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SUBSPECIFIC COMPOSITION OF THE ILLINOIS CANADA GOOSE HARVEST

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ABSTRACT

Carcass parts and measurements were collected from adult Canada geese (*Branta canadensis*) in southern Illinois during the November-December hunting seasons in 1982 and 1983 (N=256), and in central and northern Illinois in 1986 and 1987 (N=565). Subspecific composition varied little between years, but significantly ($P<0.01$) between regions of the state. Statewide composition (±1%) was 2% *B. c. hutchinsii*, 82% *B. c. interior*, and 16% *B. c. maxima* in 1986 and 1987.

INTRODUCTION

Current harvest management strategies for Canada geese (*Branta canadensis*) in the Mississippi Flyway involve setting statewide quotas primarily meant to control harvest of *B. c. interior* from the Eastern Prairie (EPP), Mississippi Valley (MVP) and Tennessee Valley (TVP) populations (Unpubl. Reps., Mississippi Flyway Council). For example, annual statewide quotas for Illinois are designed primarily to control harvest of interior Canada geese of the MVP. However,

Canada goose harvest in the Mississippi Flyway also includes *B. c. hutchinsii* and *B. c. maxima* (Bellrose 1980, Spitzkeit and Tacha 1986, Tacha et al. 1987). Appropriate statewide quotas therefore require knowing proportions of the 3 subspecies in the harvest of each state. This need is underscored by recent rapid increases in *B. c. maxima* populations (Unpubl. Reps. Mississippi Flyway Council and Illinois Department of Conservation; Lawrence 1987). Our objectives are to provide reliable estimates of the subspecific composition of the Illinois Canada goose harvest; compare these estimates to those currently employed in setting harvest quotas, and evaluate the results in terms of improving Canada goose harvest management in the Mississippi Flyway.

METHODS

Carcass parts including the head, one leg, and the fleshy parts of the tail (including the cloaca) were collected from 565 adult Canada geese (Table 1) in central and northern Illinois (Regions I-IV, Fig. 1) during November-December hunting seasons in 1986 and 1987. Carcass samples were generally representative of the county by county distribution of harvest within regions, and harvest chronology throughout the hunting season. Age and sex were determined from cloacal examinations (Hanson 1967). Culmen and tarsus measurements (nearest mm) were obtained from heads and legs and used in discriminate function analyses that were >95% accurate in identifying subspecies (Spitzkeit and Tacha 1986).

Subspecific composition was calculated for the 6 regions and subregions of the state to insure sampling was geographically representative of the statewide harvest distribution. By calculating subspecies composition for each region, and weighting regional composition by proportion of statewide harvest, we were able to avoid effects of oversampling in Regions IB and II where resident flocks of *B. c. maxima* occur. Data for Region V were obtained from Spitzkeit and Tacha (1986) and assumed reflective of 1986-87 Region V harvests because a) their data from 1983-84 showed no change among years in subspecific composition and b) over 97% of harvest was 1 subspecies (*B. c. interior*). Harvest estimates by region for 1986 and 1987 were obtained from hunter surveys conducted by the Illinois Department of Conservation (see Anderson 1987 for methods).

Discriminate function analyses, data summaries, and chi-square tests for variation in subspecific composition were conducted using the Statistical Analysis System (SAS Institute Inc. 1982). Statistical tests were considered significant with $P < 0.05$.

RESULTS AND DISCUSSION

Subspecific composition varied little between years, but significantly ($P < 0.01$) between regions (Table 1). Most regional variation was due to higher percentages of *B. c. maxima* in Regions I-IV than in Region V, and the higher percentage of *B. c. hutchinsii* in Regions III and IV (see Table 1 and Fig. 1). Statewide composition (±1%) was 2% *B. c. hutchinsii*, 82% *B. c. interior*, and 16% *B. c. maxima*.

The U.S. Fish and Wildlife Service (USFWS) and Mississippi Flyway Council (MFC) currently assume that 8% of the Illinois statewide Canada goose harvest is *B. c. maxima* based on analysis of leg band recoveries (Unpubl. Reps., MFC). Our

data indicating a consistent 16% *B. c. maxima* in the statewide harvest suggest that results of these leg-band analyses are seriously underestimating the harvest of giant Canada geese (*B. c. maxima*) and overestimating the harvest of *B. c. interior* in Illinois. Leg-band analyses may (or may not) yield reliable estimates of proportions of the *B. c. interior* harvest that are EPP, MVP, and TVP within Illinois and other Mississippi Flyway states. However, leg-band analyses have not yielded reliable estimates of subspecific composition in Illinois, and may yield biased estimates in other states.

We believe the statewide harvest quotas meant primarily to protect EPP, MVP and TVP Canada geese should be based on reliable estimates of subspecific and population composition. States of the MFC should undertake research to estimate subspecific composition using techniques similar to ours. However, discriminate functions of Spitzkeit and Tacha (1986) are designed only for use in the major MVP harvest states; different discriminate analyses will be needed elsewhere.

Increased precision is needed in management of the Canada goose harvest in the Mississippi Flyway. The abilities to monitor annual recruitment, and adjust harvest accordingly, need to be developed for each population (giant Canada geese should be considered separately). This will require improved midwinter inventory and production survey techniques, as well as coordinated efforts among MFC states to delineate the collective harvest of each population (see also Tacha et al. 1988). Numbers of geese in the EPP, MVP, TVP, and *B. c. maxima* populations often change rapidly, suggesting that harvest composition surveys should be perceived as ongoing management activities conducted at periodic intervals (e.g., every 5 years).

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Table 1. Estimated subspecific composition of the 1986 and 1987 Illinois Canada goose harvests.

Region[a]	Year	Harvest[b]	Sample[c]	% composition		
				hutchinsii	*interior*	*maxima*
IA	1986	916	18	0	67	33
	1987	1,050	5	0	80	20
	Total	1,966	23	0	70	30
IB[d]	1986	6,774	119	6	38	56
	1987	3,994	302	3	37	60
	Total	10,768	421	4	37	59
II[e]	1986	2,157	39	0	44	56
	1987	2,719	20	0	50	50
	Total	4,876	59	0	46	54
III & IV	1986	2,644	20	10	50	40
	1987	2,813	42	21	64	15
	Total	5,457	62	17	60	23
V[f]	1986	32,366	—	—	—	—
	1987	23,386	—	—	—	—
	Total	55,752	256	1	97	2
Statewide[g]	1986	44,757	196	2	82	16
	1987	33,962	369	2	83	15
	Total	78,719	821	2	82	16

[a]See Fig. 1 for definitions of regions.

[b]Numbers of Canada geese harvested by region are from preliminary estimates from mail surveys of hunters purchasing Illinois duck stamps in 1986 and 1987 (Unpubl. data, IDOC).

[c]Numbers of harvested geese from which parts and measurements were obtained.

[d]Region IB includes the Tri-County Zone and associated breeding population of *B. c. maxima*.

[e]Region II includes the breeding range of a resident flock of *B. c. maxima*.

[f]Region V includes Rend Lake and Southern Illinois Quota Zones. Subspecific composition is from Spitzkeit and Tacha (1986).

[g]Statewide composition estimates are based on regional compositions weighted by the respective proportion of statewide harvest.

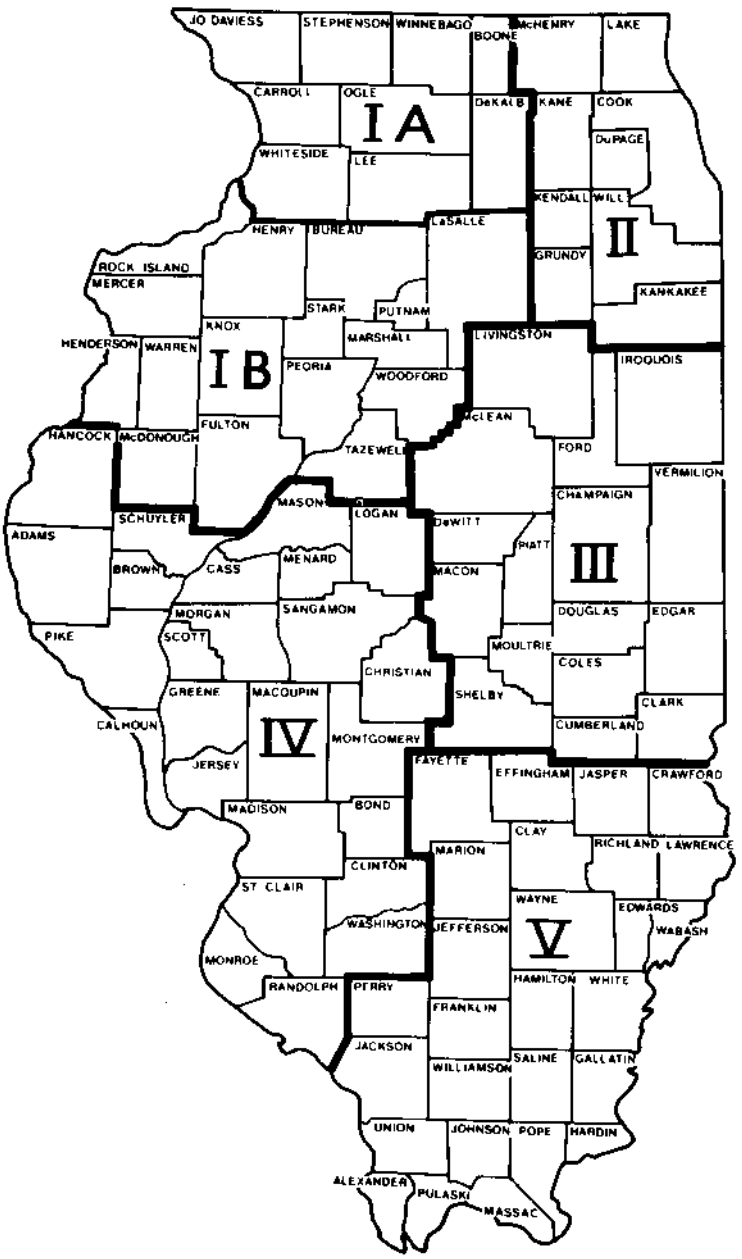

Figure 1. Administrative regions of the Illinois Department of Conservation used in sampling to estimate subspecific composition of the Illinois Canada goose harvest.