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## ***Biology and Management of Noxious Rangeland Weeds* Roger L. Sheley and Janet K. Petroff, editors**

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## BOOK REVIEW

**Biology and Management of Noxious Rangeland Weeds.** Roger L. Sheley and Janet K. Petroff, editors. Oregon State University Press, Corvallis. 1999. \$32.95, softcover; 438 pages. ISBN 0-87071-461-9.

Invasive plant species (aka noxious weeds) have been described as one of the most serious threats to the integrity and productivity of our nation's landscape. Successful management of noxious weeds is an extremely complex process due to numerous biological and anthropogenic constraints. This book provides a thorough overview of our current knowledge concerning the biology and management of noxious rangeland weeds. The book's geographic range is stated as encompassing 15 states and 4 Canadian provinces in western North America. It is co-authored by 52 individuals from universities, private industry, and state, federal, and county agencies or organizations. Twenty-nine of the contributors are employed in the northwestern U.S. (Idaho, Montana, Oregon, Washington), which probably reflects the editors' regional collegial network. The authors and editors are to be commended for making diversity in writing style and content a strength rather than a weakness of the book.

The book is divided into 2 main sections. Section I, titled "Theory and Practice of Weed Management," provides a primer on the general principles of weed management and includes 11 chapters that should assist managers in developing weed management plans. Chapter 1 takes a systems approach in explaining the ecologic (i.e., ecosystem structure, function, and organization) and economic (micro- and macro-) impacts of noxious weeds. It may be the most intriguing chapter of the book except for a confusing statement about cattle numbers presently being at "close to record highs on many western rangelands." The phrase, "many western rangelands," needs to be defined because trends in cattle numbers vary throughout

the West according to land ownership. Chapter 2 adequately discusses basic principles of noxious weed mapping and explains why accurate maps are critical in developing a successful weed management plan. Coordinated weed management planning is the topic of Chapter 3, which provides a satisfactory discussion of why human behavior and attitudes are more often barriers to developing and implementing weed management plans than lack of technical expertise. Chapter 4, a discussion of economic procedures for evaluating weed management actions, is directly related to Chapter 6 (Prevention) and Chapter 7 (Early Detection and Eradication), primarily because the most economical (and ecologically efficient) way to deal with noxious weeds is to apply prevention and early eradication measures. Chapter 5 outlines 4 phases of an integrated weed management program, discusses the rationale behind maintaining "weed resistant" plant communities, and features 2 ecologically based models that predict outcomes of various integrated weed management strategies. Apt discussions on several weed management tools (i.e., grazing management, biological control, herbicides, and revegetation techniques on disturbed land) are covered in the final 4 chapters (8–11) of Section I. Mechanical or physical control as a weed management tool apparently did not warrant a separate chapter in Section I, but it is discussed where appropriate in Section II, which covers individual weed species. Adequate references appear at the end of most chapters in Section I for those who want to delve deeper into the area under discussion; exceptions are Chapter 3 (Coordinated Planning, where only 6 references are cited), Chapter 4 (Economics, only 3 references cited), and Chapter 6 (Prevention, no references cited).

Section II, "The Weeds," consists of 25 chapters that cover individual weed species characterized by the editors as ". . . the most serious noxious weed species in the western United States." Section II actually covers at

least 32 species when you consider that 2 species of “snakeweed” (i.e., *Gutierrezia sarothrae* and *G. microcephala*) and 3 species of “whitetop” (i.e., *Cardaria pubescens*, *C. chalapa*, and *C. draba*) are discussed in those respective chapters. Each of Section II’s chapters typically provides a concise, yet informative review of a plant’s origin, history, identifying features, biology, ecology, impacts, invasion potential, specific management options, and distribution in the western U.S. The management options section of each chapter will be especially useful in helping land managers determine species- and site-specific management tactics and strategies for weed species that may occur in their area. Distribution maps in each chapter will be especially useful to U.S. managers because the maps provide a county-by-county snapshot of weed distribution across 15 western states and show the imminent potential for invasion throughout the region. Most figures, tables, and illustrations are comprehensible and easy to read. An ample reference section is provided at the end of each chapter in Section II for those who want to learn more about a particular weed species.

Section II is not completely without problems, however. First, including a chapter on “snakeweeds” seems inappropriate when one considers the 3 ways that noxious weeds are classified in the introductory chapter. To wit, noxious weeds are (1) . . . foreign organisms—the invaders—of forest and rangeland; (2) legally, . . . any plant designated by a federal, state, or county government to be injurious to public health, agriculture, recreation, wildlife, or any public or private property; or (3) . . . those weeds that have invasive characteristics, regardless of whether they have been legally designated “noxious” at some government level. Only the last classification appears to fit the 2 snakeweed species discussed in the book, and even then, these native species do not seem to have near the invasive potential of the other nonnative species covered in Section II. Several invasive plant species that occur primarily or exclusively in the southwestern U.S. (e.g., African rue, buffalograss, camelthorn, Lehmann lovegrass, malta starthistle, red brome, salt cedar, sweet resin bush) could have effectively replaced the snakeweed chapter. Second, color photographs of 29 noxious weed species are

presented in the middle of the chapter on biennial thistles. More logical locations for the photos would have been either immediately before (or immediately after) Section II, or within the appropriate chapters on the individual weed species. Photos of the individual species vary greatly in quality and are presented as a mixed assortment of close-up and landscape views. Scientific names are not listed under each photo, only common names, which is an unfortunate omission because common names are often used to refer to any number of plant species (e.g., whitetop). Third, although the back cover indicates that 4 provinces are included in the book’s geographic range, Canadians will be disappointed to find only 15 western U.S. states shown on each weed distribution map. Finally, chapters in Section II are arranged alphabetically; I would have preferred botanical organization.

These problems aside, the 1st edition of this book will undoubtedly serve as a baseline from which to evaluate “the way we were” near the end of the 20th century with regard to noxious weed distributions in the western U.S., and our state of knowledge of invasive plant management. Hopefully, there will be additional editions forthcoming that will build on the material presented in this original work. Subsequent editions could serve as a steady source of new knowledge on invasive plant issues, a topic that will surely continue to receive considerable attention for many years to come. The book’s back cover hits the mark in describing the current effort: “An invaluable resource for land managers, resource specialists, and students of natural resource management.” With regard to the last point, I recently used this book as a text in a capstone independent study course designed for a senior level undergraduate student. I also plan to use it for a graduate seminar course and as an important resource for developing extension and outreach programs. I recommend this book to all who are interested in learning more about the *Biology and Management of Noxious Rangeland Weeds*.

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