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# Preface

Including wildlife priorities in land management decisions is a common goal for state and federal agencies, nongovernment organizations, and industrial and nonindustrial private landowners. Conservation efforts increasingly occur at larger spatial scales with greater consideration of multispecies strategies, collaboration across agency and ownership boundaries, and with consideration of population performance. These strategies and approaches are driven by increased recognition that successful wildlife conservation and natural resources planning at large scales must consider more than just site-level habitat management. We must consider the use of models that predict vegetation and corresponding wildlife impacts, ecological theory, and social and economic factors.

Although theoretical advancements in landscape ecology have driven us to large-scale conservation activities, several technological advancements have also contributed to our ability to model and study wildlife dynamics at large spatial scales. Spatially explicit information about land use and vegetation composition and structure is now available for landscapes around the world. Advancements in remote sensing and related technologies have increased the resolution and quantity of landscape data, and efforts have been made to increase the availability of landscape data. Advancements have also been made in desktop computers and software to model vegetation dynamics and quantify spatial patterns in large landscapes. Geographic information systems (GIS) allow managers and researchers to study the spatially explicit effects of management decisions and other disturbances on vegetation at large spatial scales and allow for inclusion of complex spatial processes in models of wildlife-habitat relationships. These developments have changed the way wildlife habitat is modeled and how wildlife priorities are considered in land management planning. As we considered the latest ecological theory, analytical techniques, and technological advancements in our own studies, we sensed the need for a book that consolidates the conceptual basis and practical approaches to modeling and conserving wildlife in large landscapes.

This book focuses on practical approaches, concepts, and tools to model and conserve wildlife in large landscapes. The book is intended for conservation and wildlife biologists, managers, resource planners, and students interested in wildlife habitat models and conservation planning. We secured manuscripts from a diverse group of scientists from university, state and federal agencies, industrial landowners, private consulting firms, and nongovernmental organizations. By default, this diversity of personnel also ensured a mix of expertise related to landscape simulation, wildlife population viability, ecological modeling, wildlife management, and natural resources planning. We felt such diversity was

important to demonstrate the variety of philosophies, approaches, and strategies being implemented. We also invited international participants to further broaden the perspective of available ideas and methods.

The book is roughly divided into three components. The first third of the book largely addresses critical concepts that should be considered in large-scale conservation activities. In addition to consideration of social and economic issues, chapters address the conceptual basis of multispecies assessment approaches; population viability analysis; reserve design; issues of scale and error in landscape planning; and practical approaches used by federal, state, and private landowners. The second third of the book is primarily methods based. Here, the reader will find reviews of available methods and software for modeling vegetation and wildlife dynamics. Chapters in this section discuss approaches for modeling overstory and understory vegetation, methods to validate vegetation and wildlife models, ideas for integrating vegetation and wildlife population viability, and issues with using spatially explicit data from within large landscapes. Although there is a strong focus on methods, several case studies highlight application of these methods. The last third of the book integrates theory and methods by presenting detailed, practical case studies from a diversity of ecosystems and for a diversity of species. These chapters illustrate approaches to modeling and conserving wildlife, including both game and non-game species, in forested and nonforested environments, and in urban environments and industrial landscapes to broad-scale and comprehensive approaches that cover a diversity of ownerships. However, even the concept chapters contain case studies and the application chapters also contain important theory. For this reason, we have no formal section designators in the book.

As with any edited book, much of the focus and applications relate directly to the editors' research. Thus, given much of our large-scale modeling work has related to bird conservation over the past 10 years, the primary focus of the applications contained within the book use bird examples. Additionally, many large-scale conservation programs have involved birds (e.g., North American Waterfowl Management Plan, the Partners in Flight North American Landbird Conservation Plan, and the U.S. Shorebird Conservation Plan). Concepts and applications involving reserve design, coarse filters, and community or species richness approaches are discussed, but we emphasized multiple-use landscapes and approaches that ultimately step down to modeling species habitat, abundance, or viability because even most large-scale approaches usually eventually address focal or high-concern species. Although we attempted to provide a broad suite of applications, there are admittedly outstanding examples of wildlife conservation at large spatial scales that were not adequately discussed in this book.

We greatly appreciate the willingness of chapter authors to participate in this project. They were remarkably patient, timely, and responsive to our requests. Clearly, peer-review is critical to an edited volume such as this one. We are grateful to those who reviewed papers. A complete "List of Reviewers" is included in

the book. Several people graciously reviewed two manuscripts. We thank several agencies and personnel for their support, assistance, and many contributions. The School of Natural Resources, Department of Fisheries and Wildlife Sciences, University of Missouri, and the U.S. Forest Service, Northern Research Station supported production of this book. Our thanks are extended to Jen Reidy for her constructive and meticulous reviews of the literature cited sections. Dick DeGraaf and John Marzluff provided constructive and valuable comments on the production of this book. Bill Dijak produced the GIS image for the back cover. We thank Gary Kramer for the Greater sage-grouse photo and USDI Bureau of Land Management for the sagebrush landscape photo used on the front cover. We gratefully acknowledge our spouses, Rami Woods and Fran Thompson, for their patience during the production of this book (and other work). We thank the U.S. Forest Service; U.S. Fish and Wildlife Service; National Park Service; National Science Foundation; Missouri Department of Conservation; South Dakota Department of Game, Fish and Parks; University of Missouri; and Boise Cascade Corporation for support of research that has been the impetus for our interest in the use of habitat models and in wildlife studies. We are sincerely grateful to all these people and organizations.

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