Real World Biology Analysis Population Research

This is an up-to-date and comprehensive look at the increasingly important subject of population management and conservation. Drawing on case studies of previous extinctions and near-extinctions, the authors discuss current theories for why species are driven into decline and how these declines can be reversed. Set in a real-world context of economics, legislation and treaties, this book is very much a practical guide for conservation action. An eminently practical book discussing the theory and practice of conservation as it is in the real world rather than in an imaginary ideal scenario. A synthesis of the very important contribution Graeme Caughley made to the science of conservation biology.

Population ecology has matured to a sophisticated science with astonishing potential for contributing solutions to wildlife conservation and management challenges. And yet, much of the applied power of wildlife population ecology remains untapped because its broad sweep across disparate subfields has been isolated in specialized texts. In this book, L. Scott Mills covers the full spectrum of applied wildlife population ecology, including genomic tools for non-invasive genetic sampling, predation, population projections, climate change and invasive species, harvest modeling, viability analysis, focal species concepts, and analyses of

connectivity in fragmented landscapes. With a readable style, analytical rigor, and hundreds of examples drawn from around the world, Conservation of Wildlife Populations (2nd ed) provides the conceptual basis for applying population ecology to wildlife conservation decision-making. Although targeting primarily undergraduates and beginning graduate students with some basic training in basic ecology and statistics (in majors that could include wildlife biology, conservation biology, ecology, environmental studies, and biology), the book will also be useful for practitioners in the field who want to find - in one place and with plenty of applied examples - the latest advances in the genetic and demographic aspects of population ecology. Additional resources for this book can be found at: www.wiley.com/go/mills/wildlifepopulations.

This open access book examines the methodological complications of using complexity science concepts within the social science domain. The opening chapters take the reader on a tour through the development of simulation methodologies in the fields of artificial life and population biology, then demonstrates the growing popularity and relevance of these methods in the social sciences. Following an in-depth analysis of the potential impact of these methods on social science and social theory, the text provides substantive examples of the application of agent-based models in the field of demography. This work offers a unique combination of applied simulation work and substantive, in-depth philosophical analysis, and as such

has potential appeal for specialist social scientists, complex systems scientists, and philosophers of science interested in the methodology of simulation and the practice of interdisciplinary computing research.?

The major subdisciplines of ecology--population ecology, community ecology, ecosystem ecology, and evolutionary ecology--have diverged increasingly in recent decades. What is critically needed today is an integrated, real-world approach to ecology that reflects the interdependency of biodiversity and ecosystem functioning. From Populations to Ecosystems proposes an innovative theoretical synthesis that will enable us to advance our fundamental understanding of ecological systems and help us to respond to today's emerging global ecological crisis. Michel Loreau begins by explaining how the principles of population dynamics and ecosystem functioning can be merged. He then addresses key issues in the study of biodiversity and ecosystems, such as functional complementarity, food webs, stability and complexity, material cycling, and metacommunities. Loreau describes the most recent theoretical advances that link the properties of individual populations to the aggregate properties of communities, and the properties of functional groups or trophic levels to the functioning of whole ecosystems, placing special emphasis on the relationship between biodiversity and ecosystem functioning. Finally, he turns his attention to the controversial issue of the evolution of entire ecosystems and their properties, laying the theoretical foundations for

a genuine evolutionary ecosystem ecology. From Populations to Ecosystems points the way to a much-needed synthesis in ecology, one that offers a fuller understanding of ecosystem processes in the natural world.

Explorations of Mathematical Models in Biology with MATLAB

Ecology of Shallow Lakes

Habitat Conservation Under The Endangered Species Act

Population Viability Analysis

Spatial Dynamics and Pattern Formation in Biological Populations

Demography Genetics and Management with Wildlife Ecology Set

Comprised of essays by top scholars in the field, this volume offers detailed overviews of philosophical issues raised by biology. Brings together a team of eminent scholars to explore the philosophical issues raised by biology Addresses traditional and emerging topics, spanning molecular biology and genetics, evolution, developmental biology, immunology, ecology, mind and behaviour, neuroscience, and experimentation Begins with a thorough introduction to the field Goes beyond previous treatments that focused only on evolution to give equal attention to other areas, such as molecular and developmental biology Represents both an authoritative guide to philosophy of biology, and an accessible reference work for anyone seeking to learn about this rapidly-changing field

This textbook, now in its fourth edition, offers a rigorous

and self-contained introduction to the theory of continuous-time stochastic processes, stochastic integrals, and stochastic differential equations. Expertly balancing theory and applications, it features concrete examples of modeling real-world problems from biology, medicine, finance, and insurance using stochastic methods. No previous knowledge of stochastic processes is required. Unlike other books on stochastic methods that specialize in a specific field of applications, this volume examines the ways in which similar stochastic methods can be applied across different fields. Beginning with the fundamentals of probability, the authors go on to introduce the theory of stochastic processes, the Itô Integral, and stochastic differential equations. The following chapters then explore stability, stationarity, and ergodicity. The second half of the book is dedicated to applications to a variety of fields, including finance, biology, and medicine. Some highlights of this fourth edition include a more rigorous introduction to Gaussian white noise, additional material on the stability of stochastic semigroups used in models of population dynamics and epidemic systems, and the expansion of methods of analysis of one-dimensional stochastic differential equations. An Introduction to Continuous-Time Stochastic Processes, Fourth Edition is intended for graduate students taking an introductory course on stochastic processes, applied probability, stochastic calculus, mathematical finance, or mathematical biology. Prerequisites include knowledge of calculus and some analysis; exposure to probability would be helpful but not required since the necessary

fundamentals of measure and integration are provided. Researchers and practitioners in mathematical finance, biomathematics, biotechnology, and engineering will also find this volume to be of interest, particularly the applications explored in the second half of the book.
Conservation BiologyFor the Coming DecadeSpringer Science & Business Media
The goal of this book is to provide practical, intelligible, and intuitive explanations of population modelling to empirical ecologists and conservation biologists. Modelling methods that do not require large amounts of data (typically unavailable for endangered species) are emphasised. As such, the book is appropriate for undergraduate and graduate students interested in quantitative conservation biology, managers charged with preserving endangered species, and, in short, for any conservation biologist or ecologist seeking to better understand the analysis and modelling of population data.
With Applications in the Biological and Life Sciences

Models, Methods, and Matlab ® Set
Population Biology of Plants
With Applications for the Social Sciences
Wildlife Biology
Environmental statistics is a rapidly growing field, supported by advances in digital computing power, automated data collection systems, and interactive, linkable Internet software. Concerns over public and ecological health and the continuing need to support environmental policy-making and regulation have

driven a concurrent explosion in environmental data analysis. This textbook is designed to address the need for trained professionals in this area. The book is based on a course which the authors have taught for many years, and prepares students for careers in environmental analysis centered on statistics and allied quantitative methods of data evaluation. The text extends beyond the introductory level, allowing students and environmental science practitioners to develop the expertise to design and perform sophisticated environmental data analyses. In particular, it: Provides a coherent introduction to intermediate and advanced methods for modeling and analyzing environmental data. Takes a data-oriented approach to describing the various methods. Illustrates the methods with real-world examples Features extensive exercises, enabling use as a course text. Includes examples of SAS computer code for implementation of the statistical methods. Connects to a Web site featuring solutions to exercises, extra computer code, and additional material. Serves as an overview of methods for analyzing environmental data, enabling use as a reference text for environmental science professionals. Graduate students of statistics studying environmental data analysis will find this invaluable as will practicing data analysts and environmental scientists including specialists in atmospheric science, biology and biomedicine, chemistry, ecology, environmental health, geography, and geology.

In the new edition of this highly successful book, Malcolm Hunter and new co-author James Gibbs offer a thorough introduction to the fascinating and important field of conservation biology, focusing on what can be done to maintain biodiversity through management of ecosystems and populations. Starting with a succinct look at conservation and biodiversity, this book progresses to contend with some of the subject's most complex topics, such as mass extinctions, ecosystem degradation, and over exploitation. Discusses social, political, and economic aspects of conservation biology. Thoroughly revised with over six hundred new references and web links to many of the organizations involved in conservation biology, striking photographs and maps. Artwork from the book is available to instructors online at www.blackwellpublishing.com/hunter and by request on CD-ROM.

This set of exercises has been created expressly for students and teachers of conservation biology and wildlife management who want to have an impact beyond the classroom. The book presents a set of 32 exercises that are primarily new and greatly revised versions from the book's successful first edition. These exercises span a wide range of conservation issues: genetic analysis, population biology and management, taxonomy, ecosystem management, land use planning, the public policy process and more. All exercises discuss how to take what has been learned and apply it to practical, real-world

issues. Accompanied by a detailed instructor's manual and a student website with software and support materials, the book is ideal for use in the field, lab, or classroom. Also available: Fundamentals of Conservation Biology, 3rd edition (2007) by Malcolm L Hunter Jr and James Gibbs, ISBN 9781405135450 Saving the Earth as a Career: Advice on Becoming a Conservation Professional (2007) by Malcolm L Hunter Jr, David B Lindenmayer and Aram JK Calhoun, ISBN 9781405167611

The book provides an introduction to deterministic (and some stochastic) modeling of spatiotemporal phenomena in ecology, epidemiology, and neural systems. A survey of the classical models in the fields with up to date applications is given. The book begins with detailed description of how spatial dynamics/diffusive processes influence the dynamics of biological populations. These processes play a key role in understanding the outbreak and spread of pandemics which help us in designing the control strategies from the public health perspective. A brief discussion on the functional mechanism of the brain (single neuron models and network level) with classical models of neuronal dynamics in space and time is given. Relevant phenomena and existing modeling approaches in ecology, epidemiology and neuroscience are introduced, which provide examples of pattern formation in these models. The analysis of patterns enables us to study the dynamics of macroscopic and microscopic

behaviour of underlying systems and travelling wave type patterns observed in dispersive systems. Moving on to virus dynamics, authors present a detailed analysis of different types models of infectious diseases including two models for influenza, five models for Ebola virus and seven models for Zika virus with diffusion and time delay. A Chapter is devoted for the study of Brain Dynamics (Neural systems in space and time). Significant advances made in modeling the reaction-diffusion systems are presented and spatiotemporal patterning in the systems is reviewed. Development of appropriate mathematical models and detailed analysis (such as linear stability, weakly nonlinear analysis, bifurcation analysis, control theory, numerical simulation) are presented. Key Features Covers the fundamental concepts and mathematical skills required to analyse reaction-diffusion models for biological populations. Concepts are introduced in such a way that readers with a basic knowledge of differential equations and numerical methods can understand the analysis. The results are also illustrated with figures. Focuses on mathematical modeling and numerical simulations using basic conceptual and classic models of population dynamics, Virus and Brain dynamics. Covers wide range of models using spatial and non-spatial approaches. Covers single, two and multispecies reaction-diffusion models from ecology and models from bio-chemistry. Models are analysed for stability of equilibrium points, Turing instability, Hopf

bifurcation and pattern formations. Uses Mathematica for problem solving and MATLAB for pattern formations. Contains solved Examples and Problems in Exercises. The Book is suitable for advanced undergraduate, graduate and research students. For those who are working in the above areas, it provides information from most of the recent works. The text presents all the fundamental concepts and mathematical skills needed to build models and perform analyses.

The Population Bomb

A Companion to the Philosophy of Biology

Theory, Models, and Applications to Finance, Biology, and Medicine

The Biostatistics of Aging

Time Delayed Models in Population Biology and Epidemiology

The Ecology of the Ancient Greek World

The faunistic richness of insects in the tropics: a bief overview; Individual and population responses to environments; Machinery of environmental response mechanisms in insects: key to evolutionary and ecological diversification; Ecological aspects of plant defenses against insects; Distribuion paterns of insects in tropical habitants; Population responses to the environment in tropical insects; Effects of seasonality in insect populations in the tropics; Dynamics of organization of insect communities in tropical ecosystems; Insect species in agricultural habitats in the tropics; Biogeographycal and regional evolutionary-ecological effects on the maintenance of tropical insect faunas: a brief perspective.

A practical and clarifying approach to aging and aging-related diseases Providing a thorough and extensive theoretical framework, The Biostatistics of Aging: From Gompertzian Mortality to an Index of Aging-Relatedness addresses the surprisingly subtlenotion—with consequential biomedical and public health relevance—of what it means for acondition to be related to aging. In this pursuit, the book presents a new quantitative methodto examine the relative contributions of genetic and environmental factors to mortality anddisease incidence in a population. With input from evolutionary biology, population genetics, demography, and epidemiology, this medically motivated book describes an index of aging-relatedness and also features: Original results on the asymptotic behavior of the minimum of time-to-event random variables, which extends those of the classical statistical theory of extreme values A comprehensive and satisfactory explanation based on biological principles of the Gompertz pattern of mortality in human populations The development of an evolution-based model of causation relevant to mortality and aging-related diseases of complex etiology An explanation of how and why the description of human mortality by the Gompertz distribution can be improved upon from first principles The amply illustrated analysis of real-world data, including a program for conducting the analysis written in the freely available R statistical software Technical appendices including mathematical material as well as an extensive and multidisciplinary bibliography on aging and aging-related diseases The Biostatistics of Aging: From Gompertzian Mortality to

an Index of Aging-Relatedness is an excellent resource for practitioners and researchers with an interest in aging and aging-related diseases from the fields of medicine, biology, gerontology, biostatistics, epidemiology, demography, and public health.

This is an introduction to the concepts and principles for solving management problems in wildlife and conservation biology. The book shows how population biology addresses questions involving the harvest, monitoring, and conservation of wildlife populations.

Bringing Biology to Lifeis a guided tour of the philosophy of biology, canvassing three broad areas: the early history of biology, from Aristotle to Darwin; traditional debates regarding species, function, and units of selection; and recent efforts to better understand the human condition in light of evolutionary biology. Topics are addressed using no more technical jargon than necessary, and without presupposing any advanced knowledge of biology or the philosophy of science on the part of the reader. Discussion questions are also provided to encourage reader reflection.

Orangutans

Real-World Evidence in Drug Development and Evaluation

From Gompertzian Mortality to an Index of Aging-Relatedness

An Introduction to the Philosophy of Biology

Integrodifference Equations in Spatial Ecology

Theoretical Foundations for a New Ecological Synthesis (MPB-46)

This book presents a theoretical framework for

understanding the dynamics of shallow lake communities as it has evolved over the past years from a combination of empirical studies, experimental work and model analysis. Although, as in most theoretical work, mathematical formulations play a role, the models that are used remain simple and most analyses are graphical rather than algebraic. The book will therefore appeal to workers who do not usually dig deep into theoretical ecology such as lake managers, field biologists and experimentalists. Students of theoretical ecology will also gain from the many real-world applications of topics such as predation and competition theory, bifurcation analysis and catastrophe theory.

Analysis and Management of Animal Populations deals with the processes involved in making informed decisions about the management of animal populations. It covers the modeling of population responses to management actions, the estimation of quantities needed in the modeling effort, and the application of these estimates and models to the development of sound management decisions. The book synthesizes and integrates in a single volume the methods associated with these themes, as they apply to ecological assessment and conservation of animal populations. Integrates population modeling, parameter estimation and decision-theoretic approaches to management in a single, cohesive framework Provides authoritative, state-of-the-art descriptions of quantitative approaches to modeling, estimation and decision-making Emphasizes the role of mathematical modeling in the conduct of science and

management Utilizes a unifying biological context, consistent mathematical notation, and numerous biological examples

Population Biology of Plants defines a science of population biology for plants and other fixed organisms. The author describes the processes that determine the number of plants (and the number of plant parts), examines the separate stages in a general model of population behavior, the ways in which individual plants interfere with each others growth and risk of death and aspects of the behavior of animals that influence or determine the size of plant populations.

This book provides a review of methods for obtaining and analysing data from stage-structured biological populations. The topics covered are sam pling designs (Chapter 2), the estimation of parameters by maximum likelihood (Chapter 3), the analysis of sample counts of the numbers cif individuals in different stages at different times (Chapters 4 and 5), the analysis of data using Leslie matrix types of model (Chapter 6) and key factor analysis (Chapter 7). There is also some discussion of the approaches to modelling and estimation that have been used in five studies of particular populations (Chapter 8). There is a large literature on the modelling of biological populations, and a multitude of different approaches have been used in this area. The various approaches can be classified in different ways (Southwood, 1978, ch. 12), but for the purposes of this book it is convenient to think of the three categories mathematical, statistical and

predictive modelling. Mathematical modelling is concerned largely with developing models that capture the most important qualitative features of population dynamics. In this case, the models that are developed do not have to be compared with data from natural populations. As representations of idealized systems, they can be quite informative in showing the effects of changing parameters, indicating what factors are most important in promoting stability, and so on.

Stage-Structured Populations

Problem-Solving in Conservation Biology and Wildlife Management

Conservation Biology in Theory and Practice

Conservation of Wildlife Populations

An Introduction to Continuous-Time Stochastic Processes

The Science of Conservation Planning

The book contains a selection of articles on special research topics on Mathematical Biology and the interdisciplinary fields of mathematical modelling of biosystems. The treatment is both pedagogical and advanced to enhance future scientific research. We include comprehensive reviews written by prominent leaders of scientific research groups, new results on Population Dynamics such as Hybrid Discrete-Continuous Models of Cell Populations and the Hopf bifurcation on Predator-Prey Models, and some state of the art research on Medical Physics such as Optimization

Methods applied to Raman Spectroscopy. Other topics covered focus on evolution biology, infectious diseases, DNA structure and many more.

What good are wild animals?; Wildlife values; Wildlife as a natural resource; The status of wildlife conservation; The ten-thousand year war; Everything tied together; Functioning of ecosystems; Ecosystem development; Change and degradation; Distribution of biotic communities; Ecologic niches; A place to live; Enough to eat; Cover; Water; Quantity versus interspresion; Limiting factors; Introducing wildlife populations; Density and biomass; Population structure; Natality; Mortality; Interaction of population; Characteristics; Turnover; Productivity; Territory and travels; Movements internal to the population area; Movements external to the population; Group size and spacing; Territory; Significance of spacing and movements; Too many mice, too few elephants; New populations in new habitats; Some real life problems; The annual cycle of populations; Shootable surplus; Stocking of game; Stability of populations; Evolutionary strategies; Levelling off; The many meanings of carrying capacity; Declining diversity; Species extinction

and area size; Destruction of habitat; Nature reserves; Animal trade; International assistance; The controllers.
In The Science of Conservation Planning, three of the nation's leading conservation biologists explore the role of the scientist in the planning process and present a framework and guidelines for applying science to regional habitat-based conservation planning. Chapters consider history and background of conservation planning efforts, criticisms of science in conservation planning, principles of conservation biology that apply to conservation planning, detailed examination of conservation plans, and specific recommendations for all parties involved. The Science of Conservation Planning will serve as a model for the application of conservation biology to real-life problems, and can lead to the development of scientifically and politically sound plans that are likely to achieve their conservation goals, even in cases where biological and ecological information is limited.
Provides an excellent introductory text for students on the principles and methods of statistical analysis in the life sciences, helping them choose and analyse statistical tests for their own problems

and present their findings. An understanding of statistical principles and methods is essential for any scientist but is particularly important for those in the life sciences. The field biologist faces very particular problems and challenges with statistics as "real-life" situations such as collecting insects with a sweep net or counting seagulls on a cliff face can hardly be expected to be as reliable or controllable as a laboratory-based experiment. Acknowledging the peculiarites of field-based data and its interpretation, this book provides a superb introduction to statistical analysis helping students relate to their particular and often diverse data with confidence and ease. To enhance the usefulness of this book, the new edition incorporates the more advanced method of multivariate analysis, introducing the nature of multivariate problems and describing the the techniques of principal components analysis, cluster analysis and discriminant analysis which are all applied to biological examples. An appendix detailing the statistical computing packages available has also been included. It will be extremely useful to undergraduates studying ecology, biology, and earth and environmental sciences and

of interest to postgraduates who are not familiar with the application of multiavirate techniques and practising field biologists working in these areas.
Theory and Practice of Population Viability Analysis
Demography, Genetics, and Management
From Populations to Ecosystems
Methodological Investigations in Agent-Based Modelling
Population Biology of Tropical Insects
Quantitative Conservation Biology

In this dissertation, we focus on the development and analysis of time-delayed mathematical models to represent real world applications in biology and epidemiology, especially, population growth and disease spread. Throughout five projects, we establish then analyze the models using various theorems and methods in the literature, such as, the comparison principle and the method of fluctuations, to study qualitative features of the models including existence and uniqueness of solutions, boundedness, steady states, persistence, local, and global stability with respect to the adult/basic reproduction number RA/R0, which is a key threshold parameter. Firstly, we discuss ecological models in Chapters 2-4. In Chapter 2, we derive a single species-fish model with three stages: juveniles, small adults and large adults with two harvesting strategies depending on the size and

maturity. We study the population extinction and persistence with respect to RA and find that the over-harvesting of large matured fish after a certain age can lead to population extinction under certain circumstances. Numerically, we investigate the influence of harvesting functions and discuss the optimal harvesting rates. In Chapter 3, we develop a model for the growth of sea lice with three stages such that the development age for non-infectious larvae to develop into infectious larvae relates to the size of adult population size. As a beginning, we describe the nonlinear dynamics by a system of partial differential equations, then, we transformed it into a system of delay differential equation with constant delay by using the method of characteristics and an appropriate change of variables. We address the system threshold dynamics for the established model with respect to the adult reproduction number, including the global stability of the trivial steady state, persistence, and global attractivity of a coexistence unique positive steady state. As a case study, we provide some numerical simulation results using Lepeophtheirus salmonis growth parameters. To explore the biological control of sea lice using one of their predators, "cleaner fish", we propose a model with predator-prey interaction at the adult level of sea lice in Chapter 4. Mathematically, we address threshold dynamics with respect to the adult

reproduction number for sea lice Rs and the net reproductive number of cleaner fish Rf, including the global stability of the trivial steady state when Rs 1, global attractivity of the predator-free equilibrium point when Rs 1 and Rf > 1, persistence and coexistence of a unique positive steady state when Rs > 1 and Rf > 1. Furthermore, we discuss the local stability of the positive equilibrium point and investigate the Hopf bifurcation. Numerically, we compare between two cleaner fish species, goldsinny and ballan wrasse, as a case study. For epidemiological models, in Chapter 5, we propose an SEIRD model for Ebola disease transmission that incorporates both the transmission of infection between the living humans and from the infected corpses to the living individuals, with a constant latent period. Through mathematical analysis, we prove the globally stability of the disease-free and a unique endemic equilibria with respect to R0. Moreover, we find that the long latent period or low transmission rate from infectious corpses may reduce the spread of Ebola. In Chapters 6, we consider the influence of seasonal fluctuations on disease transmission and develop a periodic infectious disease model where asymptomatic carriers are potential sources for disease transmission. We consider a general nonlinear incidence rate function with the asymptomatic carriage and latent periods. We implement a case study regarding the meningococcal meningitis disease

transmission in Dori, Burkina Faso. Our numerical simulation indicates an irregular pattern of epidemics varying size and duration, which is consistent with the reported data in Burkina Faso from 1940 to 2014. In summery, in population growth models, we find that the basic reproduction ration depends on maturation time, indicating that this key parameter can play an important role in population extinction and persistence. In disease transmission model, we understand that latent period can play a positive role in eliminating or slowing a disease spread.

Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and

everyday applications of the concepts at hand.We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

Molecular biologists are performing increasingly large and complicated experiments, but often have little background in data analysis. The book is devoted to teaching the statistical and computational techniques molecular biologists need to analyze their data. It explains the big-picture concepts in data analysis using a wide variety of real-world molecular biological examples such as eQTLs, ortholog identification, motif finding, inference of population structure, protein fold prediction and many more. The book takes a pragmatic approach, focusing on techniques that are based on elegant mathematics yet are the simplest to explain to scientists with little background in computers and statistics.

This book describes one of our closest

relatives, the orangutan, and the only extant great ape in Asia. It is increasingly clear that orangutan populations show extensive variation in behavioural ecology, morphology, life history, and genes. Indeed, on the strength of the latest genetic and morphological evidence, it has been proposed that orangutans actually constitute two species which diverged more than a million years ago - one on the island of Sumatra the other on Borneo, with the latter comprising three subspecies. This book has two main aims. The first is to carefully compare data from every orangutan research site, examining the differences and similarities between orangutan species, subspecies and populations. The second is to develop a theoretical framework in which these differences and similarities can be explained. To achieve these goals the editors have assembled the world's leading orangutan experts to rigorously synthesize and compare the data, quantify the similarities or differences, and seek to explain them. Orangutans is the first synthesis of orangutan biology to adopt this novel, comparative approach. It analyses and compares the latest data, developing a theoretical framework to explain morphological, life history, and behavioural variation. Intriguingly, not all behavioural differences can be attributed to ecological variation between and within the two islands; relative rates of social learning also appear

to have been influential. The book also emphasizes the crucial impact of human settlement on orangutans and looks ahead to the future prospects for the survival of critically endangered natural populations.
Explorations of Mathematical Models in Biology with Maple
Practical Statistics for Field Biology
Biomat 2011 - International Symposium On Mathematical And Computational Biology
Concepts of Biology
Population Regulation
Opportunities in Biology

Provides well-organized coverage of statistical analysis and applications in biology, kinesiology, and physical anthropology with comprehensive insights into the techniques and interpretations of R, SPSS®, Excel®, and Numbers® output An Introduction to Statistical Analysis in Research: With Applications in the Biological and Life Sciences develops a conceptual foundation in statistical analysis while providing readers with opportunities to practice these skills via research-based data sets in biology, kinesiology, and physical anthropology. Readers are provided with a detailed introduction and orientation to statistical analysis as well as practical examples to ensure a

thorough understanding of the concepts and methodology. In addition, the book addresses not just the statistical concepts researchers should be familiar with, but also demonstrates their relevance to real-world research questions and how to perform them using easily available software packages including R, SPSS®, Excel®, and Numbers®. Specific emphasis is on the practical application of statistics in the biological and life sciences, while enhancing reader skills in identifying the research questions and testable hypotheses, determining the appropriate experimental methodology and statistical analyses, processing data, and reporting the research outcomes. In addition, this book: • Aims to develop readers' skills including how to report research outcomes, determine the appropriate experimental methodology and statistical analysis, and identify the needed research questions and testable hypotheses • Includes pedagogical elements throughout that enhance the overall learning experience including case studies and tutorials, all in an effort to gain full comprehension of designing

an experiment, considering biases and uncontrolled variables, analyzing data, and applying the appropriate statistical application with valid justification • Fills the gap between theoretically driven, mathematically heavy texts and introductory, step-by-step type books while preparing readers with the programming skills needed to carry out basic statistical tests, build support figures, and interpret the results • Provides a companion website that features related R, SPSS, Excel, and Numbers data sets, sample PowerPoint® lecture slides, end of the chapter review questions, software video tutorials that highlight basic statistical concepts, and a student workbook and instructor manual An Introduction to Statistical Analysis in Research: With Applications in the Biological and Life Sciences is an ideal textbook for upper-undergraduate and graduate-level courses in research methods, biostatistics, statistics, biology, kinesiology, sports science and medicine, health and physical education, medicine, and nutrition. The book is also appropriate as a reference for researchers and professionals in the

fields of anthropology, sports research, sports science, and physical education. KATHLEEN F. WEAVER, PhD, is Associate Dean of Learning, Innovation, and Teaching and Professor in the Department of Biology at the University of La Verne. The author of numerous journal articles, she received her PhD in Ecology and Evolutionary Biology from the University of Colorado. VANESSA C. MORALES, BS, is Assistant Director of the Academic Success Center at the University of La Verne. SARAH L. DUNN, PhD, is Associate Professor in the Department of Kinesiology at the University of La Verne and is Director of Research and Sponsored Programs. She has authored numerous journal articles and received her PhD in Health and Exercise Science from the University of New South Wales. KANYA GODDE, PhD, is Assistant Professor in the Department of Anthropology and is Director/Chair of Institutional Review Board at the University of La Verne. The author of numerous j

Explore and analyze the solutions of mathematical models from diverse disciplines As biology increasingly

depends on data, algorithms, and models, it has become necessary to use a computing language, such as the user-friendly MATLAB, to focus more on building and analyzing models as opposed to configuring tedious calculations. Explorations of Mathematical Models in Biology with MATLAB provides an introduction to model creation using MATLAB, followed by the translation, analysis, interpretation, and observation of the models. With an integrated and interdisciplinary approach that embeds mathematical modeling into biological applications, the book illustrates numerous applications of mathematical techniques within biology, ecology, and environmental sciences. Featuring a quantitative, computational, and mathematical approach, the book includes: Examples of real-world applications, such as population dynamics, genetics, drug administration, interacting species, and the spread of contagious diseases, to showcase the relevancy and wide applicability of abstract mathematical techniques Discussion of various mathematical

concepts, such as Markov chains, matrix algebra, eigenvalues, eigenvectors, first-order linear difference equations, and nonlinear first-order difference equations Coverage of difference equations to model a wide range of real-life discrete time situations in diverse areas as well as discussions on matrices to model linear problems Solutions to selected exercises and additional MATLAB codes Explorations of Mathematical Models in Biology with MATLAB is an ideal textbook for upper-undergraduate courses in mathematical models in biology, theoretical ecology, bioeconomics, forensic science, applied mathematics, and environmental science. The book is also an excellent reference for biologists, ecologists, mathematicians, biomathematicians, and environmental and resource economists. Combining contributions from both the old school and the new breed of conservation biologists, this insightful text focuses primarily on topics that are integral to the daily activities of conservation biologists. Several chapters address ecosystem restoration and biotic invasions as well as the mechanics of

population viability analyses, which are now a routine facet of conservation efforts. A "case history" approach is implemented throughout the book, with the use of practical real-world examples. Biology has entered an era in which interdisciplinary cooperation is at an all-time high, practical applications follow basic discoveries more quickly than ever before, and new technologies--recombinant DNA, scanning tunneling microscopes, and more--are revolutionizing the way science is conducted. The potential for scientific breakthroughs with significant implications for society has never been greater. Opportunities in Biology reports on the state of the new biology, taking a detailed look at the disciplines of biology; examining the advances made in medicine, agriculture, and other fields; and pointing out promising research opportunities. Authored by an expert panel representing a variety of viewpoints, this volume also offers recommendations on how to meet the infrastructure needs--for funding, effective information systems, and other support--of future biology research.

Exploring what has been accomplished and what is on the horizon, Opportunities in Biology is an indispensable resource for students, teachers, and researchers in all subdisciplines of biology as well as for research administrators and those in funding agencies.

Analysis and Management of Animal Populations

Statistical Modeling and Machine Learning for Molecular Biology

An Introduction to Statistical Analysis in Research, Optimized Edition

For the Coming Decade

Geographic Variation in Behavioral Ecology and Conservation

Applied Mathematics for the Analysis of Biomedical Data

Explore and analyze the solutions of mathematical models from diverse disciplines As biology increasingly depends on data, algorithms, and models, it has become necessary to use a computing language, such as the user-friendly MapleTM, to focus more on building and analyzing models as opposed to configuring tedious calculations. Explorations of Mathematical Models in Biology with Maple provides an introduction to model creation using Maple, followed by the translation, analysis, interpretation, and observation of the models. With

an integrated and interdisciplinary approach that embeds mathematical modeling into biological applications, the book illustrates numerous applications of mathematical techniques within biology, ecology, and environmental sciences. Featuring a quantitative, computational, and mathematical approach, the book includes: Examples of real-world applications, such as population dynamics, genetics, drug administration, interacting species, and the spread of contagious diseases, to showcase the relevancy and wide applicability of abstract mathematical techniques Discussion of various mathematical concepts, such as Markov chains, matrix algebra, eigenvalues, eigenvectors, first-order linear difference equations, and nonlinear first-order difference equations Coverage of difference equations to model a wide range of real-life discrete time situations in diverse areas as well as discussions on matrices to model linear problems Solutions to selected exercises and additional Maple codes Explorations of Mathematical Models in Biology with Maple is an ideal textbook for undergraduate courses in mathematical models in biology, theoretical ecology, bioeconomics, forensic science, applied mathematics, and environmental science. The book is also an excellent reference for biologists, ecologists, mathematicians, biomathematicians, and environmental and resource economists.

This book is the first thorough introduction to and comprehensive treatment of the theory and applications of integrodifference equations in spatial ecology. Integrodifference equations are discrete-time continuous-space dynamical systems describing

the spatio-temporal dynamics of one or more populations. The book contains step-by-step model construction, explicitly solvable models, abstract theory and numerical recipes for integrodifference equations. The theory in the book is motivated and illustrated by many examples from conservation biology, biological invasions, pattern formation and other areas. In this way, the book conveys the more general message that bringing mathematical approaches and ecological questions together can generate novel insights into applications and fruitful challenges that spur future theoretical developments. The book is suitable for graduate students and experienced researchers in mathematical ecology alike.

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.

A pioneering study in historical population biology, this book offers the first comprehensive ecological history of the ancient Greek world. It proposes a new model for treating the relationship between the population and the land, centering on the distribution and abundance of living organisms.

Bringing Biology to Life

Conservation Biology

Sampling, Analysis and Simulation

Fundamentals of Conservation Biology

Analyzing Environmental Data

Real-world evidence (RWE) has been at the forefront of pharmaceutical innovations. It plays an important role in

transforming drug development from a process aimed at meeting regulatory expectations to an operating model that leverages data from disparate sources to aid business, regulatory, and healthcare decision making. Despite its many benefits, there is no single book systematically covering the latest development in the field. Written specifically for pharmaceutical practitioners, Real-World Evidence in Drug Development and Evaluation, presents a wide range of RWE applications throughout the lifecycle of drug product development. With contributions from experienced researchers in the pharmaceutical industry, the book discusses at length RWE opportunities, challenges, and solutions. Features Provides the first book and a single source of information on RWE in drug development Covers a broad array of topics on outcomes- and value-based RWE assessments Demonstrates proper Bayesian application and causal inference for real-world data (RWD) Presents real-world use cases to illustrate the use of advanced analytics and statistical methods to generate insights Offers a balanced discussion of practical RWE issues at hand and technical solutions suitable for practitioners with limited data science expertise

Professor L. Scott Mills has been named a 2009 Guggenheim Fellow by the board of trustees of the John Simon Guggenheim Memorial Foundation.Conservation of Wildlife Populations provides an accessible introduction to the most relevant concepts and principles for solving real-world management problems in wildlife and conservation biology. Bringing together insights from traditionally disparate disciplines, the book shows how population biology addresses important questions involving the harvest, monitoring, and conservation of wildlife populations.Covers the most up-to-date approaches for assessing factors that affect both population growth and interactions with

other species, including predation, genetic changes, harvest, introduced species, viability analysis and habitat loss and fragmentation.Is an essential guide for undergraduates and postgraduate students of wildlife biology, conservation biology, ecology, and environmental studies and an invaluable resource for practising managers on how population biology can be applied to wildlife conservation and management.Artwork from the book is available to instructors online at www.blackwellpublishing.com/mills. An Instructor manual CD-ROM for this title is available. Please contact our Higher Education team at HigherEducation@wiley.com for more information.