Evolutionary Ecology Concepts And Case Studies

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Evolutionary Ecology of Parasites Robert Poulin 2011-06-27 Parasites have evolved independently in numerous animal lineages, and they now make up a considerable proportion of the biodiversity of life. Not only do they impact humans and other animals in fundamental ways, but in recent years they have become a powerful model system for the study of ecology and evolution, with practical applications in disease prevention. Here, in a thoroughly revised and updated edition of his influential earlier work, Robert Poulin provides an evolutionary ecologist's view of the biology of parasites. He sets forth a comprehensive synthesis of parasite evolutionary ecology, integrating information across scales from the features of individual parasites to the dynamics of parasite populations and the structuring of parasite communities. Evolutionary Ecology of Parasites presents an evolutionary framework for the study of parasite biology, combining theory with empirical examples for a broader understanding of why parasites are as they are and do what they do. An up-to-date synthesis of the field, the book is an ideal teaching tool for advanced courses on the subject. Pointing toward promising directions and setting a research agenda, it will also be an invaluable reference for researchers who seek to extend our knowledge of parasite ecology and evolution.

Relentless Evolution John N. Thompson 2013-04-15 At a glance, most species seem adapted to the environment in which they live. Yet species relentlessly evolve, and populations within species evolve in different ways. Evolution, as it turns out, is much more dynamic than biologists realized just a few decades ago. In Relentless Evolution, John N. Thompson explores why adaptive evolution never ceases and why natural selection acts on species in so many different ways. Thompson presents a view of life in which ongoing evolution is essential and inevitable. Each chapter focuses on one of the major problems in adaptive evolution: How fast is evolution? How strong is natural selection? How do species co-opt the genomes of other species as they adapt? Why does adaptive evolution sometimes lead to more, rather than less, genetic variation within populations? How does the process of adaptation drive the evolution of new species? How does coevolution among species continually reshape the web of life? And, more generally, how are our views of adaptive evolution changing? Relentless Evolution draws on studies of all the major forms of life—from microbes that evolve in microcosms within a few weeks to plants and animals that sometimes evolve in detectable ways within a few decades. It shows evolution not as a slow and stately process, but rather as a continual and sometimes frenetic process that favors yet more evolutionary change.

The Structural Links between Ecology, Evolution and Ethics Donato Bergandi 2013-01-06 Evolutionary biology, ecology and ethics: at first glance, three different objects of research, three different worldviews and three different scientific communities. In reality, there are both structural and historical links between these disciplines. First, some topics are obviously common across the board. Second, the emerging need for environmental policy management has gradually but radically changed the relationship between these disciplines. Over the last decades in particular, there has emerged a need for an interconnecting meta-paradigm that integrates more strictly evolutionary studies, biodiversity studies and the ethical frameworks that are most appropriate for allowing a lasting co-evolution between natural and social systems. Today such a need is more than a mere luxury, it is an epistemological and practical necessity.

Evolution Driven by Organismal Behavior Rui Diogo 2017-03-08 This book proposes a new way to think about evolution. The author carefully brings together evidence from diverse fields of science. In the process, he bridges the gaps between many different--and usually seen as conflicting--ideas to present one integrative theory named ONCE, which stands for Organic Nonoptimal Constrained Evolution. The author argues that evolution is mainly driven by the behavioral choices and persistence of organisms themselves, in a process in which Darwinian natural selection is mainly a secondary--but still crucial--evolutionary player. Within ONCE, evolution is therefore generally made of mistakes and mismatches and trial-and-error situations, and is not a process where organisms engage in an incessant, suffocating struggle in which they can't thrive if they are not optimally adapted to their habitats and the external environment. Therefore, this unifying view incorporates a more comprehensive view of the diversity and complexity of life by stressing that organisms are not merely passive evolutionary players under the rule of external factors. This insightful and well-reasoned argument is based on numerous fascinating case studies from a wide range of organisms, including bacteria, plants, insects and diverse examples from the evolution of our own species. The book has an appeal to researchers, students, teachers, and those with an interest in the history and philosophy of science, as well as to the broader public, as it brings life back into biology by emphasizing that organisms, including humans, are the key active players in evolution and thus in the future of life on this wonderful planet.

Behavioural Responses to a Changing World Ulrika Candolin 2012-06-14 The first book of its kind devoted to understanding behavioural responses to environmental change, discussing impacts on both the mechanisms underlying behavioural processes, as well as the longer-term ecological and evolutionary consequences.

Handbook of Evolutionary Research in Archaeology Anna Marie Prentiss 2019-06-03 Evolutionary Research in Archaeology seeks to provide a comprehensive overview of contemporary evolutionary research in archaeology. The book will provide a single source for introduction and overview of basic and advanced evolutionary concepts and research programs in archaeology. Content will be organized around four areas of critical research including microevolutionary and macroevolutionary process, human ecology studies (evolutionary ecology, demography, and niche construction), and evolutionary cognitive archaeology. Authors of individual chapters will address theoretical foundations, history of research, contemporary contributions and debates, and implications for the future for their respective topics. As appropriate, authors present or discuss short empirical case studies to illustrate key arguments.

Evolution Of Life Histories Derek Roff 1993-04-30 There are many different types of organisms in the world: they differ in size, physiology, appearance, and life history. The challenge for evolutionary biology is to explain how such diversity arises. The

Evolution of Life Histories does this by showing that natural selection is the principal underlying force molding life history variation. The book describes in particular the ways in which variation can be analyzed and predicted. It covers both the genetic and optimization approaches to life history analysis and gives an overview of the general framework of life history theory and the mathematical tools by which predictions can be made and tested. Factors affecting the age schedule of birth and death and the costs of reproduction are discussed. The Evolution of Life Histories concentrates on those theoretical developments that have been tested experimentally. It will interest both students and professionals in evolution, evolutionary ecology, mathematical and theoretical biology, and zoology and entomology.
Agroecology Stephen R. Gliessman 2006-11-15 Providing the theoretical and conceptual framework for this continually evolving field, Agroecology: The Ecology of Sustainable Food Systems, Second Edition explores environmental factors and complexities affecting agricultural crops and animals. Completely revised, updated, and reworked, the second edition contains new data, new readings, new issues and case studies, and new options. It includes two completely new chapters, one on the role of livestock animals in agroecosystems and one on the cultural and community aspects of sustainable food systems. The author clearly delineates the importance of using an ecosystem framework for determining if a particular agricultural practice, input, or management decision contributes or detracts from sustainability. He explains how the framework provides the ecological basis for the functioning of the chosen management strategy over the long-term. He also examines system level interactions, stressing the need for understanding the emergent qualities of populations, communities, and ecosystems and their roles in sustainable agriculture. Using examples of farming systems in a broad array of ecological conditions, the book demonstrates how to use an ecosystem approach to design and manage agroecosystems for sustainability.
Epidemiology Nuno Lunet 2012-03-13 This special issue resulted from the invitation made to selected authors to contribute with an overview of a specific subject of their choice, and is based on a collection of papers chosen to exemplify some of the interests, uses and views of the epidemiology across different areas of research and practice. Rather than the comprehensiveness and coherence of a conventional textbook, readers will find a set of independent chapters, each of them of a great interest in their own specialized areas within epidemiology. Taken together, they illustrate the contrast between the attempt to extend the limits of applicability of epidemiological research, and the "regular" scientific activity in this field or an applied epidemiology. Epidemiologists with different levels of expertise and interests will be able to find informative and inspiring readings among the chapters of this book.
The Ecology of Place Ian Billick 2010 Mary V. Price is professor emerita of biology at the University of California, Riverside. --Book Jacket.
Manual of Environmental Microbiology Cindy H. Nakatsu 2020-08-11 The single most comprehensive resource for environmental microbiology Environmental microbiology, the study of the roles that microbes play in all planetary environments, is one of the most important areas of scientific research. The Manual of Environmental Microbiology, Fourth Edition, provides comprehensive coverage of this critical and growing field. Thoroughly updated and revised, the Manual is the definitive reference for information on microbes in air, water, and soil and their impact on human health and welfare. Written in accessible, clear prose, the manual covers four broad areas: general methodologies, environmental public health microbiology, microbial ecology, and biodegradation and biotransformation. This wealth of information is divided into 18 sections each containing chapters written by acknowledged topical experts from the

international community. Specifically, this new edition of the Manual Contains completely new sections covering microbial risk assessment, quality control, and microbial source tracking Incorporates a summary of the latest methodologies used to study microorganisms in various environments Synthesizes the latest information on the assessment of microbial presence and microbial activity in natural and artificial environments The Manual of Environmental Microbiology is an essential reference for environmental microbiologists, microbial ecologists, and environmental engineers, as well as those interested in human diseases, water and wastewater treatment, and biotechnology.

Using the Biological Literature Diane Schmidt 2014-04-14 The biological sciences cover a broad array of literature types, from younger fields like molecular biology with its reliance on recent journal articles, genomic databases, and protocol manuals to classic fields such as taxonomy with its scattered literature found in monographs and journals from the past three centuries. Using the Biological Literature: A Practical Guide, Fourth Edition is an annotated guide to selected resources in the biological sciences, presenting a wide-ranging list of important sources. This completely revised edition contains numerous new resources and descriptions of all entries including textbooks. The guide emphasizes current materials in the English language and includes retrospective references for historical perspective and to provide access to the taxonomic literature. It covers both print and electronic resources including monographs, journals, databases, indexes and abstracting tools, websites, and associations—providing users with listings of authoritative informational resources of both classical and recently published works. With chapters devoted to each of the main fields in the basic biological sciences, this book offers a guide to the best and most up-to-date resources in biology. It is appropriate for anyone interested in searching the biological literature, from undergraduate students to faculty, researchers, and librarians. The guide includes a supplementary website dedicated to keeping URLs of electronic and web-based resources up to date, a popular feature continued from the third edition.

Evolutionary Ecology of Plant-Herbivore Interaction Juan Núñez-Farfán 2020-07-30 Plant-herbivore interactions are a central topic in evolutionary ecology. Historically, their study has been a cornerstone for coevolutionary theory. Starting from classic ecological studies at the phenotypic level, it has since expanded to molecular and genomic approaches. After a historical perspective, the book’s subsequent chapters cover a wide range of topics: from populations to ecosystems; plant- and herbivore-focused studies; in natural and in man-modified ecosystems; and both micro- and macro-evolutionary levels. All chapters include valuable background information and empirical evidence. Given its scope, the book will be of interest to both students and researchers, and will hopefully stimulate further research in this exciting field of evolutionary biology.

Pillars of Evolution Douglas W. Morris 2011-07-14 Pillars of Evolution provides a fresh and provocative perspective on adaptive evolution. Readers new to the study of evolution will find a refreshing new insight that establishes evolutionary biology as a rigorous and predictive science, whilst practicing biologists will discover a provocative book that challenges traditional approaches. The book begins by leading readers through the mechanics of heredity, reproduction, movement, survival, and development. With that framework in place, it then explores the numerous ways that traits emerge from the interactions between genetics, development, and the environment. The key message is that adaptive changes in traits (and their underlying allelic frequencies) evolve through the traits' functions and their connection with fitness. The complex mappings from genes-to-traits-to-fitness are characterized in the structure of evolution. A single "structure matrix" describes why individuals vary in the values of adaptive

traits, their ability to perform the function of those traits, and in the fitness they accrue. Fitness depends on how organisms interact with and perceive their environment in time and space. These relationships are made explicit in spatial, temporal, and organizational scale that also sets the stage for the crucially important role that ecology always plays in evolution. The ecological hallmarks of density- and frequency-dependent interactions allow the authors to explore new and exciting insights into evolution's dynamics. The theories and principles are then brought together in a final synthesis on adaptation. The book's unique approach unites genetic, development, and environmental influences into a single comprehensive treatment of the eco-evolutionary process.

Strickberger's Evolution Brian K. Hall 2011-06-07 Thoroughly updated and reorganized, Strickberger's Evolution, Fourth Edition, presents biology students with a basic introduction to prevailing knowledge and ideas about evolution, discussing how, why, and where the world and its organisms changed throughout history. Keeping consistent with Strickberger's engaging writing style, the authors carefully unfold a broad range of philosophical and historical topics that frame the theories of today including cosmological and geological evolution and its impact on life, the origins of life on earth, the development of molecular pathways from genetic systems to organismic morphology and function, the evolutionary history of organisms from microbes to animals, and the numerous molecular and populational concepts that explain the earth's dynamic evolution. Important Notice: The digital edition of this book is missing some of the images or content found in the physical edition.

The Geographic Mosaic of Coevolution John N. Thompson 2005-06-15 Coevolution—reciprocal evolutionary change in interacting species driven by natural selection—is one of the most important ecological and genetic processes organizing the earth's biodiversity: most plants and animals require coevolved interactions with other species to survive and reproduce. The Geographic Mosaic of Coevolution analyzes how the biology of species provides the raw material for long-term coevolution, evaluates how local coadaptation forms the basic module of coevolutionary change, and explores how the coevolutionary process reshapes locally coevolving interactions across the earth's constantly changing landscapes. Picking up where his influential The Coevolutionary Process left off, John N. Thompsonsynthesizes the state of a rapidly developing science that integrates approaches from evolutionary ecology, population genetics, phylogeography, systematics, evolutionary biochemistry and physiology, and molecular biology. Using models, data, and hypotheses to develop a complete conceptual framework, Thompson also draws on examples from a wide range of taxa and environments, illustrating the expanding breadth and depth of research in coevolutionary biology.

Niche Construction F. John Odling-Smee 2013-02-15 The seemingly innocent observation that the activities of organisms bring about changes in environments is so obvious that it seems an unlikely focus for a new line of thinking about evolution. Yet niche construction--as this process of organism-driven environmental modification is known--has hidden complexities. By transforming biotic and abiotic sources of natural selection in external environments, niche construction generates feedback in evolution on a scale hitherto underestimated--and in a manner that transforms the evolutionary dynamic. It also plays a critical role in ecology, supporting ecosystem engineering and influencing the flow of energy and nutrients through ecosystems. Despite this, niche construction has been given short shrift in theoretical biology, in part because it cannot be fully understood within the framework of standard evolutionary theory. Wedding evolution and ecology, this book extends evolutionary theory by formally including niche construction and ecological inheritance as additional evolutionary processes. The authors support their historic

move with empirical data, theoretical population genetics, and conceptual models. They also describe new research methods capable of testing the theory. They demonstrate how their theory can resolve long-standing problems in ecology, particularly by advancing the sorely needed synthesis of ecology and evolution, and how it offers an evolutionary basis for the human sciences. Already hailed as a pioneering work by some of the world's most influential biologists, this is a rare, potentially field-changing contribution to the biological sciences.

The Evolution of Personality and Individual Differences David M. Buss 2011 Capturing a scientific change in thinking about personality and individual differences that has been building over the past 15 years, and this volume stands at an important moment in the development of psychology as a discipline. It draws together theoretical inspiration from life history theory, evolutionary genetics, molecular genetics, developmental psychology, personality psychology, and evolutionary psychology.

Ecological Paradigms Lost Beatrix Beisner 2005-08-23 This edited volume in the Theoretical Ecology series addresses the historical development and evolution of theoretical ideas in the field of ecology. Not only does Ecological Paradigms Lost recount the history of the discipline by practitioners of the science of ecology, it includes commentary on these historical reflections by philosophers of science. Even though the theories discussed are, in many cases, are at the forefront of research, the language and approach make this material accessible to non-theoreticians. The book is structured in 5 major sections including population ecology, epidemiology, community ecology, evolutionary biology and ecosystem ecology. In each section a chapter by an eminent, experienced ecologist is complemented by analysis from a newer, cutting-edge researcher. Reflection on the past and future of ecology A historical overview of major ideas in the field of ecology Pairing of historical views by ecologists along with a philosophical commentary directed at the practicing scientists' views by a philosopher of science Historical analysis by practicing ecologists including anectodal experiences that are rarely recorded Based on a very popular symposium at the 2002 Ecological Society of America annual meeting in Tucson, AZ

Phenotypic Plasticity Massimo Pigliucci 2001-08-17 "The author begins by defining phenotypic plasticity and detailing its history, including important experiments and methods of statistical and graphical analysis. He then provides extended examples and discussion of the molecular basis of plasticity, the plasticity of development, the ecology of plastic responses, and the role of costs and constraints in the evolution of plasticity. A brief epilogue looks at how plasticity studies shed light on the nature/nurture debate in the popular media.".

Encyclopedia of Ecology 2014-11-03 The groundbreaking Encyclopedia of Ecology provides an authoritative and comprehensive coverage of the complete field of ecology, from general to applied. It includes over 500 detailed entries, structured to provide the user with complete coverage of the core knowledge, accessed as intuitively as possible, and heavily cross-referenced. Written by an international team of leading experts, this revolutionary encyclopedia will serve as a one-stop-shop to concise, stand-alone articles to be used as a point of entry for undergraduate students, or as a tool for active researchers looking for the latest information in the field. Entries cover a range of topics, including: Behavioral Ecology Ecological Processes Ecological Modeling Ecological Engineering Ecological Indicators Ecological Informatics Ecosystems Ecotoxicology Evolutionary Ecology General Ecology Global Ecology Human Ecology System Ecology The first reference work to cover all aspects of ecology, from basic to applied Over 500 concise, stand-alone articles are written by prominent leaders in the field Article text is supported by full-color photos, drawings, tables, and other visual material Fully indexed and cross referenced with detailed

references for further study Writing level is suited to both the expert and non-expert Available electronically on ScienceDirect shortly upon publication

Evolutionary Behavioral Ecology David Westneat 2010-04-01 Evolutionary Behavioral Ecology presents a comprehensive treatment of theevolutionary and ecological processes shaping behavior across a wide array of organisms and a diverse set of behaviors and is suitable as a graduate-level text and as a sourcebook for professional scientists.

Molecular Approaches to Ecology and Evolution R. deSalle 2012-12-06 Four years ago we edited a volume of 36 papers entitled Molecular Approaches to Ecology and Evolution (Schierwater et ai. , 1994), in which we attempted to put to gether a diverse array of papers that demonstrated the impact that the technologi cal revolution ofmolecular biology has had on the field ofevolutionary biologyand ecology. The present volume borrows from that theme but attempts to focus more sharply on the impact that molecular biology has had on our understanding of dif ferent hierarchical levels important in evolutionary and ecological studies. Because DNA sequence variation is at the heart ofeverypaper in the present volume, we feel it necessary to examine how DNA has affected study at various levels of biological organization. The majority of the chapters in the present volume follow themes es tablished in the earlier volume; all chapters by authors in the previous volume are either fully updated or entirely new and expand into areas that we felt were impor tant for a more complete understanding of the impact of DNA technology on ecol ogy and evolution. The collection of papers in this volume cover a diverse array of ecological and evolutionary questions and demonstrates the breadth of coverage molecular tech nology has imparted on modern evolutionary biology. There are also a broad range of hierarchical questions approached by the 17 papers in this volume.

Package Price Agroecology Stephen R. Gliessman 2021-02-25 Stephen Gliessman's complementary volumes, Agroecology: The Ecology of Sustainable Food Systems, Third Edition and Field and Laboratory Investigations in Agroecology, Third Edition are now available together for one low price. Completely revised, updated, and reworked, the third edition of Agroecology presents new data, material, case studies, and options, as well as more emphasis on topics such as the values, beliefs, and ethics of sustainable food systems. The new edition of Field and Laboratory Investigations in Agroecology facilitates hands-on, experimental learning that involves close observation, creative interpretation, and constant questioning of findings.

Evolutionary Ecology of Freshwater Animals B. Streit 2013-03-11 Evolutionary ecology includes aspects of community structure, trophic interactions, life-history tactics, and reproductive modes, analyzed from an evolutionary perspective. Freshwater environments often impose spatial structure on populations, e.g. within large lakes or among habitat patches, facilitating genetic and phenotypic divergence. Traditionally, freshwater systems have featured prominently in ecological research and population biology. This book brings together information on diverse freshwater taxa, with a mix of critical review, synthesis, and case studies. Using examples from bryozoans, rotifers, cladocerans, molluscs, teleosts and others, the authors cover current conceptual issues of evolutionary ecology in considerable depth. The book can serve as a source of critically evaluated ideas, detailed case studies, and open problems in the field of evolutionary ecology. It is recommended for students and researchers in ecology, limnology, population biology, and evolutionary biology.

Evolution Brian K. Hall 2011-08-24 If you want to know whether evolution is a science, how life began, what Charles Darwin really said about evolution, why a fungus is more closely related to humans than to a plant, how experiments in evolution can be carried out, why birds are flying dinosaurs, how we manipulate the

evolution of other species, and if you want a clear treatment of the processes that result in evolution, then this is the book for you! Written for those with a minimal science background, Evolution: Principles and Processes provides a concise introduction of evolutionary topics for the one-term course. Using an engaging writing style and a wealth of full-color illustrations, Hall covers all topics from the origin of universe, Earth, the origin of life, and on to how humans influence the evolution of other species. He brings together the principles and processes that explain evolutionary change and discusses the patterns of life that have resulted from the operation of evolution over the past 3.5 billion years. This overview, coupled with numerous case studies and examples, helps readers understand and truly appreciate the origin and diversity of life.

Evolution by Association Jan Sapp 1994-09-15 In this comprehensive history of symbiosis theory--the first to be written--Jan Sapp masterfully traces its development from modest beginnings in the late nineteenth century to its current status as one of the key conceptual frameworks for the life sciences. The symbiotic perspective on evolution, which argues that "higher species" have evolved from a merger of two or more different kinds of organisms living together, is now clearly established with definitive molecular evidence demonstrating that mitochondria and chloroplasts have evolved from symbiotic bacteria. In telling the exciting story of an evolutionary biology tradition that has effectively challenged many key tenets of classical neo-Darwinism, Sapp sheds light on the phenomena, movements, doctrines, and controversies that have shaped attitudes about the scope and significance of symbiosis. Engaging and insightful, Evolution by Association will be avidly read by students and researchers across the life sciences.

Encyclopedia of Evolutionary Biology 2016-04-14 Encyclopedia of Evolutionary Biology is the definitive go-to reference in the field of evolutionary biology. It provides a fully comprehensive review of the field in an easy to search structure. Under the collective leadership of fifteen distinguished section editors, it is comprised of articles written by leading experts in the field, providing a full review of the current status of each topic. The articles are up-to-date and fully illustrated with in-text references that allow readers to easily access primary literature. While all entries are authoritative and valuable to those with advanced understanding of evolutionary biology, they are also intended to be accessible to both advanced undergraduate and graduate students. Broad topics include the history of evolutionary biology, population genetics, quantitative genetics; speciation, life history evolution, evolution of sex and mating systems, evolutionary biogeography, evolutionary developmental biology, molecular and genome evolution, coevolution, phylogenetic methods, microbial evolution, diversification of plants and fungi, diversification of animals, and applied evolution. Presents fully comprehensive content, allowing easy access to fundamental information and links to primary research Contains concise articles by leading experts in the field that ensures current coverage of each topic Provides ancillary learning tools like tables, illustrations, and multimedia features to assist with the comprehension process

Evolutionary Ecology Charles W. Fox 2001-10-19 Evolutionary Ecology simultaneously unifies conceptual and empirical advances in evolutionary ecology and provides a volume that can be used as either a primary textbook or a supplemental reading in an advanced undergraduate or graduate course. The focus of the book is on current concepts in evolutionary ecology, and the empirical study of these concepts. The editors have assembled a group of prominent biologists who have made significant contributions to this field. They both synthesize the current state of knowledge and identity areas for future investigation. Evolutionary Ecology will be of general interest to researchers and students in both ecology and evolutionary biology. Researchers in evolutionary ecology that

want an overview of the current state of the field, and graduate students that want an introduction the field, will find this book very valuable. This volume can also be used as a primary textbook or supplemental reading in both upper division and graduate courses/seminars in Evolutionary Ecology.

Evolutionary Conservation Biology Régis Ferrière 2004-06-10 As anthropogenic environmental changes spread and intensify across the planet, conservation biologists have to analyze dynamics at large spatial and temporal scales. Ecological and evolutionary processes are then closely intertwined. In particular, evolutionary responses to anthropogenic environmental change can be so fast and pronounced that conservation biology can no longer afford to ignore them. To tackle this challenge, areas of conservation biology that are disparate ought to be integrated into a unified framework. Bringing together conservation genetics, demography, and ecology, this book introduces evolutionary conservation biology as an integrative approach to managing species in conjunction with ecological interactions and evolutionary processes. Which characteristics of species and which features of environmental change foster or hinder evolutionary responses in ecological systems? How do such responses affect population viability, community dynamics, and ecosystem functioning? Under which conditions will evolutionary responses ameliorate, rather than worsen, the impact of environmental change?

An Introduction to Methods and Models in Ecology, Evolution, and Conservation Biology Stanton Braude 2010-01-04 An innovative introduction to ecology and evolution This unique textbook introduces undergraduate students to quantitative models and methods in ecology, behavioral ecology, evolutionary biology, and conservation. It explores the core concepts shared by these related fields using tools and practical skills such as experimental design, generating phylogenies, basic statistical inference, and persuasive grant writing. And contributors use examples from their own cutting-edge research, providing diverse views to engage students and broaden their understanding. This is the only textbook on the subject featuring a collaborative "active learning" approach that emphasizes hands-on learning. Every chapter has exercises that enable students to work directly with the material at their own pace and in small groups. Each problem includes data presented in a rich array of formats, which students use to answer questions that illustrate patterns, principles, and methods. Topics range from Hardy-Weinberg equilibrium and population effective size to optimal foraging and indices of biodiversity. The book also includes a comprehensive glossary. In addition to the editors, the contributors are James Beck, Cawas Behram Engineer, John Gaskin, Luke Harmon, Jon Hess, Jason Kolbe, Kenneth H. Kozak, Robert J. Robertson, Emily Silverman, Beth Sparks-Jackson, and Anton Weisstein. Provides experience with hypothesis testing, experimental design, and scientific reasoning Covers core quantitative models and methods in ecology, behavioral ecology, evolutionary biology, and conservation Turns "discussion sections" into "thinking labs" Professors: A supplementary Instructor's Manual is available for this book. It is restricted to teachers using the text in courses. For information on how to obtain a copy, refer to: http://press.princeton.edu/class_use/solutions.html

Approaches to Plant Evolutionary Ecology Gregory Paul Cheplick 2015 This book introduces the rapidly growing field of plant evolutionary ecology. It summarizes and synthesizes much primary literature, providing a historical context for the study of populations. It also examines both traditional (common gardens, reciprocal transplants) and modern (molecular genetic) approaches used to address questions about adaptation to abiotic and biotic factors.

Evolution's Wedge David W. Pfennig 2012-10-25 Evolutionary biology has long sought to explain how new traits and new species arise. In their synthetic and provocative book David and Karin Pfennig explore competition's role in generating and

maintaining biodiversity.
Environmental Stress, Adaptation and Evolution K. Bijlsma 2013-03-08 Most organisms and populations have to cope with hostile environments, threatening their existence. Their ability to respond phenotypically and genetically to these challenges and to evolve adaptive mechanisms is, therefore, crucial. The contributions to this book aim at understanding, from a evolutionary perspective, the impact of stress on biological systems. Scientists, applying different approaches spanning from the molecular and the protein level to individuals, populations and ecosystems, explore how organisms adapt to extreme environments, how stress changes genetic structure and affects life histories, how organisms cope with thermal stress through acclimation, and how environmental and genetic stress induce fluctuating asymmetry, shape selection pressure and cause extinction of populations. Finally, it discusses the role of stress in evolutionary change, from stress induced mutations and selection to speciation and evolution at the geological time scale. The book contains reviews and novel scientific results on the subject. It will be of interest to both researchers and graduate students and may serve as a text for graduate courses.
Discovering Evolutionary Ecology Peter J. Mayhew 2006-01-05 Why are some kinds of organism species-rich and others species-poor? How do new species arise and why do some go extinct? Why do organisms grow and behave the way they do? This book provides an introduction to evolutionary ecology, the science that brings ecology and evolution together to help understand biological diversity. In a concise, readable format, Peter Mayhew covers the entire breadth of the subject, from life histories and the evolution of sex, to speciation and macroecology. Many emerging fields are also introduced, such as metabolic ecology, the evolution of population dynamics, and the evolution of global ecology. Discovering Evolutionary Ecology highlights the connections between these different subject areas, and for the first time paints a picture of a truly integrated field. It illustrates the research tools utilized, and demonstrates how advances in one area can spur on developments elsewhere when scientists combine evolutionary and ecological knowledge. To maximize accessibility, the book assumes only a basic knowledge of biology, includes a comprehensive glossary, and contains almost no maths. Each chapter provides suggestions for further reading, and there is also an extensive reference list. Ideal as an introduction to evolutionary ecology for undergraduates, this book will also interest established researchers, providing a broad and up-to-date context for their work.
Evolutionary Ecology of Freshwater Animals Bruno Streit 2012-11-01 Evolutionary ecology includes aspects of community structure, trophic interactions, life-history tactics, and reproductive modes, analyzed from an evolutionary perspective. Freshwater environments often impose spatial structure on populations, e.g. within large lakes or among habitat patches, facilitating genetic and phenotypic divergence. Traditionally, freshwater systems have featured prominently in ecological research and population biology. This book brings together information on diverse freshwater taxa, with a mix of critical review, synthesis, and case studies. Using examples from bryozoans, rotifers, cladocerans, molluscs, teleosts and others, the authors cover current conceptual issues of evolutionary ecology in considerable depth. The book can serve as a source of critically evaluated ideas, detailed case studies, and open problems in the field of evolutionary ecology. It is recommended for students and researchers in ecology, limnology, population biology, and evolutionary biology.
EVOLUTION Michael Ruse 2009-01-01 Spanning evolutionary science from its inception to its latest findings, from discoveries and data to philosophy and history, this book is the most complete, authoritative, and inviting one-volume introduction to evolutionary biology

available. Clear, informative, and comprehensive in scope, Evolution opens with a series of major essays dealing with the history and philosophy of evolutionary biology, with major empirical and theoretical questions in the science, from speciation to adaptation, from paleontology to evolutionary development (evo devo), and concluding with essays on the social and political significance of evolutionary biology today. A second encyclopedic section travels the spectrum of topics in evolution with concise, informative, and accessible entries on individuals from Aristotle and Linneaus to Louis Leakey and Jean Lamarck; from T. H. Huxley and E. O. Wilson to Joseph Felsenstein and Motoo Kimura; and on subjects from altruism and amphibians to evolutionary psychology and Piltdown Man to the Scopes trial and social Darwinism. Readers will find the latest word on the history and philosophy of evolution, the nuances of the science itself, and the intricate interplay among evolutionary study, religion, philosophy, and society. Appearing at the beginning of the Darwin Year of 2009Ñthe 200th anniversary of the birth of Charles Darwin and the 150th anniversary of the publication of the Origin of SpeciesÑthis volume is a fitting tribute to the science Darwin set in motion.

Integral Ecology Sean Esbjorn-Hargens, Ph.D. 2011-03-08 Today there is a bewildering diversity of views on ecology and the natural environment. With more than two hundred distinct and valuable perspectives on the natural world—and with scientists, economists, ethicists, activists, philosophers, and others often taking completely different stances on the issues—how can we come to agreement to solve our toughest environmental problems? In response to this pressing need, Integral Ecology unites valuable insights from multiple perspectives into a comprehensive theoretical framework—one that can be put to use right now. The framework is based on Integral Theory, as well as Ken Wilber's AQAL model, and is the result of over a decade of research exploring the myriad perspectives on ecology available to us today and their respective methodologies. Dozens of real-life applications and examples of this framework currently in use are examined, including three in-depth case studies: work with marine fisheries in Hawai'i, strategies of eco-activists to protect Canada's Great Bear Rainforest, and a study of community development in El Salvador. In addition, eighteen personal practices of transformation are provided for you to increase your own integral ecological awareness. Integral Ecology provides the most sophisticated application and extension of Integral Theory available today, and as such it serves as a template for any truly integral effort.

Evolutionary Ecology Charles W. Fox 2001 This text unifies conceptual and empirical advances in evolutionary ecology, and the focus is on current concepts in evolutionary ecology and the empirical study of these concepts. The book is divided into five sections: an overview of the major topics in evolutionary biology for ecologists, sections on life histories, behavior, coevolution, and adaptation to anthropogenic change. (Midwest).

Evolutionary Genetics Charles W. Fox 2006-04-27 Charles Fox and Jason Wolf have brought together leading researchers to produce a cutting-edge primer introducing readers to the major concepts in modern evolutionary genetics. This book spans the continuum of scale, from studies of DNA sequence evolution through proteins and development to multivariate phenotypic evolution, and the continuum of time, from ancient events that lead to current species diversity to the rapid evolution seen over relatively short time scales in experimental evolution studies. Chapters are accessible to an audience lacking extensive background in evolutionaryy genetics but also current and in-depth enough to be of value to established researchers in evolution biology.