levels of understanding in toxicology and the breadth of knowledge needed to make confident judgement about chemicals in our environment. Because the science of toxicology is a biological science and, as such, has to deal with a dynamic system of living organisms, it deals with a high degree of uncertainty. These uncertainties should be used properly in assessing risk.

The book should be useful to those interested or working on the effects of toxic substances on biological systems.—M.A. TABatabAl, Department of Agronomy, Iowa State University, Ames, IA 50011.

Wetlands of Canada (Ecological Land Classification Series, No. 24)


Wetlands of Canada was developed by an informal “committee” in Canada called the National Wetlands Working Group (NWWG), a group that first formed in 1976 but has its roots to other committees developed as early as 1970. It was during the period 1976 to 1980, under the direction of Fred Pollett, that the working group decided to pursue a publication on wetlands of Canada. Although 10 years in coming, this book fills an obvious gap in the wetlands literature of North America and does it rather completely. Pollett suggests that the book “offers the scientist and student a chance to understand better the nature, variety, and extent of our wetlands.”

Although the extent of wetlands in Canada is not well known, it has been estimated to be 1 270 000 km² or 14% of the country. To put this in perspective, the Soviet Union is estimated to have 830 000 to 1 500 000 km² of wetlands, whereas the extent of wetlands in the lower 48 United States, where half of the pre-settlement wetlands have been drained, is now approximately 400 000 km². The total area of wetlands in the world is estimated to be 8 560 000 km² (Mitsch and Gosselink, 1986), so Canada has a significant portion (15%) of the world’s wetland resources. Canada’s wetlands deserve a book of this scope and detail.

The book is divided into 10 chapters written by a total of 32 authors. Chapter 1 by S.C. Zoltai is an overview of wetland types, classifications, and extent in Canada. Most of Canada’s wetlands are described as being “in a belt across northern Ontario, central Manitoba and Saskatchewan, northern Alberta, and the Mackenzie Valley” and in the Pacific and Atlantic coastal areas. The chapter reviews several wetland classifications, in addition to the ones used in Canada, and provides a useful description of methodologies generally used in the studies described in subsequent chapters.

Most of the chapters of the book (Chapters 2–9) give detail on the major types of wetland ecosystems found in Canada. These include freshwater wetlands of Arctic (C.Tarnocai and S.C. Zoltai), Subarctic (Zoltai et al.), Boreal (Zoltai et al.), Prairie (G.D. Adams), Eastern Temperate (V. Glooschenko and P. Grondin), Atlantic (E.D.Wells, H.E. Hirvonen, and several contributors), and Pacific Canada (Banner et al.), and a separate chapter on salt marshes (W.A. Glooschenko et al.). Each of these chapters, written by experts on these types of wetlands, makes effective use of data tables, photographs, and line drawings to describe the types, abundance, and values of these wetlands. These ecosystem chapters have similar outlines, discussing the environmental setting, the forms of wetlands in the region (based on the Canadian Wetland Classification in the Appendix), the dynamics, and the values. Editorial authority is sometimes light, as the outlines stray at times, but not to the detriment of the chapters. I would have like to have seen more information on ecosystem function (productivity estimates and nutrient budgets are rare). Integrative models, conceptual or otherwise, are not included.

Chapter 10 by Rubec et al. presents management and utilization of wetlands in Canada. The authors speculate that the economic value of Canada’s wetlands may exceed $5 to $10 billion per year, based partially on previous studies in the USA by Raphael, Tilton, and others in Michigan. Although much of the wetland value discussion emphasizes the replacement value approach, commercial harvesting of peat (worth more than $47 million) and peatland and hardwood forestry (yielding as much as $252 million) are also included. The Appendix, authored by the entire National Wetlands Working Group, includes one of the more useful parts of the book, a detailed description of Canada’s wetland classification system, which, compared to the one developed in the USA (Cowardin et al., 1979), is delightfully simple. The Canadian system includes five classes (bog, fen, marsh, swamp, and shallow water), each including several wetland forms (70 total).

The book is large for the bookshelf (30 cm by 22 cm) but nicely published, even though it was not produced by a major private publishing house. A nice touch is the inclusion of color plates in the beginning of each chapter and a nice colored map of wetland extent in Canada inside the front and back covers of the book. (The map in my review copy was pasted up-side down, giving an unusual perspective of Canada to consider.) I would have liked to have seen all of the references consolidated in the back of the book and the inclusion of a reference list with a very useful glossary in the back gives the impression that this was done. It was not. The general index is tied too closely to the subtitles of the chapters. But my overall impression of this book is favorable and I believe that it serves as an excellent wetlands reference book and adds to our understanding of a major wetland region of our earth.—WILLIAM J. MITSCHE, School of Natural Resources, The Ohio State University, Columbus, OH 43210.

References


Ecology and Our Endangered Life-Support Systems


Since the environmental awareness and protection movement began almost two decades ago, there has been a need for a textbook designed for nonscience students (and, perhaps, for nonenvironmental scientists), which could integrate the principles derived from ecological research with contemporary environmental concerns, problems, and issues. Most books that attempted this synthesis have fallen far short of success. The usual format became: several chapters on basic ecology with depth, content, and presentation similar to that in a basic freshman biology text, followed by several chapters on contemporary environmental issues with few data and fewer links to the ecological principles pre-