

it as an outgroup for populations of threespine sticklebacks will result in incorrect polarization of character states.

The solution to the phylogenetic problem might be, first, to examine relationships among all recognizable marine and anadromous populations, and then insert the freshwater populations under study onto that phylogeny to test for independence. If two freshwater populations are derived from separate extant ancestors, they will pair with different marine populations. The initial study will tell us whether the black-spotted stickleback is a raceme emergent, as Bell and Foster believe, or is a sister species to the threespine stickleback complex, as current taxonomy suggests. Subsequent phylo-

genetic analyses of sets of populations selected to address specific evolutionary questions will permit the threespine stickleback to fulfill the expectations of the authors.

This book is important because of its exhaustive coverage of virtually every aspect of the biology of a well-studied species. The authors are enamored with the threespine stickleback, and most readers looking for information on the threespine stickleback will be equally enamored with this book.

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Ecology 76(7), 1995, pp. 2339–2340
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CONSERVATION AND MANAGEMENT OF NEOTROPICAL MIGRANTS

Dobkin, David S. 1994. **Conservation and management of Neotropical migrant landbirds in the Northern Rockies and Great Plains.** University of Idaho Press, Moscow, Idaho. xiii + 220 p. \$29.95, ISBN: 0-89301-168-1.

Numerous recent articles and books on the population declines and conservation of neotropical migratory landbirds herald a new interest by university researchers, governmental agencies, and private organizations in inventorying, monitoring, and managing populations of bird species in North America. Dobkin's book, written under contract to the Northern Region of the USDA Forest Service, contributes to a growing body of literature that summarizes population status and natural histories of migratory landbird species on managed lands. The purpose of the book was to summarize effects of management practices (e.g., logging, grazing, pesticide use) on species of neotropical migratory birds within the boundaries defined by the Forest Services' Northern Region (Montana, northern Idaho, North Dakota, northwestern South Dakota) and to review the habitat requirements, foraging behavior, and status of regional migratory species. The goals of the book are modest, with no intent to develop ground-shaking theories. The book accomplishes what the author set out to do, to supply a summary report that will assist government agencies in identifying how and which neotropical migratory bird species may need attention in light of various management practices. In many respects, it reads like a field guide to the Northern Region's neotropical birds, minus the pictures. The book is available only in paperback.

Divided into two sections, the book introduces the problem of forest fragmentation as a significant factor in causing declines of populations of migratory landbirds in North America, then develops the first section by summarizing the scanty literature on bird habitat use in western North America. Dobkin surveys the management practices and impacts on migratory birds in the common habitats of the Northern Region, focusing on coniferous and deciduous forests and woodlands, and grasslands and shrubsteppe. The reader is left with the sense that more research is needed in the West before clearcut conclusions can be drawn on whether western birds are indeed having problems, where the problems

might be, and what should be done to conserve populations. While the first section is a solid summary of the available literature, land managers will probably be left pondering what to do with the information, how to integrate so many species into their plans, and wishing for specific models and guidelines. One might ask, how in the world can we successfully maintain or recover populations of multiple bird species, when habitat use patterns vary greatly by species, locality, vegetation type, and seral stage? Is it up to natural resource agencies to figure out how to save all the species, or should agencies demand more from researchers than researchers have yet been able to offer? And really, when and can the real problem be addressed—that of human population growth and its relationship to disappearing habitats—and whose responsibility is it?

The second major section of the book provides summary accounts of habitat, feeding, and management information for 144 terrestrial migratory species, encompassing raptors, shorebirds, woodpeckers, hummingbirds, and passerines. Each account includes a map of the species' breeding distribution in the Forest Service's Northern Region, numerically identifies the species' wintering area, and cites further sources of information. The book's Table 3 lists the major habitats of the region in which each species occurs. Each written account is about a half page long. While general species guides, including some co-authored by Dobkin, include similar information, these species accounts are unique in that they include information on kinds of land management practices that may affect bird populations.

In summary, the book will be of most use to conservationists and agency professionals in the western United States, especially Montana, Idaho, and the Dakotas, who are looking for a basic understanding of the species and habitats of migratory landbirds in this region. It is one of those kinds of books that will likely serve as a reference volume, alongside one's dictionary and telephone book, that an agency biologist can refer to whenever a question arises about a particular species or habitat. Because the scope of the book is limited to a particular region and group of species, the volume lacks the depth and complexity that might appeal to a broader range of disciplines. A special concern is the exclusion of year-

round resident birds from the book's coverage because it leaves the impression that they are of no concern or are of lesser value than migrants. Other sources indicate that resident species in the western United States, especially those using grasslands, may be having greater population problems than neotropical migrants. Therefore, the best conservation approach may be to assess all species in a particular area, taking into account not only migratory status, but as many

other useful factors that help to identify shared problems and trends.

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Ecology, 76(7), 1995, p. 2340
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ECOLOGY AND RANGELAND MANAGEMENT

Heady, Harold F., and R. Dennis Child. 1994. **Rangeland ecology and management**. Westview Press, Boulder, Colorado. xvi + 519 p. \$59.85, ISBN: 0-8133-2052-6 (alk. paper).

Ecology is the fundamental scientific discipline of rangeland science which is the fundamental scientific discipline of rangeland management technology. This linkage between ecology and rangeland management is the underlying theme of the book *Rangeland ecology and management*. The authors state in the Preface that the focus of the book is "on the ecology of rangeland grazing, practical management of animals, and vegetational manipulation. Part Four brings these together in the context of decision making for damaged land, riparian and water conservation, multiple-use, and modeling." The book is a much expanded version of Dr. Heady's 460 page, 1975 text entitled *Rangeland management*.

Part One is subtitled "Grazing Ecology" and includes 10 chapters. Subject matters covered are very broad with emphasis placed on introducing the reader to elementary ecological concepts as they relate to rangeland management. Chapter titles are: "Rangeland Conservation," "Defoliation," "Physiological Effects of Defoliation," "Palatability, Preference, and Selective Defoliation," "Physical Effects of Grazing Animals," "Energy Flow and Nutrient Cycling," "Redistribution of Minerals by Plants and Animals," "Distribution of Plants by Animals," "Fire as an Environmental Factor," and "Rangeland Synecology." Part Two is subtitled "Grazing Management" and consists of eight chapters focusing on the art and science of managing both domestic (i.e., livestock) and wild herbivores in a mix of rangeland environments. Chapter titles are: "Numbers of Animals," "Utilization of Forage," "Animal Distribution," "Mixed Species Grazing," "Mixed Species Management," "Seasonal Management," "Grazing Plans," and "Responses to Seasonal Grazing Plans." Part Three is entitled "Vegetation Management" and consists of eight chapters. Subject matter focus is on "using such tools as machines, chemicals, fire, and organisms to reduce undesirable species and thereby encourage desirable vegetation. New species may be seeded, and the site improved by fertilization and water management." Chapter titles are: "Modification of Vegetation," "Mechanical Control of Rangeland Plants," "Chemical Control of Rangeland Plants," "Prescribed Fire in Rangeland Management," "Biological Control," "Seeding of Rangelands," "Rangeland Fertilization," and "Soil and Water Conservation." The final section consists of five chapters and is entitled "Man-

aging Rangeland Complexity." Subject matter focus is on strategic and tactical planning strategies. Chapter titles are: "Reclamation of Damaged Rangeland," "Riparian Areas and Pollution: Best Management Practices," "Multiple Use," "Planning for Rangeland Management," and "Decision Support Systems."

As expected, this book is a classical rangeland management textbook of considerable value to teaching professionals. The chapters are a mix of the old (Heady, Harold F. 1975 *Rangeland management*. McGraw-Hill) and the new as reflected in part from a review of each chapter's literature citations. For example, of the 41 citations included in Chapter 6 ("Energy Flow and Nutrient cycling"), only six have been published since 1980. This is in contrast to Chapters 18 ("Responses to Seasonal Grazing Plans") and 31 ("Decision Support Systems") wherein 47 of 72 and 27 of 30 citations, respectively, have been published since 1980.

The content of several chapters are particularly noteworthy. Chapter 10 ("Rangeland Synecology") is a particularly refreshing treatment of such fundamental ecological concepts as succession, climax vegetation, range condition, and trend. The authors do a commendable job in presenting conflicting viewpoints (e.g., monoclinal vs. polyclinal successional theory) in a cohesive, common sense manner. Similarly, Chapters 17 ("Grazing Plans") and 18 ("Responses to Seasonal Grazing Plans") are skillful presentations of the merits, both real and perceived, of various grazing plans (i.e., grazing systems and strategies). Likewise, Chapters 29 ("Multiple-Use"), 30 ("Planning for Rangeland Management"), and 31 ("Decision Support Systems") introduce the reader to the newest of issues driving rangeland management technology.

In general, the authors' writing style is clear, concise, and appropriate for a collegiate undergraduate textbook. In addition, the extensive use of bold print text is an effective means of calling attention to points of emphasis although in some chapters its use approaches excessive. Two noted distractions are the within and between chapters organization of subject matter and the general absence of high quality figures and tables with this latter point frequently compounded by a general absence of quality labels.

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