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IOWA WILDLIFE RESEARCH BULLETIN NO. 34

Deer in Iowa - 1982

Annual Progress Report
Wildlife Research and Surveys Project
Federal Aid Project No. W-115-R

Phase D. Study No. 13
Job No. 1: Deer Harvest Survey

Phase D. Study No. 15
Job No. 1: Winter Population Estimate
Job No. 2: Miscellaneous Mortality Survey
Job No. 3: Winter aerial survey
Job No. 4: Sex and Age Ratio Survey

by

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ABSTRACT

The 1982 estimated harvest of 26,461 deer was a new record high for Iowa. Shotgun hunters accounted for 21,741 deer while archers bagged 4,720. Higher any-sex license quotas, increased license issue, and a high deer population were responsible for the increased harvest. There were 74,322 paid shotgun, 15,425 free landowner-tenant, and 18,824 archery licenses issued. Paid shotgun any-sex hunters averaged 59% success for both seasons compared to 41% for landowner-tenants. Paid shotgun bucks-only hunters averaged 20% success while landowner-tenants reported 21%. Success rates between the two seasons were nearly equal. Bowhunters reported a success rate of 26% which is comparable to the past few years. About 4,000 hunters reported they hunted with muzzleloading rifles, and they reported lower success rates than hunters using shotguns. The season provided about 1/2 million days of hunting recreation. Mean expectation of life for does, calculated from a sample of deer teeth sent in by any-sex hunters, was generally comparable to previous years. A sample of any-sex hunters reported that 47% of their harvest was composed of adult does, 37% fawns, and 16% adult bucks. There were 4,805 deer reported killed in deer-vehicle accidents which represents a 13% increase from 1981. Winter population estimates made by conservation officers indicated a 14% increase over the previous year. The first year of the aerial deer survey was partially successful with 65 counties completed. Future deer population trends will be determined from this new survey.

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INTRODUCTION

Deer management in Iowa is characterized by a high interest in hunting recreation and the need to control deer numbers to minimize landowner complaints about deer damage. Proper regulation of legal harvest is the primary management tool utilized to manipulate deer populations to meet management goals. Quotas on any-sex shotgun licenses in 10 geographical areas are used to maintain a stable to slightly increasing trend in the deer population. Annual population surveys (traffic kill, winter population estimate, and aerial count) are conducted to provide deer population trend information. Harvest results are calculated from post-season hunter report cards to help evaluate effects of the hunting season. Hunter report cards also provide information on hunter success rates, hunter effort, sex ratio of deer harvested, and crippling rate. Age composition of the harvest is determined from deer teeth submitted by a sample of hunters with any-sex licenses. This age data is utilized to calculate the mean expectation of life for deer and to document changes in age ratios. Results of the 1982 hunter post-card survey and annual population trend indicators are reported in this bulletin.

HUNTING SEASON REGULATIONS

Two separate shotgun seasons were held in 1982 with the first held from 4-7 December and the second from 11-17 December. Shotgun hunters were allowed to apply for a combination of 1 season and 1 of 10 hunting zones (Fig. 1). Twice as many any-sex licenses were issued for the second season to help equalize hunter numbers, harvest, and success rates. Any-sex licenses were issued by randomized computer drawing from valid applications containing certificates issued to bucks-only license recipients in 1981. About 46% of the hunters receiving certificates in 1981 returned them with their 1982 applications. If the any-sex quota for any zone and season combination could not be filled from applications with certificates, they were filled by random drawing from noncertificate holders. All unsuccessful applicants in the any-sex license drawing received a bucks-only license valid statewide. These bucks-only hunters were also issued a certificate granting them preference in the 1983 random drawing for any-sex licenses. Landowner-tenants were issued free shotgun licenses at the same bucks-only to any-sex license ratio as determined by the application rates of paid shotgun hunters in each zone and season combination. All other regulations remained the same as in previous years.

The bow season was 56 days long, opening on 9 October and closing on 3 December. Bow licenses could be purchased from all county recorders and from the Iowa Conservation Commission license section. No other changes were made in the bow regulations compared to previous years.

HUNTING SEASON RESULTS

Hunter Report Card Survey

A post-season hunter report card was sent to 30% of the licensed hunters (25% of the paid shotgun hunters and 53% of the landowner-tenants) to obtain information on harvest, success rate, sex ratio, hunting effort, crippling rate, and area hunted. A reminder questionnaire was sent to hunters not responding to the first mailing within 1 month. Harvest results of nonrespondents were estimated by assigning them the same success rates as those returning the reminder mailing. Success rates were calculated on the basis of active hunters only. Post-season report cards were also sent to 2,010 archers of which 74% returned complete information.

License Issue

There were 74,322 paid shotgun licenses issued in 1982 (Table 1), a 7% increase from 1981. This is a record high paid shotgun license issue and continues the upward trend in license sales since the license fee increase in 1978. In addition, 15,425 free landowner-tenant licenses were issued, a 10% increase from 1981. Landowner-tenant license issue has increased each of the past 4 seasons. Increased license issue was probably due to favorable publicity about high deer population levels and increased interest in the sport of deer hunting. About 63% of all shotgun licenses were issued for the first season. The highest-bucks-only to any-sex license ratio (14/1) occurred in hunting zone 7 during the first season (Table 2). Bucks-only to any-sex ratios were much lower in all zones during the second season because of higher any-sex license quotas.

There also were 18,824 archery licenses issued in 1982 (Table 3), an increase of 9% from 1981. This is a new record high archery license issue and continues the upward trend in demand for this sport. About 39% or 7,300 archers reported that they also purchased a shotgun permit.

Harvest

A new record high deer harvest was reported in 1982 with an estimated 26,461 deer bagged. This is an increase of 2% from the 1981 harvest of 25,946 deer. This is the third straight year that new record high harvests have been reported. Higher any-sex license quotas, increased license issue, and a high deer population were responsible for the increased harvest. These factors were able to overcome low first season hunter success rates caused by cold and wet weather conditions. An estimated 21,741 (± 678) deer were harvested by shotgun hunters with 11,717 (± 599) taken the first season and 10,024 (± 317) taken the second. The second season harvest was close to the first season harvest in spite of only 37% of the hunters hunting that season. Twice as many any-sex licenses and good hunting conditions maintained good second season hunter success rates. Shotgun hunter harvest and success rates varied by zone and season (Table 4). The highest regional harvest was reported in hunting zone 5 (3295) followed closely by 6 (3034) and 4 (2956). Archers harvested an additional 4,720 (± 456) deer which was a new record high harvest. Increased hunter numbers and high deer populations were responsible for this new record.

Distribution of the harvest by day of the season was estimated from deer tooth envelopes returned by successful hunters. Most of the deer harvested were taken on weekends (Table 5). The weather on the opening weekend was responsible for the lower take in 1982 (57%) compared to 1981 (69%). The second weekend opener was about the same for both years with half the deer taken during weekend days and the remainder on weekdays.

Hunter Success

Both bucks-only and any-sex shotgun hunter success rates were lower during the first season and generally higher during the second season compared to 1981 (Table 6). In 1982, second season paid bucks-only shotgun hunters had a higher success rate than first season hunters for the first time since two seasons were initiated in 1975. However, in all other license categories, the first season success rates were higher than second season. Weather was a critical factor in hunter success rates.

Paid shotgun any-sex hunters averaged 59% success for both seasons compared to 41% for landowner-tenants (Table 1). Paid shotgun bucks-only hunters averaged 20% while landowner-tenants reported a 21% success rate. The highest shotgun success rates were reported in northern Iowa (hunting zones 1, 2, and 10) (Table 4) probably because of the high vulnerability of deer in limited timber habitat. Bow hunter success was 26% which is the same as the past few years.

Another measure of hunter success is the number of hours of hunting required to harvest a deer. Paid bucks-only shotgun hunters averaged 102 hours of hunting to bag a deer compared to 92 hours in 1981 and 101 hours in 1980. Paid any-sex shotgun hunters averaged 37 hours of hunting to bag a deer compared to 39 hours in 1981 and 40 in 1980. Archers required 215 hours of hunting to bag a deer in 1982 which is better than in 1981 (243 hours). This was accomplished in spite of a later corn harvest that was comparable to the late corn harvest of 1981.

Sex Ratio of the Harvest

An estimated 6,301 does were harvested by shotgun hunters compared to 5,157 in 1981. This increased doe harvest was primarily due to higher any-sex license quotas. An additional 1,548 does were harvested by archers for a total of 7,849 (Table 7). Does accounted for 66% of the shotgun any-sex harvest while 33% of the archers reported harvesting does. Does accounted for about 30% of the total harvest.

Hunter Effort

A larger number of hunters stayed home during the first season compared to 1981 (Table 8). However, second season did not hunt rates were comparable to the previous year. Again, bad weather was the primary factor in lower hunter effort. Free landowner-tenant hunters continued their high rate of not hunting with only about half of those hunters with bucks-only licenses in the field during the second season. Approximately the same percentage of licensed paid shotgun hunters were in the field each season during 1982. In the landowner-tenant categories, a higher rate of did not hunts was reported during the second season compared to the first.

Those hunters that entered the field in 1982 hunted about as long as they did in 1981 (Table 9). The higher number of days and hours hunted by second season hunters indicates that they did take advantage of the extra days available during that season. The deer season provided about 1/2 million days of hunting recreation with shotgun hunters in the field for 242,000 days and archers about 281,000 days. Hunters obtain over 2 1/2 million hours of recreation from the season.

Crippling Rate

In 1982, about 9% of the shotgun hunters reported crippling a deer. Crippling rates were slightly higher during the second season (10%) compared to the first (9%). Paid shotgun hunters

reported a higher crippling rate (10%) than free landowner-tenants (6%). About 14% of the archers reported they crippled a deer during the season. A new crippling estimate technique was used in 1982 which generally lowered crippling rates compared to previous seasons. Crippled deer may recover from their wounds or are harvested by other hunters and therefore, only a portion of them can be considered a loss in addition to legal harvest.

Muzzleloader Use

About 4,000 hunters indicated they used a muzzleloader rifle during the 1982 deer season. Bucks-only hunters using only muzzleloaders had a success rate of 15% compared to 20% for bucks-only shotgun hunters. Lower success rates were also apparent for any-sex license holders with a reported 45% success rate for muzzleloader hunters compared to 56% for shotgun hunters. Reported crippling rate for those using only muzzleloaders was 8% which is slightly lower than the shotgun rate. Muzzleloader hunters obtained about 12,000 days of recreation during the season.

SEX AND AGE COMPOSITION

Age Composition

About 19,100 any-sex shotgun hunters were sent deer tooth envelopes along with their license. A total of 3,036 usable samples was returned for aging by tooth examination and sectioning (Low and Cowan 1963). The reported harvest of these any-sex hunters consisted of 37% fawns.

Mean expectation of life (MEL) was calculated only for does to reduce the cost of the survey. MEL for does was generally comparable to previous years (Table 10). MEL has increased slightly for doe fawns during the past 5 years, but has been relatively stable for the other age classes.

MEL for does varied by hunting zone presumably because of different mortality rates (Table 11). MEL was highest for hunting zones 1, 6, and 9 while they were lowest in 3, 4, 7, and 10.

The age of the oldest doe submitted in the tooth sample was 14½ years old. About 10% of the does sampled were 5½ years old or greater.

Sex Ratio

Does comprised 52% of the fawn harvest and 67% of the total harvest reported by any-sex hunters returning tooth envelopes. These hunters also reported that 16% of their harvest was adult bucks while 47% was adult does. Sex ratio of the any-sex harvest may be biased because of hunter selectivity, but changes in annual trends may be indicated by this survey.

MISCELLANEOUS MORTALITY

Conservation officers reported that 5,294 deer were lost to various mortality factors exclusive of legal harvest. Traffic accidents were the primary cause of mortality with 4,805 reported compared to 4,164 in 1981. Known illegal loss was placed at 196 with 51 deer lost to dog predation and 242 to other accidents such as mowing, entanglement in fences, and trains.

The number of deer killed in traffic accidents provides a reasonable population trend indicator when related to number of vehicle miles driven on Iowa's highways. An estimated 11.7 billion vehicle miles were logged on rural roads and highways (Iowa DOT estimates). A new record high of 412 deer killed/billion vehicle miles traveled was recorded, an increase of 13% from 1981 (Table 12).

Sex ratio trends in the traffic kill may be an indicator of trends in the population if vulnerability and behavior are considered constant between years. In 1982, 52% of the traffic kill was does compared to 54% in 1981 (Table 12).

Deer killed per billion vehicle miles traveled can be calculated to provide regional population trends for deer survey units which correspond closely to hunting zones (Gladfelter 1977). Trends have fluctuated, but are generally upward in most survey units during 1976-82 (Table 13). Increases of 7-61% were reported in 1982 for western, central, southeastern, eastern, and northeastern Iowa while decreases of 4-10% occurred in southcentral and northern Iowa.

The major peak in traffic mortality occurred during October through December (Fig. 2). This high mortality period corresponds to the peak in rutting activity. October and November are the only months that the number of bucks killed by vehicles exceeded number of does (Fig. 2). This is probably due to increased movement of bucks at this time because of rutting activity. The lowest deer kill occurred in July and August when does were caring for young and bucks were relatively inactive.

WINTER POPULATION ESTIMATE

Conservation officers annually estimate the number of wintering deer in their assigned territories. The 1982-83 winter population estimate of 45,800 deer was a 14% increase from the previous year. Estimates increased in 76 counties, decreased in 15, and remained unchanged in 8 compared to the previous year. Open snow conditions during most of the winter made survey estimates difficult because deer were not herded together for any extended period. Population estimates increased in all 10 deer survey units (Table 14) compared to 1981-82. The largest increases were in survey unit 2 (northcentral) and 9 (northeast). Estimated size of the wintering deer population has been steadily increasing in most regions of the state during the past 6 years.

AERIAL SURVEY

To properly manage deer in Iowa, there is need for an additional operational survey technique that will estimate annual trends in the deer population on a regional basis. Results of a recent research project indicate that an aerial survey could provide a reliable deer population trend indicator if conducted under standardized conditions. Wildlife biologists were asked to select study areas and to conduct aerial surveys during the 1982-83 winter period. The following methods were used to conduct this survey.

Area Selection

Each wildlife biologist was given a goal for the number of acres of winter deer habitat, by county, to be included in this survey. These goals were at least 10% of the timber in each county except in deer survey units 1, 2, and 10 where 20% was required. This higher goal for northern Iowa was established because county timber figures underestimate the potential winter cover available for deer. A minimum goal of 100 acres/county was established and a maximum goal of 3500 acres/county was set. Goals for a management unit (4-6 counties) were designed to be completed in an average of 2 days (4 hours/day) of flying.

Because of differing deer habitat requirements, traditional wintering areas as well as some medium to low deer density areas were selected. Survey areas included state parks, public hunting areas, county areas, and private timber tracts. Selected areas had definite boundaries (for standardization) and included blocks of timber, narrow timber bands along major streams, and brushy and weedy cover. Timber blocks and associated winter cover ranged in size from 60 acres up to 1200 acres. When possible, level to undulating areas were selected in preference to steep, rough terrain.

Aircraft and Pilots

High-winged aircraft with low altitude capabilities were necessary for this survey. They also needed to be maneuverable and capable of slow airspeed during transects. All planes were rented from local commercial flying services. Only pilots with a commercial license were used for survey flights. It was helpful if these pilots had some low altitude flying experience such as crop spraying. The pilot was not used as a deer counter, but was responsible for flying good transects, and maintaining proper altitude and air speed.

Survey Technique

Survey flights were conducted between 20 December and 30 March after deer were concentrated in wintering areas. Concentration of deer in wintering areas usually occurs after the hunting season and after a severe winter snow storm. Survey flights were limited to 4 hours per day to reduce bias from observer fatigue and boredom. Mid-day flights were recommended because of reduced shadows, higher light intensity, and reduced deer movement.

Weather conditions were critical to conducting standardized survey flights. A new snowfall of at least 3-4 inches was necessary to cover old deer beds, trails, stumps, melted areas, etc. Flights could only be conducted within a day following adequate snowfall unless a heavy snowcover was already present. This was necessary to reduce problems with bedded deer melting down to the leaf cover and their beds being mistakenly counted as deer several days later. Wind speed must be less than 15 mph to allow for proper transect patterns and for observer comfort.

Height above ground, speed of aircraft, and transect width are other important factors. Aircraft were flown at the slowest, safest speed possible, aided by a 15% lowering of the flaps. The best height to fly surveys was approximately 400-450 feet above the ground. Total transect width was to be about 440 yards or 1/4 mile with 2 observers. Each observer then was covering about 1/8 mile on his side of the aircraft. A piece of tape wrapped around the wing strut was used to help the observer determine transect width.

Several different survey patterns were used depending on the size of the area and number of observers. Straight line transects with 1 or 2 observers was the best technique for larger timber blocks and thin bands of timber along river bottoms. Circling transects were used for smaller timber blocks and only 1 observer was needed to count deer. Once a survey pattern was established for a study area, it must be continued in future flights for standardization reasons.

Survey Results 1982-83

The 1982-83 winter was characterized by a generally open winter with several severe snowstorms that dumped large amounts of snow across Iowa. Weather conditions were generally not good for the aerial survey, and only 65 counties were completed. Future deer population trends will be based on the counts made during the winter of 1982-83.

SUMMARY

A new record high deer harvest was accomplished in 1982 because of increased hunter numbers, increased any-sex license quotas, and a high deer population. Population surveys indicate that the herd continued to increase during 1982. This sets the stage for another good hunting season in 1983 with an expected increase in hunter numbers and higher any-sex license quotas.

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TABLES AND FIGURES

Table 1. Comparison of statewide results of shotgun deer seasons in Iowa, 1953-82.

Year	Season length in days	Licenses issued		No. deer harvested		Total gun harvest	% success			
		Shotgun	Landowner ¹	Shotgun	Landowner		Paid shotgun		Landowner ¹	
							Any-sex	Bucks-only	Any-sex	Bucks-only
1953	5	3,772	-----	2,401	1,606	4,007	61	---	---	---
1954	3	3,788	-----	1,827	586	2,413	64	---	---	---
1955	3	5,586	-----	2,438	568	3,006	44	---	---	---
1956	2	5,440	-----	2,000	561	2,561	39	---	---	---
1957	2	5,997	-----	2,187	480	2,667	37	---	---	---
1958	2	6,000	-----	2,141	588	2,729	38	---	---	---
1959	2	5,999	-----	1,935	541	2,476	33	---	---	---
1960	3	7,000	-----	3,188	804	3,992	46	---	---	---
1961	3	8,000	-----	4,033	964	4,997	52	---	---	---
1962	3	10,001	-----	4,281	1,018	5,299	44	---	---	---
1963	2,3	12,001	-----	5,595	1,018	6,613	48	---	---	---
1964	2,4	15,993	-----	7,274	1,750	9,024	47	---	---	---
1965	2,4	17,491	-----	6,588	1,322	7,910	39	---	---	---
1966	2,4	20,811	-----	9,070	1,672	10,742	45	---	---	---
1967	2,3	20,812	21,121	7,628	2,764	10,392	39	---	19	---
1968	2,3	20,485	24,796	9,052	3,890	12,941	48	---	21	---
1969	2,3	18,000	23,476	6,952	2,779	10,731	41	---	21	---
1970	2,3	18,000	21,697	8,398	4,345	12,743	49	---	26	---
1971	2	18,000	10,522	7,779	2,680	10,459	45	---	31	---
1972	2,4	19,000	11,205	7,741	2,738	10,485	44 ²	30	34 ²	20
1973	5	27,530	9,686	10,017	2,191	12,208	58	31	40	25
1974	5	33,772	16,329	11,720	4,097	15,817	64	29	48	27
1975	4,7	56,003	17,821	15,300	3,650	18,950	60	23	43	22
1976	4,7	60,197	17,818	11,725	2,525	14,250	48	17	37	17
1977	4,7	58,715	16,289	10,737	2,051	12,788	47	16	34	16
1978	4,7	51,934	15,699	12,815	2,353	15,168	55	21	39	20
1979	4,7	55,718	10,504	14,178	1,971	16,149	56	21	45	24
1980	4,7	64,462	12,858	16,511	2,346	18,857	56	21	42	22
1981	4,7	69,529	14,068	19,224	2,354	21,578	55	24	40	21
1982	4,7	74,331	15,431	19,269	2,472	21,741	59	20	41	21

¹ These data have been collected since 1967 when landowner-tenants were first required to obtain a permit.

² Percent success was calculated, for comparison purposes, for any-sex hunting zones 1, 2, and 4 only.

Table 2. License issue by type of hunter, zone, season and ratio of bucks-only to any-sex licenses sold in 1982.

Hunting zone	Season 1				
	Paid shotgun			Landowner-tenant	
	Bucks-only	Any-sex	B.O./A.S. ratio	Bucks-only	Any-sex
1	3479	300	12/1	598	51
2	2166	250	9/1	359	41
3	2503	525	5/1	360	75
4	5130	675	8/1	1068	141
5	5144	850	6/1	1251	207
6	3701	975	4/1	846	222
7	6407	450	14/1	1243	87
8	3172	325	10/1	575	59
9	5841	525	11/1	1061	95
10	2250	225	10/1	387	39
No zone	1950	0		0	0
Total	41,743	5,100		7,748	1,017

Hunting zone	Season 2				
	Paid shotgun			Landowner-tenant	
	Bucks-only	Any-sex	B.O./A.S. ratio	Bucks-only	Any-sex
1	942	600	2/1	212	135
2	598	500	1/1	131	108
3	594	1050	1/1	108	189
4	2158	1350	2/1	596	372
5	2002	1700	1/1	647	547
6	1492	1950	1/1	390	514
7	4012	900	4/1	921	207
8	1430	650	2/1	369	168
9	2063	1050	2/1	494	252
10	859	450	2/1	201	105
No zone	1138	0		0	0
Total	17,288	10,200		4,069	2,597

Table 3. Comparison of statewide results of archery deer seasons in Iowa, 1953-82.

Year	Season length in days	Licenses issued	No. of deer harvested	% success
1953	5	10	1	10
1954	12	92	10	11
1955	21	414	58	14
1956	31	1,284	117	10
1957	31	1,227	138	11
1958	30	1,380	162	12
1959	31	1,627	255	16
1960	44	1,772	277	16
1961	48	2,190	367	17
1962	51	2,404	404	17
1963	51	2,858	538	19
1964	51	3,687	670	19
1965	51	4,342	710	17
1966	51	4,576	579	13
1967	62	4,413	791	19
1968	62	5,136	830	17
1969	62	5,465	851	16
1970	62	5,930	1,037	18
1971	51	6,789	1,232	19
1972	51	6,916	1,328	20
1973	53	10,506	1,822	18
1974	51	12,040	2,173	19 ¹
1975	52	12,296	2,219	19 ¹
1976	56	12,522	2,350	20
1977	56	12,994	2,400	20
1978	56	12,809	2,957	25
1979	56	13,378	3,305	26
1980	56	15,398	3,803	26 ²
1981	56	17,258	4,368	26
1982	56	18,824	4,720	26

¹ Average % success from 1970-73 was used to estimate success in 1974 and 1975.

² % success from 1979 was used for 1980 success rate.

Table 4. Harvest and success rates for active shotgun hunters by hunting zone, season, and license type, 1982.

Hunting zone	Season 1		Season 2		Total harvest
	Bucks-only harvest (% success)	Any-sex harvest (% success)	Bucks-only harvest (% success)	Any-sex harvest (% success)	
1	1057(27)	234(72)	216(21)	464(69)	1971
2	530(18)	194(69)	187(21)	303(55)	1214
3	631(20)	292(53)	171(19)	556(50)	1650
4	884(17)	462(56)	720(30)	890(58)	2956
5	1282(21)	460(48)	527(20)	1026(52)	3295
6	999(24)	592(53)	383(22)	1060(49)	3034
7	1063(16)	303(60)	620(14)	585(58)	2571
8	494(14)	190(52)	186(11)	392(52)	1262
9	1078(18)	406(68)	463(21)	726(61)	2673
10	410(16)	156(61)	215(22)	334(64)	1115
Total	8428(20)	3289(57)	3688(21)	6336(55)	21,741

Table 5. Percentage distribution of the 1982 shotgun deer harvest by day of season.

Day	Season 1 harvest	Cumulative %	Season 2 harvest	Cumulative %
Saturday	34	34	24	24
Sunday	23	57	25	49
Monday	24	81	13	62
Tuesday	19	100	10	72
Wednesday			7	79
Thursday			9	88
Friday			12	100

Table 6. Success rates for active shotgun hunters, 1978-82.

Type of hunter	Bucks-only					Any-sex				
	1978	1979	1980	1981	1982	1978	1979	1980	1981	1982
<u>Season 1</u>										
Paid shotgun	22	22	23	26	20	54	64	59	63	59
Landowner- tenant	22	26	24	23	22	39	49	46	49	46
<u>Season 2</u>										
Paid shotgun	19	19	18	19	21	55	53	54	51	58
Landowner- tenant	17	23	18	18	18	39	44	41	37	39

Table 7. Comparison of antlered, antlerless, and doe harvest for 1953-82.

Year	Total harvest	Antlered harvest	Antlerless harvest ¹	Doe harvest
1953	4,008	1,580	2,428	1,858
1954	2,423	781	1,642	1,009
1955	3,064	1,046	2,018	1,460
1956	2,678	964	1,714	1,234
1957	2,805	884	1,921	1,316
1958	2,891	828	2,063	1,360
1959	2,731	959	1,772	1,176
1960	4,269	1,348	2,921	1,881
1961	5,364	1,599	3,765	2,512
1962	5,703	1,709	3,994	2,814
1963	7,151	2,117	5,034	3,366
1964	9,694	2,486	7,208	4,846
1965	8,620	2,668	5,952	3,886
1966	11,321	3,101	8,220	5,392
1967	11,183	3,110	8,073	5,361
1968	13,771	3,583	10,188	6,808
1969	11,582	3,034	8,548	5,456
1970	13,780	3,612	10,168	6,951
1971	11,691	3,091	8,600	5,735
1972	11,813	3,697	8,116	5,294
1973	14,030	6,796	7,234	4,875
1974	17,990	9,071	8,919	6,607
1975	21,169	13,141	8,028	6,037
1976	16,600	10,255	6,345	4,779
1977	15,188	10,157	5,031	3,553
1978	18,125	11,567	6,558	4,565
1979	19,454	12,378	7,026	4,986
1980	22,660	14,657	8,003	5,723
1981	25,946	16,927	9,019	6,544
1982	26,461	15,943	10,518	7,849

¹ Antlerless harvest includes male fawns.

Table 8. Percent of shotgun hunters that did not hunt, 1978-82.

Type of hunter	Bucks-only					Any-sex				
	1978	1979	1980	1981	1982	1978	1979	1980	1981	1982
<u>Season 1</u>										
Paid shotgun	10	5	5	8	10	7	5	4	3	4
Landowner-tenant	36	32	28	36	42	32	24	19	15	18
<u>Season 2</u>										
Paid shotgun	10	8	7	10	10	7	6	4	5	5
Landowner-tenant	41	37	35	44	48	33	32	25	28	30

Table 9. Shotgun hunter effort, 1978-82.

Type of hunter	Hours/hunter					Days/hunter				
	1978	1979	1980	1981	1982	1978	1979	1980	1981	1982
<u>Season 1</u>										
Paid shotgun	17	19	19	20	19	2.7	2.8	2.8	2.9	2.9
Landowner-tenant	11	10	11	12	11	2.3	2.2	2.3	2.4	2.3
<u>Season 2</u>										
Paid shotgun	21	23	23	24	24	3.4	3.6	3.6	3.7	3.8
Landowner-tenant	12	12	13	13	12	2.6	2.6	2.7	2.8	2.8

Table 10. The statewide mean expectation of life for does (in years), 1977-82.

Age class	Year					
	1977	1978	1979	1980	1981	1982
Fawn	1.97	2.02	2.11	2.12	2.12	2.15
1½	1.68	1.81	1.85	1.83	1.89	1.85
2½	1.68	1.72	1.75	1.72	1.80	1.67
3½	1.53	1.43	1.54	1.52	1.52	1.56
4½	1.11	1.10	1.18	1.13	1.15	1.12
5½+	0.50	0.50	0.50	0.50	0.50	0.50

Table 11. Mean expectation of life for does (in years), 1982.

Hunting zone	Sample size	Age class					
		Fawn	1½	2½	3½	4½	5½+
1	152	2.74	2.32	1.97	1.65	1.02	0.50
2	107	2.14	1.73	1.48	1.79	1.19	0.50
3	138	2.14	1.76	1.41	1.32	0.92	0.50
4	228	2.02	1.73	1.62	1.48	1.02	0.50
5	222	2.12	1.81	1.62	1.62	1.18	0.50
6	264	2.09	1.99	1.91	1.54	1.17	0.50
7	204	2.19	1.73	1.54	1.61	1.20	0.50
8	128	1.95	1.76	1.48	1.32	1.14	0.50
9	240	2.20	1.94	1.86	1.67	1.20	0.50
10	120	1.98	1.51	1.39	1.41	1.04	0.50

Table 12. Deer killed per billion vehicle miles traveled and percent does in the traffic kill, 1972-82.

Year	Deer killed per billion miles driven	% change from previous year	% does in traffic kill
1972	233	--	48
1973	248	+ 6.7	50
1974	250	+ 0.5	50
1975	227	- 9.1	54
1976	225	- 0.8	54
1977	252	+11.9	56
1978	241	- 4.1	47
1979	259	+ 7.5	50
1980	335	+29.2	53
1981	365	+ 9.1	54
1982	412	+12.9	52

Table 13. Number of deer killed per billion vehicle miles traveled, 1976-82.

Deer survey unit	Deer killed/billion miles traveled						1982	% change 1981 to 1982
	1976	1977	1978	1979	1980	1981		
1	247	223	258	214	414	504	456	-10
2	156	172	178	184	250	308	330	+ 7
3	224	236	220	224	236	225	357	+59
4	161	209	172	201	218	316	403	+28
5	264	294	248	293	363	398	381	- 4
6	581	606	607	600	736	658	722	+10
7	160	211	182	242	279	304	333	+10
8	219	263	259	283	378	370	435	+18
9	518	520	682	556	737	623	1005	+61
10	220	252	243	249	409	435	404	- 7

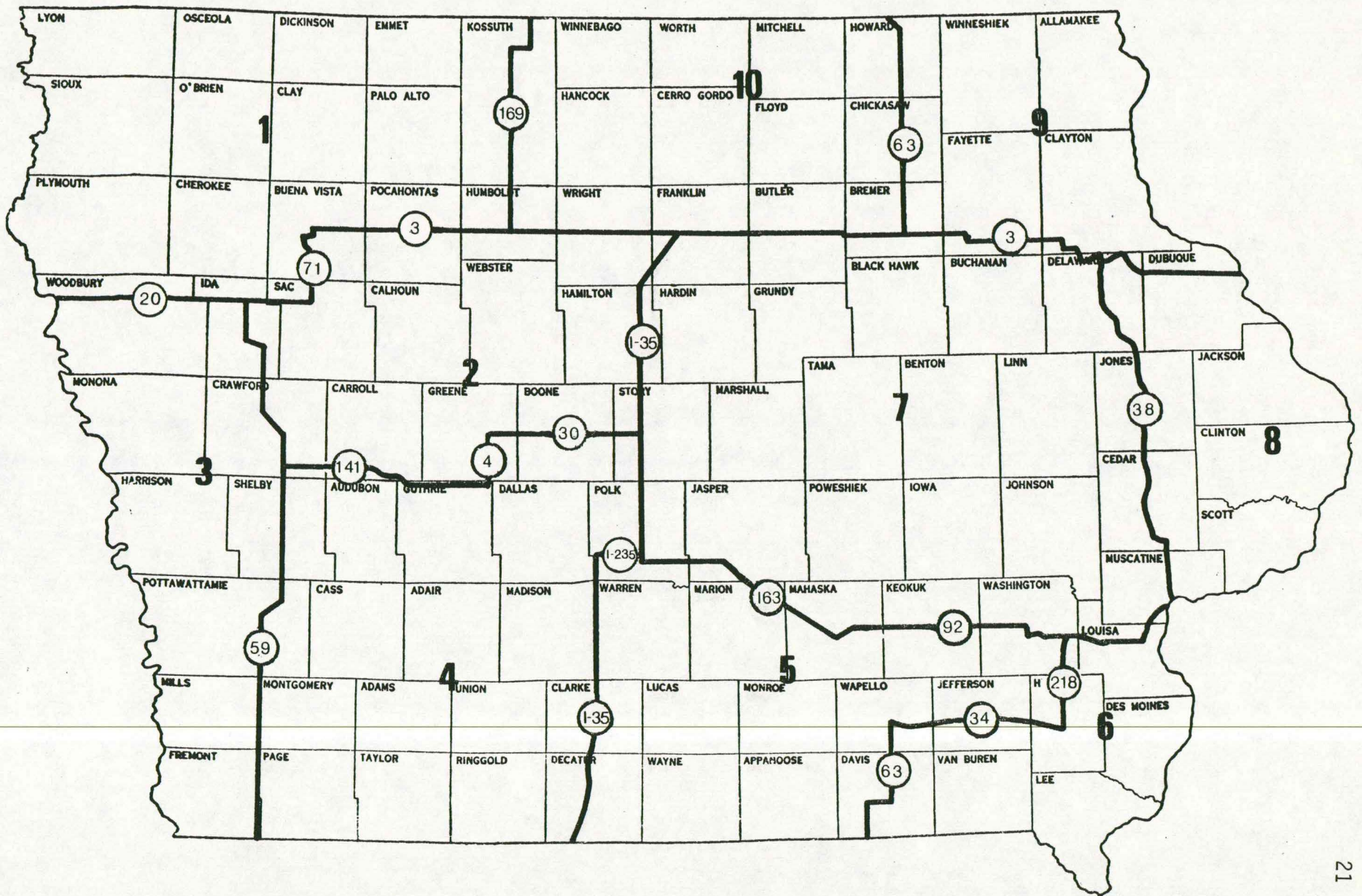


Figure 1. Boundaries of the 1982 hunting zones.

Table 14. Results of winter population estimates by deer survey unit, 1976-77 to 1982-83.

Deer survey unit	Winter population estimate							% change 1981-82 to 1982-83
	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	
1	1954	1958	2229	2409	2820	3378	4049	+20
2	1117	1449	1276	1317	1783	2277	3204	+41
3	3201	3722	3831	3646	3917	4413	4857	+10
4	3927	4018	3958	4292	4615	7180	7372	+ 3
5	4520	4539	4070	4873	4980	5365	6165	+15
6	3225	3168	3275	3583	3622	3583	3741	+ 4
7	2393	2621	2884	3111	3296	3874	4278	+10
8	1653	1820	2301	2341	2595	2990	3453	+15
9	1840	2195	2883	3555	3455	3780	4750	+26
10	1324	1399	1542	1471	2057	3417	3888	+14
Total	25,154	26,889	28,249	30,598	33,140	40,257	45,757	
% Annual change	-6	+7	+5	+8	+8	+21	+14	

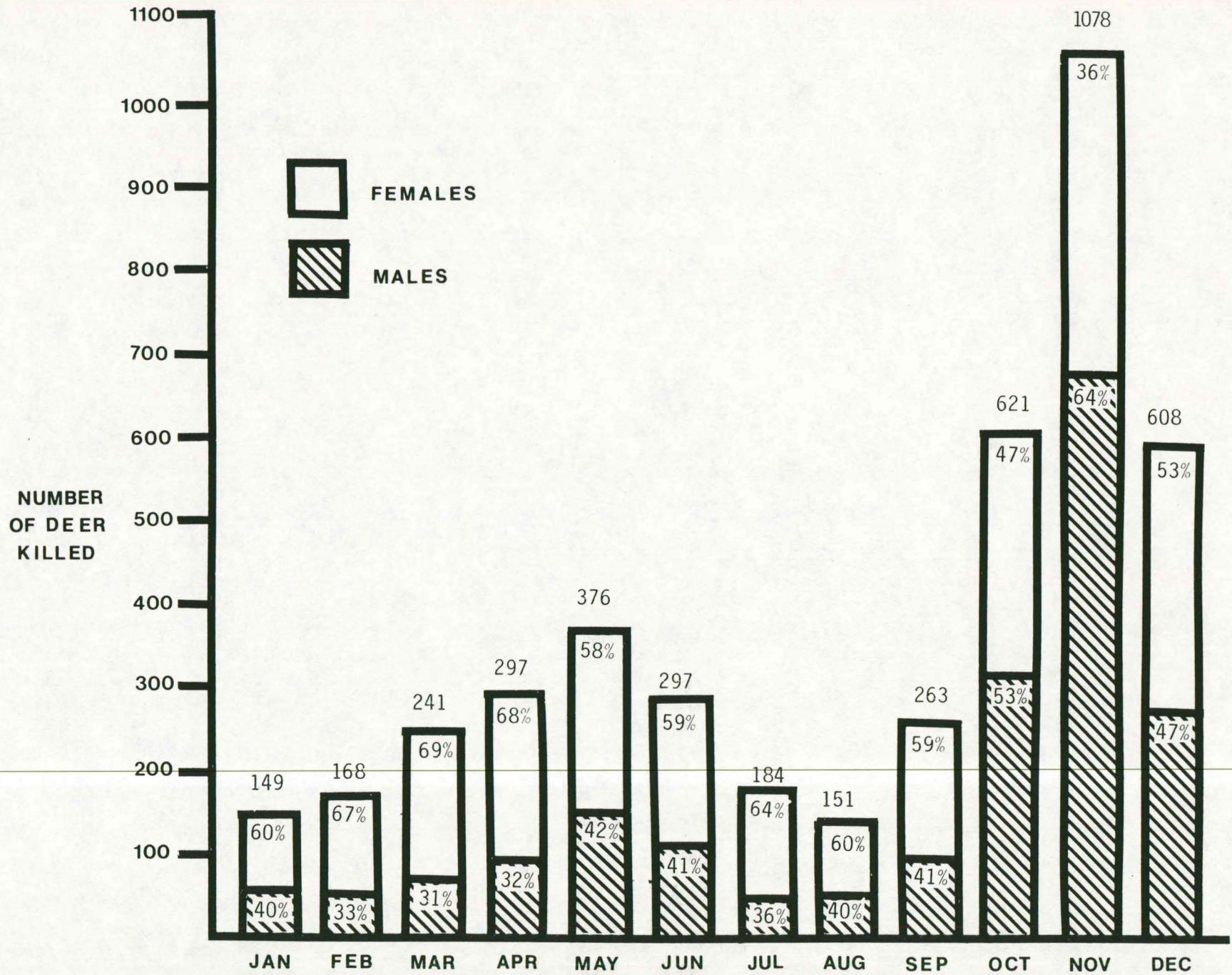


Figure 2. The 1982 traffic mortality by month and sex ratio.

APPENDIX

County	1982-83 Winter population estimate	1982 Traffic mortality	County	1982-83 Winter population estimate	1982 Traffic mortality
Adair	355	30	Jasper	366	33
Adams	290	77	Jefferson	520	24
Allamakee	1700	82	Johnson	450	195
Appanoose	390	28	Jones	875	54
Audubon	400	19	Keokuk	244	32
Benton	75	28	Kossuth	381	73
Black Hawk	205	54	Lee	825	131
Boone	183	44	Linn	345	112
Bremer	215	37	Louisa	400	27
Buchanan	100	41	Lucas	900	28
Buena Vista	219	44	Lyon	425	36
Butler	480	58	Madison	800	15
Calhoun	80	19	Mahaska	266	18
Carroll	170	5	Marion	430	36
Cass	425	30	Marshall	540	76
Cedar	200	33	Mills	560	46
Cerro Gordo	85	16	Mitchell	230	41
Cherokee	452	35	Monona	790	42
Chickasaw	205	25	Monroe	340	16
Clarke	850	18	Montgomery	432	69
Clay	385	78	Muscatine	200	71
Clayton	1330	120	O'Brien	290	30
Clinton	438	87	Osceola	385	16
Crawford	430	54	Page	500	52
Dallas	500	58	Palo Alto	185	25
Davis	520	32	Plymouth	292	13
Decatur	1125	39	Pocahontas	410	6
Delaware	155	30	Polk	590	108
Des Moines	1250	87	Pottawattamie	1322	94
Dickinson	480	57	Poweshiek	220	28
Dubuque	600	40	Ringgold	900	25
Emmet	260	45	Sac	412	41
Fayette	520	80	Scott	630	92
Floyd	290	52	Shelby	300	14
Franklin	369	53	Sioux	295	19
Fremont	350	56	Story	131	44
Greene	208	16	Tama	150	30
Grundy	35	8	Taylor	335	53
Guthrie	1000	51	Union	845	59
Hamilton	330	70	Van Buren	915	39
Hancock	219	21	Wapello	370	34
Hardin	440	63	Warren	370	82
Harrison	900	72	Washington	395	60
Henry	351	47	Wayne	350	25
Howard	450	17	Webster	545	65
Humboldt	465	14	Winnebago	700	30
Ida	186	30	Winneshiek	1200	97
Iowa	161	110	Woodbury	205	39
Jackson	510	110	Worth	645	51
			Wright	215	39

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