (Sep. 1—Aug. 31), regardless of the method of taking.

Methods	Legal Deer and Locations	Dates	Hours
Longbow: minimum draw weight 40 lb. Crossbow: draw weight not less than 75 lb. nor more than 200 lb.	Buck or doe, statewide (except buck only during primitive season on special areas)	October 6, 1990, through January 31, 1991, except closed during gun season	½ hour before sunrise to ½ hour after sunset
Primitive season: longbow, crossbow (draw weight limitations same as above), muzzleloading rifle .38 calibar or larger, or muzzleloading shotgun of 10, 12, 16, or 20 gauge using one ball per barrel	Buck only, special areas only	October 22, 1990, through October 27, 1990	½ hour before sunrise to sunset
Primitive season: same as above	Statewide Buck or doe (Kelleys Island closed to gun hunting)	January 3, 1991, through January 5, 1991	
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) 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	Statewide Buck or doe Nov. 26 through Dec. 1 EXCEPT buck only Nov. 28 through Dec. 1 in Allen, Auglaize, Crawford, Darke, Defiance, Erie, Fulton, Hancock, Henry, Huron, Lucas, Mercer, Ottawa, Paulding, Putnam, Sandusky, Seneca, Van Wert, Williams, Woods, and Wyandot counties (Kelleys Island closed to gun hunting)	November 26, 1990, through December 1, 1990	

DEER GUN SEASON REGULATIONS AND PRIMITIVE HUNTING AREAS



Deer must be checked in the county where killed, or in an adjacent county.

A Special Deer Hunting Permit (cost $15.00 plus $1.00 writing fee) is required in addition to a hunting license. Persons are not required to have a deer permit while hunting deer on property they or their parents own. Tenants or managers of land and their children may hunt deer on land where they reside without a deer permit. Ohio residents 66 years of age or older, permanently disabled veterans, holders of veterans license plates, and former prisoners of war may obtain a free deer permit by following the instructions set forth in Publication 85, **1990-91 Ohio Hunting & Trapping Regulations.** U.S. military personnel and former prisoners of war are required to have a deer permit.

Fig. 1. 1990-91 Ohio deer seasons.

South Dakota
1990 Deer Status Report
by
Les Rice

Deer status in South Dakota is unchanged from 1989 reports. Farmland whitetail herds are stable to increasing. For West River Prairie management areas, mule deer are increasing. EHD was a serious problem in only one hunting unit so prairie whitetail numbers are stable to increasing. Black Hills deer herds continue to be in trouble but herd numbers are fairly stable.

Drought lessoned last summer but moisture patterns continue to be a problem. EHD continues to occur very late in the season. Historically, any die off would be over by mid September. For the past 3 to 4 years EHD suspected deaths have occurred in October and even into November. Cause for change in timing is unknown.

CRP in farmland areas is giving us all the headaches we suspected would occur. The nesting habitat provided is great but fawning habitat also is excellent. Harvest was affected due to lack of snow cover so the CRP provided abundant escape cover. CRP and desired harvest levels are certainly in conflict.

Game harvest summary for 1989 is provided at the end of this report. For 1990 deer harvest results are not available but increased kill is projected especially for antlerless segments of the populations. We are unfortunately repeating the mistakes make in the early 80's. Herd growth is getting out of hand. Harvest is not sufficient especially if we get a hard winter. As is usual, hunters could potentially harvest over 15 deer last fall.

Last year we reported that we were considering a youth only deer hunt. This season was held last fall for those hunters 12 through 15 years old. As a pilot project, only antlerless deer could be taken, limited quotas were in force and the season dates were the last two weekends in September. The season went remarkably well. This was one of the best P-R programs we have ever initiated. The public was very enthusiastic. There were problems as expected. Antlerless only licenses, timing of hunt, archery hunter complaints, low demand in rural areas, etc. were some of the problems encountered. But these were certainly minor. We will probably expand the season to cover all hunting units in the state this fall. Enclosed is harvest summary for this special season.

A few archery hunters requested bonus antlerless tags since deer numbers were increasing. We agree to do so and as is usually the case, the special archery allocation was a flop. Demand was not high enough to warrant the extra work.

We are well into the research project on deer movements and habitat use in the Black Hills. As this applies more to western mountain regions, I have not gone into any detail for this group..

SOUTH DAKOTA GAME HARVEST AND HUNTER SUCCESS, 1989

Species	Number Harvested	Number Of Hunters		Hunter Success	Man-days Recreation
DEER					
West River					
White-tailed Deer	7,645	(16,886	Resident (21,935 Tags)		)
Mule Deer	8,615	(1,425	Non-resident (1,756 Tags)		)
Total	16,260	18,311	(23,691 Tags)	69%	54,933
East River					
White-tailed Deer	29,214	(34,004	Resident (39,138 Tags)		)
Mule Deer	703	(604	Non-resident (717 Tags)		)
Total	29,917	34,608	(39,855 Tags)	76%	110,746
Refuge					
White-tailed Deer	825	(728	Resident (1,228 Tags)		)
Mule Deer	0	(58	Non-resident (98 Tags)		)
Total	825	786	(1,326 Tags)	62%	2,245
Winter Reduction					
White-tailed Deer	652	(740	Resident (980 Tags)		1,304
Mule Deer					
Total	652	(740	(980 Tags)	67%	1,304
Black Hills-Buck Only					
White-tailed Deer	3,685	(12,715	Resident		76,290)
Mule Deer	1,128	(1,572	Non-resident		7,388)
Total	4,813	14,287		34%	83,678
Black Hills-Special					
White-tailed Deer	912	(1,063	Resident		)
Mule Deer		(72	Non-resident		)
Total	912	1,135		80%	3,178
Custer State Park-Buck					
White-tailed Deer	14	(25	Resident	56%	)
Mule Deer	0				
Total	14	25		56%	80
Archery					
White-tailed Deer	3,081	(10,625	Resident	30%	155,125)
Mule Deer	347	(484	Non-resident	46%	3,243)
Total	3,428	11,109		31%	158,368
All Seasons					
White-tailed Deer	46,028	(76,761	Resident (87,684 Tags)		)
Mule Deer	10,793	(4,215	Non-resident (4,699 Tags)		)
Total	56,821	80,976	(92,383 Tags)		414,532
ANTELOPE					
Custer State Park					
Archery	-	0	Resident	-	0
East and West River					
Rifle	3,702	4,433	Resident	84%	7,359
Archery	56	301	Resident	18%	1,746
		18	Non-resident		79
Total	3,758	4,752			9,184
ELK					
Custer State Park					
Archery	4	45	Resident	9%	327
Rifle	30	35	Resident	86%	202
Black Hills					
Rifle	107	249	Resident	43%	1,818
Archery	2	58	Resident	3%	505
Total	143	387			2,852

Species	Number Harvested	Number Of Hunters		Hunter Success	Man-days Recreation
MOUNTAIN GOAT					
Black Hills	5	5	Resident	100%	20
BIGHORN SHEEP					
Custer State Park	2	2	Resident	100%	9
TURKEY					
Spring					
Archery	105	457	Resident	21%	2,597
	0	33	Non-resident		
Black Hills	757	2,016	Resident	38%	9,072
	350	809	Non-resident	43%	3,155
Prairie	2,284	2,794	Resident (3,962 Tags)	58%	9,341
	270	269	Non-resident (420 Tags)	64%	
Custer State Park	34	100	Resident	34%	266
Spring Total	3,800	6,478	(7,797 Tags)		24,431
Fall					
Black Hills	632	1,358	Resident	45%	3,802
		47	Non-resident	47%	188
Prairie	2,761	2,693	Resident (5,004 Tags)	52%	7,467
		179	Non-resident (343 Tags)		
Custer State Park	15	33	Resident	45%	63
Fall Total	3,408	4,310	(6,785 Taps)		11,520
All Seasons Total	7,208	10,788	(14,582 Tags)		35,951
PHEASANT	435,000	71,700	Resident	1.0/Man-day	417,300
	252,000	26,100	Non-resident	1.9/Man-day	131,000
Total	687,000	97,800			548,300
GROUSE	59,100	14,060	Resident	1.1/Man-day	54,300
PARTRIDGE	43,800	15,410	Resident	0.4/Man-day	103,700
QUAIL	3,530	1,080	Resident	0.7/Man-day	5,050
DUCKS	111,600	17,600	Resident	1.1/Man-day	100,000
GEESE	97,800	26,000	Resident	0.7/Man-day	146,900
CRANE	194	153	Resident	0.6/Man-day	319
SNIPE	500	100	Resident	0.5/Man-day	950
MOURNING DOVE	288,900	15,410	Resident	4.1/Man-day	70,400
SQUIRREL	18,070	4,070	Resident	0.8/Man-day	22,470
COTTONTAIL	40,300	6,940	Resident	1.1/Man-day	35,300
GRAND TOTAL (All Species)	1,418,731				1,550,237

R.M. Fowler - 11/5/90
H.H. Pietz - 11/5/90

1990 Special Youth Antlerless Deer Harvest Survey Projections (pilot season)

County	Unit	Licenses Available	Sold	Whitetail Bucks	Whitetail Does	Mule Deer Bucks	Mule Deer Does	Total Deer Harvested	Success	Land Type Where Harvest Was Reported PU	OWN	OP	NONE
Minnehaha	801A-03	50	50	5	14	0	0	19	38%	1	1	9	18
Pennington/Meade NE	802A-03	50	26 *	0	2	2	17	21	81%	0	1	11	3
Pennington	802B-03	25	18	0	1	0	15	16	89%	7	0	6	1
Pennington SE	802C-03	50	24	0	0	0	15	15	63%	6	0	6	6
Brown	803A-03	75	47	0	30	0	0	30	64%	1	2	20	11
Brown NE	803B-03	75	67	21	37	0	0	58	87%	5	3	23	5
Codington	805A-03	100	42	5	21	0	0	26	62%	5	1	11	9
Brookings	806A-03	50	50	3	23	0	0	26	52%	6	0	12	12
Yankton	807A-03	50	50	2	22	0	0	24	48%	5	1	8	15
Lawrence	809A-03	100	36	3	14	1	4	22	61%	8	0	8	10
Bennett N	811A-03	25	1 *	0	0	0	0	0	0%	0	0	0	0
Bennett S	811B-03	25	2 *	0	0	0	0	0	0%	0	0	0	1
Butte N	815A-03	25	18	1	5	1	8	15	83%	5	0	7	2
Butte SW	815B-03	20	20	1	10	0	4	15	75%	1	0	10	3
Clark	818A-03	100	51	11	22	0	0	33	65%	5	4	21	17
Day	822A-03	100	71	15	25	0	0	40	56%	8	0	18	19
Deuel	823A-03	50	50	4	28	0	0	32	64%	2	2	13	10
Edmunds	826A-03	50	29 *	3	15	0	1	19	66%	2	2	10	8
Fall River/Custer	827A-03	25	25	0	0	1	18	19	76%	10	0	4	5
Fall River	827B-03	25	25	1	1	0	19	21	84%	3	0	13	2
Faulk	828A-03	100	20	1	12	0	1	14	70%	1	2	8	4
Haakon	831A-03	50	16	1	3	1	10	15	94%	1	4	7	1
Hamlin	832A-03	50	45 *	4	24	0	0	28	62%	2	4	8	9
Harding NW	835A-03	50	7	0	2	0	2	4	57%	2	0	2	3
Harding SW	835B-03	50	6 *	0	2	0	2	4	67%	1	0	1	1
Harding SE	835C-03	100	24	0	1	0	13	14	58%	8	0	4	6
Jackson	839A-03	50	10	0	3	0	3	6	60%	1	2	1	2
Jones	841A-03	50	16 *	0	3	2	8	13	81%	3	0	5	2
Lake	843A-03	50	50	4	22	0	0	26	52%	3	0	11	13

1990 Special Youth Antlerless Deer Harvest Survey Projections (pilot season) continued

County	Unit	Licenses Available	Sold	Whitetail Bucks	Whitetail Does	Mule Deer Bucks	Mule Deer Does	Total Deer Harvested	Success	Land Type Where Harvest Was Reported PU	OWN	OP	NONE
McPherson	847A-03	50	22	1	14	0	0	15	68%	4	0	7	5
Marshall	848A-03	50	41	8	23	0	2	33	80%	8	4	10	5
Meade SW	849A-03	50	38	1	7	0	16	24	63%	1	1	15	10
Meade NE	849B-03	25	10	0	3	0	5	8	80%	0	0	6	2
Mellette	850A-03	50	18 *	2	0	0	8	10	56%	0	2	5	5
Roberts	855A-03	50	50	13	26	0	0	39	78%	6	2	13	6
Spink	857A-03	100	46 *	6	15	0	2	23	50%	5	0	7	13
Ziebach	864A-03	25	3	0	1	1	1	3	100%	0	2	1	0
		2020	1124	116	431	9	174	730	65%	126	40	321	244

* Estimates were generated for units where response rates were less than 85% and may not be within +/- 15% of the sample estimate.

Overall survey response rate was 90%.

11/14/90

kMcP

WISCONSIN DEER STATUS REPORT, 1990-91

Keith R. McCaffery

HUNTING SEASONS

The gun deer season in Wisconsin has traditionally been 9 days including two weekends beginning the Saturday before Thanksgiving. Most of the state is open to bucks-only (>3" antler) plus prescribed quotas of antlerless deer. The exception is a 2+7 (2-day anydeer, plus 7-day bucks only) in some units adjacent to the Mississippi River. About 4.1 million hunter days of recreation are exercised during the 9-day hunt (6.2 days/hunter). For 1990 we sought and obtained authority to have a 7-day extended season for hunters holding unused antlerless permits in all units where deer populations were 20% or more above goals. About half of the 114 units in the state qualified for the 16-day hunt.

The archery deer season begins the 3d Saturday of September and continues through 31 December with a break beginning 5 days before the gun deer season until 5 days after. In 1990 there was a 2 day overlap with the extended gun hunt. Season length provides about 83 days of bowhunting. Archers exercise about 4.0 million hunts (19 hunts/archer). Total deer license revenue (firearm and bow) exceeds $13 million.

POPULATION TRENDS

Deer density goals have been established for 103 management units in the state (not including 11 island and state park units). In forested zones, goals were set relative to carrying capacity. In farmland zones, goals were set relative to human tolerance. Farmland goals have gradually increased since 1962. Overwinter goals range from 10 to 35 deer/mi^2 and total about 703,000 deer. Normal recruitment should produce fall populations near 1,000,000.

Deer populations have been on the increase since 1971 and reached a preseason population of about 1.24 million in 1989 (Fig. 1). The farmland deer herd increased about 6 fold since 1962 and has doubled since 1976. The farmland herd <u>overall</u> is near goal, however, 21 of 55 units were above goals and 4 were below goals during the 1989-90 winter. Of 5 Central Forest units, only one was above goals. The greatest concern was in our Northern Forest where 34 of 44 units were above goals. Dramatic herd increases have occurred in the North as a result of a number of factors: sequence of mild winters (esp. 1986-87), baiting and recreational winter feeding, insect defoliations, forest management activities, etc.

DEER HARVESTS

The combined gun and archery harvest has been near or above 300,000 deer since 1985 (Table 1). In addition to the legal harvest, we have more than 30,000 recorded roadkills annually.

TABLE 1. Recent deer harvests and license sales in Wisconsin.*

	Gun Hunting			Bowhunting		
Year	Adult Bucks	Harvest Total	Licensed Hunters	Adult Bucks	Harvest Total	Licensed Archers
1985	112.7	274.3	670.3	19.4	40.7	215.7
1986	117.9	259.2	662.5	19.1	40.4	216.2
1987	116.9	250.5	660.4	21.3	42.7	208.3
1988	121.4	263.4	653.8	22.1	42.4	210.5
1989	139.7	310.2	661.7	25.2	46.4	210.9
1990	140.7	351.8	N.A.	24.2	45.7	N.A.

* Harvests based on mandatory registration. All numbers in 1,000.

---Prepared for Midwest Deer and Turkey Study Group, Iowa.---

Hunting conditions in 1990 were popularly felt to be excellent because of the record warm temperatures. However, "harvest conditions" were far from excellent (perhaps average). Overdressed hunters and sedentary brown deer on brown background depressed the harvest. In contrast, hunting conditions during the 1989 firearm season were excellent; access was frozen, light snow cover was present for much of the season, and days were free of precipitation. The peak of rutting activity also seemed to coincide with the hunt. Therefore, buck harvest rates and deer-sighting rates were above normal for firearm hunters in 1989. Excessively warm, snowfree conditions in 1990 greatly reduced the number of deer seen and have caused sportsmen and others to question our deer population estimates despite the all time record buck harvest.

Recent archery harvest trends have tended to follow the rising deer herd. However, selection for adult bucks has continued to increase. Prior to 1975, adult bucks comprised less than 30% of the bow kill. From 1984 to 1989 the proportion of adult bucks in the kill has progressively increased from 44% to 54%.

License sales for both firearm and archery deer hunting have declined from the peak in 1985 and have temporarily stabilized (Table 1). We expect license sales may continue to drop in light of increased urbanization, growing non-traditional families, and our aging human population. We are also seeking higher license fees for 1991.

PROSPECTS FOR 1991 HUNT

We again sought a season similar to 1990 which included an "emergency" extension in all units more than 20% above population goals. The main purpose for the longer hunt was to provide some insurance against poor weather during the usual short season. However, unfavorable reaction from the Sportsmen's Congress caused us to withdraw from a preannounced extention. The emergency provision could still be implemented if inclement weather occurs. The change from a 23 November opening in 1991 vs. 17th in 1990 could depress northern buck harvests by up to 15% because most rut activity will have been completed. The total harvest is likely to be greater than in 1990 because we are having another mild (low snow) winter.

OTHER ACTION

We are committed by prior agreement to review our deer population goals with our statewide Sportsmen Congress and local land conservation committees. Unprecedented deer numbers and harvests in recent years have not satiated sportsmens' desire for more deer. Pressure seems to be building to increase overwinter population goals. The record warm decade of the 1980s has temporarily raised carrying capacity in forested units causing many hunters to believe our current goals are too low. We believe the usual climate is still there and normal weather patterns will return. There is also pressure to further test the tolerance of landowners by raising goals in our farmland despite having depleted a million dollar crop damage program in 1989-90. Furthermore, there is growing evidence of deer damage (oak and pine regeneration) in the non-crop habitats of our farmland range.

A significant minority of hunters is calling for quality buck management in our farmland. Hunting pressure is very heavy and annual buck mortality ranges from 85-90% in many units. A committee is pursuing possibilities despite obstacles: (1) hunting opportunity would have to be greatly reduced (half or more of the hunters displaced, or a 1-2 day firearm deer season with limited archery hunting), (2) landowner preference for hunting (privatization of deer herd) and accelerated trend toward fee hunting, and (3) strong opposition from hunters who would be displaced or forced to pay fees. Our best opportunities for quality buck management may be limited to areas like state parks, military reservations, and islands where land ownership and public hunting has been restricted.

DEER SURVEYS AND RESEARCH

We annually age deer at about 75 of our 475+ registration stations. We aged 24,700 deer in 1990. Yearling percents were about normal indicating the statewide herd was continuing to recruit high numbers of deer into the adult population. Yearling doe percents in the North were above normal for the fourth consecutive year reflecting the rapidly growing populations there. Antler development on yearlings was also normal or above statewide indicating good physiological condition.

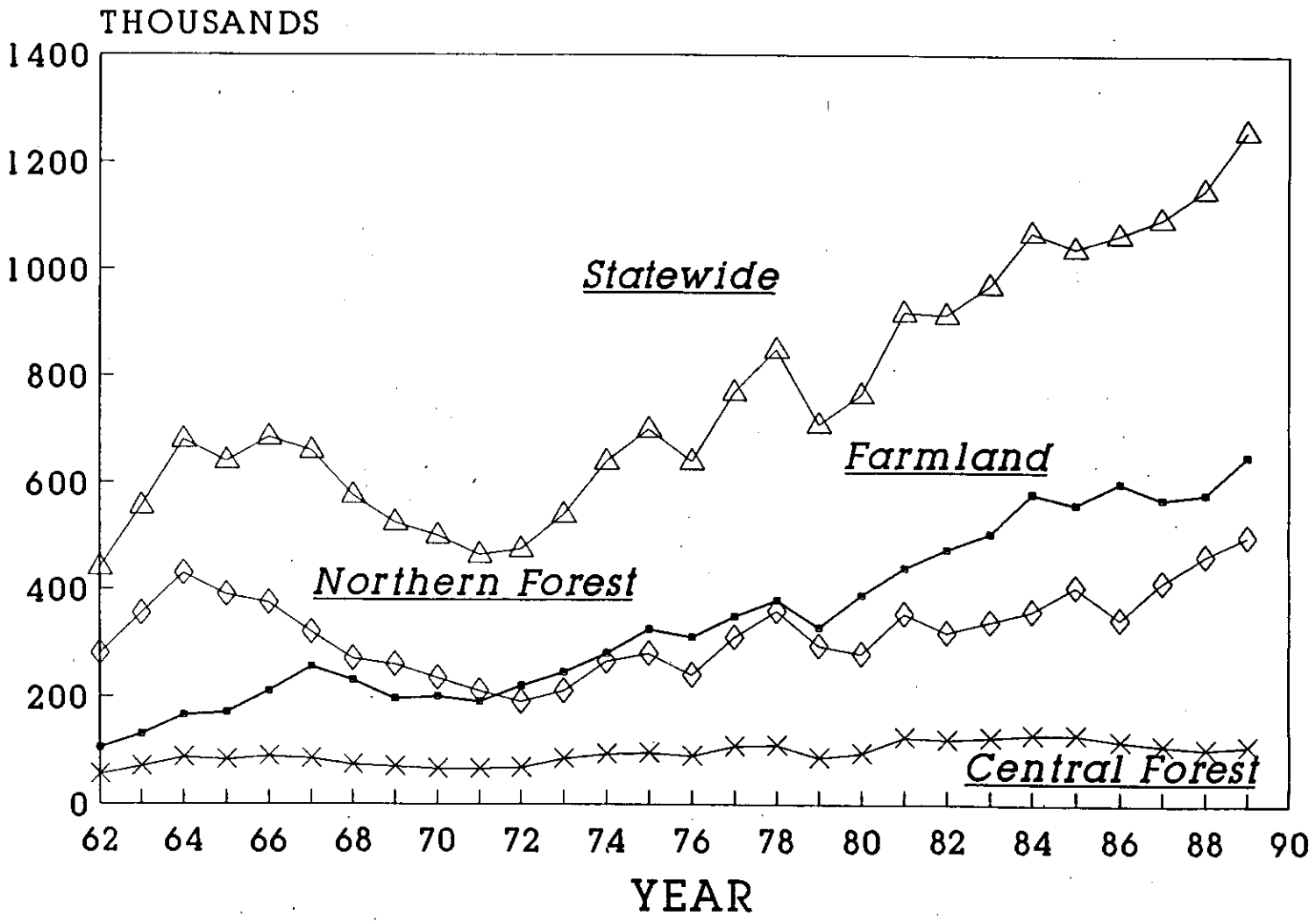
Deer populations are monitored by management unit. Mandatory harvest registration has been in place since 1953 and forms the foundation for our herd management system. Deer populations are reconstructed using sex, age, harvest, and fawn index data. These density estimates relative to established goals provide the basis for defining antlerless quotas for the following fall. No other field surveys or modeling is currently in use or felt necessary. Our harvest registration and aging program has cost about $100,000 per year.

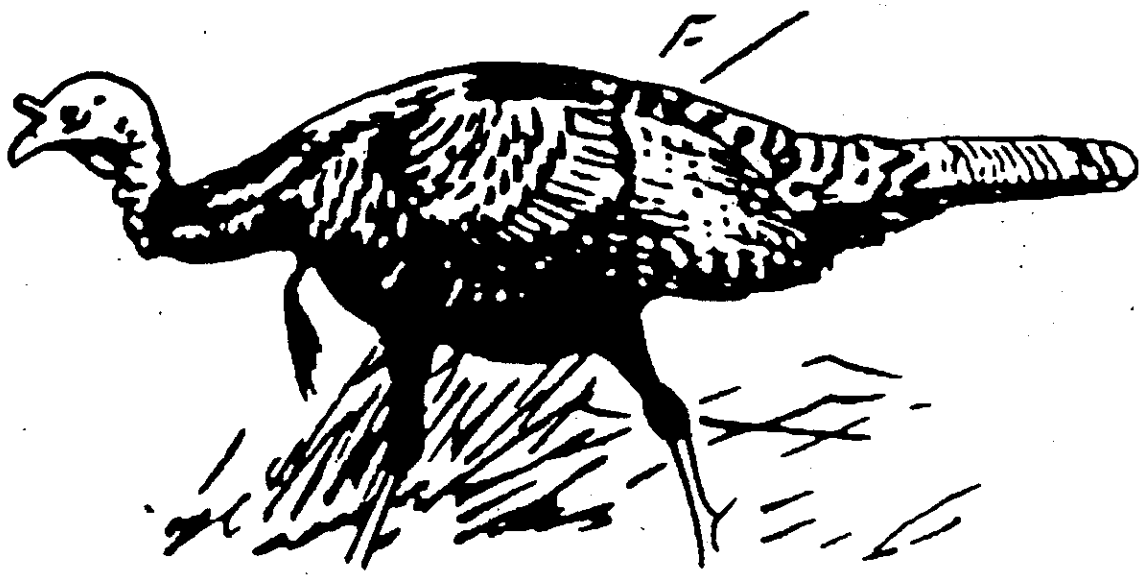
A recently completed study of deer reproduction indicated statewide gross productivity averaged 1.65 fetuses/pregnant doe which compared favorably with earlier Wisconsin studies. The percent of fawns breeding ranged from 3% in the North to 50% in the South. The sex ratio of all 1,803 fetuses was 109 males per 100 females. Estimates of gross productivity of all does ranged from 1.10 in the North to 1.26 in the South.

Results of a study of the impact of forest openings on deer carrying capacity tended to support a conceptual model that related deer density to varying habitat composition. The habitat model estimated carrying capacities of 32 and 29 deer/mi^2 for the two study areas. Recruitment analyses were corroborating and provided independent estimates of carrying capacities at 32 and 31, respectively. Wetland types appeared to reduce carrying capacity except where lowlands were the only permanent cover in agricultural areas. Findings regarding other habitat types were corroborative of existing information, but offered little for refining present management guidelines.

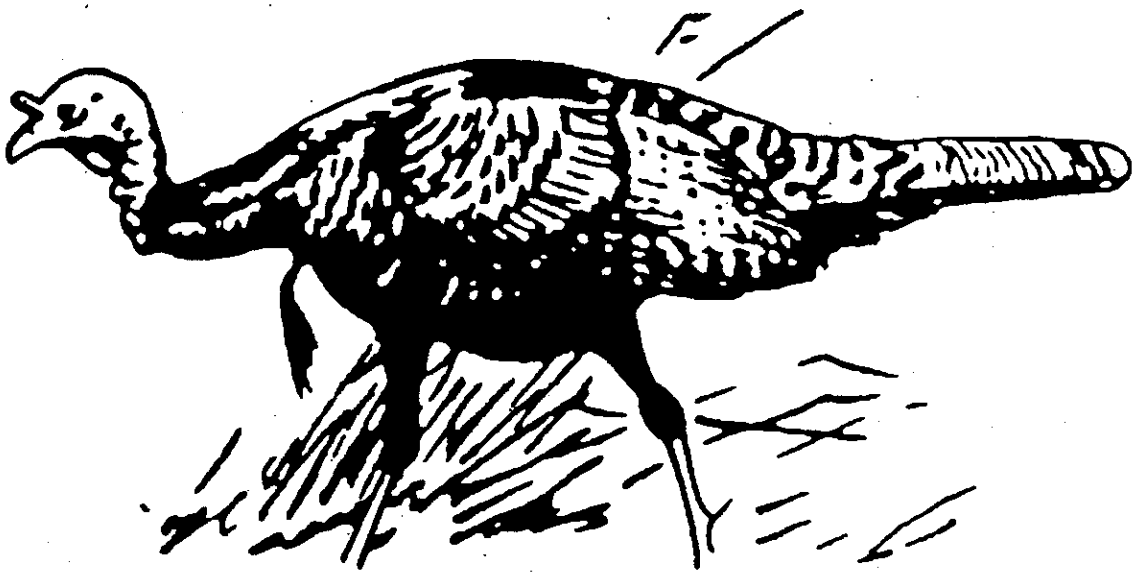
Analyses of yearling antler measurements showed excellent correlations between beam diameter, percent forking, and number of points. Regressions permit transformation of data between these indexes. States may continue to use whichever index they like, or may choose to use the simplest method.

Fall Deer Populations





TURKEY STUDY GROUP REPORTS



MIDWEST WILD TURKEY GROUP REPORT - ILLINOIS - 1990

RESTORATION

During 1990, a total of 156 hens and 74 gobblers were trapped and transplanted to 16 sites in Illinois. An additional 10 hens and 4 adult gobblers were shipped to Minnesota in completion of a trade agreement for ruffed grouse.

Since 1959, a total of 1,115 hens and 550 gobblers have been stocked at 114 release sites in Illinois. We still have several more years to go in our restoration efforts.

PRODUCTION

Statewide reproduction in 1990 was below average. Our landowner brood survey resulted in reports of 2,647 poults and 802 hens for a poults/hen index of 3.30 in 1990. This compares to 1989 when the index was 4.36. The average over the past 11 years is 4.61.

HARVEST

In 1990, we had 3 separate spring seasons totaling 24 days that started on April 9 and ended May 2. The first season was 5 days in length (Monday through Friday); the second season was 7 days in length (one weekend); the third season was 12 days in length (two weekends). This format is used in an attempt to spread the applications and the harvest equitably between the 3 seasons. After the lottery drawing, remaining permits were made available as second permits. This is the third year that we have used this same format. During all 3 years, the first season was the best and the second season the worst.

A new record of 2,886 birds were taken in the 32 open counties. This is an increase of 21% over 1989 when 2,381 birds were taken. Hunter success averaged 17.2% (based on the 16,763 permits issued).

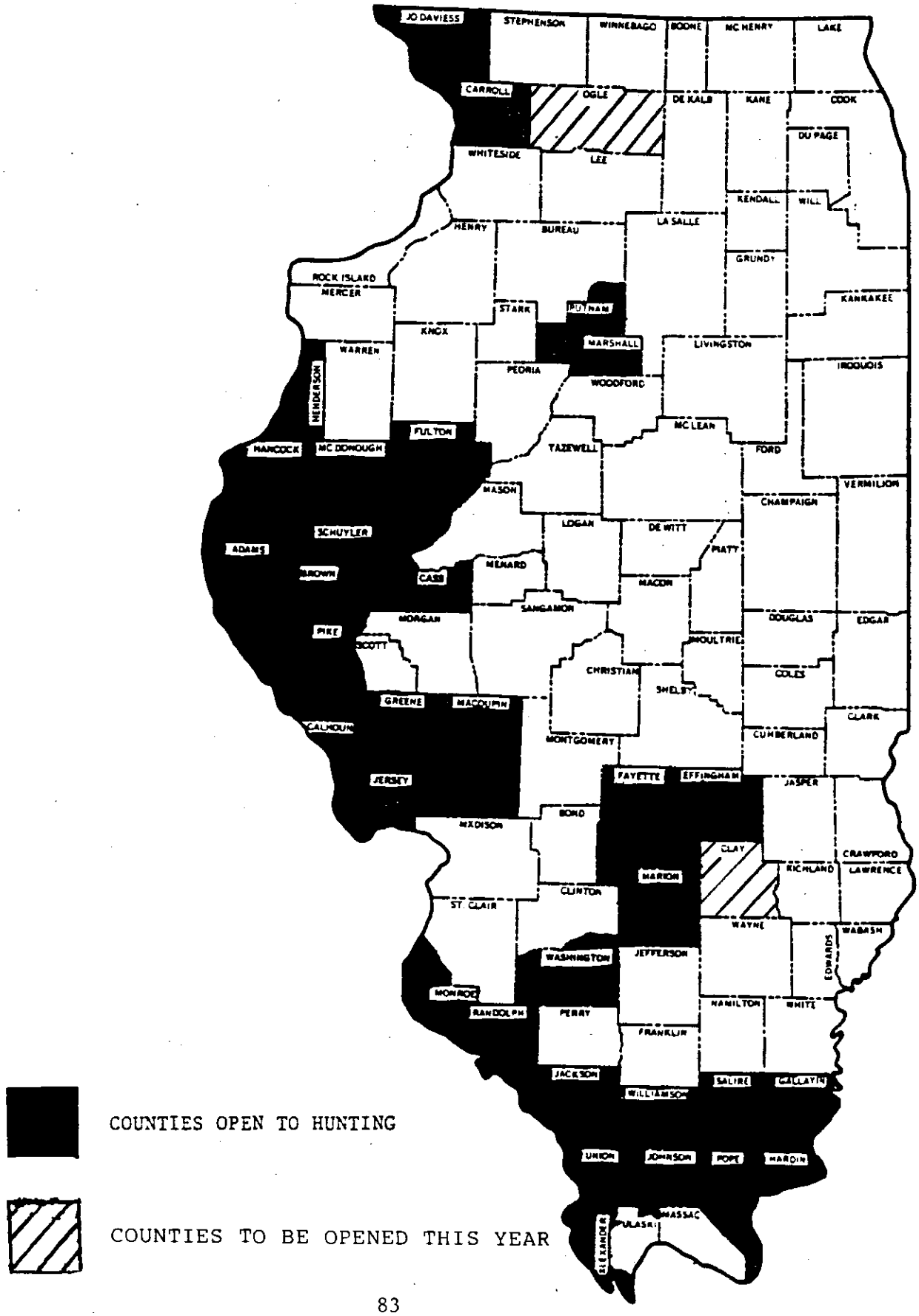
Illinois had its 7th fall archery turkey season from October 1 through December 31, 1990. There was no quota on the number of $5 permits. Hunters were allowed to take 1 turkey of either sex. A total of 3,270 permits were issued which resulted in a reported harvest of 70 birds. Based on the number of permits issued, hunter success was 2.1%.

Illinois had its second fall shotgun turkey season from October 13-21, 1990. This was an either-sex season in 19 counties of the state. A total of 3,472 permits were issued for this 9 day season. A total of 696 birds were checked at our mandatory check stations. Based on the number of permits issued, hunter success was 20.0%. The remaining data from this season hasn't been tabulated and analyzed.

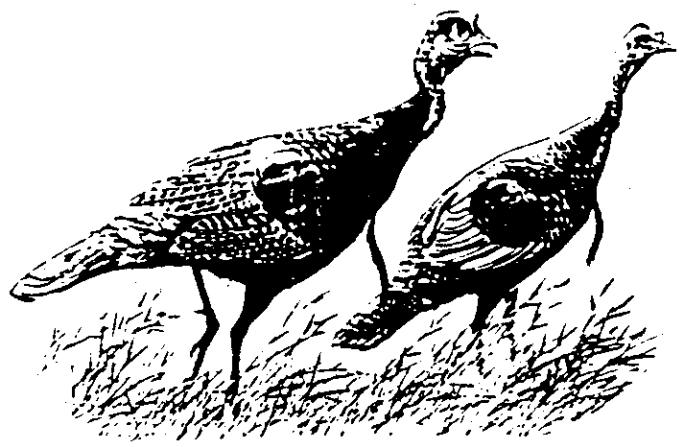
We didn't have any reported hunting accidents during any of our turkey seasons in 1990. We haven't had an accident since 1987 when we had 5 hunters mistaken for turkeys.

The near future is bright. Populations are expanding rapidly in many areas. We will be opening 2 more counties to hunting this spring. We still have many areas to stock.

FIGURE 1. ILLINOIS TURKEY HUNTING



1990 ILLINOIS SPRING TURKEY HUNTER SURVEY



INSTRUCTIONS

Please answer the questions beginning below about turkey hunting and about background information on yourself.

To properly manage the Illinois wild turkey population, the Department of Conservation needs more information about Illinois turkey hunters and their hunting experiences.

Your responses are strictly confidential and will never be associated with your name. Since you are part of a small, randomly selected group, your participation is very important.

When completed, insert questionnaire into the self-addressed envelope and mail. POSTAGE IS PREPAID.

YOUR COMMENTS ARE WELCOME BUT PLEASE WRITE THEM ON A SEPARATE SHEET OF PAPER TO RECEIVE PROPER ATTENTION.

PART I: 1990 SPRING TURKEY SEASON

1. How many permits did you have for turkey hunting during each of the 3 spring turkey seasons in Illinois in 1990? (Circle number or numbers for appropriate answer).

1st Season	1	2
2nd Season	1	2
3rd Season	1	2

2. Did you hunt during the spring turkey season in Illinois in 1990? (Circle number or numbers for appropriate answer).

	Yes	No
1st Season	1	2
2nd Season	1	2
3rd Season	1	2

IF YOU DID NOT HUNT IN ILLINOIS DURING THE 1990 SPRING TURKEY SEASON, SKIP TO PART II.

3. How many days did you actually hunt in Illinois during the 1990 Spring Turkey Season?

1st Season . . . . . _____days
2nd Season . . . . . _____days
3rd Season . . . . . _____days

4. How many turkeys (gobblers or bearded hens) did you kill and retrieve in Illinois during the 1990 Spring Season? (Circle number for appropriate answer).

0 . . . . . 1 2

5. Are you aware of anyone who killed a protected hen (no beard) turkey in Illinois during the 1990 Spring Season? (Circle number for appropriate answer).

Yes . . . 1 No . . . 2

6. How many turkeys did you cripple but could not retrieve in Illinois in 1990? (Circle number for appropriate answer).

0 . . 1 . . 2 . . 3 . . 4 . . 5 or more

7. If you used a shotgun, what gauge did you use? (Circle one number).

#10 ga. . . . 1 #3-in. 12 ga. . . . 2 #2 3/4-in. 12 ga. . . 3

#16 ga. . . . 4 #20 ga. . . . . 5 Other_____ga.

8. What size shot did you use for the <u>first</u> shell in your gun? (Circle one number).

#7 1/2. . . . 1 #6. . . . . 2 #5 3

#4. . . . . 4 duplex #4 x #6. . . 5 other #_____

9. Was this <u>first</u> shell loaded with lead or steel shot? (Circle one number).

lead. . . . . 1 steel 2

10. Did you pay someone for the right to hunt turkeys on their land in Illinois in 1990? (Circle number for appropriate answer).

Yes . . . . 1 No 2

11. What is your opinion of the number of hunters in the area you hunted most in Illinois in 1990? (Check number for appropriate answer).

Too many . . 1 About right . . 2 Too few . . 3

12. Did you use a call while hunting in Illinois during the 1990 spring turkey season? (Circle number for appropriate answer).

Yes . . . . . 1 No 2

If yes, what type did you use? (Circle all numbers that apply).

Diaphragm mouth call . . . 1	Yelper 5
Box call 2	Your own voice . 6
Slate or glass call . . . 3	Gobble call . . .7
Tube call 4	Other_____. . 8

13. Did you have any direct interference or conflicts from other sources while turkey hunting in Illinois during the 1990 Spring Season? (Circle number for appropriate answer).

Yes . . . 1 No . . . 2

If yes, what was the source? (Circle all numbers that apply).

Other hunters 1	Non-hunters 3
Off-road vehicles 2	Other_____ . . 4

14. What forms of camouflage did you use while hunting in Illinois during the 1990 Spring Turkey Season? (Circle all numbers that apply).

Cap or hat. 1	Face paint 6
Coat only 2	Camouflaged gun. 7
Pants only. 3	Blind. 8
Coveralls or coat and pants . . 4	Camouflage orange. . . . 9
Headnet, face mask. 5	None 10

15. Have you ever patterned your shotgun on a (paper, cardboard, etc.) target? (Circle number for appropriate answer).

Yes . . . . 1 No 2

16. Did you use a decoy while hunting in Illinois during the 1990 spring turkey season? (Circle number for appropriate answer).

Yes . . . . 1 No 2

17. We would like an estimate of your turkey hunting expenses for spring turkey hunting in Illinois in 1990 only. Please include money spent on clothing, turkey calls, new gun, ammunition, transportation, lodging, food, leased hunting land, film, permits, taxidermy, etc. (Circle number for appropriate answer).

$0 - $25. . . . 1 $26 - $50. . . . 2 $51 - $100. . . . 3

$101 - $200. . .4 $200 - $300. . . 5 over $300. 6

18. How many turkeys did you check in at one of the mandatory county turkey check stations in Illinois in 1990? (Circle number for appropriate answer).

0 . . . . . 1 2

PART II: Background Information and Opinions

1. How many years have you hunted one or more other game species?___Yrs.

2. How many years have you hunted turkeys? ____Yrs.

3. How many turkeys have you successfully killed during your lifetime?___

4. What other game species do you currently hunt? (Circle all numbers that apply).

Deer 1	Quail 4	Geese 7
Squirrels . .2	Rabbits 5	Ducks 8
Pheasants . .3	Raccoons. . . . 6	Other 9

5. In what type of community do you now live? (Circle number for appropriate answer).

Rural (country, farm, town less than 500 residents) . . 1
Small town (500 to 20,000 residents). 2
Urban (city, over 20,000 residents, suburban) 3

6. You are (circle appropriate number): Male . . . 1 Female . . . 2

7. What is your opinion of the present 3 season (5, 7 & 12 days) framework where most hunters are able to obtain at least 1 permit? (Circle number for appropriate answer).

Like . . . . 1 Dislike . . . . 2 No Opinion. . . . 3

8. If the demand for permits continues to increase, would you support or not support establishing a 4th turkey season? (Circle number for appropriate answer).

Support . . . 1 Not Support . . . 2 No Opinion . . . 3

9. The 1990 Spring Turkey Season dates in Illinois were April 9-13, April 14-20, April 21-May 2. How do you feel about using similar dates for the 1991 Spring Turkey Season? (Circle number for appropriate answer).

Too early . . 1 Too late . . 2 About right . . 3 No Opinion . . 4

10. Which category best describes your total household income for 1989? (Circle number for appropriate answer).

Under $10,000 1	$30,000 to 40,000 . . 4
$10,000 to 20,000 . . 2	$40,000 to 50,000 . . 5
$20,000 to 30,000 . . 3	Over $50,000. 6

Thank you for your cooperation.

POSTAGE IS PREPAID

Forest Wildlife Hdqts.
R.R. # 2 Box 477
Mitchell, IN 47446
812-849-4586

Submitted by: Steven E. Backs
Carl H. Eisfelder
Date 1/08/91

INDIANA

STATUS REPORT TO MIDWEST TURKEY GROUP
1991

RESTORATION

Winter 1989-90: A total of 76 wild turkeys was released in Indiana during December 1998 through February 1990. Birds were from in-state trapping only. Trapping success was hindered by an abundant mast crop and mild winter weather through most of the trapping period. Four releases were new range establishments and two supplemental/interplanting type releases were initiated.

Winter 1990-91: Restoration work began in December and so far 39 birds have been captured. Trapping success this winter appears to be good with very low mast availability. Trapping success the rest of the winter will depend primarily on weather conditions. Restoration totals for Indiana at this date are 2,038 birds at 137 sites since 1956, with about 90% of the birds released since 1980. Wild turkeys now exist in about 58 of the 92 counties of Indiana.

POPULATION SURVEYS

Gobbler counts are conducted annually to determine the relative density, dispersal, and population trends of wild turkeys in the areas surveyed. Counts of gobblers were recorded during the conduction of the roadside drumming counts for ruffed grouse. Routes were approximately 20 mi (13 km) in length with 15 stops (4 min listening time). In 1990, portions of 33 counties were surveyed. The average number of gobblers heard on 20 roadside trend routes ranged from 0 to 1.33 birds/stop. Thirteen area gobbling counts were conducted. Gobblers heard per mi^2 ranged from 0.17 to 4.00.

Wild turkey observation cards were received from cooperators in 52 counties, primarily related to 60 releases made during 1987-89. Observation data reflected the amount of population growth related to the length of time since the individual releases were made. Landowner/resident interviews have proven efficient in providing information on the distribution and range expansion of a wild turkey release and indices relative to the released population's growth. Evaluations of releases should be generally delayed until at least 2-3 breeding seasons following release. The continual acceleration of the wild turkey restoration program has forced the concentration of evaluation effort on only those releases for which little or no other population information has been obtained.

HARVEST

The twenty-first wild turkey hunt was held in Indiana between 25 April and 9 May 1990. Harvest data were collected through the traditional mail-in questionnaires and 72 mandatory check stations

in the 39 counties open to hunting. Questionnaire response was 69% (n=2,066). The number of wild turkey hunters (n=8,175) increased (+35%) over 1989 (n=6,068). The reported kill from check stations was 1,505 birds compared to 1,359 birds in 1989 (8th consecutive increase). The hunter success rate was 19.4%, and 59% of the kill occurred during the first five days of the season. Despite the inclement weather for hunting (rainy and windy) that occurred on both Saturdays, the 1990 season was characterized by very good weather conditions for hunting during approximately 9 of 15 days. Spring green-up phenology coincided with the season and many hunters contacted in the field thought the season was well timed.

Approximately 36,542 hunter efforts were expended during the hunting season for an average of 24.3/bird killed. The total turkey hunting range in 1990 was roughly 8,098 mi^2 (3,414 mi^2 forestland = 42% forested). A mean of 0.2 birds was harvested/mi^2 hunting range (0.4 birds/mi^2 forestland). An average of 2,436 hunters were afield per day during the 15-day season. The cumulative hunter density during the season was 1.0 hunter/mi^2 hunting range (2.4 hunters/mi^2 forestland) with a daily mean of 0.3 hunter/mi^2 hunting range (0.7 hunters/mi^2 forestland). The proportion of hunter effort on public land decreased, but public lands are still used greater (>4 times) than their availability.

Juveniles composed 31% of the harvest while 2-year old gobblers composed the greatest percentage of adult birds (41%). High kills (>100) occurred in Parke, Switzerland, Jefferson, Martin and Dearborn counties. Hunter effort was highest in Parke, Jefferson, Switzerland, and Martin counties with almost 2,000 efforts occurring in a couple other counties. Turkey hunter demographics indicated the proximity of available hunting range primarily determined where a person hunted.

A 21-year summary shows substantial growth in hunter numbers and hunter success (Table 1). During 1985-90, the number of turkey hunters increased at an average annual rate of 46% or 528% in total. The annual rate of increased has however leveled off the last 2 years at 32%. Overall hunter success during 1985-90 was 22% (18-30%) with an average of 21 (14-24) hunter efforts expended per bird harvested.

Populations in 4 new counties and additional areas in 20 counties already within the turkey hunting range are to be included in the 1991 (4/24-5/8) and 1992 (4/22-5/6) turkey hunting range. The total turkey hunting range will be about 10,650 mi^2 (4,300 mi^2 forested; 40%) and occur in 43 counties. The additional amount of huntable range for the 1991-92 seasons will represent the last major increase. Additions to the hunting range in subsequent years will gradually be smaller in size, contain little public land open to hunting, and generally support lower densities of wild turkeys.

Turkey hunting in Indiana has been relatively accident free compared to other states with less than 1 accidental shooting per season and no shooting fatalities during 21 seasons. While the accident rate (accidents/hunter efforts) may remain unchanged, logic dictates that as turkey hunter numbers increase and the number of seasons go by, the probability of more accidents and more serious accidents increases.

Table 1. Summary of Indiana wild turkey hunting seasons, 1970-90.

Year	Regular Season Dates	Season Length (Days)	No. of Counties	No. of Permits Sold	Est. No. of Hunters	Kill	Hunter Success
1970	5/2 - 5/5	4	3	62	62	6	9.6
1971	5/1 - 5/5	5	9	224	224	11	4.9
1972	4/26 - 4/30	5	9	422	422	12	2.8
1973	4/25 - 4/29	5	11	503	503	27	5.4
1974	4/24 - 4/28	5	11	496	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	7.0
1977	4/28 - 5/5	8	16	668	520	46	10.0
1978	4/26 - 5/7	12	18	852	619	33	6.1
1979	4/25 - 5/6	12	19	932	860	48	7.0
1980	4/23 - 5/4	12	17	706	670	54	8.6
1981	4/22 - 5/3	12	18	922	814	90	10.7
1982	4/21 - 5/2	12	18	1,125	696	73	6.9
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	20.0
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	30.3
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	19.4

1/ Totals starting in 1987 include lifetime license holders; youth licenses started in 1988.

MIDWEST TURKEY GROUP REPORT - IOWA

1990

DEWAINE JACKSON

SEASON FORMAT:

Spring 1990: This was the second year, since the initial Eastern wild turkey releases 23 years ago, that the entire state was open to spring turkey hunting. Iowa gun-hunters had to choose 1 of 5 zones during 1 of 4 seasons (a 4 day, 5 day, 7 day, and 12 day). Season dates were as follows: season 1: April 9-12, season 2: April 13-17, season 3: April 18-24 and season 4: April 25-May 6. Archery only licenses were also available and were valid statewide for all seasons. A quota of 4,420 licenses were available in each of the first three seasons for $20/license to residents. For the third year, there was no quota on shotgun license issue during the fourth season. 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.

A 4-season format with the 4,420 licenses/season and no fourth season quota resulted in 27,444 shotgun licenses issued (a 25% increase from 1989). Only season 1 (zones 2 & 4) had licenses remaining after two application periods (1279 licenses remained after the first application period). Nearly 41% of the licenses issued were for fourth season and most (59%) of the fourth season permits were permits for an additional bird. Our present management concerns are to control hunter densities which are evaluated primarily through interference rates. A 33% rate has been arbitrarily chosen as the allowable maximum. Zone 1 (Stephens State Forest) was the only zone to exceed this level during 1990. This is a "small" state owned forest that has had special management considerations, generally since spring hunting was initiated in 1974. Hunter densities are controlled, but in years with limited gobbler numbers, hunter interference rates increase dramatically.

Non-residents: This was the first year for non-resident spring turkey hunting in Iowa. Seven zones with 450 licenses were available for seasons 1,3, and 4 (licenses were limited per zone and 150 per season) at a cost of $55 (see attached copy of application). Due to a reciprocal license law, hunters in some adjacent states were unable to purchase a permit. Only 184 non-resident permits were issued.

Fall 1989: This was the first time for non-resident turkey hunters in Iowa. Non-resident license quota was 500 regular gun/bow permit valid for the regular gun season (Oct. 9 - Nov. 26). Non-resident turkey permits cost $50 minimum or a reciprocal fee if greater than $50, plus a $5 habitat stamp.

Resident fall gun-hunters were restricted to applying for 1 of 7 zones to hunt a 49 day season (October 9-November 26). A second license was available to shotgun hunters after the first application period in zones with fewer applicants than the quota. There was a large increase in demand for fall licenses and only 110 individuals received a second license.

Unlimited archery permits were available for a season from 1 October-1

December and 18 December 1989-10 January 1990 (concurrent with Iowa's archery deer season) and were valid statewide. Archers could purchase licenses throughout the season. A total 1022 archery turkey permits were sold.

HARVEST:

Spring 1990: Iowa turkey hunters established a new record harvest, 8117 bearded birds, during spring 1990. Although this was a record harvest, success rates declined slightly from 1989 and may reflect the reduced hatches of summers 1988 and 1989. An additional 1,075 archers took to the field, adding 117 birds to the total harvest.

As mentioned, active shotgun hunters had reduced success rates, but still logged a high 35.3% statewide. Success rates for active hunters ranged from 6% in zone 1/season 4 to a high 45.8% rate in zone 2/season 1. Archery success rates were 11.8%. Success rates were higher on private land (41%) than on public land (39%), and hunters without interference were more successful (40%) than those that were interfered with (38%). As in previous years, interference rates statewide were lower on private land (10.4%) than on public (11.4%).

Non-resident hunters had slightly better success than did residents. Forty percent of the non-residents took home a turkey and the 184 licenses accounted for 74 turkeys harvested. Non-residents hunted an average of 5.9 days per turkey killed.

Fall 1989: The second year of extended season length and high public awareness of good turkey populations resulted in 13,833 licenses issued (a 36.5% increase over 1988). A record 5,212 turkeys were harvested in fall 1989. Resident shotgun hunter success rates dropped slightly but still remained an outstanding 49.4%.

Non-residents: Hunters from 13 different states applied for a non-resident license and 157 licenses were issued. Due to legislative restrictions the non-resident turkey zones had to match resident deer zones and were not identical to resident zones. Non-resident hunters experienced 48% success rates and harvested an estimated 67 turkeys.

Fall 1990: Fall harvest estimates are not available as yet, due to the extended archery season. However, based on a 14,833 license issue and poor brood production estimates, I doubt the harvest will be much greater than in 1989, if at all.

TURKEY INFORMATION:

Adult gobblers accounted for 53% of the harvest statewide based on a sample of 388 reported ages. Approximately 25% of the birds harvested in season 1, 2, and 3 were jakes, but this decreased to 16% in season 4. Zones ranged from 13-31% jake harvest. Harvest in zone 1 was nearly 71% adult gobblers! There are obviously several factors influencing these rates: overall turkey densities, percent of adult gobblers in the flock, and hunter selectivity. Based on 873 responses, only 21.9% of the turkeys were killed on public land.

RESTORATION: See additional handout for summary of restoration of wild turkeys in Iowa, including trades with other states.

PRODUCTION SURVEY: Iowa's wild turkey poult production per hen during 1990 was up 8.5% from the summer of 1989. This is a definite improvement over last year, which had our lowest production estimates in 10 years, yet it is still 16% below the average production for the last 5 years. The slight increase in production did not occur uniformly across the state. Notably the central, east-central and southern portions of Iowa had decreases in production from 1989. The central portion of Iowa, the area including Des Moines, had only 2.7 poults produced per hen. Floods and regional weather patterns apparently had significant impacts on this year's poult production. However on a statewide basis, the production index, which combines the poults per hen and the percent of hens with a brood, did increase slightly from last year.

Four survey regions had declines in both the number of young per adult and the percent of hens with broods compared to the average values for the last five years. Two regions (the northwest and north-central) were added to the survey this year and have no previous data base on which to make comparisons. Only the west region had an increase in young per adult over 1989, but it had a 17.4% decline in the percent of hens with a brood.

1990 Turkey Brood Survey Results (% change from 5-year average 1985-89).

REGION	REPORTS	TURKEYS PER FLOCK	YOUNG PER ADULT	% HENS WITH BROOD
NORTHEAST	421	15.8 (-3)	5.1 (-16)	66.2 (-12)
SOUTH	257	9.0 (-23)	4.9 (-21)	45.8 (-25)
CENTRAL	38	7.9 (-32)	2.7 (-55)	58.6 (-15)
WEST	118	12.2 (+4)	6.0 (+3)	38.0 (-38)
EAST-CENTRAL	303	11.9 (-15)	4.9 (-25)	48.7 (-20)
NORTH-WEST	18	11.3 NR	7.7 NR	46.4 NR
NORTH-CENTRAL	28	8.3 NR	6.6 NR	14.0 NR
STATEWIDE	1183	12.8 (-6)	5.1 (-16)	54.0 (-18)

NR = new region, no previous data

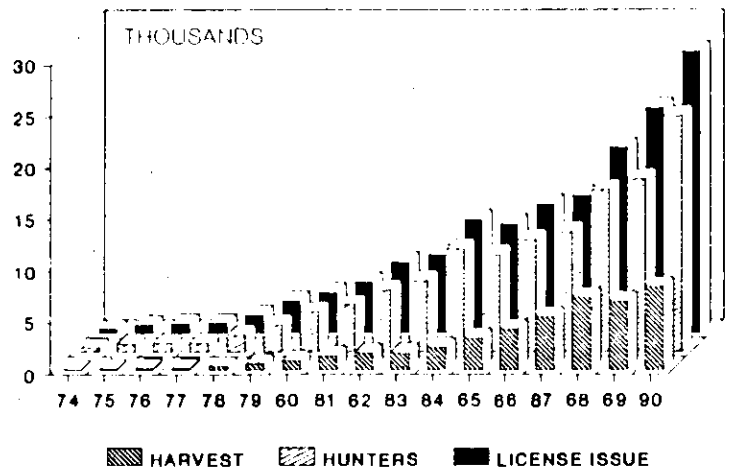


FIGURE 2. Iowa spring turkey statewide estimates 1974-90.

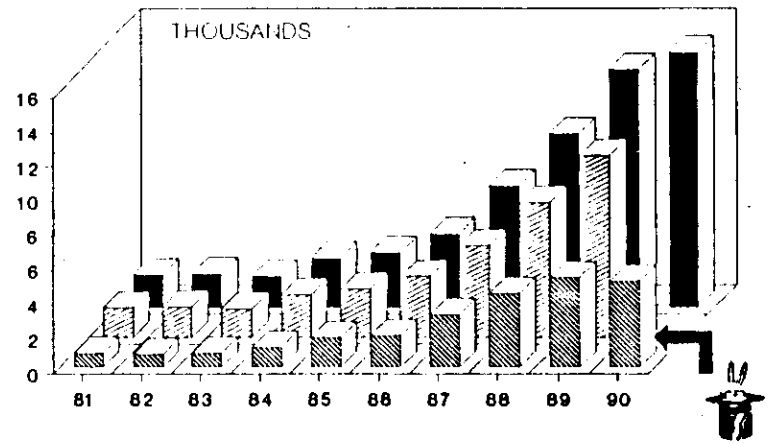


FIGURE 3. Iowa fall turkey statewide estimates 1981-90. (1990 harvest is estimated)

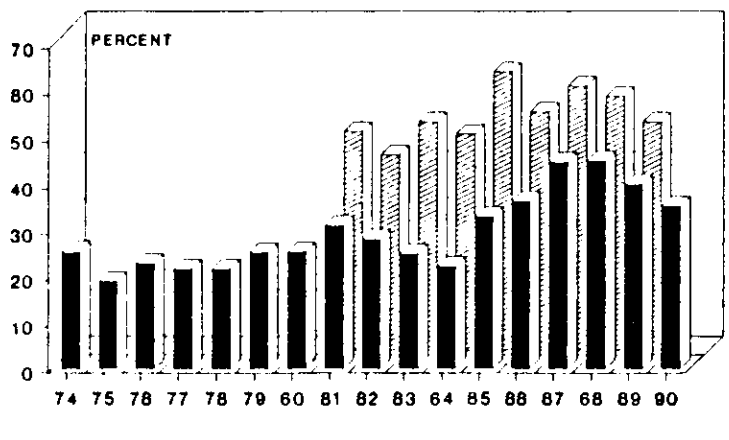


FIGURE 4. Harvest success rates for Iowa turkey hunters, 1974-90 (active hunters only).

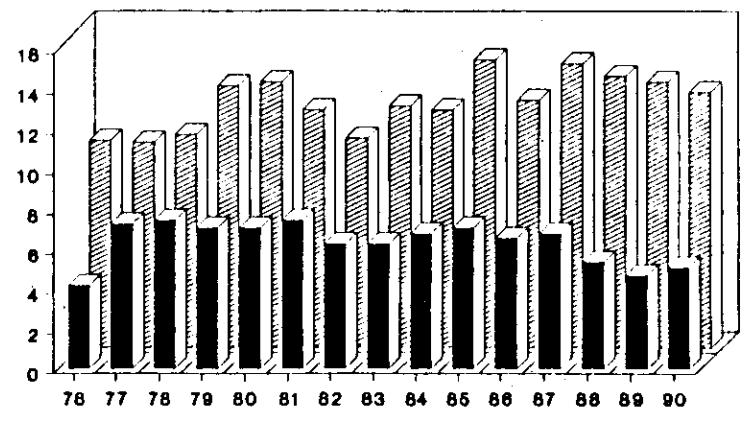


FIGURE 5. Iowa statewide turkey brood estimates 1976-90.

1990 SPRING TURKEY HARVEST SUMMARY – BY ZONE

ZONE	QUOTA PER SEASON	TOTAL LICENSE ISSUE	DOUBLE PERMITS ISSUE	NUMBER ACTIVE HUNTERS	ACTIVE SUCCESS RATE	INTERFER RATE	TOTAL HARVEST
1	65	261	64	231	20.8	22.9	48
2	125	500	117	456	32.9	22.7	148
3	80	322	69	301	35.0	17.6	106
4	4000	25331	6638	21085	35.3	7.7	7452
5	150	1030	264	862	42.1	9.2	363
STATE	4420	27444	7152	22935	35.3	11.4	8117
ARCHERY	NO LIMIT	1075		918	11.8		117
LANDOW	NO LIMIT	5035					

COMMENTS:
#1 LANDOWNER LICENSES ALREADY INCLUDED IN THE 27,444 TOTAL
BUT ARCHERY LICENSES ARE NOT
#2 AVERAGE NUMBER OF DAYS HUNTED = 3.1 GUN, 7 BOW
#3 AVERAGE DAYS HUNTED/TURKEY KILLED = 7.9 GUN, 58.3 BOW

1990 SPRING TURKEY HARVEST SUMMARY – BY SEASON

SEASON	QUOTA PER SEASON	TOTAL LICENSE ISSUE	DOUBLE PERMITS ISSUE	NUMBER ACTIVE HUNTERS	ACTIVE SUCCESS RATE	INTERFER RATE	TOTAL HARVEST
1	4420	5074	1463	4336	41.8	21.6	1809
2	4420	5742	1124	4959	33.5	24.5	1659
3	4420	5448	1122	4597	38.4	18.3	1765
4	NONE	11180	3443	9043	31.9	23.1	2884
STATE		27444	7152	22935	35.3	21.9	8117

SHOT SIZE USE SPRING 1990

SHOT SIZE	FREQ.	% OF USE
2	73	8
4	404	45
5	34	4
6	266	30
2X4	18	2
2X6	63	7
4X6	23	3
OTHER	17	1
TOTAL	898	100

1990 TURKEY HARVEST – % BY AGE

ZONE	JAKE	UNKN	ADULT
1	14.7	14.7	70.6
2	30.7	15.9	53.4
3	31.3	32.8	35.9
4	20.6	23.5	55.9
5	12.5	37.5	50.0
SEASON			
1	25.8	22.5	51.7
2	22.6	21.5	55.9
3	25.9	25.0	49.1
4	16.4	26.9	56.7
OVERALL	23	24	53

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
WILDLIFE DIVISION REPORT NO. 3129
by Tim F. Reis

DNR

HUNTING RESULTS, MICHIGAN SPRING TURKEY SEASON, 1990*

This report presents the results of a mail survey to hunters who were licensed to hunt wild turkeys (Meleagris gallopavo) in Michigan during the 1990 Spring Turkey Season. A random sample of 7,656 hunters were asked to summarize their turkey hunting results. Estimates were derived from 7,165 returned questionnaires. The 94 percent response rate was the result of an original mailing plus three follow-up mailings.

Statewide, an estimated 27,728 individuals hunted 113,107 days during the 1990 Spring Turkey Season. Hunter numbers increased 25 percent compared to the previous season; whereas the mean number of days spent hunting increased from 3.9 to 4.1 days per individual. An estimated 8,456 turkeys were harvested; a 36 percent increase from 1989. Hunter success increased from 28 to 30 percent. Three out of four hunters rated their spring turkey hunting experience as "good" or "very good."

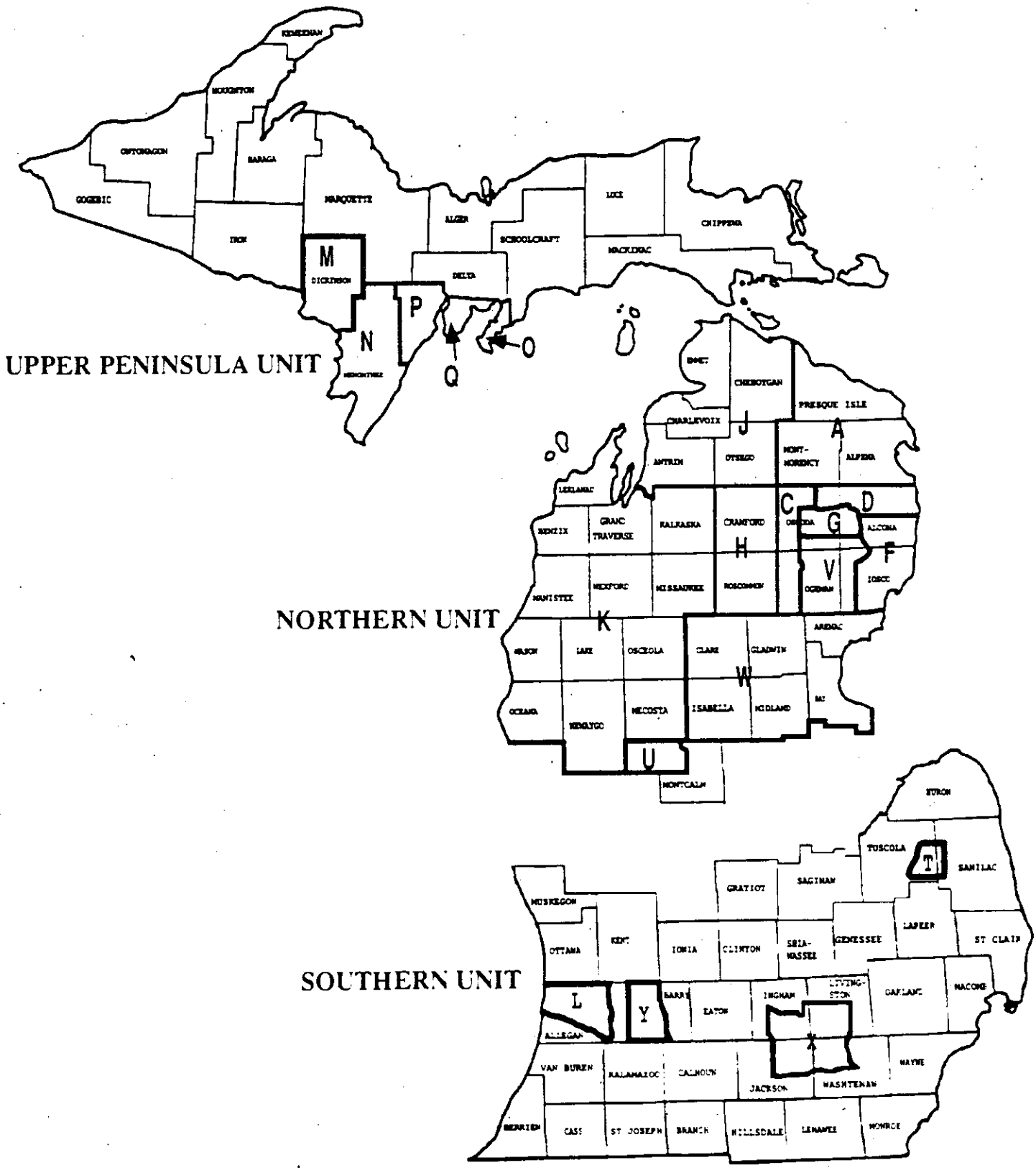
In five management areas in the Upper Peninsula Unit, 12 percent more hunters (1,852) harvested four percent more birds (735) than in 1989. Hunter success dropped slightly from 43 to 40 percent. In 11 management areas open to hunting in the Northern Unit, hunter numbers increased 26 percent to 24,715. Their harvest of 7,532 birds was 41 percent more than the previous year. Hunter success increased as well from 27 to 30 percent. In the Southern Unit, turkey hunting was expanded to four areas. As a result, 18 percent more hunters (1,161) harvested a total of 189 birds, which was a 41 percent increase from last season. Hunter success increased from 14 percent to 16.

Hunter numbers, hunting effort, harvest, and hunter satisfaction by area are presented on pages 4-8.

* A contribution of Federal Aid in Wildlife Restoration, Michigan Project W-127-R.

1990 WILD TURKEY MANAGEMENT UNITS

(LETTERED AREAS ONLY)



HOW RECENT SPRING TURKEY SEASONS COMPARE

	1986	1987	1988	1989	1990
UPPER PENINSULA UNIT					
Licenses available	800	1,300	1,425	2,050	2,075
Licenses issued	727	1,035	1,308	1,819	2,075
Hunters [1]	609	884	1,100	1,656	1,852
Turkey harvest	146	334	393	709	735
Hunter-days	2,005	3,115	4,058	5,643	7,184
Percentage of hunters successful	24%	38%	36%	43%	40%
NORTHERN UNIT					
Licenses available	15,450	15,940	18,235	21,830	27,150
Licenses issued	14,912	15,261	18,235	21,830	27,150
Hunters [1]	12,116	13,144	16,120	19,558	24,715
Turkey harvest	2,171	2,883	4,136	5,352	7,532
Hunter-days	46,951	53,449	64,985	77,692	101,263
Percentage of hunters successful	18%	22%	26%	27%	30%
SOUTHERN UNIT					
Licenses available	400	400	600	1,200	1,350
Licenses issued	400	400	564	1,200	1,350
Hunters [1]	312	350	433	985	1,161
Turkey harvest	44	43	38	134	189
Hunter-days	1,445	1,550	1,787	3,900	4,660
Percentage of hunters successful	14%	12%	9%	14%	16%
TOTAL STATE					
Licenses available	16,650	17,640	20,260	25,080	30,575
Licenses issued	16,039	16,696	20,107	24,849	30,575
Hunters [1]	13,037	14,378	17,653	22,199	27,728
Turkey harvest	2,361	3,260	4,567	6,195	8,456
Hunter-days	50,451	50,114	70,830	87,235	113,107
Percentage of hunters successful	18%	23%	26%	28%	30%

[1] This is the number of license holders actually hunting.

ESTIMATED NUMBER OF HUNTERS, HARVEST AND HUNTING EFFORT BY AREA

1990 Spring Turkey Season

Area	Licenses Issued	Number of Hunters	Harvest	Percent of Licensees Hunting	Percent of Licensees Successful	Percent of Hunters Successful	Hunter-days	Days Hunted Per Hunter
A	3,700	3,364	1,127	91	30	33	16,391	4.9
C	1,700	1,592	490	94	29	31	5,619	3.5
D	3,500	3,185	821	91	24	26	14,553	4.6
F	1,950	1,762	509	90	26	29	7,055	4.0
G	1,500	1,308	288	87	19	22	4,660	3.6
H	600	549	187	91	31	34	2,148	3.9
J	1,000	907	422	91	42	46	4,717	5.2
K	7,800	7,130	2,271	91	29	32	28,020	3.9
U	150	140	38	93	25	27	540	3.9
V	1,050	985	297	94	28	30	3,249	3.3
W	4,200	3,793	1,082	90	26	28	14,311	3.8
Northern Unit	27,150	24,715	7,532	91	28	30	101,263	4.1
L	600	476	44	79	7	9	1,882	3.9
T	150	135	35	90	23	26	541	4.0
X	450	414	64	92	14	15	1,692	4.1
Y	150	136	46	91	31	34	545	4.0
Southern Unit	1,350	1,161	189	88	18	16	4,660	4.0
M	525	468	160	89	30	34	1,736	3.7
N	1,200	1,083	467	90	39	43	4,207	3.9
O	100	88	36	88	36	41	430	4.9
P	150	122	39	81	26	32	384	3.1
Q	100	91	33	91	33	36	427	4.7
Upper Peninsula Unit	2,075	1,852	735	88	34	40	7,184	3.9
STATE TOTAL	30,575	27,728	8,456	90	28	30	113,107	4.1

HOW TURKEY HUNTERS RATED THEIR HUNTING EXPERIENCE

Area	Hunt Number	*Percentage of Turkey Hunters Rating Their 1990 Spring Turkey Hunting Experience as:* Very Good	Good	Neither Good Nor Poor	Poor	Very Poor
A	01	35	40	10	11	4
C	02	54	34	3	7	2
	03	39	40	10	8	3
	04	22	47	13	11	7
	Area Mean	38	40	9	9	4
D	05	29	40	11	15	5
F	06	43	38	11	6	2
	07	32	45	9	11	3
	08	26	43	11	16	4
	Area Mean	34	42	10	11	3
G	09	38	42	10	7	3
	10	21	43	12	17	7
	11	10	43	18	23	6
	Area Mean	24	43	13	15	5
H	12	54	38	2	4	2
	13	39	47	6	6	2
	14	35	23	19	19	4
	Area Mean	43	36	9	9	3
J	15	49	32	9	6	4

HOW TURKEY HUNTERS RATED THEIR HUNTING EXPERIENCE (CONT.)

Percentage of Turkey Hunters Rating Their 1990 Spring Turkey Hunting Experience as:

Area	Hunt Number	Very Good	Good	Neither Good Nor Poor	Poor	Very Poor
K	16	44	41	7	6	2
	17	32	47	8	10	3
	18	28	45	13	9	5
	Area Mean	35	44	9	8	4
L	19	9	25	13	24	29
	20	8	13	10	36	33
	21	14	17	5	11	53
	Area Mean	10	18	10	25	37
M	22	37	40	9	9	5
	23	36	31	11	20	2
	24	32	27	18	16	7
	Area Mean	35	33	13	15	4
N	25	39	42	10	7	2
	26	36	43	11	7	3
	27	23	55	8	7	7
	Area Mean	33	47	9	7	4
O	28	43	37	9	11	0
P	29	29	39	17	12	3
	30	31	37	9	6	17
	31	18	54	14	14	0
	Area Mean	28	42	13	10	7
Q	32	27	41	12	10	10

HOW TURKEY HUNTERS RATED THEIR HUNTING EXPERIENCE (CONT.)

Area	Hunt Number	*Percentage of Turkey Hunters Rating Their 1990 Spring Turkey Hunting Experience as:* Very Good	Good	Neither Good Nor Poor	Poor	Very Poor
T	33	49	41	3	5	2
	34	43	30	11	11	5
	35	9	55	11	21	4
	Area Mean	33	43	8	12	4
U	36	59	33	2	4	2
	37	33	35	9	14	9
	38	12	26	21	18	23
	Area Mean	37	32	9	11	11
V	39	46	38	8	6	2
	40	33	42	11	12	2
	41	30	41	14	11	4
	Area Mean	36	40	11	10	3
W	42	34	41	9	11	5
	43	25	44	12	14	5
	44	22	42	18	13	5
	Area Mean	27	42	13	13	5
X	45	33	31	14	14	8
	46	23	33	18	16	10
	47	19	44	15	12	10
	Area Mean	25	36	16	14	9
Y	48	40	40	9	4	7
	49	48	43	0	7	2
	50	48	35	12	5	0
	Area Mean	45	39	7	6	3
STATE MEAN		33	41	10	11	5

COMPARISON OF HOW SUCCESSFUL VS. UNSUCCESSFUL TURKEY HUNTERS RATED THEIR HUNTING EXPERIENCE

Respondent Tagged a Turkey	*Percentage of Turkey Hunters Rating Their 1990 Spring Turkey Hunting Experience as:*				
	Very Good	Good	Neither Good Nor Poor	Poor	Very Poor
Yes	64	32	3	1	0
No	19	45	14	15	7
STATE MEAN	33	41	10	11	5

Minnesota Wild Turkey Status Report

Gary Nelson
Wild Turkey Specialist

Midwest Deer/Turkey Group Meeting, 1991

1990 SPRING TURKEY SEASON:

The total 1990 harvest was a record 1,709 turkeys, of which 32% were juvenile gobblers. The 1990 harvest was up 779 birds (54.4%) from the 1989 spring harvest (Table 1). Range expansion, additional hunting areas and increased permits contributed to the increase in total harvest. Total applications received for the 1990 season (14,326) is slightly higher than in 1989 (13,007). Hunter success (31%) was the highest on record.

1991 SPRING TURKEY SEASON:

A total of 9,170 permits will be available for this year's hunt scheduled to begin April 11. A computerized drawing will again be used. Approximately 16,000 applications have been received. Additional hunting zones, one additional 5-day season (7 5-day seasons total) and increased permits should result in another spring harvest record.

1990 FALL TURKEY SEASON:

Minnesota's first either-sex fall turkey season resulted in a harvest of 326 turkeys. Total harvest comprised of 53.3% adult birds. Hunter success was estimated to be approximately 45%. A total of 4,521 applications were

received for the 1,000 permits offered.

ACCIDENTS:

There has been only 1 non-fatal accident recorded in 13 years of spring turkey hunting in Minnesota and none during our first fall hunt. Turkey hunter education clinics (not mandatory anymore) held throughout the state undoubetly has kept this accident rate very low.

RESTORATION:

Restoration efforts are continuing as 129 turkeys were captured in-state last year for relocation.

In addition, 14 turkeys were received from Illinois (Ruffed Grouse trade agreement).

Blood samples taken from live-trapped turkeys showed no evidence of disease in our turkey population sampled.

Additional funding committments will enable us to conclude our restoration efforts within 6 years.

TABLE 1. Spring and fall wild turkey application numbers, permits, and harvest in Minnesota, 1978-91.

Year	Spring Applications	Spring Permits	Spring Harvest	Fall Applications	Fall Permits	Fall Harvest
1978	10,740	420	94	---	---	---
1979	11,116	840	116	---	---	---
1980	9,613	1,200	98	---	---	---
1981	8,398	1,500	113	---	---	---
1982	7,223	2,000	106	---	---	---
1983	8,153	2,100	116	---	---	---
1984	7,123	3,000	178	---	---	---
1985	5,662	2,750	323	---	---	---
1986	5,715	2,500	333	---	---	---
1987	6,361	2,700	520	---	---	---
1988	8,402	3,000	674	---	---	---
1989	13,007	4,000	930	---	---	---
1990	14,326	6,600	1,709	4,521	1,000	326
1991	15,918	9,170	----	---	2,200	---

Wildlife Harvest and Population Status Report

Wild Turkey - 1990

Larry D. Vangilder
Wildlife Research Biologist

Midwest Deer/Turkey Study Group Meeting

January 14-17, 1991

1990 SPRING TURKEY SEASON:

The final tabulation of the 1990 spring turkey season harvest is not yet complete but Protection Division's count provides preliminary information. The total harvest was 30,088 birds, of which 33.5% were juvenile gobblers. The 1990 harvest was down 5,530 birds (15.5%) from the 1989 spring harvest (Table 1). A late spring and the lack of 2-year-old gobblers that resulted from the poor hatch of 1988 contributed to the decline in harvest. Permit sales for the 1990 season (92,093) were only slightly below those of 1989 (92,914). This is the second year in a row of declining permit sales. The increase in permit prices for 1990 was probably responsible for part of the decline.

Prospects for the 1991 spring season are not the best, but there should be an average number of 2-year-old gobblers available for harvest. Because of the poor hatch of 1988, 3-year-old gobblers will be rare and most of the gobblers hatched before 1988 have probably already succumbed. Based on the poult to hen ratio for the 1990 hatch, I expect about 17% juvenile gobblers in the harvest. The harvest during the 1991 season may be less than 30,000 birds.

Looking ahead to 1992, I expect the harvest to decline even more because of the cumulative impacts of the poor 1988, 1989, and 1990 hatches. If we have a good hatch in 1991, juvenile gobblers may help alleviate some of the impacts of the poor hatches.

1990 BROOD SURVEY

The 1990 brood survey indicated a uniformly poor hatch (1.7 poults per hen) in all regions of the state (Figure 1). The 31-year statewide average poult to hen ratio is 2.9 poults per hen. The 1990 hatch is tied with 2 other years (1964 and 1973) for the second worst hatch in history. Only in 1960, when the poult to hen ratio was 0.8 poults per hen, was the hatch poorer. A late spring probably contributed to the poor hatch in 1990. In the Ozarks, at least on our research study areas, also had a poor mast crop probably also contributed to the poor hatch.

1990 FALL FIREARMS SEASON

The 1990 fall firearms harvest of 16,012 declined substantially from 1989's fall harvest of 22,131 birds (Table 1). The harvest was comprised of 46.4% adult birds. I also expect permit sales to decline again. Because our fall season is conservative, and in some ways self-regulating (a poor hatch results in fewer hunters and a lower harvest), I don't think this year's fall harvest will greatly effect the ability of Missouri turkey populations to rebound.

POPULATION STATUS

After 3 poor hatches in a row, turkey populations in Missouri are down substantially. Fortunately, our seasons are conservative enough to get us through a series of poor reproductive years. Right now I am more concerned about the impacts of the spring harvest on the future quality of spring hunting than about the impacts of our fall season on populations. If we have a good hatch in 1991 I don't think any changes in regulations will be necessary.

However, if the 1991 hatch is below average again, I am going to recommend that MDC consider reducing the bag limit to one bird for both the 1992 spring and 1992 fall firearms turkey season. A reduction in bag limit to one bird should reduce the harvest both spring and fall by about 20%. A reduction in bag limit may also reduce permit sales which would further reduce the harvest.

ACCIDENTS

There were 13 non-fatal and one fatal accident during the 1990 spring season and 10 non-fatal accidents during the 1990 fall firearms season. Mistaken-for-game is still the primary cause of these accidents. I am hopeful that the number of accidents will continue to decline with continued mandatory hunter education, continued publicity about turkey hunting safety, and new penalties for the shooters involved in mistaken-for-game accidents.

TABLE 1. Spring and fall firearms turkey harvest, permit sales and production indices, 1985-1990.

Year	Spring Harvest	Spring Permit Sales	Fall Harvest	Fall Permit Sales	Production Index (poults per hen)
1990	30,088	92,093	16,012	--	1.7
1989	35,618	92,914	22,131	46,946	2.8
1988	33,187	94,301	23,080	50,615	2.4
1987	35,951	85,723	28,139	51,922	3.3
1986	30,965	77,972	21,019	46,688	3.6
1985	24,770	69,945	12,181	35,218	4.3

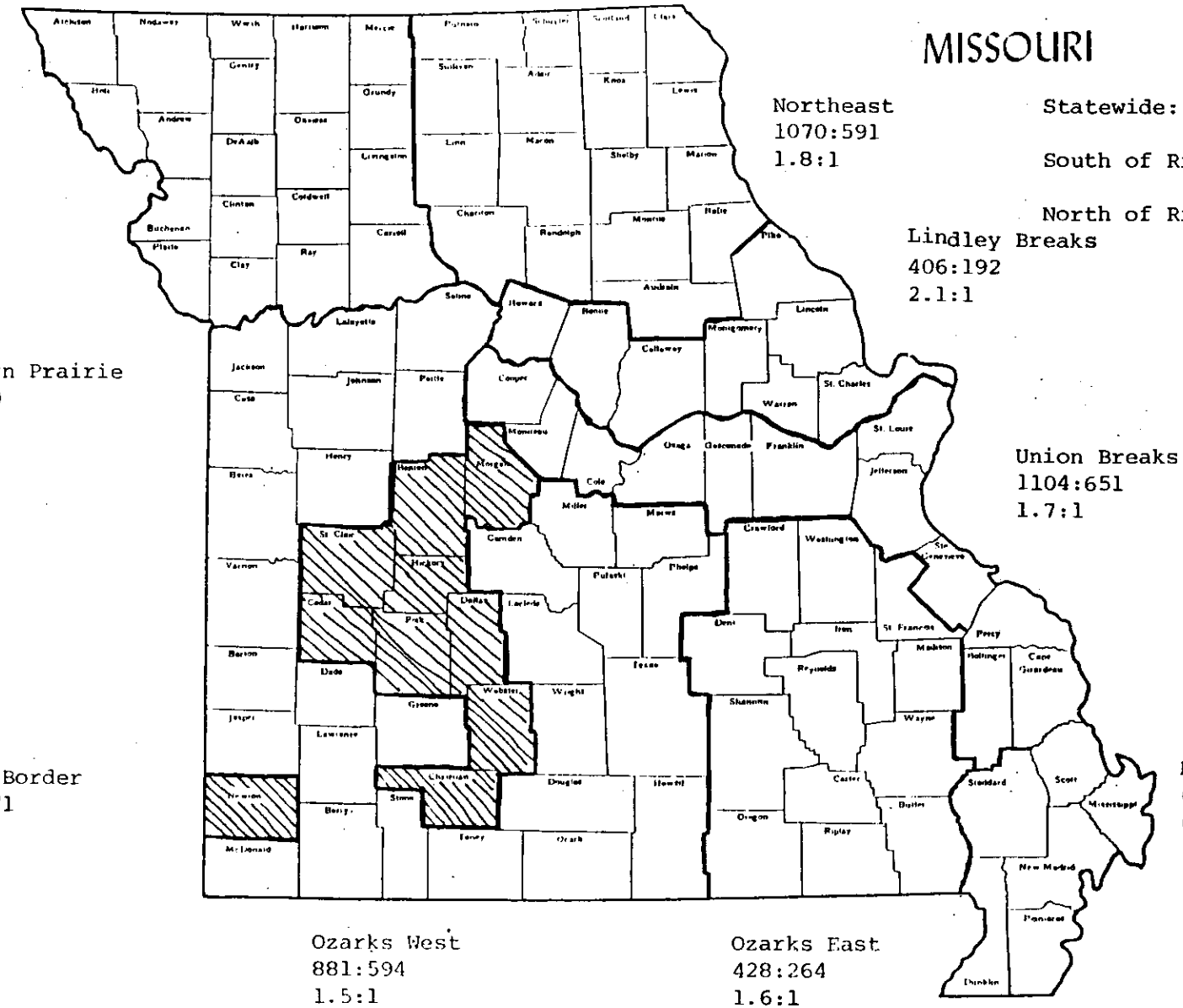
TABLE 2. Number of injuries during spring and fall firearms turkey season, 1986-1990. New regulations pertaining to safety were enacted beginning with the 1987 spring season.

	SPRING SEASON		FALL FIREARMS SEASON	
Year	Non-Fatal Injuries	Fatal Injuries	Non-Fatal Injuries	Fatal Injuries
1990	13	1	10	0
1989	21	0	9	0
1988	28	1	11	0
1987	15	0	15	0
1986	29	2	13	0

Figure 1

WILD TURKEY PRODUCTIVITY BY REGION - 1990

(Poult:Hens)



NORTH DAKOTA WILD TURKEY REPORT - 1990

Lowell A. Tripp

TRAP/TRANSPLANT PROGRAM

We continue to trap wild turkeys from high density and/or problem areas and transplant them to other areas of suitable habitat. Last year, the winter of 1989-1990, 421 wild turkeys were trapped at six sites and 373 of them were released at 23 different sites. The released birds consisted of 21 adult gobblers, 139 adult hens, 69 juvenile gobblers and 144 juvenile hens.

Presently the conditions this winter have been favorable for trapping and the crew has been active. We have trapped better than 150 birds so far.

SPRING HUNTING SEASON

During the spring of 1990, 18 areas were open for wild turkey gobbler hunting. The spring season was open April 21 through May 13 and only bearded male turkeys were legal to be harvested. There was a total of 1,175 permits available but we issued 1,188 permits. The hunter questionnaire data indicated that 84.0 percent of the permittees hunted and 54.9 percent of those hunters were successful. Age data collected from the spring turkey harvest found that 19.0 percent were sub-adults. This probably indicates lower reproduction during the drought years of 1988 and 1989.

A recommendation for 1,485 permits for the spring of 1991 has been submitted. The season will run from April 20 through May 12. Our spring season continues to become more popular each year among both the land-owners and the sportsmen.

FALL HUNTING SEASON

During the fall of 1989, permits were issued to 5,760 turkey hunters of which 4,818 actually hunted and harvested 3,233 birds. These numbers were down somewhat from 1988 but reflects the poor reproduction we experienced during 1988 and 1989. The 1,892 hunters during the early season time period had a hunter success of 71.2 percent, the late season hunters (2,072) averaged 65.3 percent success and the winter season data showed that 620 hunters averaged 62.1 percent success. Land-owner hunters (234) hunting on their own land averaged 62.4 percent hunter success.

In the fall of 1990, we again split the turkey hunting season into three time periods. This was the third fall for this schedule and will probably remain in place for a few years. The early fall season opened on Oct. 13 and closed Nov. 11, the late fall ran from Nov. 12 through Dec. 9, and the winter season was three weeks long extending from Dec. 10 through Dec. 31. Results are not yet available, but the weather was good and I suspect that our hunters did quite well.

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

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

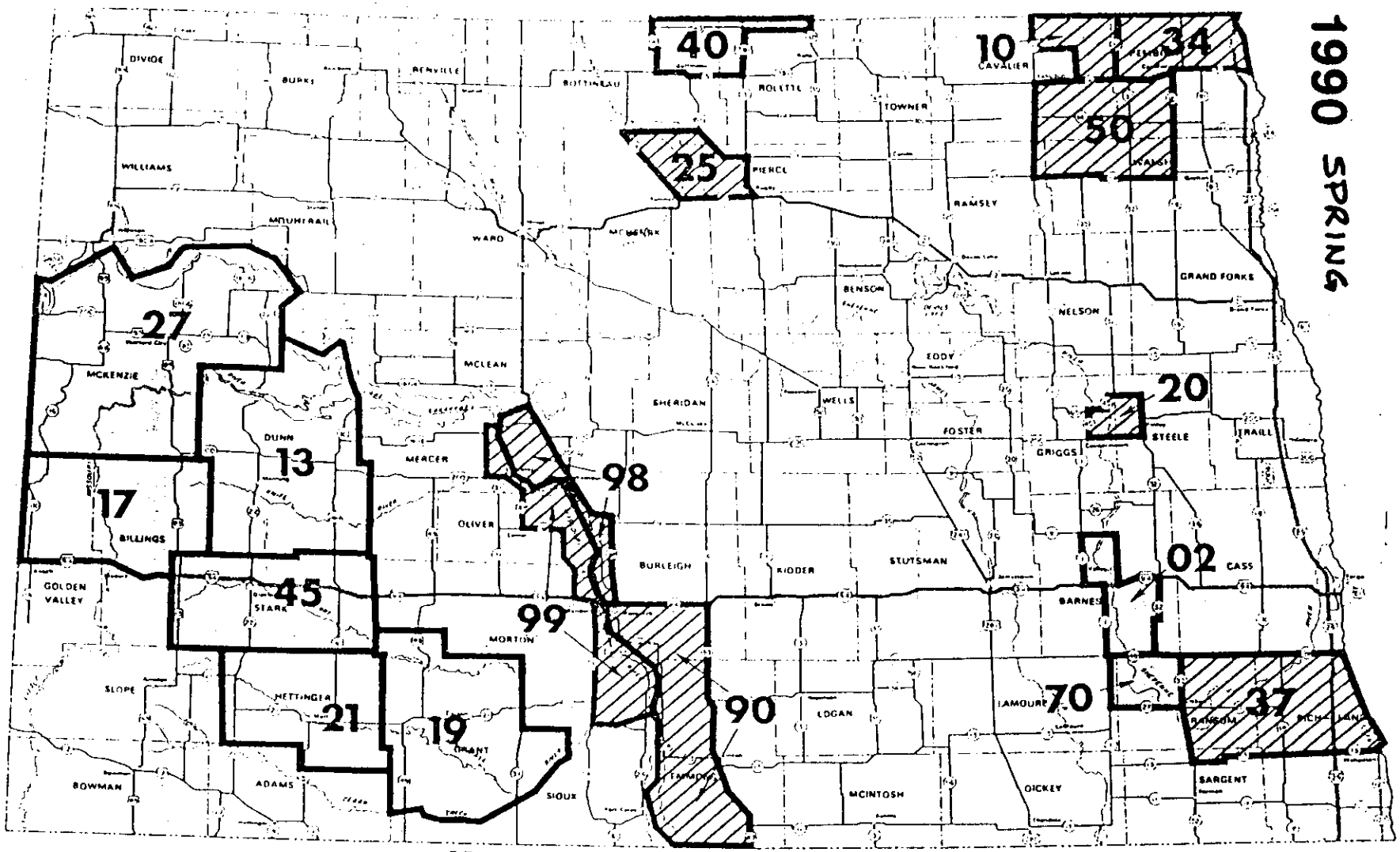
NORTH DAKOTA SPRING WILD TURKEY HUNTING SEASONS

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	548	54.9

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			

1990 SPRING NORTH DAKOTA



Unit 02 – (30 licenses) An area in Barnes County starting at Valley City, then east approximately 10 miles to N.D. No. 32, then south to N.D. No. 46, then west to N.D. No. 1, then north on N.D. No. 1 to Barnes County road No. 10 (at Rogers), then east on Barnes County road No. 10 five miles, then straight east 4 miles across Lake Ashtabula to Barnes County road No. 21, and then south to point of origin at Valley City.

Unit 10 – (100 licenses) 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 Cavalier County road No. 55, then east to Cavalier County road No. 35 (1 mile west of Vang), then south to N.D. No. 5, and then east to the point of origin.

Unit 13 – (75 licenses) Dunn County.

Unit 17 – (25 licenses) Those portions of Billings and Golden Valley counties north of Interstate 94.

Unit 19 – (50 licenses) Grant County.

Unit 20 – (25 licenses) Those portions of Griggs and Steele counties bounded by N.D. No. 200 on the south, N.D. No. 45 on the west and north and N.D. No. 32 on the east and north.

Unit 21 – (20 licenses) Hettinger County.

Unit 25 – (200 licenses) Those portions of McHenry, Pierce and Rolette counties starting at [illegible] on N.D. No. 14 to Upham, then east on the Willow City Road to N.D. No. 66, then south and east to N.D. [illegible] to U.S. Highway 2 at Rugby, then west to [illegible].

Unit 27 – (100 licenses) McKenzie County.

Unit 34 – (50 licenses) An area in Pembina [illegible].

Unit 37 – (140 licenses) An area in Ransom and Richland counties starting at the junction of N.D. No. 27 and N.D. No. 32 (at Lisbon), then north on N.D. No. 32 to 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 to Lisbon (the point of origin).

Unit 40 – (50 licenses) Those portions of Rolette and Bottineau counties starting at Dunseith, then west on N.D. No. 5 to N.D. No. 14, then north to the 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 45 – (25 licenses) Stark County.

Unit 50 – (75 licenses) Those parts of Walsh, Ramsey, Cavalier and Pembina 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 and then north to N.D. No. 5 (the point of origin).

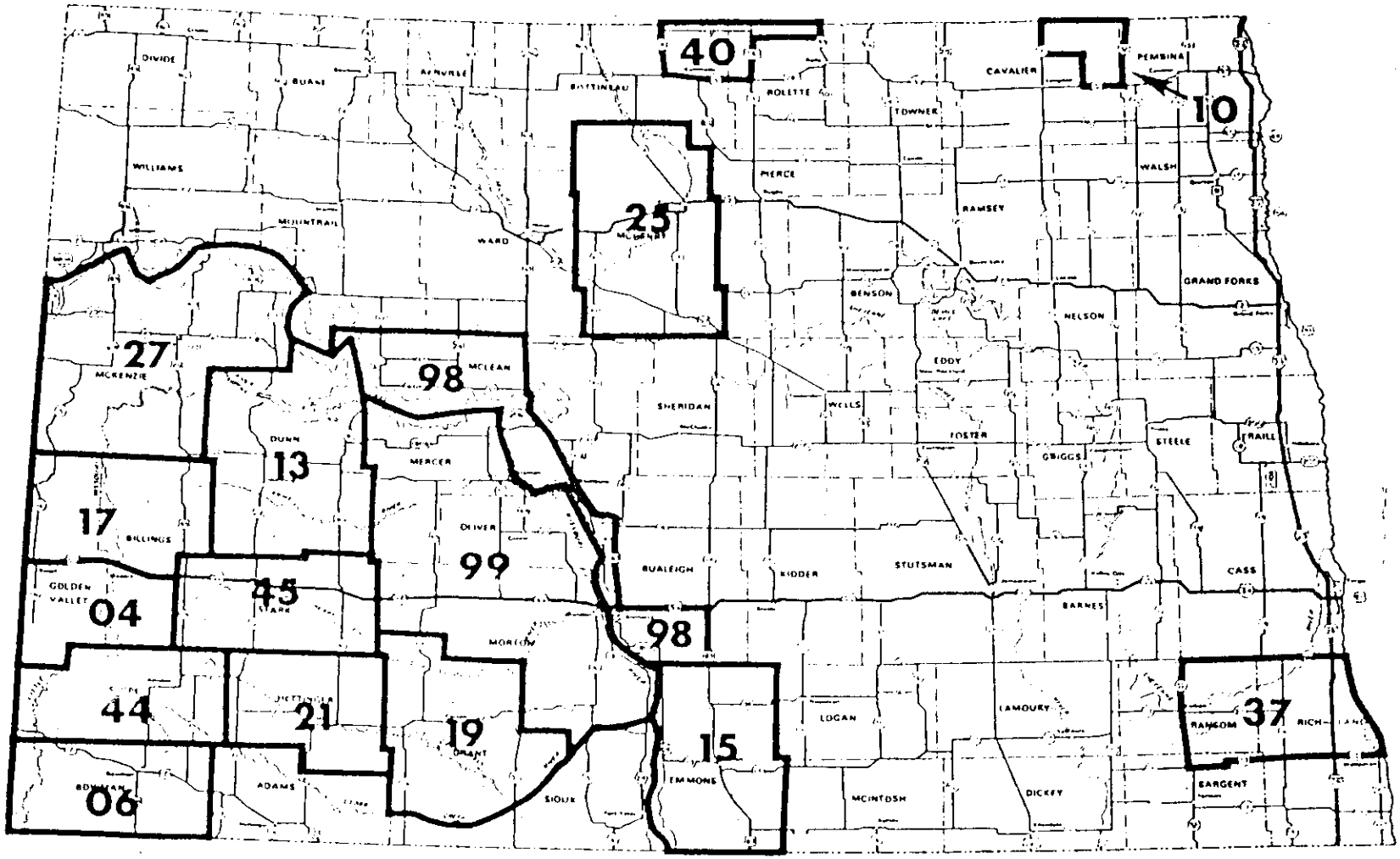
Unit 70 – (40 licenses) Those parts of LaMoure and Ransom counties bounded by N.D. No. 46 on the north, N.D. No. 32 on the east, N.D. No. 77 on the south and N.D. No. 1 on the west.

Unit 90 – (50 licenses) Those parts of Burleigh and Emmons counties west of U.S. Highway 83 and south of Interstate 94.

Unit 98 – (40 licenses) Those parts of Burleigh and McLean counties west of U.S. Highway 83 and north of Interstate 94 to the south end of the Snare Creek embankment. Turkey calls must be used while hunting turkeys in Unit 98.

Unit 99 – (50 licenses) Those parts of Mercer, Morton, and Oliver Counties starting at the Garrison Dam on N.D. No. 200, then west and south to the junction of N.D. No. 200A, then east and south on N.D. No. 200A to the junction of U.S. 83

NORTH DAKOTA
1990 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 Cavalier county Road No. 55, then east to Cavalier county Road No. 35 (1 mile west of Vang), 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 [illegible]ant County.

Unit [illegible]nger County.

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 98 Those part[illegible] Burleigh and [illegible] of U.S.

WILD TURKEYS IN OHIO - 1990

(Bob Stoll)

Harvest Results

An estimated 26,739 hunters participated in Ohio's 1990 three week spring turkey season. This was an 8% increase in hunter numbers over 1989. A total of 4,096 turkeys, 29% more than in 1989, were registered at mandatory check stations in 1990. Juvenile males comprised 32% of the harvest compared with an average of 38% for the period 1979-90. There were 2 non-fatal turkey hunting accidents in 1990. A more complete report of 1990 season results is provided in the attached report (Wildlife Inservice Note 628).

There will be no change in season length or bag limit for 1991, however the number of counties open to hunting will be increased from 37 to 38.

Turkey Hunter Survey

A sample of 3,000 turkey hunters was mailed a questionnaire after the 1989 turkey season. Estimated expenditures and total recreation days for turkey hunting was $3.8 million and 112,000 days, respectively. Hunters appeared genuinely concerned about turkey hunting safety and identified uninformed hunters and crowded hunting conditions as the most important factors affecting turkey hunting safety. Sixty-six percent did not favor an increase in the spring bag limit from 1 to 2 birds. Interestingly, reported in-the-field hunter disturbance rates were somewhat lower in 1989 than in 1985, even though hunter numbers increased substantially during the period. Public land continues to be important to Ohio turkey hunters. Thirty-two percent reported hunting mostly on public land and 51% equally on public and private land; 28% of the kill occurred on public land which comprises less than 4% of Ohio's land base. A complete summary of survey results is available in the attached Wildlife Inservice Note 623.

Trap and Transfer

A total of 167 turkeys were trapped and transported to 11 approved release sites in 10 counties during 1989-90. With luck, the stocking of all remaining release sites (11 sites) should be completed in 1990-91. When this is completed, we intend to focus our stocking efforts on areas with good turkey habitat, but where turkey populations have not expanded as expected. This will also serve to keep us in the trapping business while recently stocked marginal sites are evaluated.

Odds and Ends

A turkey strategic plan was completed and published. In-the-field turkey hunter numbers are projected to increase from 27,000 in 1990 to 45,000 by 1995.

The number of turkey hunting accidents per 10,000 hunters has declined from a 1985 high of 4.5 to the present low of 0.8 inspite of substantial increases in hunter numbers during the period.

Ohio's turkey hunting accident history.

Year	Estimated Hunters	Number of Hunting Accid. Fatal	Nonfatal	Number of Accid. 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

Brood observations for June, July, and August, 1990 showed 3.4 poults/hen, the third lowest in the 14 year history of the survey.

Reports of wild turkeys seen by fall squirrel hunters is being examined as a possible index to both fall and following spring turkey abundance.

The shotgun safety sticker program funded by NWTF will be continued during the 1991 season. Hunters are not required to use the sticker and voluntary compliance is about 50%. For 1991, state game protectors will carry a supply and hand them to hunters not using their sticker as a safety reminder.

Guidelines for NWTF Super Fund expenditures were developed along with a specific projects list. Both emphasize land purchase. The Ohio Chapter, NWTF has approved a Super Fund contribution of $50,000 toward a 15,000 acre land purchase by the Division of Wildlife.

Ohio Department of Natural Resources
Division of Wildlife

Wildlife
Inservice Note 628
September 1990

TURKEY HARVEST MANAGEMENT, 1990[1]

Robert J. Stoll, Jr., Project Leader
and
W.L. Culbertson, Wildlife Technician

Forest Wildlife Research and Management Project
New Marshfield, Ohio 45766-9990

Hunters and Regulations

For the 1990 turkey season, 45,960 individuals applied for and received a permit to hunt during Ohio's 25th modern day turkey season (Table 1). This year's permit recipients consisted of 19,613 individuals who paid $16.00 for a turkey permit and 26,347 who were exempted from purchasing a permit, primarily because they were over 65 years old. Those required to purchase a turkey permit were also required to purchase a resident ($12.00) or nonresident ($81.00) hunting license. All turkey permits were valid for the entire 3-week season, April 23-May 12, 1990. Approximately one week before the season, all paid permit applicants were mailed a permit with a temporary tag, a hunting and check station brochure, and a card with two "Be Safe" stickers. The safety stickers were funded by the Ohio Chapter, National Wild Turkey Federation. Individuals receiving a free permit were instructed to provide their own temporary tag and were advised that hunting and checking station brochures and "Be Safe" stickers were available at Wildlife District offices.

Hunters were allowed one bearded turkey, to be taken by shotgun, longbow, or crossbow, between one-half hour before sunrise and noon. Successful hunters were required to attach a temporary tag to their turkey immediately after harvest and to have their bird permanently registered and tagged at an official check station by 2 p.m. on the day of harvest. The opening of Belmont County brought the total number of counties with a turkey hunting season to 37 (Fig. 1).

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[1]Contribution from Federal Aid in Wildlife Restoration Act, Project W-105-R.

Harvest and Hunting Pressure

The total of 4,096 turkeys harvested in 1990 was 29.2% higher than the previous record harvest of 3,171 set in 1989 (Table 1). This increase can be attributed to exceptionally favorable weather during the season, a thriving turkey population, and more hunters. Sixty percent of the harvest was recorded during the first week of the season, similar to last year (Fig. 2). Statewide, 32% of the harvest consisted of juvenile turkeys, higher than the 28% in 1989 but below the 1979-90 average of 38%. Eleven hunters reported using longbows and one using a crossbow to harvest their turkeys. Two hunting accidents were recorded in 1990 compared to three in 1989.

Vinton County recorded the most turkeys harvested with 450. Hocking County was next highest with 373. In its first modern day turkey season, Belmont County recorded a harvest of 50 gobblers. A total of 20,363 turkeys have been harvested during the 25 years of spring gobbler hunting (Table 2, Fig. 1). A chronology of Ohio's modern day turkey seasons, 1966-1990, is shown in Table 3.

Whole body weights were obtained from 2,656 adult and 1,152 juvenile gobblers. The adults averaged 19 pounds, and juveniles averaged 14 pounds (Fig. 3), consistent with average weights from previous years.

The estimated number of turkey permit recipients who hunted was 26,739 (Table 1). This was an 8% increase in hunter numbers over the previous year and a continuation of the annual increase in hunter participation (Table 3). Overall, turkey hunter success was higher in 1990 than in 1989 (Table 1). This was particularly evident for paid hunters in 1990, who registered a success rate of one in 5.0 or 20.2% compared with a 1989 success rate of one in 6.4 or 15.6%. Although confounded somewhat by the recent (1988) issuance of free permits, the 20.2% success rate for paid hunters is among the highest recorded (Table 3).

Daily turkey hunting pressure was monitored on a 5,000-acre portion of Zaleski State Forest, Vinton County, and on the 1,350-acre Waterloo Wildlife Area, Athens County (Table 4). Hunter use of public land is high, ranging from 1.2 to 8.9 hunters per square mile during the first two weeks of the season. For the most part, hunter density on the Zaleski area was two to three times higher in 1990 than the comparable day in 1980. Twenty-seven percent of the reported 1990 turkey harvest occurred on publicly owned land (Fig. 4).

Based on information provided by 271 hunters checking their birds at the Waterloo Wildlife Experiment Station, nearly 92% used a 12 gauge shotgun (Table 5) to harvest their birds. The 2 3/4-inch shell was slightly more popular than the 3-inch (49% vs. 45%). Most (87%) hunters reported using no. 4 or smaller size shot, with no. 6 being most common (42.4%) followed by no. 4 (29.5%). About

16% of the hunters used combination loads (2x4, 2x6, and 4x6), similar to last year. More than 54% of the turkeys were reported harvested at distances between 20 and 34 yards (Fig. 5). This is slightly more than last year when 50% reported harvesting their birds at this range. Data presented in Table 6 indicate that as shell length and shot size increased, so did the tendency for hunters to take longer shots.

Discussion

The substantial increase in the turkey harvest and turkey hunter success for 1990 was unexpected. Productivity, as indicated by poult per hen observations for 1988 and 1989, was average or below average. Consistent with the mediocre productivity indices, the percentage of juveniles in the 1989 and 1990 harvests was below average and the 1990 rangewide gobbling count index (Miller 1990) was down 8% from the previous year. Thus, the greater than expected turkey harvest may have resulted from a higher harvest rate of gobblers facilitated by virtually perfect weather during the turkey season, rather than by an appreciable increase in the turkey population.

The 19,613 paid permit applicants represented a 3.8% increase over the 18,887 in 1989. This rate of increase is substantially smaller than the 18% annual increase observed over the previous four years. An increase in the cost of the turkey permit from $11.00 in 1989 to $16.00 in 1990 in all likelihood discouraged some individuals from purchasing a permit. Further increases in turkey hunter numbers are expected as turkey populations and range continue to expand.

Based on information provided by hunters checking their birds at the Waterloo Wildlife Experiment Station, 49% of the hunters who had been sent safety stickers used them. The most common reasons cited for not using them were that they forgot or that they were already safe and did not need them. Two hunting accidents were reported in 1990 compared with three in 1989, two in 1988, three in 1987, and four each in 1986 and 1985. Although in-the-field hunter numbers have increased annually from 8,849 in 1985 to 26,739 in 1990, turkey hunting accidents have not increased. Perhaps efforts by wildlife agencies and sportsman groups to emphasize safety through education (e.g., hunter education courses, hunting seminars) and awareness (e.g., media articles, safety stickers) programs are paying dividends.

Recommendations

If turkey trapping success remains good this coming winter, stocking of all remaining approved and suitable areas will be completed by March 1991. Rather than begin a program of stocking turkeys in marginal or sub-marginal range, efforts should be made to restock the better habitat which, for unknown reasons, has not

produced up to expectation. Monitoring of turkeys in previously stocked marginal "test" areas should continue in an attempt to determine whether these areas are capable of supporting viable turkey populations.

A 3-week bearded turkey season was recommended and approved for April 22 through May 11, 1991. A bag limit of one turkey per hunter per year will be in effect. Legal hunting devices will be shotgun, longbow, and crossbow with season hours being one-half hour before sunrise until noon. Turkey permits will be issued to all who apply. The opening of Geauga County will bring the total number of counties with an open season to 38.

Acknowledgments

We thank the following: (1) S. Miller and G. Mountz, Survey and Inventory Section, and W. Page, Permit Section, for managing the turkey permit system; (2) T. Kranyik for typing the paper; (3) A. Hershner for helping with checking station operation and data summary; and (4) K. Laub for editorial comments.

Literature Cited

Miller, S.E. 1990. Grouse-turkey survey results, 1990. Inserv. Note 624, Ohio Dept. Nat. Resour., Div. Wildl., Columbus. 6pp.

Table 1. Turkey gobbler hunting statistics for 1990 compared with those for 1989.

	1990 Season	1989 Season
Number of applicants and turkey permits issued		
Paid	19,613	18,887
Free	26,347	23,253
Total	45,960	42,140
Estimated total number and percent of permittees who hunted.[1]		
Paid	18,044 (92.0%)	17,508 (92.7%)
Free	8,695 (33.0%)	7,232 (31.1%)
Total	26,739 (58.2%)	24,740 (58.7%)
Number of successful hunters and (in parentheses) ratio of hunter success by permit type		
Paid	3,638 (1:5.0)	2,729 (1:6.4)
Free	166 (1:52.4)	264(1:27.4)
Landowners w/o permit	292 (?)	178 (?)
Total[2]	4,096 (1:7.0)	3,171 (1:8.3)
Number of successful hunters who used a turkey caller	3,904	3,018
Percent of harvest before 9:00 a.m.	72	73

[1]Participation rate for 1989 was based on the results of a 1989 survey of turkey permit recipients; participation rate for 1990 is an average of the participation rates reported for surveys conducted in 1988 and 1989.

[2]Successful landowners without a permit were excluded from hunter success calculations.

Table 2. Results of Ohio's 1990 spring turkey harvest, by county, compared with the 1989 spring harvest.

County of Harvest	1989 Apr. 24-May 13	1990 Apr. 23-May 12	25-Year Total (1966-1990)	County of Harvest	1989 Apr. 24-May 13	1990 Apr. 23-May 12	25-Year Total (1966-1990)
Adams[1]	151	188(+37)[2]	1,138	Knox[3]	91	103(+12)	367
Ashland[3]	51	66(+15)	273	Lawrence[4]	53	79(+26)	449
Ashtabula[3]	13	11(-2)	45	Licking[3]	25	21(-4)	111
Athens[1]	188	253(+65)	1,129	Logan[5]	21	26(+5)	47
Belmont[6]	-	50(+50)	50	Meigs[4]	164	233(+69)	977
Brown[5]	35	49(+14)	84	Monroe[1]	75	148(+73)	504
Carroll[7]	19	22(+3)	172	Morgan[8]	80	110(+30)	462
Clermont[5]	25	32(+7)	57	Muskingum[3]	83	124(+41)	451
Columbiana[3]	38	47(+9)	137	Noble[9]	18	23(+5)	95
Coshocton[10]	127	155(+28)	597	Perry[4]	137	158(+21)	793
Fairfield[3]	19	21(+2)	65	Pike[1]	117	144(+27)	899
Gallia[4]	145	237(+92)	860	Richland[5]	42	77(+35)	119
Guernsey[7]	34	63(+29)	235	Ross[1]	111	164(+53)	1,123
Harrison[3]	50	73(+23)	233	Scioto[1]	58	62(+4)	446
Highland[8]	8	20(+12)	71	Trumbull[3]	21	18(-3)	81
Hocking[1]	363	373(+10)	2,498	Tuscarawas[3]	14	30(+16)	80
Holmes[7]	121	124(+3)	737	Vinton[1]	388	450(+62)	3,276
Jackson[4]	162	182(+20)	909	Washington[1]	80	109(+29)	500
Jefferson[7]	44	51(+7)	293				
				Total	3,171	4,096	20,363

[1]Open for hunting 1966-1990 (25 yr).
[2]( ) Change, 1989-1990.
[3]Open for hunting 1984-1990 (7 yr).
[4]Open for hunting 1970-1990 (21 yr).
[5]Open for hunting 1989-1990 (2 yr).
[6]Open for hunting in 1990 (1 yr).
[7]Open for hunting 1978-1990 (13 yr).
[8]Open for hunting 1980-1990 (11 yr).
[9]Open for hunting 1987-1990 (4 yr).
[10]Open for hunting 1983-1990 (8 yr).

Table 3. Ohio's turkey season dates and harvest success, 1966-1990.

Year	Season Dates	Number of Counties Open	Permit Fee	Number of Eligible Permittees	Estimated Number of Permittees Who Hunted	Total Harvest[1]	Percent Successful[2]
1966	05/04-05/07	9	Free	500	321	12	3.7
1967	05/03-05/06	9	Free	898	706	18	2.5
1968	05/08-05/11	9	Free	914	765	20	2.6
1969	05/07-05/10	9	Free	945	815	37	4.5
1970	04/29-05/02	14	Free	909	774	30	3.9
	05/06-05/09			896	732	36	4.9
1971	04/28-05/01	14	Free	1,000	797	37	4.6
	05/05-05/08			1,000	790	17	2.2
1972	05/03-05/06	14	$5.35	917	824	32	3.9
	05/10-05/13			881	787	25	3.2
1973	05/02-05/05	14	$5.35	1,034	897	39	4.3
	05/09-05/12			1,034	884	32	3.6
1974	05/01-05/04	14	$10.50	999	900	61	6.8
	05/08-05/11			184	167	10	6.0
1975	04/28-05/03	14	$10.50	996	893	75	8.4
	05/05-05/10			267	242	19	7.9
1976	04/26-05/08	14	$10.50	1,471	1,296	139	10.7
1977	05/02-05/14	14	$10.50	1,751	1,504	137	9.1
1978	05/01-05/13	18	$10.50	2,000	1,711	147	8.6
1979	04/30-05/12	18	$10.50	2,000	1,714	265	15.5
1980	04/21-05/03	20	$10.75	2,097	1,882	387	20.6
1981	04/27-05/09	20	$10.75	3,458	2,954	577	19.5
1982	04/26-05/08	20	$10.75	4,262	3,636	651	17.9
1983	04/25-05/07	21	$10.75	5,141	4,402	764	17.4
1984	04/23-05/12	31	$10.75	6,935	5,824	1,233	19.9
1985	04/22-05/11	31	$10.75	10,084	8,849	1,583	17.3
1986	04/28-05/17	31	$10.75	11,913	10,209	1,816	17.0
1987	04/27-05/16	32	$10.75	13,396	11,521	2,268	18.9
1988	04/25-05/14	32	$11.00	30,155[3]	19,492	2,629	12.7
1989	04/24-05/13	36	$11.00	42,140[3]	24,740	3,171	12.1
1990	04/23-05/12	37	$16.00	45,960[3]	26,739	4,096	14.2
			Total	196,137	137,767	20,363	14.1

[1]Includes harvest by landowners not required to buy a permit.

[2]Beginning in 1984, gobblers harvested by landowners without a permit (1984 thr n 1990 total = 916) were excluded from hunter success calculations.

[3]Includes 13,947 applicants in 1988, 23,253 applicants in 1989, and 26,347 applicants in 1990 who received a free permit.

Table 4. A comparison of hunting pressure and harvest by day of week between the 1980 and 1990 spring seasons, Vinton (Zaleski State Forest) and Athens (Waterloo Exp. Sta.) counties.

Day of Week	County	Hunters Per Square Mile 1980	Hunters Per Square Mile 1990	Harvest Per Square Mile 1980	Harvest Per Square Mile 1990
Week one					
Monday	Vinton	3.75	8.9	0.18	0.75
	Athens	-[1]	7.3	0.03	0.08
Tuesday	Vinton	3.55	6.0	0.13	0.34
	Athens	-	6.6	0.0	0.05
Wednesday	Vinton	3.36	7.4	0.13	0.18
	Athens	-	8.0	0.0	0.03
Thursday	Vinton	1.97	6.8	0.18	0.29
	Athens	-	5.1	0.0	0.0
Friday	Vinton	2.37	6.0	0.05	0.39
	Athens	-	5.1	0.0	0.0
Saturday	Vinton	2.17	5.0	0.03	0.08
	Athens	-	5.8	0.0	0.0
Week two					
Monday	Vinton	0.59	2.2	0.0	0.10
	Athens	-	2.1	0.0	0.03
Tuesday	Vinton	0.99	2.8	0.0	0.13
	Athens	-	3.7	0.0	0.0
Wednesday	Vinton	1.18	1.6	0.0	0.10
	Athens	-	2.1	0.0	0.0
Week two (cont.)					
Thursday	Vinton	0.79	1.2	0.0	0.18
	Athens	-	2.1	0.0	0.0
Friday	Vinton	1.58	2.0	0.08	0.13
	Athens	-	3.7	0.0	0.0
Saturday	Vinton	2.37	3.6	0.29	0.26
	Athens	-	2.1	0.0	0.0
Week three					
Monday	Vinton		1.6		0.16
	Athens		0.7		0.0
Tuesday	Vinton		2.0		0.08
	Athens		0.7		0.0
Wednesday	Vinton		2.8		0.16
	Athens		0.7		0.0
Thursday	Vinton		0.6		0.13
	Athens		0.0		0.0
Friday	Vinton		1.8		0.16
	Athens		0.7		0.0
Saturday	Vinton		2.8		0.34
	Athens		0.0		0.0

[1]Dashes indicate that this information was not collected.

Table 5. Shotgun gauge, shell size, and shot size used by successful turkey hunters who checked their birds at the Waterloo Wildlife Experiment Station, Athens County, Ohio, 1990.

Weapon and Load	Number of Hunters	Percent of Hunters
Shotgun gauge		
20	3	1.1
16	6	2.2
12	249	91.9
10	13	4.8
Shell size (in.)		
2 3/4	133	49.1
3	122	45.0
3 1/2	16	5.9
Shot size		
2	7	2.6
4	80	29.5
5	15	5.5
6	115	42.4
7 1/2	4	1.5
2 x 4	2	0.7
2 x 6	18	6.7
4 x 6	23	8.5
other	7	2.6

Table 6. Average reported distance that hunters using a 12 gauge shotgun harvested their turkeys in relation to shell and shot size, Waterloo Wildlife Experiment Station, Athens County, Ohio, 1990. Only shell and shot size combinations for which samples exceeded 10 were included.

Shot Size	3" Shell		2 3/4" Shell	
	Average Distance (yd)	Number Hunters	Average Distance (yd)	Number Hunters
4	31.9	39	29.5	35
6	29.3	50	27.0	50

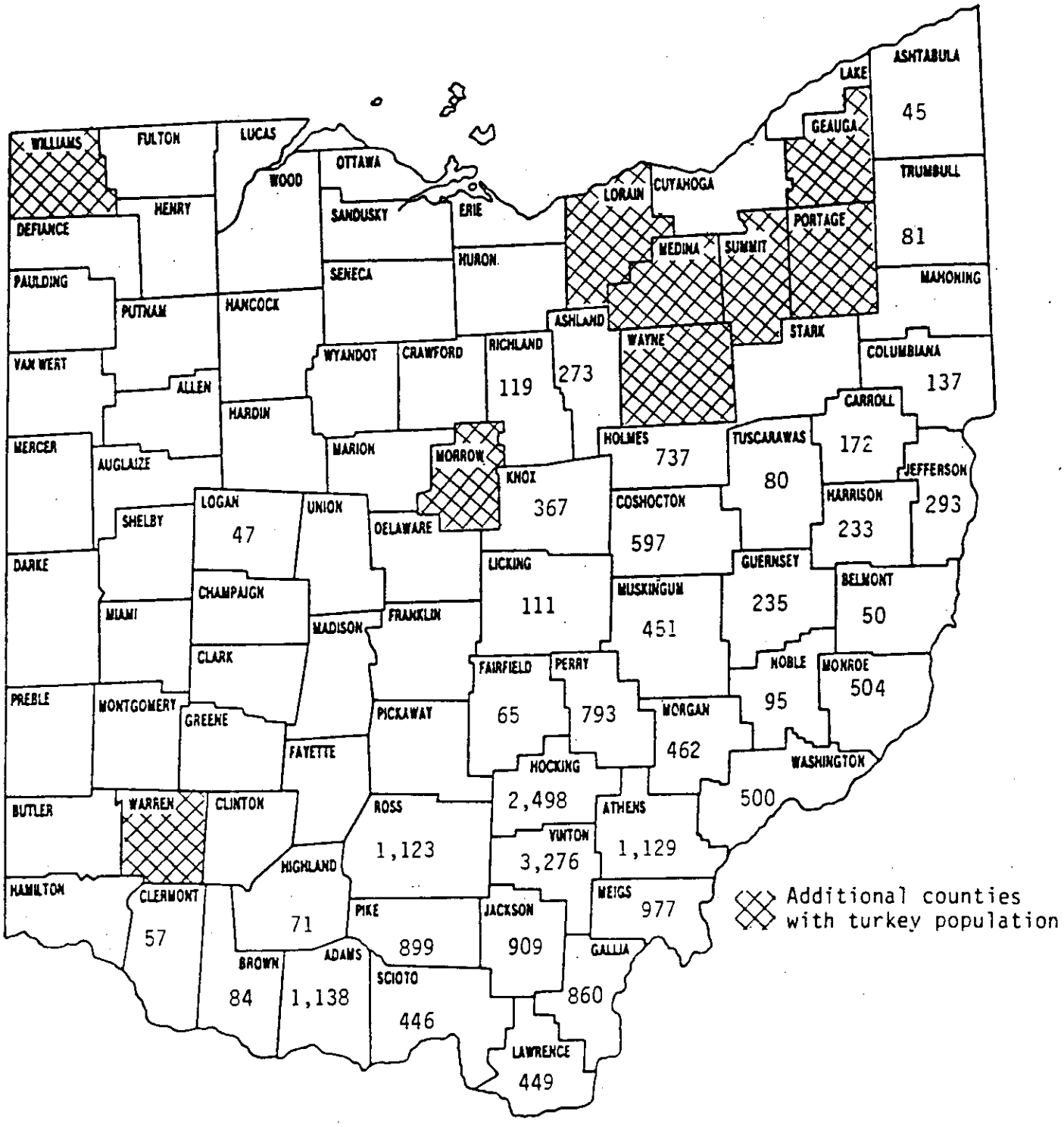

Fig. 1. Total turkey harvest (20,363) in 37 counties for 25 spring hunts, 1966-1990.

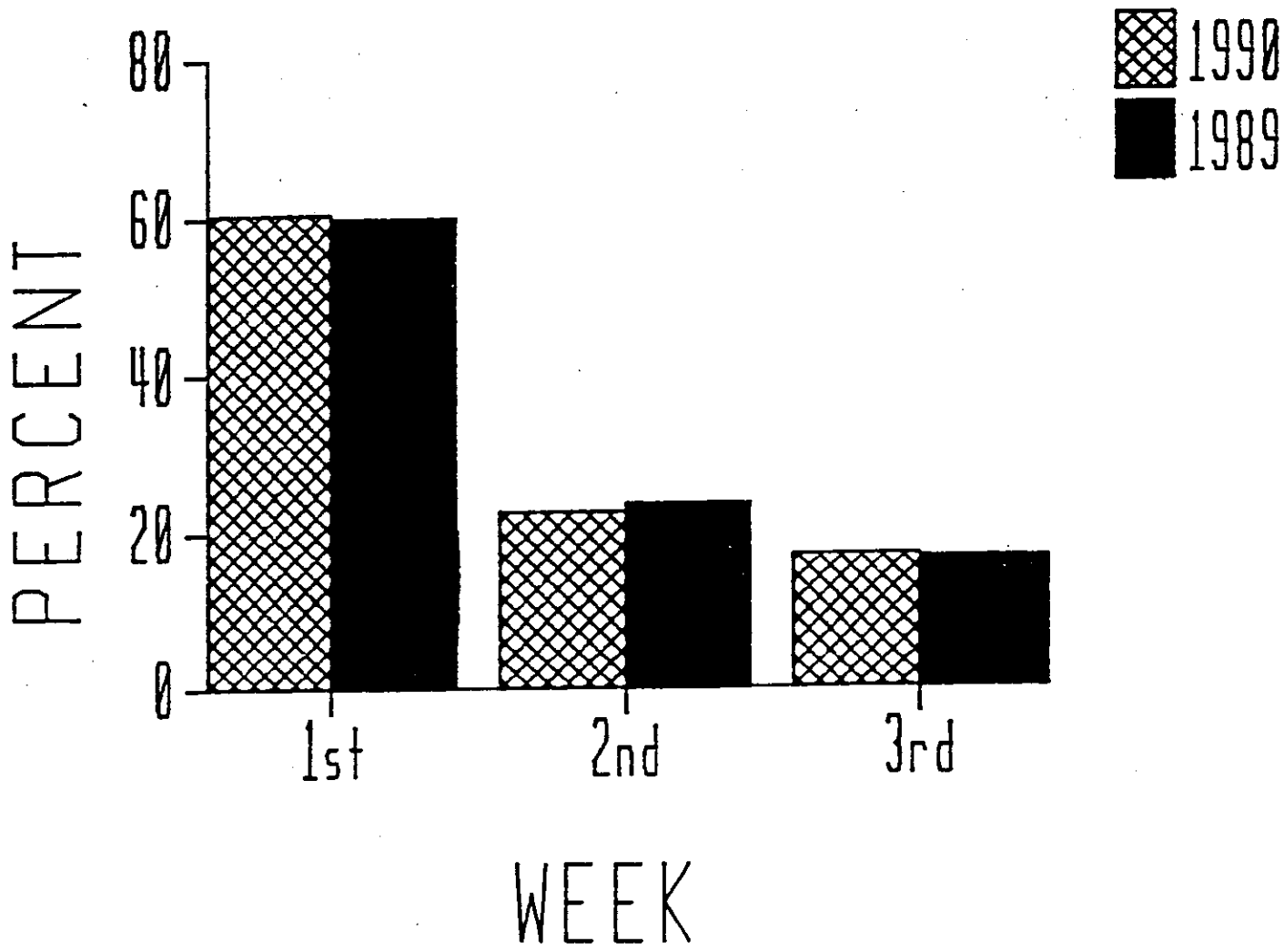

Fig. 2. Percentage distribution of 1989 and 1990 turkey harvests by week.

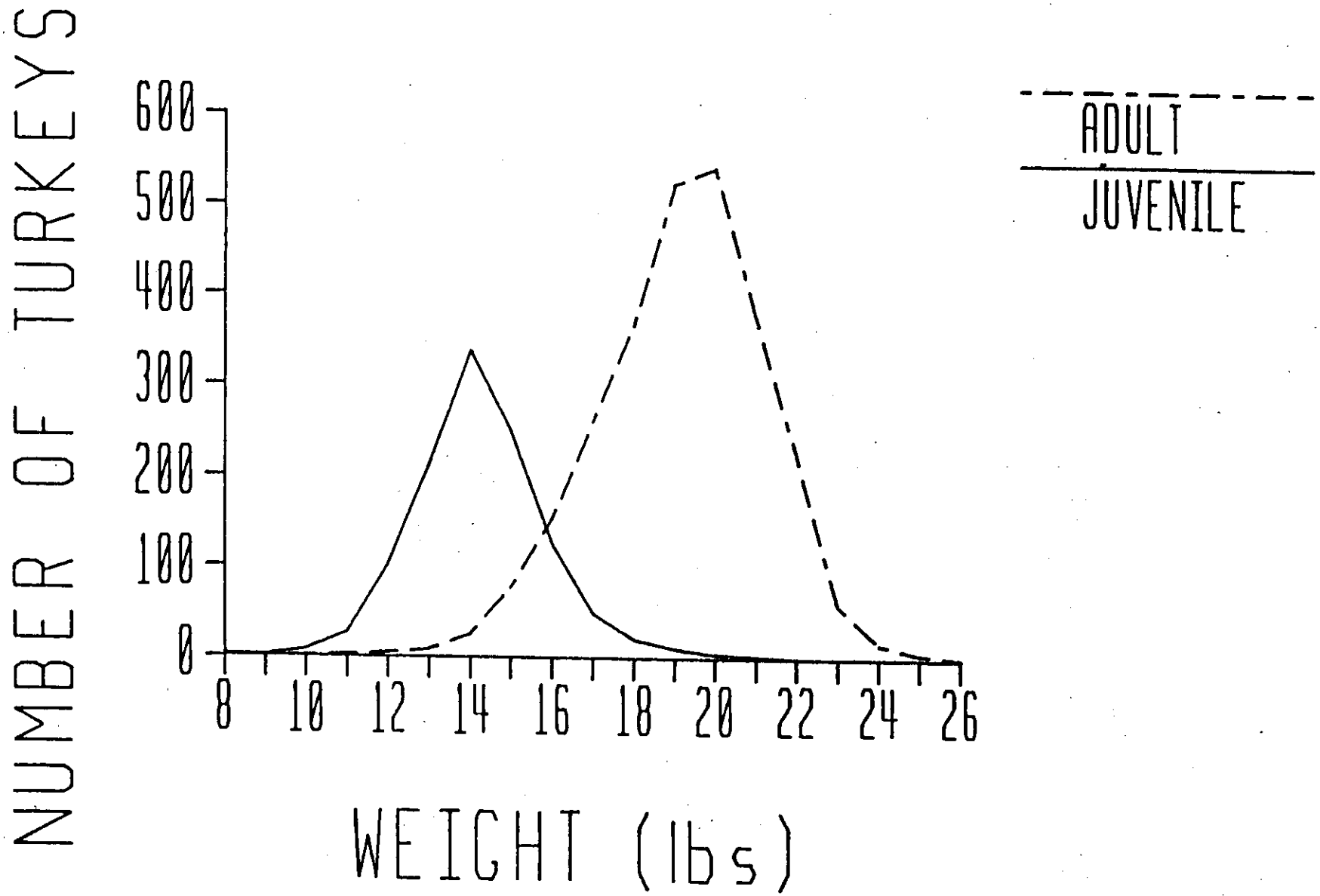

Fig. 3. Whole body weights of 3,808 turkey gobblers harvested in Ohio, 1990.

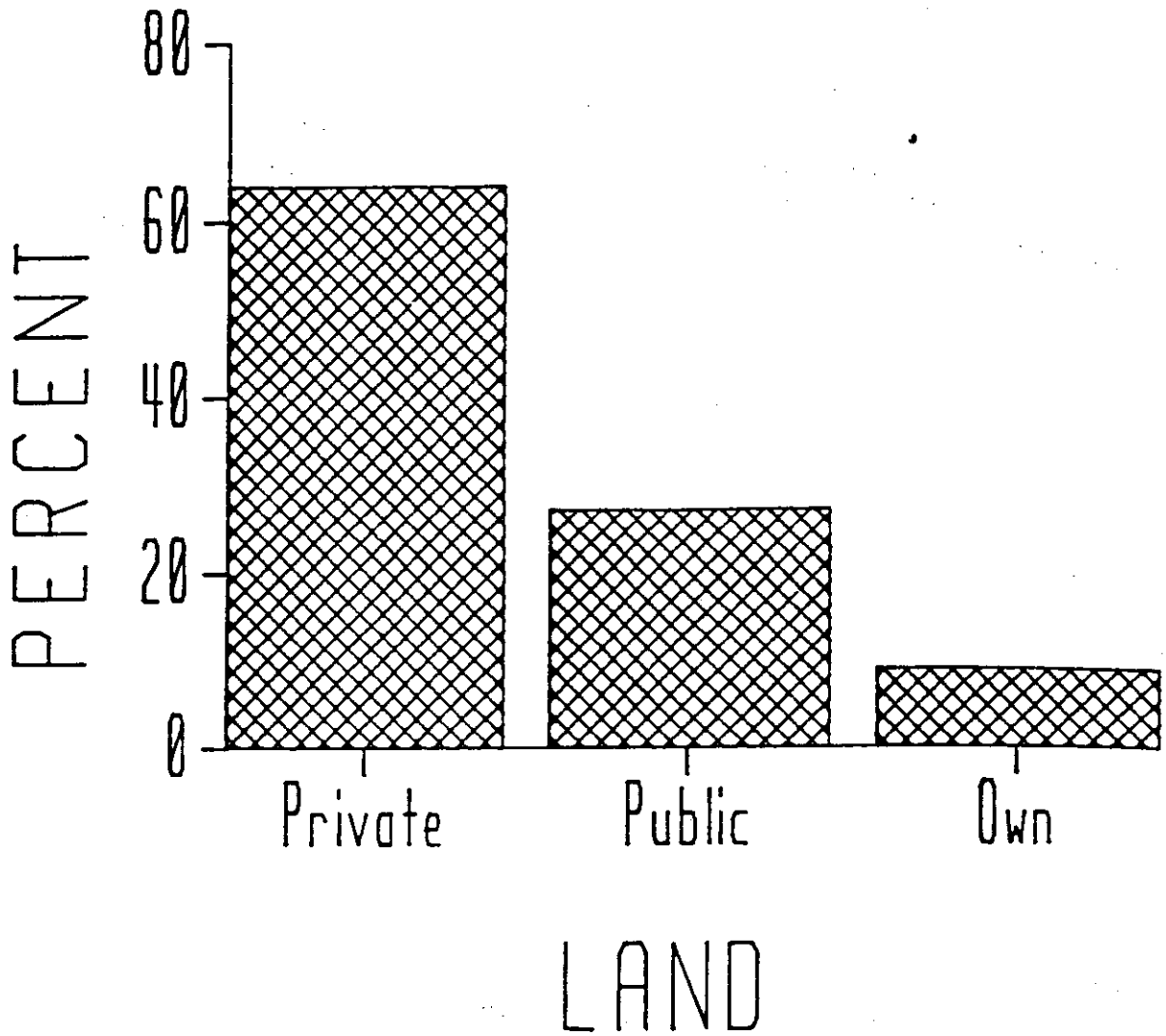

Fig. 4. Percentage distribution of 1990 turkey harvest by land ownership.

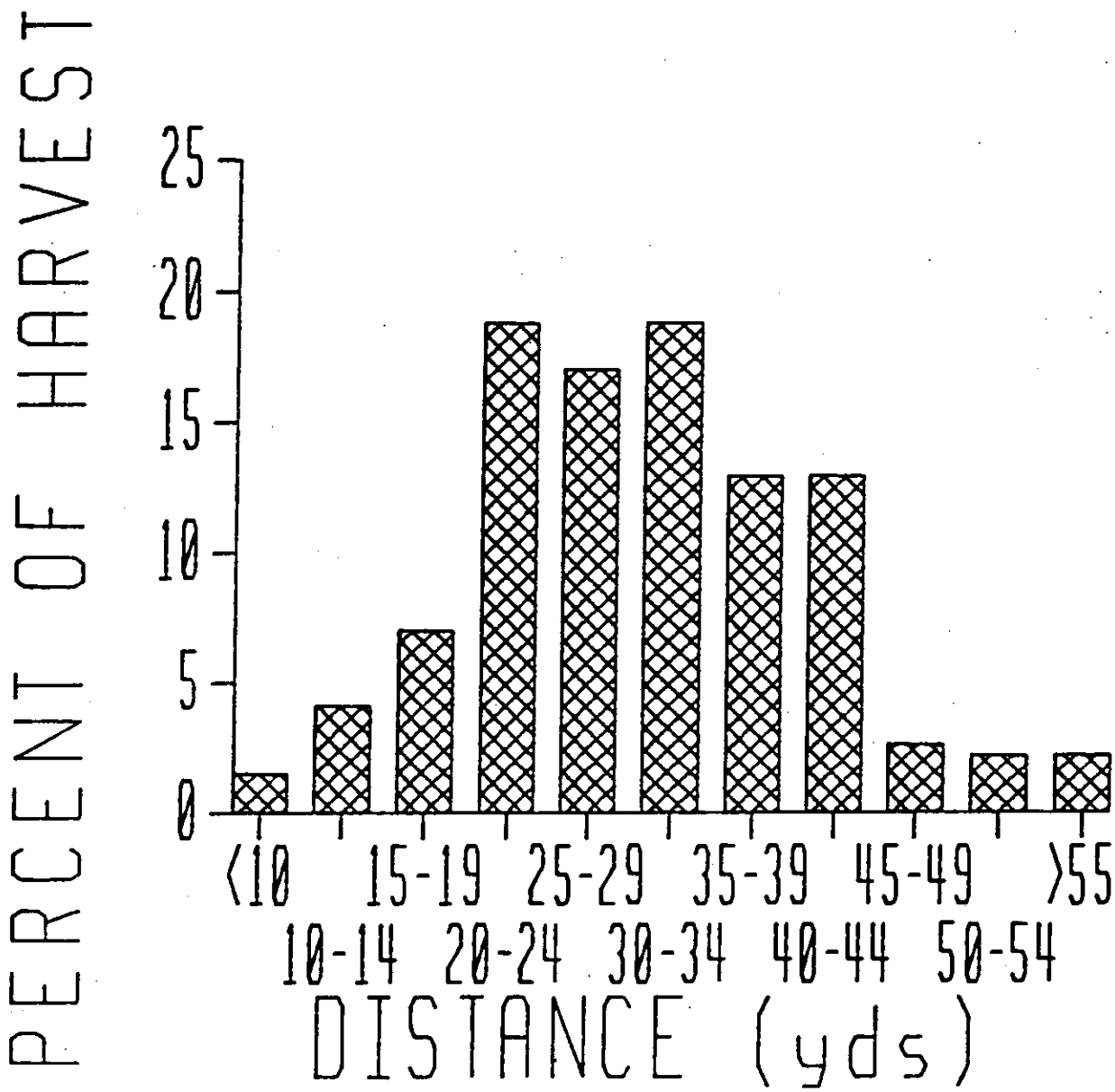

Fig. 5. Percentage distribution of turkeys harvested in relation to the reported distance shot. Based on a sample of 271 turkeys checked at the Waterloo Wildlife Experiment Station, Athens County, Ohio, 1990.

Ohio Department of Natural Resources
Division of Wildlife

Wildlife
Inservice Note 623
June 1990

TURKEY HUNTER SURVEY RESULTS - 1989

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Steven E. Miller, Survey and Inventory Section, Columbus, OH 43224

Interest in wild turkey hunting has increased almost annually since the first modern season was initiated in 1966 (Donohoe and Mountz 1986). To a large degree, this interest has been spurred by increasing opportunity provided by an expanding turkey population. In 1966, nine counties were open to hunting and 12 birds were harvested by 295 participating hunters (Donohoe 1967). In 1989, 36 counties were open to hunting and 3,171 turkeys were harvested by 24,740 participating hunters (Stoll and Culbertson 1989).

As hunter numbers have increased, so too have problems and issues associated with managing the spring hunt. These problems and issues were recently identified during the Division's strategic planning process and include the following: (1) overcrowded hunting conditions, (2) hunting safety, (3) hunter opinions on seasons and hunting opportunity, and (4) hunting pressure. For future planning and management purposes, a questionnaire was developed to provide information on these and other related issues such as turkey hunter expenditures.

METHODS

In 1989, 42,140 individuals applied for and received permits for Ohio's 24th modern turkey season (Stoll and Culbertson 1989). This total consisted of 18,887 paid and 23,253 free permittees (who were mainly persons $\geq$66 years old that were exempt from purchasing the $11.00 turkey permit). A questionnaire (Appendix A) was developed and mailed immediately after the turkey season to a random sample of 2,000 paid and 1,000 free permit recipients. Two follow-up mailings were sent to nonrespondents at approximately 3-week intervals. Due to a low response from individuals receiving a free permit, a telephone survey of 25 randomly selected nonrespondents was conducted to determine hunting participation.

Landowners and their immediate families are not required to obtain a turkey permit and could not be included in this survey.

Therefore, estimates of recreational opportunity (total hunter days) and hunter expenditures are minimum estimates. In 1989, 5.6% of the total turkey harvest was by unlicensed landowners.

RESULTS

Usable responses were received from 1,458 (73%) of the 2,000 paid permittees and from 411 (41%) of the free permittees for a total of 1,869 responses. The telephone survey of individuals who received a free permit and did not respond to the mail survey indicated that only 16% had hunted. This compared with a 53% hunting rate for the sample of free permittees who responded by mail. Appropriate adjustments were made to account for this nonresponse bias. Unless otherwise noted, response rates to individual questions exceeded 90% of the usable responses. Where possible, comparisons are made with results obtained from a 1985 survey of turkey hunters (Donohoe and Mountz 1986).

Hunter Recreation and Expenditures

Approximately 93% of the paid and 31% of the free permittees actually hunted. Reported turkey hunting success rates were considerably higher for paid (21%) than for free (4%) hunters. For both groups combined, the estimated total recreational opportunity provided by turkey hunting was 111,825 days (Table 1, Appendix B).

The total estimated annual expenditure, excluding license fees, for turkey hunting in Ohio was $3.76 million (Table 2). Of this total, an estimated $2.1 million was spent just during the turkey season.

Hunter Characteristics and Opinions

Approximately 70% of 1989 turkey hunters reported that they had turkey hunted 2 or more years in Ohio; this compares with 66% in 1985 (Table 3). The estimated total number of hunters in 1989 was 27% higher than in 1988. Since the survey indicated that 30% of the participants were first-time hunters and hunter numbers increased 27%, the dropout rate among Ohio's spring turkey hunters appears low.

The vast majority (95%) of Ohio's spring turkey hunters hunted strictly with shotgun; very few hunted with bow, crossbow, or muzzleloader, and use of a decoy was not especially popular (Table 4). Most (51%) of the respondents reported that they hunted equally on public and private lands.

The majority (66%) of survey respondents did not favor increasing the spring gobbler bag limit from one to two birds (Table 5). Opposition to an increased bag limit was consistent across all levels of hunting experience.

Inexperienced and experienced turkey hunters were in favor (57% total) of a $5.00 turkey habitat stamp to be purchased by all turkey hunters, with proceeds used strictly for buying or leasing land for turkey habitat and hunting (Table 5).

Respondents were asked to rank six turkey management activities. Law enforcement was ranked first, followed by research, habitat development on private land, turkey stocking, public education, and land acquisition (Fig. 1). Apparently, these activities were considered almost equal in importance, since only six-tenths of a point separated the first and sixth ranked activities.

Hunter Disturbance/Overcrowding

Almost 57% of the respondents felt that disturbance by other hunters was a "minor" or "big" problem and 19% felt that such disturbance was the main reason they failed to harvest a turkey (Table 6). These percentages were slightly lower than those reported by 1985 turkey survey respondents.

A surprisingly high proportion (46%) of respondents favored restricting the issuance of turkey permits in order to reduce hunter overcrowding (Table 7). The acceptability of restriction increased with increasing turkey hunting experience, from 45% for first-time hunters to 54% for ≥11-year hunters. If permit restrictions were deemed necessary, the plurality of respondents favored a "hunter's choice" type system which provided an unlimited number of permits, but split the season into segments and allowed each hunter to choose the segment he/she wanted to hunt.

Hunting Safety

Respondents were clearly concerned about turkey hunting safety (Table 8). In all instances these safety concerns increased with the amount of turkey hunting experience. For example, respondents concerned about being shot increased from 56% for first-time hunters to 79% for ≥11-year hunters, and mandatory turkey hunter education was favored by 39% of first-time hunters compared with 52% of the hunters with ≥11 years experience.

A surprisingly high proportion of respondents indicated that they had been exposed to hunter education (38%) and various information sources (79%) pertaining to turkey hunting safety (Table 9, Fig. 2). They identified uninformed hunters as the most significant problem affecting turkey hunting safety followed by overcrowded hunting conditions, wearing camouflage, shell shot size, and shotgun gauge (Fig. 3).

DISCUSSION

Since 1979, spring turkey hunter numbers have been increasing about 20% annually. In 1989, turkey hunters comprised 4% of the hunting license buyers, and recreational opportunity approached an estimated 112,000 hunter-days.

In addition to becoming a spring tradition for many Ohio hunters (Donohoe and Mountz 1986), turkey hunting is fast becoming an important contributor to state and local economies. In 1989, turkey hunter expenditures for items such as hunting equipment, food, lodging, and transportation were estimated to exceed $3.7 million. Approximately 56% of this outlay was reportedly spent just during the turkey season. Eastern Ohio counties, where land use favors good turkey populations, stand to reap the greatest benefit from this "hidden" economy. Vinton County, apparently aware of this potential, has sponsored an early May "Wild Turkey Festival" since 1984 to focus attention on the county's forested beauty and recreational opportunity as a means for increasing economic activity. Vinton County is also one of the few counties in the state that has supported a professional forester to promote sound forest land management.

Survey results also demonstrate the importance of public land to Ohio turkey hunters. Public land comprises less than 7% of the land area in occupied turkey range, yet supports in excess of 32% of the hunting pressure. The fact that respondents were willing to support a $5.00 habitat stamp for buying or leasing land is further testimony to the importance turkey hunters place on public land.

In recent years, there have been requests for the addition of a 1-week spring turkey season exclusively for longbow hunters. Survey results indicate that less than 2% of the hunters hunt only with longbows. This low level of participation and the fact that longbows may be used during the present 3-week season do not justify the increased costs associated with an added week of longbow-only hunting.

A solitary and safe hunting opportunity are commonly considered key ingredients in a quality spring turkey hunt (Madson 1975). Eighteen and 38% of the survey respondents felt that hunter disturbance was a big or minor problem, respectively and 66% were concerned about being shot. A sobering 33% said other hunters had snuck up on them and 7% of the individuals with $\geq$ 11 years experience reported having been shot at.

Considering the above statistics, it's not surprising that respondents were consistent in their responses to survey questions pertaining to crowding and safety. A relatively high percentage (46%), although not a majority, of hunters were willing to restrict hunting opportunity to reduce overcrowding. Uninformed turkey hunters and overcrowded hunting conditions were ranked #1

and #2 as important problems affecting safety. A substantial percentage (43%) of all hunters and the majority (52%) of hunters with $\geq$ 11 years experience favored mandatory turkey hunter education. Expanding the spring bag limit to two birds (a change that would likely increase hunter interest and participation) was soundly (67%) rejected.

Wildlife managers have long been concerned about overcrowding, safety, and quality in turkey hunting (e.g., Eriksen et al. 1985, Hawn et al. 1987, Donohoe 1990). Based on our survey results, turkey hunters share these same concerns. Recent hunter perceptions regarding crowding and safety are cause for concern but not alarm. In fact, the percentage of Ohio turkey hunters who considered disturbance by other hunters to be a "big" problem declined from 26% in 1985 to 18% in 1989. Turkey hunting accidents have remained at two or three per year since a high of four accidents in 1985 and 1986. Nonetheless, we must be prepared to address the problems of hunter crowding and safety. This can best be achieved by continuing to monitor hunter numbers, success, and effort, as well as hunter attitudes and satisfaction.

Acknowledgments: Thanks to K. Laub for editorial comments and to T.A. Kranyik for typing the paper.

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Table 1. Hunter success and time spent hunting based on a random survey of 2,000 paid and 1,000 free Ohio turkey permit recipients, 1989.

Permit Type	Usable Responses	Percent Who Hunted	Percent Who Harvested Gobbler	Av. Number Days Hunted(SD)	Est. Total Days Hunted
Paid	1458	92.7	21.0	4.9 (3.5)	85,790
Free[1]	411	31.1	4.3	3.6 (2.8)	26,035

[1]Due to a poor response rate from those issued free permits, a telephone survey of nonrespondents was conducted. The percent of free license recipients who hunted was adjusted based on the response to the telephone follow-up.

Table 2. Expenditures other than for license fees, (e.g., turkey calls, scouting trips, seminars, equipment, transportation food, lodging, taxidermy) attributed to turkey hunting in 1989.

Time Period	Av. Estimated Expenditure per Hunter (SD)	Estimated Total Expenditure
Entire year	$152 (152)	$3,760,000
Turkey season only	$ 85 (99)	$2,103,000

Table 3. Turkey hunting experience reported by 1985 and 1989 respondents and success reported by paid and free 1989 respondents.

Years Hunted Turkeys in Ohio	Percent of Respondents		Av. Total Number of Turkeys Harvested by 1989 Respondents
	1985	1989	
1	34.3	30.5	0.09
2-5	49.6	52.9	0.56
6-10	9.2	10.8	2.23
$\geq$ 11	6.9	5.8	4.85

Table 4. Hunting devices, decoy use, and type of land hunted by 1989 spring turkey hunters.

	Percent of Hunters
Hunting device	
Shotgun only	95.4
Longbow only	1.2
Crossbow only	0.5
Muzzleloading shotgun only	0.3
Combination	2.6
Used decoy in 1989	14.4
Type of land hunted	
Mostly public	31.9
Mostly private	17.2
Equally public and private	50.9

Table 5. Percent of survey respondents supporting an increase in the turkey bag limit to two birds and a $5.00 turkey habitat stamp for land acquisition, by hunter experience.

	Years Hunted Turkeys				All Respondents
	1	2-5	6-10	≥11	
Favor increased bag limit[1]					
Yes, within next year	13.6	11.3	13.8	23.2	13.0
Yes, within 2-3 years	9.8	13.2	13.2	5.1	11.7
Yes, but not for 5 years	9.1	9.7	13.2	5.1	9.6
No	67.5	65.8	59.8	66.6	65.7
Favor $5.00 habitat stamp					
Yes	56.6	56.9	58.8	64.3	57.4
No	43.4	43.1	41.2	35.7	42.6

[1] 1,519 of a possible 1,869 (81%) responded to survey question.

Table 6. Survey respondents' feelings and perceptions regarding disturbance by other turkey hunters, 1985 and 1989.

	Percent of Respondents	
	1985	1989
Disturbance by other hunters		
No problem	37.7	43.4
Minor problem	36.4	38.4
Big problem	25.9	18.2
Successful hunters who experienced disturbance on day of harvest	23.3	18.6
Failure to harvest a turkey caused by disturbance	25.5	18.8

Table 7. Acceptability of a permit restriction and type of restriction preferred, by hunting experience (percent).

	Years Hunted Turkeys				All Respondents
	1	2-5	6-10	≥11	
Favor restriction to reduce overcrowding					
Yes	44.8	45.2	53.3	54.0	46.4
No	55.2	54.8	46.7	46.0	53.6
Restriction option preferred					
A[1]	28.9	21.5	19.8	21.4	23.5
B[2]	10.2	13.2	20.9	14.3	13.2
C[3]	18.8	19.7	20.3	19.4	19.5
D[4]	42.1	45.6	39.0	44.9	43.8

[1]Option A: Randomly select a limited number of permit recipients from all applicants.
[2]Option B: Issue an unlimited number of permits, but randomly select half the applicants for the entire season and the remaining applicants for the last two weeks only.
[3]Option C: Issue an unlimited number of permits and randomly assign one-third of the applicants each to the first, second, and third weeks of the season.
[4]Option D: Issue an unlimited number of permits, allowing the hunters to choose either the first week or the last two weeks.

Table 8. Safety concerns and problems identified by turkey survey respondents, by hunting experience (percent).

	Years Hunted Turkeys				All Respondents
	1	2-5	6-10	≥11	
Concerned about being shot	55.7	68.7	73.3	78.6	65.8
Have had another hunter sneak up on them	14.4	35.2	56.3	66.7	33.0
Have been shot at by another hunter	0.4	1.5	3.1	6.9	1.6
Favor mandatory hunter education for turkey hunters	39.2	41.6	52.1	52.0	42.6

Table 9. Percent of respondents who reported completing a hunter education course or who obtained safety information through miscellaneous sources, by hunting experience.

	Years Hunted Turkeys				All Respondents
	1	2-5	6-10	≥11	
Completed Ohio hunter education course	34.3	39.9	34.5	49.0	38.1
Read articles, saw films, attended seminars on safety	75.7	80.5	80.2	83.5	79.2

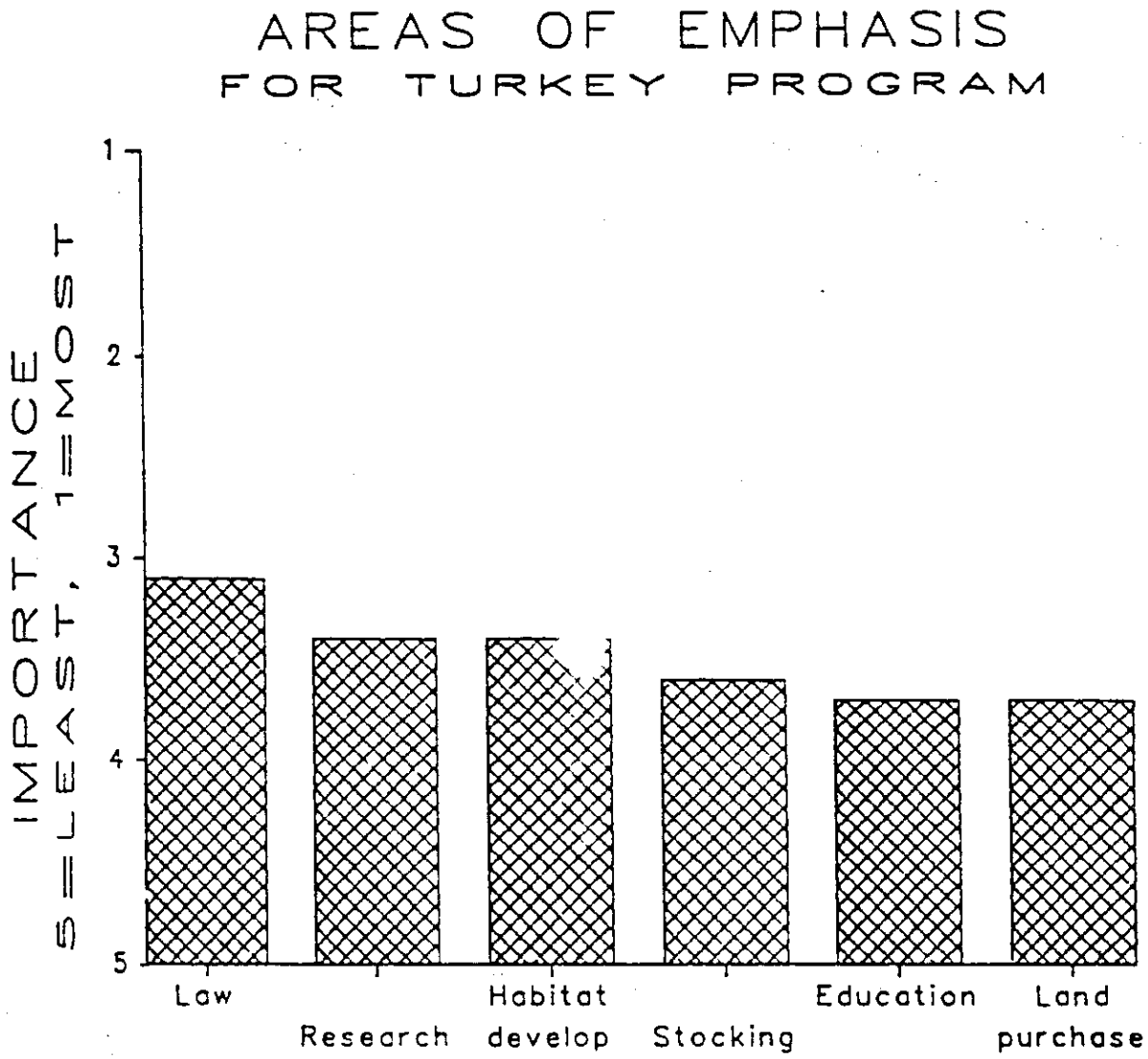

Fig. 1. Average rank of importance assigned to six turkey management activities by 1989 survey respondents.

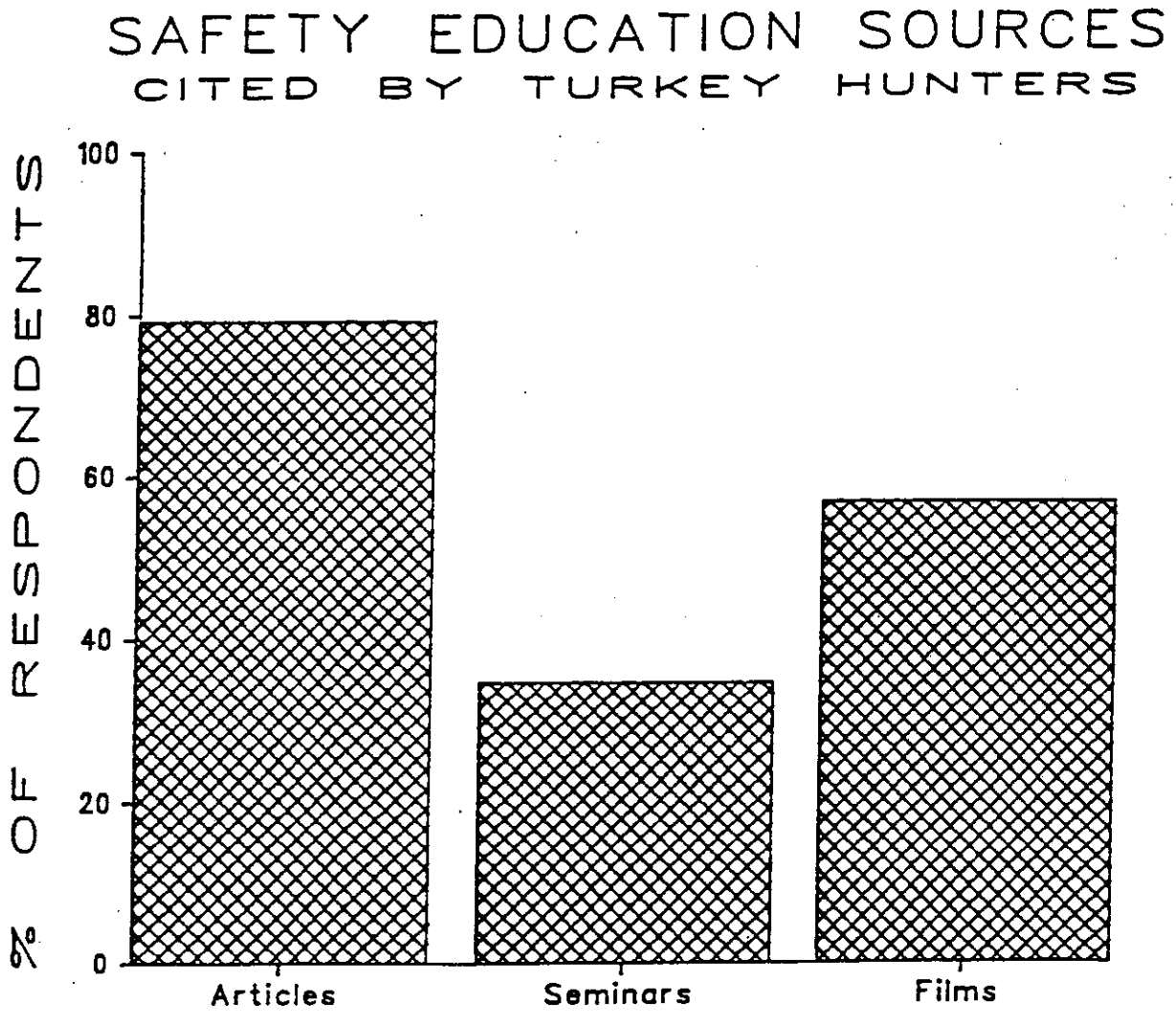

Fig. 2. Safety education sources cited by respondents as having provided information to them on turkey hunting safety.

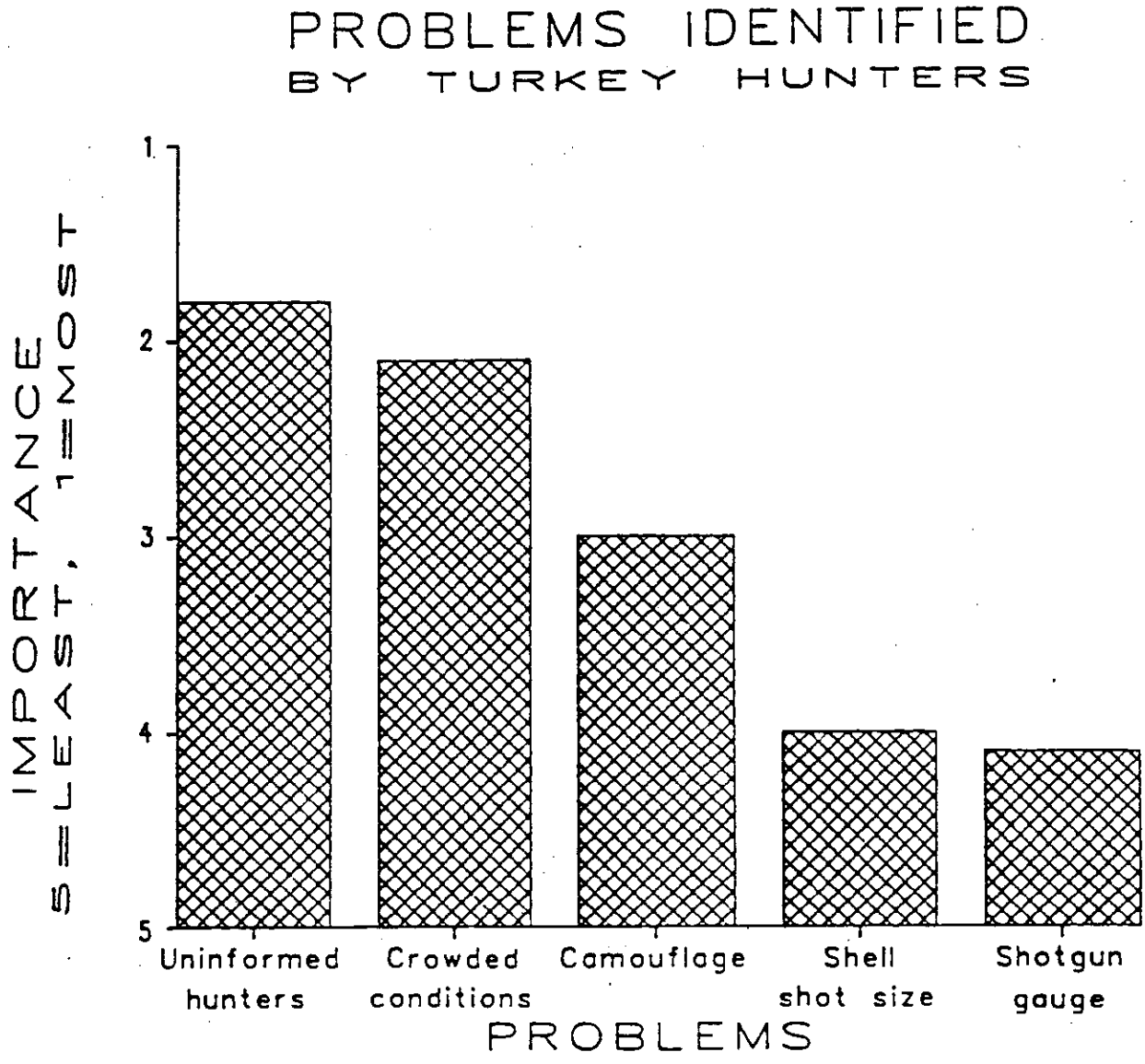

Fig. 3. Average rank of importance assigned to five problems affecting turkey hunting safety by 1989 survey respondents.

OHIO WILD TURKEY HUNTER SURVEY

The Division of Wildlife is conducting this survey to determine your preferences on a variety of topics related to wild turkey hunting. The questionnaire is being sent to a sample of the 1989 wild turkey permit applicants.

Please check (✓) the most appropriate response(s) for each question unless otherwise directed. Your responses will remain confidential.

Thank you for your cooperation.

Clayton H. Lakes, Chief
Division of Wildlife

Section A: TURKEY HUNTING INFORMATION

1. Including this year, how many years have you actively hunted turkeys in Ohio?
   ☐ 1 year ☐ 6-10 years
   ☐ 2-5 years ☐ more than 10 years

2. How many wild turkeys have you harvested in Ohio? _____

3. Did you hunt wild turkey in Ohio in 1989? ☐ Yes ☐ No
   If you answered Yes to question 3, please go to question 4.
   If you answered No, please go to Section B.

4. How many days did you hunt wild turkey in Ohio in 1989?
   _____

5. If you hunted wild turkey in Ohio in 1989, how did you feel about disturbances from other hunters?
   ☐ No problem ☐ Minor problem ☐ Big problem

6. Did you harvest a wild turkey in Ohio in 1989?
   ☐ Yes; go to question 7 ☐ No; go to question 8

7. On the date that you harvested your bird, were you disturbed by other hunters in the field?
   ☐ Yes ☐ No

8. Do you feel the **main** reason you failed to harvest a wild turkey this year was due to disturbances from other hunters in the field?
   ☐ Yes ☐ No

9. When hunting wild turkey in 1989 what hunting device(s) did you use? (check one or more)
   ☐ Shotgun ☐ Muzzleloading Shotgun
   ☐ Longbow ☐ Crossbow

10. When hunting wild turkey in 1989 did you use a turkey decoy?
    ☐ Yes ☐ No

11. When hunting wild turkey in 1989 did you hunt:
    ☐ Mostly on public land? ☐ Mostly on private land?
    ☐ Equally on public and private land?

12. Excluding license fees, approximately how much money did you spend this past year (June 1, 1988, through May 1989) on wild turkey hunting in Ohio? **Include cost of calls, scouting trips, seminars, ammunition, new firearms, taxidermy, transportation fuel, lodging, and food as appropriate (we won't tell your spouse).** $_____

13. Of the total money you recorded spending (in question 12) this past year for wild turkey hunting in Ohio, approximately what amount was spent just during the turkey hunting season?
    $ _____ spent during season

14. For your 1989 wild turkey hunt, please list the county(ies) and days hunted in each county.

County	Days Hunted
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Section B: TURKEY HUNTING SAFETY

15. Have you completed the Ohio Hunter Education course?
    ☐ Yes ☐ No

16. Have you ever read articles, seen films, or attended seminars that present the safety considerations involved with turkey hunting?
    ☐ Yes ☐ Read articles ☐ Attended seminars ☐ Seen films
    ☐ No

17. Have you ever been concerned about being shot by another turkey hunter?
    ☐ Yes ☐ No

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18. Have you ever had another hunter sneak up on you when you were calling (hunting) turkey?

☐ Yes ☐ No

19. Have you ever been shot at when turkey hunting?

☐ Yes ☐ No

20. The following have been identified as problems affecting turkey hunting safety. Please rank them from "**1**," **the most important to you**, to "**5**" **the least important:**

_____ Shotgun gauge
_____ Wearing camouflage
_____ Uninformed turkey hunters
_____ Shell shot size
_____ Overcrowded hunting conditions

Section C: WHAT IS YOUR OPINION?

21. The number of hunters who wish to hunt wild turkeys during the spring gobbler season has grown in the past several years. Assuming no change in the present season length, shooting hours, bag limit, legal weapons, or license/permit requirement, **do you favor:**

☐ Issuing turkey permits to all who apply for the entire season?
☐ A restriction on the way permits are issued in order to reduce hunter overcrowding?

22. If it becomes necessary to put a restriction on the way permits are issued (even if you don't want a restriction), what form of restriction would you favor (assume no change in the present spring season regulations)?

☐ Putting a ceiling on total permits issued and randomly selecting eligible hunters from all permit applications received.
☐ Issuing an unlimited number of permits, but randomly selecting half the permit applicants to hunt all three weeks of the season and half to hunt only the last two weeks.
☐ Issuing an unlimited number of permits, but randomly selecting one-third to hunt the first week of the season, one-third to hunt the second week, and one-third to hunt the last week.
☐ Hunter's choice - Issuing an unlimited number of permits, but splitting the season into segments and allowing each hunter to choose the segment he or she wants to hunt; for example, a choice between segment #1, a one-week hunt during the first week, or segment #2 a two-week hunt during the last two weeks.

23. Would you be in favor of expanding the spring gobbler bag limit from one to two birds:

☐ Yes, within the next year
☐ Yes, within the next 2-3 years
☐ Yes, but not for at least 5 years
☐ No, I like the existing one-bird limit

24. Please rank from "**1**," **the most important to you**, to "**6**" **the least important**, the following management activities to improve and preserve the wild turkey population in Ohio:

_____ Research—on reproduction, predators, range expansion
_____ Law enforcement—on poaching, trespass
_____ Public education—on hunter safety
_____ Acquiring more public land
_____ Habitat development on private land
_____ Trapping and transferring turkeys

25. Would you favor a $5.00 turkey habitat stamp to be purchased by all turkey hunters, with proceeds used solely for buying or leasing land for turkey habitat and hunting?

☐ Yes ☐ No

26. Would you favor a mandatory turkey hunter education course or turkey hunting safety clinic for all turkey hunters?

☐ Yes ☐ No

Thank you for completing this survey. Your contribution will help in improving the sport of wild turkey hunting in Ohio. Please put this survey form in the enclosed postage paid envelope and mail as soon as possible.

APPENDIX B

Estimated Hunter Days and Percent of Total Hunter Days per County During the 1989 Turkey Season

County	Est. Hunter Days[1]	Percent of Total
Adams	6,050	5.4
Ashland	1,677	1.5
Ashtabula	1,163	1.0
Athens	5,602	5.0
Brown	850	0.8
Carroll	962	0.9
Clermont	347	0.3
Columbiana	1,756	1.6
Coshocton	4,607	4.1
Fairfield	525	0.5
Gallia	4,909	4.4
Guernsey	1,756	1.6
Harrison	2,583	2.3
Highland	481	0.4
Hocking	11,406	10.2
Holmes	2,628	2.3
Jackson	5,446	4.9
Jefferson	1,364	1.2
Knox	2,673	2.4
Lawrence	2,236	2.0
Licking	861	0.8
Logan	1,387	1.2
Meigs	4,137	3.7
Monroe	3,601	3.2
Morgan	2,784	2.5
Muskingum	3,645	3.3
Noble	1,409	1.3
Perry	5,737	5.1
Pike	2,673	2.4
Richland	906	0.8
Ross	4,137	3.7
Scioto	2,494	2.2
Trumbull	1,040	0.9
Tuscarawas	917	0.8
Vinton	14,560	13.0
Washington	2,203	2.0
Unknown	313	0.3
Total	111,825	

[1]Est. hunter days/county = (% survey days in county) x (est. total days hunted, statewide).

ONTARIO WILD TURKEY STATUS REPORT

Midwest Deer and Turkey Group
Springbrook State Park, Guthrie Centre, Iowa
January 14-17, 1991
by David J. Reid, District Biologist
Ontario Ministry of Natural Resources
Simcoe, Ontario

Population Status

Wild turkeys continue to increase in numbers and expand their range throughout southern Ontario. Between 1984 and 1987 a total of 276 birds were transferred into Ontario from New York, New Jersey, Vermont, Michigan, Missouri and Iowa. Today, the estimated size of the population in Ontario exceeds 7,000 birds (Table 1). The area of range occupied is approximately 5,650 sq. km (2,207 sq. mi). This represents about 21 percent of the 27,000 sq. km (10,500 sq. mi) which made up the historical range.

A census completed in February and March of 1989 estimated the population of Michigan origin birds in Napanee District at about 1,000 birds well below the previous estimates for this population (Weaver and Bellamy, 1990). Similar surveys have not been completed for our other populations - estimates on Table 1 are "best guesses" by field staff based on brood reports, and expected nesting success, and mortality as reported in the literature. Occupied range is based on public and staff observations plotted on maps. Observation cards are distributed to rural households in the immediate area of new release sites. Huronia District had good response from over 5,000 cards mailed to shotgun and archery deer hunters in the fall of 1990.

Trap and Transfer

A total of 126 turkeys were trapped last winter (1989/90) and released at 11 sites throughout southern Ontario (Table 2). So far this winter, 28 turkeys have been released at 3 sites. The trap and transfer program will remain a high priority in the province for the near future, however, budget constraints have resulted in a reduced effort this trapping season. A total of 340 birds have been trapped within the Province and released at 31 sites, since 1987.

We are trying to develop a set of criteria/guidelines for ranking release sites so that we can stock our best quality habitat first. The draft criteria listed on Table 3 are meant to apply to the township in which specific releases are to be made - townships in Ontario are generally 50 to 300 km^2 in size. Your comments are welcome.

Hunting

Wild turkey hunts have taken place during two six-day seasons in early May of each year since 1987. The bag limit is one wild turkey with a beard. Table 4 compares the 1990 hunt with hunts in the previous three years. Information on participation, effort, expenditures, etc., is obtained by a post hunt questionnaire mailed to all hunters who purchased a validation tag. The biological data on harvested birds is obtained at mandatory check stations.

Hunter interest is growing. To date 3,399 people have attended the mandatory wild turkey hunter education seminars. Eight seminars are scheduled this spring, with attendance of 50 to 100 people expected at each. Because the number of applications received annually for the random draw was well below the quota of validation tags available, changes to hunting regulations are being made for 1991 to remove controls on hunter numbers for most wildlife management units.

Other proposals for the spring 1991 season include: change from two six day seasons to one 3 week season beginning on the first Monday following the last Saturday in April (to avoid conflict with the opening day of trout season) and ending on the Friday before the Victoria Day holiday in May (to avoid conflict with non-hunters out to enjoy the first long weekend in the spring) eg. April 29 to May 17, 1991; hunters will not be resticted to specific wildlife management units but will be able to hunt in any unit with an open season, except those units where controls on hunter numbers will be maintained, and; non-residents will be allowed for the first time provided they meet all eligibility requirements. Eligibility for the 1991 hunt include:

- Hunters require a valid Ontario small-game hunting licence and a wild turkey validation tag;
- Before purchasing a validation tag, hunters require a certificate verifying that 1) they attended a wild turkey hunter education seminar sponsored by the Ontario Federation of Anglers and Hunters (see attached fact sheet) and 2) they passed an MNR wild turkey hunter examination.
- Wild turkey validation tags are available upon application at most MNR district offices in southern Ontario.
- Hunter numbers will be controlled in WMU 89 administered by Niagara District and interested hunters must apply in a random draw to obtain authorization to hunt in this unit.

Conclusion

The future of the wild turkey in southern Ontario continues to look good with a large area of suitable habitat still unpopulated. Successful reproduction was documented for two flocks (all juvenile birds) released in the fall of 1989 at the extreme edge of the historic range, northwest of Lake Simcoe within Ontario's "snow belt" (mean winter snowfall > 100 inches). They survived heavy snowfalls in December of 1989 when more than 12 inches of fluffy snow remained for much of that month. We wander what the limits of our potential turkey range might be.

Reference

Weaver, J. and K. Bellamy, 1990. Winter wild turkey census. Napanee District, Ontario. February - March 1989. Unpublished technical report. Ontario Ministry of Natural Resources, Napanee, Ontario. 23 p.

Table 1. Population status of wild turkeys in Ontario.

		SPRING POPUL.	BROOD REPORTS	AVG.BROOD SIZE	SUMMER POPUL.	OCCUPIED RANGE(SQ.KM)
Simcoe	1989	1000	18	7.3	1300-2600	1600
	1990	1300	18	6.1	1500-3000	1800
Napanee	1989	1000	29	6.8	1500-2000	900
	1990	1200	11	5.2	1500-2200	1050
Huronia	1989	800	26	7.6	1200-1800	1300
	1990	1500	19	7.7	1600-2200	1450
Cambridge	1989	500	8	6.5	700-1200	500
	1990	800	11	7.8	1000-1200	600
Niagara	1989	200	7	8.0	300-500	200
	1990	500	3	8.0	1300-1500	300
Lindsay	1989	125	4	7.0	200-300	300
	1990	175	0	---	200-300	300
Maple	1989	20	0	---	30-60	50
	1990	50	0	---	70-100	150
TOTAL	1989	3845	92	7.2	5230-8460	4850
	1990	5525	62	6.8	7170-10500	5650

Table 2. Trap and transfer of wild turkeys in Ontario.

	BIRDS (# SITES) PER SEASON					
DISTRICT	1986/87	1987/88	1988/89	1989/90	1990/91[1]	TOTAL[2]
Simcoe	7(1)	36(6)	8(3)	40(5)	21(2)	112(12)
Huronia	---	32(3)	44(5)	51(3)	7(1)	133(12)
Lindsay	---	---	27(2)	9(2)	---	36(4)
Cambridge	---	---	3(1)	7(1)	---	10(2)
Niagara	---	1(1)	29(2)	19(3)	---	49(5)
Maple	---	---	---	---	---	---
Napanee	---	---	---	---	---	---
TOTAL[3]	7(1)	69(10)	111(11)	126(11)	28(3)	340(30)

1 As of January 10, 1991

2 Total number of sites per district may not add across the seasons as some sites received birds in more than one year.

3 Total number of sites may not add across the districts as some sites received birds from more than one district.

Table 3. Assessing wild turkey stocking sites[1] in Ontario

CRITERIA	MINIMAL	IDEAL
people density	<50/km²	<25/km²
road density	<2.0 km/km²	<1.5 km/km²
mean winter snowfall	<200 cm/yr.	<150 cm/yr.
mean #days>5cm snow	≤90	≤60
area of forest cover	≥12%	40-70%
free ranging gamefarm birds	rare	absent
mature conifers	present	10-30% of forest cover
brood habitat (savanna, grassland, abandoned farmland)	present	12-25% of area
row crops (beans, corn, grain)	present	5-30% of area
mature hardwoods (≥40 yr. old) (≥25.4 cm. dbh)	present	≥40% forest cover

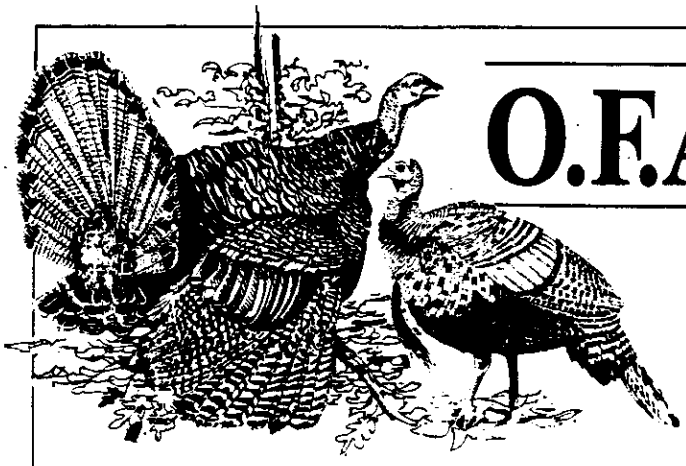
[1] Township area considered for area calculations.

Other Desirable Characteristics

- minimum of 250 ha. of contiguous forest cover at release site - may include woodlots no more than 0.5 km apart with connecting travel corridors eg. wooded ravines, drainage systems with cover, windbreaks
- permanent water or spring seeps present
- winter food near wooded areas - eg. winter manure spreading, unplowed crop stubble, soft and/or hard mast producers
- public support/demand strong
- central part of wildlife management unit
- turkeys in adjacent township
- spring plowing predominate over fall plowing
- public land present
- future hunting possible

Table 4. Summary of wild turkey hunts in Ontario.

	YEAR			
	1987	1988	1989	1990
No. MNR districts	1	1	3	6
No. wildlife managements	2	2	6	10
No. validation tags available (both seasons)	1000	1200	2600	4000
No. applications to the draw	1419	754	1466	2008
No. questionnaires returned	636	582	1168	1314
Percent of hunters who hunted	65	78	77	76
Average No. days hunted/hunter	3	4	3	3
Average No. birds heard/hunter	4	3	4	3
Average No. birds seen/hunter	5	6	7	5
Percent of hunter success	14	17	14	18
No. birds harvested	63	73	120	213
Adult birds: percent	54	63	57	53
mean weight (lb.)	19.0	18.6	19.8	19.3
weight range (lb.)	15.9-22.5	13.7-22.3	13.7-24.3	10.8-24.3
mean beard (in.)	9.0	8.1	9.1	9.2
beard range (in.)	7.5-10.6	3.9-10.8	2.7-12.5	0-11.6
mean spur (in.)	0.8	0.7	0.8	0.9
spur range (in.)	0.5-1.4	0.2-1.2	0.1-1.1	0-1.6
Juvenile birds: percent	46	37	43	47
mean weight (lb.)	14.6	14.1	14.6	14.3
weight range (lb.)	12.6-17.1	12.3-15.9	9.3-19.2	10.4-17.6
Average expenditure per hunter ($)	253	197	185	178
Percent novice hunters	94	50	61	47



O.F.A.H. FACT SHEET

1991 WILD TURKEY HUNTER SEMINARS

- Attendance at a Wild Turkey Hunter Seminar is MANDATORY prior to purchasing a tag to hunt wild turkeys for all first-time wild turkey hunters.
- These seminars will prepare hunters for the Ministry of Natural Resources' Wild Turkey Hunter Examination, given at the end of each seminar day. A certificate will be issued to each person passing the Examination. This certificate must be produced when purchasing a tag to hunt wild turkeys. Persons who hold a certificate from a previous seminar are not required to attend again.
- PLEASE PRE-REGISTER BY COMPLETING THE ATTACHED CARD AND MAILING IT TO THE ONTARIO FEDERATION OF ANGLERS AND HUNTERS AT LEAST 3 WEEKS PRIOR TO SEMINAR YOU WISH TO ATTEND.
- Hunters are advised that some seminars fill very quickly. Hunters whose pre-registration cards are received after their first choice seminar has filled will be asked to select another date.
- Wild Turkey Hunter seminars are free of charge and are scheduled to take place on the following dates in the locations specified, if enough interest is shown. All workshops run from 8:30 a.m. to 4:30 p.m.

Saturday, February 23 SIMCOE	**Sunday, March 10** ST. CATHARINES	**Saturday, April 6** BORDEN	**Sunday, April 14** TORONTO
Sunday, March 3 PETERBOROUGH	**Sunday, March 17** LONDON	**Sunday, April 7** WATERLOO	**Sunday, April 28** FRANKFORD

- Wild Turkey Hunter Seminars will be taught by experienced wild turkey hunters. These seminars are open to all persons interested in wild turkeys. ALL PERSONS INTERESTED IN ATTENDING A SEMINAR MUST PRE-REGISTER WITH THE ONTARIO FEDERATION OF ANGLERS AND HUNTERS AT LEAST 3 WEEKS PRIOR TO THE SEMINAR THEY WISH TO ATTEND. If a seminar is over-subscribed, preference will be given to those who have not taken the seminar previously and who intend to hunt.
- Wild Turkey Hunter Seminars will provide information on the natural history of wild turkeys, hunting safety and ethics, hunting regulations, hunting techniques, equipment and calling.
- Hunters will have the opportunity to purchase camouflage hunting clothing and turkey calls at the seminars.
- Sources of pre-registration cards are as follows:
  - Ministry of Natural Resources district offices in: Napanee, Cambridge, Simcoe, Huronia, Lindsay, Wingham, Chatham, Aylmer, Owen Sound, Maple and Fonthill;
  - Public Information Centre, Ministry of Natural Resources 99 Wellesley Street West, Toronto, M7A 1W3;
  - By calling the Ontario Federation of Anglers and Hunters.

The Ontario Federation of Anglers & Hunters
HEAD OFFICE-Box 2800, Peterborough, Ontario K9J 8L5
Telephone: (705) 748-6324 Fax: (705) 748-9577

1991 O.F.A.H. Wild Turkey Hunter Seminars

(Please print clearly) PRE-REGISTRATION CARD

Name: _____

Address: _____ City: _____

Postal Code _____ Phone (days) _____ (evenings) _____

NOTE TO HUNTERS:

1. Attendance at a seminar is MANDATORY for all first-time wild turkey hunters.
2. Attendance is not required by persons who hold a certificate from a previous seminar.
3. Your registration will be confirmed in writing by O.F.A.H. approximately 2 weeks before the seminar date.
4. The O.F.A.H. reserves the right to cancel any seminar due to insufficient pre-registration.

Please check (✓) desired date and location:

☐ **Saturday, February 23**-SIMCOE
Minden Manor, Queensway West

☐ **Sunday, March 3**-PETERBOROUGH
Sir Sandford Fleming College

All workshops run from 8:30 a.m.-4:30 p.m.

☐ **Sunday, March 10**-ST. CATHARINES
Brock University

☐ **Sunday, March 17**-LONDON
Fanshawe College

☐ **Saturday, April 6**-BORDEN
C.F.B. Borden
Would you like to purchase lunch at the base? Yes ☐ No ☐

☐ **Sunday, April 7**-WATERLOO
Waterloo Rod and Gun Club
Would you like to purchase lunch at the clubhouse? Yes ☐ No ☐

☐ **Sunday, April 14**-TORONTO
Macdonald Block, 900 Bay Street

☐ **Sunday, April 28**-FRANKFORD
Lower Trent Valley Fish & Game Club

South Dakota
1990 Turkey Status Report
by
Les Rice

Presented at 1991 Midwest Deer & Turkey Group Meeting
Springbrook State Park, Iowa

Due to timing of this meeting 1990 harvest data for Black Hills units cannot be presented at this time. Data analysis is currently being conducted. However, seasons went about as expected.

Spring Gobbler Seasons

The Black Hills spring season dates were April 7 through May 13. As in the past, unlimited license numbers were available for resident and nonresident hunters. License sale projections should be fairly stable for residents while nonresident numbers are expected to increase. Total hunter numbers are projected at approximately 3,000 hunters. Due to poor nesting success and/or brood numbers projected success should be static to decreasing and is estimated to be close to 35%.

The prairie spring gobbler season also ran from April 7 through May 13. A total of 27 units were open with 3,020 resident licenses available and 2,810 licenses sold. Nonresident licenses totaled 341. Projected overall success was 57% based on tags sold. Projected total gobbler harvest was 1,789 compared to 2,554 in 1989.

1990 was the third year South Dakota offered a spring statewide archery turkey season. Permit numbers were unlimited and 455 archers took advantage of the additional license opportunity compared to 490 in 1989. They killed 61 gobblers for a projected success of 13% compared to 105 gobblers harvested and 21% success in 1989.

Fall Either Sex Seasons

The Black Hills and priaire seasons ran from October 1 through December 9. Harvest data is unavailable at this time. Due to higher nesting success and/or brood survival, success should increase especially for Black Hills hunters.

Reproduction

The 1990 turkey brood survey information reflected better production this year. A total of 891 young and 150 adult hens were observed in the Black Hills. This 5.9 young/hen ratio was essentially the same as the 25 year average of 5.6 in the Black Hills. On the prairie 801 young and 222 adult hens were observed for a 3.6 young/hen ratio. This was better than the 3.0 observed last year but was not statistically different so reproduction on prairie areas continues to be poor.

Trapping

During the Winter of 1989-90 only 63 birds were trapped and relocated. These birds were primarily relocated on Indian reservations or willing landowners. In addition 13 Eastern turkeys obtained from Iowa were released in the Spink Hills area of Union County.

Winter Flock Count

The winter flock count by agency personnel was conducted during January and February of 1990. A total of 4,127 turkeys were observed in 81 different flocks. This was a decrease of approximately 5,000 birds from the 1989 survey. Average flock size was 18 birds per flock in the Black HIls and 55 on the prairie. Sex ratio was 65 toms/100 hens in the Black Hills and 50 toms/100 hens on the prairie.

Outlook

Harsh winters, late spring snow storms, and poor reproduction in 1983-85 substantially lowered our turkey population. Beginning in 1986, weather factors had turned in our favor. Three mild winters have helped our population. However, next success and/or brood survival has been poor for three years.

Beginning in 1988 we initiated a double tag season for some units on the prairie. Prices ($10) remained the same, but hunters could kill two birds on one license and could purchase up to two additional licenses. Nonresidents were also allowed to purchase prairie licenses. Season dates were expanded to cover the entire period of the antelope and deer season. In 1990 we offered double tags on the prairie for the fall season in select units. The proposed spring season for 1991 will go back to mostly single tags.

GF&P OFFICES

Information Office
445 East Capitol
Pierre, SD 57501
605/773-3485

Licensing
412 West Missouri
Pierre, SD 57501

5850 E. Highway 12
Aberdeen SD 57401
605/622-2391

HC 69, Box 7
Chamberlain SD 57325
605/734-5622

State Fairgrounds
Huron, SD 57350
605/353-7145

1019 E. Grand Crossing
Mobridge, SD 57601
605/845-7814

3305 W. South Street
Rapid City SD 57702
605/394-2391

517 West Tenth
Sioux Falls, SD 57104
605/339-6621

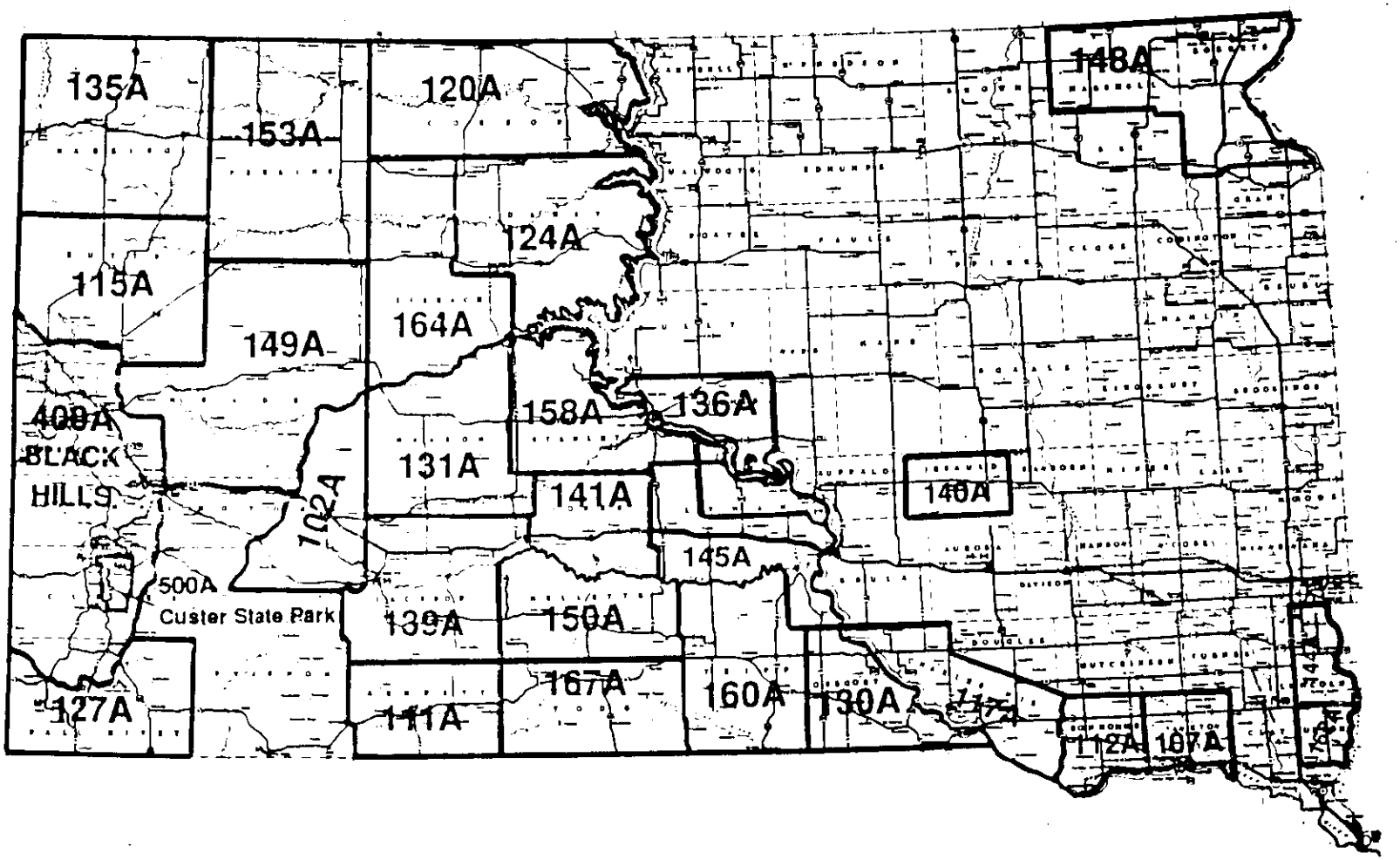
400 West Kemp
Watertown SD 57201
605/886-4769

603 E. 8th Avenue
Webster, SD 57274
605/345-3381

Custer State Park
HCR 83, Box 70
Custer, SD 57730
605/255-4515

OFFICE HOURS
Monday-Fri
8-12 a.m., 1

SPRING TURKEY UNITS



Units bordering the Cheyenne and White rivers also include an adjacent area one mile wide on the opposite side of the rivers.

GF&P OFFICES

Information Office
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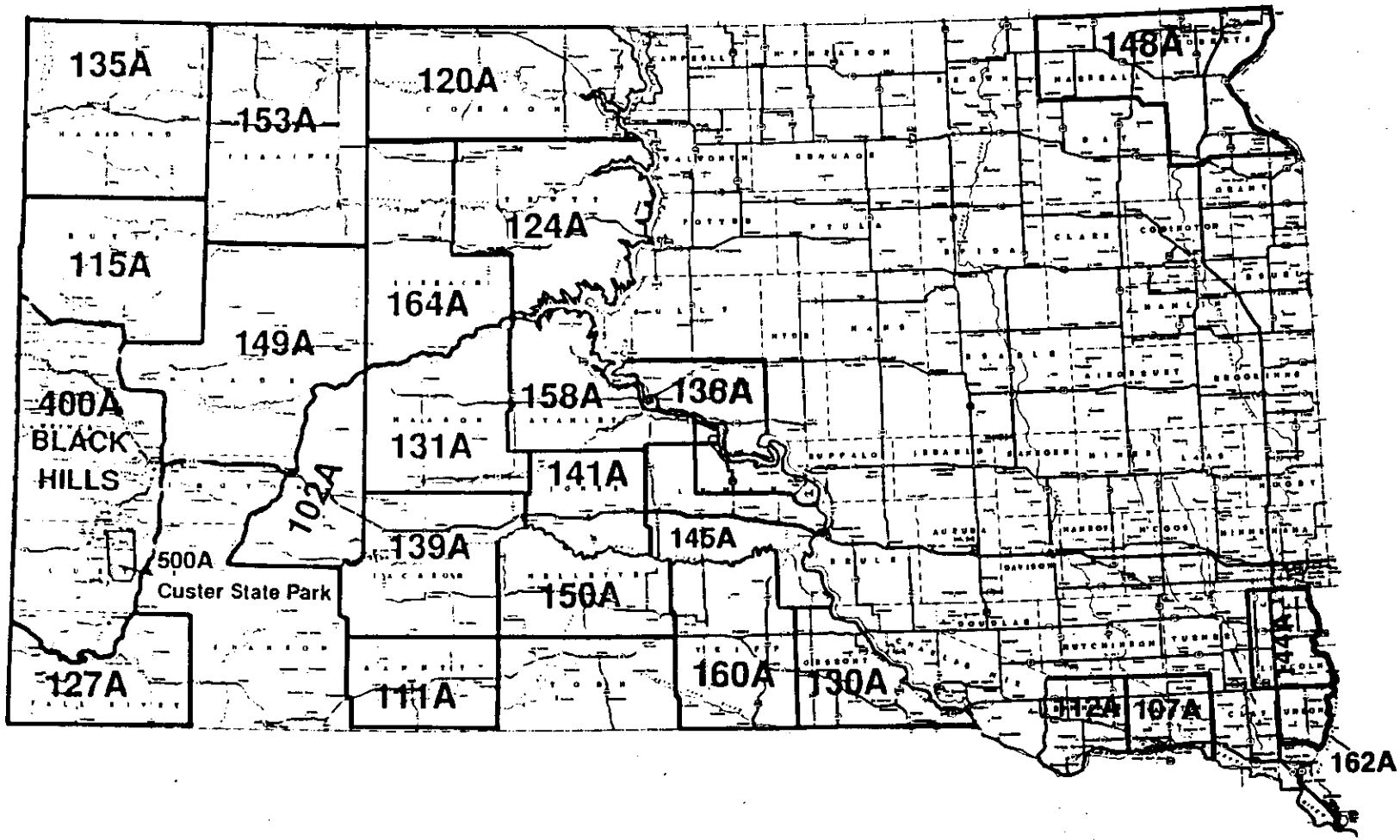
Sioux Falls, SD 57104
605/339-6621

400 West Kemp
Watertown, SD 57201
605/886-4769

603 E. 8th Avenue
Webster, SD 57274
605/345-3381

OFFICE HOURS
Monday-Friday
8 a.m.-12 Noon
1 p.m.-5 p.m.

FALL TURKEY UNITS



Units bordering the Cheyenne and White rivers also include an adjacent area one mile wide on the opposite side of the rivers.

WISCONSIN
1991 Wild Turkey Status Report
by
Ed Frank and John Kubisiak

Restoration

Wild turkeys are now present in 40 counties, mostly in the southern half of the state. In 1989-90, 178 turkeys were trapped and transferred to 10 release sites including two new counties. Wisconsin exported 91 turkeys to North Carolina and 45 to Michigan last winter. We have trapped and transferred a couple hundred turkeys already this winter (1990-91). Wisconsin's best range now has turkeys (Fig. 1). The future is likely to be a learning experience as we move toward completing our wild turkey trap and transfer program.

The 1990 Spring Hunt

Wisconsin held its eighth consecutive spring gobbler season in 1990 (Table 1). There were 2 accidental shooting incidents. Both were nonfatal, mistaken for game incidents, at 70 and 85 yards.

A total of 29,877 permits were issued to approximately 33,000 applicants. In 1990, Wisconsin went from 4 to 6 consecutive Wednesday through Sunday permit periods starting April 11 and ending May 20. Approximately 80 percent of permit holders actually hunt. Hunting pressure is well distributed from Wednesday through Saturday and tails off on Sundays. We do not issue more than 3 permits per square mile of timber per time period except for the research project area. Cumulative hunting pressure ranged from 8.8 to 14.9 permits per mile square of timber in the 7 zones with the most turkeys and reached 21.2 in our research zone.

Total season harvests ranged form 1.5 to 4.4 bearded turkeys per square mile of timber in the 7 zones with the most turkeys (registration data). Total season success rates ranged from 16-29 percent in the 7 zones and averaged 22 percent for all zones. In 1990, 72 percent of the harvest consisted of adult gobblers compared to a range of 61-65 percent from 1985-1989. We took this as further proof that recruitment to the population was below normal in 1989.

Recruitment

The southwest Wisconsin ratio of poults per hen, reported June through August by rural residents, was 3.18 in 1989, 3.35 in 1990 and 3.95 in 1988.

The 1990 Fall Hunt

Wisconsin held its second consecutive fall either sex turkey hunt in 1990 (Table 2). There was one shooting accident in fall 1990 in which a squirrel hunter shot his partner who was hunting turkeys. The turkey hunter had moved from his original location and was fatally shot in the head at 13 yards with no. 6 shot when movement at the edge of a tree trunk was mistaken for a squirrel.

A total of 12,465 permits was issued to approximately 25,000 applicants. Wisconsin went from three consecutive Wednesday-Sunday permit periods in 1989 to three consecutive Monday-Sunday permit periods in 1990. Our fall season started October 8 and ended October 28. Hunting pressure within the 7-day permit period was well distributed with Wednesday having the lowest and Saturday the highest rate of participation. We issued a maximum of 3 permits per square mile of timber per time period, except in the research project area. While there is no doubt some aging and sexing error in our fall harvest data, adult males made up 22 percent, adult females 30 percent and juveniles 48 percent of the harvest. In fall, 1989, adult males made up 29 percent, adult females 26 percent and juveniles 45 percent of the fall harvest. Only 12 of the 19 zones open to spring hunting were open for fall hunting in 1990.

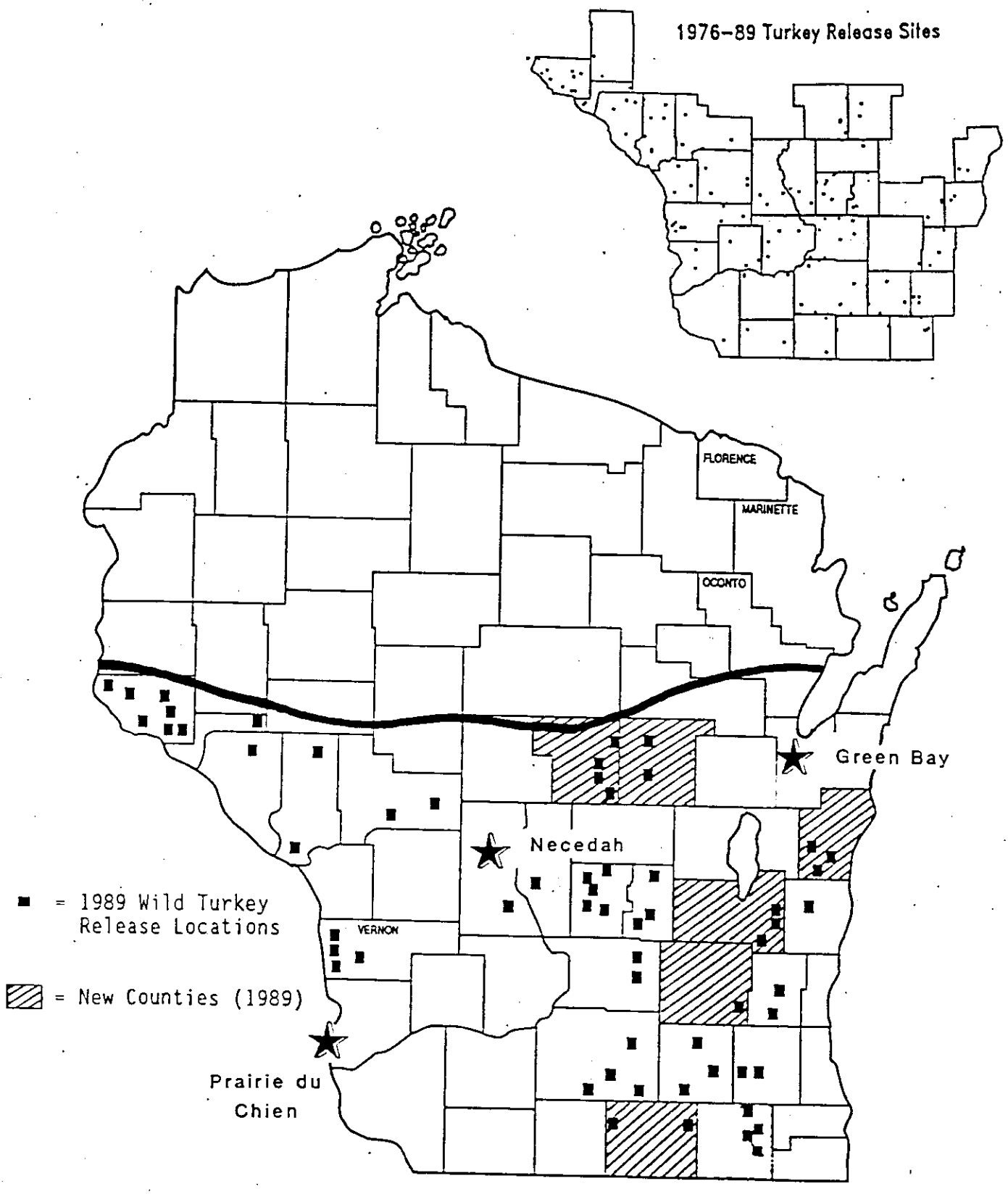


Figure 1. Proposed wild turkey stocking zone line. Additional stocking may be south of this line depending on how recommended sites meet or exceed the criteria specified by the DNR Wild Turkey Committee.

Table 1 2. 1990 Spring Wild Turkey Season Summary

NUMBER OF TURKEYS HARVESTED AND HUNTER SUCCESS (in parentheses) - 1990

	Time period							Number of
Zone	1	2	3	4	5	6	Total	Permits
1	38 (19)	42 (21)	31 (16)	29 (15)	5 (5)	4 (7)	149 (16)	948
1a	66 (23)	58 (21)	50 (18)	45 (16)	38 (14)	0 (0)	257 (17)	1484
2	223 (34)	228 (35)	221 (33)	192 (29)	167 (25)	98 (18)	1129 (29)	3829
3	269 (30)	242 (27)	213 (24)	171 (19)	91 (15)	20 (7)	1005 (22)	4470
4	230 (38)	184 (31)	199 (33)	172 (29)	140 (23)	103 (17)	1028 (29)	3600
5	70 (23)	61 (20)	57 (19)	47 (16)	29 (10)	14 (8)	278 (17)	1674
6	60 (20)	53 (18)	43 (14)	26 (9)	18 (8)	5 (16)	205 (14)	1462
7	65 (26)	60 (24)	43 (17)	51 (20)	36 (19)	7 (9)	262 (21)	1271
8	35 (14)	66 (26)	63 (25)	32 (13)	20 (20)	3 (6)	219 (19)	1154
9	32 (18)	20 (11)	13 (7)	13 (7)	13 (7)	8 (5)	99 (9)	1049
10	135 (39)	116 (33)	104 (30)	91 (26)	54 (15)	25 (19)	525 (28)	1881
11	94 (31)	59 (20)	70 (23)	51 (18)	10 (9)	6 (8)	290 (21)	1371
12	48 (24)	44 (22)	49 (25)	31 (16)	18 (11)	2 (3)	192 (19)	1037
13	55 (28)	42 (21)	38 (19)	11 (12)	4 (7)	2 (13)	152 (20)	764
14	24 (25)	16 (16)	10 (10)	12 (12)	5 (7)	0 (0)	67 (14)	488
15	49 (33)	38 (25)	23 (15)	35 (23)	5 (11)	1 (7)	151 (23)	662
30	28 (37)	27 (36)	19 (25)	12 (16)	5 (7)	9 (12)	100 (22)	450
31	63 (32)	57 (29)	55 (28)	34 (17)	22 (11)	17 (9)	248 (21)	1200
32	43 (29)	23 (15)	24 (16)	21 (14)	5 (3)	6 (4)	122 (14)	902
Ft McCoy							22 (12)	181
UNK							23	
Total	1627 (29)	1436 (25)	1325 (24)	1077 (20)	685 (15)	328 (12)	6523 (22)	29877

Table 2 3. 1990 Fall Wild Turkey Season Summary

Turkey Harvest, by zone and time period, (success rate uncorrected for non-active hunters).

	Period				
Zone	1	2	3	Total	Permits
1	45 (25)	36 (20)	22 (12)	103 (24)	540
1A	72 (24)	67 (22)	56 (19)	195 (22)	900
2	206 (41)	158 (32)	170 (34)	534 (36)	1500
3	273 (32)	204 (24)	188 (22)	665 (26)	2550
4	322 (40)	264 (33)	249 (31)	835 (35)	2400
5	51 (20)	43 (17)	39 (16)	133 (18)	750
9	19 (13)	19 (13)	15 (10)	53 (12)	450
10	147 (37)	144 (36)	115 (29)	406 (34)	1200
11	76 (34)	48 (21)	64 (28)	188 (28)	675
12	36 (24)	33 (22)	20 (13)	89 (20)	450
31	56 (28)	49 (25)	33 (17)	138 (23)	600
32	41 (27)	23 (15)	25 (17)	89 (20)	450
TOTAL	1,344 (32)	1,088 (26)	996 (24)	3,433*(28)	12,465

* 5 Turkeys were registered with zone and period unknown.

RESEARCH UPDATE: WISCONSIN

TITLE: Wild Turkey Populations and Management. Incorporates NWTF Grant-In-Aid Study "Optimization of Turkey Hunting Opportunity Considering Turkey Population Dynamics, Hunter Satisfaction, and Landowner Tolerances"

Objectives:

1. Determine landowner perceptions and tolerances of crop damage by turkeys and assess the real economic losses attributable to turkeys versus other causes.

2. Determine the impact of different exploitation levels during spring and fall hunts on the size and population dynamics of turkey populations.

3. Determine the effect of specific hunter densities during spring and fall hunts on hunter satisfaction, perceptions of crowding, and hunt quality and tolerance of turkey hunters by private landowners.

4. Develop a population model to predict population trends occurring at different exploitation levels and hunter densities.

5. Develop habitat suitability criteria appropriate to the Wisconsin range.

Food Habits. Summer crop contents were analyzed from 4 adult hens and 30 poults collected in agricultural fields in southwestern Wisconsin in 1988-90. Cultivated plant parts, insects, and wild plants comprised 73, 17, and 10%, respectively, of the aggregate volume of the crop contents of adult hens. In comparison, insects, principally, grasshoppers, seeds and leaves of cultivated plants, and wild plant parts comprised 72, 27, and 1%, respectively of the aggregate volume of the crop contents of poults.

Useable crop samples were also collected from 199 turkeys shot during the 1989-90 fall hunts in southwestern Wisconsin. Parts of cultivated plants, wild plants, and animal matter, principally insects comprised 45, 42, and 13%, respectively, of the aggregate volume of the crop contents. Among poults, animal matter, principally insects, cultivated plant parts, and wild plants comprised 72, 27, and 1%, respectively, of the aggregate volume of the crop contents. In comparison, cultivated plant parts, principally waste grain, animal matter, and wild plant parts comprised 73, 17, and 10%, respectively, of the aggregate volume of the crop contents among adults. Corn, principally waste grain, was the single most important food utilized comprising 37% of the diet.

Survival, movement, and causes of mortality. Seventy-two hens, including 53 adults and 19 subadults were fitted with radio-transmitters and released from 1-24 February 1990. Another 13 hens radio-tagged in 1989 remained alive on 24 February 1990, the last day birds were captured and radio-tagged. Hen survival was lowest in spring and higher during the remainder of the year (Fig. 1). Annual survival was higher in 1988-89 than in 1989-90 and probably reflects higher summer survival in 1988. Movements from release sites to kill location averaged 1.5 (0.2-10.9)

miles among 73 hens and 1.7 (0.2-5.6) miles among 19 gobblers since 1988. Of 85 radioed turkeys recovered since 19 January 1988, most (50) were killed by predators. Among those 50 losses, 69% could be classified as mammalian predation involving either coyote or fox.

Hen Success. Of 163 (107 adult and 56 subadult) hens radio-tagged during 3 winters, 117 (84 adult and 33 subadult) survived to the date nesting was initiated. The earliest date of nest initiation for 1988, 1989, and 1990 was 22, 15, and 11 April, respectively. During 1988-90, only 6% of 33 subadult hens successfully nested compared to 20% of 84 adults. All subadults were unsuccessful in 1989 and 1990 despite high nesting rates (Table 1).

Poult/Hen Ratios. Results of a mail survey to about 4,500 landowners indicated the poult/hen ratio increased from 3.2 $\pm$ 0.01 in 1989 to 3.3 $\pm$ 0.01 in 1990 in the 7 counties surveyed both years (Fig. 2). Forty-nine percent of the hens were accompanied by poults in 1989 and 1990. Results included observations of 1-3 hens with 1-15 poults and groups of 1-8 hens without poults.

Harvest Levels. Live-trapping was conducted without success in Zone 1a (Fig. 2) during August-September 1989-90 as abundant natural foods reduced the attractiveness of bait. Adults occurred in greater proportions than expected in the fall kill, comprising 59% in 1990 and 63% in 1989. These results suggested poor recruitment and this was further substantiated as adult gobblers comprised 80% of the spring 1990 kill.

Turkey Numbers. Deer hunters reported an average of 2.8 (0.2-12.1) turkeys seen/hunter-day and turkeys were seen on 44% (10-84) of the hunter-days among 2,600 respondents of 10,000 deer hunters surveyed in 1989. This compares to 3.0 (0.1-16.2) turkeys seen/hunter-day and turkeys seen on 39% (7-83) of the hunter-days among 2,366 respondents in 1988. Results of the 1990 survey remain to be analyzed. Results of this survey will be compared to aerial counts to determine the validity of the deer hunter turkey observation index as an estimator of turkey numbers. The helicopter count of turkeys in winter 1990 was not conducted due to unsatisfactory snow conditions.

Hunter and Landowner Surveys. Mail surveys to hunters were conducted during fall 1989 and spring 1990 to determine the effect of a higher hunter density in the experimental area (EA; Fig. 2 - Zone 1A in Vernon County) on hunter satisfaction, perceptions of crowding, and hunting quality. Comparative statistics were obtained in the control area (CA - Zone 2 and 3 in Crawford and Richland County). Four hunting permits were issued/mile^2 of commercial timber/hunting period during fall 1989 and spring 1990 in the EA and 1.2 permits were issued/mile^2 of commercial timber/hunting period in the CA. The number of permits available in spring 1990 averaged 4.0/mile^2 in the EA and 2.0 in the CA. However, hunting during six time periods was initiated in spring 1990 (versus 4 in 1989). There were more permits than applicants during time period six (May 16-20) and the average number of permits issued was somewhat lower, averaging 1.3/mile^2 in the EA and 1.2 in the CA. A mail survey of landowners was conducted during fall 1989, but it was not repeated in 1990 because the same individuals would have been sampled.

Hunter Satisfaction - 1989 Fall Hunt. The overall quality of the fall 1989 hunt was similar to spring 1989 on both the EA and CA. Most hunters did not feel

crowded and very few indicated that other hunters interfered with their chance to bag a bird. Forty-one percent of the hunters rated the overall quality of their hunt fairly to very high in the EA compared to 44% in the CA. Eighty-nine percent of the hunters reported feeling not at all crowded in the EA compared to 92% in the CA. Only 9% of the hunters indicated other hunters interfered with their chance to bag a bird in the EA compared to 7% in the CA. Only thirteen percent of the hunters were refused hunting permission in both the EA and CA. Hunting success averaged 26% in the EA and 23% in the CA. The number of turkeys killed/mile^2 of timber was 3.1 in the EA compared to 0.8 in the CA.

Landowner Tolerance. The 1989 fall landowner survey indicated that the proportion of landowners allowing turkey hunters on their land in fall was similar to spring, but a lower proportion refused hunting permission and were aware of persons hunting without permission on their land in fall. Ninety-six percent allowed turkey hunters on their land in the EA compared to 90% in the CA, while 20% refused turkey hunting permission in the EA compared to only 6% in the CA. Twenty-four percent were aware of persons hunting without permission on their land in the EA compared to 21% in the CA. Turkey hunters were rated above average by 36% of the respondents in the EA and 29% in the CA.

Hunter Satisfaction - 1990 Spring Hunt. Results of mail surveys to hunters indicate that the overall hunt quality was good. Only 2% of the hunters reported seeing more than 5 hunters on the first day they hunted in both the EA and CA. Fifty-eight percent reported feeling not at all crowded in the EA compared to 64% in the CA. Forty percent rated the overall quality of their hunt as fairly to very high in the EA compared to 50% in the CA. Only fifteen percent of the hunters in the EA indicated other hunters interfered with their chance to bag a bird compared to 11% in the CA. Twenty-two percent of the hunters were refused hunting permission in the EA compared to 15% in the CA. Hunting success based on the total number of permits issued averaged 17% in the EA and 26% in CA. The number of turkeys killed/mile^2 of timber was 3.7 in the EA compared to 3.1 in the CA.

1990 Fall Hunt. Results of surveys remain to be analyzed.

Prepared by: John Kubisiak, Neal Paisley, and Bob Wright
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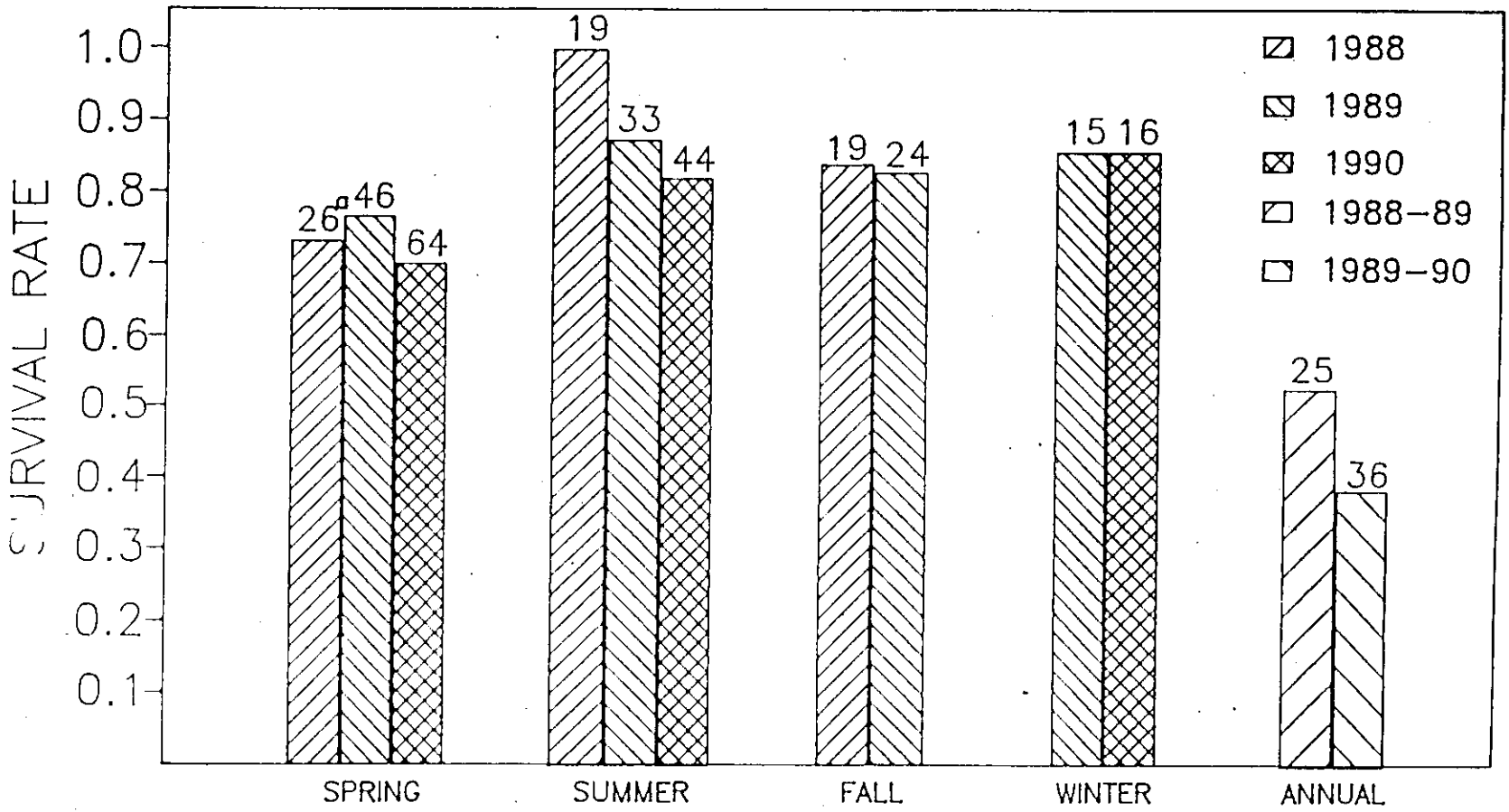
Table 1. Nesting summary of radio-marked wild turkey hens in Zone 1A, Vernon County, Wisconsin, 1988-1990.

	No. Hens			Nesting Rate[a]			Hen Success[b]		
	1988	1989	1990	1988	1989	1990	1988	1989	1990
Adult	10	29	45	80	79	82	36	17	27
Subadult	13	12	8	62	92	63	25	0	0
Combined	23	41	53	74	83	79	29 (22)[c]	12 (10)	24 (19)

[a] Percentage of hens attempting to nest.

[b] Percentage of attempting hens that produced a brood.

[c] Percentage of all hens that produced a brood.



[a] Beginning sample size.

Fig. 1. Seasonal and annual survival rates of radio-marked wild turkey hens in southwestern Wisconsin. (Spring = 15 Mar–15 Jun, summer = 16 Jun–31 Aug, fall = 1 Sep–30 Nov, winter = 1 Dec–14 Mar, annual = 15 Mar–14 Mar.)

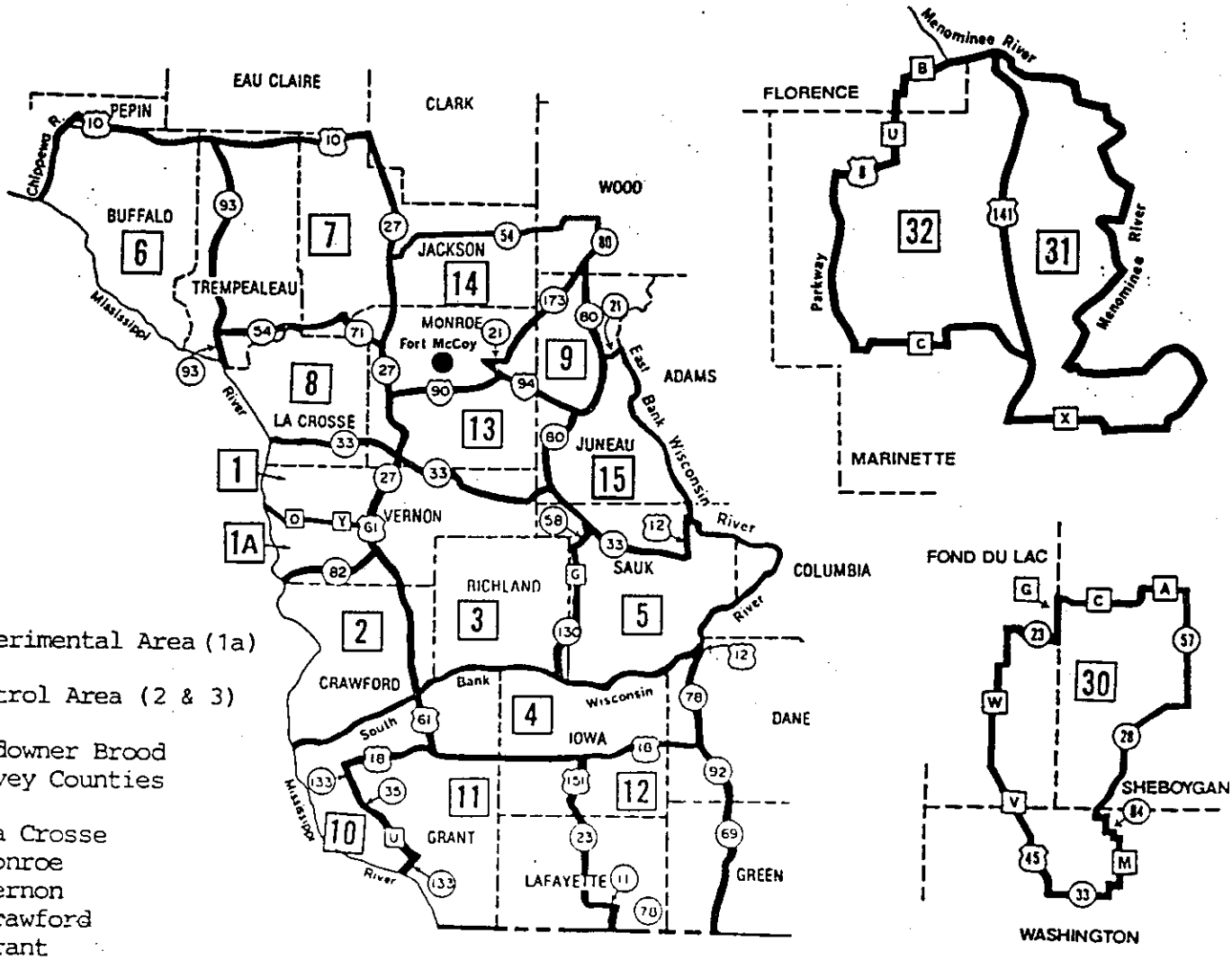
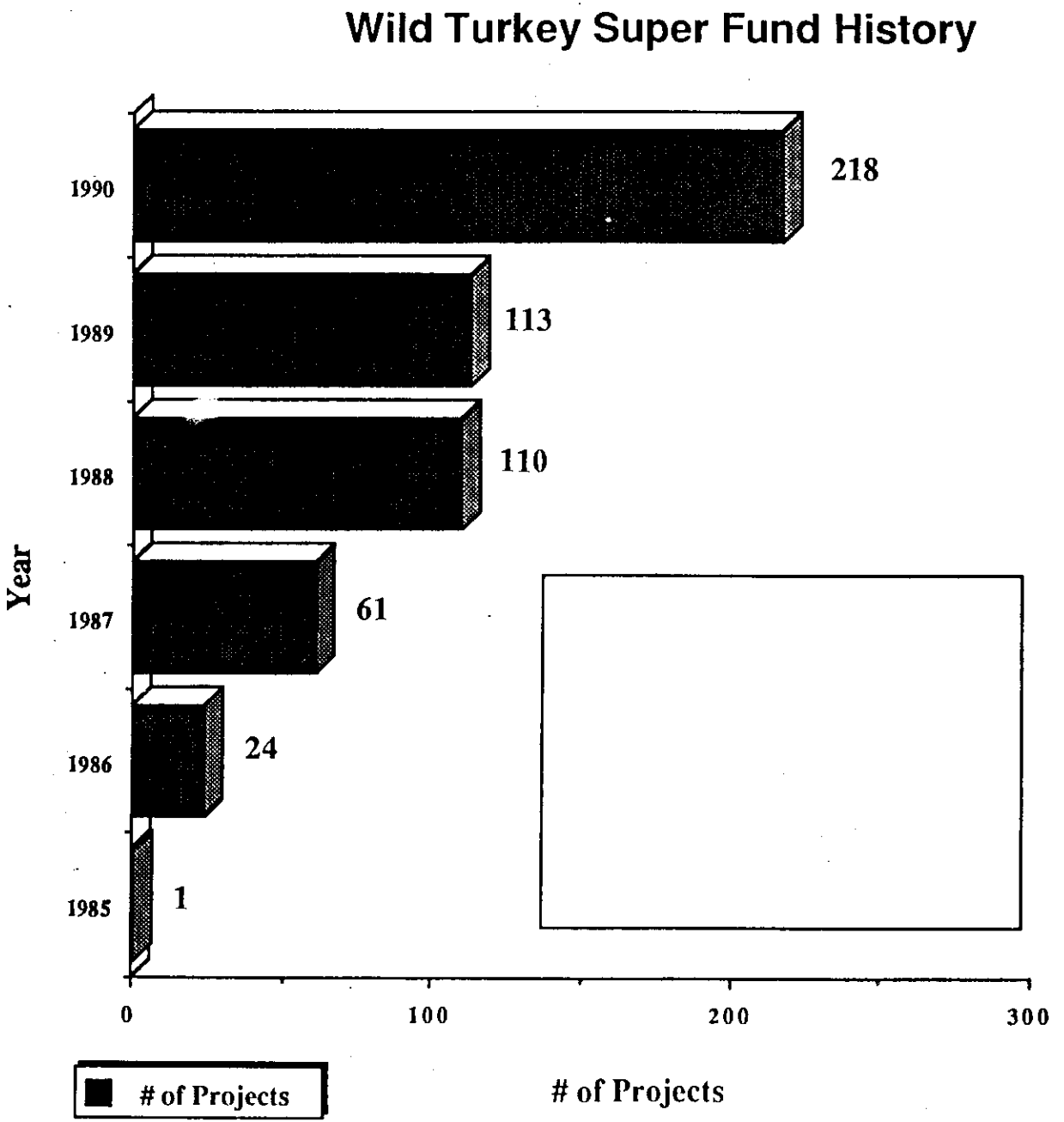
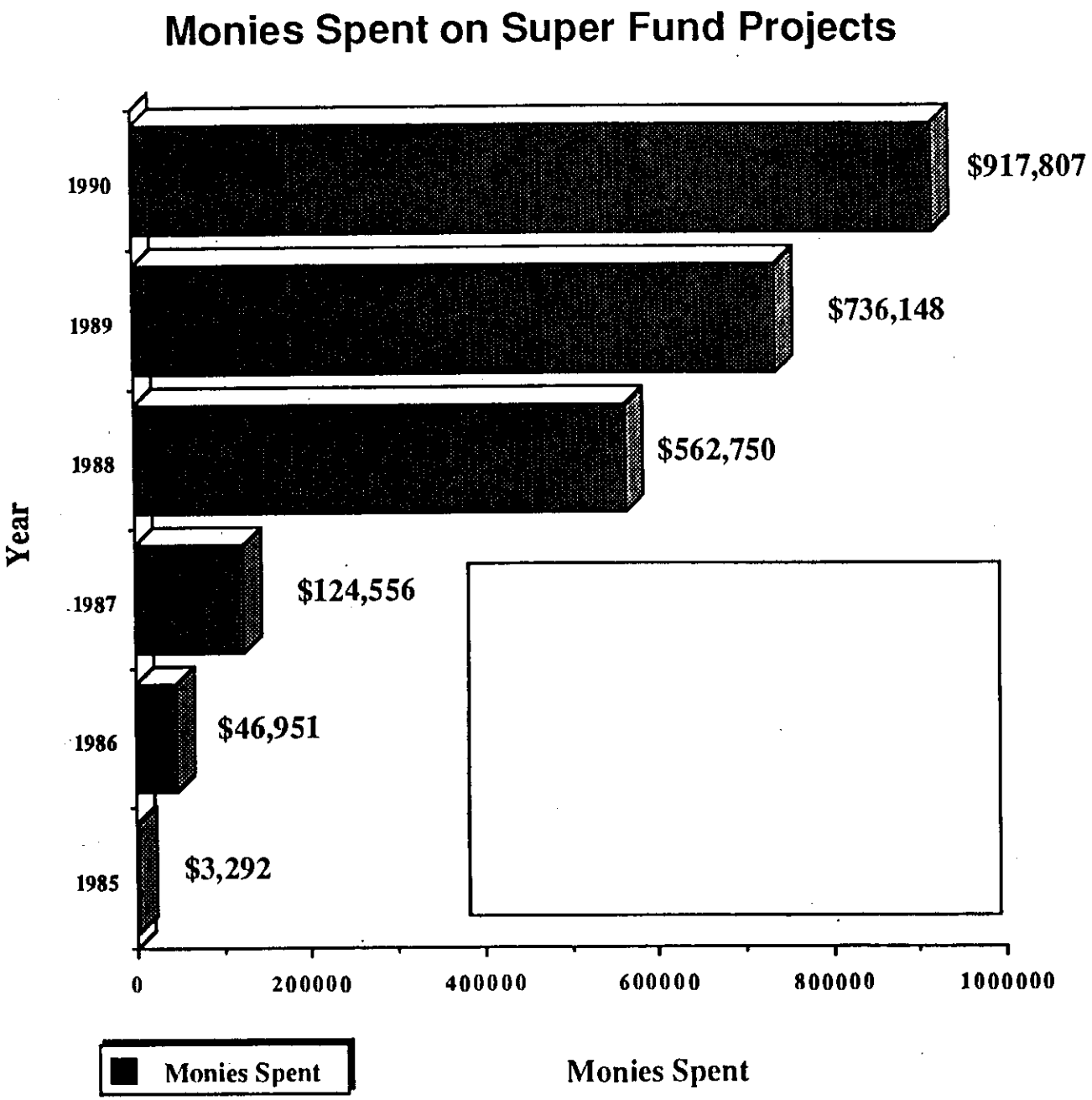
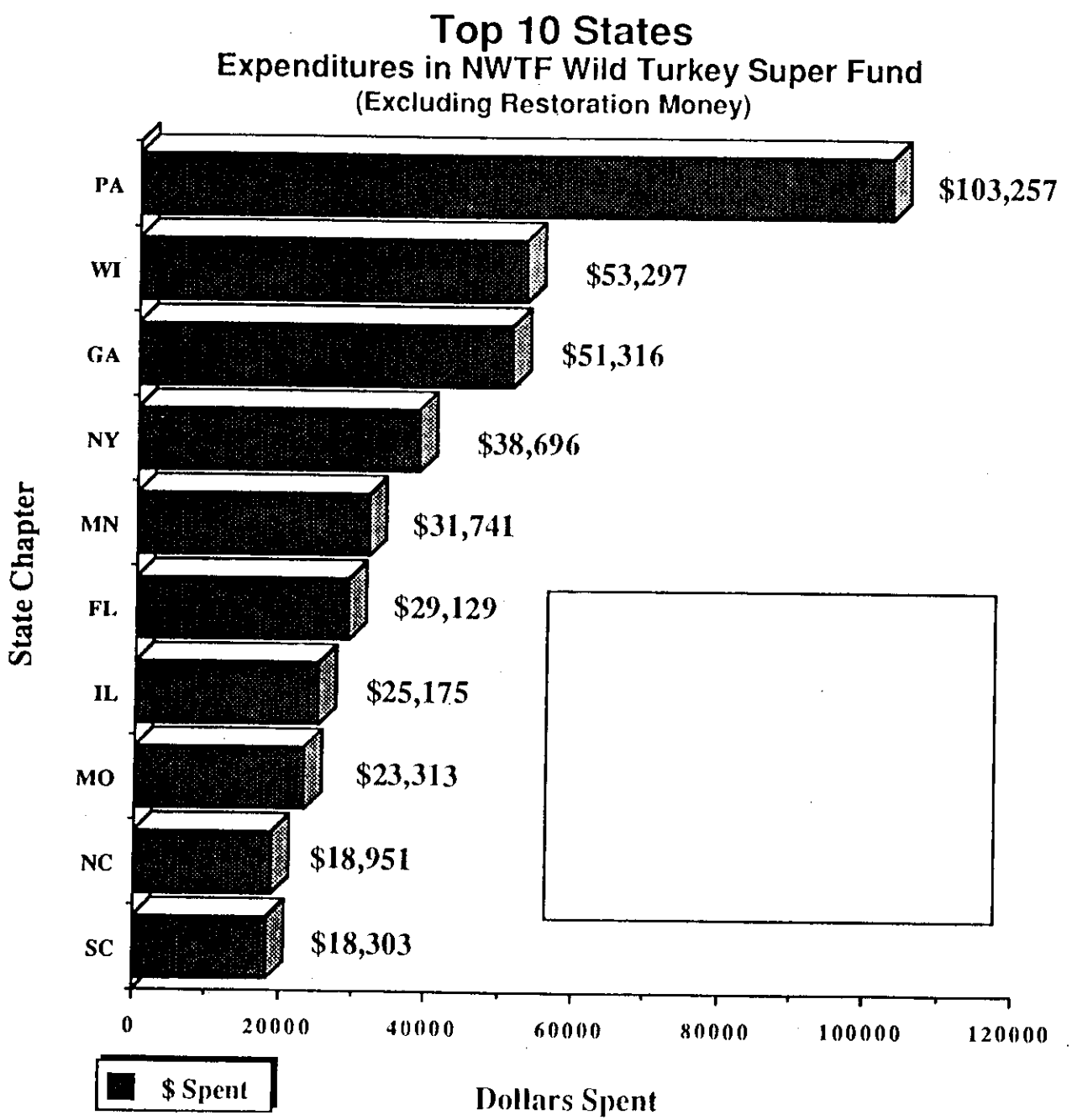


Figure 2. Distribution of Wild Turkey Research and Spring 1990 Hunting Zones


Wild Turkey Super Fund History
1990
1989
1988
1987
1986
1985
218
113
110
61
24
1
Year
0
100
200
300
# of Projects
# of Projects


Monies Spent on Super Fund Projects
Year
1990
1989
1988
1987
1986
1985
$917,807
$736,148
$562,750
$124,556
$46,951
$3,292
0
200000
400000
600000
800000
1000000
Monies Spent
Monies Spent


Top 10 States
Expenditures in NWTF Wild Turkey Super Fund
(Excluding Restoration Money)
PA
WI
GA
NY
MN
FL
IL
MO
NC
SC
$103,257
$53,297
$51,316
$38,696
$31,741
$29,129
$25,175
$23,313
$18,951
$18,303
State Chapter
0
20000
40000
60000
80000
100000
120000
$ Spent
Dollars Spent