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Virtual Biology Laboratory Introduction to Population Biology Introduction to Population Biology Introduction to Population Ecology Population Biology Population Ecology Population Biology and Evolution A Population Biology Reader Population Ecology in Practice A Population Reader Ecological Orbits The Evolution of Population Biology Population Biology Population Principles in Research Into Natural Focality of Zoonoses Population Biology The Biology and Conservation of Animal Populations Population Biology Population Biology and Evolution of Clonal Organisms Case Studies in Population Biology Conservation of Wildlife Populations Population Biology of Genes and Molecules Integrated Population Biology and Modeling Population Viability Analysis Evolutionary Feedbacks Between Population Biology and Genome Architecture Population Ecology Population Ecology Population Management for Survival and Recovery Population Genetics and Microevolutionary Theory Forward-Time Population Genetics Simulations Population Biology and Evolution of Clonal Organisms Management and Analysis of Biological Populations Population genetics Case Studies in Population Biology Ecology, Genetics and Evolution of Metapopulations Biology of the Ubiquitous House Sparrow Population Genetics Data-driven Modelling of Structured Populations Population Ecology Human Population Genetics Parasitoid Population Biology

Places the converging disciplines of wildlife management and captive management in the context of the developing field of population and habitat viability analysis. The contributors explore the science of the demographic management of small populations, both in zoos and in the wild. Introductory guide to human population genetics and microevolutionary theory Providing an introduction to mathematical population genetics, Human Population Genetics gives basic background on the mechanisms of human microevolution. This text combines mathematics, biology, and anthropology and is best suited for advanced undergraduate and graduate study. Thorough and accessible, Human Population Genetics presents concepts and methods of population genetics specific to human population study, utilizing uncomplicated mathematics like high school algebra and basic concepts of probability to explain theories central to the field. By describing changes in the frequency of genetic variants from one generation to the next, this book hones in on the mathematical basis of evolutionary theory. Human Population Genetics includes: Helpful formulae for learning ease Graphs and analogies that make basic points and relate the evolutionary process to mathematical ideas Glossary terms marked in boldface within the book the first time they appear In-text citations that act as reference points for further research Exemplary case studies Topics such as Hardy-Weinberg equilibrium, inbreeding, mutation, genetic drift, natural selection, and gene flow Human Population Genetics solidifies knowledge learned in introductory biological anthropology or biology courses and makes it applicable to genetic study. NOTE: errata for the first edition can be found at the author's website: http://employees.oneonta.edu/relethjh/HPG/errata.pdf A foundational text on animal population conservation featuring practical applications and case studies. The study of animal populations is integral to wildlife ecology and conservation. Analyzing population biology data

can help facilitate the recovery of threatened species, manage overabundant species, and ensure sustainable levels of harvest. But for many students, the complex math involved is a barrier to understanding the importance of the data's applications. The emphasis on solving mathematical problems in traditional population biology texts may also seem far removed from the heart of conservation work that students find most compelling. The Biology and Conservation of Animal Populations is built differently. It provides a thorough introduction to this fundamental science in an accessible context that centers conservation, not equations. This textbook, written by prominent conservation scientist, author, and wolf biologist John A. Vucetich, challenges students to think critically about big questions in conservation work—such as what does and does not count as an endangered species and why—and addresses these issues using practical examples and case studies. The crucial mathematics concepts needed to fully understand these issues are explained by directly connecting the equations with their use in efforts to conserve animal populations. Included in the text are explicit learning goals for each chapter, in-depth case studies, and step-by-step exercises demonstrating how to perform calculations and simulations in Excel, and online supplementary materials. Vucetich also gives substantive attention to the growing call for integrative learning by connecting population science to the ethical considerations that guide its application. Introduction to Population Ecology is an accessible and up-to-date textbook covering all aspects of population ecology. Discusses field and laboratory data to illustrate the fundamental laws of population ecology. Provides an overview of how population theory has developed. Explores single-species population growth and self-limitation; metapopulations; and a broad range of interspecific interactions including parasite-host, predator-prey, and plant-herbivore. Keeps the mathematics as simple as possible, using a careful step-by-step approach and including graphs and other visual aids to help understanding. Artwork from the book is available to instructors online at www.blackwellpublishing.com/rockwood and by request on CD-ROM. Professor L. Scott Mills has been named a 2009 Guggenheim Fellowby the board of trustees of the John Simon Guggenheim MemorialFoundation. Conservation of Wildlife Populations provides anaccessible introduction to the most relevant concepts andprinciples for solving real-world management problems in wildlifeand conservation biology. Bringing together insights fromtraditionally disparate disciplines, the book shows how populationbiology addresses important questions involving the harvest,monitoring, and conservation of wildlife populations. Covers the most up-to-date approaches for assessing factorsthat affect both population growth and interactions with otherspecies, including predation, genetic changes, harvest, introducedspecies, viability analysis and habitat loss andfragmentation. Is an essential guide for undergraduates and postgraduatestudents of wildlife biology, conservation biology, ecology, andenvironmental studies and an invaluable resource for practisingmanagers on how population biology can be applied to wildlifeconservation and management. Artwork from the book is available to instructors online at ahref="http://www.blackwellpublishing.com/mills"www.blackwellpublishing.com/mills/a.An Instructor manual CD-ROM for this title is available. Pleasecontact our Higher Education team at ahref="mailto:HigherEducation@wiley.com"HigherEducation@wiley.com/afor more information. Extraordinary in the diversity of their lifestyles, insect parasitoids have become extremely important study organisms in the field of population biology, and they are the most frequently used agents in the biological control of insect pests. This book presents the ideas of seventeen international specialists, providing the reader not only with an overview but also with lively discussions of the most salient questions pertaining to the field today and prescriptions for avenues of future research. After a general introduction, the book divides into three main sections: population dynamics, population diversity, and population applications. The first section covers gaps in our knowledge in parasitoid behavior,

parasitoid persistence, and how space and landscape affect dynamics. The contributions on population diversity consider how evolution has molded parasitoid populations and communities. The final section calls for novel approaches toward resolving the enigma of success in biological control and questions why parasitoids have been largely neglected in conservation biology. Parasitoid Population Biology will likely be an important influence on research well into the twenty-first century and will provoke discussion amongst parasitoid biologists and population biologists. In addition to the editors, the contributors are Carlos Bernstein, Jacques Brodeur, Jerome Casas, H.C.J. Godfray, Susan Harrison, Alan Hastings, Bradford A. Hawkins, George E. Heimpel, Marcel Holyoak, Nick Mills, Bernard D. Roitberg, Jens Roland, Michael R. Strand, Teja Tscharntke, and Minus van Baalen. Despite various studies carried out by scientific centres for population biology research in the USSR, many findings remain unknown to Western scientists. This collection of reviews on population biology in the USSR, attempts to remedy the situation. The areas covered include surveys of animal population biology studies - population genetics, population ecology and ecophysiology, population ethology, population cytogenetics, and population radioecology. Also explored are the population biology of amphibians and invertebrates, the population biology of the lower taxa - plants, protists, and microorganisms, and some general problems of population biology. Integrated Population Biology and Modeling: Part A offers very complex and precise realities of quantifying modern and traditional methods of understanding populations and population dynamics. Chapters cover emerging topics of note, including Longevity dynamics, Modeling human-environment interactions, Survival Probabilities from 5-Year Cumulative Life Table Survival Ratios (Tx+5/Tx): Some Innovative Methodological Investigations, Cell migration Models, Evolutionary Dynamics of Cancer Cells, an Integrated approach for modeling of coastal lagoons: A case for Chilka Lake, India, Population and metapopulation dynamics, Mortality analysis: measures and models, Stationary Population Models, Are there biological and social limits to human longevity?, Probability models in biology, Stochastic Models in Population Biology, and more. Covers emerging topics of note in the subject matter Presents chapters on Longevity dynamics, Modeling human-environment interactions, Survival Probabilities from 5-Year Cumulative Life Table Survival Ratios (Tx+5/Tx), and more Population biology has been investigated quantitatively for many decades, resulting in a rich body of scientific literature. Ecologists often avoid this literature, put off by its apparently formidable mathematics. This textbook provides an introduction to the biology and ecology of populations by emphasizing the roles of simple mathematical models in explaining the growth and behavior of populations. The author only assumes acquaintance with elementary calculus, and provides tutorial explanations where needed to develop mathematical concepts. Examples, problems, extensive marginal notes and numerous graphs enhance the book's value to students in classes ranging from population biology and population ecology to mathematical biology and mathematical ecology. The book will also be useful as a supplement to introductory courses in ecology. A famous ecologist and a philosopher of science team up to offer a fresh new approach to population biology and ecology. Challenging the traditionally accepted Lotka-Volterra model, which is based on predator-prey interactions, this new model emphasizes maternal effects, specifically the significance of a mother's interest in the success of her female offspring. Population Genetics and Microevolutionary Theory Explore the fundamentals of the biological implications of population genetic theory In the newly revised Second Edition of Population Genetics and Microevolutionary Theory, accomplished researcher and author Alan R. Templeton delivers a fulsome discussion of population genetics with coverage of exciting new developments in the field, including new discoveries in epigenetics and genome-wide studies. The book prepares students to successfully apply population genetics analytical tools by providing a solid foundation in microevolutionary theory. The

book emphasizes that population structure forms the underlying template upon which quantitative genetics and natural selection operate and is a must-read for future population and evolutionary geneticists and those who wish to work in genetic epidemiology or conservation biology. You'll learn about a wide array of topics, including quantitative genetics, the interactions of natural selection with other evolutionary forces, and selection in heterogeneous environments and age-structured populations. Appendices that cover genetic survey techniques and probability and statistics conclude the book. Readers will also benefit from the inclusion of: A thorough introduction to population genetics, including the scope of the subject, its premises, and the Hardy-Weinberg Model of Microevolution An exploration of systems of mating, including a treatment of the use of runs of homozygosity to show pedigree inbreeding in distant ancestors A practical discussion of genetic drift, including the use of effective sizes in conservation biology (with a discussion of African rhinos as an example) A concise examination of coalescence, including a treatment of the infinite sites model Perfect for graduate students in genetics and evolutionary biology programs and advanced undergraduate biology majors, Population Genetics and Microevolutionary Theory will also earn a place in the libraries of students taking courses in conservation biology, human genetics, bioinformatics, and genomics. Updated to include two new chapters, a modified Part II structure, more recent empirical examples, and online spreadsheet simulations. Management and Analysis of Biological Populations ... This book is a "How To" guide for modeling population dynamics using Integral Projection Models (IPM) starting from observational data. It is written by a leading research team in this area and includes code in the R language (in the text and online) to carry out all computations. The intended audience are ecologists, evolutionary biologists, and mathematical biologists interested in developing data-driven models for animal and plant populations. IPMs may seem hard as they involve integrals. The aim of this book is to demystify IPMs, so they become the model of choice for populations structured by size or other continuously varying traits. The book uses real examples of increasing complexity to show how the life-cycle of the study organism naturally leads to the appropriate statistical analysis, which leads directly to the IPM itself. A wide range of model types and analyses are presented, including model construction, computational methods, and the underlying theory, with the more technical material in Boxes and Appendices. Self-contained R code which replicates all of the figures and calculations within the text is available to readers on GitHub. Stephen P. Ellner is Horace White Professor of Ecology and Evolutionary Biology at Cornell University, USA; Dylan Z. Childs is Lecturer and NERC Postdoctoral Fellow in the Department of Animal and Plant Sciences at The University of Sheffield, UK; Mark Rees is Professor in the Department of Animal and Plant Sciences at The University of Sheffield, UK. Population biology has been investigated quantitatively for many decades, resulting in a rich body of scientific literature. Ecologists often avoid this literature, being put off by its apparently formidable mathematics. This textbook provides an introduction to the biology and ecology of populations by emphasizing the roles of simple mathematical models in explaining the growth and behavior of populations. The author only assumes acquaintance with elementary calculus, and provides tutorial explanations where needed to develop mathematical concepts. Examples, problems, extensive marginal notes and numerous graphs enhance the book's value to students in classes ranging from population biology and population ecology to introductory courses in ecology. Publisher Description This eBook presents all 10 articles published under the Frontiers Research Topic "Evolutionary Feedbacks Between Population Biology and Genome Architecture", edited by Scott V. Edwards and Tariq Ezaz. With the rise of rapid genome sequencing across the Tree of Life, challenges arise in understanding the major evolutionary forces influencing the structure of microbial and eukaryotic genomes, in particular the prevalence of natural selection versus genetic drift in shaping those genomes. Additional complexities in understanding

genome architecture arise with the increasing incidence of interspecific hybridization as a force for shaping genotypes and phenotypes. A key paradigm shift facilitating a more nuanced interpretation of genomes came with the rise of the nearly neutral theory in the 1970s, followed by a greater appreciation for the contribution of nonadaptive forces such as genetic drift to genome structure in the 1990s and 2000s. The articles published in this eBook grapple with these issues and provide an update as to the ways in which modern population genetics and genome informatics deepen our understanding of the subtle interplay between these myriad forces. From intraspecific to macroevolutionary studies, population biology and population genetics are now major tools for understanding the broad landscape of how genomes evolve across the Tree of Life. This volume is a celebration across diverse taxa of the contributions of population genetics thinking to genome studies. We hope it spurs additional research and clarity in the ongoing search for rules governing the evolution of genomes. Many of the world's leading conservation and population biologists evaluate what has become a key tool in estimating extinction risk and evaluating potential recovery strategies - population viability analysis, or PVA. This text, which has been adopted as an Open University course textbook, examines the ecological processes that determine the size and structure of a population, and demonstrates that there are many fundamental principles that apply to populations of both animals and plants. A synthesis of contemporary analytical and modeling approaches in population ecology The book provides an overview of the key analytical approaches that are currently used in demographic, genetic, and spatial analyses in population ecology. The chapters present current problems, introduce advances in analytical methods and models, and demonstrate the applications of quantitative methods to ecological data. The book covers new tools for designing robust field studies; estimation of abundance and demographic rates; matrix population models and analyses of population dynamics; and current approaches for genetic and spatial analysis. Each chapter is illustrated by empirical examples based on real datasets, with a companion website that offers online exercises and examples of computer code in the R statistical software platform. Fills a niche for a book that emphasizes applied aspects of population analysis Covers many of the current methods being used to analyse population dynamics and structure Illustrates the application of specific analytical methods through worked examples based on real datasets Offers readers the opportunity to work through examples or adapt the routines to their own datasets using computer code in the R statistical platform Population Ecology in Practice is an excellent book for upper-level undergraduate and graduate students taking courses in population ecology or ecological statistics, as well as established researchers needing a desktop reference for contemporary methods used to develop robust population assessments. Ecology, Genetics and Evolution of Metapopulations is acollection of specially commissioned articles that looks at fragmented habitats, bringing together recent theoretical advances and empirical studies applying the metapopulation approach. Several chapters closely integrate ecology with genetics and evolutionary biology, and others illustrate how metapopulation concepts and models can be applied to answer questions about conservation, epidemiology, and speciation. The extensive coverage of theory from highly regarded scientists and the many substantive applications in this one-of-a-kind work make it invaluable to graduate students and researchers in a wide range of disciplines. Provides a comprehensive and authoritative account of all aspects of metapopulation biology, integrating ecology, genetics, and evolution Developed by recognized experts, including Hanski who won the Balzan Prize for Ecological Sciences Covers novel applications of the metapopulation approach to conservation The essential introduction to population ecology—now expanded and fully updated Ecology is capturing the popular imagination like never before, with issues such as climate change, species extinctions, and habitat destruction becoming ever more prominent. At the same time, the science of ecology has advanced dramatically, growing in mathematical and theoretical sophistication.

Here, two leading experts present the fundamental quantitative principles of ecology in an accessible yet rigorous way, introducing students to the most basic of all ecological subjects, the structure and dynamics of populations. John Vandermeer and Deborah Goldberg show that populations are more than simply collections of individuals. Complex variables such as distribution and territory for expanding groups come into play when mathematical models are applied. Vandermeer and Goldberg build these models from the ground up, from first principles, using a broad range of empirical examples, from animals and viruses to plants and humans. They address a host of exciting topics along the way, including age-structured populations, spatially distributed populations, and metapopulations. This second edition of Population Ecology is fully updated and expanded, with additional exercises in virtually every chapter, making it the most up-to-date and comprehensive textbook of its kind. Provides an accessible mathematical foundation for the latest advances in ecology Features numerous exercises and examples throughout Introduces students to the key literature in the field The essential textbook for advanced undergraduates and graduate students An online illustration package is available to professors The only book available in the area of forward-time population genetics simulations—applicable to both biomedical and evolutionary studies The rapid increase of the power of personal computers has led to the use of serious forward-time simulation programs in genetic studies. Forward-Time Population Genetics Simulations presents both new and commonly used methods, and introduces simuPOP, a powerful and flexible new program that can be used to simulate arbitrary evolutionary processes with unique features like customized chromosome types, arbitrary nonrandom mating schemes, virtual subpopulations, information fields, and Python operators. The book begins with an overview of important concepts and models, then goes on to show how simuPOP can simulate a number of standard population genetics models—with the goal of demonstrating the impact of genetic factors such as mutation, selection, and recombination on standard Wright-Fisher models. The rest of the book is devoted to applications of forward-time simulations in various research topics. Forward-Time Population Genetics Simulations includes: An overview of currently available forward-time simulation methods, their advantages, and shortcomings An overview and evaluation of currently available software A simuPOP tutorial Applications in population genetics Applications in genetic epidemiology, statistical genetics, and mapping complex human diseases The only book of its kind in the field today, Forward-Time Population Genetics Simulations will appeal to researchers and students of population and statistical genetics. Worldwide, Population Ecology is the leading textbook on this titled subject. Written primarily for students, it describes the present state of population ecology in terms that can be readily understood by undergraduates with little or no background in the subject. Carefully chosen experimental examples illustrate each topic, and studies of plants and animals are combined to show how fundamental principles can be derived that apply to both species. Use of complex mathematics ia avoided throughout the book, and what math is necessary is dealt with by examination of real experimental data rather than dull theory. The latest edition of this leading textbook. Adopted as an Open University set text. After the chicken, the House Sparrow is the most widely distributed bird species in the world, occurring on all continents except Antarctica and on most human-inhabited islands. Although its Latin name is Passer domesticus, it is certainly not domesticated. In fact, it is widely regarded as a pest species and is consequently not protected in most of its extensive range. This combination of ubiquity and minimal legal protection has contributed to its wide use in studies by avian biologists throughout the world. The purpose of this book is to review and summarize the results of these global studies on House Sparrows, and to provide a springboard for future studies on the species. House Sparrows have been used to study natural selection in introduced species, circadian rhythms, and the neuroendocrine control of the avian annual cycle. One current question of considerable

interest concerns the catastrophic House Sparrow population declines in several urban centers in Europe. Is the House Sparrow a contemporary canary in the mine? Other topics of broad interest include the reproductive and flock-foraging strategies of sparrows, and sexual selection and the function of the male badge in the species. Anderson also explores the role of the House Sparrow in disease transmission to humans and their domesticated animals. How do plant and animal populations change genetically to evolve and adapt to their local environments? How do populations grow and interact with one another through competition and predation? How does behaviour influence ecology and evolution? This second edition of Dick Neal's unique textbook on population biology addresses these questions and offers a comprehensive analysis of evolutionary theory in the areas of ecology, population genetics, and behaviour. Taking a quantitative and Darwinian perspective, Neal uses mathematical models to develop the basic theory of population processes. Key features in this edition include new chapters on inbreeding and species interactions and community structure, a modified structure in Part II, more recent empirical examples to illustrate the application of theoretical models to the world around us, and end-of-chapter problems to help students with self-assessment. A series of spreadsheet simulations have also been conveniently located online, for students to further improve their understanding of such models. This 2004 collection of essays deals with the foundation and historical development of population biology and its relationship to population genetics and population ecology on the one hand and to the rapidly growing fields of molecular quantitative genetics, genomics and bioinformatics on the other. Such an interdisciplinary treatment of population biology has never been attempted before. The volume is set in a historical context, but it has an up-to-date coverage of material in various related fields. The areas covered are the foundation of population biology, life history evolution and demography, density and frequency dependent selection, recent advances in quantitative genetics and bioinformatics, evolutionary case history of model organisms focusing on polymorphisms and selection, mating system evolution and evolution in the hybrid zones, and applied population biology including conservation, infectious diseases and human diversity. This is the third of three volumes published in honour of Richard Lewontin.

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