

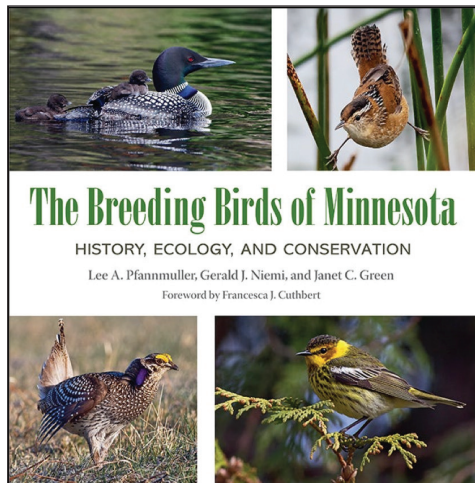
The Breeding Birds of Minnesota: History, Ecology, and Conservation, by Lee A. Pfannmuller, Gerald J. Niemi, and Janet C. Green. 2024. University of Minnesota Press, Minneapolis, Minnesota, USA. 614 pages. \$59.95 (hardcover). ISBN: 9781517906795.

The Breeding Birds of Minnesota: History, Ecology, and Conservation is an outcome of 5 years of extensive breeding bird surveys in the state of Minnesota. The book is packed with detailed information regarding natural history, conservation, and breeding records of various bird species in Minnesota. The sheer volume of information provided in this book has usefulness outside of the state of Minnesota and demonstrates the enormous amount of effort that went into this publication. In places, it feels like there is more information than is necessary, which could make it less accessible to the average reader. That said, individuals can pick and choose what level of information they wish to explore.

The first few chapters of *The Breeding Birds of Minnesota* deal with an introduction to the first Minnesota Breeding Bird Atlas, historical accounts of ornithological research, and the biogeography of the state of Minnesota. In Chapter 2, the authors describe major habitat types in Minnesota, supported with photos of the grasslands, croplands, mixed forests, lowland coniferous forests, and bog vegetation types in Minnesota, including the common species of plants and trees in the respective ecoregions. The descriptions, along with the photos of the actual habitat types, make it easier to understand the ecology and biogeography of breeding birds in the state. Historical ornithological studies and records for the state of Minnesota are covered in detail, including in-depth aspects of population declines as well as population increases for some species that benefitted from conservation efforts from various organizations.

Chapter 3 sets up the structure and patterns of the book to the readers and includes short accounts for each breeding bird species. The authors outline the definitions and explanations for the terminologies describing various aspects of species occurrence during the atlas survey. The methodology, however, is vague at times, leading to questions about the intended audience. For instance, the selection process of the first of 3 point counts for each township was done at random; however, the other 2 point counts were sampled from the most abundant habitat. It is unclear why this was done or what prior methodology was adopted.

Every breeding bird species recorded during the atlas has its own species account in Chapter 3 that spans a couple of pages. The authors have done a good job in outlining each species recorded during the atlas. The species accounts include comprehensive details about every species, starting with a simple identification of the species and covering the breeding distribution in Minnesota, breeding habitat, and conservation and population status within the state. One of the best features of the book are the breeding distribution maps, as well as the land cover suitability maps, for all species in each county. The breeding distribution map provides overall evidence of a species' breeding activity, with breeding status categorized as



either confirmed, probable, possible, or observed. Earlier in the book, in Chapter 1, the authors give a general overview of the categories and codes for confirmed, probable, and possible breeding status. The “probable” and “possible” categories seem redundant at first, but the codes attached to each category make things clearer. For each observation, the category (i.e., confirmed, probable, possible, and observed) have a code attached to them which describes if the species was seen once (X) or multiple times (M). However, the reader has to revisit the text to figure out the type of evidence for the species and go back to the breeding categories table to figure out the code. Adding those codes to the legend for each species’ map would have made the maps stand on their own. Each species account also has a good quality photo of the habitat that the species utilizes along with detailed text describing the ecotype used.

The appendices include information on the protocol for field surveys and data analysis. Appendix B is one of the most important aspects of this book, especially for organizations or states looking into conducting their own Breeding Bird Atlas; this appendix outlines all of the organizations that contributed to the first Minnesota Breeding Bird Atlas. Appendix C provides an outline for data summary, including total records as well as percentage of observations in each atlas block. Considering the size and density of the the book, it is surprising that the authors did not include an index; an index to look for a specific species would have been useful for readers of a book of this size.

With the volume of information in this book, it makes one wonder who the authors are targeting for readership. For a scientist or a graduate student hoping to get a lot of information about a specific species of interest, this book feels like an encyclopedia. For any organizations or states that are interested in conducting their own Breeding Bird Atlas, *The Breeding Birds of Minnesota* can serve as a useful resource. Overall, we believe that *The Breeding Birds of Minnesota* is a monumental and valuable resource for anyone currently involved in or beginning to work on a Breeding Bird Atlas. *The Breeding Birds of Minnesota* provides one of the best current accounts of bird species breeding in the north-central United States.

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