



BOOK REVIEW

Conservation of Wildlife Populations: Demography, Genetics, and Management. 2nd edition. L. Scott Mills, editor. 2013. John Wiley & Sons, Ltd., Oxford, UK. 342 pp. \$154.95 hardcover. ISBN: 978-0-470-67150-4.

Central to the conservation of wildlife populations is an understanding of the factors that contribute to the spatial and temporal variation in the distribution and abundance of wildlife species. It has been 6 years since L. Scott Mills published the first edition of *Conservation of Wildlife Populations: Demography, Genetics, and Management*, where he covered a wide spectrum of topics related to applied wildlife population ecology within a single, comprehensible text. Wildlife population ecology has remained, and will continue to be, an active area of research. Therefore, such texts must be updated periodically, with recent and on-going research endeavors, to remain relevant and continue to provide readers with the foundation needed to pursue more advanced topics in wildlife conservation. In the second edition of this book, Mills set out to do just that by retaining many of the core concepts presented in the first edition and expanding chapter content to cover many contemporary, state-of-the-art approaches used to study wildlife populations.

Similar to the first edition, the second edition is separated into 3 parts: 1) Background to Applied Population Biology (Chapters 1–4), 2) Population Processes: The Basis for Management (Chapters 5–10), and 3) Applying Knowledge of Population Processes to Problems of Declining, Small, or Harvestable Populations (Chapters 11–14). Each chapter is separated into subsections of related topics with multiple inserts that elaborate on key concepts and discuss real-world case studies. The end of each chapter provides citations for more advanced topics related to the material presented—for readers interested in pursuing topics in greater detail. As an added bonus, a companion website provides instructors and students with high-resolution copies of the figures and tables presented in the book, as well as exercises to aid in kinesthetic learning.

Part 1 focuses on key concepts that are required to comprehend factors that contribute to wildlife population dynamics. The book begins by examining population dynamics of humans and how they are interrelated with wildlife population ecology (Chapter 1). In Chapter 2, sampling and study design are introduced, with topics including how to establish hypotheses; types of controls; the difference between accuracy, variation, and error (and how they are related); the importance of replication and randomization; and potential complications with pseudo-replication. Chapter 2 also introduces frequently used approaches to statistical inference (i.e., null hypothesis testing, information-theoretic approaches, and Bayesian inference) and provides examples of each, yet does not

overcomplicate the discussion with complex mathematical derivations. The chapter concludes by reviewing ethics for wildlife biologists with Mills providing a personal story of how ethics relates to wildlife studies. My only critique for Chapter 2 is that it covers a diverse array of topics where each warrants its own chapter. Chapter 3 introduces key concepts and applications of genetic tools to study wildlife populations. Chapter 4 was oddly placed in Part 1. Given that the estimation of population vital rates is often the basis for management, Chapter 4 would be more appropriate in Part 2. Nevertheless, I was delighted to see this material being presented in an introductory text because an understanding of the assumptions of these analyses is essential to establish effective wildlife monitoring and research protocols. In Chapter 4, advanced topics related to the analysis of wildlife monitoring data (e.g., capture-mark-recapture/resight, telemetry, distance sampling, etc.) are adeptly introduced. However, other contemporary methods such as N-mixture models and spatial capture-recapture models were unfortunately omitted from the chapter. Hopefully, these methods (and extensions therein) will be included in future editions of this book.

Part 2 concentrates on factors that influence wildlife population dynamics. First, Chapter 5 discusses the meaning and practical use of population growth rate (λ) and intrinsic rate of population increase (r) to quantify population change. Further, in the same chapter, factors that lead to variation in these parameters as well as the consequences of that variation are introduced. Chapter 6 builds upon the previous chapter and illustrates how structured population-projection models can be used to simulate population dynamics, with several case studies illustrating their real-world use in wildlife conservation endeavors. Chapter 7 covers topics related to density-dependent effects and how they can affect population dynamics, followed by the roles of predation (Chapter 8) and genetic variation (Chapter 9) in population dynamics. The final chapter of Part 2 (Chapter 10) covers a wide spectrum of topics related to multiple populations across a landscape and how they are associated. Specifically, the chapter explains different forms of habitat connectivity, introduces commonly used methods to measure connectivity (e.g., radiotelemetry, capture-mark-recapture/resight, and multiple genetic approaches), covers how individuals can operate within the landscape (e.g., metapopulation, source-sink populations, and ecological traps), and discusses some techniques biologists can use to restore connectivity. Again, these topics are followed by multiple real-world examples.

Part 3 does an excellent job in bringing the previous sections together by focusing on how an understanding of population dynamics is directly related to on-the-ground management. Chapter 11 examines human-induced, deterministic stressors (e.g., pollution, habitat loss, habitat fragmentation, etc.) on the environment, and how wildlife might respond through changes in movement, adaptation, and/or mortality. In Chapter 12, key concepts and

methodologies of population viability analysis in wildlife management decision making are introduced. Again, these approaches are built around complex statistical methods but are discussed in a straightforward manner. Chapter 13 is a short, albeit important, chapter that introduces various types of focal species (e.g., flagship, umbrella, indicator, dominant, and keystone species) and how they can be used to manage entire ecosystems. The closing chapter of the book (Chapter 14) focuses on the use of population models to guide harvest management decisions, including the effects of hunting on population dynamics, compensatory versus additive mortality, how long-term selective hunting pressure can affect phenotypic variation of wildlife species, and the use of adaptive harvest management to achieve management objectives in the face of uncertainty.

Perhaps the greatest strength of *Conservation of Wildlife Populations: Demography, Genetics, and Management* is that concepts are reinforced with real-world examples that are relatable to wildlife practitioners. The purpose of this book is

not to provide detailed knowledge needed to carry out all of the presented methods. Instead, the book introduces a wide range of contemporary statistical and genetic approaches used to study wildlife populations, and gives direction to where further insight can be gleaned. These topics can often be daunting. However, Mills clearly presents these topics in a way that makes the reader excited to pursue a higher education in quantitative ecology and/or conservation genetics. Once again, *Conservation of Wildlife Populations: Demography, Genetics, and Management* is a great contribution to the current wildlife literature and will no doubt prove to be an excellent and indispensable resource when training wildlife biologists, upper level undergraduate students, and graduate students.

—**Adam Duarte**, Department of Biology, Texas State University, 601 University Drive, San Marcos, TX 78666, USA, ad1401@txstate.edu