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Population Ecology in Practice Cambridge University Press

How did rodent outbreaks in Germany help to end World War I? What caused the destructive outbreak of rodents in Oregon and California in the late 1950s, the large population outbreak of lemmings in Scandinavia in 2010, and the great abundance of field mice in Scotland in the spring of 2011? Population fluctuations, or outbreaks, of rodents constitute one of the classic problems of animal ecology, and in *Population Fluctuations in Rodents*, Charles J. Krebs sifts through the last eighty years of research to draw out exactly what we know about rodent outbreaks and what should be the agenda for future research. Krebs has synthesized the research in this area, focusing mainly on the voles and lemmings of the Northern Hemisphere—his primary area of expertise—but also referring to the literature on rats and mice. He covers the patterns of changes in reproduction and mortality and the mechanisms that cause these changes—including predation, disease, food shortage, and social behavior—and discusses how landscapes can affect population changes, methodically presenting the hypotheses related to each topic before determining whether or not the data supports them. He ends on an expansive note, by turning his gaze outward and discussing how the research on rodent populations can apply to other terrestrial mammals. Geared toward advanced undergraduate students, graduate students, and practicing ecologists interested in rodent population studies, this book will also appeal to researchers seeking to manage rodent populations and to understand outbreaks in both natural and urban settings—or, conversely, to protect endangered species.

Ecology John Wiley & Sons

""à required reading for anyone interested in the economy, ecology, and demography of human societies."" --*American Journal of Human Biology* ""This excellent book can serve both as a text¼book and as a scholarly reference."" --*American Scientist*

The Message of Ecology Cambridge University Press

This book brings together a set of approaches to the study of individual-species ecology based on the analysis of spatial variations of abundance. Distribution ecology assumes that ecological phenomena can be understood when analyzing the extrinsic (environmental) or intrinsic (physiological constraints, population mechanisms) that correlate with this spatial variation. Ecological processes depend on geographical scales, so their analysis requires following environmental heterogeneity. At small scales, the effects of biotic factors of ecosystems are strong, while at large scales, abiotic factors such as climate, govern ecological functioning. Responses of organisms also depend on scales: at small scales, adaptations dominate, i.e. the ability of organisms to respond adaptively using habitat decision rules that maximize their fitness; at large scales, limiting traits dominate, i.e., tolerance ranges to environmental conditions.

Experiments in Ecology John Wiley & Sons

Evolutionary Behavioral Ecology presents a comprehensive treatment of the evolutionary 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.

Complex Ecology John Wiley & Sons

Fleas are one of the most interesting and fascinating taxa of ectoparasites. All species in this relatively small order are obligatory haematophagous (blood-feeding) parasites of higher vertebrates. This book examines how functional, ecological and evolutionary patterns and processes of host-parasite relationships are realized in this particular system. As such it provides an in-depth case study of a host-parasite system, demonstrating how fleas can be used as a model taxon for testing ecological and evolutionary hypotheses. The book moves from basic descriptive aspects, to functional issues and finally to evolutionary explanations. It extracts several general principles that apply equally well to other host-parasite systems, so it appeals not only to flea biologists but also to 'mainstream' parasitologists and ecologists.

Enterprising Nature Benjamin-Cummings Publishing Company

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.

Ecological Orbits Oxford University Press on Demand

Ecology has long been shaped by ideas that stress the sharing of resources and the competition for those resources, and by the assumption that populations and communities typically exist under equilibrium conditions in habitats saturated with both individuals and species. However, much evidence contradicts these assumptions and it is likely that nonequilibrium is much more widespread than might be expected. This book is unique in focusing on nonequilibrium aspects of ecology, providing evidence for nonequilibrium and equilibrium in populations (and metapopulations), in extant communities and in ecological systems over evolutionary time, including nonequilibrium due to recent and present mass extinctions. The assumption that competition is of overriding importance is central to equilibrium ecology, and much space is devoted to its discussion.

As communities of some taxa appear to be shaped more by competition than others, an attempt is made to find an explanation for these differences.

Ecology and Conservation of Lynx in the United States Springer Science & Business Media

The third edition of this successful textbook looks again at the influence of natural selection on behavior - an animal's struggle to survive by exploiting resources, avoiding predators, and maximizing reproductive success. In this edition, new examples are introduced throughout, many illustrated with full color photographs. In addition, important new topics are added including the latest techniques of comparative analysis, the theory and application of DNA fingerprinting techniques, extensive new discussion on brood parasite/host coevolution, the latest ideas on sexual selection in relation to disease resistance, and a new section on the intentionality of communication. Written in the lucid style for which these two authors are renowned, the text is enhanced by boxed sections illustrating important concepts and new marginal notes that guide the reader through the text. This book will be essential reading for students taking courses in behavioral ecology. The leading introductory text from the two most prominent workers in the field. Second colour in the text. New section of four colour plates. Boxed sections to illustrate difficult and important points. New larger format with marginal notes to guide the reader through the text. Selected further reading at the end of each chapter.

Ecosystem Dynamics of the Boreal Forest Princeton University Press

Foraging is fundamental to animal survival and reproduction, yet it is much more than a simple matter of finding food; it is a biological imperative. Animals must find and consume resources to succeed, and they make extraordinary efforts to do so. For instance, pythons rarely eat, but when they do, their meals are large—as much as 60 percent larger than their own bodies. The snake's digestive system is normally dormant, but during digestion metabolic rates can increase fortyfold. A python digesting quietly on the forest floor has the metabolic rate of thoroughbred in a dead heat. This and related foraging processes have broad applications in ecology, cognitive science, anthropology, and conservation biology—and they can be further extrapolated in economics, neurobiology, and computer science. Foraging is the first comprehensive review of the topic in more than twenty years. A monumental undertaking, this volume brings together twenty-two experts from throughout the field to offer the latest on the mechanics of foraging, modern foraging theory, and foraging ecology. The fourteen essays cover all the relevant issues, including cognition, individual behavior, caching behavior, parental behavior, antipredator behavior, social behavior, population and community ecology, herbivory, and conservation. Considering a wide range of taxa, from birds to mammals to amphibians, Foraging will be the definitive guide to the field.

Behavioral Mechanisms in Evolutionary Ecology Cambridge University Press

This new textbook fills an important niche by offering a lively overview of the principles of ecology for a broad range of university-level science and biology courses. Written for those who need to understand key ecological concepts but may specialise in other fields, it is filled with many vivid examples of topical issues and current events. The Ecological World View briefly covers the history of ecology and describes the general approach of the scientific method, then takes a wide-ranging look at basic principles of population dynamics and applies them to everyday practical problems. Each chapter clearly presents key concepts and learning objectives, combined with thought-

provoking, open-ended questions to facilitate discussion. Stimulating, appealing and written in non-technical language, this is an essential resource for understanding how the ecological world works.

Distribution Ecology Princeton University Press

A definitive guide to the depth and breadth of the ecological sciences, revised and updated The revised and updated fifth edition of *Ecology: From Individuals to Ecosystems* - now in full colour - offers students and practitioners a review of the ecological sciences. The previous editions of this book earned the authors the prestigious 'Exceptional Life-time Achievement Award' of the British Ecological Society - the aim for the fifth edition is not only to maintain standards but indeed to enhance its coverage of Ecology. In the first edition, 34 years ago, it seemed acceptable for ecologists to hold a comfortable, objective, not to say aloof position, from which the ecological communities around us were simply material for which we sought a scientific understanding. Now, we must accept the immediacy of the many environmental problems that threaten us and the responsibility of ecologists to play their full part in addressing these problems. This fifth edition addresses this challenge, with several chapters devoted entirely to applied topics, and examples of how ecological principles have been applied to problems facing us highlighted throughout the remaining nineteen chapters. Nonetheless, the authors remain wedded to the belief that environmental action can only ever be as sound as the ecological principles on which it is based. Hence, while trying harder than ever to help improve preparedness for addressing the environmental problems of the years ahead, the book remains, in its essence, an exposition of the science of ecology. This new edition incorporates the results from more than a thousand recent studies into a fully up-to-date text. Written for students of ecology, researchers and practitioners, the fifth edition of *Ecology: From Individuals to Ecosystems* is an essential reference to all aspects of ecology and addresses environmental problems of the future.

Foundations of Ecology University of Chicago Press

In many ecosystems dung beetles play a crucial role--both ecologically and economically--in the decomposition of large herbivore dung. Their activities provide scientists with an excellent opportunity to explore biological community dynamics. This collection of essays offers a concise account of the population and community ecology of dung beetles worldwide, with an emphasis on comparisons between arctic, temperate, and tropical species assemblages. Useful insights arise from relating the vast differences in species' life histories to their population and community-level consequences. The authors also discuss changes in dung beetle faunas due to human-caused habitat alteration and examine the possible effects of introducing dung beetles to cattle-breeding areas that lack efficient native species. "With the expansion of cattle breeding areas, the ecology of dung beetles is a subject of great economic concern as well as one of intense theoretical interest. This excellent book represents an up-to-date ecological study covering important aspects of the dung beetle never before presented."--Gonzalo Halffter, Instituto de Ecologia, Mexico City Originally published in 1991. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books

published by Princeton University Press since its founding in 1905.

Dung Beetle Ecology University of Chicago Press

This account of the current state of foraging theory is also a valuable description of the use of optimality theory in behavioral ecology in general. Organizing and introducing the main research themes in economic analyses of animal feeding behavior, the authors analyze the empirical evidence bearing on foraging models and answer criticisms of optimality modeling. They explain the rationale for applying optimality models to the strategies and mechanics of foraging and present the basic "average-rate maximizing" models and their extensions. The work discusses new directions in foraging research: incorporating incomplete information and risk-sensitive behavior in foraging models; analyzing trade-offs, such as nutrient requirements and the threat of being eaten while foraging; formulating dynamic models; and building constrained optimization models that assume that foragers can use only simple "rules of thumb." As an analysis of these and earlier research developments and as a contribution to debates about the role of theory in evolutionary biology. Foraging Theory will appeal to a wide range of readers, from students to research professionals, in behavioral ecology, population and community ecology, animal behavior, and animal psychology, and especially to those planning empirical tests of foraging models.

An Introduction to Behavioural Ecology HarperCollins Publishers

The boreal forest is one of the world's great ecosystems, stretching across North America and Eurasia in an unbroken band and containing about 25% of the world's closed canopy forests. The Kluane Boreal Forest Ecosystem Project was a 10-year study by nine of Canada's leading ecologists to unravel the impact of the snowshoe hare cycle on the plants and the other vertebrate species in the boreal forest. In much of the boreal forest, the snowshoe hare acts as a keystone herbivore, fluctuating in 9-10 year cycles, and dragging along secondary cycles in predators such as lynx and great-horned owls. By manipulating the ecosystem on a large scale from the bottom via fertilizer additions and from the top by predator exclosures, they have traced the plant-herbivore relationships and the predator-prey relationships in this ecosystem to try to answer the question of what drives small mammal population cycles. This study is unique in being large scale and experimental on a relatively simple ecosystem, with the overall goal of defining what determines community structure in the boreal forest. *Ecosystem Dynamics of the Boreal Forest: The Kluane Project* summarizes these findings, weaving new discoveries of the role of herbivores-turned-predators, compensatory plant growth, and predators-eating-predators with an ecological story rich in details and clear in its findings of a community where predation plays a key role in determining the fate of individuals and populations. The study of the Kluane boreal forest raises key questions about the scale of conservation required for boreal forest communities and the many mammals and birds that live there.

Foraging OUP USA

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.

Foraging Theory University of Chicago Press

Once found throughout the Rocky Mountains and forests of the northern states, the lynx now hides in pockets of its former range while feeding mostly on small animals like snowshoe hares. A team of government and university scientists review the newest scientific knowledge of this unique cat's history, distribution, and ecology. The chapters on this web site provide information for current scientific and public debates regarding the fate of the lynx in the United States. Chapters look at the relationships among lynx, its habitat, and its prey. The attributes of northern versus southern lynx populations are compared and contrasted. The authors caution against making decisions without enough knowledge and show where we lack information. While the authors present the latest preliminary research results on lynx and offer some qualified insights into lynx management, the book's intent is to assess the current state of knowledge regarding lynx.

How Species Interact Pearson

Ecologists can spend a lifetime researching a small patch of the earth, studying the interactions between organisms and the environment, and exploring the roles those interactions play in determining distribution, abundance, and evolutionary change. With so few ecologists and so many systems to study, generalizations are essential. But how do you extrapolate knowledge about a well-studied area and apply it elsewhere? Through a range of original essays written by eminent ecologists and naturalists, *The Ecology of Place* explores how place-focused research yields exportable general knowledge as well as practical local knowledge, and how society can facilitate ecological understanding by investing in field sites, place-centered databases, interdisciplinary collaborations, and field-oriented education programs that emphasize natural history. This unique patchwork of case-study narratives, philosophical musings, and historical analyses is tied together with commentaries from editors Ian Billick and Mary Price that develop and synthesize common threads. The result is a unique volume rich with all-too-rare insights into how science is actually done, as told by scientists themselves.

Evolutionary Behavioral Ecology CSIRO PUBLISHING

What is ecology?; Introduction to the science of ecology; The problem of distribution: populations; Methods for analyzing distributions; Factors limiting distributions: dispersal; Factors limiting distributions: behavior, interrelations with other organisms, temperature, moisture, other physical and chemical; The problem of abundance: populations; Population parameters; Demographic techniques; Population growth; Species interactions: competition, predation, herbivory; Natural regulation of population size; Some examples of population studies; Some examples of population studies; Applied problems: 1. the optimum-yield problem, 2. biological control; Distribution and

abundance at the community level; Community parameters; The nature of the community; Community structure; Community change; Species diversity; Community organization; Community metabolism: 1. primary production, 2. secondary production; Nutrient cycles.

Ecology Columbia University Press

This best-selling majors ecology book continues to present ecology as a series of problems for readers to critically analyze. No other text presents analytical, quantitative, and statistical ecological information in an equally accessible style. Reflecting the way ecologists actually practice, the book emphasizes the role of experiments in testing ecological ideas and discusses many contemporary and controversial problems related to distribution and abundance. Throughout the book, Krebs thoroughly explains the application of mathematical concepts in ecology while reinforcing these concepts with research references, examples, and interesting end-of-chapter review questions. Thoroughly updated with new examples and references, the book now features a new full-color design and is accompanied by an art CD-ROM for instructors. The field package also includes The Ecology Action Guide, a guide that encourages readers to be environmentally responsible citizens,

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and a subscription to The Ecology Place (www.ecologyplace.com), a web site and CD-ROM that enables users to become virtual field ecologists by performing experiments such as estimating the number of mice on an imaginary island or restoring prairie land in Iowa. For college instructors and students.

Ecology Oxford University Press, USA

Winner of the 2018 James M. Blaut Award in recognition of innovative scholarship in cultural and political ecology! Enterprising Nature explores the rise of economic rationality in global biodiversity law, policy and science. To view Jessica's animation based on the book's themes please visit <http://www.bioeconomies.org/enterprising-nature/> Examines disciplinary apparatuses, ecological-economic methodologies, computer models, business alliances, and regulatory conditions creating the conditions in which nature can be produced as enterprising Relates lively, firsthand accounts of global processes at work drawn from multi-site research in Nairobi, Kenya; London, England; and Nagoya, Japan Assesses the scientific, technical, geopolitical, economic, and ethical challenges found in attempts to 'enterprise nature' Investigates the implications of this 'will to enterprise' for environmental politics and policy