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HABITAT USE BY CANADA GEESE IN THE KASKASKIA RIVER VALLEY OF ILLINOIS

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ABSTRACT

A habitat use survey route was driven 14 times in the Kaskaskia River bottoms near Vandalia, Illinois from late February — early March, 1988. A total of 131,900 Canada geese (*Branta canadensis*) in 141 flocks was observed. Habitat use was highest in corn (46.2%), wetlands (24.6%), and winter wheat (21.3%). An average of 68% of geese were observed feeding, and 15% resting. High percentage feeding compared to wintering geese suggested birds were entering spring hyperphagia.

INTRODUCTION

Geese are known to gain substantial lipid and protein reserves needed for reproduction by changing food habits and habitat use and increasing feed activity (hyperphagia) during spring migration (McLandress and Raveling 1981, Thomas 1983). Considerable data have been gathered concerning habitat use and activities of Mississippi Valley Population (MVP) Canada geese wintering on southern Illinois refuges, and during spring staging in Wisconsin (Paine and Tacha 1987; Pritchert 1988; Unpubl. data, Coop. Wildl. Res. Lab., So. Ill. Univ.). However, little is known about habitat availability or needs of geese at early spring staging areas in central and northern Illinois.

Radiotelemetry data from 1986-87 indicate the Kaskaskia River Valley between Lake Shelbyville and Carlyle Lake in Illinois annually receives over 2 million goose-use days directly after goose departure from southern Illinois refuges in late February — early March (Unpubl. Data, Coop. Wildl. Res. Lab., So. Ill. Univ.).

Our purpose was to document habitat availability and use by Canada geese in this area during spring, 1988.

STUDY SITE AND METHODS

The Kaskaskia River flows south through central Illinois, and is the water source for both Lake Shelbyville and Carlyle Lake. This study took place north of Carlyle Lake in Fayette County, including lands up to 5 km east and west of the Kaskaskia River. The area is characterized by large bottomland crop fields and steep hills.

A circular 83 km habitat route representative of available habitats in the area was established between Vera, Illinois and Carlyle Lake Waterfowl Management Area (CLWMA) subimpoundments, with Vandalia, Illinois as the approximate center. Habitat availability was assessed within 0.8 km of the route through cover mapping. The route was driven between sunrise and sunset 23 and 26-28 February and 5-6 March 1988, 2-3 times daily for a total of 14 routes. For each goose flock observed, flock size, habitat type, and flock activity were recorded. Weather conditions during the study were normal, with the average daily temperature being 2°C.

Habitat availability was summarized as percentage of total ha available for goose use in each of 8 habitat types. Habitat use was determined by recording the percentage of geese observed in each habitat type. Proportional use divided by proportional availability yielded a Selectivity Index (SI) for each habitat.

Flock behavior was separated into 6 categories: alert, comfort, feed, locomotion, rest, and other. Behavior data were summarized as the overall mean percentage of geese exhibiting each behavior, and mean percentage of each behavior by habitat type. Differences in behavior by habitat were compared using Analysis of Variance (ANOVA). Duncan's Multiple Range Test clarified significant ($P < 0.05$) variation.

RESULTS AND DISCUSSION

A total of 29,142 ha was established as available for goose use on the habitat route. Soybeans and corn accounted for 68.2% of the available land, winter wheat 18.2%, other forage 6.7%, and wetland 5.4%. Included in the wetland category was a portion of the CLWMA subimpoundment that was planted to corn before flooding. Milo, alfalfa/clover, and other grain comprised the remaining 1.5%.

Habitat use (Table 1) was highest in corn (46.2%), wetland (24.6%), and winter wheat (21.3%); milo, other grain, and alfalfa/clover received no use. These data are consistent with habitat use by geese during winter in southern Illinois and spring staging in Wisconsin, with the exception that use of alfalfa/clover was much lower (Bell and Klimstra 1979; Paine and Tacha 1987; Pritchert 1988; Unpubl. data, Coop. Wildl. Res. Lab., So. Ill. Univ.).

Wetland was the only habitat significantly ($P < 0.05$) selected for, while soybeans were used in proportions lower ($P < 0.05$) than availability. Paine and Tacha (1987) and Pritchert (1988) found that geese wintering in southern Illinois selectively used winter wheat, alfalfa/clover, and wetland, but underutilized soybeans, milo, and other forage.

Feeding and resting comprised 83% of diurnal flock activity (Table 2). Feeding averaged 68%, and was greater in corn (66%), soybeans (71%), and winter wheat (87%) than in other forage or wetland (ANOVA; F=3.8; df=4,90; $P < 0.007$). Rest did not vary significantly by habitat (ANOVA; F=1.84; df=4,90; $P > 0.127$), and averaged 15%. Alert, comfort, and locomotion were approximately equal and constituted 15% of total activities. Pritchert (1988) found overall percentages of 31% feeding and 38% resting. Because these percentages include wetlands, which at Rend Lake is primarily lake habitat, and in this study included flooded corn stubble, mean percentage feeding was compared excluding wetland habitat. This resulted in wintering geese averaging 57% feeding (Pritchert 1988), while in this study feeding averaged 65%.

CONCLUSIONS AND RECOMMENDATIONS

Habitat use by Canada geese in the Kaskaskia River Valley was consistent with habitat use during winter in southern Illinois and spring staging in Wisconsin. However, activity data indicated increased feeding and decreased resting compared to geese wintering in southern Illinois. This increased feeding suggests geese in the Kaskaskia River Valley are already entering active hyperphagia that leads to protein and lipid deposition in preparation for reproduction. This area is an important early spring staging area for MVP geese; efforts to insure an adequate supply of waste grain and forage crops during spring are encouraged.

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Table 1. Habitat availability and use by Canada geese in the Kaskaskia River bottoms in central Illinois during spring, 1988.

Habitat[a]	Available ha	Available %	Mean % use (SE)	Selectivity index
Corn	9,923	34.0	46.2(0.1)	1.4
Soybeans	9,966	34.2	6.7(0.0)	0.2[b]
Milo	85	0.3	0.0	0.0
Other Grain	246	0.8	0.0	0.0
Winter Wheat	5,296	18.2	21.3(0.0)	1.2
Alfalfa/Clover	111	0.4	0.0	0.0
Other Forage	1,950	6.7	1.2(0.0)	0.2
Wetland	1,564	5.4	24.6(0.1)	4.6[b]
TOTAL	29,142	100.0	100.0	

[a]Does not include roads, residential areas, forest, and other habitats considered unavailable to geese.

[b]Proportional use significantly different from availablity (Z - tests, $P<0.05$).

Table 2. Diurnal activities of Canada geese in Kaskaskia River bottoms in central Illinois during spring, 1988.

Habitat[a]	Mean % (SE) activities: Feed	Rest	Comfort	Locomotion	Alert	Other
Corn	66(5)AB	14(4)A	6(2)B	5(1)B	7(2)AB[b]	2(0)A
Soybeans	71(6)AB	20(6)A	3(1)B	3(1)B	2(0)B	1(0)A
Winter Wheat	87(1)A	4(1)A	2(1)B	3(0)B	3(1)B	1(0)A
Other Forage	36(10)B	9(4)A	3(0)B	40(23)A	11(8)A	1(0)A
Wetland	44(10)B	24(7)A	19(7)A	10(4)B	3(1)B	1(1)A
Overall $\bar{x}$	68(3)	15(2)	6(1)	5(1)	4(1)	2(0)

[a]No geese were observed in milo, other grain, or alfalfa/clover habitats.

[b]Different letters within columns denote significantly different ($P<0.05$) means, Duncan's Multiple Range Test.