

Online Library Evaluation And
Community Ecology Chapter
Vocabulary Review Crossword
Puzzle
Evaluation And
Community Ecology
Chapter Vocabulary
Review Crossword
Puzzle

Online Library Evaluation And Community Ecology Chapter Vocabulary Review Crossword Puzzle

This multi-author text has been planned as a companion to the successful volumes on theoretical ecology, behavioural ecology and physiological ecology mentioned elsewhere in this catalogue. The editors have covered the main approaches in community ecology.

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This novel, interdisciplinary text achieves an integration of empirical data and theory with the aid of mathematical models and statistical methods. The emphasis throughout is on spatial ecology and evolution, especially on the interplay between environmental heterogeneity and

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biological processes. The book provides a coherent theme by interlinking the modelling approaches used for different subfields of spatial ecology: movement ecology, population ecology, community ecology, and genetics and evolutionary ecology

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(each being represented by a separate chapter). Each chapter starts by describing the concept of each modelling approach in its biological context, goes on to present the relevant mathematical models and statistical methods, and ends with a discussion of the benefits and

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limitations of each approach. The concepts and techniques discussed throughout the book are illustrated throughout with the help of empirical examples. This is an advanced text suitable for any biologist interested in the integration of empirical data and theory in spatial ecology/evolution

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through the use of quantitative/statistical methods and mathematical models. The book will also be of relevance and use as a textbook for graduate-level courses in spatial ecology, ecological modelling, theoretical ecology, and statistical ecology.

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As a novel endeavour in ecological science, this book focuses on a major issue in organismal life on Earth: species coexistence. The book crosses the usual disciplinary boundaries between palaeobiology, ecology and evolutionary biology and provides a timely overview of the

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patterns and processes of species diversity and coexistence on a range of spatio-temporal scales. In this unique synthesis, the author offers a critical and penetrating examination of the concepts and models of coexistence and community structure, thus

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making a valuable contribution to the field of community ecology. There is an emphasis on clarity and accessibility without sacrificing scientific rigour, making this book suitable for both advanced students and individual researchers in ecology, palaeobiology and environmental

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and evolutionary biology.

Comprehensive and contemporary synthesis. Pulls together the aggregate influence of evolution and ecology on patterns in communities. Balanced mix of theory and empirical work. Clearly structured chapters with short introduction and summary.

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Community ecology: the study of the patterns and processes involving two or more species - has developed rapidly in the last two decades, driven by new and more sophisticated research techniques, advances in mathematical theory and modeling, and the increasing pressure on the

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environment wrought by humans.

Once a purely descriptive science, it is now one of the most forward-looking areas of scientific inquiry. Morin skillfully guides the reader through the main tenets and central concepts of community ecology - competition, predation, food webs, indirect effects,

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habitat selection, diversity, and succession. In an attempt to introduce the reader to the most balanced coverage possible, Morin includes examples drawn from both the aquatic and terrestrial realm and from both plant and animal species. Balancing theory with

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experimentation and drawing on exciting new studies to complement the historical foundations of the discipline, he also stresses that both the empirical and theoretical approaches are necessary to drive ecology forward into the new millennium. The final chapter on

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applied community ecology ably demonstrates how community ecological processes have a wide environmental relevance. Although in its infancy, the application of community ecology to emerging problems in human-dominated ecosystems could mitigate problems

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as diverse as management strategies for important diseases transmitted by animals and the restoration and reconstruction of viable communities. Required reading for all students and practitioners interested in community phenomena, Community Ecology marks an important contribution to

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the development of this protean discipline. The first serious textbook for a decade on one of the keystone subdisciplines of ecology. Broad taxonomic and habitat coverage. Section on implications of community ecology for environmental issues. Integrating models with data

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Mutualism

An Introduction to Mathematical
Models in Ecology and Evolution
Evolutionary Community Ecology,
Volume 58
The Macroscopic Perspective

Concepts of Biology is

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designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such,

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***this course represents
an important opportunity
for students to develop
the necessary knowledge,
tools, and skills to
make informed decisions
as they continue with***

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***their lives. Rather than
being mired down with
facts and vocabulary,
the typical non-science
major student needs
information presented in
a way that is easy to***

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***read and understand.
Even more importantly,
the content should be
meaningful. Students do
much better when they
understand why biology
is relevant to their***

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***everyday lives. For
these reasons, Concepts
of Biology is grounded
on an evolutionary basis
and includes exciting
features that highlight
careers in the***

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***biological sciences and
everyday applications of
the concepts at hand. We
also strive to show the
interconnectedness of
topics within this
extremely broad***

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***discipline. In order to
meet the needs of
today's instructors and
students, we maintain
the overall organization
and coverage found in
most syllabi for this***

***course. A strength of
Concepts of Biology is
that instructors can
customize the book,
adapting it to the
approach that works best
in their classroom.***

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***Concepts of Biology also
includes an innovative
art program that
incorporates critical
thinking and clicker
questions to help
students understand--and***

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apply--key concepts.

***Recent empirical studies
demonstrate that
feedbacks between
ecological and
evolutionary processes
can alter the***

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***demographic and trait
dynamics of natural
communities. These
feedbacks occur when one
or more focal
populations evolve in
traits that affect their***

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***own or other
populations' densities
in the community. The
demographic response of
the community, in turn,
alters the selection
pressures and trait***

***evolution of these focal
populations. In light of
this empirical evidence,
a new challenge is to
analyze when and how
these feedbacks affect
dynamics to fully***

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***understand natural
communities. To address
this challenge, I use
mathematical models to
address three main
problems concerning
communities with***

***feedbacks between
ecological and
evolutionary processes.
These three problems
differ in their scope,
ranging in generality
from focusing on a***

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***specific type of
interaction to
communities with any
type of interaction, as
well as in their scale,
from local to global
dynamics. In the first***

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***chapter, I provide an
introduction to the
general problem and
summarize my main
results. In the second
chapter, I focus on a
simple three-species***

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***community involving
intraguild predation,
and address how the
evolution of the
predator can affect the
dynamics of the
community structure. In***

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***the third chapter, I
develop results to
identify the conditions
that enable coexistence
of populations in
general mathematical
models of ecological***

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***communities with
feedbacks. Specifically,
I use permanence as a
notion of coexistence,
which ensures that if
all population densities
start positive then***

***every population stays
sufficiently away from
extinction after some
time. Finally, in the
fourth chapter, I
develop a general theory
on how eco-evolutionary***

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***feedbacks alter local
community stability.
Importantly, using this
theory, I highlight that
these feedbacks lead to
stable communities that
would be unstable in the***

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***absence of the
feedbacks, and vice
versa. Chapters 2-4 were
done in collaboration
with my advisor,
Sebastian J. Schreiber
and Chapter 4 was also***

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***done in collaboration
with Michael H. Cortez.***

***By applying existing
mathematical tools to
important questions in
ecology and developing
new ecologically-***

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***inspired tools in math,
this work contributes to
a growing body of theory
aimed at understanding
the role of eco-
evolutionary feedbacks
on community dynamics.***

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Mutualisms, interactions between two species that benefit both of them, have long captured the public imagination. Their influence transcends levels of

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***biological organization
from cells to
populations,
communities, and
ecosystems. Mutualistic
symbioses were crucial
to the origin of***

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eukaryotic cells, and perhaps to the invasion of land. Mutualisms occur in every terrestrial and aquatic habitat; indeed, ecologists now believe

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***that almost every
species on Earth is
involved directly or
indirectly in one or
more of these
interactions. Mutualisms
are essential to the***

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reproduction and survival of virtually all organisms, as well as to nutrient cycles in ecosystems. Furthermore, the key ecosystem services that mutualists

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***provide mean that they
are increasingly being
considered as
conservation priorities,
ironically at the same
time as the acute risks
to their ecological and***

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***evolutionary persistence
are increasingly being
identified. This volume,
the first general work
on mutualism to appear
in almost thirty years,
provides a detailed and***

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***conceptually-oriented
overview of the subject.
Focusing on a range of
ecological and
evolutionary aspects
over different scales
(from individual to***

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**ecosystem), the chapters
in this book provide
expert coverage of our
current understanding of
mutualism whilst
highlighting the most
important questions that**

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***remain to be answered.
In bringing together a
diverse team of expert
contributors, this novel
text captures the
excitement of a dynamic
field that will help to***

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***define its future
research agenda.***

***A comprehensive account
of joint species
distribution modelling,
covering statistical
analyses in light of***

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**modern community ecology
theory.**

***Time and Space
Quaternary Ecology,
Evolution, and
Biogeography
Ecology and Evolution of***

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Communities

Eco-evolutionary

Dynamics

Parasitoid Community

Ecology

*A plethora of different theories,
models, and concepts make up the*

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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

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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

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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:

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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

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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,

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*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*

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community ecology, The Theory of Ecological Communities provides a new way for thinking about biological composition and diversity.

Quaternary Ecology, Evolution, and Biogeography is an introduction on

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the study of the ecological and evolutionary processes that have shaped our present biosphere under the influence of glacial-interglacial cycles. Written by a renowned ecologist with paleoecological expertise, the book reviews the

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climactic changes that have occurred during the last million years, along with the responses of organisms and ecosystems. The book offers an understanding of the evolutionary origin of extant biodiversity, its biogeographical

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patterns, and the composition of modern ecological communities. In addition, it explores human evolution and the influence of our activities on the biosphere, especially in the last millennia. The valuable resource is intended for a

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*wide audience, including
researchers and students in natural
sciences. It offers the latest
information on how studying the
past can contribute to our
understanding of present climate
issues for a better future.*

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Key Benefit: Fred and Theresa Holtzclaw bring over 40 years of AP Biology teaching experience to this student manual. Drawing on their rich experience as readers and faculty consultants to the College Board and their participation on the

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*AP Test Development Committee,
the Holtzclaws have designed their
resource to help your students
prepare for the AP Exam. **

*Completely revised to match the new
8th edition of Biology by Campbell
and Reece. * New Must Know*

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*sections in each chapter focus
student attention on major concepts.*

** Study tips, information
organization ideas and
misconception warnings are
interwoven throughout. * New
section reviewing the 12 required*

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*AP labs. * Sample practice exams. **

The secret to success on the AP

Biology exam is to understand what

you must know—and these

experienced AP teachers will guide

your students toward top scores!

Market Description: Intended for

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those interested in AP Biology.

*The evolution of species abundance
and diversity; Competitive strategies
of resource allocation; Community
structure; Outlook.*

*Joint Species Distribution Modelling
Routes of Theory Change*

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Processes, Models, and Applications
Hominid Evolution and Community
Ecology
Ecological and Evolutionary
Perspectives
Community ecology is the study of the
interactions between populations of co-

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existing species. This book provides a survey of the state-of-the-art in theory and applications of community ecology, with special attention to topology, dynamics, the importance of spatial and temporal scale, as well as applications to emerging problems in human-dominated ecosystems (including the restoration and

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reconstruction of viable communities). It adopts a mainly theoretical approach and focuses on the use of network-based theory which remains little explored in standard community ecology textbooks. The book includes discussion of the effects of biotic invasions on natural communities, the linking of ecological

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network structure to empirically measured community properties and dynamics, the effects of evolution on community patterns and processes, and the integration of fundamental interactions into ecological networks. A final chapter indicates future research directions for the discipline. This book provides ideal

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graduate seminar course material.

*I use the fig/fig wasp system to address several questions in the fields of evolutionary and community ecology. I present a general review of speciation and community ecology in insects on plants in general and in fig trees (genus *Ficus*) and fig wasps (*Hymenoptera: Chalcidoidea*)*

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in particular. Following on from this introduction are four experimental chapters. The first experimental chapter investigates the contrasting impact of two genera of parasitic, or non-pollinating fig wasps, on their host Ficus and its pollinating wasps. I present my findings in terms of community ecology and

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mutualism stability. In the second experimental chapter I describe the community of fig wasps associated with two Ficus species from the Australasian Ficus section Ma/vanthera. Using behavioural, ecological and molecular barcoding data I investigate the host Ficus specificity and trophic role of each genus

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of wasp. Furthermore I carry out a detailed investigation into the mode of speciation in a key kelp parasite genus: Sycoscapter (Pteromalidae: Sycoryctinae), highlighting the role of ecological speciation in generating diversity. In the next chapter I present a global multi-gene phylogeny of the subfamily Sycoryctinae

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before evaluating its age, origins and mode of radiation in relation to other major components of fig wasp communities. The final experimental chapter addresses the assembly of fig wasp communities over evolutionary time. I combine phylogenetic and ecological data from three wasp communities

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associated with three Ficus species from different continents to investigate the roles of niche stasis and niche lability in shaping community structure. I find that overall, general ecological rules appear little constrained by the local pool of insect species in these complex, globally dispersed and multi-trophic communities.

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A general discussion is presented in the final chapter in which I highlight areas for future research and provide closing comments. /.

Metacommunity ecology links smaller-scale processes that have been the provenance of population and community ecology—such as birth-death processes,

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species interactions, selection, and stochasticity—with larger-scale issues such as dispersal and habitat heterogeneity. Until now, the field has focused on evaluating the relative importance of distinct processes, with niche-based environmental sorting on one side and neutral-based ecological drift

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and dispersal limitation on the other. This book moves beyond these artificial categorizations, showing how environmental sorting, dispersal, ecological drift, and other processes influence metacommunity structure simultaneously. Mathew Leibold and Jonathan Chase argue that the relative

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importance of these processes depends on the characteristics of the organisms, the strengths and types of their interactions, the degree of habitat heterogeneity, the rates of dispersal, and the scale at which the system is observed. Using this synthetic perspective, they explore metacommunity patterns in time and space, including

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patterns of coexistence, distribution, and diversity. Leibold and Chase demonstrate how these processes and patterns are altered by micro- and macroevolution, traits and phylogenetic relationships, and food web interactions. They then use this scale-explicit perspective to illustrate how metacommunity processes are essential

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for understanding macroecological and biogeographical patterns as well as ecosystem-level processes. Moving seamlessly across scales and subdisciplines, Metacommunity Ecology is an invaluable reference, one that offers a more integrated approach to ecological patterns and processes.

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In recent years, scientists have realized that evolution can occur on timescales much shorter than the 'long lapse of ages' emphasized by Darwin - in fact, evolutionary change is occurring all around us all the time. This work provides an authoritative and accessible introduction to eco-evolutionary

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dynamics, a cutting-edge new field that seeks to unify evolution and ecology into a common conceptual framework focusing on rapid and dynamic environmental and evolutionary change.

Pattern and Process

Concepts and Applications

Metacommunity Ecology

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Preparing for the Biology AP Exam

Disease Ecology

The study of parasitoid communities has direct relevance to general ecological theory and to the applied practice of biological control. Yet, despite the existence of a large and active international research community involved

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in the study of parasitoids, until now no books devoted to the theme of parasitoid community ecology have been available. Here, with a healthy mix of general discussions and specific examples such as tortricids and weevils, the authors constructively review and evaluate our understanding of these often very complex

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systems. The book emphasizes basic science, linking the discussion to wider areas such as population dynamics, food webs, competition, and community structure. The more applied end of the subject is covered in a section exclusively devoted to biological control. This book, the first to deal entirely with ecological

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aspects of parasitoid biology, offers summaries of the state of the field by leading researchers and identifies critical areas in need of further investigation. Students, researchers, and teachers in the field of ecology, animal behavior, entomology, forestry, and agriculture will all want to have a copy of the book on

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their shelves.

This book describes the evolutionary and ecological consequences of reproductive competition for scarabaeine dung beetles. As well as giving us insight into the private lives of these fascinating creatures, this book shows how dung beetles can be used as model systems for improving our

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general understanding of broad evolutionary and ecological processes, and how they generate biological diversity. Over the last few decades we have begun to see further than ever before, with our research efforts yielding new information at all levels of analysis, from whole organism biology to genomics. This book

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brings together leading researchers who contribute chapters that integrate our current knowledge of phylogenetics and evolution, developmental biology, comparative morphology, physiology, behaviour, and population and community ecology. Dung beetle research is shedding light on the ultimate question of how best

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to document and conserve the world's biodiversity. The book will be of interest to established researchers, university teachers, research students, conservation biologists, and those wanting to know more about the dung beetle taxon.

Community ecology has undergone a transformation in recent years, from a

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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

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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

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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,

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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.

Piper is an economically and ecologically

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important genus of plant that includes a fascinating array of species for studying natural history, natural products chemistry, community ecology, and evolutionary biology. The diversification of this taxon is unique and of great importance in understanding the evolution of plants. The diversity and ecological relevance of this

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genus makes it an obvious candidate for ecological and evolutionary studies, but surprisingly, most research on Piper spp. to-date has focused on the more economically important plants *P. nigrum* (black pepper), *P. methysticum* (kava), and *P. betle* (betel leaf). While this book does address the applied techniques of

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studying Piper, its focus is more on Piper in its natural setting. Piper: A Model Genus for Studies of Phytochemistry, Ecology, and Evolution synthesizes existing data and provides an outline for future investigations of the chemistry, ecology, and evolution of this taxon, while examining its key themes of Piper as a

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model genus for ecological and evolutionary studies, the important ecological roles of Piper species in lowland wet forests, and the evolution of distinctive Piper attributes. This volume has a place in the libraries of those studying or working in the fields of ecology, evolutionary biology, natural

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products chemistry, invasive species
biology, pharmaceuticals, and ethnobotany.

Ecology and Evolution of Dung Beetles

Concepts of Biology

Ecological Paradigms Lost

A Study of One-Tree Island, Great Barrier
Reef, Australia

Quantitative Ecology and Evolutionary

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Biology

For sophomore- to junior-level courses in Evolution, with an Introductory Biology prerequisite. This text introduces biology majors to the basic concepts of the fields comprising Darwinian biology: population genetics, population ecology, community ecology, macroevolution,

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physiological ecology, systematics, and functional morphology. The general theme is the interconnectedness of organism, environment, and evolution. Just as biochemistry and molecular biology provide the foundation for our understanding of the cell, evolutionary biology and ecology are used to construct

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a foundation for understanding the organism. Using evocative language and an eye-catching magazine format, the authors aim to prepare undergraduates for more advanced specialist courses in Darwinian biology as they pursue their degrees.

A pluralistic approach to community

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ecology.

Biology for AP[®] courses covers the scope and sequence requirements of a typical two-semester Advanced Placement[®] biology course. The text provides comprehensive coverage of foundational research and core biology concepts through an evolutionary lens. Biology for

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AP[®] Courses was designed to meet and exceed the requirements of the College Board's AP[®] Biology framework while allowing significant flexibility for instructors. Each section of the book includes an introduction based on the AP[®] curriculum and includes rich features that engage students in scientific

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practice and AP® test preparation; it also highlights careers and research opportunities in biological sciences.

Now that so many ecosystems face rapid and major environmental change, the ability of species to respond to these changes by dispersing or moving between different patches of habitat can be crucial

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to ensuring their survival. Understanding dispersal has become key to understanding how populations may persist. Dispersal Ecology and Evolution provides a timely and wide-ranging overview of the fast expanding field of dispersal ecology, incorporating the very latest research. The causes, mechanisms,

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and consequences of dispersal at the individual, population, species, and community levels are considered. Perspectives and insights are offered from the fields of evolution, behavioural ecology, conservation biology, and genetics. Throughout the book theoretical approaches are combined with

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empirical data, and care has been taken to include examples from as wide a range of species as possible - both plant and animal.

Mathematics and 21st Century Biology
Community Structure and Pathogen
Dynamics
Community Ecology

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Conceptual Breakthroughs in
Evolutionary Ecology

Piper: A Model Genus for Studies of
Phytochemistry, Ecology, and Evolution

Theoretical Ecology:

concepts and applications

continues the authoritative

and established sequence of

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*theoretical ecology books
initiated by Robert M. May
which helped pave the way
for ecology to become a more
robust theoretical science,
encouraging the modern
biologist to better
understand the mathematics*

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behind their theories. This latest instalment builds on the legacy of its predecessors with a completely new set of contributions. Rather than placing emphasis on the historical ideas in

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*theoretical ecology, the
Editors have encouraged each
contribution to: synthesize
historical theoretical ideas
within modern frameworks
that have emerged in the
last 10-20 years (e.g.
bridging population*

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interactions to whole food webs); describe novel theory that has emerged in the last 20 years from historical empirical areas (e.g. macro-ecology); and finally to cover the rapidly expanding area of theoretical

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ecological applications

*(e.g. disease theory and
global change theory). The
result is a forward-looking
synthesis that will help
guide the field through a
further decade of discovery
and development. It is*

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*written for upper level
undergraduate students,
graduate students, and
researchers seeking
synthesis and the state of
the art in growing areas of
interest in theoretical
ecology, genetics,*

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*evolutionary ecology, and
mathematical biology.*

*This is an up-to-date study
of patterns and processes
involving two or more
species. The book strikes a
balance between plant and
animal species and among*

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*studies of marine,
freshwater and terrestrial
communities.*

*This informative book, first
published in 1987, presents
the theories of community
ecology within the context
of a natural example. The*

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*text describes and examines
issues in community ecology
and shows how research on
salamanders has helped to
solve some of the problems
surrounding the theories.
Salamanders exist in stable
populations of the kind*

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*assumed in community theory
and are more appropriate
than most other animals for
research on the applications
of that theory. The
interesting and meaningful
results, collected from
observation on these*

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*excellent subjects posed
challenges to beliefs within
community ecology. Life
histories of salamanders,
fieldwork in distinctly
differing habitats,
competition, predation and
evolution are discussed in*

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an easily readable text.

*Professional ecologists and
students of community
ecology and herpetology will
be interested in the
information synthesised in
this book.*

Although biologists

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*recognize evolutionary
ecology by name, many only
have a limited understanding
of its conceptual roots and
historical development.
Conceptual Breakthroughs in
Evolutionary Ecology fills
that knowledge gap in a*

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*thought-provoking and
readable format. Written by
a world-renowned
evolutionary ecologist, this
book embodies a unique blend
of expertise in combining
theory and experiment,
population genetics and*

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ecology. Following an easily-accessible structure, this book encapsulates and chronologizes the history behind evolutionary ecology. It also focuses on the integration of age-structure and density-dependent

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*selection into an
understanding of life-
history evolution. Covers
over 60 seminal
breakthroughs and paradigm
shifts in the field of
evolutionary biology and
ecology Modular format*

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*permits ready access to each
described subject Historical
overview of a field whose
concepts are central to all
of biology and relevant to a
broad audience of
biologists, science
historians, and philosophers*

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of science

*Can Microbial Communities
Regenerate?*

*Uniting Ecology and
Evolutionary Biology*

Biology for AP ® Courses

*Community Ecology and
Salamander Guilds*

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With Applications in R

Evolutionary Community Ecology develops a unified framework for understanding the structure of ecological communities and the dynamics of natural selection that shape the evolution of the species inhabiting them. All species engage in

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interactions with many other species, and these interactions regulate their abundance, define their trajectories of natural selection, and shape their movement decisions. Mark McPeck synthesizes the ecological and evolutionary dynamics generated by species interactions that structure local

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biological communities and regional metacommunities. McPeck explores the ecological performance characteristics needed for invasibility and coexistence of species in complex networks of species interactions. This species interaction framework is then extended to examine the ecological

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dynamics of natural selection that drive coevolution of interacting species in these complex interaction networks. The models of natural selection resulting from species interactions are used to evaluate the ecological conditions that foster diversification at multiple trophic levels. Analyses show

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that diversification depends on the ecological context in which species interactions occur and the types of traits that define the mechanisms of those species interactions. Lastly, looking at the mechanisms of speciation that affect species richness and diversity at various spatial scales

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and the consequences of past climate change over the Quaternary period, McPeck considers how metacommunity structure is shaped at regional and biogeographic scales. Integrating evolutionary theory into the study of community ecology, Evolutionary Community Ecology

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provides a new framework for predicting how communities are organized and how they may change over time.

By investigating a simple question, a philosopher of science and a molecular biologist offer an accessible understanding of microbial

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communities and a motivating theory for future research in community ecology. Microorganisms, such as bacteria, are important determinants of health at the individual, ecosystem, and global levels. And yet many aspects of modern life, from the overuse of antibiotics to chemical spills

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and climate change, can have devastating, lasting impacts on the communities formed by microorganisms. Drawing on the latest scientific research and real-life examples such as attempts to reengineer these communities through microbial transplantation, the

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construction of synthetic communities of microorganisms, and the use of probiotics, this book explores how and why communities of microorganisms respond to disturbance, and what might lead to failure. It also unpacks related and interwoven philosophical questions: What is an organism? Can

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a community evolve by natural selection? How can we make sense of function and purpose in the natural world? How should we think about regeneration as a phenomenon that occurs at multiple biological scales? Provocative and nuanced, this primer offers an accessible conceptual and

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theoretical understanding of
regeneration and evolution at the
community level that will be essential
across disciplines including philosophy
of biology, conservation biology,
microbiomics, medicine, evolutionary
biology, and ecology.

The exponentially increasing amounts

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of biological data along with comparable advances in computing power are making possible the construction of quantitative, predictive biological systems models. This development could revolutionize those biology-based fields of science. To assist this transformation, the U.S.

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Department of Energy asked the National Research Council to recommend mathematical research activities to enable more effective use of the large amounts of existing genomic information and the structural and functional genomic information being created. The resulting study is a

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broad, scientifically based view of the opportunities lying at the mathematical science and biology interface. The book provides a review of past successes, an examination of opportunities at the various levels of biological systemsâ€" from molecules to ecosystemsâ€"an analysis of cross-

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cutting themes, and a set of recommendations to advance the mathematics-biology connection that are applicable to all agencies funding research in this area.

AcknowledgmentsCh. 1: Of Entangled Banks and Humble Bees Ch. 2: From Micro to Macro and Back Again Ch. 3:

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Communities on Small Spatial and
Temporal Scales Ch. 4: Communities
as Linear Systems Ch. 5:
Communities as Nonlinear Systems
Ch. 6: Macroecology: Expanding the
Spatial Scale of Community Ecology
Ch. 7: Geographic Range Structure:
Niches Written in Space Ch. 8:

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Geographic Assembly of Local
Communities Ch. 9: The Evolution of
Species Diversity at the Macroscale
Ch. 10: The Macroscopic Perspective
and the Future of Ecology Literature
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Prehistoric Human Adaptation in

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Biological Perspective

Untangling Ecological Complexity

Dispersal Ecology and Evolution

Evolution and Ecology of the

Organism

The Ecology and Evolution of Fig

Wasp Communities

This edited volume in the Theoretical

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Ecology series addresses the historical development and evolution of theoretical ideas in the field of ecology. Not only does Ecological Paradigms Lost recount the history of the discipline by practitioners of the science of ecology, it includes commentary on these historical reflections by philosophers of science. Even though the

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theories discussed are, in many cases, are at the forefront of research, the language and approach make this material accessible to non-theoreticians. The book is structured in 5 major sections including population ecology, epidemiology, community ecology, evolutionary biology and ecosystem ecology. In each section a chapter by an eminent,

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experienced ecologist is complemented by analysis from a newer, cutting-edge researcher. Reflection on the past and future of ecology A historical overview of major ideas in the field of ecology Pairing of historical views by ecologists along with a philosophical commentary directed at the practicing scientists' views by a philosopher

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of science Historical analysis by practicing ecologists including anecdotal experiences that are rarely recorded Based on a very popular symposium at the 2002 Ecological Society of America annual meeting in Tucson, AZ

Disease Ecology highlights exciting advances in theoretical and empirical research

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towards understanding the importance of community structure in the emergence of infectious diseases. The chapters in this book illustrate aspects of community ecology that influence pathogen transmission rates and disease dynamics in a wide variety of study systems. The innovative studies presented here communicate a clear

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message: studies of epidemiology can be approached from the perspective of community ecology, and students of community ecology can contribute significantly to epidemiology.

Students often find it difficult to grasp fundamental ecological and evolutionary concepts because of their inherently

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mathematical nature. Likewise, the application of ecological and evolutionary theory often requires a high degree of mathematical competence. This book is a first step to addressing these difficulties, providing a broad introduction to the key methods and underlying concepts of mathematical models in ecology and

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evolution. The book is intended to serve the needs of undergraduate and postgraduate ecology and evolution students who need to access the mathematical and statistical modelling literature essential to their subjects. The book assumes minimal mathematics and statistics knowledge whilst covering a wide variety of methods, many

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of which are at the fore-front of ecological and evolutionary research. The book also highlights the applications of modelling to practical problems such as sustainable harvesting and biological control. Key features: Written clearly and succinctly, requiring minimal in-depth knowledge of mathematics Introduces students to the use

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*of computer models in both fields of ecology
and evolutionary biology Market - senior
undergraduate students and
beginning postgraduates in ecology and
evolutionary biology
Species Coexistence
The Effects of Ecological and Evolutionary
Feedbacks on Community Dynamics*

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Theoretical Ecology

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

Community Ecology of a Coral Cay