

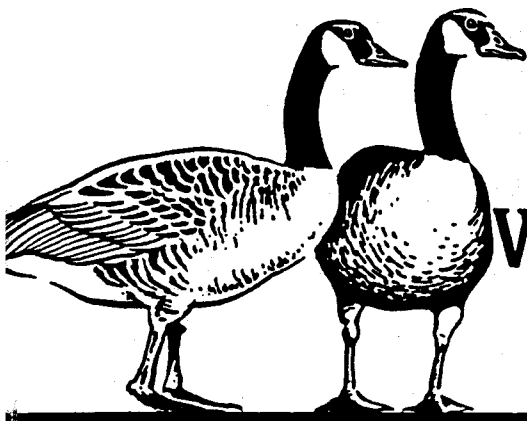


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UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

PRODUCTION NOTE

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WATERFOWL PROGRAM

ILLINOIS DEPARTMENT OF CONSERVATION

DIVISION OF WILDLIFE RESOURCES

CANADA GOOSE HARVEST AND HUNTER ACTIVITY IN THE 4-COUNTY QUOTA ZONE DURING THE 1992 SEASON

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Abstract: The 1992 4-County Quota Zone goose hunting season opened 14 November and closed 31 January. The goose season began the same day as the opening of the southern zone for duck hunting. The established season length was 79 days (84 days in 1991) or when a quota of 39,500 geese was harvested. A total of 17,255 Canada geese was harvested, which represented 44% of the maximum allowable harvest. The daily bag limit was 2 Canada geese per day. Commercial clubs harvested 79% of the total harvest or 13,613 Canada geese. Goose hunters in Williamson/Jackson Counties accounted for 55% (9,508) of the total quota zone harvest, while 25% (4,270) occurred in Alexander County and 20% (3,477) in Union County. Commercial licenses were issued to 107 clubs in the quota zone. Goose hunters spent 57,877 days afield (18% less than 1991), and averaged 0.30 goose per trip (0.38 in 1991). Commercial clubs in Williamson/Jackson Counties reported the highest success rates (0.42). Commercial clubs in Union and Alexander Counties reported success rates of 0.36 and 0.29, respectively. A total of 605 Canada geese was harvested by 2,618 hunters on the Union County Public Hunting Area. Goose hunters (746) on the Horseshoe Lake Public Hunting Area harvested 61 geese, and 2,910 hunters harvested 498 geese on the public hunting area at Crab Orchard NWR. Success rates for the Union County, Horseshoe Lake and Crab Orchard National Wildlife Refuge Public Hunting Areas were 0.23, 0.08, and 0.17, respectively. The 1992 mid-December MVP Canada goose count in the quota zone and Mississippi Flyway was 241,000 (280,400 in 1991) and 673,400 (766,800 in 1991), respectively. Major migrations (300,000) of Canada geese occurred on 4 and 11 December. The population peaked at 372,000 (350,000 in 1991) in the quota zone on 14 January. The peak wintering population in southern Illinois and western Kentucky was recorded on 19 January, 597,000 compared to 583,000 in 1991. Tail fans (n=1,727) collected from commercial pickers in Alexander, Union, and Williamson/Jackson Counties revealed an age ratio of 0.99 immatures/adult (0.95:1 in 1991). Crab Orchard NWR accounted for 35% (7.3 million) of the goose use-days in southern Illinois. Horseshoe Lake and Union County Conservation Areas accounted for 25% (5.4 million) and 15% (3.2 million) of the goose use-days, respectively. Goose use-days on the wintering refuges in southern Illinois and western Kentucky decreased from 25.7 million in 1991-92 to 21.3 million in 1992-93. No significant losses of waterfowl to disease were observed on the wintering refuges in southern Illinois in 1992-93.

INTRODUCTION

Alexander, Jackson, Union, and Williamson Counties comprise the 4-County Quota Zone. Located in this region are three major Canada goose wintering areas. The most important wintering area is the Horseshoe Lake Conservation Area in Alexander County. The Department recognized the importance of Horseshoe Lake to Canada geese and established it as a refuge in 1927. Traditionally, the area records the largest amount of goose use-days in southern Illinois. The area contains 7,900 acres and encompasses an ancient oxbow of the Mississippi River. Approximately 30 miles north of Horseshoe Lake is the 6,200 acre Union County Conservation Area. The northern-most wintering refuge in the 4-County Zone is Crab Orchard National Wildlife Refuge, (44,000 acres) which is located approximately 35 miles northeast of Union County Conservation Area in Jackson and Williamson Counties.

The quota zone system requires that all goose hunters hunting on licensed areas register and report their harvest daily. All commercial clubs (those receiving compensation for goose hunting) are required to apply for a license at a cost of \$15.00 per blind or pit. This system of hunter registration is recognized as one of the most intensive, efficient, and accurate methods of monitoring Canada goose harvest in areas where both geese and hunting pressure are heavily concentrated. The quota zone system has been in effect in southern Illinois since 1960, with only minor changes made in regulations through the years. Approximately 79% of the quota zone goose harvest in 1992 occurred on land licensed as commercial clubs.

Goose hunting regulations in the quota zone were amended in 1987 to allow three persons to occupy a pit or blind for taking or attempting to take Canada geese on commercial clubs. In the past, the number of hunters was restricted to two, except in those blinds where a licensed guide accompanied the hunters. Guide licensing by the Department of Conservation was eliminated as part of the 1987 legislation change.

METHODS AND MATERIALS

All landowners applying for a commercial goose license in the quota zone received a registration packet containing daily registration sheets, club permits, administrative orders and self-addressed envelopes. Commercial clubs submitted daily harvest registration forms weekly throughout the season, and the zone harvest was updated at each interval by Waterfowl Program Staff at Union County Refuge. All procedures in 1992 were the same as in 1991, including methods of estimating harvest and hunting pressure on outlying non-commercial areas by using the mean percent harvest occurring on those areas from 1973-1981 (Thornburg and Estel 1983).

An automatic answering machine was maintained in the phone system at the Union County Refuge office. Harvest information and results of the most recent aerial inventories were updated weekly as new information became available. Goose hunters, club operators and media representatives were able to get updated information on the progress of the 1992 quota zone goose hunting season.

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Canada goose populations on wintering areas in the quota zone, Rend Lake and Ballard County, Kentucky were monitored by aerial inventories starting 19 October and ending 1 February. Flights were conducted at weekly intervals, weather permitting. Biologists with the DOC and the USFWS conducted the inventories using the state's Cessna 337.

RESULTS AND DISCUSSION

The 1992 quota zone goose hunting season opened 14 November and closed 79 days later on 31 January. The goose season began on the same day as the opening of the southern zone for duck hunting which allowed hunters to harvest ducks and geese. The assigned harvest quota decreased 45% from 72,400 in 1991 to 39,500 in 1992. Season length decreased from 84 days in 1991 to 79 days in 1992 (Table 1). The daily bag limit was 2 Canada geese per day. Shooting hours were extended from 3 p.m. to sunset the last 3 days of the season. Canada geese began arriving at southern Illinois wintering refuges during the week of 14-21 September. Major migrations of geese from Wisconsin occurred on 4 and 11 December, when the population increased from 52,450 to 329,800 in southern Illinois and western Kentucky. Aerial inventories revealed that the Canada goose population in the quota zone and southern Illinois continued to increase for the next four weeks. The population finally peaked at 372,000 (350,000 in 1991) in the quota zone on 14 January. The peak wintering population (597,000) in southern Illinois and western Kentucky was recorded on 19 January (583,000 in 1991). The final harvest of 17,255 was 22,245 geese below the assigned quota of 39,500. Approximately 44% of the harvest quota was achieved in the 4-County Quota Zone.

Hunting Pressure

Goose hunters spent a total of 57,877 days afield during the 1992 season which was 18% less than 1991 (Figure 1). A total of 31,528 hunters registered at commercial clubs in 1992 (19% less than in 1991). An additional 6,274 hunters registered on the public hunting areas at Horseshoe Lake, Union County and Crab Orchard NWR (18% less than 1991). An estimated 20,075 hunter-trips occurred on non-commercial areas in 1992 (16% less than in 1991) (Whitton 1992). The average daily number of hunters in 1992 (733) was considerably less than in 1991 (836), however season length was 5 days shorter.

Commercial licenses were issued to 107 clubs in the quota zone in 1992 (16% less than in 1991). Commercial clubs were the most numerous in Williamson/Jackson Counties (48), while clubs in Alexander and Union Counties numbered 43 and 16, respectively.

Williamson/Jackson Counties reported 41% of the hunter-trips on commercial clubs. Approximately 36% of the hunter-trips on commercial clubs occurred in Alexander County, while the remaining 23% occurred in Union County. Williamson/Jackson Counties had the greatest number of total hunter-trips (32,447) (15% less than 1991) in the quota zone with 56%, followed by Alexander County with 26% (14,895) (21% less than 1991) and Union County with 18% (10,535)

(20% less than 1991) (Table 2).

Hunter use and harvest on the public hunting areas in the quota zone are included in the commercial club totals. These areas accounted for 17% (1% greater than in 1991) of the hunting effort on commercial clubs in 1992. A total of 6,274 hunters registered on the three public hunting areas (18% less than 1991). Union County Public Hunting Area accounted for the most hunters (2,910). This represented 46% of the total hunting effort on public hunting areas in the quota zone. The Crab Orchard NWR and Horseshoe Lake Public Hunting Areas registered 2,618 (42%) and 746 hunters (12%), respectively (Table 3).

Harvest

A total of 17,255 Canada geese was harvested in the quota zone during the 1992 season (35% less than 1991). This was 22,245 geese below the maximum allowable harvest of 39,500. Commercial clubs accounted for 79% of the total harvest or 13,613 Canada geese (Figure 2). Approximately 47% of the total harvest on commercial clubs occurred in Williamson/Jackson Counties (6,418), 30% in Alexander County (4,014) and 23% in Union County (3,181).

Public hunting areas reported a harvest of 1,164 geese in 1992 (40% less than 1991). The Union County Public Hunting Area reported 52% of the harvest (605), while 43% occurred at Crab Orchard NWR Public Hunting Area (498) and 5% at Horseshoe Lake Public Hunting Area (61) (Table 3). The contribution of the Canada goose harvest on public hunting areas in the quota zone represented 9% (no change from 1991) of the total commercial club harvest.

The 1992 goose harvest on the Union County Public Hunting Area (605) was 49% less than the 1986-90, average and 43% less than the harvest in 1991. The goose harvest at Horseshoe Lake Public Hunting Area in 1992 (61) was 85% less than the 1986-90, average and 63% less than the harvest in 1991 (Table 4). The 1992 goose harvest and success rate at Horseshoe Lake was the lowest ever recorded.

The average daily goose harvest for the 1992 season was 218 geese per day. This was 31% less than in 1991 (314) and 51% less than 1990 (447). The greatest harvest occurred during the 7-day reporting period 26 December - 1 January, when 2,551 geese were harvested. The lowest harvest (394) occurred during the 7-day reporting period 28 November - 4 December (Table 5).

Williamson/Jackson Counties harvested 55% (9,508) of the total goose harvest in 1992. Alexander County followed with 25% (4,270) and Union County 20% (3,477) (Table 6).

The estimated harvest on non-commercial lands in 1992 was 3,642 Canada geese or 21% of the total geese harvested. Approximately 85% of the harvest occurred in Williamson/Jackson Counties (3,090). Eight percent occurred in Union County (296) and 7% in Alexander County (256).

Hunter Success

Success rates for Canada goose hunters on commercial clubs in the quota zone decreased from 0.45 goose per trip in 1991 to 0.36 in 1992 (Table 7). Success rates on commercial clubs in the quota zone continued their downward trend since 1988. Commercial clubs in Williamson/Jackson Counties reported the highest success rates (0.42), while commercial clubs in Union and Alexander Counties reported success rates of 0.36 and 0.29, respectively (Figure 3).

The Union County Public Hunting Area reported the highest success rate (0.23) on public hunting areas in 1992 (Table 8). The public hunting areas at Crab Orchard NWR and Horseshoe Lake each reported success rates of 0.17 and 0.08, respectively (Table 9).

Population Status

Canada geese began arriving on schedule in southern Illinois during the week of 14-21 September. The first aerial inventory was conducted on 19 October and revealed that 31,000 Canada geese (43,650 in 1991) were present in southern Illinois and western Kentucky. A total of 27,200 Canada geese were present in the quota zone by opening day (14 November). The major, late winter migrations occurred on 4 and 11 December when the population in southern Illinois and western Kentucky increased from 52,450 to 329,800 (Table 10, Figure 4). The goose population in southern Illinois and western Kentucky increased weekly from 16 December to 19 January when the population finally peaked at 597,000 (583,000 in 1991). The population peaked in the quota zone in 1991 at 372,000 (350,000 in 1991) (Figure 5). Unusually warm temperatures on 23 January encouraged many Canada geese to initiate their northward migration to spring staging areas. The aerial survey conducted the following week revealed that the peak population decreased from 597,000 to 409,500 on 25 January. The population continued to decrease for the remainder of January. The final aerial survey conducted on 1 February revealed that 368,250 Canada geese were present in southern Illinois and western Kentucky.

Canada goose numbers at Horseshoe Lake peaked at 130,000 in 1992-93 (145,000 in 1991-92). Union County Refuge and Crab Orchard NWR reported peaks of 68,000 (90,000 in 1991-92) and 165,000 (152,000 in 1991-92), respectively (Figure 6). The 1992 mid-December MVP goose survey in the quota zone and Mississippi Flyway was 241,000 (280,400 in 1991) and 673,400 geese (766,800 in 1991), respectively.

Tail fan analysis contradicted gosling survival estimates following the snowstorm in June which caused severe mortality across the MVP breeding grounds. Tail fans collected from commercial pickers in 1992-93 (n=1,727) in Alexander, Union and Williamson Counties revealed an age ratio of 0.99 immatures per adult (0.95 in 1991 and 0.53 in 1990) (Table 11). Tail fans analyzed from geese harvested at Union County and Horseshoe Lake Public Hunting Areas (n=666) revealed age ratios of 1.10 and 0.56 immatures per adult, respectively (Table 12). Age ratios from the Union County and Horseshoe Lake Public Hunting Areas in 1992 were below the long-term average (Table 13). Collectively, tail fans

(n=2,393) revealed an age ratio of 1.00 immatures per adult (1.07 in 1991). Analysis of tail fans suggests that the age ratio in 1992-93 (1:1) compared favorable with 1991 and improved from 1990, despite a near failure in production. The majority of tail fans were collected immediately after major migrations when hunting success was at its highest. During this period, the majority of immature tail fans was collected. Following the migration periods, adult tail fans comprised the greatest percentage throughout the season. Based on the tail fan analysis, goslings which survived the summer snowstorm on the breeding grounds were harvested soon after their arrival in southern Illinois.

Goose use-days (GUD) and percent totals at 5 refuges in southern Illinois and western Kentucky are shown in Table 14. In 1992-93, Horseshoe Lake accounted for 5.4 million GUD (6.9 million in 1991-92) (25% of the total); Crab Orchard NWR had 7.3 million GUD (6.5 million GUD in 1991-92) (35% of the total); Rend Lake had 3.4 million GUD (5.8 million GUD in 1991-92) (16% of the total); Union County Refuge had 3.2 million GUD (4.5 million GUD in 1991-92) (15% of the total); and Ballard County, Kentucky accounted for 1.9 million GUD (1.8 million in 1991-92) (9% of the total). Goose use-days in southern Illinois and western Kentucky decreased from 25.7 million in 1991-92 to 21.3 million in 1992-93. Individual refuges reported significant changes in the number of goose use-days from 1991 to 1992. Goose use-days in 1992-93 decreased 22%, 29% and 41% at Horseshoe Lake, Union County and Rend Lake Refuges, respectively. Goose use-days at Crab Orchard NWR and Ballard County, Kentucky increased 12% and 1%, respectively. No detectable disease losses of waterfowl were observed on the wintering refuges in southern Illinois in 1992-93.

CONCLUSIONS

The projected fall flight for MVP Canada geese in 1992 was estimated at 1.46 million. A snowstorm in late June caused severe mortality among goslings across major portions of the MVP breeding range. The fall flight was reduced from 1.46 million to 1.20 million. Due to the reduction in fall flight estimate, harvest allocations were reduced among MVP harvest states.

Mild weather and a lack of significant snowfall and ice cover across the entire state throughout much of the fall and winter widely dispersed Canada geese and reduced concentrations in southern Illinois for the second consecutive year. Aerial inventories revealed that peak Canada goose populations (597,000) (583,000 in 1991-92) and goose use-days (21.3 million) (25.7 million in 1991-92) decreased on the wintering refuges in southern Illinois and western Kentucky in 1992-93. Available energy on Union County and Horseshoe Lake Refuges was reduced in 1992-93 at the request of commercial goose club operators in an attempt to encourage greater use of cropfields off-refuge during the hunting season. This was accomplished by increasing the percent of corn harvested and delaying the date for wheat planting at Union County and Horseshoe Lake Refuges. Wheat reserves at Union County Refuge were exhausted by approximately 25 December. The only food resources available were standing corn or corn residue left after harvesting. The refuge goose population and county goose harvest

exhibited downward trends following exhaustion of wheat in late December. The wheat reserves at Horseshoe Lake Refuge were exhausted on approximately 10 January. The refuge population and county goose harvest also experienced a similar downward trend following the exhaustion of wheat. This suggests that decreasing food resources at a particular refuge will not result in a substantial increase the goose harvest and success rate adjacent to that refuge. In fact, it may have initiated an early departure from that refuge which had deficient wheat reserves. It appears that off-refuge usage increased in 1992-93 as a result of flooding along major river systems, deficient wheat reserves on refuges, hunting pressure adjacent to the refuges or a combination of the factors.

The 1992 Illinois Waterfowl Hunter Questionnaire Survey revealed a statewide harvest estimate of 60,007 Canada geese (45,605 MVP, 76%) (Anderson 1993). The federal harvest estimate indicated that 76,700 Canada geese were harvested statewide (Table 15) (Gamble 1993). The federal harvest estimate (10,857) for the 4-County Quota Zone was considerably less than the state estimate (17,255) which is derived from daily registration forms.

The 1992 goose harvest (17,255) represented only 44% of the harvest quota, or 22,245 geese below the maximum allowable harvest. The 4-County Quota Zone annually receives 50% of the statewide Canada goose harvest allocation, however the 1992-93 harvest (17,255) represented only 29% of the statewide Canada goose harvest.

Success rates on commercial clubs in 1992-93 decreased an average of 10% in each of the counties in the 4-County Quota Zone. In 1992-1993, the Horseshoe Lake Public Hunting Area reported the lowest harvest and success rate on record.

Heavy snowstorms in late June across the MVP breeding range severely reduced recruitment in 1992. Harvest allocations for MVP Canada geese are anticipated to be reduced again in 1993 in order to achieve spring population and fall flight objectives outlined in the MVP plan.

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Table 1. Annual 4-County Quota Zone goose season statistics, 1973-1992.

Year	Quota Size	Season Length	Date Open	Date Closed	Harvest	Percent Success Rate	Pop. Peak	Hunter Use-Days	Comm. Clubs	Free Permits
1973	24,000	63	11/19/73	01/20/74	22,871	41	209,500	56,245	101	207
1974	22,000	38	11/25/74	01/01/75	24,673	49	217,000	49,971	60	230
1975	22,000	30	11/23/75	12/23/75	25,075	57	180,000	44,310	58	239
1976	22,000	27	11/22/76	12/18/76	25,865	59	316,000	44,080	61	296
1977	29,000	44	11/21/77	01/03/78	30,747	53	405,000	57,472	72	347
1978	40,000	69	11/13/78	01/20/79	40,490	57	253,000	70,983	146	290
1979	29,000	70	11/09/79	01/17/80	29,193	42	248,000	69,414	137	307
1980	27,000	31	11/03/80	12/03/80	27,835	68	220,000	40,888	113	332
1981	24,000	50	11/09/81	12/28/81	25,328	44	180,000	56,964	109	358
1982	17,500	40	11/08/82	12/17/82	17,863	42	166,000	42,432	106	---
1983	17,500	35	11/14/83	12/18/83	18,164	44	207,000	41,124	101	---
1984	17,500	25	11/12/84	12/06/84	14,607	46	272,000	31,515	92	---
1985	17,500	31	11/11/85	12/11/85	21,767	58	245,000	37,820	89	---
1986	24,000	42	11/17/86	12/28/86	25,858	51	239,000	50,663	97	---
1987	26,300	50	11/16/87	01/04/88	18,585	31	492,000	60,804	99	---
1988	37,000	50	11/21/88	01/09/89	39,332	56	560,000	70,460	95	---
1989	51,750	56	11/20/89	01/14/90	42,254	54	731,000	78,699	104	---
1990	71,100	70	11/10/90	11/12/90	31,319	39	540,000	80,885	124	---
1991	72,400	84	11/09/91	01/31/92	26,403	38	350,000	70,210	127	---
1992	39,500	79	11/14/92	01/31/93	17,255	30	372,000	57,877	107	---
20-Yr. Avg.	31,552	49	-----	-----	26,274	48	320,125	55,641	100	---

Table 2. Hunter-trips and harvest of Canada geese in the 4-County Quota Zone during the 1992 season.

	Number of Permits Issued	Hunter Trips	Percent By Permit	Percent By Counties	Harvest	Percent By Permit	Percent By Counties	Percent Success Rate
<u>Alexander (Horseshoe Lake)</u>								
Licensed Clubs	43	13,703	92		4,014	94		29
Other Areas		1,192	8		256	6		21
		14,895	100	26	4,270	100	25	29
<u>Union County</u>								
Licensed Clubs	16	8,849	84		3,181	91		36
Other Areas		1,686	16		296	9		18
		10,535	100	18	3,477	100	20	33
<u>Williamson/Jackson (Crab Orchard NWR)</u>								
Licensed Clubs	48	15,250	47		6,418	68		42
Other Areas		17,197	53		3,090	32		18
		32,447	100	56	9,508	100	55	29
Grand Total	107	57,877		100	17,255		100	30

Licensed clubs are those areas that charge a daily fee for hunting and areas covered by lease or other monetary agreement. Number of hunter trips and harvest are reported directly by daily registration of hunters.

Other areas represent all other areas where goose hunting occurs. In 1982, the free permit was eliminated and hunters were no longer required to register to hunt on free areas. Number of hunter-trips and harvest were estimated using a 9-year mean percent harvest and percent hunter-trips occurring on free areas in each of the counties in past years.

Table 3. Contribution of public hunting areas to the hunting effort and harvest of Canada geese during the 1992 season.

County	Hunter Trips	Percent of County Commercial Club Total	Harvest (%)	Percent of County Commercial Club Total	Percent Success Rate
Alexander	746	5.4	61 (5)	1.5	8
Union	2,618	29.6	605 (52)	19.0	23
Williamson/Jackson	2,910	19.1	498 (43)	7.7	17
All Counties	6,274	16.6	1,164	11.7	19

^a Horseshoe Lake Public Hunting Area is a licensed club.

^b Union County Public Hunting Area is a licensed club.

^c Crab Orchard NWR Public Hunting Area is a licensed club.

Table 4. Comparison of the 1992 goose season on the Union County and Horseshoe Lake Public Hunting Areas with the 1991 goose season and the 1986-1990, 5-year average.

	Union County Public Hunting Area			Horseshoe Lake Public Hunting Area		
	5-Year Avg. (86-90)	1991	1992	5-Year Avg. (86-90)	1991	1992
Percent of Total County Hunters	20	27	25	8	5	5
Percent of Total County Harvest	15	19	17	4	2	1
Number of Hunters	2,824	3,571	2,618	1,577	1,005	746
Average Number Hunters Per Day	63	44	40	36	12	11
Harvest	1,178	1,062	605	422	164	61
Percent Success Rate	41	30	23	25	16	8

Table 5. Canada goose harvest in the 4-County Quota Zone throughout the 1992 season.

Date	Alexander		Canada Goose Harvest**		Will./Jackson		*Number Geese Harvested Per Report Period	*Total Goose Harvest in Quota Zone
	Hunters	Geese	Hunters	Geese	Hunters	Geese		
11-20-92	524	39	410	24	2,889	1,373	1,436	1,436
11-27-92	399	32	318	27	1,598	339	398	1,834
12-04-92	465	61	262	25	1,653	308	394	2,228
12-11-92	1,024	232	712	223	2,387	713	1,168	3,396
12-18-92	1,882	689	1,375	510	3,326	1,047	2,246	5,642
12-25-92	1,745	773	1,035	297	2,987	810	1,880	7,522
01-01-93	2,410	907	1,705	789	3,919	855	2,551	10,073
01-08-93	1,817	400	1,195	328	3,187	692	1,420	11,493
01-15-93	1,409	295	957	289	2,883	695	1,279	12,772
01-22-93	1,518	465	1,161	511	3,311	1,240	2,216	14,988
01-29-93	1,152	298	988	321	3,187	1,116	1,735	16,723
01-31-93	550	79	417	133	1,120	320	532	17,255
Total	14,895	4,270	10,535	3,477	32,447	9,508	17,255	17,255

*Includes harvest on non-commercial areas

**Reported harvest by commercial clubs

Table 6. Total harvest of Canada geese by county in the 4-County Quota Zone, 1989-1992.

County	1989		1990		1991		1992	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Alexander	13,806	33	7,683	25	7,026	27	4,270	25
Union	9,996	24	7,861	25	5,650	21	3,477	20
Williamson/Jackson	<u>18,452</u>	<u>43</u>	<u>15,775</u>	<u>50</u>	<u>13,727</u>	<u>52</u>	<u>9,508</u>	<u>55</u>
Total:	42,254	100	31,319	100	26,403	100	17,255	100

Table 7. Percent success rates for Canada goose hunters on commercial clubs in the 4-County Quota Zone 1985-1992.

County	1985	1986	1987	1988	1989	1990	1991	1992
Alexander	60	56	31	62	59	35	38	29
Union	64	69	31	66	71	54	46	36
Williamson/Jackson	81	60	45	73	66	54	52	42
All Counties	67	61	36	67	65	46	45	36

Table 8. Hunter use, harvest and hunter success on the Union County Public Hunting Area 1973-1992.

Year	No. Days Hunted	Number Hunters	Average Number Hunters Per Day	Geese Harvested	% Success Rate
1973	63	4,266	80	1,593	37
1974	38	2,980	93	1,964	66
1975	30	2,489	96	2,292	92
1976	27	2,302	99	1,832	80
1977	44	3,045	82	962	32
1978	69	4,998	83	3,441	69
1979	70	5,524	81	2,800	51
1980	31	2,681	86	2,325	87
1981	47	3,647	78	1,927	53
1982	34	2,327	68	1,098	47
1983	35	2,269	76	1,074	47
1984	21	1,696	81	735	43
1985	26	2,073	80	969	47
1986	33	2,628	80	1,052	40
1987	39	2,446	63	391	16
1988	39	2,618	65	1,664	64
1989	45	2,782	62	1,318	47
1990	64	3,644	57	1,467	40
1991	81	3,571	44	1,062	30
1992	65	2,618	40	605	23
20-Yr. Avg.	45	3,030	75	1,529	51

Table 9. Hunter use, harvest and hunter success on the Horseshoe Lake Public Hunting Area 1973-1992.

Year	No. Days Hunted	Number Hunters	Average Number Hunters Per Day	Geese Harvested	% Success Rate
1973	63	3,857	54	875	31
1974	38	2,724	82	1,527	58
1975	30	2,373	91	960	40
1976	27	2,154	94	562	26
1977	44	2,439	66	678	28
1978	69	3,381	56	1,457	43
1979	70	2,514	37	434	17
1980	31	1,427	46	1,194	84
1981	47	1,986	42	494	25
1982	34	1,097	32	146	13
1983	35	1,153	38	374	32
1984	21	1,070	51	404	38
1985*	20	806	40	167	21
1986	33	1,382	42	367	27
1987	39	1,191	31	196	16
1988	39	1,714	43	597	35
1989	45	2,191	49	766	35
1990*	58	1,406	24	184	13
1991	81	1,005	12	164	16
1992	65	746	11	61	08
20-Yr. Avg.	44	1,831	47	580	30

*Horseshoe Lake Public Hunting Area closed due to flooding from Nov. 21-29, 1985 and Jan. 3-8, 1991.

Table 10. Canada goose populations on wintering areas throughout the fall and winter of 1992-93.

Date	*Ballard Co.	Horseshoe Lake	Union Co.	Crab Orchard	Rend Lake	Campbell Pond	Carlyle Lake	Cache River Bottoms	Burning Star Mine	Total
10-19-92	1,200	9,000	3,500	13,000	3,500	800	--	0	--	31,000
10-26-92	1,500	16,000	4,000	9,000	4,000	200	--	0	--	30,500
11-02-92	1,000	11,800	6,500	11,300	1,000	1,000	--	0	600	33,200
11-09-92	3,000	12,000	3,000	13,000	4,000	0	--	0	2,000	37,000
11-16-92	3,200	9,000	3,000	12,000	9,500	200	--	0	3,000	39,900
11-23-92	1,250	14,000	5,000	14,000	10,000	100	--	0	3,000	47,350
11-30-92	2,600	8,500	4,500	18,000	14,000	200	600	50	4,000	52,450
12-07-92	9,050	38,000	25,000	40,000	29,000	4,500	800	700	500	147,550
12-16-92	18,500	75,000	56,000	105,000	41,000	3,500	18,000	11,000	1,500	329,800 ^a
12-21-92	22,000	56,000	65,000	116,000	27,000	3,500	29,000	8,000	6,500	335,000 ^b
01-06-93	29,000	130,000	45,000	114,000	28,000	10,000	30,800	13,000	7,000	416,800 ^c
01-14-93	50,000	115,000	68,000	165,000	60,000	9,000	51,000	20,000	15,000	559,000 ^d
01-19-93	46,000	105,000	58,000	165,000	108,000	5,000	65,000	9,000	36,000	597,000
01-25-93	29,000	85,000	40,000	100,000	85,000	9,000	48,000	7,000	6,000	409,500 ^e
02-01-93	44,000	58,000	19,000	81,000	63,000	5,000	89,000	5,500	3,500	368,250 ^f

*Includes Swan Lake, KY

^cIncludes Ten Mile Creek - 10,000 ^eIncludes Ten Mile Creek - 500

^aIncludes Ten Mile Creek -

300 ^dIncludes Ten Mile Creek - 6,000 ^fIncludes Ten Mile Creek - 250

^bIncludes Ten Mile Creek 2,000

Table 11. Age ratio in the Illinois Canada goose harvest during the 1992 Season. Data gathered from tail fans (n=1,727) collected throughout the season from commercial pickers in Alexander, Union, Williamson and Jackson counties.

Area	Immatures	Adults	Ratio
Alexander County	578	569	1.01:1
Union County	176	175	1.01:1
Williamson/Jackson Counties	105	124	0.85:1
Total	859	868	0.99:1

Table 12. Age ratio in the Canada goose harvest (n=666) on the Union County and Horseshoe Lake Public Hunting Areas during the 1992 season.

	Horseshoe Lake P.H.A. Age Ratio/Sample Size (22 Im./39 Ad.)	Union County P.H.A. Age Ratio/Sample Size (318 Im./287 Ad.)
Nov. 14 ^a	0.0:1 00	0.0:1 00
Nov. 15 - Nov. 21	0.0:1 00	2.0:1 09
Nov. 22 - Nov. 28	0.0:1 00	0.6:1 10
Nov. 29 - Dec. 05	0.0:1 00	0.5:1 03
Dec. 06 - Dec. 12	0.0:1 01	2.2:1 45
Dec. 13 - Dec. 19	0.2:1 11	1.5:1 108
Dec. 20 - Dec. 26	1.5:1 05	0.8:1 41
Dec. 27 - Jan. 02	0.7:1 32	1.1:1 202
Jan. 03 - Jan. 09	0.6:1 05	0.5:1 54
Jan. 10 - Jan. 16	0.2:1 05	0.5:1 34
Jan. 17 - Jan. 23	0.0:1 01	1.8:1 81
Jan. 24 - Jan. 30	0.0:1 01	0.4:1 17
Jan. 31	0.0:1 00	0.0:1 01
Total 79-Day Season	0.56:1 61	1.1:1 605

^aFirst Day of Hunting
Both areas were closed December 24-26.

Table 13. Age ratios, expressed as immatures per adult, among Canada geese harvested on the Horseshoe Lake and Union County Public Hunting Areas, 1966 to 1992.

Year	Horseshoe Lake	Union County
1966	1.1	2.6
1967	0.8	2.6
1968	1.2	2.2
1969	0.9	1.2
1970	0.9	3.4
1971	1.4	2.8
1972	0.8	1.1
1973	0.8	1.6
1974	1.8	2.5
1975	2.6	4.1
1976	2.5	2.7
1977	1.7	1.3
1978	1.2	1.2
1979	---	2.8
1980	3.2	4.5
1981	2.6	2.2
1982	1.3	2.7
1983	1.0	0.9
1984	2.6	3.2
1985	1.7	1.8
1986	1.4	1.3
1987	0.9	1.0
1988	2.0	1.6
1989	1.5	1.2
1990	0.4	0.7
1991	1.0	1.4
1992	0.5	1.1
27-Year Avg.	1.45	2.06

Table 14. Total goose use days and percent total at 5 refuges in southern Illinois and western Kentucky in 1992-93.

Week	Union County		Horseshoe Lk.		Crab Orchard		Rend Lake		Ballard County		Total Goose Use Days
	Goose Use Days	% Total	Goose Use Days	% Total	Goose Use Days	% Total	Goose Use Days	% Total	Goose Use Days	% Total	
10-19-92	24,500	11	63,000	30	91,000	43	24,500	12	8,400	4	211,400
10-26-92	28,000	12	112,000	46	63,000	26	28,000	12	10,500	4	241,500
11-02-92	45,500	21	82,600	37	79,100	36	7,000	3	7,000	3	221,200
11-09-92	21,000	9	84,000	34	91,000	37	28,000	11	21,000	9	245,000
11-16-92	21,000	8	63,000	24	84,000	33	66,500	26	22,400	9	256,900
11-23-92	35,000	11	98,000	32	98,000	32	70,000	23	8,750	3	309,750
11-30-92	31,500	9	59,500	18	126,000	38	98,000	29	18,200	5	333,200
12-07-92	225,000	18	342,000	27	360,000	28	261,000	21	81,450	6	1,269,450
12-16-92	280,000	19	375,000	25	525,000	36	205,000	14	92,500	6	1,477,500
12-21-92	455,000	23	392,000	20	812,000	41	189,000	9	154,000	7	2,002,000
12-28-92	585,000	23	504,000	20	1,044,000	40	243,000	9	198,000	8	2,574,000
01-06-93	360,000	13	1,040,000	38	912,000	34	224,000	8	232,000	7	2,768,000
01-14-93	340,000	15	575,000	26	825,000	37	300,000	13	250,000	9	2,290,000
01-19-93	348,000	12	630,000	22	990,000	35	648,000	23	276,000	8	2,892,000
01-25-93	280,000	12	595,000	26	700,000	31	595,000	26	203,000	5	2,373,000
02-01-93	133,000	8	406,000	24	567,000	34	441,000	26	308,000	7	1,855,000
Total	3,212,500	15	5,421,100	25	7,367,100	35	3,428,000	16	1,891,200	9	21,319,900

Table 15. Canada goose harvest in Illinois, 1973-1992.

Year	Statewide Harvest Obj.	Season Lgth. Quota Z./Upstate	4-Co. Quotas (1,000s)	Statewide Harvest Fed. Est./State Est. (1,000s)	Quota Z. Harvest (1,000s)	Upstate Harvest Fed. Est. / State Est.	29%	54%	48%	55%
1973	28,000	63	70	24.0 (85) ^a	28.5	22.9 (80) ^b	5.6 (20)	19.0 (42) ^c		
1974	28,000	38	70	22.0 (80)	47.1	24.7 (52)	22.4 (48)	11.7 (40)		
1975	28,000	30	70	22.0 (80)	44.8	25.1 (56)	19.7 (44)	13.2 (42)		
1976	28,000	27	70	22.0 (80)	53.7	25.9 (48)	27.8 (52)	8.5 (37)		
1977	35,000	44	70	29.0 (80)	76.6	30.7 (40)	45.9 (60)	15.6 (42)		
1978	50,000	69	70	40.0 (80)	118.7	40.5 (34)	78.2 (66)	21.4 (45)		
1979	35,000	70	70	29.0 (80)	69.0	29.2 (42)	39.8 (58)	17.5 (48)		
1980	33,000	31	70	27.0 (80)	57.7	27.8 (48)	29.9 (52)	17.5 (48)		
1981	30,000	50	50	24.0 (80)	51.5	25.3 (49)	26.2 (51)	11.7 (40)		
1982	27,000	40	40	17.5 (65)	27.2	17.9 (66)	9.3 (34)	11.7 (40)		
1983	27,000	35	40	17.5 (65)	38.8	18.2 (44)	23.4 (56)	13.2 (42)		
1984	27,000	25	20	17.5 (65)	31.0	14.6 (47)	16.4 (53)	8.5 (37)		
1985	27,000	31	20	17.5 (65)	36.9	21.8 (59)	15.1 (41)	15.6 (42)		
1986	48,000	42	40	24.0 (50)	48.9	25.9 (53)	23.0 (47)	21.4 (45)		
1987	52,500	50	40	26.3 (50)	45.7	18.6 (41)	27.1 (59)	17.5 (48)		
1988	74,000	50	50	37.0 (50)	91.0	39.3 (43)	51.7 (57)	33.2 (44)		
1989	103,500	56	60	51.7 (50)	95.6	42.3 (44)	53.3 (56)	49.1 (52)		
1990	142,200	70	70	71.1 (50)	93.7	31.3 (33)	62.4 (67)	38.7 (55)		
1991	144,800	84	90	72.4 (50)	95.4	26.4 (28)	69.0 (72)	69.3 (72)		
1992	79,000	79	79	39.5 (50)	76.7	17.2 (22)	65.8 (78)	42.7 (72)		
20-yr. Avg.	52,350	49	58	31.5	61.4	26.2	35.6	28.3		

^aPercent of statewide harvest objective
^bPercent of federal estimate of statewide harvest
^cPercent of state estimate of statewide harvest
 1966-1973 average percent of statewide harvest occurring upstate - 29%
 1974-1981 average percent of statewide harvest occurring upstate - 54%
 1982-1985 average percent of statewide harvest occurring upstate - 48%
 1986-1989 average percent of statewide harvest occurring upstate - 55%

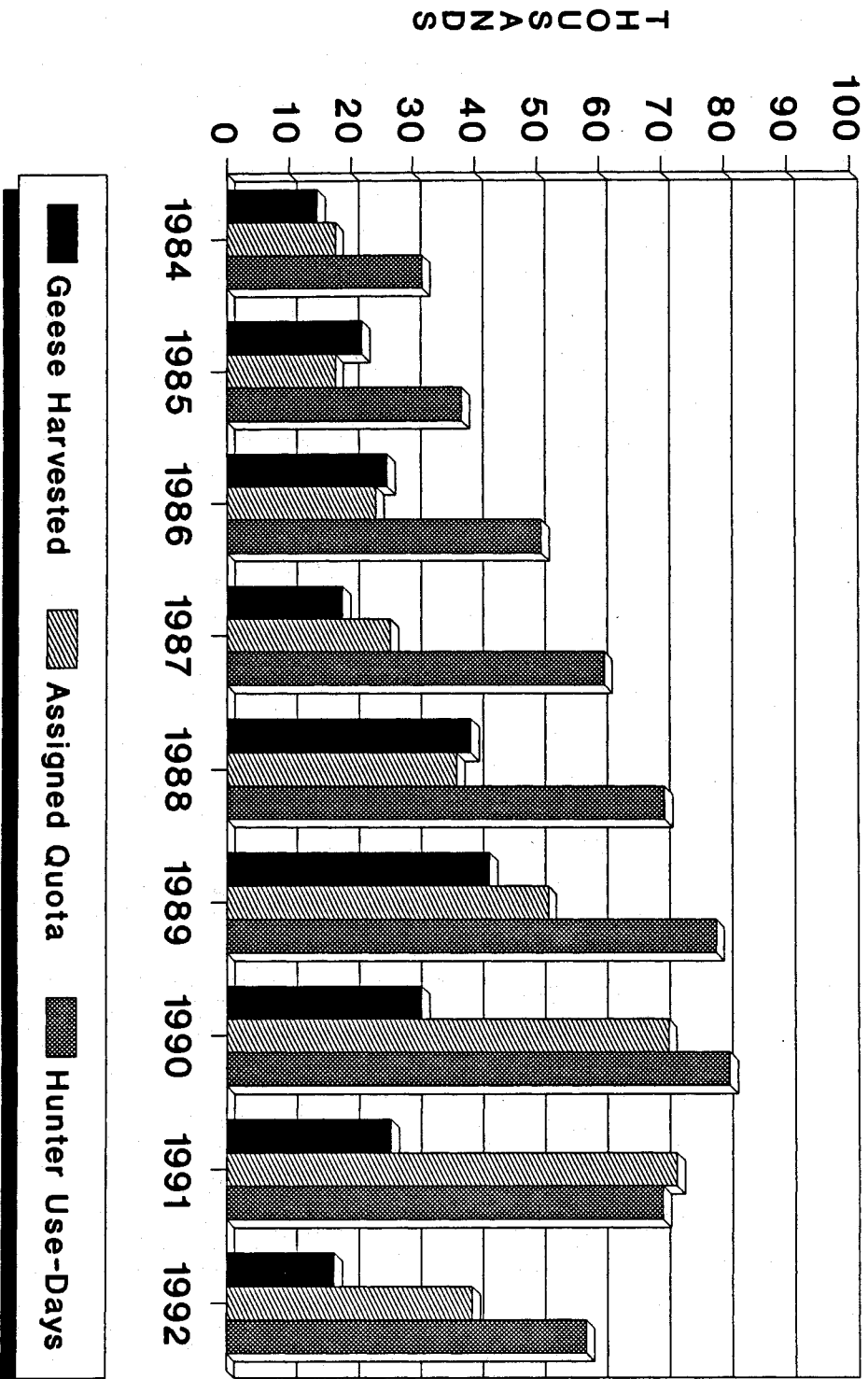


Figure 1. Number of geese harvested, assigned quota and hunter use-days in the 4-County Quota Zone, 1984-1992.

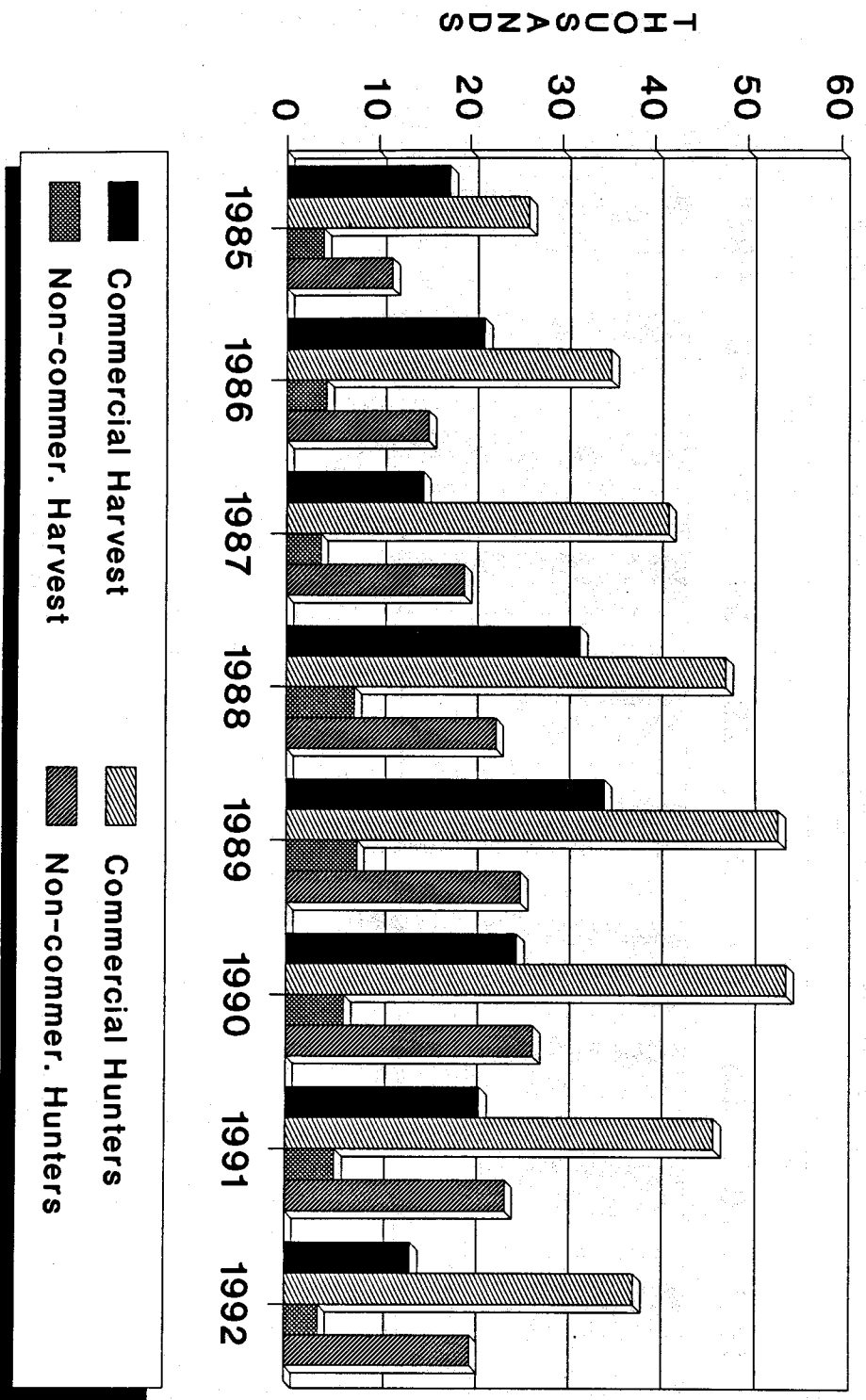


Figure 2. Number of commercial and non-commercial hunters and goose harvest, 1985-1992.

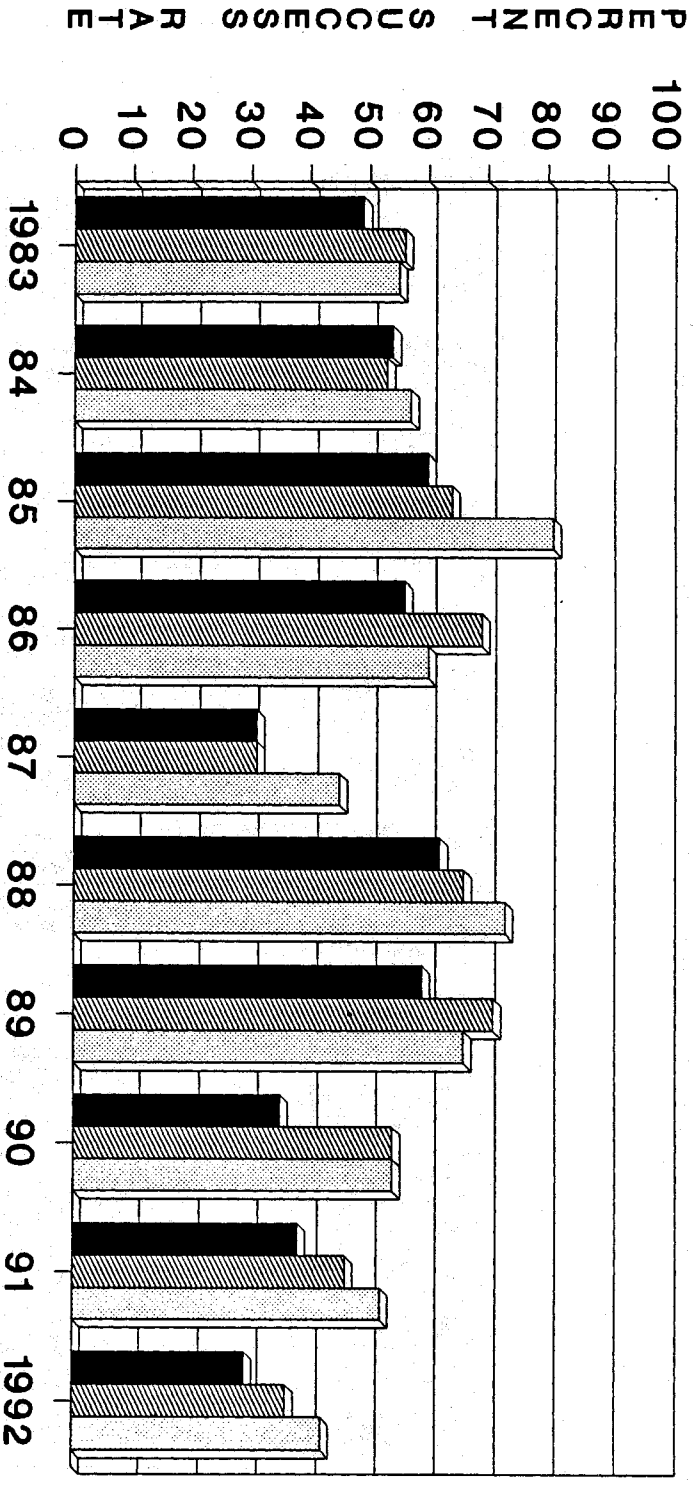


Figure 3. Success rates for Canada goose hunters on commercial clubs in the 4-County Quota Zone, 1983-1992.

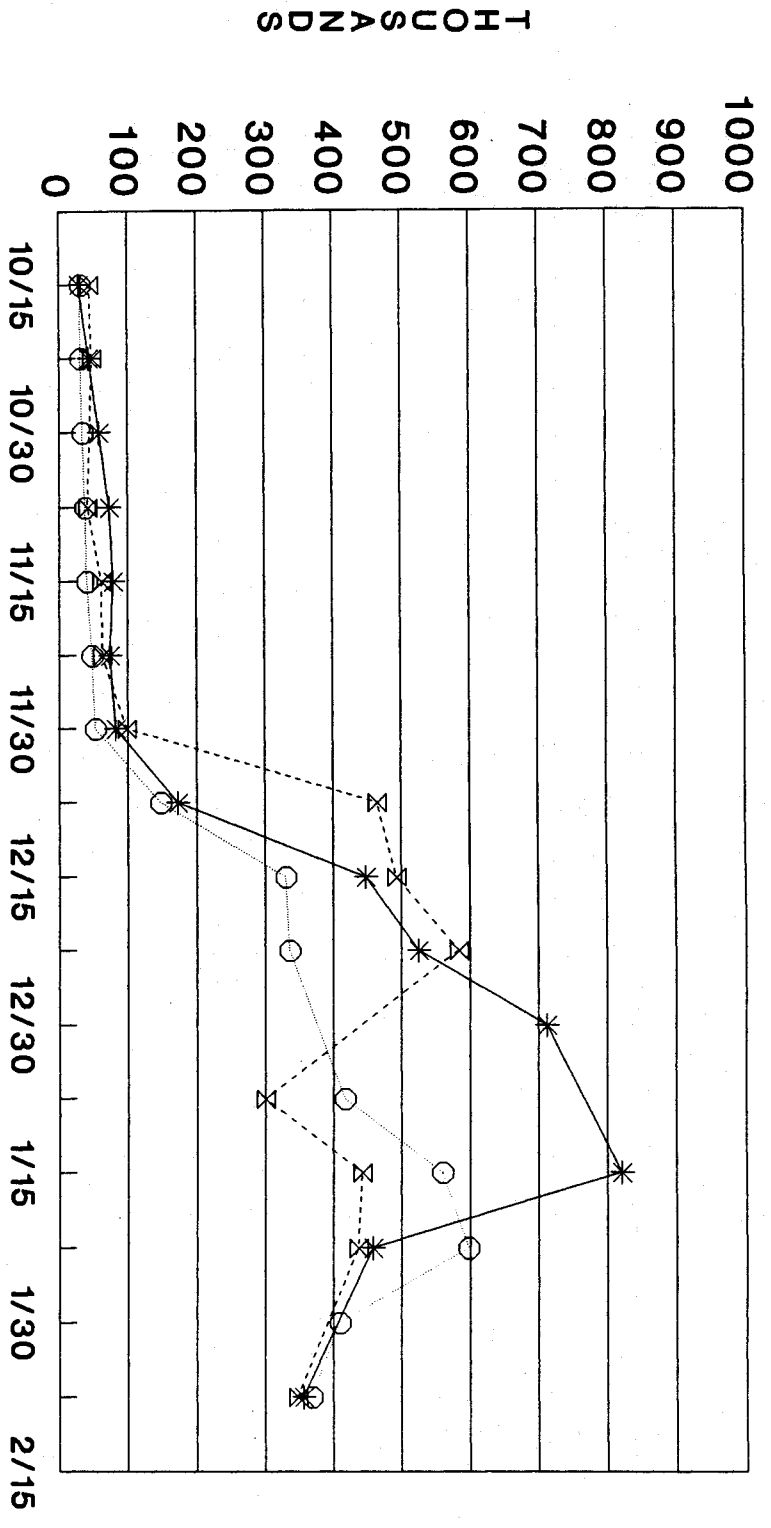


Figure 4. Number of Canada geese in Southern Illinois and Western Kentucky during fall and winter, 1990-1993.

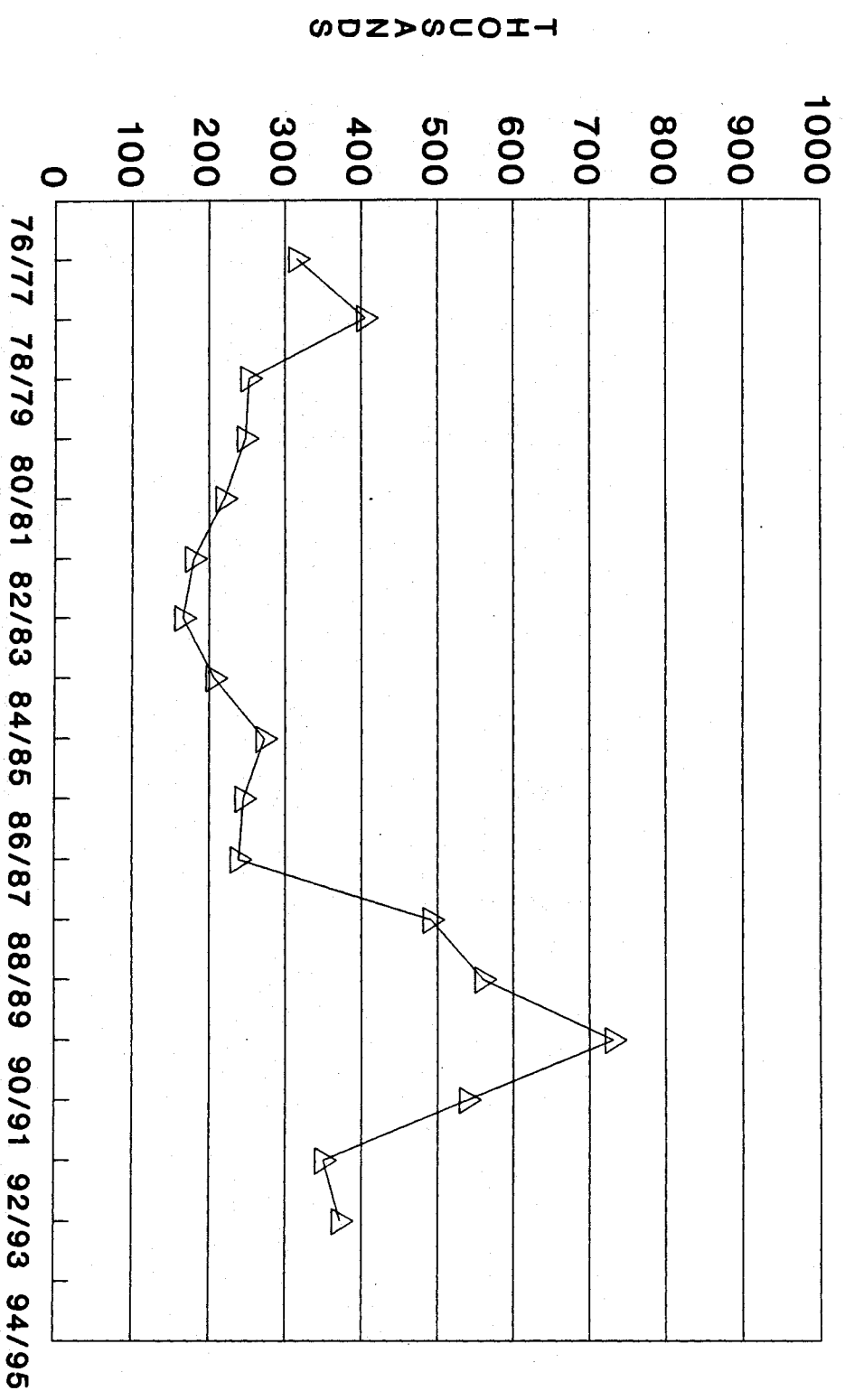


Figure 5. Peak populations of Canada geese in the 4-County Quota Zone, 1976-1993.

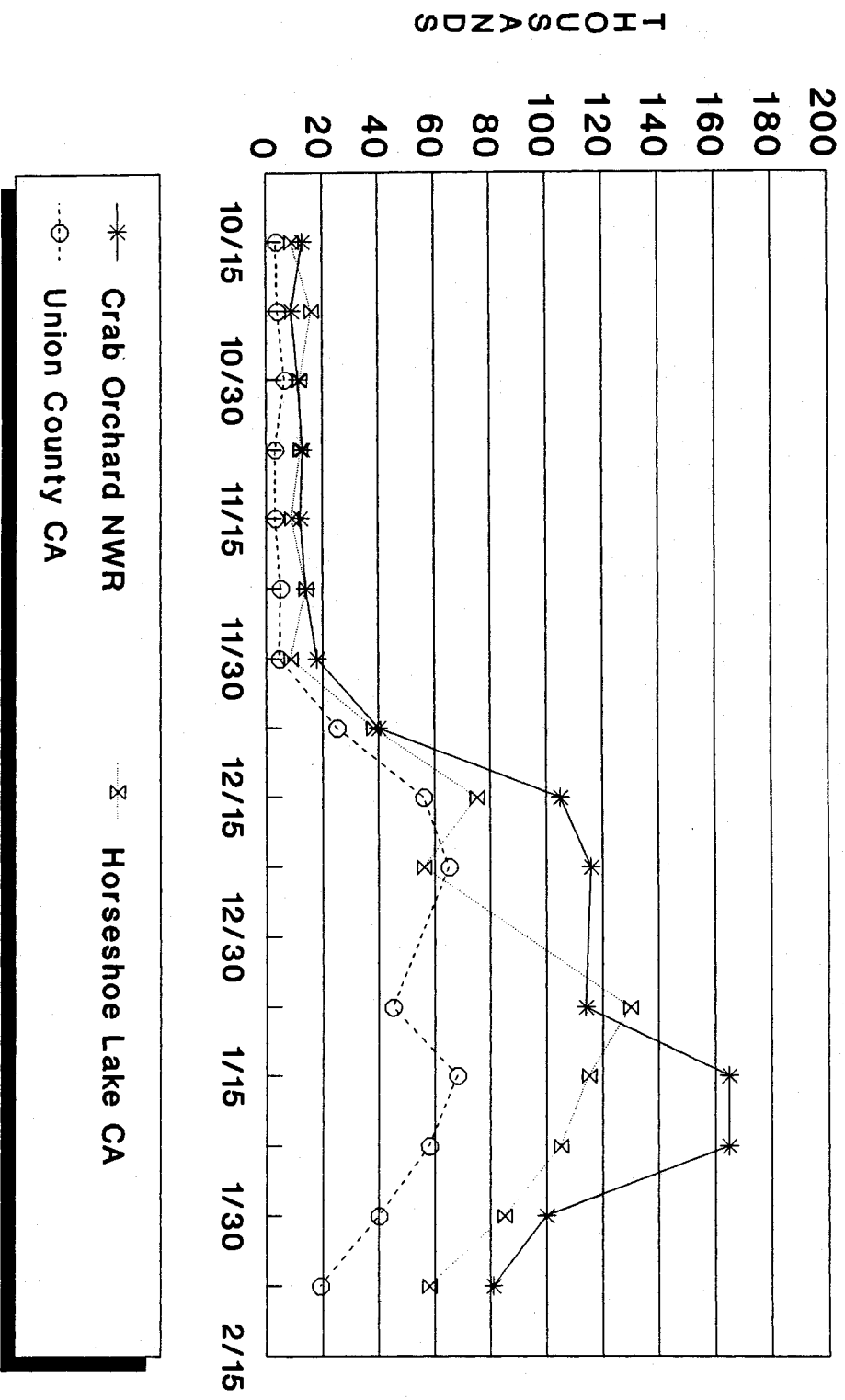


Figure 6. Numbers of Canada geese on three refuges in the 4-County Quota Zone during fall and winter, 1992-1993.