

# The Sex, Age, and Weight Structure of the Canada Goose Flock of Ballard County, Kentucky

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## ABSTRACT

The sex, age, and weight structure of Canada geese (*Branta canadensis*), Ballard County, Kentucky, identified the weight range of 500 *B. c. interior* as 2,353–5,585 g (5.19–12.31 lb) with a mean of 3,435 g (7.57 lb). Twelve geese weighed more than 4,537 g (10 lb) suggesting the possibility of the presence of *B. c. maxima*. The population had respective sex and age ratios of 107.5 males/100 females and 262.3 immatures/100 adults.

## INTRODUCTION

The sex, age, and weight structure of Canada goose flocks (*Branta canadensis*) inhabiting the Mississippi Valley has been documented by several researchers. In southern Illinois, Elder (1946) and Hanson (1965) reported data for the Horseshoe Lake flock, and Raveling (1968) reported on the Crab Orchard flock. The flocks of southwestern Michigan have been reported by Friley (1960) and Rudersdorf (1962, unpublished doctoral dissertation, Michigan State University, East Lansing, Michigan).

The purpose of this study was to report on the sex, age, and weight structure of Canada geese utilizing the Ballard County Wildlife Management Area of Ballard County, Kentucky. Though some undetermined portion of the Horseshoe Lake and Crab Orchard flocks utilized the Ballard County area, these data for the Ballard County flock have not appeared in the literature.

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throughout the study. Mr. James Moynahan, Refuge Manager, also provided valuable assistance in completing this study.

## METHODS AND MATERIALS

The facilities of a local processing plant were utilized from 22 December 1974 to 11 January 1975 as a data collection point. The sex, age, and weight of a random sample of Canada geese killed by hunters were recorded as they arrived at the plant. The weight of each goose was determined to the nearest ounce and then converted to grams. Sex and age characteristics were made following the plumage and cloacal characteristics described by Hanson (1967) with 1 modification. Only 2 age classifications were used; all geese less than 8 months old were considered immatures and those older than 8 months were considered adults.

Of the geese presented at the processing plant, it was apparent that at least 2 races of Canada geese utilized the area. Three specimens of Hutchins Canada goose *B. c. hutchinsi* and 500 specimens of Todds Canada goose *B. c. interior* were examined and weighed. The 3 Hutchins geese included 1 male 1,984 g (4.37 lb) and 2 females 1,550 g (4.44 lb) and 1,786 g (3.94 lb).



TABLE 1.—WEIGHTS (G) OF 500 *B. C. INTERIOR* ARRANGED ACCORDING TO SEX AND AGE GROUPS, BALLARD COUNTY, KENTUCKY. SE = STANDARD ERROR OF THE MEAN, SD = STANDARD DEVIATION

	No.	%	Weight	Mean	SE	SD
Males						
Immatures	177	35.4	2,381-4,224	3,498	24	316
Adults	82	16.4	2,778-5,585	4,084	50	456
Females						
Immatures	185	37.0	2,353-4,560	3,059	26	350
Adults	56	11.2	2,636-4,933	3,532	59	442
All immatures	362	72.4	2,353-4,560	3,274	21	399
All adults	138	27.6	2,636-5,585	3,860	45	525
All males	259	51.8	2,381-5,585	3,684	28	456
All females	241	48.2	2,353-4,933	2,169	27	423
Total	500	100.0	2,353-5,585	3,436	23	510

The data for these 3 geese are not included in the rest of the computations.

#### RESULTS

The entire sample (Table 1) had a weight range of 2,353-5,585 g (5.19-12.31 lb) with a mean of 3,435 g (7.57 lb). Analyses of variance (F-test) demonstrated that the weight differences between males 3,683 g (8.12 lb) and females 3,169 g (6.99 lb) and between immatures 3,274 g (7.22 lb) and adults 3,860 g (8.51 lb) were highly significant ( $P = 0.01$ ). Males averaged heavier than females and immatures averaged lighter than adults. The interaction of sex and age with weights was not significantly different.

Several individuals were exceptionally large and their weights are worth noting. Twelve geese weighed more than 4,537 g (10 lb) each. Of these, 1 immature female weighed 4,560 g (10.05 lb) and 2 adult males weighed 5,273 g (11.62 lb) and 5,585 g (12.31 lb), respectively.

The population had a sex ratio of 107.5 males/100 females and an age ratio of 262.3 immatures/100 adults. Males (51.8%) were slightly more abundant than females (48.2%) and immatures (72.4%) were more numerous than adults (27.6%).

Of the total population, immature fe-

males (37.0%) were slightly more numerous than immature males (35.4%) and adult females (11.2%) were less numerous than adult males (16.4%).

#### DISCUSSION

The population mean for the Ballard County flock falls between the overall means of 3,217 g (7.09 lb) and 3,615 g (7.97 lb) for the 2 Michigan flocks, respectively, reported by Rudersdorf (unpublished doctoral dissertation) and Friley (1960). Also, the Ballard goose weights averaged between 49 g (0.11 lb) lower and 253 g (0.56 lb) higher than the southern Illinois flock studied by Elder (1946) in December and between 39 g (0.09 lb) lower and 45.1 g (0.10 lb) higher in January.

It is difficult to compare the weights of the Ballard geese with those of the Crab Orchard flock (Raveling 1968) and the Horseshoe Lake flock (Hanson 1965) except for immatures, yearlings, and adults, since this study distinguished only between immatures and adults. However, Ballard County immature males and immature females were lighter than those in the Crab Orchard flock in November-December by 63 g (0.14 lb) and 144 g (0.32 lb), respectively, and lighter than the Horseshoe Lake flock in December by 12 g (0.03 lb)



and 177 g (0.26 lb), respectively. Ballard County adult males and females were lighter than those in the Crab Orchard flock in November–December by 41 g (0.09 lb) and 111 g (0.24 lb), respectively, and ranged 29 g (0.06 lb) lower to 15 g (0.03 lb) higher, respectively, than Hanson's Horseshoe Lake flock in December. There was very little difference in weight between the Ballard County adult geese and the 2 Illinois flocks. However, if the Ballard County flock had been separated into yearlings and adults, as were the 2 Illinois flocks of Raveling (1968) and Hanson (1965), the differences might have been more significant.

Twelve of the 500 geese from Ballard County weighed more than 4,536 g (10 lb). In 1946, Elder found 6 of 2,179 geese that weighed more than 4,536 g (10 lb). Three of the largest geese are especially worth noting because they may have been examples of *B. c. maxima*. For their respective age and sex categories, no geese examined by Elder were as large as the immature female 4,560 g (10.05 lb) and the 2 adult males 5,273 g (11.62 lb) and 5,585 g (12.31 lb) from Ballard County. Nor were any geese this large reported by Raveling (1968), who made special attempts to exclude the greater Canada goose from his sample.

No factors other than weights (namely, culmen, and tarsus lengths) were noted for these larger geese except for age and sex.

The immature female was 22 g (0.05 lb) heavier than the 4,536 g (10 lb) recommended minimum weight necessary for immature females as selective breeding stock in a flock of greater Canada geese (Dill and Lee 1970). This immature goose was also heavier than 2 immature greater Canada geese, each weighing 4,479 g (9.88 lb) reported by McWhorter and Bossenmaier (Hanson 1965). The 5,585 g (12.31 lb) adult male was 589 g (1.3 lb)

heavier than the 4,989 g (11 lb) recommended as the minimum weight for adult males necessary to retain a flock of greater Canada geese (Dill and Lee 1970). This goose was also heavier than an adult male reported by Schoonover in Hanson (1965) that weighed 5,159 g (11.38 lb). More detailed studies are needed to determine whether the larger individuals from Ballard County were just larger and healthier specimens of Todds goose or smaller specimens of the giant Canada goose.

The sex ratio (107.5 males/100 females) is not significantly different from the theoretical and expected 50:50 ratio. This agrees closely with Friley (1960) who found a 4-year ratio of 110.3 males/100 females in a Michigan flock. It also agrees with data reported by Rudersdorf (unpublished doctoral dissertation) who determined that the Chi-square value was not significant for his population of 286 males and 249 females.

The age ratio of 262.3 immatures/100 adults is higher than that reported by Friley (1960) who found a 5-year mean of 87.6 immatures/100 adults. His extremes were 58.4 immatures and 119.8 immatures/100 adults.

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