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## MIGRATORY BIRD SECTION

PERIODIC REPORT NO. 3

May 29, 1973

### THE 1972 CANADA GOOSE HARVEST IN ILLINOIS FROM THE MAIL QUESTIONNAIRE SURVEY

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**Abstract:** Mail questionnaires were sent to 5,655 individuals selected by a stratified random sample. Returned were 3,561 for a return rate of 63 percent. From the goose hunter population of 40,435 Cook county contributed the greatest number of hunters with 4,199 or 10 percent. Out-of-state hunters were the next largest group with five percent or 2,142 individuals. The average goose hunter made 5.22 trips in 1972. His average age was 38.2 and he had been hunting geese for 11.8 years. Over 44 percent of the individuals had hunted five years or less. In the quota zone Alexander and Union counties attracted hunters from longer distances while Williamson and Jackson counties had more localized use. There were 2,691 Canada geese harvested by sample hunters for a seasonal success rate of .75. These sample figures were projected to a state wide harvest of 23,759 Canada geese, 16,370 from the quota zone and 7,389 from the remainder of the state. Most birds taken upstate were incidental to duck hunting. Some 58 percent of the sample hunters took no birds while 26 percent took one or two and 10 percent took three or four. The upstate harvest corresponded to migration patterns and dates. The goose harvest after the close of duck season was 1,034 birds or 14 percent of the out-of-zone harvest. There were 276 blue/snow geese reported in the sample, giving a projected state harvest of 2,487.

#### INTRODUCTION

It is generally accepted that the single most important factor limiting Canada goose populations is hunting. Therefore, harvest determination with the maximum precision allowable by physical and financial constraints is necessary.

The Mississippi Flyway Council minutes of the August, 1971 meeting outlines a plan for measuring goose kill. The 1971 mandatory goose permit and the 1972 mail questionnaire were efforts within the framework of this plan to determine state wide harvest figures and to determine a suitable means for annual collection of this information.

Special credit is due Mrs. Mildred Rodgers for her diligent effort in preparing goose permit data for questionnaire use.

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## METHODS AND MATERIAL

### Hunter Population

During the 1971 Illinois goose season, each hunter who hunted Canada geese in Illinois was required to possess an Illinois Goose Hunting Permit. At the end of the season, each hunter was required to return the permit to the Illinois Department of Conservation, reporting the counties in which he hunted Canada geese and the number of Canada geese harvested in each county hunted. In the permit returns, 30,230 hunters indicated that they hunted Canada geese in Illinois during the 1971 season. Another 10,205 reported that, although they obtained a permit, they did not hunt geese during the 1971 season. It was assumed, for the present study, that the population of hunters hunting Canada geese in Illinois totaled 40,435 individuals. This population figure was used in the identification of the survey sample and in all harvest projections made as a result of the survey. A degree of caution must be exercised in interpreting this harvest projection in that the actual population of Illinois goose hunters may be larger than the assumed population size. This caution is based on the fact that some 60,000 permits were used during the 1971 season, which indicates that approximately 19,500 used permits were not returned at the end of the season. Part of these 19,500 permits represented duplicate permits issued to hunters who needed a second or third permit for one reason or another. In addition, part of the 19,500 permits were never issued to hunters but are not accounted for. As a result, it is not possible to tell what proportion of the 19,500 permits unaccounted for actually represent hunters who did not return their permit.

### Sample

The sample for this harvest survey consisted of 5,655 individuals. Of these 5,655 individuals, 5,141 were selected from the 30,230 individuals who indicated that they had hunted during the 1971 season, while 514 represented the 10,205 individuals who did not hunt during the 1971 season. The sample was selected as a proportional stratified random sample with the population being stratified according to Illinois county or residence. All non-Illinois residents were grouped together to form a single category of "out-of-state hunters".

### Method

A letter<sup>1</sup> was sent to the 5,655 sample members on October 28, 1972, indicating to that individual that he was to be included in a questionnaire survey of the 1972 Canada goose harvest in Illinois. The purpose of this letter was to alert each sample member of the upcoming survey and to encourage him to keep records of his hunting activities. The October 28, 1972 letter included a form<sup>1</sup> which the hunter could use to record data and location of hunting trips, as well as the number of Canada geese killed on each hunting trip. In addition, a map<sup>1</sup> indicating the location of the 102 Illinois counties and selected reference points was included to help the hunter identify the names of counties in which he hunted Canada geese.

The harvest survey questionnaire<sup>1</sup> was mailed to each sample member within one week of the close of 1972 Illinois Canada Goose Season. Again, a letter of explanation was included along with a list of code numbers to be used in recording which counties were hunted and where Canada geese were taken.

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<sup>1</sup> This material is on file at the Union County Field Office.

Originally, a follow-up mailing had been planned to those individuals not responding to the questionnaire within two weeks. However, the second mailing was cancelled because approximately 68 percent of the 5,655 questionnaires mailed had been accounted for within two weeks after the first mailing. It was felt that alternative procedures investigating the characteristics of the questionnaire, responses to the questionnaire, and non-respondents might provide more information with respect to harvest surveys than could be gained through the follow-up mailing.

#### Data Analysis

Information provided by questionnaire respondents was punched onto computer cards for the purpose of analysis. The greatest part of the data analysis consisted of preparing descriptive statistics and tables in the sample data. The descriptive information was compiled, for the most part, by computer at Southern Illinois University and is presented in the results section.

The information provided by the respondents was also used to make projections as to the total harvest of Canada geese in Illinois during the 1972 season. Essentially, these projections were arrived at as follows:

1. First, the total harvest reported by the sample was adjusted downward to correct for prestige, bias, etc. The U. S. Fish and Wildlife Service recommended correction factor was used.
2. The percentage of the total population of hunters represented in the sample was determined.
3. The adjusted Canada goose harvest for the sample was expanded according to the percentage in step two, to arrive at an estimate of the total Illinois harvest.

Once the state wide harvest projection was known, county harvest projections were made according to the percentage of the sample harvest which were taken in each county (more detailed description of the projection procedures are on file at the Union County Field Office).

Projections as to the harvest of snow/blue geese in Illinois were made using the procedures outlined above, except that no attempt was made to determine the snow/blue harvest by county.

#### RESULTS AND DISCUSSION

Of the 5,655 questionnaires mailed in the stratified random sample, 3,561 usable forms were returned for a 63 percent return rate. Undeliverable questionnaires, spoiled forms, or late returns totaled 805, thus accounting for 68 percent of all questionnaires. Questionnaires mailed and percent returns by county is found in Figure 1.

Some 1,615 of those returning questionnaires, or 42 percent, did not hunt in 1972, leaving 1,946 active hunters on which to base harvest projections. Of the 10,205 hunters who obtained permits in 1971 but did not hunt, 24 percent did hunt in 1972. This and the fact that 42 percent of the active 1971 hunters did not hunt in 1972 suggests two things. First, goose hunters are sensitive and responsive to conditions of a given season. Since 1972 was a poor harvest year in the quota

zone, many hunters did not go. Secondly, there appears to be a group of marginal hunters who hunt only sporadically.

### Hunter characteristics and origin

According to the 1971 Canada goose permit data, Illinois has about 40,500 goose hunters or waterfowl hunters whose chances of taking a Canada goose were good enough to warrant his obtaining a permit. The 1971 permit data indicated Cook county lead all counties in the number of hunters with 4,199, followed by 2,142 out-of-state hunters. These and thirteen other counties contribute 52 percent of all Illinois goose hunters (Table 1). The fourteen Illinois counties contributing the largest number of hunters are either major population centers or counties with large populations fairly close to the southern Illinois quota zone. The relative contribution of other counties can be determined from the questionnaire sample data in Figure 1.

Of all counties, residents from Jackson county accounted for the largest harvest of geese, some 11 percent of the total, followed by out-of-state hunters and those from Cook county with nine percent each (Table 2). Details of the harvest will be discussed in a later section.

The average number of hunts by active hunters was 5.22, some of which were primarily duck hunts.

The mean age of goose hunters is 38.2 and 45 percent of goose hunters are between the ages of 16 and 35. A complete breakdown by age group is found in Table 3. The average number of years of goose hunting experience is 11.8. The greatest number of hunters, 44 percent, have hunted five years or less and a few report having hunted as many as 70 years (Table 4).

The origin of persons hunting in the four county, southern Illinois, quota zone surrounding the three goose refuges demonstrates the attraction of Canada goose hunting (Table 5). Over 25 percent of those hunting in Alexander county, around Horseshoe Lake, are from Cook county or out-of-state. The Madison and St. Clair county population center contributes another 22 percent. Some 76 percent of the hunting efforts in Alexander county is from 15 counties and out-of-state. Alexander county has had national publicity for a number of years, thus accounting for its wide attraction of goose hunters. Union county, around the Union County Refuge, attracts more home and nearby county hunters and fewer hunters from the population centers. The same trend toward local hunters is even more pronounced in Jackson and Williamson counties around the Crab Orchard National Wildlife Refuge. The large federal refuge usually yields a low harvest scattered over a wide area, thus attracting high local use and low use from far away (Table 5).

The harvest, in the quota zone by county origin of hunters, indicates that 78 percent of the harvest comes from counties in the zone plus 13 other counties and from out-of-state hunters (Table 6). Alexander county residents take only 14 percent of the harvest in their home county, while Cook, Madison, St. Clair counties, and out-of-state hunters account for 46 percent. Union county residents do better at home, taking 18 percent, while hunters from the same population centers as above get only 26 percent. Local hunters have a dramatic effect in Williamson county where the residents from that county and adjacent Jackson county take 50 percent of the harvest. In Jackson county, residents from the same two counties take 70 percent of the birds (Table 6).

The 1972 season was atypical in that the quota was not reached after 52 days of hunting and success ratios were the poorest in recent years. Alexander county had poorer success proportionally than the other three counties, thus effecting hunting pressure at the highly publicized Horseshoe Lake. In addition, the 1972 goose season was unique in that it remained open beyond the close of the (December 16) duck season in the out-of-quota-zone (upstate) counties. The harvest questionnaire sought to measure hunting pressure and success during that period. Of the total hunts reported, just over one percent (.014) came after December 16th in all counties except the quota zone counties. Nineteen counties outside the quota zone had hunting activity after December which accounted for 14 percent of the total upstate harvest. Hunting efforts during the early, middle and late period can be interpreted from Figures 2, 3 and 4.

### Harvest

Hunters responding to the questionnaire reported a harvest of 2,691 Canada geese for a seasonal success rate of .75. The seasonal success rate from the 1971 permit was .86. Hunters active during 1971 and again during 1972 had success of .80 while inactive permittees from 1971 had a success rate of .24 in 1972. This reflects the sporadic nature of the marginal hunting element.

Of the Canada geese reported, 2,029 or 75 percent were taken in the quota zone and 662 or 25 percent were harvested upstate.

These sample figures from the questionnaire were projected to provide a state wide harvest estimate of 23,759 Canada geese. The projected harvest by county and the percent of total harvest is found in Figure 5. The state wide estimate is comprised of 16,370 geese projected for the quota zone and 7,389 geese projected from the remainder of the state.

These projections appear to be in line with the known harvest of the quota zone as determined by the mandatory daily registration procedure (Table 7). The specific projection for Alexander county appears to be low while the projections for Williamson and Jackson counties appear to be high. While these differences are large, they seem to occur because of the differences in the origin of hunters in the two locations. The Alexander county harvest is attributable to hunters who reside outside Alexander county. The harvest in Williamson and Jackson county is primarily attributable to local hunters (Table 6). The differing reporting rates of hunters across the state would influence projection for Alexander county, but not for Williamson and Jackson counties. Only the reporting rates of Williamson and Jackson county hunters would have major influence on the projection for these counties.

It appears that the errors in projection for these two locations are attributable to differing reporting ratio of the differing population of hunters in these two locations.

The quota zone projection accounts for 69 percent of the state wide projected harvest during 1972. This compares with 83 percent in 1971. The 1971 permit data shows 4,719 geese taken upstate with a total harvest of 27,239 birds. It should be noted that, according to the 1972 harvest projections, the upstate harvest increased over 1971 while the total harvest and quota zone harvest projections indicate a considerable decrease as compared to 1971. While these figures are not strictly comparable they do suggest that the upstate harvest is dependant primarily on the nature of the migration while the quota zone harvest is dependant more on food, habitat conditions, age structure of the population and weather.

Harvest projections indicate that only three percent, 761 birds, of the total state harvest are taken from counties adjacent to the quota zone (Table 8).

The sample indicates that 58 percent of all 1972 hunters took no birds (Table 9). Some 26 percent of the hunters took one or two birds, 10 percent took three or four birds and some hunters reported in excess of 40 birds.

Timing for harvest could be approximated from the questionnaire. A county breakdown by three time periods; October 28th through November 19th; November 20th through December 16th; and December 17th through January 10th is found in Figures 2, 3 and 4. Figure 2 shows that many of the northern counties, most of the counties along the Mississippi River, a diagonal line of counties across southwestern Illinois and a block of counties in southeastern Illinois had 50 percent or over of their total harvest occur during the first time period. Figure 3 shows a heavy line of counties from Winnebago down the Illinois River and a solid block in southwestern Illinois had over 50 percent of their total harvest occur during the second time period. This suggests that early migrant geese not stopping at the Horicon National Wildlife Refuge in Wisconsin have a broad migration pattern across the state. In addition, one segment appears to heavily favor the Mississippi River. The second period reveals a singular heavy flight across northern Illinois and down the Illinois River, which corresponds to the pattern of the large Horicon migration.

The majority of harvest occurring after December 16th is adjacent to goose concentration points: the southern Illinois complex; Carlyle and Rend Lake; Mermet Lake; Hovey Lake in Indiana; Baldwin Reservoir; Mark Twain-Calhoun Refuge; Sanganois Refuge; and Sangchris Lake (Fig. 4). The harvest during this period accounted for 14 percent of the total excluding the quota zone.

According to sample respondents, 690 Canada geese (25 percent of the total) were taken on duck hunts. There was a total of 662 birds harvested out of the zone, of which 92 were taken after December 16th. This indicates that 570 Canada geese were harvested prior to the end of the duck season in the upstate counties. This data suggests that most if not all of the goose harvest occurring in the upstate counties and some of the in zone harvest occurs incidentally on duck hunting trips.

There were 276 blue/snow geese reported in the sample. This figure projects to a state harvest of 2,487. Only three percent of the hunters report harvesting 1 to 5 blue/snow geese. A few hunters reported harvesting over six blue/snow geese (Table 10).



Table 1. Origin of Illinois goose hunters by the fourteen most important counties and from out-of-state (from the 1971 goose permits).

County	Number of Hunters	Percent of Total
Cook	4,199	.10
out-of-state	2,142	.05
St. Clair	1,871	.05
Madison	1,869	.05
Jackson	1,353	.03
Peoria	1,319	.03
Williamson	1,099	.03
Tazewell	1,079	.03
Adams	1,031	.03
Will	911	.02
Du Page	863	.02
Lake	831	.02
Rock Island	794	.02
Franklin	710	.02
Mason	708	.02
Total	20,779	.52

Table 2. Canada goose harvest by residents of important counties in Illinois and out-of-state hunters in 1972.

County	Sample Harvest	Percent of Total State Harvest
Jackson	308	.11
out-of-state	244	.09
Cook	213	.09
Madison	169	.06
St. Clair	161	.06
Williamson	157	.06
Union	127	.05
Franklin	121	.04
Alexander	117	.04
Total		.60

Table 3. Distribution of Illinois goose hunters by age groups.

Age Group	Percent of Total
6-15	.03
16-25	.19
26-35	.26
36-45	.20
46-55	.16
56-65	.11
66-75	.04
76-85	.01
86-95	<u>T</u>
Total	1.00

Table 4. Distribution by number of years of goose hunting experience for Illinois goose hunters in 1972.

Years Hunted	Percent of Total Hunters
1-5	.44
6-10	.18
11-15	.09
16-20	.12
21-25	.06
26-30	.05
31-35	.02
36-40	.03
41-45	T
46-50	.01
51-55	T
56-60	T
61-65	T
66-70	<u>T</u>
Total	1.00

Table 5. County origin of the quota zone hunters.

	Alexander		Union		Williamson		Jackson		Total	
	n	Percent of Total	n	Percent of Total	n	Percent of Total	n	Percent of Total	n	Percent of Total
Cook	168	.13	154	.10	45	.02	4	.01	371	.07
out-of-state	166	.13	72	.05	78	.04	3	.01	319	.06
Alexander	151	.12	25	.02	10	T	0	.00	186	.03
Madison	144	.11	136	.09	53	.02	8	.02	341	.06
St. Clair	137	.11	109	.07	55	.03	9	.02	310	.06
Du Page	50	.04	27	.02	20	.01	3	.01	100	.02
Peoria	38	.03	37	.02	3	T	0	.00	78	.01
Tazewell	32	.03	27	.02	10	T	0	.00	69	.01
Union	17	.01	260	.17	0	0	8	.02	285	.05
Jackson	21	.02	150	.10	512	.24	244	.46	927	.17
Williamson	9	.01	21	.01	834	.38	41	.08	905	.16
Will	10	.01	46	.03	28	.01	0	.00	84	.02
Randolph	0	.00	45	.03	30	.01	38	.07	113	.02
Clinton	9	.01	54	.03	7	T	1	T	71	.01
Franklin	0	.00	2	T	181	.08	41	.08	224	.04
Massac	7	.01	2	T	64	.03	0	.00	73	.01
All others	308	.24	395	.25	237	.11	129	.24	1,069	.19
Total:	1,267	1.01	1,562	1.01	2,167	.99	529	1.02	5,525	.99

Table 6. Harvest of Canada geese in the quota zone by hunter's county of residence.

	Alexander		Union		Williamson		Jackson		Total	
	n	Percent of Total	n	Percent of Total	n	Percent of Total	n	Percent of Total	n	Percent of Total
Cook	70	.14	74	.10	21	.03	4	.05	169	.08
out-of-state	79	.16	24	.03	53	.07	0	.00	156	.08
Alexander	73	.14	32	.04	0	.00	0	.00	105	.05
Madison	44	.09	61	.08	24	.03	1	.01	130	.06
St. Clair	34	.07	39	.05	39	.05	1	.01	113	.06
Du Page	24	.05	7	.01	6	.01	0	.00	37	.02
Peoria	9	.02	12	.02	3	T	0	.00	24	.01
Tazewell	18	.04	8	.01	9	.01	0	.00	35	.02
Union	1	T	132	.18	0	.00	0	.00	133	.07
Jackson	8	.02	83	.11	161	.22	43	.57	295	.14
Williamson	2	T	5	.01	201	.28	10	.13	218	.11
Will	3	.01	19	.03	2	T	0	.00	24	.01
Randolph	0	.00	27	.04	10	.01	3	.04	40	.02
Clinton	2	T	22	.03	3	T	2	.03	29	.01
Franklin	0	.00	2	T	60	.08	7	.09	69	.03
Massac	1	T	4	.01	7	.01	0	.00	12	.01
All others	136	.27	194	.26	122	.17	4	.05	456	.22
Total:	504	1.01	745	1.01	721	.98	75	.99	2,045	1.00

Table 7. A comparison of actual registered harvest in the four county quota zone of projected harvest from mail questionnaires.

County	Registered Harvest	Projected Harvest from Questionnaires
Alexander	6,042	4,039
Union	5,236	5,964
Jackson and Williamson	<u>4,544</u>	<u>6,367</u>
Total	15,822	16,370

Table 8. Projected harvest in counties adjacent to the southern Illinois quota zone.

County	Percent of Total Projected Harvest	Projected Harvest
Pulaski	.009	214
Johnson	.001	24
Saline	.000	0
Franklin	.012	285
Perry	.005	119
Randolph	<u>.005</u>	<u>119</u>
Total	.032	761

Table 9. Distribution of hunters by seasonal Canada goose bag size during 1972.

Number of Geese Harvested	Percent of Total Hunters
0	.58
1	.14
2	.12
3	.05
4	.05
5	.02
6	.02
7	T
8	.01
9	T
10	.01
11-15	.01
16-20	T
21-25	T
26-30	T
31-35	.00
36-40	T
41-45	T
46+	T
Total	1.01

Table 10. Distribution of hunters by seasonal blue/snow goose bag size during 1972.

Blue/snows Harvest Per Season	Percent of Total Hunters
0	.966
1-5	.032
6-10	.002
10+	T
Total	1.000

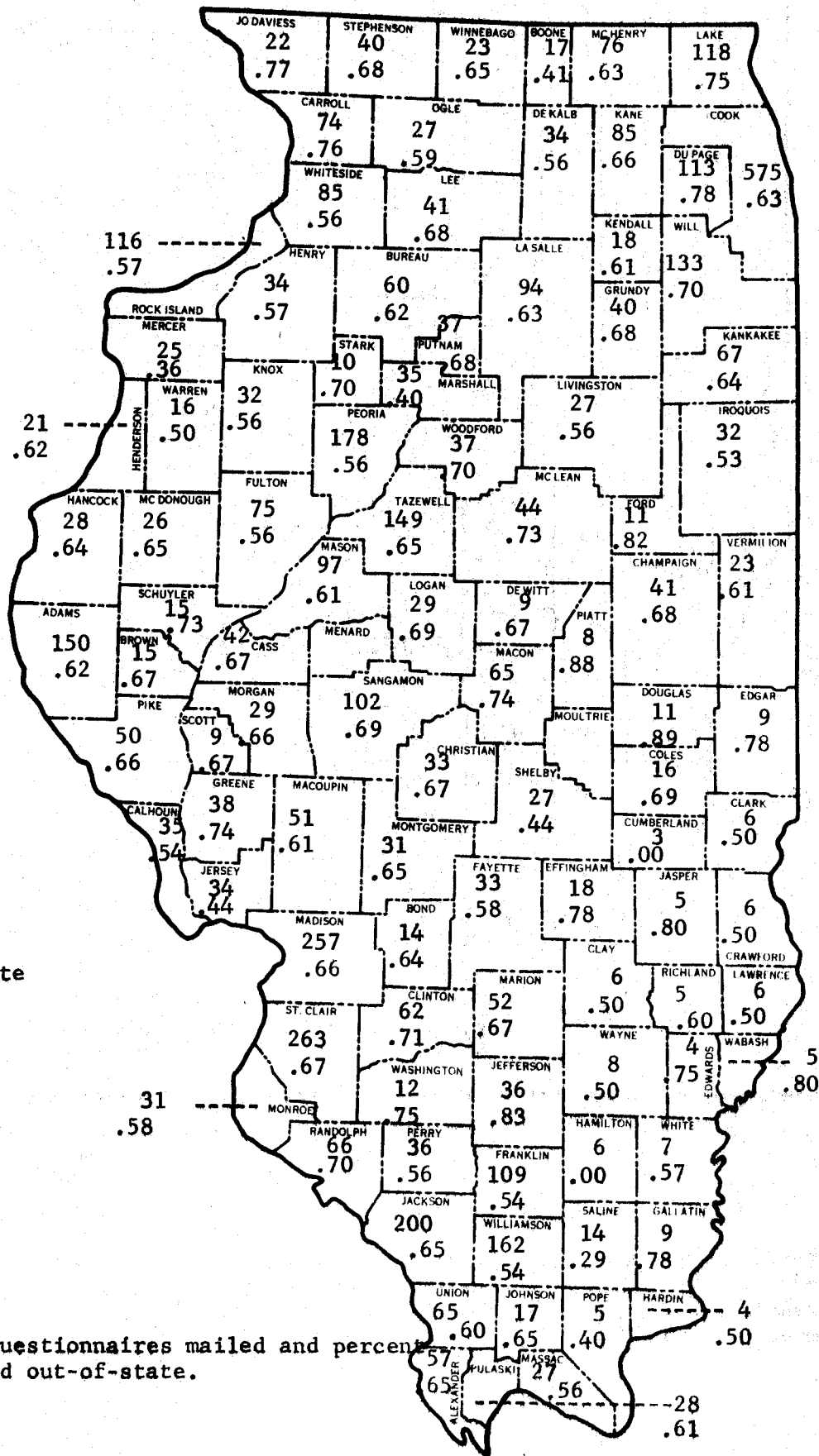


Figure 1. Number of questionnaires mailed and percent of return by county and out-of-state.

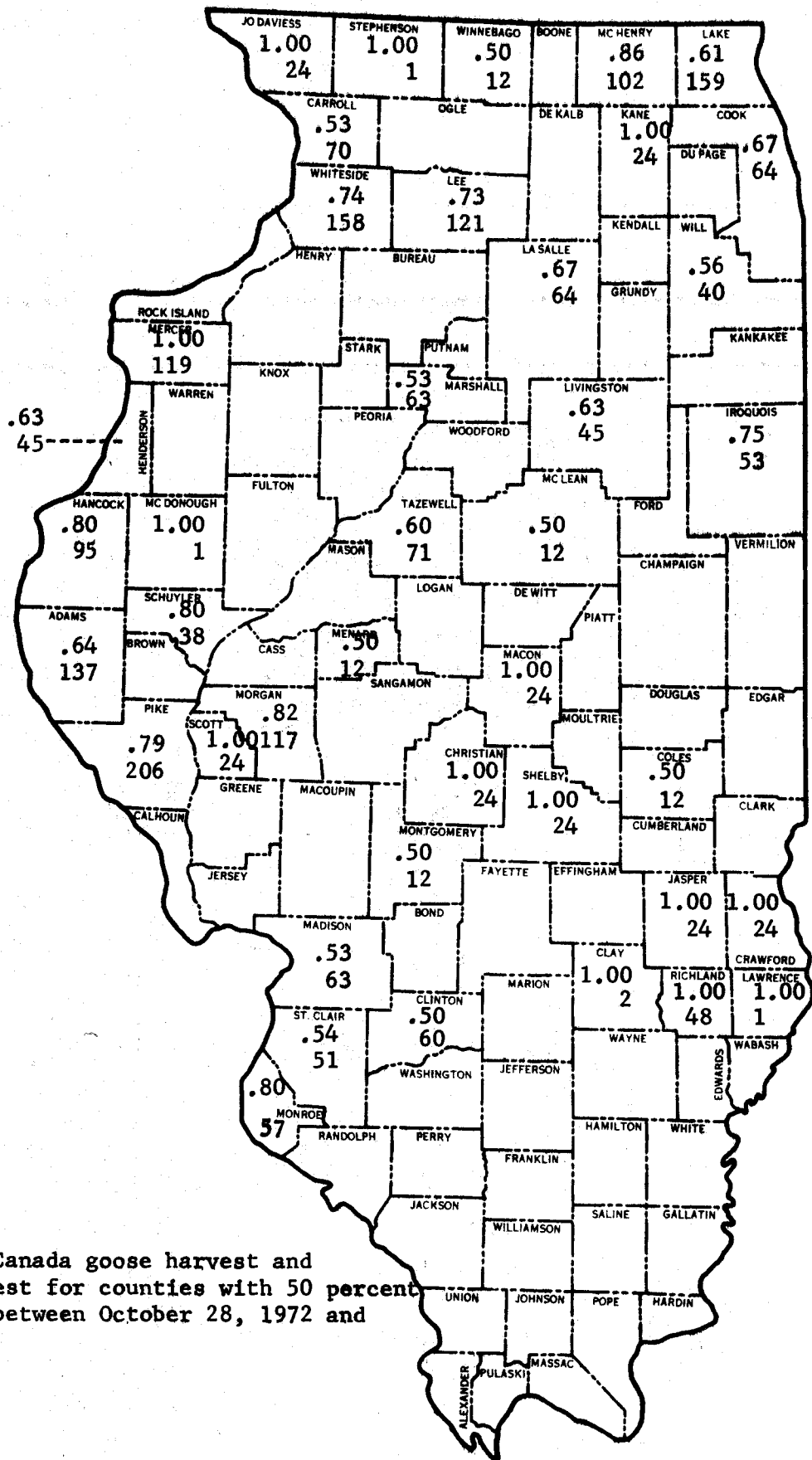


Figure 2. Projected Canada goose harvest and percent of total harvest for counties with 50 percent or greater occurring between October 28, 1972 and November 19, 1972.



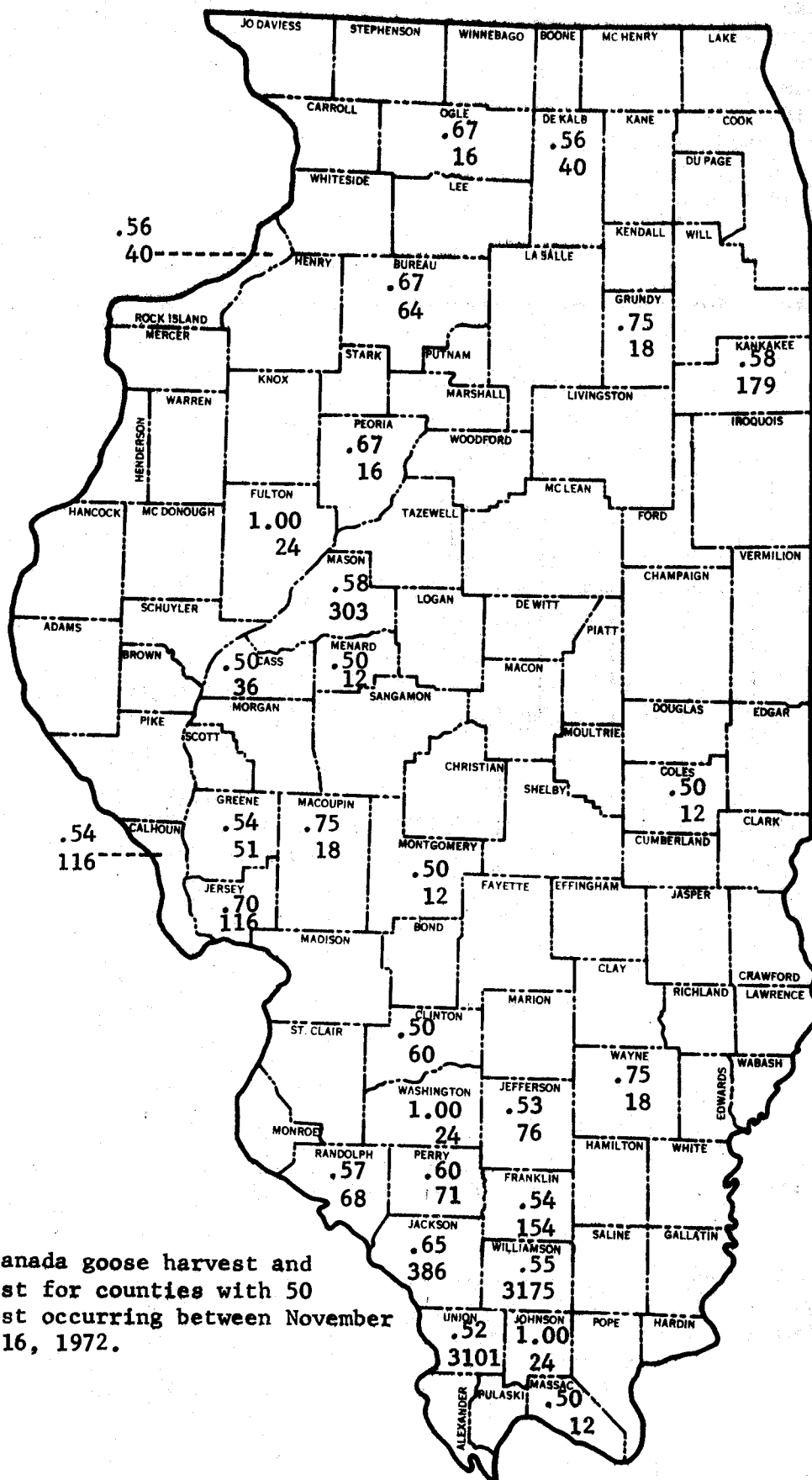


Figure 3. Projected Canada goose harvest and percent of total harvest for counties with 50 percent of their harvest occurring between November 20, 1972 and December 16, 1972.



