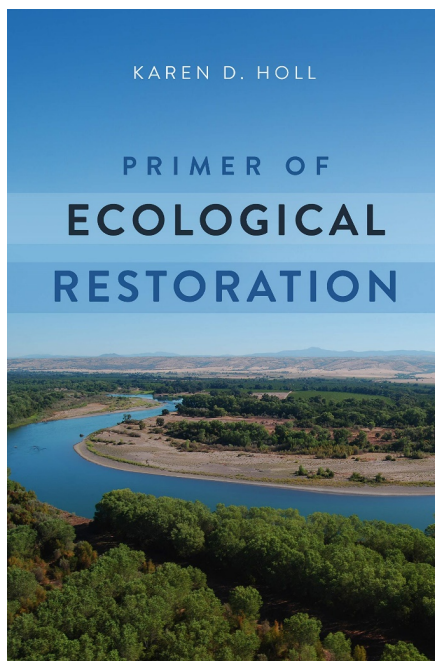




Primer of Ecological Restoration

Karen D. Holl

islandpress.org/books/primer-ecological-restoration

Why I wrote this book

The science and practice of ecological restoration have grown exponentially over the past few decades, as we aim to compensate for the negative impacts humans have had on the ecosystems on which we and millions of other species depend. With the growth of ecological restoration has come a plethora of resources: thousands of articles in the peer-reviewed and

management literature, countless websites describing individual projects, a few general textbooks, and many books focused on restoring specific ecosystem types. This book aims to provide a broad but succinct introduction to ecological restoration for a few audiences. First, I anticipate that this book will be used as an introductory text for some Ecological Restoration and Restoration Ecology courses in which the instructors assign students in depth readings on specific topics and case studies tailored to the focus of the course. Second, this book could be used as one of a few texts in courses on Conservation Biology and Resource Management where ecological restoration is not the only topic covered. Third, this book should be of interest to natural resource managers and a more general audience who want a short introduction to ecological restoration.

To those ends, I have aimed to keep the writing succinct, limit specialized jargon to a minimum, and define terms in both the text and the glossary. I have also kept the book cost low by including tables and black and white figures in the book and complementing those with online case studies and links to color photos and videos that can be updated frequently in this rapidly changing field.

Restoring ecosystems requires an interdisciplinary background. Understanding the ecology and natural history of the ecosystem being restored and knowing appropriate restoration methods are essential. But, as any restoration practitioner knows, successful project implementation requires familiarity with a host of other topics, including but not limited to managing stakeholder involvement and public outreach; experience with planning, goal setting, and monitoring; and knowledge of relevant legislation, permitting processes, and funding sources. This book could not possibly discuss all these topics in detail while achieving the goal of brevity, so I provide an overview of key points and illustrate them with brief examples. Concepts are integrated by cross-referencing of chapters, and several online case studies that provide detailed information and integrate various themes illustrated by the project.

Book Outline

Ch. 1. Why Restore Ecosystems? – discusses the extensive range of motivations for restoring damaged ecosystems.

Ch 2. Defining Restoration – reviews the definitions of the continuum of restoration activities and how they have changed over time; obstacles to restoring predisturbance ecosystems; and the novel ecosystems debate.

Ch. 3. Project Planning – discusses key points related to project planning including stakeholder engagement, reference models, goal setting, analysis of existing conditions, writing a design plan, permits, timelines, and contingency plans.

Ch. 4. Monitoring and Adaptive Management – summarizes the adaptive management cycle; selection of monitoring parameters and methods; and best practices for developing a rigorous monitoring plan.

Ch 5. Applying Ecological Knowledge to Restoration – highlights the importance of applying ecological knowledge to restoration with a focus on disturbance regimes, recovery trajectories, and ecological processes at large spatial scales.

Ch 6. Landform and Hydrology – focuses on strategies for restoring abiotic conditions and physical processes in terrestrial, wetland, and riverine systems.

Ch. 7. Soil and Water Quality – reviews approaches to restoring nutrient cycling and reducing acidity and toxic chemicals in both terrestrial and aquatic systems.

Ch 8. Invasive Species – considers problems caused by invasive species and methods for controlling them as part of ecological restoration efforts.

Ch 9. Revegetation – summarizes a range of topics related to vegetation recovery including selection of species and sources of plant material; propagation methods; and strategies to enhance plant survival and growth.

Ch 10. Fauna – examines drivers of faunal decline; key habitat characteristics required to restore specific faunal guilds; and techniques for faunal reintroduction.

Ch 12. Legislation – reviews approaches and challenges to regulating restoration drawing on a range of international and national examples.

Ch 12. Paying for Restoration – illustrates different sources and strategies to fund restoration projects using case studies worldwide.

Additional Resources

This book is intended as a launching point into the diverse and exciting field of ecological restoration. I have provided a number of resources both in the book and on the book website (islandpress.org/primer-ecological-restoration) that to help the reader continue on their education journey into the field. The online resources will be updated periodically.

Recommended readings – Each chapter concludes with a few key recommended readings on the topic and the book includes an extensive reference list at the end.

Case studies – Eight case studies with color photos are referenced to illustrate key points throughout the book and are available to download from the book website. These include examples of restoring different ecosystems and species throughout the globe from restoring the Kissimmee and Sacramento Rivers in the U.S. to restoring the Galapagos giant tortoise in Ecuador.

Questions for discussion and reflection – I provide questions for reflection and discussion that ask both individual readers and students in classes to apply the ideas presented in the book to a restoration project of their choice.

Figures, photos, and videos – Digital slides of the figures in the book and additional figures licensed under Creative Commons are available on the book website. I provide a list of links to additional figures and videos that I use in the ecological restoration class I teach.

Restoration design plans – A number of restoration practitioners have kindly shared examples of restoration design plans to be used for educational purposes.