

# Foundations Of Ecology Leslie A Real 9780226705941

Foundations of Macroecology Evolutionary Ecology Foundations of Biogeography The Natural Communities of Georgia Tropical Ecology Behavioral Mechanisms in Evolutionary Ecology Foundations of Ecology Road Ecology Ecological Niches Relentless Evolution Spiritual Ecology: A Quiet Revolution Methods in Stream Ecology Foundations of Ecology Overshoot A Critique for Ecology Geographical Ecology Modeling Nature Nature's Economy Law and Ecology Chance and Change Foundations of Paleocology Foundation Papers in Landscape Ecology Laws, Theories, and Patterns in Ecology Community Ecology The Theory of Ecology The Population Ecology of Interest Representation Sensitivity Analysis: Matrix Methods in Demography and Ecology The Philosophical Foundations of Ecological Civilization Foundations of Restoration Ecology Foundations of Tropical Forest Biology The Theory of Ecological Communities (MPB-57) Ecosystem-Based Management for the Oceans Bayesian Analysis for Population Ecology Landscape Ethnoecology Foundations of Animal Behavior Species Diversity in Space and Time Why Ecology Matters Ecological Stoichiometry Introduction to Population Ecology Green Roofs

## Foundations of Macroecology

Nature's Economy is a wide-ranging investigation of ecology's past, first published in 1994.

## Evolutionary Ecology

A prominent scientist and scholar documents and explains the thoughts, actions, and legacies of spiritual ecology's pioneers from ancient times to the present, demonstrating how the movement may offer the last chance to restore a healthy relationship between humankind and nature. • Clear, concise, and captivating essays on well-known, as well as little-known, pioneers in spiritual ecology • Chapter-long treatment of each individual's contributions, allowing for in-depth coverage • An extensive resource guide, including films and websites • An appendix listing approximately 100 pioneers in spiritual ecology

## Foundations of Biogeography

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 Natural Communities of Georgia**

Conventional management approaches cannot meet the challenges faced by ocean and coastal ecosystems today. Consequently, national and international bodies have called for a shift toward more comprehensive ecosystem-based marine management. Synthesizing a vast amount of current knowledge, *Ecosystem-Based Management for the Oceans* is a comprehensive guide to utilizing this promising new approach. At its core, ecosystem-based management (EBM) is about acknowledging connections. Instead of focusing on the impacts of single activities on the delivery of individual ecosystem services, EBM focuses on the array of services that we receive from marine systems, the interactive and cumulative effects of multiple human activities on these coupled ecological and social systems, and the importance of working towards common goals across sectors. *Ecosystem-Based Management for the Oceans* provides a conceptual framework for students and professionals who want to understand and utilize this powerful approach. And it employs case studies that draw on the experiences of EBM practitioners to demonstrate how EBM principles can be applied to real-world problems. The book emphasizes the importance of understanding the factors that contribute to social and ecological resilience—the extent to which a system can maintain its structure, function, and identity in the face of disturbance. Utilizing the resilience framework, professionals can better predict how systems will respond to a variety of disturbances, as well as to a range of management alternatives. *Ecosystem-Based Management for the Oceans* presents the latest science of resilience, while it provides tools for the design and implementation of responsive EBM solutions.

## **Tropical Ecology**

Approximately 99% of all life that has ever existed is extinct. Fortunately, these long dead species have left traces of their lives and interactions with other species in the rock record that paleoecologists use to understand how species and ecosystems have changed over time. This record of past life allows us to study the dynamic nature of the Earth and gives context to current and future ecological challenges. This book brings together forty-four classic papers published between 1924 and 1999 that trace the origins and development of paleoecology. The articles cross taxonomic groups, habitat types, geographic areas, and time and have made substantial contributions to our knowledge of the evolution of life. Encompassing the full breadth of paleoecology, the book is divided into six parts: community and ecosystem dynamics, community reconstruction, diversity dynamics, paleoenvironmental reconstruction, species interaction, and taphonomy. Each paper is also introduced by a contemporary expert who gives context and

explains its importance to ongoing paleoecological research. A comprehensive introduction to the field, *Foundations of Paleocology* will be an essential reference for new students and established paleoecologists alike.

## **Behavioral Mechanisms in Evolutionary Ecology**

As the practical application of ecological restoration continues to grow, there is an increasing need to connect restoration practice to areas of underlying ecological theory. *Foundations of Restoration Ecology* is an important milestone in the field, bringing together leading ecologists to bridge the gap between theory and practice by translating elements of ecological theory and current research themes into a scientific framework for the field of restoration ecology. Each chapter addresses a particular area of ecological theory, covering traditional levels of biological hierarchy (such as population genetics, demography, community ecology) as well as topics of central relevance to the challenges of restoration ecology (such as species interactions, fine-scale heterogeneity, successional trajectories, invasive species ecology, ecophysiology). Several chapters focus on research tools (research design, statistical analysis, modeling), or place restoration ecology research in a larger context (large-scale ecological phenomena, macroecology, climate change and paleoecology, evolutionary ecology). The book makes a compelling case that a stronger connection between ecological theory and the science of restoration ecology will be mutually beneficial for both fields: restoration ecology benefits from a stronger grounding in basic theory, while ecological theory benefits from the unique opportunities for experimentation in a restoration context. *Foundations of Restoration Ecology* advances the science behind the practice of restoring ecosystems while exploring ways in which restoration ecology can inform basic ecological questions. It provides the first comprehensive overview of the theoretical foundations of restoration ecology, and is a must-have volume for anyone involved in restoration research, teaching, or practice.

## **Foundations of Ecology**

*Road Ecology* links ecological theories and concepts with transportation planning, engineering, and travel behavior. With more than 100 illustrations and examples from around the world, it is an indispensable and pioneering work for anyone involved with transportation.

## **Road Ecology**

*Novel Statistical Tools for Conserving and Managing Populations* By gathering information on key demographic parameters, scientists can often predict how populations will develop in the future and relate these parameters to external influences, such as global warming. Because of their ability to easily incorporate random effects, fit state-space mode

## **Ecological Niches**

*Foundations of Biogeography* provides facsimile reprints of seventy-two works that have proven fundamental to the development of the field. From classics by

Georges-Louis LeClerc Comte de Buffon, Alexander von Humboldt, and Charles Darwin to equally seminal contributions by Ernst Mayr, Robert MacArthur, and E. O. Wilson, these papers and book excerpts not only reveal biogeography's historical roots but also trace its theoretical and empirical development. Selected and introduced by leading biogeographers, the articles cover a wide variety of taxonomic groups, habitat types, and geographic regions. Foundations of Biogeography will be an ideal introduction to the field for beginning students and an essential reference for established scholars of biogeography, ecology, and evolution. List of Contributors John C. Briggs, James H. Brown, Vicki A. Funk, Paul S. Giller, Nicholas J. Gotelli, Lawrence R. Heaney, Robert Hengeveld, Christopher J. Humphries, Mark V. Lomolino, Alan A. Myers, Brett R. Riddle, Dov F. Sax, Geerat J. Vermeij, Robert J. Whittaker

## **Relentless Evolution**

This full-color illustrated textbook offers the first comprehensive introduction to all major aspects of tropical ecology. It explains why the world's tropical rain forests are so universally rich in species, what factors may contribute to high species richness, how nutrient cycles affect rain forest ecology, and how ecologists investigate the complex interrelationships among flora and fauna. It covers tropical montane ecology, riverine ecosystems, savanna, dry forest--and more. Tropical Ecology begins with a historical overview followed by a sweeping discussion of biogeography and evolution, and then introduces students to the unique and complex structure of tropical rain forests. Other topics include the processes that influence everything from species richness to rates of photosynthesis: how global climate change may affect rain forest characteristics and function; how fragmentation of ecosystems affects species richness and ecological processes; human ecology in the tropics; biodiversity; and conservation of tropical ecosystems and species. Drawing on real-world examples taken from actual research, Tropical Ecology is the best textbook on the subject for advanced undergraduates and graduate students. Offers the first comprehensive introduction to tropical ecology Describes all the major kinds of tropical terrestrial ecosystems Explains species diversity, evolutionary processes, and coevolutionary interactions Features numerous color illustrations and examples from actual research Covers global warming, deforestation, reforestation, fragmentation, and conservation The essential textbook for advanced undergraduates and graduate students Suitable for courses with a field component Leading universities that have adopted this book include: Biola University Bucknell University California State University, Fullerton Colorado State University - Fort Collins Francis Marion University Michigan State University Middlebury College Northern Kentucky University Ohio Wesleyan University St. Mary's College of Maryland Syracuse University Tulane University University of California, Santa Cruz University of Central Florida University of Cincinnati University of Florida University of Missouri University of New Mexico University of North Carolina at Chapel Hill University of the West Indies Some images inside the book are unavailable due to digital copyright restrictions.

## **Spiritual Ecology: A Quiet Revolution**

Community ecology has undergone a transformation in recent years, from a discipline largely focused on processes occurring within a local area to a discipline

encompassing a much richer domain of study, including the linkages between communities separated in space (metacommunity dynamics), niche and neutral theory, the interplay between ecology and evolution (eco-evolutionary dynamics), and the influence of historical and regional processes in shaping patterns of biodiversity. To fully understand these new developments, however, students continue to need a strong foundation in the study of species interactions and how these interactions are assembled into food webs and other ecological networks. This new edition fulfils the book's original aims, both as a much-needed up-to-date and accessible introduction to modern community ecology, and in identifying the important questions that are yet to be answered. This research-driven textbook introduces state-of-the-art community ecology to a new generation of students, adopting reasoned and balanced perspectives on as-yet-unresolved issues. Community Ecology is suitable for advanced undergraduates, graduate students, and researchers seeking a broad, up-to-date coverage of ecological concepts at the community level.

## **Methods in Stream Ecology**

The result of a lifetime in the field and in the classroom, *Chance and Change* challenges many of the tenets of establishment ecology. Charging that most of the environmental movement has ignored or rejected the changes in thinking that have infiltrated ecological theory since the mid 70s, William Drury presents a convincing case that disorder is what makes the natural world work, and that clinging to romantic notions of nature's grand design only saps the strength of the conservation movement. Drury's training in botany, geology, and zoology as well as his life-long devotion to work in the field gave him a depth and range of knowledge that few ecologists possess. This book opens our eyes to a new way of looking at the environment and forces us to think more deeply about nature and our role in it. *Chance and Change* is intended for the serious amateur naturalist or professional conservationist. Drury argues that chance and change are the rule, that the future is as unpredictable to other organisms as it is to us, and that natural disturbance is too frequent for equilibrium models to be useful. He stresses the centrality of natural selection in explaining the meaning of biology and insists the book and the laboratory must be checked at all times against the real world. Written in an easy, personal style, Drury's narrative comes alive with the landscape—the salt marshes, dunes, seashores, and forests—that he believed served as the best classroom. His novel approach of correlating landscape evolution with ecological principles offers a welcome corrective to discordance between what we observe in nature and what theory tells us we should see.

## **Foundations of Ecology**

All life is chemical. That fact underpins the developing field of ecological stoichiometry, the study of the balance of chemical elements in ecological interactions. This long-awaited book brings this field into its own as a unifying force in ecology and evolution. Synthesizing a wide range of knowledge, Robert Sterner and Jim Elser show how an understanding of the biochemical deployment of elements in organisms from microbes to metazoa provides the key to making sense of both aquatic and terrestrial ecosystems. After summarizing the chemistry of elements and their relative abundance in Earth's environment, the authors

proceed along a line of increasing complexity and scale from molecules to cells, individuals, populations, communities, and ecosystems. The book examines fundamental chemical constraints on ecological phenomena such as competition, herbivory, symbiosis, energy flow in food webs, and organic matter sequestration. In accessible prose and with clear mathematical models, the authors show how ecological stoichiometry can illuminate diverse fields of study, from metabolism to global change. Set to be a classic in the field, *Ecological Stoichiometry* is an indispensable resource for researchers, instructors, and students of ecology, evolution, physiology, and biogeochemistry. From the foreword by Peter Vitousek: "[T]his book represents a significant milestone in the history of ecology. . . . Love it or argue with it--and I do both--most ecologists will be influenced by the framework developed in this book. . . . There are points to question here, and many more to test . . . And if we are both lucky and good, this questioning and testing will advance our field beyond the level achieved in this book. I can't wait to get on with it."

## **Overshoot**

*Methods in Stream Ecology, Second Edition*, provides a complete series of field and laboratory protocols in stream ecology that are ideal for teaching or conducting research. This updated edition reflects recent advances in the technology associated with ecological assessment of streams, including remote sensing. In addition, the relationship between stream flow and alluviation has been added, and a new chapter on riparian zones is also included. The book features exercises in each chapter; detailed instructions, illustrations, formulae, and data sheets for in-field research for students; and taxonomic keys to common stream invertebrates and algae. With a student-friendly price, this book is key for all students and researchers in stream and freshwater ecology, freshwater biology, marine ecology, and river ecology. This text is also supportive as a supplementary text for courses in watershed ecology/science, hydrology, fluvial geomorphology, and landscape ecology. Exercises in each chapter Detailed instructions, illustrations, formulae, and data sheets for in-field research for students Taxonomic keys to common stream invertebrates and algae Link from Chapter 22: FISH COMMUNITY COMPOSITION to an interactive program for assessing and modeling fish numbers

## **A Critique for Ecology**

Presents a critical yet optimistic view of contemporary ecology.

## **Geographical Ecology**

Assembled here for the first time in one volume are forty classic papers that have laid the foundations of modern ecology. Whether by posing new problems, demonstrating important effects, or stimulating new research, these papers have made substantial contributions to an understanding of ecological processes, and they continue to influence the field today. The papers span nearly nine decades of ecological research, from 1887 on, and are organized in six sections: foundational papers, theoretical advances, synthetic statements, methodological developments, field studies, and ecological experiments. Selections range from Connell's elegant

account of experiments with barnacles to Watt's encyclopedic natural history, from a visionary exposition by Grinnell of the concept of niche to a seminal essay by Hutchinson on diversity. Six original essays by contemporary ecologists and a historian of ecology place the selections in context and discuss their continued relevance to current research. This combination of classic papers and fresh commentaries makes *Foundations of Ecology* both a convenient reference to papers often cited today and an essential guide to the intellectual and conceptual roots of the field. Published with the Ecological Society of America.

## **Modeling Nature**

Examine possibilities for city-wide green roof development using 335 color photographs, 40 in-depth building case studies, and 7 municipal case studies of Berlin, Tokyo, London, Portland, Chicago, Toronto, and New York. This book includes an opening essay by William McDonough, an architect and leader of the sustainable development movement, and details the ecological benefits, technical requirements, architectural history, and design possibilities of vegetated rooftops.

## **Nature's Economy**

Although anthropologists and cultural geographers have explored "place" in various senses, little cross-cultural examination of "kinds of place," or ecotopes, has been presented from an ethno-ecological perspective. In this volume, indigenous and local understandings of landscape are investigated in order to better understand how human communities relate to their terrestrial and aquatic resources. The contributors go beyond the traditional ecological knowledge (TEK) literature and offer valuable insights on ecology and on land and resources management, emphasizing the perception of landscape above the level of species and their folk classification. Focusing on the ways traditional people perceive and manage land and biotic resources within diverse regional and cultural settings, the contributors address theoretical issues and present case studies from North America, Mexico, Amazonia, tropical Asia, Africa and Europe.

## **Law and Ecology**

Global temperatures and seawater levels rise; the world's smallest porpoise species looms at the edge of extinction; and a tiny emerald beetle from Japan flourishes in North America—but why does it matter? Who cares? With this concise, accessible, and up-to-date book, Charles J. Krebs answers critics and enlightens students and environmental advocates alike, revealing not why phenomena like these deserve our attention, but why they demand it. Highlighting key principles in ecology—from species extinction to the sun's role in powering ecosystems—each chapter introduces a general question, illustrates that question with real-world examples, and links it to pressing ecological issues in which humans play a central role, such as the spread of invasive species, climate change, overfishing, and biodiversity conservation. While other introductions to ecology are rooted in complex theory, math, or practice and relegate discussions of human environmental impacts and their societal implications to sidebars and appendices, *Why Ecology Matters* interweaves these important discussions throughout. It is a

book rooted in our contemporary world, delving into ecological issues that are perennial, timeless, but could not be more timely.

## **Chance and Change**

The global ecological crisis is the greatest challenge humanity has ever had to confront, and humanity is failing. The triumph of the neo-liberal agenda, together with a debauched 'scientism', has reduced nature and people to nothing but raw materials, instruments and consumers to be efficiently managed in a global market dominated by corporate managers, media moguls and technocrats. The arts and the humanities have been devalued, genuine science has been crippled, and the quest for autonomy and democracy undermined. The resultant trajectory towards global ecological destruction appears inexorable, and neither governments nor environmental movements have significantly altered this, or indeed, seem able to. The Philosophical Foundations of Ecological Civilization is a wide-ranging and scholarly analysis of this failure. This book reframes the dynamics of the debate beyond the discourses of economics, politics and techno-science. Reviving natural philosophy to align science with the humanities, it offers the categories required to reform our modes of existence and our institutions so that we augment, rather than undermine, the life of the ecosystems of which we are part. From this philosophical foundation, the author puts forth a manifesto for transforming our culture into one which could provide an effective global environmental movement and provide the foundations for a global ecological civilization.

## **Foundations of Paleoecology**

In 1970 Earth Day was first celebrated marking the dawn of worldwide environmental consciousness and the passing of many environmental laws. In part, these events were the result of the maturing of the science of ecology which recognized the interdependence of the web and cycles of nature. This volume explores the relationship between ecology and environmental law, beginning with a description of the two very different disciplines. This description is followed by a history of their episodic interactions: the early period of origin, the mid-century formative period from 1950 to 1970, the initial serious period of interaction after Earth Day in 1970 and the testing of the relationship during the next two decades. Utilizing a number of case studies, examinations of the key 'linkage persons', legal instruments and the migration of ecological concepts and frameworks, this book analyzes the final flowering of an ecosystem regime which embraces the connections between the two disciplines of ecology and environmental law. Concluding with an inventory of the problems posed by the relationship between the two disciplines and an agenda for future research, this clearly structured, comprehensive and stringent book is an essential resource for all serious scholars and students of ecology and environmental law.

## **Foundation Papers in Landscape Ecology**

The first book-length exploration of behavioral mechanisms in evolutionary ecology, this ambitious volume illuminates long-standing questions about cause-and-effect relations between an animal's behavior and its environment. By

focusing on biological mechanisms—the sum of an animal's cognitive, neural, developmental, and hormonal processes—leading researchers demonstrate how the integrated study of animal physiology, cognitive processes, and social interaction can yield an enriched understanding of behavior. With studies of species ranging from insects to primates, the contributors examine how various animals identify and use environmental resources and deal with ecological constraints, as well as the roles of learning, communication, and cognitive aspects of social interaction in behavioral evolution. Taken together, the chapters demonstrate how the study of internal mechanistic foundations of behavior in relation to their ecological and evolutionary contexts and outcomes provides valuable insight into such behaviors as predation, mating, and dispersal. Behavioral Mechanisms in Evolutionary Ecology shows how a mechanistic approach unites various levels of biological organization to provide a broader understanding of the biological bases of behavioral evolution.

## **Laws, Theories, and Patterns in Ecology**

Despite claims to the contrary, the science of ecology has a long history of building theories. Many ecological theories are mathematical, computational, or statistical, though, and rarely have attempts been made to organize or extrapolate these models into broader theories. The Theory of Ecology brings together some of the most respected and creative theoretical ecologists of this era to advance a comprehensive, conceptual articulation of ecological theories. The contributors cover a wide range of topics, from ecological niche theory to population dynamic theory to island biogeography theory. Collectively, the chapters ably demonstrate how theory in ecology accounts for observations about the natural world and how models provide predictive understandings. It organizes these models into constitutive domains that highlight the strengths and weaknesses of ecological understanding. This book is a milestone in ecological theory and is certain to motivate future empirical and theoretical work in one of the most exciting and active domains of the life sciences.

## **Community Ecology**

Why do species live where they live? What determines the abundance and diversity of species in a given area? What role do species play in the functioning of entire ecosystems? All of these questions share a single core concept—the ecological niche. Although the niche concept has fallen into disfavor among ecologists in recent years, Jonathan M. Chase and Mathew A. Leibold argue that the niche is an ideal tool with which to unify disparate research and theoretical approaches in contemporary ecology. Chase and Leibold define the niche as including both what an organism needs from its environment and how that organism's activities shape its environment. Drawing on the theory of consumer-resource interactions, as well as its graphical analysis, they develop a framework for understanding niches that is flexible enough to include a variety of small- and large-scale processes, from resource competition, predation, and stress to community structure, biodiversity, and ecosystem function. Chase and Leibold's synthetic approach will interest ecologists from a wide range of subdisciplines.

## **The Theory of Ecology**

Introduction to Population Ecology, 2nd Edition is a comprehensive textbook covering all aspects of population ecology. It uses a wide variety of field and laboratory examples, botanical to zoological, from the tropics to the tundra, to illustrate the fundamental laws of population ecology. Controversies in population ecology are brought fully up to date in this edition, with many brand new and revised examples and data. Each chapter provides an overview of how population theory has developed, followed by descriptions of laboratory and field studies that have been inspired by the theory. Topics explored include single-species population growth and self-limitation, life histories, metapopulations and a wide range of interspecific interactions including competition, mutualism, parasite-host, predator-prey and plant-herbivore. An additional final chapter, new for the second edition, considers multi-trophic and other complex interactions among species. Throughout the book, the mathematics involved is explained with a step-by-step approach, and graphs and other visual aids are used to present a clear illustration of how the models work. Such features make this an accessible introduction to population ecology; essential reading for undergraduate and graduate students taking courses in population ecology, applied ecology, conservation ecology, and conservation biology, including those with little mathematical experience.

## **The Population Ecology of Interest Representation**

Foundations of Tropical Forest Biology presents a timely collection of pioneering work in the study of these diverse and fascinating ecosystems. Modeled on the highly successful Foundations of Ecology, this book consists of facsimiles of papers chosen by world experts in tropical biology as the "classics" in the field. The papers are organized into sections on related topics, each introduced with a discussion of their role in triggering subsequent research. Topics covered include ecological and evolutionary perspectives on the origins of tropical diversity; plant-animal interactions; patterns of species diversity and distribution of arthropods, vertebrates, and plants; forest dynamics and ecosystem ecology; conservation biology; and tropical forest management. Foundations of Tropical Forest Biology makes essential works in the development of tropical biology available in a convenient form to both senior scholars interested in the roots of their discipline and to students encountering the field for the first time, as well as to everyone concerned with tropical conservation.

## **Sensitivity Analysis: Matrix Methods in Demography and Ecology**

The Natural Communities of Georgia presents a comprehensive overview of the state's natural landscapes, providing an ecological context to enhance understanding of this region's natural history. Georgia boasts an impressive range of natural communities, assemblages of interacting species that have either been minimally impacted by modern human activities or have successfully recovered from them. This guide makes the case that identifying these distinctive communities and the factors that determine their distribution are central to understanding Georgia's ecological diversity and the steps necessary for its

conservation. Within Georgia's five major ecoregions the editors identify and describe a total of sixty-six natural communities, such as the expansive salt marshes of the barrier islands in the Maritime ecoregion, the fire-driven longleaf pine woodlands of the Coastal Plain, the beautiful granite outcrops of the Piedmont, the rare prairies of the Ridge and Valley, and the diverse coves of the Blue Ridge. With contributions from scientists who have managed, researched, and written about Georgia landscapes for decades, the guide features more than four hundred color photographs that reveal the stunning natural beauty and diversity of the state. The book also explores conservation issues, including rare or declining species, current and future threats to specific areas, and research needs, and provides land management strategies for preserving, restoring, and maintaining biotic communities. *The Natural Communities of Georgia* is an essential reference for ecologists and other scientists, as well as a rich resource for Georgians interested in the region's natural heritage.

## **The Philosophical Foundations of Ecological Civilization**

The first history of population ecology traces two generations of science and scientists from the opening of the twentieth century through 1970. Kingsland chronicles the careers of key figures and the field's theoretical, empirical, and institutional development, with special attention to tensions between the descriptive studies of field biologists and later mathematical models. This second edition includes a new afterword that brings the book up to date, with special attention to the rise of "the new natural history" and debates about ecology's future as a large-scale scientific enterprise.

## **Foundations of Restoration Ecology**

A plethora of different theories, models, and concepts make up the field of community ecology. Amid this vast body of work, is it possible to build one general theory of ecological communities? What other scientific areas might serve as a guiding framework? As it turns out, the core focus of community ecology—understanding patterns of diversity and composition of biological variants across space and time—is shared by evolutionary biology and its very coherent conceptual framework, population genetics theory. *The Theory of Ecological Communities* takes this as a starting point to pull together community ecology's various perspectives into a more unified whole. Mark Vellend builds a theory of ecological communities based on four overarching processes: selection among species, drift, dispersal, and speciation. These are analogues of the four central processes in population genetics theory—selection within species, drift, gene flow, and mutation—and together they subsume almost all of the many dozens of more specific models built to describe the dynamics of communities of interacting species. The result is a theory that allows the effects of many low-level processes, such as competition, facilitation, predation, disturbance, stress, succession, colonization, and local extinction to be understood as the underpinnings of high-level processes with widely applicable consequences for ecological communities. Reframing the numerous existing ideas in community ecology, *The Theory of Ecological Communities* provides a new way for thinking about biological composition and diversity.

## **Foundations of Tropical Forest Biology**

This examination of lobbying communities explores how interest group populations are constructed and how they influence politics and public policy. By examining how populations of interest groups are comprised, this work fills an important gap between existing theories of the origins of individual interest groups and studies of interest group influence. The population ecology model of interest communities developed here builds on insights first developed in population biology and later employed by organizational ecologists. The model's central premise is that it is the environmental forces confronting interest organizations that most directly shape the contours of interest populations. After examining the demography of interest organizations in the fifty American states, the population ecology model is used to account for variations in the density and diversity of their interest communities, the nature of competition among similar interest organizations to establish viable niches, and the impact of alternative configurations of interest communities on the legislative process and the policies it produces. These empirical findings suggest that the environment of interest communities is highly constraining, limiting their size, composition, and potential impact on politics. Virginia Gray is Professor of Political Science, University of Minnesota. David Lowery is Burton Craige Professor of Political Science, University of North Carolina at Chapel Hill.

## **The Theory of Ecological Communities (MPB-57)**

Our day-to-day experiences over the past decade have taught us that there must be limits to our tremendous appetite for energy, natural resources, and consumer goods. Even utility and oil companies now promote conservation in the face of demands for dwindling energy reserves. And for years some biologists have warned us of the direct correlation between scarcity and population growth. These scientists see an appalling future riding the tidal wave of a worldwide growth of population and technology. A calm but unflinching realist, Catton suggests that we cannot stop this wave - for we have already overshot the Earth's capacity to support so huge a load. He contradicts those scientists, engineers, and technocrats who continue to write optimistically about energy alternatives. Catton asserts that the technological panaceas proposed by those who would harvest from the seas, harness the winds, and farm the deserts are ignoring the fundamental premise that "the principals of ecology apply to all living things." These principles tell us that, within a finite system, economic expansion is not irreversible and population growth cannot continue indefinitely. If we disregard these facts, our sagging American Dream will soon shatter completely.

## **Ecosystem-Based Management for the Oceans**

The editors begin with articles that illuminate the discipline's diverse scientific foundations, such as L.

## **Bayesian Analysis for Population Ecology**

Assembled here for the first time in one volume are forty classic papers that have laid the foundations of modern ecology. Whether by posing new problems,

demonstrating important effects, or stimulating new research, these papers have made substantial contributions to an understanding of ecological processes, and they continue to influence the field today. The papers span nearly nine decades of ecological research, from 1887 on, and are organized in six sections: foundational papers, theoretical advances, synthetic statements, methodological developments, field studies, and ecological experiments. Selections range from Connell's elegant account of experiments with barnacles to Watt's encyclopedic natural history, from a visionary exposition by Grinnell of the concept of niche to a seminal essay by Hutchinson on diversity. Six original essays by contemporary ecologists and a historian of ecology place the selections in context and discuss their continued relevance to current research. This combination of classic papers and fresh commentaries makes *Foundations of Ecology* both a convenient reference to papers often cited today and an essential guide to the intellectual and conceptual roots of the field. Published with the Ecological Society of America.

## **Landscape Ethnoecology**

Macroecology is an approach to science that emphasizes the description and explanation of patterns and processes at large spatial and temporal scales. Some scientists liken it to seeing the forest through the trees, giving the proverbial phrase an ecological twist. The term itself was first introduced to the modern literature by James H. Brown and Brian A. Maurer in a 1989 paper, and it is Brown's classic 1995 study, *Macroecology*, that is credited with inspiring the broad-scale subfield of ecology. But as with all subfields, many modern-day elements of macroecology are implicit in earlier works dating back decades, even centuries. *Foundations of Macroecology* charts the evolutionary trajectory of these concepts—from the species-area relationship and the latitudinal gradient of species richness to the relationship between body size and metabolic rate—through forty-six landmark papers originally published between 1920 and 1998. Divided into two parts—"Macroecology before Macroecology" and "Dimensions of Macroecology"—the collection also takes the long view, with each paper accompanied by an original commentary from a contemporary expert in the field that places it in a broader context and explains its foundational role. Providing a solid, coherent assessment of the history, current state, and potential future of the field, *Foundations of Macroecology* will be an essential text for students and teachers of ecology alike.

## **Foundations of Animal Behavior**

Species diversity is marked by some interesting facts--such as larger areas have more species, and diversity is particularly high near the equator. Other factors to consider are what reduces diversity in ecologically productive places and across what scales of space and time diversity patterns hold. This book examines these questions and many others, the author employing both theory and data in his search for answers. Surprisingly, many of the questions have reasonably likely answers. By identifying these, attention can be turned toward life's many still-unexplained diversity patterns. As evolutionary ecologists race to understand biodiversity before it is too late, this book will help set the agenda for diversity research into the next century and will be useful to graduate students and researchers in ecology and evolutionary and conservation biology.

## **Species Diversity in Space and Time**

"Physics and chemistry are distinguished from biology by the way generalizations are codified into theories tested by observation and experimentation. This work enumerates generalizations in ecology. It describes how the practice of science, in general, and ecology specifically, yields theories and laws." -- BOOK PUBLISHER WEBSITE.

## **Why Ecology Matters**

Beginning with Darwin's work in the 1870s, *Foundations of Animal Behavior* selects the most important works from the discipline's first hundred years—forty-four classic papers—and presents them in facsimile, tracing the development of the field. These papers are classics because they either founded a line of investigation, established a basic method, or provided a new approach to an important research question. The papers are divided into six sections, each introduced by prominent researchers. Sections one and two cover the origins and history of the field and the emergence of basic methods and approaches. They provide a background for sections three through six, which focus on development and learning; neural and hormonal mechanisms of behavior; sensory processes, orientation, and communication; and the evolution of behavior. This outstanding collection will serve as the basis for undergraduate and graduate seminars and as a reference for researchers in animal behavior, whether they focus on ethology, behavioral ecology, comparative psychology, or anthropology. Published in association with the Animal Behavior Society

## **Ecological Stoichiometry**

*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 identify 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*.

## **Introduction to Population Ecology**

## **Green Roofs**

This open access book shows how to use sensitivity analysis in demography. It presents new methods for individuals, cohorts, and populations, with applications

to humans, other animals, and plants. The analyses are based on matrix formulations of age-classified, stage-classified, and multistate population models. Methods are presented for linear and nonlinear, deterministic and stochastic, and time-invariant and time-varying cases. Readers will discover results on the sensitivity of statistics of longevity, life disparity, occupancy times, the net reproductive rate, and statistics of Markov chain models in demography. They will also see applications of sensitivity analysis to population growth rates, stable population structures, reproductive value, equilibria under immigration and nonlinearity, and population cycles. Individual stochasticity is a theme throughout, with a focus that goes beyond expected values to include variances in demographic outcomes. The calculations are easily and accurately implemented in matrix-oriented programming languages such as Matlab or R. Sensitivity analysis will help readers create models to predict the effect of future changes, to evaluate policy effects, and to identify possible evolutionary responses to the environment. Complete with many examples of the application, the book will be of interest to researchers and graduate students in human demography and population biology. The material will also appeal to those in mathematical biology and applied mathematics.

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