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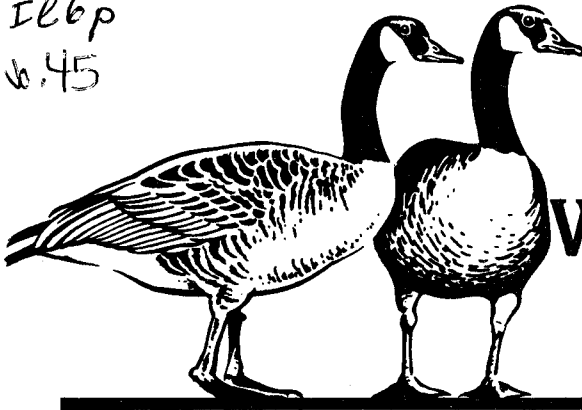
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CANADA GOOSE HARVEST AND HUNTER ACTIVITY
IN THE SOUTHERN ILLINOIS QUOTA ZONE DURING
THE 1983 SEASON

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Abstract: The 1983 quota zone goose season was the first season in nearly 10 years where neither the assigned quota nor designated length changed from the previous year. The season opened 14 November and closed 18 December after 35 days, 5 days short of its 40 day limit. The final harvest exceeded the 17,500 quota somewhat with a total of 18,164 geese. Williamson/Jackson counties accounted for 47 percent of the total quota zone harvest, 33 percent occurred in Alexander county, and 22 percent in Union county. A total of 101 commercial licenses were issued and harvest on outlying non-commercial areas was estimated using the last 9 year mean. Goose hunters made 41,124 trips to the quota zone and experienced an average success rate of .44 geese per trip. Hunters at commercial clubs in Union county reported the highest success rate of .56. Hunters at commercial clubs in the Crab Orchard vicinity followed with an almost equal success rate of .55, and Alexander county followed closely with a rate of .49 geese per hunter. The highest success rates for all counties were reported during the last 10 days of the season. The Canada goose population wintering on areas in the quota zone peaked at 207,000 on 20 December following a major migration of geese into southern Illinois. During this time, freezing temperatures, snow, and ice concentrated geese on the refuges allowing for an accurate count. These same weather conditions were likely the reason for the increase in numbers of geese in southern Illinois compared to the peak population seen during the mild winter of 1982. An increase in the Mississippi Population in 1983 would appear impossible considering the extremely low age ratio found in the harvest. Tail fans collected from geese harvested in Union and Alexander counties revealed an unprecedented low of .7 immatures per adult. Although hunting conditions, weather and migrations were more normal in 1983, the reduced population and few number of young birds in the flock resulted in only a fair hunting season.

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INTRODUCTION

The southern Illinois quota zone is composed of Alexander, Union, Williamson, and Jackson counties. The three major goose wintering areas located within this 4 county zone include Horseshoe Lake Refuge, a state owned 7,900 acre area encompassing an oxbow of the Mississippi River in Alexander county, the Union County Refuge, a 6,200 acre state owned area also located within the Mississippi River floodplain, and the 44,000 acre Crab Orchard National Wildlife Refuge surrounding Crab Orchard Lake.

The quota zone system requires that all goose hunters hunting on licensed areas register and report their harvest daily. This system of hunter registration is recognized as one of the most efficient and accurate methods of monitoring Canada goose harvest in local areas where geese are concentrated and hunting pressure is intensive. The quota zone system has been in effect in southern Illinois since 1960 with only minor changes made in regulations through the years.

This report and the Canada Goose Harvest and Population Study in Illinois is a part of Federal Aid, Pittman-Robertson Project, Number W-43-R(32).

METHODS AND MATERIALS

Registration packets containing daily registration sheets, club permit, administrative order, and self-addressed envelopes were prepared and distributed to all landowners in the quota zone applying for a commercial goose license. These commercial clubs submitted daily registration sheets twice weekly throughout the season, and harvest inventories were updated at each interval by Union County field office personnel. All procedures in 1983 were the same as in 1982, including methods of estimating harvest and hunting pressure on outlying non-commercial areas by using the last 9-year mean (Thornburg, Estel, 1983).

An automatic answering machine was again maintained in the phone system at the Union County office. Harvest information and results of the most recent aerial inventories were updated on the recording each time a harvest count was made. In this way, interested goose hunters, club operators, and media services were able to get immediate information on the progress of the 1983 quota zone goose season.

Canada goose populations on wintering areas in the quota zone and at Rend Lake and Ballard County, Kentucky were monitored by aerial inventories starting in October and ending in mid-February. Flights were scheduled at weekly intervals, however, consistently poor weather conditions in December prevented several counts from being made. Biologists with the Illinois Department of Conservation and the U.S. Fish and Wildlife Service conducted the inventories using the Department's Cessna 210 or Cessna 337.

Age ratio information was obtained from examination of tail fans of geese

harvested at the Union County and Horseshoe Lake public hunting areas. Tail fans were also collected from commercial picking sheds in Union and Alexander counties in order to sample age ratios representative of both private clubs and public areas.

RESULTS AND DISCUSSION

The 1983 quota zone goose season opened on 14 November and closed 35 days later on 18 December. The quota for 1983 was set at 17,500 and was exceeded slightly with a final harvest of 18,164 Canada geese. Maximum season length and assigned quota remained the same as in 1982. In 1983 the season opened one week later than the previous year to lessen the hunting pressure on the early migrating portion of the MVP. Annual harvest quotas have declined yearly from a high of 40,000 geese in 1978 to 17,500 in 1982. Season length has also decreased from a span of 70 days in 1978 to 40 days in 1982 and 1983 (Table 1).

The 1983 Canada goose hunting season in the quota zone was in some ways opposite and other ways similar to the 1982 season. Unlike 1982 when good hunter success during the first few weeks caused predictions of a short season, poor hunter success in November of 1983 resulted in predictions that the season would extend to its legal limit. After the initial influx of geese into southern Illinois in early fall, mild weather discouraged any significant migration into the area through November. This, combined with the most extreme of 3 consecutive years of poor production on the breeding grounds, contributed to the very slow start of the hunting season. However, when freezing conditions prompted a major migration of geese into southern Illinois early in December, hunter success and harvest immediately improved. In 1983, similar to 1982, early predictions about the quota zone goose hunting season proved to be incorrect. While harvest slowed in December of 1982 so much that the season unexpectedly continued to its 40-day limit, harvest in December of 1983 accelerated to the point that the season was closed 5 days short of the 40-day limit.

Hunting Pressure

Goose hunters reported a total of 28,402 trips to commercial clubs in the quota zone during the 1983 season. This included 4,543 trips to the public hunting areas at Horseshoe Lake, Union County, and Crab Orchard. An additional 12,722 hunter trips were estimated for non-commercial areas that did not have to report during the 1983 season. The total estimate for all areas in the quota zone was therefore 41,124 hunter trips. The average daily number of hunters was 1,175, an increase from the 1,061 daily average of the 1982 season.

On commercial clubs 42 percent of hunter effort was reported in Alexander county, 32 percent occurred in Williamson/Jackson counties, and 26 percent in Union County. When non-commercial areas are included in the total, the Crab Orchard region, as usual, is found to support the greatest amount

of hunting activity in the quota zone with 47 percent for 1983 (Table 2).

Commercial licenses were issued to 101 clubs in the quota zone in 1983. This was 5 less than the 106 permits issued in 1982. Over half of the permits were for the comparatively small clubs located in the vicinity of Crab Orchard National Wildlife Refuge. Numbers of licensed clubs have remained about the same for the past three years in both Alexander and Williamson counties, but have decreased by 9 or 43 percent in Union county since 1981.

Public hunting areas continued to contribute significantly to hunter efforts in the quota zone. During the 1983 season these areas attracted 16 percent of the total hunting effort at commercial clubs. The distribution of hunters among the three areas remained essentially the same as in 1982, with Union county receiving 50 percent of the hunters utilizing public lands. Also consistent with 1982, the Union county public hunting area comprised slightly over 30 percent of all hunting effort on commercial clubs in Union county (Table 3).

Harvest

The final harvest in the quota zone for the 1983 season was 18,164 geese. This was 664 birds over the assigned quota of 17,500. Licensed commercial clubs harvested 15,001 geese, or 83 percent of the total harvest. Hunters in the Crab Orchard area took 7,400 geese, or 41 percent of the quota zone harvest. Alexander county hunters followed with 6,186 geese or 34 percent, and the 4,578 geese taken in Union county represented 25 percent of the total quota zone harvest. The distribution of harvest among the four counties was not significantly different from 1982. Table 4 outlines the harvest by county in the quota zone for the past 5 years.

The average number of geese harvested per day during the 1983 season was 519. This was up 16 percent from the low daily average seen in 1982. The 1983 season's harvest was rather unusual in that numbers of geese taken during the last report periods were nearly as high as harvest figures for the first few report periods. As is typical, the most intense harvest occurred during the first report period, when 2837 geese were taken between 14 and 17 November. However, this represented only about half as many geese as were harvested during the first report period of the previous two years. A low of 916 birds were taken during a mid-season report but was followed by a second high of 2,404 geese harvested between 8 and 11 December. This second peak in harvest was very close to the number of geese taken during the first report period of 1983 and corresponded with severe weather and the late migration of geese into southern Illinois (Table 5).

Canada goose harvest on outlying areas was estimated as explained in the 1982 report (Thornburg, Estel 1983). The result for this year was an estimated harvest of 3,163 geese on non-commercial areas and represented 17 percent of the total quota zone harvest.

Goose harvest on controlled public hunting areas in the quota zone totaled 1,561 birds in the 1983 season and represented 8.6 percent of the total quota zone harvest (Table 3). Geese taken on public areas accounted for 10.4 percent of the commercial club harvest, a slight increase over the 9.5 percent calculated for 1982. This increase was attributed only to the Horseshoe Lake public hunting area where the total harvest of 374 geese was an improvement over the extreme low of 146 geese taken there in 1982. The harvest at Union county of 1,074 geese was a very slight decrease from 1982 and comprised 68 percent of all harvest on controlled public hunting areas. The 113 geese taken at Crab Orchard in 1983 represented the lowest harvest at any of the public areas in recent years. Overall, the contribution of public lands to the total quota zone harvest has remained at about the same proportion for the past three years, however it does show a decline of 7 percent when compared to 1980.

Hunter Success

The average daily success rate was .44 geese per hunter in the quota zone for the 1983 season (Table 2). This was a slight increase over the 1982 daily success rate of .42 and is equal to the success found by hunters in 1981 (Table 6). All counties of the quota zone experienced the highest hunter success rates during the last 10 days of the season. During this time, Alexander county hunters enjoyed the greatest success and reported a peak rate of .84 between 8 and 11 December. Union County, however, reported the highest success rate for the season overall, with a rate of .52 geese per hunter. Alexander and Williamson/Jackson counties followed with success rates of .48 and .38 respectively.

Union county exhibited the highest average success rate for commercial clubs with .56, Williamson/Jackson counties followed closely with .55, and Alexander county trailed with a rate of .49 geese per hunter. For non-commercial areas, the 9-year mean was utilized to indicate a success ratio of .36 for Alexander county, a .27 for Union county, and .23 for Williamson/Jackson counties.

The Union County public hunting area reported a success rate of .47. This was exactly the same rate as reported for 1982 and once again represents the most successful of the public lands in the quota zone. At the Horseshoe Lake public hunting area success improved considerably when compared to 1982. Tables 7, 8 and 9 show that while Horseshoe Lake came near to approaching its 5-year average with a success rate of .32 for 1983, success at Union County remained far below its 5-year average.

Population Status

The 1983 population peak for Canada geese in the quota zone was recorded during the mid-winter inventory on 20 December (Fig. 1). This peak of 207,000 birds was well above the high of 166,000 geese counted during 1982. However, populations of Canada geese inventoried on southern Illinois wintering areas from October through November of 1983 consistently revealed

fewer geese than corresponding inventories in 1982 (Table 10, Fig. 2). The extremely mild weather conditions that prevailed during the fall and early winter of 1983 were similar to the weather conditions experienced throughout the winter of 1982. After the initial influx of geese into southern Illinois in fall of 1983, practically no increase in numbers was seen on the refuges until a drastic change in the weather and drop in temperatures occurred in early December. A major migration of geese occurred during the period 6-9 December and geese continued to arrive in lesser numbers through 20 December. Freezing temperatures, snow and ice concentrated geese on the refuges creating ideal conditions for censusing during the mid-winter count. Although the peak inventory for 1983 indicated the presence of 41,000 more geese than during the peak in 1982, it is likely that the greater numbers of geese represented migrational differences due to severe December weather throughout the flyway, rather than an increase in the Mississippi Valley Population.

Peak populations at both Horseshoe Lake and Union County Refuge was recorded 20 December 1983 with 110,000 geese at Horseshoe Lake and 57,000 at Union County. This was approximately twice the amount of geese counted at each of the two refuges during peak occupation in November of 1982. The Crab Orchard population peaked at 74,000 in late October 1983, and did not show any increase in goose numbers after the December migration (Table 10). By the second week in January, geese were dispersing rapidly from the refuges in response to thawing conditions and exhaustion of food resources (Figure 3).

The number of geese at Rend Lake, 30 miles north of the quota zone, and Ballard county, Kentucky also showed peaks higher than those recorded in 1982. The population at Rend Lake jumped from 5,000 geese in late November to 38,000 on 20 December and peaked at 44,000 on 7 February. This was an increase of 4,000 birds from the 1982 peak, but is still far below the population levels of over 100,000 that Rend Lake has attracted in recent years. Similarly, at Ballard County, Kentucky, geese did not build up until after the late migration. The population peaked at 40,000 on 20 December, again an increase over 1982 but far below the 1981 peak of 140,000.

Age ratios of Canada geese harvested in Union and Alexander counties reached unprecedented lows in 1983. The .6 immatures per adult goose harvested in Union county was the lowest ratio in recorded history, and the .8 ratio for Alexander county was as low as ever recorded for that county (Table 11). Age ratios of birds harvested on the public hunting areas were slightly higher than for the counties as a whole, with a 1.0 to 1.0 ratio at Horseshoe Lake and .9 immatures per adult harvested at the Union County public hunting area. The greatest proportion of immatures harvested at the Union County public hunting area occurred on opening day, and was followed by a steady decline in ratios throughout the season. Interestingly, the proportion of immatures taken at Horseshoe Lake increased in December and was highest during the last two days of the season (Table 12). The extremely low age ratio of geese harvested on the public hunting areas in 1983 compares only with the ratios seen in 1972 and is otherwise the most severe on the record. Table 13 compares age ratios from the harvest

at public hunting areas since 1965.

The age ratios in the 1983 fall harvest, when considered with the greater vulnerability of immature geese, confirmed predictions of a near bust in Canada goose production. 1983 was the most extreme of three consecutive years of poor production. Taking this into account, it would seem impossible for an actual increase in the Mississippi Valley Population in 1983.

CONCLUSIONS

The 1983 quota zone goose season started out extremely slow but with a change in the weather, harvest later increased rapidly. The severe weather conditions that prompted a second major migration into southern Illinois in December prevented the season from comparing to that of 1982, one of the poorest on record. Due to late spring flooding followed by summer drought, crop production was generally poor in 1983 and geese were forced to range out from the refuges in search of food. This also contributed to the increased hunter success late in the season.

Statewide goose hunting regulations in 1983 were the same as in 1982. Season length was set at 40 days and the bag limit outside of the quota zone was restricted to one goose per day. Whereas, these more restrictive regulations effectively controlled the Illinois harvest in 1982, the state estimate of harvest (30,668) and the Federal harvest estimate (46,757) revealed a significant overharvest in 1983. Harvest estimates for other states in the flyway, including Kentucky, Wisconsin and Tennessee indicate that the total harvest on the MVP may have exceeded the flyway harvest objective by 100 percent.

The status of the MVP did not improve in 1983. Age ratios of immatures to adult in the harvest revealed the most drastic of three consecutive years of poor production. Greater reproductive success along with coordinated and controlled harvest throughout the Mississippi Flyway are essential for a reversal of the downward trend in the MVP.

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Table 1. Annual Southern Illinois Quota Zone goose season statistics, 1973-1983.

<u>Year</u>	<u>Quota Size</u>	<u>Season Length</u>	<u>Date Open</u>	<u>Date Closed</u>	<u>Harvest</u>	<u>Avg. Daily Succ. Rate</u>	<u>Pop. Peak</u>	<u>Hunter Trips</u>	<u>No. of Comm. Clubs</u>	<u>Free Permits</u>
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	----

Table 2. Hunter-trips and harvest of Canada geese in the southern Illinois quota zone during the 1983 season.

County	Number of Permits Issued	Hunter Trips	Percent By Permit	Percent By Counties	Harvest	Percent By Permit	Percent By Counties	Success Rate
<u>Alexander (Horseshoe Lake)</u>								
Licensed Club ^a	35	11,836	92		5,815	94		.49
Other Areas ^b		1,029	08		371	06		.36
Total		12,865	100	31	6,186	100	34	.48
<u>Union County</u>								
Licensed Clubs ^a	12	7,456	84		4,191	92		.56
Other Areas ^b		1,420	16		387	08		.27
Total		8,876	100	22	4,578	100	25	.52
<u>Williamson/Jackson (Crab Orchard NWR)</u>								
Licensed Clubs ^a	54	9,110	47		4,995	67.5		.55
Other Areas ^b		10,273	53		2,405	32.5		.23
Total		19,383	100	47	7,400	100	41	.38
Grand Total	101	41,124		100	18,164			.44

^a 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.

^b 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 the past 9-year mean percent harvest and percent hunter trips occurring on free areas in each of the counties.

Table 3. Contribution of public hunting areas to the hunting effort and harvest of Canada geese during the 1983 season.

County	Hunter Trips	Percent of County Commercial Club Total	Harvest	Percent of County Commercial Club Total	Success Rate
Alexander ^a	1,153	9.7	374	6.4	.32
Union ^b	2,269	30.4	1,074	25.6	.47
Williamson/Jackson ^c	1,121	12.3	113	2.3	.10
All counties	4,543	16.0	1,561	10.4	.34

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

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

^c Crab Orchard NWR Controlled Hunting Area, a licensed club.

Table 4. Harvest of Canada geese by county in the Southern Illinois Quota Zone, 1980 to 1983^a

County	1980		1981		1982		1983	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Alexander	9,810	35	7,766	31	6,281	35	6,186	34
Union	5,733	21	7,133	28	3,855	22	4,578	25
Williamson/Jackson	<u>12,292</u>	<u>44</u>	<u>10,429</u>	<u>41</u>	<u>7,727</u>	<u>43</u>	<u>7,400</u>	<u>41</u>
Total:	27,835	100	25,328	100	17,863	100	18,164	100

^a Harvest data for 1980-1981 are from daily registers of licensed commercial and non-commercial clubs. In 1982 the non-commercial or "free" license and registration requirement was eliminated so that the harvest on these areas was estimated using past 9-year county harvest averages.

Table 5. Goose harvest in the quota zone throughout the 1983 season.

Date	Canada Goose Harvest on Commercial Areas				*Total Harvest in Quota Zone	*Harvest Per Report Period		
	Alexander Hunters	Geese	Union Hunters	Geese			Will./Jackson Hunters	Geese
11-17-83	2,254	1,031	878	466	3,100	1,370	2,867	2,867
11-20-83	3,814	1,791	2,301	1,209	5,400	2,159	5,159	2,322
11-24-83	5,179	2,416	3,138	1,528	7,364	2,823	6,767	1,608
11-27-83	6,698	2,945	4,073	1,804	9,232	3,218	7,967	1,200
12-01-83	7,687	3,185	4,804	2,018	10,911	3,680	8,883	916
12-04-83	9,099	3,738	5,806	2,462	13,006	4,317	10,517	1,634
12-08-83	10,065	4,152	6,540	2,945	14,647	5,087	12,184	1,667
12-11-83	11,203	5,103	7,415	3,597	16,277	5,890	14,590	2,406
12-15-83	12,359	5,807	8,170	4,078	18,134	6,744	16,631	2,039
12-18-83	12,865	6,186	8,876	4,578	19,383	7,400	18,164	1,533

* Includes harvest on non-commercial areas

Table 6. Success rates for Canada goose hunters in the Southern Illinois Quota Zone, 1975-1983.

COUNTY	1975	1976	1977	1978	1979	1980	1981	1982	1983
Alexander	.55	.49	.56	.64	.37	.79	.42	.51	.48
Union	.50	.62	.35	.66	.50	.72	.56	.45	.52
Williamson/Jackson	.43	.65	.59	.46	.41	.60	.40	.36	.38
All Counties	.57	.59	.53	.57	.42	.68	.44	.42	.44

Table 7. Hunter use, harvest and hunter success on the Horseshoe Lake Public Hunting Area 1973-1983.

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

Table 8. Hunter use, harvest and hunter success on the Union County Public Hunting Area 1973-1983.

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

Table 10. Canada goose populations on wintering areas throughout the fall and winter of 1983-84.

DATE	BALLARD COUNTY	HORSESHOE LAKE	UNION COUNTY	CRAB ORCHARD	REND LAKE	CAMPBELL POND	TOTAL
10-31-83	4,000	40,000	18,000	74,000	7,000	500	143,500
11-07-83	4,000	37,000	28,000	66,000	8,000	3,000	146,000
11-14-83	6,000	51,000	24,000	63,000	3,500	500	148,000
11-21-83	7,000	26,000	23,000	52,000	5,000	2,500	115,500
12-20-83	40,000	110,000	57,000	40,000	38,000	8,000	293,000
01-09-84	18,000	38,000	43,000	7,500	34,000	3,000	143,500
01-31-84	21,000	35,000	42,000	34,000	35,000	10,000	177,000
02-07-84	35,000	25,000	35,000	30,000	44,000	10,000	179,000
02-14-84	3,000	4,000	10,000	5,000	12,000	3,000	37,000

Table 11. Age ratio in the Illinois Canada goose harvest during the 1983 season. Data gathered from tail fans collected throughout the season from commercial pickers in Alexander County and Union County.

<u>Area</u>	<u>Immatures</u>	<u>Adults</u>	<u>Ratio</u>
Alexander County	281	336	.84:1
Union County	<u>174</u>	<u>282</u>	<u>.62:1</u>
Total:	455	618	.74:1

Table 12. Age ratio in the Canada goose harvest on the Union County and Horseshoe Lake Public Hunting Areas during the 1983 season.

<u>Date</u>	<u>Horseshoe Lake P.H.A.</u>		<u>Union County P.H.A.</u>	
	<u>Age Ratio</u>	<u>Sample Size</u>	<u>Age Ratio</u>	<u>Sample Size</u>
Nov. 15*	.8:1	43	2.4:1	81
Nov. 16 - Nov. 25	1.2:1	148	1.0:1	282
Nov. 26 - Dec. 05	1.5:1	45	.8:1	204
Dec. 06 - Dec. 15	.7:1	114	.8:1	389
Dec. 16 - Dec. 18	<u>2.3:1</u>	<u>23</u>	<u>.7:1</u>	<u>105</u>
For the 35-Day Season	1.0:1	373	.9:1	1,061

* First day of hunting

Table 13. Age ratios, expressed as immatures per adult, among Canada geese harvested on the Horseshoe Lake and Union County Public Hunting Areas, 1965 to 1983.

Year	Horseshoe Lake	Union County
1965	---	3.7
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
MEAN	1.4	2.4

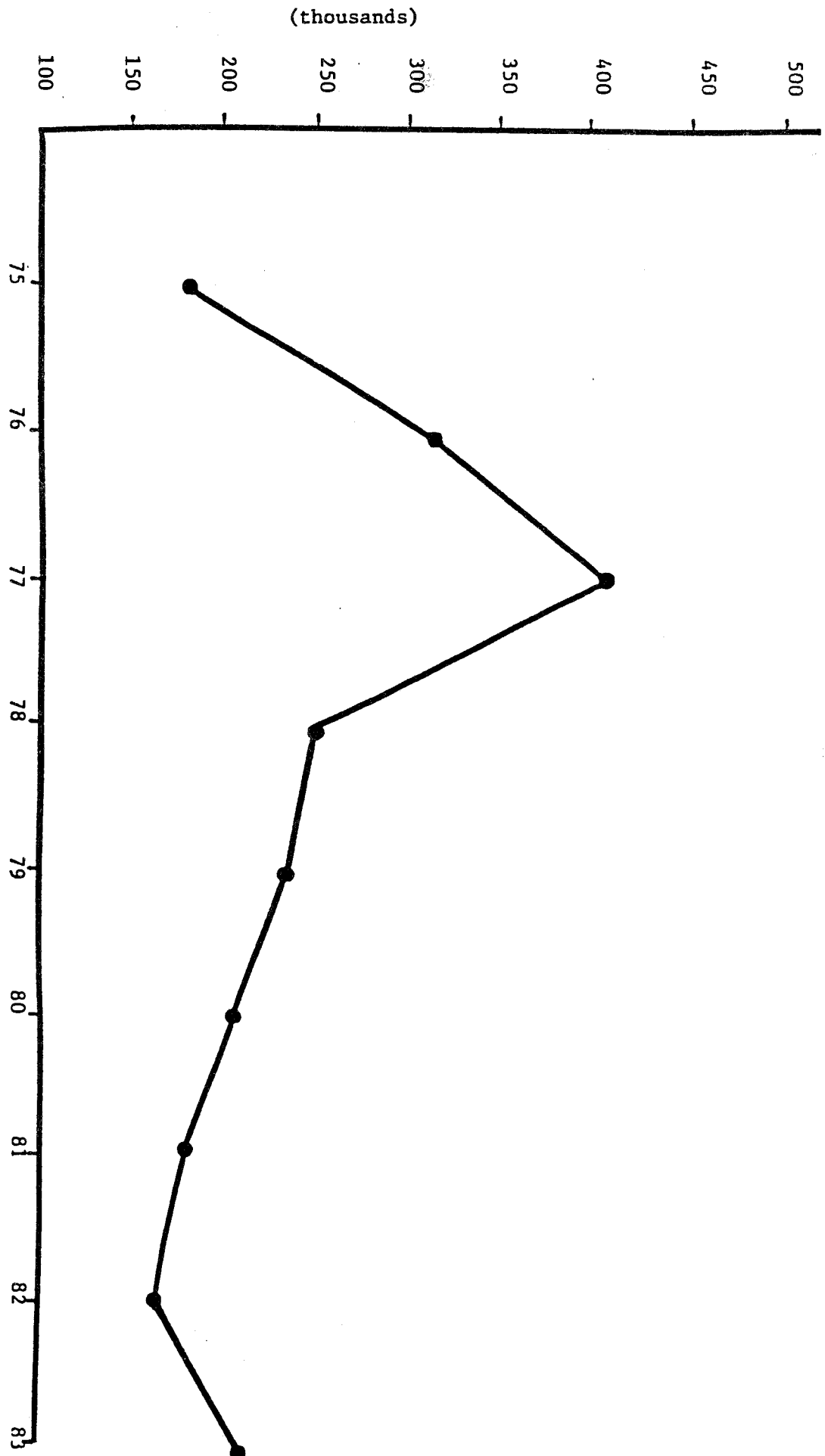


Figure 1. Peak populations of Canada geese in the southern Illinois quota zone, 1975 to 1983.

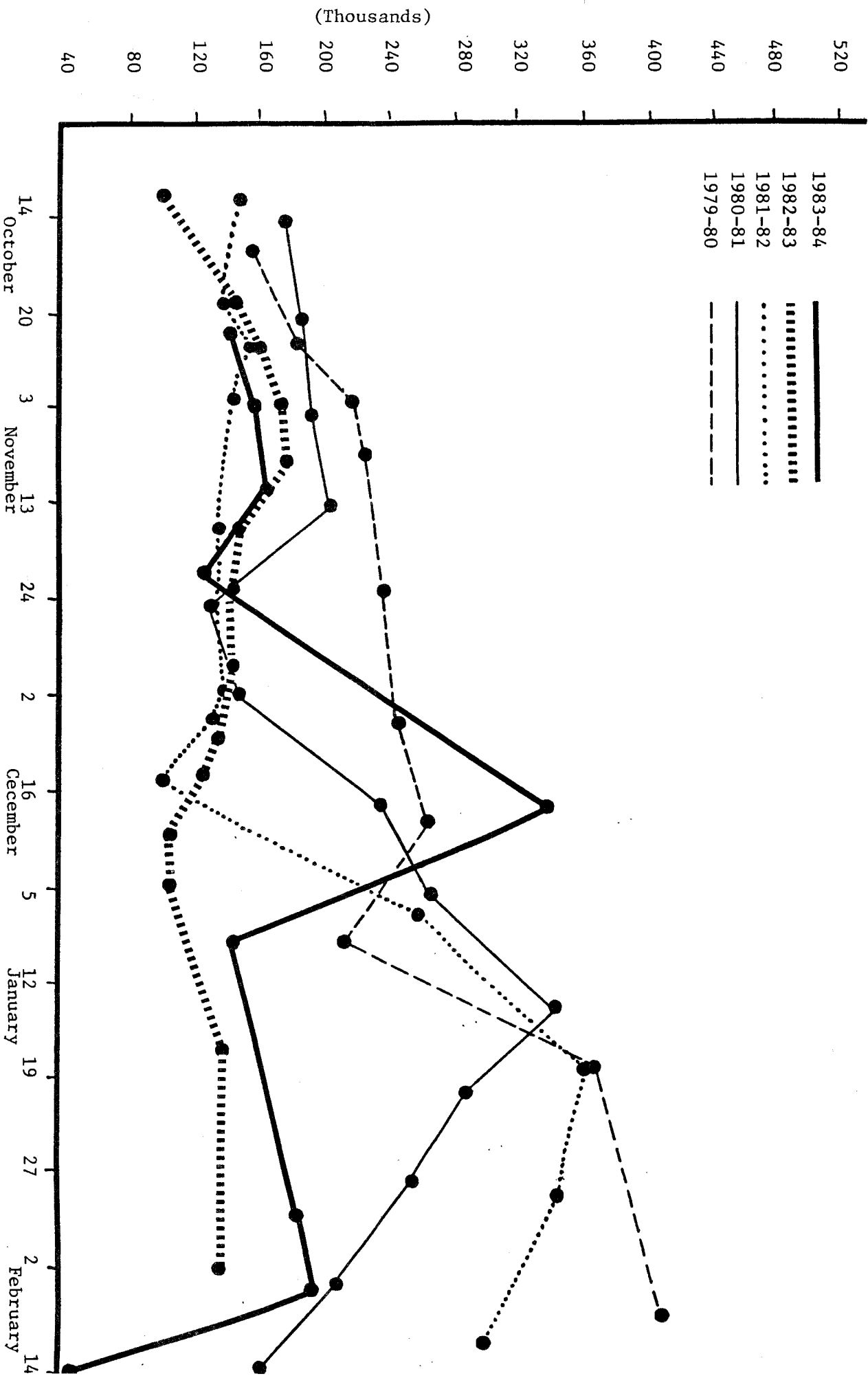


Figure 2. Numbers of Canada geese in southern Illinois (Quota Zone, Rend Lake and Ballard County, Kentucky combined)

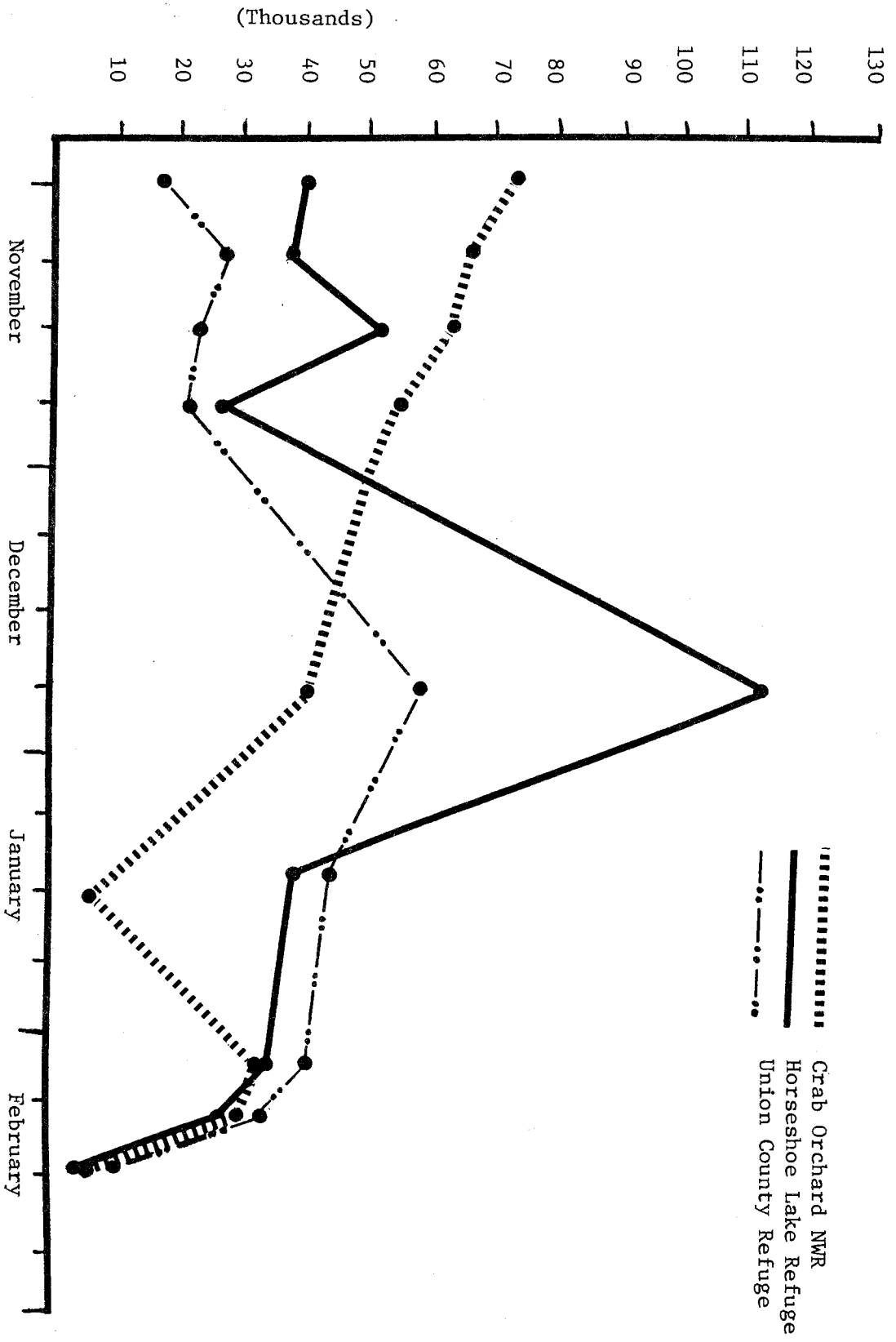


Figure 3. Numbers of geese on the three refuges in southern Illinois quota zone during fall and winter, 1983-84.