

Wetlands of the Ontario Hudson Bay Lowland: A Regional Overview

By John L. Riley. 2011. Nature Conservancy of Canada, Toronto, Ontario. 156 pages. + appendices. Paper and available online: NCC – <http://www.natureconservancy.ca> OMNR – <http://www.mnr.gov.on.ca/en/Business/FarNorth>

What is a fen? Are there different kinds of fens and how do you tell them apart? Here is an overview that answers these and many other questions for one of the most important wetland areas in the world. In fact the Hudson's Bay Lowland is the world's third largest wetland and the largest in North America, – and 83% of it is in Ontario. It takes up ¼ of the province and spills over into Quebec and Manitoba. The area has a significant effect on earth's climate by sequestering atmospheric carbon. It also home to a fascinating diversity of plants and animals. This globally important landscape is likely to experience rapid environmental changes over the next few decades. This requires effi-

cient and informed land use planning – and here we have the basis for it.

The use of many colour photos not only increases the book's appeal, but also is important in illustrating the subject matter. It is of interest to think a little more about the photos. Several of them show the author and/or his colleagues on a sunny day with a blue sky – and of course it looks like fun. Try to imagine the risks associated with this remote area and the extreme discomfort of biting insects and bad weather. Working in the lowlands was not an easy job.

The first chapter entitled "Regional Overview" covers geology, climate change, carbon storage and bio-

logical diversity. There are a few more studies that might be referred to, but one has to remember that this is an overview and its particular strength is in wetland classification. Those seeking a little more in the area of biodiversity may refer to Desroches *et al.* (2010), James *et al.* (1983), Peck (1972), Prevett & Lumsden (1983), and Sutherland *et al.* (2005). Biological information has been gathered from the more accessible parts of the lowlands around Moosonee and at Churchill, Manitoba, and this can be searched online. It may be of interest to readers that most of the articles listed above were published in Canadian Field-Naturalist. Actually the journal has long played a role providing information on the Hudson Bay Lowlands. It was in 1896 that J. B. Tyrrell and R. Bell were disagreeing over whether or not the land around Hudson Bay was still rising. Bell's article in "The Ottawa Naturalist" entitled "Proof of the Rising of the Land Around Hudson Bay" was supported by later research and Riley cites Weber's figure of 1.2 m per century over the past 1000 years.

The "Regional Wetland Variability" chapter begins with a valuable history of terminology and classification and concludes with a useful description of major wetland formations. The following chapter describes sampling procedures. "Environmental Variability" presents quantitative vegetation ordination (detrended correspondence analysis). A few statistics wizards will want significance tests, best fit regression lines and perhaps a more direct use of correspondence, but as it stands the figures are well chosen and quite adequate to indicate the trends discussed. This chapter provides a good understanding of variation on broad geographic scales and concludes with a useful table of plant indicator species.

The chapter entitled "Ecoregional Wetland Characteristics" describes wetlands of the lowlands on the basis of ecoregions recently established by the Ontario Ministry of Natural Resources (OMNR) and by the National Wetland Working Group two decades ago. How this relates to the national system is not as clear as bog water and may have deserved more discussion, but in fact the boundaries are almost identical. The OMNR ecoregions are shown on Figure 1, page 11. The final chapter is entitled "Major Wetland Types." It included helpful photos and lists of dominant species.

Appendix A includes a key to wetland types including formations, subformations and groups. It is a major contribution. Appendix B is a list of dominant plants in different formations, subformations and groups, as well as indicating their distribution by ecoregion and association with permafrost, – another major contribution. Appendix C is a catalogue of wetland site types showing floristic composition, pH, peat depth, etc. Users will notice that Riley has effectively included the mosses which play such an important role in the lowlands. Appendix D includes graphs showing cover

values and surface water pH for common peatland species. Appendix E provides updated scientific names. Finally the reference list appears complete and will serve as a valuable general source for the lowlands.

This is a very good overview and not much is missing. How the fauna fits into the wetland types, the effects of climate change using improved models, and other aspects require more study. There was definitely no reason for the author to talk about the pre-glacial vegetation of the region, but I find it interesting that Woolly Mammoths may have occupied the area in those times (Nielsen *et al.* 1988) suggesting a different vegetation than the wetland of the postglacial period.

Although I found some minor errors (e.g., *Sagittaria* is spelled wrong on p. 102 and the key to dashed lines on Figure 3 is reversed), this is an impressive, authoritative and essential overview. In fact it is an outstanding summary of older information and contains much new information as well. Any biologist in northern Canada could benefit from it.

Publication support for this document seems to be an excellent way for the Ontario Ministry of Natural Resources (OMNR) to assist First Nations in planning under the Far North Land Use Planning Initiative. It also seems to be an excellent way for the Nature Conservancy of Canada (NCC) to assist in the North where their usual activities of evaluation, acquisition and stewardship are less easily applied. These publication partners are to be applauded for making essential information so readily available.

It is also important to remember the supporters of the many years of research in the lowlands that provides the substance of this overview. The details of this research can be accessed through this overview. The supporters were the Ontario Ministry of Natural Resources (Remote Sensing, Forest Research and Ontario Parks), Canadian Forestry Service, Environment Canada (Canadian Wildlife Service, Lands Directorate) and the Royal Ontario Museum. All of these agencies can take some pride in this accomplishment which is one of many beneficial results of their reliable support over a long period.

Finally John Riley is already a legend with respect to the lowlands – and to conservation in Canada (major syntheses of information on the Niagara Escarpment, Ontario alvars, etc. for conservation planning). An extensive and unique knowledge is required to write this kind of book, but it also requires great dedication, determination and love. In many cases a synthesis of this kind never gets done because the requirements are unusual and unmet. Luckily sometimes they are met. This very valuable and authoritative work will help us understand and protect the lowlands – a huge and important part of Canada. Like some of Riley's other works, it is a major contribution to land use planning based on excellent scientific research.

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