Book review

North American terrestrial vegetation
M.G. Barbour and W.D. Billings (Eds.); 2nd edition

The article preparation for the second edition of North American Terrestrial Vegetation was almost completed before Dwight Billings, co-editor, passed away. Appropriately, a painting of aspen that Dwight did when he was 36 adorns the book’s jacket. The volume is dedicated to his wife Shirley, as she and Dwight were a research team.

As in the first edition, the book chapters are organized around major plant formations in North America, with some attention to local vegetation types. The intended audience is lay people, advanced undergraduates, graduate students, and professional ecologists. The volume has increased from 434 to 708 pages, largely due to expansion of vegetation types covered. The new chapters are on freshwater wetlands (C. Richardson), salt marshes and mangroves (I. Mendelssohn and K. McKee), temperate Mexico (A. Valazquez, V. Manuel Toledo, I. Luna), the Caribbean (A. Lugo, J. Colon, F. Scatena), and vegetation in the Hawaiian Islands (L. Loope). Chapter contributors are people who have conducted research in these vegetation types. Some are contributors from the first edition, with new co-authors.

This book is useful for those who are in search of an overview of a particular vegetation type, biome, or plant communities in a region, and the associated ecological processes, soil properties, climate, or disturbance characteristics. The writing style varies with the authors of each chapter, but it is nice to see some consistency of content. The material covered in each chapter includes vegetation structure, response to disturbance, community/environment relations, nutrient cycling and productivity, and autecological behavior of dominant species. Perhaps the most interesting feature of each chapter is the new coverage of habitat loss, restoration status, sustainability and disturbance history. The 13 original chapters were revised to different extents, but all have new figures, photos, and references, including improved vegetation distribution maps, although with new survey and remote sensing data, there is still much room for improvement in accuracy of vegetation distributions.

Chapter content varies to some extent by what factors are important in the particular region, such as fire in chaparral (J. Keeley) and grassland systems (P. Sims and P. Risser), loss of native biota (e.g. bird species) in the Hawaiian Islands, or productivity, longevity, and diversity of Pacific Northwest forests (J. Franklin and C. Halpern). Some vegetation types appear in more than one chapter, e.g. the forest tundra ecotone is covered in chapters on arctic tundra and polar desert biome (L. Bliss), and on taiga and boreal forests (D. Elliott-Fisk).

An example of new information in revised chapters is grasslands. New sections include recurring adaptive features of grassland communities (e.g. physiological response to drought stress, seed dormancy during adverse conditions), ecosystem processes (interactive processes of carbon and nitrogen assimilation and allocation), and landscape and global-scale processes. The section on habitat loss (e.g. 82–99% of tall grass prairie), conservation, and restoration is good, describing recent improvements in understanding of grassland response to drought, grazing and fire, and the implications of habitat loss to loss of biological diversity of grassland birds.

The new chapter on Caribbean vegetation provides a synthesis explanation for diversity of the vegetation (e.g. sharp climatic gradients over short distances associated with changes in elevation), and interesting diversity of ecophysiological characteristics in short
distances. It includes a fascinating description of differences in geological development of the islands and major landforms.

In an attempt to be comprehensive, many details are only briefly mentioned, necessarily pointing the reader to citations for more in-depth information. The community composition lists in some chapters can be overwhelming, unless the reader is seeking information on whether or not a particular observed association is common to the region, or for information on the typical environment in which a species or association is found.

Discussion of the ecophysiology of vegetation types is quite limited, with a few exceptions. For example, there is recent information on factors limiting summer photosynthesis in boreal forests, and the importance of carbon allocation patterns and vegetative reproduction to reproductive success in boreal species. It would be useful to link our understanding of ecophysiology to sustainability, disturbance effects and restoration success.

In summary, the book is a worthy addition to a reference library for field scientists, and a guide to more in-depth literature on highlighted topics. The new sections on disturbance history, habitat loss, and restoration provide an important context for descriptions of the vegetation types. It is quite a comprehensive volume, and a commendable achievement.

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