

THE GIANT CANADA GOOSE. By HAROLD C. HANSON. Illinois Natural History Survey. Carbondale and Edwardsville: Southern Illinois University Press, 1997. Rev. ed. 252 p., 7 maps, 74 plates, 15 graphs, 31 tables, 3 appendices, bib., index. Hardbound. US\$29.95.

Dr. Harold C. Hanson is a pioneer in the study of waterfowl. Connections linking him with the Arctic Institute of North America (AINA) and large races of Canada geese reach back to 1946, when he took part in a study of *Branta canadensis interior* on the Hudson Bay Lowlands. AINA then supported the Perry River Expedition and published its findings (Hanson et al., 1956) as well as other seminal work by Hanson (1962) on the physiology of geese. My own research on arctic geese near the Perry River south of Queen Maud Gulf has led me to cross paths with David and Lena Ammaganik and Donald Korvik, who as children living on the land with their parents, met members of the Perry River Expedition of 1949. It seems therefore serendipitous that this review of the latest version of Dr. Hanson's book on giant Canada geese should appear in *Arctic*.

This book, first published over three decades ago, was a classic contribution to waterfowl biology. Dr. Hanson's research on the ecology of geese was multidisciplinary. A quick review of his publication profile shows a special interest in the physiology of geese, although his knowledge and expertise certainly have not been restricted to that. Instead he has studied these birds from many perspectives over the last five decades and, in his quest to document the state of knowledge about giant Canada geese (*B.c. maxima*) in the 1960s, he left few stones unturned.

This monograph, exhaustive in detail, is especially interesting in that it provides important information from previously unpublished letters. Instead of relying solely on professional sources, Hanson in Chapter 1 capitalized on the information provided by amateur naturalists and hunters with an interest in what was thought to be an extinct race or species. Indeed, recognition and rediscovery of the giant Canada goose "is a story of the Indian, and often the hunter and layman, having a more acute understanding of a bird than the professional" (p. 3).

In Chapter 2, the morphology of giant Canada geese is described and compared with other putative subspecies (*B.c. canadensis*, *B.c. moffitti*, *B.c. interior*) of large Canada geese. Averages are compared without much rigor, and inclusion of more modern multivariate statistical treatment of these values, easily accomplished with today's computers, was warranted in this new edition. Besides appropriate morphometric analyses, more recent and relevant published data (e.g., Merendino et al., 1994) are also lacking. Instead, the reader is advised to consult Appendix I for an updated interpretation of the ranges and morphs described (see below).

Most readers that have an interest in geography and biogeography will enjoy Chapters 3–5 about the distributions of these birds during their annual cycle. I found this section particularly interesting, having travelled many of the areas to which these birds were formerly restricted. Anecdotal

documentation of the historical distribution of these birds, region by region, provides a good perspective on the long-term dynamics of some populations and the local extirpation of others. Although it is tempting to ascribe the near demise of this large goose to unregulated shooting, Hanson documents other negative influences, such as drainage of natural wetlands to make way for agriculture, and the stealing of eggs so that goslings could be raised and fattened for consumption in the fall. Appealing to the avocational historians in us are references to 18th century observations of large geese by the likes of General George Clark, in the area of present-day Kentucky and Indiana in the 1760s, and M. de Lamothe Cadillac, the French commander of Detroit, in 1701. Also documented is the peculiarity that yearling or nonbreeding adults of this temperate-nesting race migrate north to arctic areas to spend the annual flightless period. Numbers of *B.c. maxima* molt migrants currently appear to be increasing south of Queen Maud Gulf in Canada's central Arctic. On Akimiski Island in James Bay, where *B.c. maxima* molt migrants mix with the locally breeding *interior* race, they may be interfering, through competition for food, with the ability of local Canada geese to raise young (Ankney, 1996).

Hanson postulates in Chapter 6 (Nesting) that the attractiveness of wetlands for nesting by giant Canada geese depends on the presence of muskrat houses because "most prairie lakes lack islands; the muskrat houses, therefore, offer the ecological equivalent of islets or islands which are so abundant in lakes used by nesting geese in Arctic and subarctic areas" (p. 106). Clearly, this no longer applies: evidence is the population explosion of large Canada geese throughout their former range and beyond, which includes their use of urban areas for nesting.

A very short Chapter 7 (Growth, Development, and Flightless Periods) reflects the state of knowledge at the time of writing. It is only recently that experiments (Leafloor et al., 1998) have indicated that a significant portion of geographic variation in the morphology of large races of Canada geese is greatly influenced by feeding conditions for growing young. Published studies on numerous other species of arctic geese also conclude that much of the phenotypic variability within populations results from variance in the nutrition of growing goslings. These results have strong relevance to some of Dr. Hanson's ideas about inferred distinctness of populations. Leafloor et al.'s (1998) findings have particular relevance to Hanson's statements (p. 215) that *B.c. interior* geese on "Akimiski Island will be described as a race new to science." On the other hand, genetic studies done over a broader geographic range indicate measurable divergences in genomes of putative subspecies of geese (e.g., Shields and Wilson, 1987; van Wagner and Baker, 1990). (The preface to this book and Appendix I contain tantalizing references to Dr. Hanson's apparently imminent publication, "The White-cheeked geese (*Branta canadensis*, *B. maxima*, *B. hutchinsii*, *B. leucopareia*, and *B. minima*) Taxonomy, Ecophysiological Relationships, Biogeography, and Evolutionary Considerations," which advances the case that the giant Canada goose is a separate species, composed of seven subspecies, within a

general mosaic of 186 geographic races of white-cheeked geese. In Appendix I, Dr. Hanson claims “at least 83” vs. 186 races.)

Following Chapter 8 (Characters of Age, Sex, and Sexual Maturity) are short chapters on Food and Feeding Habits (Chapter 9) and Endoparasites (Chapter 10). Chapter 11 (Physiology) provides a thumbnail sketch, based on Hanson’s seminal dissertation work with *interior* Canada geese, of the general dynamics of body mass and its components of fat and protein, and the importance of nutrient reserves to the ecology of geese. There is no treatment of nutritional dynamics in *B.c. maxima* geese specifically, although some of that information exists (e.g., McLandress and Raveling, 1981).

Chapter 12 describes social behaviour and covers flock composition, pair formation, sexual behaviour, and behaviour during nesting. Family integrity is a prominent feature of goose sociality with young attending parents normally for almost a year.

Chapter 13 (Productivity and Regulation of Populations) provides figures on the parameters that can influence population size: age at sexual maturity, clutch size, and nest and hatching success. The author describes and discusses the key factors that impinge on nesting success: weather, predators, and inexperience at nesting. There are records of captive Canada geese attaining 80 years of age, but the author correctly focuses on population parameters of wild birds. Although giants tend to have lower productivity than other subspecies of Canada geese, they have tremendous capacity for population increase, to the point that *B.c. maxima*, formerly presumed extinct, may now number in the millions. Certainly, they are considered a nuisance by many municipalities in both Canada and the United States.

In Chapter 14, Dr. Hanson describes the focus of management as maintaining or enhancing local goose populations. Over three decades later, managers have undergone a paradigm shift and are grappling with methods to control and reduce populations of large Canada geese, particularly giants (see Ankney, 1996). Finally, in Chapter 15, Dr. Hanson synthesizes his observations about clinal variation in the size of giant Canada geese within their former, more limited breeding range and summarizes the “distinctive characters” that distinguish them from other races. Some paleontological observations are also included.

In the preface, Hanson states that “the main objectives of this revised slightly enlarged edition are to redefine the range of this race as it was originally understood” (p. xvii). Thus, the book should be read in the correct context—as an authoritative volume on the history, biogeography, and ecology of giant Canada Geese until the mid 1960s. The reader should not expect a definitive up-to-date document. Yet in Appendix I, Hanson also states that “not to cite the relevant taxonomic findings... would be retrogressive and misleading”. So, the work of Shields and Wilson (1987) and others seems to have a bearing on the question at hand: Is the giant Canada goose a unique species or subspecies, or a phenotype largely determined by transient environmental influences? There is no exhaustive, up-to-date bibliography for giant Canada geese,

nor is there any reference to pertinent publications from the last three decades. Also, there is no treatment of the great expansion in breeding range and abundance by this putative subspecies brought about by intentional relocations and establishment of breeding flocks—likely a fact that greatly complicates the original interpretations. We can only anticipate that these issues will be dealt with in Hanson’s forthcoming *magnum opus*.

For those who already have the original printing of the book, the major differences are the short preface to the new edition and some notes in Appendix I citing more of the author’s own investigations. For these reasons, the claim that this is a revised edition is somewhat misleading. It is, in effect, merely a reprinting of an already good book. Those who have yet to read the original edition can expect a well-written, concise, and important historical contribution to waterfowl ecology. It is a relevant document for anyone with an interest in Canada geese, including biologists, naturalists, and hunters.

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