

BOOK REVIEWS

Gibson, David J. (2009) **Grasslands and Grassland Ecology**. 305 pp. Oxford: Oxford University Press, ISBN 978-0-19-852919-4 (paperback) Price: US\$70.00

This volume is a general introductory treatise on grasses and grassland ecosystems. It encompasses the broad topics of grass systematics, grassland populations and communities, and rangeland management in ten chapters. The book contains 66 high-quality line drawing and half-tone illustrations, and 14 glossy color plates.

Chapter 1 discusses grassland terminology, emphasizing the regional and cultural diversity of designations commonly used to refer to grassland ecosystems. Terms such as meadow, pasturelands, rangelands, savannah, steppe, and veld are defined. This chapter closes with a brief history of grassland research. Chapter 2 focuses on grass systematics and evolution, drawing on the taxonomic classification recently elaborated by the Grass Phylogeny Working Group (GPWG). Gibson summarizes the extensive and highly complicated cladistic diagram to provide a better appreciation (Fig. 2.1, p. 25). The chapter ends with a brief evolutionary history of graminoids, in which aspects such as coevolutionary patterns with grazers and browsers, and interactions with climate change, and atmospheric carbon are discussed. Chapter 3 deals with morphology and anatomy of grasses and their ecological significance. Chapter 4 is a review of grass physiology that stresses the different photosynthetic pathways (C_3 and C_4) and their value in forage quality assessment. The chapter concludes with discussions on the role of nutrients and anti-herbivore defenses.

Chapter 5 presents the basics of population ecology in grasslands, with a strong emphasis on reproduction. Topics such as population dynamics, polyploidy, hybridization, and diseases are also discussed. Chapter 6 deals with community ecology, with illustrated examples from North America and other parts of the world. Chapter 7 (Ecosystem ecology) devotes particular attention to energy, productivity, and nutrient cycling. Chapter 8 (Disturbance) discusses aspects of grazing and fire, which are useful for grassland management and restoration, topics discussed in more detail later in the book. Chapters 7 and 8 are the core of the book, and specifically support the “grassland ecology” part of the title.

Chapter 9 (World Grasslands) seems to be out of place. It should perhaps be at the beginning (second chapter) or at the end. Although all grasslands of the

world are covered, there is inconsistency between the map on page 162 and the text. This is perhaps because the map has very poor resolution. Small grassland territories are difficult to place on the Köppen climatic types represented on the map. Perhaps the best solution to this problem could have been breaking the map into smaller areas, e.g., by continent or region. Moreover, some grasslands are misrepresented or misplaced in the climatic classification. For example, the Highveld Grasslands of South Africa do not figure among temperate grasslands (Type C climate), where they should be. According to the map and the description on page 167, they are classified as BSh (tropical/subtropical semiarid); only the western part of the Highveld is semiarid.

Chapter 10 (Management and Restoration) contains a series of sections on methodologies for grazing, fire, herbicide, range assessment, and restoration, with the majority of the case studies coming from North America. Overall, this is a good guide for managers of grassland reserves and rangelands. This chapter is a follow-up on many concepts and models presented in Chapter 8; another reason why Chapter 9, as noted above, should be somewhere else in the book.

The strong focus on North America, and particularly on research at the Konza Prairie Preserve in Kansas, is evident in this textbook. However, a fair assortment of case studies in Africa, Australia, and South America provide more diversity to the subjects discussed. Although the author discusses the impact of climate change on grasses in Chapter 4, the topic is virtually absent throughout the rest of the book. Nowadays, one of the problems that long-term ecology and biogeography aim to resolve is predicting changes in plant communities in relation to global warming.

As stated by the author in the Preface, “[this book] will be useful not just for the students taking my grassland course, but researchers, land managers, and anyone who has interest in grasslands anywhere in the world” (p.v.). I would add that this volume could be very useful as a textbook for classes in ecology and rangeland management, as well as a reference source for those interested in any area of research dealing with conservation, paleoecology, and environmental education. The vast number of references on up-to-date research makes this book worth having on your shelf.

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