

Preface

Remote sensing has long been considered an important source of environmental information that is capable of supporting a deeper understanding of trends and clarifying management strategies in a wide range of ecological applications. Biodiversity and wildlife management are of global significance and increasing concern as current environmental trends intensify. These three broad areas—remote sensing, biodiversity, and wildlife management—intersect to create a dynamic *transdisciplinary* area of research with practical applications that are based on key new methods, concepts, and insights acquired in a wide variety of field studies and management situations. The urgency of many environmental challenges and the fast-moving technological world of remote sensing provide a stimulating context for innovative applications and research in environmental management. A full implementation of a remote-sensing approach may make new solutions to demanding tasks in biodiversity and wildlife management possible.

The initial promise of remote sensing originates in the ability to deliver high-quality scientific observations at many scales, over large areas, with regular revisit intervals, in a format that is both well-suited for ecological interpretation and readily integrated with data from other components of a modern spatial information and environmental management system. Many introductory and specialized remote-sensing books provide a rich technical compendia and survey of developments, but few focus on the ecological remote-sensing applications that are now possible. None of the current literature specifically highlights and expands on the critical remote-sensing contributions to biodiversity and wildlife management. Several recent journal article reviews document a growing success in applying remote-sensing technology and methods to the analysis and modeling of habitat, species-environment relationships, and biodiversity. Recent commentary suggests that what is needed is more effective collaboration among all those working in remote sensing, wildlife management, and biodiversity science and conservation. The intent of this book is to bring a remote-sensing approach closer to many

readers and environmental managers—to synthesize the relevant aspects of this expanding scientific world in an informative, timely, and concise fashion.

A number of related themes are addressed in this book. In the opening chapters, the information needs—the critical targets that remote sensing can potentially address—are reviewed in support of environmental management applications. The broad and growing area of *biodiversity indicators* and its detailed treatment by other researchers are included in this review, while the basic operation of certain remote-sensing instruments is explained. These chapters are followed by a review of image analysis and related interpretation techniques of interest in biodiversity assessment and wildlife management (notably GIS, GPS, and spatial modeling). The heart of the book presents examples and case studies that were carefully selected to emphasize key insights and methods that have worked in actual conservation and management projects.

The information contained in this book will be useful to a full range of researchers and management professionals in the wide range of natural resource disciplines and subfields. Increasingly, traditional disciplinary-based or expertise-based divisions are fading as solutions are developed by researchers, managers, policy-makers and all manner of resource professionals who are working together in multidisciplinary, interdisciplinary, or transdisciplinary teams. Such teams bear front-line responsibility for environmental planning, management, assessment, and recovery planning for general environmental impacts and conservation in some of the most important work of our time. These teams, as well as senior undergraduate and graduate courses in the broad areas of biodiversity and wildlife management and remote sensing, will be able to draw on the material as a textbook.

The book was completed while the author had the good fortune to experience administrative leave at Curtin University of Technology in Perth, Australia. Among the many unique features of Curtin is a strong Department of Spatial Sciences which is adjacent to a strong Department of Environmental Biology and located within a dynamic intellectual setting. Colleagues at the Western Australia Department of Environmental Conservation, Murdoch University, University of Western Australia, and CSIRO shared generously of their knowledge and expertise—their outstanding institutions are among the world leaders in ecological aspects of remote sensing and spatial sciences and are located in the spectacular environmental setting of Western Australia, a biodiversity hotspot of international significance. While exploring this interesting and beautiful part of the world, I learned a great deal and was stimulated to gain a deeper understanding and to communicate better the contribution of remote sensing in biodiversity and wildlife management.

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