

LONG-TERM ANALYSIS OF MIGRATORY WATERFOWL VISITATION, COLLINS LAKE, SCHENECTADY COUNTY

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ABSTRACT

Quantitative daily observations of grounded migratory waterbirds at Collins Lake, Scotia, Schenectady County, NY, from 21 March 1988 through 30 May 1998, suggest a fixed duration for the spring migration regardless of ice-off date, i.e. early ice-off dates are not followed by a prolonged period of migration and, conversely, delayed ice-off is not followed by a relatively brief migratory period. It is proposed that such "temporal structure" provides improved resource allocation for earlier arriving senior birds. Incidence of grounding by migrants was greater in spring than in fall.

INTRODUCTION

The behavior of migratory waterfowl has been intensively reviewed (Hochbaum, 1955; Nisbet and Drury, 1968; Bellrose, 1976; Richardson, 1990; Alerstam, 1990) with regulatory factors (such as weather), navigational-orientational characterization and mechanism (radar survey is especially important) receiving particular attention. But regardless of the hundreds of studies published, long-term, daily census of grounded migratory waterfowl has received little attention. This is a significant flaw in the record because it is crucial to fully characterize the phenomenon of migration for its best analysis. The study at hand reporting on ten years of daily observation and census of migratory waterfowl at Collins Lake, Scotia, Schenectady Co., NY, provides some of the needed detail. The many numbers for 75 species of waterbirds are available on-line at www.virtual.union.edu/~birds/. Several phenomena relating to the timing of first-of-season appearance, day of peak occurrence, last-of-season appearance, ice-off dates and seasonal incidents of increased migration are also presented.

STUDY SITE AND METHODS

Collins Lake is an eutrophic, spring-fed, oval (no concealed bays), waterbody of 55-acre extent of kettlehole and river-meander origin. An elongate island is centrally located. Collins Lake is part of Collins Park, a major recreational resource of Schenectady County bordering the

northern shore of the Mohawk River. Motor boats and hunting are prohibited. The spring-fed character results in delayed ice-on and early ice-off thus fostering an extended season of visitation by waterbirds.

The lake was observed daily from March 21, 1988, through May 30, 1998, from two locations, one at the east end of the lake and one at the south. Other observation points were used when necessary. Binoculars and spotting scope facilitated counts. Data were recorded on standard forms and totaled on a weekly basis in terms of total standard sightings. Other authors have used the term "bird days" in a similar vein. Weekly summaries were then entered on-line. Ice conditions, cloud cover, movement, air and water temperature, lake and river level, air visibility, growth of aquatic vegetation, and other environmental variables were regularly recorded.

Several categories of birds are excluded from the study to better focus on migratory behavior: resident waterbirds such as Canada Goose, Wood Duck, American Black Duck and Mallard, as well as herons, hawks, shorebirds and passerines; long-term sojourning migrants such as the Common Merganser, Ring-billed Gull, Herring Gull, and Great Black-backed Gull; escapes such as the Bar-headed Goose, Barnacle Goose, Mandarin Duck; and accidental visitors such as Iceland Gull, Lesser Black-backed Gull and Glaucous Gull.

RESULTS

Twenty-four species are included in this analysis: Red-throated Loon, Common Loon, Pied-billed Grebe, Horned Grebe, Red-necked Grebe, Double-crested Cormorant, Gadwall, American Wigeon, Blue-winged Teal, Northern Shoveler, Northern Pintail, Green-winged Teal, Canvasback, Ring-necked Duck, Greater Scaup, Lesser Scaup, White-winged Scoter, Common Goldeneye, Bufflehead, Oldsquaw, Hooded Merganser, Red-breasted Merganser, Osprey and Bonaparte's Gull.

The complete results and full analyses are available on-line at www.virtual.union.edu/~birds/.

DISCUSSION

The daily record at hand is probably one of the longest available for North American waterbirds providing several novel concepts requiring further consideration. Of these the *temporal structure* of the migratory

passage with its three key parameters of onset, peak, and ending, is the more provocative. At the onset two hypotheses regarding migratory passage seem available:

1. The passage is relatively plastic, expanding or contracting in time depending upon the character and duration of the spring. In example, if the spring thaw is especially delayed we would predict that the migration would be compressed into the period following ice-off.

2. The passage is relatively structured and takes about the same duration following ice-off. In example, if the spring thaw is delayed the migratory passage would extend longer into the spring without significant shortening.

Two of our data sets support the second hypothesis.

To the best of our knowledge our study is the first to provide quantitative support for a temporally structured migration for waterbirds.

Assuming that there is validity to our interpretation of the data, we must consider the adaptive value of such a multi-species structured migration, in this case 24. We suspect that earlier migrants are more senior, experienced birds providing maximum reproductive potential. Younger, less experienced migrants, on the other hand, are delayed to reduce competition for nesting sites and forage base, further enhancing the relationship of the species group to the breeding grounds. It is the temporal structure of the migratory period, regardless of how early or late the spring, which is essential.

Analysis of the spring migration is emphasized because 83% of the excursions occur during this period. The smaller number of grounded birds seen during the fall (17% of excursions) could be the result of reduced numbers of migrants or better weather conditions supportive of continuous flight.

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