

Trophic Ecology Bottom Up And Top Down Interactions Across Aquatic And Terrestrial Systems Ecological Reviews

Dynamic Food Webs challenges us to rethink what factors may determine ecological and evolutionary pathways of food web development. It touches upon the intriguing idea that trophic interactions drive patterns and dynamics at different levels of biological organization: dynamics in species composition, dynamics in population life-history parameters and abundances, and dynamics in individual growth, size and behavior. These dynamics are shown to be strongly interrelated governing food web structure and stability and the role of populations and communities play in ecosystem functioning. Dynamic Food Webs not only offers over 100 illustrations, but also contains 8 riveting sections devoted to an understanding of how to manage the effects of environmental change, the protection of biological diversity and the sustainable use of natural resources. Dynamic Food Webs is a volume in the Theoretical Ecology series. Relates dynamics on different levels of biological organization: individuals, populations, and communities Deals with empirical and theoretical approaches Discusses the role of community food webs in ecosystem functioning Proposes methods to assess the effects of environmental change on the structure of biological communities and ecosystem functioning Offers an analyses of the relationship between complexity and stability in food webs

This book is a bridge between ecological paradigms □ organismal/community approaches to food web dynamics and

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ecosystem-level approaches to production. The unification of organismal, community, and ecosystem approaches in ecology is emerging due to the growing availability of new techniques for assessing trophic interactions and their implications for ecosystems. Trophic Ecology is a formal text for both newcomers to the discipline as well as seasoned professionals looking for new ideas and refreshers on old topics. A wide range of topics are explained including autotrophy, heterotrophy, omnivory, decomposition, foraging behavior and theory, trophic cascades, bioenergetics, and production. The audience is upper-level undergraduate students and entry-level graduate students interested in autecological, organismal approaches to ecology, community and ecosystem ecology. It is also a reference text for instructors teaching upper-division courses, providing examples from the literature, quantitative approaches to teach, and new hypotheses yet to be fully tested by ecologists.

This 1993 book documents the importance of trophic cascades in aquatic ecology.

Outlines the ecological fundamentals, assumptions, and techniques for reconstructing past environments using fossil animals from archaeological and paleontological sites.

Principles of Biology

An Integrated Approach

Biology 211, 212, and 213

Yeasts in Natural Ecosystems: Ecology

The Hluhluwe-iMfolozi Park Story

Handbook of Trait-Based Ecology

This book discusses how aquatic microbial communities develop interactive metabolic coordination both within and between species to optimize their energetics. It

explains that microbial community structuration often includes functional stratification among a multitude of organisms that variously exist either suspended in the water, lodged in sediments, or bound to one another as biofilms on solid surfaces. The authors describe techniques that can be used for preparing and distributing microbiologically safe drinking water, which presents the challenge of successfully removing the pathogenic members of the aquatic microbial community and then safely delivering that water to consumers. Drinking water distribution systems have their own microbial ecology, which we must both understand and control in order to maintain the safety of the water supply. Since studying aquatic microorganisms often entails identifying them, the book also discusses techniques for successfully isolating and cultivating bacteria. As such, it appeals to microbiologists, microbial ecologists and water quality scientists. As researchers try to predict the effects of human modification at all trophic levels and mediate the impact of rapid environmental change, it has become clear it is no longer a matter of agreeing that both bottom-up and top-down forces play important roles in

diverse ecosystems. Rather, the question is: how do these forces interact across aquatic and terrestrial systems? Written by leading experts in the field, this book presents a unique synthesis of trophic relationships within and across ecosystems that is a valuable foundation for the development of cross-system, multidisciplinary research. It also provides new insights into population biology and community ecology and examines the interactive effects of bottom-up and top-down forces on biodiversity at each trophic level. A one-stop resource for learning about bottom-up and top-down interactions, this book encourages discussion and collaboration among researchers to identify similarities and differences in trophic interactions across aquatic and terrestrial systems.

Introduces readers to key case studies that illustrate how theory and data can be integrated to understand wildlife disease ecology.

This book explores the complex interactions between plants, their herbivores and natural enemies.

Trophic Ecology

Trophic Cascades

Insights in Biological Capability

Life in Extreme Environments

Food Webs at the Landscape Level

Contaminants and Ecological Subsidies

An ecosystem's complexity develops from the vast numbers of species interacting in ecological communities. The nature of these interactions, in turn, depends on environmental context. How do these components together influence an ecosystem's behavior as a whole? Can ecologists resolve an ecosystem's complexity in order to predict its response to disturbances? *Resolving Ecosystem Complexity* develops a framework for anticipating the ways environmental context determines the functioning of ecosystems. Oswald Schmitz addresses the critical questions of contemporary ecology: How should an ecosystem be conceptualized to blend its biotic and biophysical components? How should evolutionary ecological principles be used to derive an operational understanding of complex, adaptive ecosystems? How should the relationship between the functional biotic diversity of ecosystems and their properties be understood? Schmitz begins with the universal concept that ecosystems are comprised of species that consume resources and which are then resources for other consumers. From this, he deduces a fundamental rule or evolutionary ecological mechanism for explaining context dependency: individuals within a species trade off foraging gains against the risk of being consumed by predators. Through empirical examples, Schmitz illustrates how species use evolutionary ecological strategies to negotiate a predator-eat-predator world, and he suggests that the implications of species trade-offs are critical to making ecology a predictive science. Bridging the traditional divides between individuals, populations, and communities in ecology, *Resolving Ecosystem Complexity* builds a systematic foundation for thinking about natural systems. Discusses the benefits and risks, as well as the economic and socio-political realities, of rewilding as a novel conservation tool. *Biological Control: Global Impacts, Challenges and Future*

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Directions of Pest Management provides a historical summary of organisms and main strategies used in biological control, as well as the key challenges confronting biological control in the 21st century. Biological control has been implemented for millennia, initially practised by growers moving beneficial species from one local area to another. Today, biological control has evolved into a formal science that provides ecosystem services to protect the environment and the resources used by humanity. With contributions from dedicated scientists and practitioners from around the world, this comprehensive book highlights important successes, failures and challenges in biological control efforts. It advocates that biological control must be viewed as a global endeavour and provides suggestions to move practices forward in a changing world. Biological Control is an invaluable resource for conservation specialists, pest management practitioners and those who research invasive species, as well as students studying pest management science.

The theme of this volume is Trait-Based Ecology - From Structure to Function. Advances in Ecological Research is one of the most successful series in the highly competitive field of ecology Each volume publishes topical and important reviews, interpreting ecology as widely as in the past, to include all material that contributes to our understanding of the field Topics in this invaluable series include the physiology, populations, and communities of plants and animals, as well as landscape and ecosystem ecology

The Trophic Cascade in Lakes

From Theory to R Tools

Agricultural Resilience

Why Birds Matter

The Ecological World View

Predator-prey interactions are ubiquitous, govern the flow of energy up trophic levels, and strongly

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influence the structure of ecological systems. They are typically quantified using the functional response - the relationship between a predator's foraging rate and the availability of food. As such, the functional response is central to how all ecological communities function - since all communities contain foragers - and a principal driver of the abundance, diversity, and dynamics of ecological communities. The functional response also reflects all the behaviors, traits, and strategies that predators use to hunt prey and that prey use to evade predation. It is thus both a clear reflection of past evolution, including predator-prey arms races, and a major force driving the future evolution of both predator and prey. Despite their importance, there have been remarkably few attempts to synthesize or even briefly review functional responses. This novel and accessible book fills this gap, clearly demonstrating their crucial role as the link between individuals, evolution, and community properties, representing a highly-integrated and measurable aspect of ecological function. It provides a clear entry point for students, a refresher for more advanced researchers, and a motivator for future research. Predator Ecology is an advanced textbook suitable for graduate students and researchers in ecology and evolutionary biology seeking a broad, up-to-date, and authoritative coverage of the field. It will also be of relevance and use to mathematical

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ecologists, wildlife biologists, and anyone interested in predator-prey interactions.

An insightful guide to understanding conflicts over the conservation of biodiversity and groundbreaking strategies to deal with them.

A diverse account of how life exists in extreme environments and these systems' susceptibility and resilience to climate change.

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

or trophic levels to the functioning of whole ecosystems, placing special emphasis on the relationship between biodiversity and ecosystem functioning. Finally, he turns his attention to the controversial issue of the evolution of entire ecosystems and their properties, laying the theoretical foundations for a genuine evolutionary ecosystem ecology. From Populations to Ecosystems points the way to a much-needed synthesis in ecology, one that offers a fuller understanding of ecosystem processes in the natural world.

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

Ecosystem Collapse and Recovery

Resolving Ecosystem Complexity (MPB-47)

Volume 1: Ecosystem Structure

Keystone Predators, Trophic Cascades, and Biodiversity

Competition and Coexistence

Ecological stoichiometry concerns the way that the elemental composition of organisms shapes their ecology. It deals with the balance or imbalance of elemental ratios and how that affects organism growth, nutrient cycling, and the interactions with the biotic and abiotic worlds. The elemental composition of organisms is a set of constraints through which all the Earth's biogeochemical cycles must pass. All organisms consume nutrients and acquire compounds from the environment

proportional to their needs. Organismal elemental needs are determined in turn by the energy required to live and grow, the physical and chemical constraints of their environment, and their requirements for relatively large polymeric biomolecules such as RNA, DNA, lipids, and proteins, as well as for structural needs including stems, bones, shells, etc. These materials together constitute most of the biomass of living organisms. Although there may be little variability in elemental ratios of many of these biomolecules, changing the proportions of different biomolecules can have important effects on organismal elemental composition. Consequently, the variation in elemental composition both within and across organisms can be tremendous, which has important implications for Earth's biogeochemical cycles. It has been over a decade since the publication of Sterner and Elser's book, *Ecological Stoichiometry* (2002). In the intervening years, hundreds of papers on stoichiometric topics ranging from evolution and regulation of nutrient content in organisms, to the role of stoichiometry in populations, communities, ecosystems and global biogeochemical dynamics have been published. Here, we present a collection of contributions from the broad scientific community to highlight recent insights in the field of Ecological Stoichiometry.

Trophic Ecology Cambridge University Press

This volume explores the effects of aquatic contaminants on ecological subsidies and food web exposure at the boundary of aquatic and terrestrial ecosystems. It provides the first synthesis of the findings and principles governing the "dark side" of

contaminant effects on ecological subsidies. Furthermore, the volume provides extensive coverage of the tools being developed to help managers and researchers better understand the implications of contaminants movement and their effects on natural resources and ecosystem processes. Aquatic and terrestrial ecosystems are linked through movements of energy and nutrients which subsidize recipient food webs. As a result, contaminants that concentrate in aquatic systems because of the effects of gravity on water and organic matter have the potential to impact both aquatic and terrestrial ecosystem processes. Within the last decade, increased attention has been paid to this phenomenon, particularly the effects of aquatic contaminants on resource and contaminant export to terrestrial consumers, and the potential implications for management. This volume, curated and edited by three field leaders, incorporates empirical results, management applications and theoretical synthesis and is a key reference for academics, government researchers and consultants.

The question "Why are there so many species?" has puzzled ecologist for a long time. Initially, an academic question, it has gained practical interest by the recent awareness of global biodiversity loss. Species diversity in local ecosystems has always been discussed in relation to the problem of competitive exclusion and the apparent contradiction between the competitive exclusion principle and the overwhelming richness of species found in nature. Competition as a mechanism structuring ecological communities has never been uncontroversial. Not only its importance but even its existence have been

debated. On the one extreme, some ecologists have taken competition for granted and have used it as an explanation by default if the distribution of a species was more restricted than could be explained by physiology and dispersal history. For decades, competition has been a core mechanism behind popular concepts like ecological niche, succession, limiting similarity, and character displacement, among others. For some, competition has almost become synonymous with the Darwinian "struggle for existence", although simple plausibility should tell us that organisms have to struggle against much more than competitors, e.g. predators, parasites, pathogens, and environmental harshness.

Multispecies Assemblages, Ecosystem Development and Environmental Change

The Structure and Function of Aquatic Microbial Communities

Parasitoids' Ecology and Evolution

Continental Conservation

Adaptive Food Webs

Avian Ecological Function and Ecosystem Services

Offers an interdisciplinary exploration of resilience in agriculture, and implications for producers seeking to adapt to change and uncertainty.

Presenting new approaches to studying food webs, this book uses practical management and policy examples to demonstrate the theory behind ecosystem management decisions and the broader issue of sustainability. All the information that readers need to use food web analyses as a

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tool for understanding and quantifying transition processes is provided.

Advancing the idea of food webs as complex adaptive systems, readers are challenged to rethink how changes in environmental conditions affect these systems. Beginning with the current state of thinking about community organisation, complexity and stability, the book moves on to focus on the traits of organisms, the adaptive nature of communities and their impacts on ecosystem function. The final section of the book addresses the applications to management and sustainability. By helping to understand the complexities of multispecies networks, this book provides insights into the evolution of organisms and the fate of ecosystems in a changing world.

There is a growing concern that many important ecosystems, such as coral reefs and tropical rain forests, might be at risk of sudden collapse as a result of human disturbance. At the same time, efforts to support the recovery of degraded ecosystems are increasing, through approaches such as ecological restoration and rewilding. Given the dependence of human livelihoods on the multiple benefits provided by ecosystems, there is an urgent need to understand the

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situations under which ecosystem collapse can occur, and how ecosystem recovery can best be supported. To help develop this understanding, this volume provides the first scientific account of the ecological mechanisms associated with the collapse of ecosystems and their subsequent recovery. After providing an overview of relevant theory, the text evaluates these ideas in the light of available empirical evidence, by profiling case studies drawn from both contemporary and prehistoric ecosystems. Implications for conservation policy and practice are then examined.

Through a long history of co-evolution, multicellular organisms form a complex of host cells plus many associated microorganism species. Consisting of algae, bacteria, archaea, fungi, protists and viruses, and collectively referred to as the microbiome, these microorganisms contribute to a range of important functions in their hosts, from nutrition, to behaviour and disease susceptibility. In this book, a diverse and international group of active researchers outline how multicellular organisms have become reliant on their microbiomes to function, and explore this vital interdependence across the breadth of soil, plant, animal and human hosts. They draw parallels and

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contrasts across hosts in different environments, and discuss how this invisible microbial ecosystem influences everything from the food we eat, to our health, to the correct functioning of ecosystems we depend on. This insightful read also pertinently encourages students and researchers in microbial ecology, ecology, and microbiology to consider how this interdependence may be key to mitigating environmental changes and developing microbial biotechnology to improve life on Earth.

Rewilding

Microbiomes of Soils, Plants and Animals

The Wolf's Tooth

Conflicts in Conservation

Marine Ecosystems and Global Change

The Lake Charr *Salvelinus namaycush*:

Biology, Ecology, Distribution, and

Management

Global changes, including climate change and intensive fishing, are having significant impacts on the world's oceans. This book advances knowledge of the structure and functioning of marine ecosystems and their major sub-systems, and how they respond to physical forcing.

Methods in Stream Ecology provides a complete series of field and laboratory

protocols in stream ecology that are ideal for teaching or conducting research. This two part new edition is updated to reflect recent advances in the technology associated with ecological assessment of streams, including remote sensing. Volume focusses on ecosystem structure with in-depth sections on Physical Processes, Material Storage and Transport and Stream Biota. With a student-friendly price, this Third Edition 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. Provides a variety of exercises in each chapter Includes detailed instructions, illustrations, formulae, and data sheets for in-field research for students Presents taxonomic keys to common stream invertebrates and algae Includes website with tables and a link from Chapter 22: FISH COMMUNITY COMPOSITION to an interactive program for assessing and modeling fish numbers Written by leading experts in stream ecology

The Principles of Biology sequence (BI 211, 212 and 213) introduces biology as a

scientific discipline for students planning to major in biology and other science disciplines. Laboratories and classroom activities introduce techniques used to study biological processes and provide opportunities for students to develop their ability to conduct research.

Filled with many examples of topic issues and current events, this book develops a basic understanding of how the natural world works and of how humans interact with the planet's natural ecosystems. It covers the history of ecology and describes the general approaches of the scientific method, then takes a look at basic principles of population dynamics and applies them to everyday practical problems.

Global Impacts, Challenges and Future Directions of Pest Management

The Phytochemical Landscape

Trait-Based Ecology - From Structure to Function

The Land-Water Interface

Linking Trophic Interactions and Nutrient Dynamics

Scientific Foundations of Regional Reserve Networks

From an Antagonistic to a Synergistic Predator Prey Perspective: Bifurcations in Marine Ecosystems is a groundbreaking reference that

challenges the widespread perception that predators generally have a negative impact on the abundance of their prey, and it proposes a novel paradigm — Predator-prey Synergism — in which both predator and prey enhance abundance by their co-existence. Using this model, the text explains a number of issues that appear paradoxical in the case of a negative predator-prey relationship, including observed ecosystem bifurcations (regime shifts), ecosystem resilience, red tides in apparently nutrient depleted water, and the dominance of grazed phytoplankton over non-grazed species under high grazing pressure. This novel paradigm can also be used to predict the potential impact of global warming on marine ecosystems, identify how marine ecosystem may respond to gradual environmental changes, and develop possible measures to mitigate the negative impact of increasing temperature in marine ecosystems. This book approaches the long-standing question of what generates recruitment variability in marine fishes and invertebrates in an engaging and unique way that students and researchers in marine ecosystems will understand. Introduces a new paradigm, Predator-prey Synergism, as a building block on which to construct new ecological theories. It suggests that Predator-prey Synergism is important in some terrestrial ecosystems and is in agreement with the punctuated equilibria theory of evolution (i.e., stepwise evolution). Suggests a general solution to the recruitment puzzle in marine organisms

Proposes a holistic hypothesis for marine spring blooming ecosystems by considering variability enhancing and variability dampening processes Asserts that fisheries will induce variability in marine ecosystems and alter the energy flow patterns in predictable ways

For over one hundred years, ornithologists and amateur birders have jointly campaigned for the conservation of bird species, documenting not only birds' beauty and extraordinary diversity, but also their importance to ecosystems worldwide. But while these avian enthusiasts have noted that birds eat fruit, carrion, and pests; spread seed and fertilizer; and pollinate plants, among other services, they have rarely asked what birds are worth in economic terms. In *Why Birds Matter*, an international collection of ornithologists, botanists, ecologists, conservation biologists, and environmental economists seeks to quantify avian ecosystem services—the myriad benefits that birds provide to humans. The first book to approach ecosystem services from an ornithological perspective, *Why Birds Matter* asks what economic value we can ascribe to those services, if any, and how this value should inform conservation. Chapters explore the role of birds in such important ecological dynamics as scavenging, nutrient cycling, food chains, and plant-animal interactions—all seen through the lens of human well-being—to show that quantifying avian ecosystem services is crucial when formulating contemporary conservation strategies. Both elucidating challenges and

providing examples of specific ecosystem valuations and guidance for calculation, the contributors propose that in order to advance avian conservation, we need to appeal not only to hearts and minds, but also to wallets.

Functional ecology is the branch of ecology that focuses on various functions that species play in the community or ecosystem in which they occur. This accessible guide offers the main concepts and tools in trait-based ecology, and their tricks, covering different trophic levels and organism types. It is designed for students, researchers and practitioners who wish to get a handy synthesis of existing concepts, tools and trends in trait-based ecology, and wish to apply it to their own field of interest. Where relevant, exercises specifically designed to be run in R are included, along with accompanying on-line resources including solutions for exercises and R functions, and updates reflecting current developments in this fast-changing field. Based on more than a decade of teaching experience, the authors developed and improved the way theoretical aspects and analytical tools of trait-based ecology are introduced and explained to readers.

Continental Conservation provides conservationists and biologists with the latest scientific principles for protecting living nature at spatial scales that encompass entire regions and continents. Continental Conservation is an important guide book that can serve a vital role in helping fashion a radically honest scientifically rigorous land-use agenda. It will

be required reading for scientists and professionals at all levels involved with ecosystem and land management.

From an Antagonistic to a Synergistic Predator Prey Perspective

From Populations to Ecosystems

Conserving Africa's Mega-Diversity in the Anthropocene

Fundamentals, Assumptions, Techniques

Wildlife Disease Ecology

Bottom-Up and Top-Down Interactions across Aquatic and Terrestrial Systems

Scientists rely on food webs—complex networks that trace the flow of nutrients and energy between species and through ecosystems—to understand the infrastructure of ecological communities. But given the complexities of food webs—think of following the flow of nutrients through the microbes, fungi, roots, worms, ants, and birds that pass over or through a single cubic meter of prairie soil—it's not difficult to see why most experiments on food-web dynamics focus on small, local habitats. Yet as this book convincingly shows, important insights come when scientists expand the temporal and spatial scope of their research to look at the ways energy, organisms, nutrients, and pollutants flow not just at the local level, but across whole landscapes—between and among food webs in a wide variety of habitats. Paying special attention to the fertile boundaries between terrestrial, freshwater, and marine

ecosystems, Food Webs at the Landscape Level not only shows what this new methodology means for ecology, conservation, and agriculture but also serves as a fitting tribute to Gary Polis and his major contributions to the field.

Looks at the role wolves and other predators have in regulating ecosystems.

Trophic cascades—the top-down regulation of ecosystems by predators—are an essential aspect of ecosystem function and well-being. Trophic cascades are often drastically disrupted by human interventions—for example, when wolves and cougars are removed, allowing deer and beaver to become destructive—yet have only recently begun to be considered in the development of conservation and management strategies. Trophic Cascades is the first comprehensive presentation of the science on this subject. It brings together some of the world's leading scientists and researchers to explain the importance of large animals in regulating ecosystems, and to relate that scientific knowledge to practical conservation. Chapters examine trophic cascades across the world's major biomes, including intertidal habitats, coastal oceans, lakes, nearshore ecosystems, open oceans, tropical forests, boreal and temperate ecosystems, low arctic scrubland, savannas, and islands. Additional chapters consider aboveground/belowground linkages, predation and ecosystem processes, consumer control by

megafauna and fire, and alternative states in ecosystems. An introductory chapter offers a concise overview of trophic cascades, while concluding chapters consider theoretical perspectives and comparative issues. Trophic Cascades provides a scientific basis and justification for the idea that large predators and top-down forcing must be considered in conservation strategies, alongside factors such as habitat preservation and invasive species. It is a groundbreaking work for scientists and managers involved with biodiversity conservation and protection.

Examining the interaction of bottom-up and top-down forces, it presents a unique synthesis of trophic interactions within and across ecosystems.

Linking Theory to Data and Application

Evolutionary Ecology of the Functional Response

Paleozoology and Paleoenvironments

Predators, Prey, and the Changing Dynamics of Nature

Predator Ecology

Dynamic Food Webs

The dazzling variation in plant chemistry is a primary mediator of trophic interactions, including herbivory, predation, parasitism, and disease. At the same time, such interactions feed back to influence spatial and temporal variation in the chemistry of plants. In this book, Mark Hunter provides a novel approach to linking the trophic interactions of organisms with the cycling of nutrients in ecosystems. Hunter introduces the concept of the

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"phytochemical landscape"—the shifting spatial and temporal mosaic of plant chemistry that serves as the nexus between trophic interactions and nutrient dynamics. He shows how plant chemistry is both a cause and consequence of trophic interactions, and how it also mediates ecosystem processes such as nutrient cycling. Nutrients and organic molecules in plant tissues affect decomposition rates and the fluxes of elements such as carbon, nitrogen, and phosphorus. The availability of these same nutrients influences the chemistry of cells and tissues that plants produce. In combination, these feedback routes generate pathways by which trophic interactions influence nutrient dynamics and vice versa, mediated through plant chemistry. Hunter provides evidence from terrestrial and aquatic systems for each of these pathways, and describes how a focus on the phytochemical landscape enables us to better understand and manage the ecosystems in which we live. Essential reading for students and researchers alike, this book offers an integrated approach to population-, community-, and ecosystem-level ecological processes.

Centring on South Africa's Hluhluwe-iMfolozi Park, this book synthesizes a century of insights from the ecology and conservation management of one of Africa's oldest protected wildlife areas. The park provides important lessons for conservation management, as it has maintained conservation values rivalling those of much larger parks sometimes through, and sometimes despite, strong management interventions, including the rescue of the white rhino from extinction. In addition, the book highlights the ecological science produced in the park, much of which has become widely influential, including the megaherbivore concept, new functional approaches to understanding biomes, and new understandings about the role of

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consumers in shaping ecosystems. The volume is ideal for researchers and policymakers interested in the conservation of relatively small, isolated and protected areas.

This book presents an up-to-date review of the ecology of yeast communities in natural ecosystems. It focuses on their biological interactions, including mutualism, parasitism, commensalism and antagonistic interactions, and is closely connected with the volume *Yeasts in Natural Ecosystems: Diversity* by the same editors. Yeasts are the smallest eukaryotic organisms successfully growing under a wide range of environmental conditions. They constantly modify the environment through their own metabolic activities. Although yeasts are among the earlier colonizers of nutrient-rich substrates, their role in ecosystem processes is not limited to the consumption and transformation of simple sugars. They also engage in close relationships with animals, plants and other fungi in the environment as mutualists, competitors, parasites and pathogens. This book reviews the diversity of biological interactions and roles of yeasts in ecosystems and summarises recent concepts and tools developed in community ecology. All of the chapters were written by leading international yeast research experts, and will appeal to researchers and advanced students in the field of microbial ecology.

The lake charr *Salvelinus namaycush* is a ubiquitous member of cold-water lake ecosystems in previously glaciated regions of northern continental U.S., Alaska, and Canada that often support important commercial, recreational, and subsistence fisheries. The lake charr differs from other charrs by its large size, longevity, iteroparity, top-predator specialization, reduced sexual dimorphism, prevalence of lacustrine spawning, and use of deepwater habitat. The species is remarkably variable in phenotype, physiology, and life history, some of which is

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reflected in its ecology and genetics, with as many as four morphs or ecotypes co-occurring in a single lake. The lake charr is often the top predator in these systems, but is highly adaptable trophically, and is frequently planktivorous in small lakes. The lake charr by their name highlights their common habitat, lakes both large and small, but often frequents rivers and occasionally moves into the Arctic Ocean. Movement and behaviour of lake charr are motivated by access to cool, well-oxygenated water, foraging opportunities, predator avoidance, and reproduction. Owing to their broad distribution and trophic level, the lake charr serves as a sentinel of anthropogenic change. This volume will provide an up-to-date summary of what is currently known about lake charr from distribution to genetics to physiology to ecology. The book provides a compilation and synthesis of available information on the lake charr, beginning with an updated distribution and a revised treatment of the paleoecology of the species. Understanding of ecological and genetic diversity and movement and behaviour of the species has advanced remarkably since the last major synthesis on the species over 40 years ago. Mid-sections of the book provide detailed accounts of the biology and life history of the species, and later sections are devoted to threats to conservation and fishery management practices used to ensure sustainability. A new standard lake charr-specific terminology is also presented. The book will be a valuable reference text for biologists around the world, ecologists, and fishery managers, and of interest to the angling public.

Multitrophic Level Interactions

Methods in Stream Ecology

Progress in Ecological Stoichiometry

Bifurcations in Marine Ecosystem

Biological Control

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Stability and Transitions of Real and Model Ecosystems