Insect Species Conservation Ecology Biodiversity And Conservation

The book discusses the recent advances in basic and applied approaches including research on the genetics of insects, its application in resolving the consequences of world population growth, its impact on agriculture, and control strategies and their implications on the fast-depleting insect resources. The application of insects as a probable nutrient substitute along with the role of sex hormones among insects has been thoroughly discussed. The entire book basically contains five chapters spread over two sections: Section I mainly focuses on diversity, conservation and nutrition, while Section II is concerned with economic importance and up-to-date information on the role of peptides. The book is well illustrated with diagrams, graphical representations and flow charts for easy understanding the important information discussed in the book.

Invertebrate Conservation and Agricultural Ecosystems explores the diverse interests of invertebrate conservation and agricultural production. It is both an introduction to invertebrate conservation biology for agriculturists and an introduction to crop protection for conservation biologists, demonstrating how these two disparate fields may draw on each other for greater collective benefit. It draws on recent literature to show how invertebrate conservation in highly altered landscapes may be promoted and enhanced. The book deals with problems of, and approaches to, invertebrate conservation in highly managed agricultural ecosystems, and how biodiversity may be promoted without compromising agricultural production. It draws attention to the importance of invertebrates in agricultural systems and their role in ecosystem functions.

Rapid depletion and degradation of species in diverse ecosystems and the implications of this for human welfare have the cause for increasing concern. Biodiversity or variability among living organisms and the ecological complexes of which they are a part, is essential for ensuring the basic ecological services and resources necessary for sustaining human welfare. The loss of biodiversity is therefore, considered one of the most serious problem threatening the world today. An understanding of the ecological implications of the increasing loss of bodiversity, not to mention of the economic implications, has therefore, became vital. A biodiversity loss is irreversible. A calls for increased caution in our efforts to convert and exploit natural resources. Some minimal level of biodiversity is necessary to main ecological functioning, which in turn is necessary for generating the biological resources on which human welfare depends. Needless to emphasive that substantial biodiversity loss occurs due to forest clearing and degradation, leading to the need for assessing biodiversity in different ecosystems. Keeping these aspects in mind, the present volume highlights biodiversity in different cropping systems besides that the impact of cold and hot deserts. Selection of the topics in the various chapters is essentially because of the experience of the authors in the field of biodiversity.

The present book offers an overall up-to-date overview of the biological diversity, comprising many interesting chapters focussing on the different aspects of biodiversity. Most of the chapters include findings of investigations and observations on biodiversity, whilst a few are based on statistically and theoretically derived information. The book produced sufficient information on the occurrence and distribution of many plant and animal species or groups of organisms with environmental estimates from a wide variety of interesting terrestrial and aquatic habitats. With 18 interesting and elaborately prepared chapters, the present book would definitely be an ideal source of scientific information to the advanced students, junior researchers, scientists and a portion of the public involved in ecology and other research areas involving biodiversity studies. It will also help to the development of the growing awareness of the close linkage between the conversation of biodiversity and economic development.

This book outlines the main methods and techniques available to entomologists. With up to a quarter of all insect species heading towards extinction over the next few decades, there is a pressing need to summarize the techniques available for measuring insect diversity in order to develop effective conservation strategies.

Arthropods are invertebrates that constitute over 90% of the animal kingdom, and their bio-ecology is closely linked with global functioning and survival. Arthropods play an important role in maintaining the health of ecosystems, provide livelihoods and nutrition to human communities, and are important indicators of environmental change. Yet the population trends of several arthropods species show them to be in decline. Arthropods constitute a dominant group with 1.2 million species influencing earth’s biodiversity. Among arthropods, insects are predominant, with ca. 1 million species and having evolved some 350 million years ago. Arthropods are closely associated with living and non-living entities alike, making the ecosystem services they provide crucially important. In order to be effective, plans for the conservation of arthropods and ecosystems should include a mixture of strategies like protecting key habitats and genomic studies to formulate relevant policies for in situ and ex situ conservation. This two-volume book focuses on capturing the essentials of arthropod inventories, biology, and conservation.Further, it seeks to identify the mechanisms by which arthropod populations can be sustained in terrestrial and aquatic ecosystems, and by means of which certain problematic species be managed without producing harmful environmental side-effects. This edited compilation includes chapters contributed by over 80 biologists on a wide range of topics embracing the diversity, distribution, utility and conservation of arthropods and select groups of insect taxa. More importantly, it describes in detail the mechanisms of sustaining arthropod ecosystems, services and populations. It addresses the contribution of modern biological tools such as molecular and genetic techniques regulating gene expression, as well as conventional, indigenous practices in arthropod conservation. The contributors reiterate the importance of documenting and understanding the biology of arthropods from a holistic perspective before addressing conservation issues at large. This book offers a valuable resource for all zoologists, entomologists, ecologists, conservation biologists, policy makers, teachers and students interested in the conservation of biological resources.

Insects do not live in isolation. They interact with the abiotic environment and are major components of the terrestrial and freshwater biotic milieus. They are crucial to so many

ecosystem processes and are the warp and weft of all terrestrial and freshwater ecosystems that are not permanently frozen. This means that insect conservation is a two-way process: insects as the subjects of conservation, while also they are useful tools for conserving the environment. This book overviews strategic ways forward for insect conservation. It is a general view of what has worked and what has not for the maintenance of insect diversity across the world, as well as what might be the right approaches for the future.

The chapters in this book were developed from some of the lectures presented at a sym posium at the XX International Congress of Entomology held in Florence, Italy in August 1996. The purpose of the symposium was to discuss the impact of evolving modern agricultural landscapes on the insect species, of both economic and ecological importance, that utilize that habitat. Agricultural policy, to some extent, influences the choices that farmers make and thereby the shape of the agricultural landscape. In order to move toward more sustainable agro ecosystems future policy makers will have to consider the history of land use, consumer demands for both environmentally sound and affordable products, and the conservation of biological diversity. I would hope the information contained in this book will help stimulate discussion about the consequences of policy decisions on our agricultural landscapes and their insect inhabitants. I thank all the speakers from the symposium and in particular those that have been able to contribute chapters to this book. There have been many delays, most due to circumstances beyond anyone's control. I would like to express my appreciation to Gloria Verhey and Patrick Dumont for taking care of the book in these final months. CHAPTER I INTERCHANGES OF INSECTS BETWEEN AGRICULTURAL AND SURROUNDING LANDSCAPES BARBARA EKBOM Department of Entomology, Swedish University of Agricultural Sciences, Uppsala, Sweden 1.

A global synthesis of the impacts of wildfires and controlled burning on insects, bringing together much hitherto scattered information to provide a guide to improved conservation management practice. The great variety of responses by insect species and assemblages demonstrates the often subtle balance between fire being a severe threat and a vital management component. Examples from many parts of the world and from diverse biotopes and production systems display the increasingly detailed appreciation of fire impacts on insects in terrestrial and freshwater environments and the ways in which prescribed burning may be tailored to reduce harmful ecological impacts and incorporated into protocols for threatened species and wider insect conservation benefits.

This volume is a comprehensive treatment of how the principles of ecology and conservation biology can be used to maximize biological control. Conservation Biological Control presents various means to modify or manipulate the environment to enhance the activities of natural enemies of pests. It establishes a conceptual link between ecology and the agricultural use of agents for biological control, and discusses both theoretical issues as well as practical management concerns. Certain to be interesting to ecologists and entomologists, this volume will also appeal to scientists, faculty, researchers and students interested in pest management, horticulture, plant sciences, and agriculture. Contains chapters by an international team of leading authorities Establishes a conceptual link between ecology and the agricultural use of agents for biological control Discusses both theoretical issues as well as practical management concerns Provides specific examples of how conservation principles are used to maximize the biological control of pests

This handbook outlines the main methods and techniques, both modern and traditional, used to measure insect diversity. With the growing relevance of insect conservation in nature, this guide should assist students in understanding a complicated field.

The third in a trilogy of global overviews of conservation ofdiverse and ecologically important insect groups. The first twowere Beetles in Conservation (2010) and Hymenoptera andConservation (2012). Each has different priorities andemphases that collectively summarise much of the progress andpurpose of invertebrate conservation. Much of the foundation of insect conservation has been built onconcerns for Lepidoptera, particularly butterflies as the mostpopular and best studied of all insect groups. The long-acceptedworth of butterflies for conservation has led to elucidation ofmuch of the current rationale of insect species conservation, andto definition and management of their critical resources, withattention to the intensively documented British fauna‘leading the world’ in this endeavour. In Lepidoptera and Conservation, various themes aretreated through relevant examples and case histories, andsufficient background given to enable non-specialist access.Intended for not only entomologists but conservation managers andnaturalists due to its readable approach to the subject.

The history of interest and practice in insect conservation is summarised and traced through contributions from many of the leaders in the discipline, to provide the first broad global account of how insects have become incorporated into considerations of conservation. The essays collectively cover the genesis and development of insect conservation, emphasising its strong foundation within the northern temperate regions and the contrasts with much of the rest of the world. Major present-day scenarios are discussed, together with possible developments and priorities in insect conservation for the future.

Insect Biodiversity: Science and Society brings togetherleading scientific experts to assess the impact insects have onhumankind and the earth’s fragile ecosystems. It examines whyinsect biodiversity matters and how the rapid evolution of insectspecies is affecting us all. Insects and related arthropods make up more than 50 percent ofthe known animal diversity globally, yet a lack of knowledge aboutinsects is hindering the advance of science and society. This bookexplores the wide variety in type and number of insect species andtheir evolutionary relationships. Case studies offer assessments onhow insect biodiversity can help meet the needs of a rapidlyexpanding human population, and also examine the consequences thatan increased loss of insect species will have on the world. The book concludes that a better understanding of the biologyand ecology of insects is the only way to sustainably manageecosystems in an ever changing global environment.

Insect Species ConservationCambridge University Press

The Conservation of Insects and their Habitats is a compilation of papers presented in the 15th Symposium of the Royal Entomological Society of London held at the Department of Physics Lecture Theatre Imperial College, London, on September 14-15, 1989. The papers cover topics on the diversity of entomological habitats and ecologicalroles around the world, and highlight the value of insects to humanity. Some practical proposals for conservation, especially in tropical forests and on islands, where their diversity is greatest, are also given. This book will add to the continuing force for the conservation and protection of biological diversity of the Earth.

Arthropods are invertebrates that constitute over 90% of the animal kingdom, and their bio-ecology is closely linked with global functioning and survival. Arthropods play an important role in maintaining the health of ecosystems, provide livelihoods and nutrition to human communities, and are important indicators of environmental change. Yet the population trends of several arthropods species show them to be in decline. Arthropods constitute a dominant group with 1.2 million species influencing earth’s biodiversity. Among arthropods, insects are predominant, with ca. 1 million species and having evolved some 350 million years ago. Arthropods are closely associated with living and non-living entities alike, making the ecosystem services they provide crucially important. In order to be effective, plans for the

conservation of arthropods and ecosystems should include a mixture of strategies like protecting key habitats and genomic studies to formulate relevant policies for in situ and ex situ conservation. This two-volume book focuses on capturing the essentials of arthropod inventories, biology, and conservation. Further, it seeks to identify the mechanisms by which arthropod populations can be sustained in terrestrial and aquatic ecosystems, and by means of which certain problematic species be managed without producing harmful environmental side-effects. This edited compilation includes chapters contributed by over 80 biologists on a wide range of topics embracing the diversity, distribution, utility and conservation of arthropods and select groups of insect taxa. More importantly, it describes in detail the mechanisms of sustaining arthropod ecosystems, services and populations. It addresses the contribution of modern biological tools such as molecular and genetic techniques regulating gene expression, as well as conventional, indigenous practices in arthropod conservation. The contributors reiterate the importance of documenting and understanding the biology of arthropods from a holistic perspective before addressing conservation issues at large. This book offers a valuable resource for all zoologists, entomologists, ecologists, conservation biologists, policy makers, teachers and students interested in the conservation of biological resources.

The inland waters of Australia, and their largely endemic insect inhabitants, are subject to a wide and increasing variety of threats that continue to change those environments and lead to losses of insect habitats and localised taxa. Many of those changes result from human needs for water and measures to assure supply in naturally varied flood/drought regimes on which anthropogenic changes are imposed, and to which aquatic biota are increasingly susceptible. This book is a broad overview of Australian aquatic insects, the problems they face as changes to key habitats occur, and measures by which their survival may be enhanced through practical conservation. As well as summarising the current conservation interest in aquatic insects in Australia, the text draws on information and case histories from many parts of the world to augment the generally more limited information from Australian taxa and their needs, to facilitate use and perspective on conservation practice by non-specialist conservation managers, whilst also being of value to entomologists interested more directly in aquatic insect ecology and conservation .The numerous references to many taxa, regions and ecological contexts provide examples for possible emulation in Australia, and summarises many practical lessons relevant to honing effective conservation across the range from individual threatened species to the more complex protection or restoration of aquatic communities in which insects play significant functional roles.

Pollinators--insects, birds, bats, and other animals that carry pollen from the male to the female parts of flowers for plant reproduction--are an essential part of natural and agricultural ecosystems throughout North America. For example, most fruit, vegetable, and seed crops and some crops that provide fiber, drugs, and fuel depend on animals for pollination. This report provides evidence for the decline of some pollinator species in North America, including America's most important managed pollinator, the honey bee, as well as some butterflies, bats, and hummingbirds. For most managed and wild pollinator species, however, population trends have not been assessed because populations have not been monitored over time. In addition, for wild species with demonstrated declines, it is often difficult to determine the causes or consequences of their decline. This report outlines priorities for research and monitoring that are needed to improve information on the status of pollinators and establishes a framework for conservation and restoration of pollinator species and communities.

This volume offers extensive information on insect life in dying and dead wood. Written and reviewed by leading experts from around the world, the twenty-five chapters included here provide the most global coverage possible and specifically address less-studied taxa and topics. An overarching goal of this work is to unite literature that has become fragmented along taxonomic and geographic lines. A particular effort was made to recognize the dominant roles that social insects (e.g., termites, ants and passalid beetles) play in saproxylic assemblages in many parts of the world without overlooking the non-social members of these communities. The book is divided into four parts: · Part I “Diversity” includes chapters addressing the major orders of saproxylic insects (Coleoptera, Diptera, Hymenoptera, Hemiptera, Lepidoptera and Blattodea), broadly organized in decreasing order of estimated global saproxylic diversity. In addition to order-level treatments, some chapters in this part discuss groups of particular interest, including pollinators, hymenopteran parasitoids, ants, stag and passalid beetles, and wood-feeding termites. · Part II “Ecology” discusses insect-fungal and insect-insect interactions, nutritional ecology, dispersal, seasonality, and vertical stratification. · Part III “Conservation” focuses on the importance of primary forests for saproxylic insects, offers recommendations for conserving these organisms in managed forests, discusses the relationships between saproxylic insects and fire, and addresses the value of tree hollows and highly-decomposed wood for saproxylic insects. Utilization of non-native wood by saproxylic insects and the suitability of urban environments for these organisms are also covered. · Lastly, Part IV “Methodological Advancements” highlights molecular tools for assessing saproxylic diversity. The book offers an accessible and insightful resource for natural historians of all kinds and will especially appeal to entomologists, ecologists, conservationists and foresters.

Publisher Description

Combining breadth of coverage with detail, this logical and cohesive introduction to insect ecology couples concepts with a broad range of examples and practical applications. It explores cutting-edge topics in the field, drawing on and highlighting the links between theory and the latest empirical studies. The sections are structured around a series of key topics, including behavioral ecology; species interactions; population ecology; food webs, communities and ecosystems; and broad patterns in nature. Chapters progress logically from the small scale to the large; from individual species through to species interactions, populations and communities. Application sections at the end of each chapter outline the practicality of ecological concepts and show how ecological information and concepts can be useful in agriculture, horticulture and forestry. Each chapter ends with a summary, providing a brief recap, followed by a set of questions and discussion topics designed to encourage independent and creative thinking.

With up to a quarter of all insect species heading towards extinction over the next few decades, there is now a pressing need to summarize the techniques available for measuring insect diversity in order to develop effective conservation strategies. Insect Conservation outlines the main methods and techniques available to entomologists, providing a comprehensive synthesis for use by graduate students, researchers and practising conservationists worldwide. Both modern and more 'traditional' methodologies are described, backed up by practical background information and a global range of examples. Many newer techniques are included which have not yet been described in the existing book literature. This book will be particularly relevant to postgraduate and advanced undergraduate students taking courses in insect ecology, conservation biology and environmental management, as well as established researchers in these fields. It will also be a valuable reference for nature conservation practitioners and professional entomologists worldwide.

Hymenoptera, the bees, wasps and ant, are one of the largest insect orders, and have massive ecological importance as pollinators and as predators or parasitoids of other insects. These roles have brought them forcefully to human notice , as governors of some key ecological services that strongly influence human food supply. Recent declines of pollinators and introductions of alien pests or biological control agents are only part of the current concerns for conservation of Hymenoptera, and of the interactions in which they participate in almost all terrestrial ecosystems. Both pests and beneficial species abound within the order, sometimes closely related within the same families. Many taxa are both difficult to identify, and very poorly known. This global overview, the first such account for the whole of the Hymenoptera, discusses a broad range of themes to introduce the insects and their conservation roles and needs, and how their wellbeing may be approached. The book is intended as a source of

information for research workers, students, conservation managers and naturalists as an introduction to the importance of this dominant insect order.
The threatened species categories used in Red Data Books and Red Lists have been in place for almost 30 years. The IUCN Red List Categories and Criteria provide an easily and widely understood system for classifying species at high risk of global extinction, so as to focus attention on conservation measures designed to protect them. This latest version of the classification system was adopted by the IUCN Council in February 2001 and reflects comments from the IUCN and SSC memberships and the final meeting of the Criteria Review Working Group.
Brings together scattered information on insect conservation, providing a robust foundation for future progress, using examples from around the world.
Losses of forests and their insect inhabitants are a major global conservation concern, spanning tropical and temperate forest regions throughout the world. This broad overview of Australian forest insect conservation draws on studies from many places to demonstrate the diversity and vulnerability of forest insects and how their conservation may be pursued through combinations of increased understanding, forest protection and silvicultural management in both natural and plantation forests. The relatively recent history of severe human disturbance to Australian forests ensures that reasonably natural forest patches remain and serve as ‘models’ for many forest categories. They are also refuges for many forest biota extirpated from the wider landscapes as forests are lost, and merit strenuous protection from further changes, and wider efforts to promote connectivity between otherwise isolated remnant patches. In parallel, the recent attention to improving forest insect conservation in harmony with insect pest management continues to benefit from perspectives generated from better-documented faunas elsewhere. Lessons from the northern hemisphere, in particular, have led to revelations of the ecological importance and vulnerability of many insect taxa in forests, together with clear evidence that ‘conservation can work’ in concert with wider forest uses. A brief outline of the variety of Australian tropical and temperate forests and woodlands, and of the multitude of endemic and, often, highly localised insects that depend on them highlights needs for conservation (both of single focal species and wider forest-dependent radiations and assemblages). The ways in which insects contribute to sustained ecological integrity of these complex ecosystems provide numerous opportunities for practical conservation.
The realms of conservationists and entomologists are brought together.
Wood ants play an ecologically dominant and conspicuous role in temperate boreal forests, making a keystone contribution to woodland ecosystem functions and processes. Wood ant taxonomy and global distributions set the scene for this text's exploration of wood ants as social insects, examining their flexible social structures, genetics, population ecology, and behaviour, from nest-mate recognition to task allocation. Wood ants' interactions with their environment and with other organisms are essential to their success: competition, predation and mutualism are described and analysed. Bringing together the expertise of ecological researchers and conservation practitioners, this book provides practical and theoretical advice about sampling and monitoring these insects, and outlines the requirements for effective conservation. This is an indispensable resource for wood ant researchers, entomologists, conservationists and ecological consultants, as well as anyone interested in social insects, keystone species and the management and conservation of forest ecosystems.
A comprehensive overview of wood-inhabiting fungi, insects and vertebrates, discussing habitat requirements along with strategies for maintaining biodiversity.
Volume One of the thoroughly revised and updated guide to the study of biodiversity in insects The second edition of Insect Biodiversity: Science and Society brings together in one comprehensive text contributions from leading scientific experts to assess the influence insects have on humankind and the earth’s fragile ecosystems. Revised and updated, this new edition includes information on the number of substantial changes to entomology and the study of biodiversity. It includes current research on insect groups, classification, regional diversity, and a wide range of concepts and developing methodologies. The authors examine why insect biodiversity matters and how the rapid evolution of insects is affecting us all. This book explores the wide variety of insect species and their evolutionary relationships. Case studies offer assessments on how insect biodiversity can help meet the needs of a rapidly expanding human population, and also examine the consequences that an increased loss of insect species will have on the world. This important text: Explores the rapidly increasing influence on systematics of genomics and next-generation sequencing Includes developments in the use of DNA barcoding in insect systematics and in the broader study of insect biodiversity, including the detection of cryptic species Discusses the advances in information science that influence the increased capability to gather, manipulate, and analyze biodiversity information Comprises scholarly contributions from leading scientists in the field Insect Biodiversity: Science and Society highlights the rapid growth of insect biodiversity research and includes an expanded treatment of the topic that addresses the major insect groups, the zoogeographic regions of biodiversity, and the scope of systematics approaches for handling biodiversity data.
Includes chapters on assessing changes among assemblages and in individual species, the variety of general threats (notably habitat changes and impacts of alien species) and more particularly urban threats. The first global overview and synthesis of the impacts of urbanisation on insects and their relatives and the needs and theoretical and practical background to conserving them in urban environments. Insect dependence on open spaces in built-up areas suggests a wide range of management options for conservation, from individual site (including novel habitats such as green roofs) to landscape-level connectivity. These measures, all discussed with specific examples, involve all sectors of humanity, from government agencies to individual householders and ‘citizen scientist’ groups. Each chapter includes pertinent and recent.
Biodiversity offers great potential for managing insect pests. Itprovides resistance genes and anti-insect compounds; a huge rangeof predatory and parasitic natural enemies of pests; and communityecology-level effects operating at the local and landscape scalesto check pest build-up. This book brings together world leaders intheoretical, methodological and applied aspects to provide acomprehensive treatment of this fast-moving field. Chapter authors from Europe, Asia, Africa, Australasia and theAmericas ensure a truly international scope. Topics range fromscientific principles, innovative research methods, ecologicaleconomics and effective communication to farmers, as well as casestudies of successful use of biodiversity-based pest managementsome of which extend over millions of hectares or are enshrined asgovernment policy. Written to be accessible to advanced undergraduates whilst alsostimulating the seasoned researcher, this work will help unlock thepower of biodiversity to deliver sustainable insect pestmanagement. Visit spanstyle="font-family: "Calibri","sans-serif"; font-size: 11pt; mso-fareast-font-family: SimSun; mso-fareast-theme-font: minor-fareast; mso-ansi-language: EN-US; mso-fareast-language: ZH-CN; mso-bidi-language: TH;"www.wiley.com/go/gurr/biodiversity toaccess the artwork from the book./span
Foreword - In the last twenty years, insect conservation has attracted the attention of an increasing number of researchers, as testified by the publication of textbooks [e.g. 1, 2], monographs [e.g. 3, 4], proceedings of symposia, workshops and congresses [e.g. 5-9] and two dedicated journals (Journal of Insect Conservation, started 1997 and Insect Conservation and Diversity, a recently started journal).

This book is not intended to be a balanced, comprehensive, and up-to-date review of the latest developments in the fields of insect ecology and conservation. Rather, it is a selection of papers representing different perspectives in insect conservation. The conceptual understanding needed to guide our actions in response to practical conservation problems obviously builds on basic researches in the fields of evolutionary biology, genetics, systematics, ethology, biogeography and ecology [e.g. 10]. The papers presented here offer a range of relevant and emerging themes that form the ecological basis of modern insect conservation. Insects are frequently used as model systems in conservation biology. However, in contrast with the veritable mountain of papers devoted to the conservation of single vertebrate species, most of the research on insect conservation is multi-species oriented, being more focused on the preservation of species assemblages than single species (see, for examples, papers published in the Journal of Insect Conservation). The paper by Eva Maria Griebeler, Henning Maas and Michael Veith presented here exemplifies current topics in landscape ecology and metapopulation biology from an entomological perspective. This paper, focused on the viability of the red-winged grasshopper Oedipoda germanica in a dynamic mosaic of vineyards and abandoned lots in Germany, is an example of a species-oriented approach showing the importance of collecting accurate field data and using appropriate simulation models to draw valid conclusions about the future of a population. Because basic knowledge, money and time are limited, one of the most debated problems in conservation biology is the use of indicator taxa as surrogates of the biodiversity of other taxa [11-15]. This is particularly compelling for highly diverse areas, ecosystems, or animal groups (like insects) where it is difficult, or even impossible, to obtain complete inventories. Although aquatic insects have long played an important role in conservation biology (e.g. as bioindicators of water quality), few studies have examined whether species richness community structure in different groups of stream insects shows similar patterns, whether these patterns are governed by similar responses to the environment, and whether there is temporal variability. In their paper on the among-taxon congruence in four major stream insects groups in Finland, Jani Heino and Heikki Mykrä found that predictions of species richness from environmental and spatial variables may be limited, and should be used with caution in conservation planning. They also found that no single stream insect group can be used as a surrogate of species richness and assemblage dissimilarity in other taxonomic groups and that the relationships between species richness and ecological gradients are variable and usually weak. These findings underline the need to also consider taxonomically difficult groups and to promote taxonomic studies and skills as essential prerequisites for effective conservation actions. Simon Grove, Dick Bashford and Marie Yee present here a long-term study with an extraordinary taxonomic effort to identify all saproxylic (dead wood-dependent) beetles associated with large logs in Tasmania's wet eucalypt production forests. They demonstrate the enormous richness of the saproxylic beetle fauna able to occupy Eucalyptus obliqua logs in their early stages of decomposition. This paper offers an example of an experimental approach to the conservation implications of declining availability of large logs, and shows that obligately saproxylic species were more numerous than facultative species. Because of temporal and financial limitations, most conservation studies resort to a 'snapshot' approach, which documents the fauna at a particular 'point' in time (which may span a year or more) and may or may not also attempt to document temporal changes. The study presented here underlines the importance of long-term analyses. This is especially compelling for saproxylic beetles, as there is a succession of species according to the age of decaying logs. Thanks to the long-term approach, these authors were able to show that very few species were common, and most were rare. In this paper rare species are considered those with few individuals sampled. In addition to local population density, other important dimensions of rarity of a species may be its geographical range and degree of ecological specialization, and these forms of rarity are discussed in other chapters. Species rarity assessment is one of the most important targets in conservation biology. The strong link between conservation and rarity lies in the idea that rare species have a greater threat of extinction than common species do [16-18]. Thus, conservation of rare species is driven by the view that the central goal of conservation is to prevent or limit the extinction of species. But, how well can the distribution (and hence the concentration) of geographically rare species be predicted by environmental characteristics? Jorge Miguel Lobo, Pierre Jay-Robert and Jean-Pierre Lumaret present an analysis of the spatial distribution of dung beetle rarity in France. In the paper published here, they considered three measures of geographical rarity (number of rare species, sum of rarity scores, and mean of rarity scores) to derive a synthetic rarity value. Based on this index, they found that for Scarabaeidae, rarity hotspots corresponded to diversity (species richness) hotspots. In this scenario, the species of Scarabaeidae with comparatively larger distributions and wider environmental adaptations should be more likely to persist. In contrast, rarity and species richness were uncorrelated for Aphodiinae. They argued that the distribution of warm-adapted, rare species of Scarabaeidae and Aphodiinae that have recently expanded range from southern refuges since the last glacial period would be explained by current climatic factors, while the cold-adapted Aphodiinae rare species that recently suffered a range contraction would be less predictable by contemporary environmental variables. Thus, this study underlines that rarity hotspots cannot be predicted only by current ecological factors, but historical factors have to also be taken into account to explain some patterns. The importance of historical biogeography in explaining current distribution patterns and in predicting future population dynamics is stressed in a paper on the conservation biogeography of Anatolian orthopterans by Battal Çiplak. In this paper, Çiplak uses an analogy between interglacial cycles and global warming to predict the future of glacial relicts (taxa confined to high altitude since the last Ice Age). Global warming is considered the main evolutionary force acting on global biodiversity and this action is similar to the effects of past interglacial warming periods. The Anatolian peninsula was an important refugial area during Pleistocene glaciations, but, during each warming cycle, some cold-preferring species remained isolated on the summits of mountain ranges. The consequences of global warming for these relict forms may involve niche changes, range changes and population/species extinction, depending on species ecological tolerances, evolutionary potential and dispersal abilities. Some species could change easily their range, by shifting their distribution latitudinally (northwards) or altitudinally (upwards) in response to increasing temperature, but other species will be reduced to fragmented populations and may become extinct in the absence of suitable habitats outside their present distribution range. This is especially true for rare species, endemic to individual mountains, that cannot colonize other areas. Thus, this paper not only shows how the study of past events can be used to predict the future of species dynamics, but also underlines the importance of macro- and microgeographic constraints in determining range changes. Although the size of the geographical range of a species is an obvious measure of rarity, other forms of rarity should be considered, especially at smaller scales. In their paper on true rare and pseudo-rare species, Paulo A. V. Borges, Karl I. Ugland, Francisco O. Dinis and Clara S. Gaspar used the insect and spider guilds on the island of Terceira (Azores) to shed light upon how recent historical land-use changes may shape the distribution of individual arthropod species. Island biogeography provided most of the conceptual foundations of conservation biology and for a long time the theory of island biogeography dominated much of conservation biology [19]. Although this prominent role is now reduced by the increasing role of other disciplines (like metapopulation biology and landscape ecology) [cf. 19, 20], island biogeography still provides an important theoretical and empirical framework for conservationists [e.g. 21-23]. Islands are natural laboratories and island populations will continue to represent a privileged target for conservationists. Results obtained by Borges and coworkers indicate that numerous species may appear unduly rare because they are sampled in marginal sites or at the edge of their distribution. The high dispersal abilities and wide ecological preferences of many insect and spider species imply that many species tend to be vagrants in several habitats and consequently are locally habitat pseudo-rare species. By contrast, truly regionally rare species are those that are habitat specialists and many of them are threatened endemic species or recently introduced exotic species. These findings provide clear evidence that adequate spatial data on abundance and habitat requirements of single species are needed to properly assess their rarity status at a regional scale. Basic ecological information is an essential starting point for any conservation study and subsequent action. However, in most cases, there is a serious lack of basic knowledge about biological processes for taxa which are of conservation concern. In their paper on thermoregulation in dung beetles José R. Verdú and Jorge M. Lobo explore the relevance of heat

production and dissipation temperature control mechanisms on the ecology and biogeography of these insects. Dung beetles include some of the most investigated species from the point of view of thermoregulation process. Verdú and Lobo offer a review of the relationships between flight and thermoregulation, also providing new data on the variation in thermoregulation among species, populations and individuals. They show that both heat production and heat dissipation could be the consequence of evolutionarily contingent adaptations related to the environmental conditions of the regions where the different lineages evolved. Thermal preferences are a neglected species trait in bioconservation. Since preliminary evidence suggests that populations and individuals have a wide physiological plasticity, it will be interesting to assess whether those species with a higher range of endothermic responses are also able to inhabit a higher variety of climatic conditions. An interesting future line of research could be the comparison of the thermal niches between invaders and non-invader dung beetles, as well as between those species that seem to respond quickly or slowly to climatic changes. Conservation research has been mostly focused on some well known insect groups, like butterflies and some beetle families, but the majority of insect taxa are ignored. This is an obvious consequence of the extraordinary variety of insects, and the impracticality of all groups being equally investigated. Tenebrionid beetles are a large family of beetles for which ecological knowledge is still relatively limited, especially in coastal sandy areas, where they represent one of the most important invertebrate groups by both biomass and diversity. Thus, they are an important, but usually neglected taxon, in these highly threatened environments. I present here an extensive review of the ecology of tenebrionid beetles in Mediterranean coastal areas, providing some clues about their conservation and their use as bioindicators in environmental assessment studies. In collecting papers for this book, I made an effort to cover as many major insect taxa as possible. However, the taxonomic coverage is obviously unbalanced and the lack of papers specifically dealing with the conservation of some taxa, like butterflies or ground beetles, which are among the most studied from a conservation perspective [24-26], may be surprising. However, I believe that this is not a serious shortcoming, because these groups are extensively referred to in other books devoted to insect conservation [e.g. 1, 2, 5-7, 9]. What we have come up with finally, I think, is not a thorough survey of the field of insect ecology and conservation, but rather an invitation to the field issued by some of its worldwide practitioners. Not all readers will be equally interested in every chapter, but I feel that most readers will find something interesting and will be stimulated especially by chapters dealing with subjects outside their own fields of study. This volume begun as a response to an invitation by the Research Signpost. I thank Shankar G. Pandalai, Managing Editor of Research Signpost for encouraging me to edit this volume and for all his assistance during the process. I welcome this opportunity to express publicly my obligation to all the contributors for responding so rapidly to my bullying and for sending their manuscripts so rapidly. References 1. Samways, M. J. 1994, Insect Conservation Biology, Chapman and Hall, London. 2. Samways, M. J. 2005, Insect Diversity Conservation. Cambridge University Press, Cambridge. 3. van Swaay, C. A. M., and Warren, M. 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Fully revised and updated to include new topical study areas, the second edition of the successful text the Ecology of Insects provides a balanced treatment of the theory and practice of pure and applied insect ecology. Includes new topical areas of insect ecology and provides greater coverage of physiological, genetic, molecular, and ecosystem aspects of insect ecology Concepts include the foundations of evolutionary ecology and population dynamics in ecosystem science as they are applied to topics such as climate change, conservation and biodiversity, epidemiology and pest management Fully updated and revised throughout, this new edition refers to primary literature and real world examples. To access the artwork from the book, please visit: http://www.blackwellpublishing.com/speightinsects.

These proceedings contain papers on insect conservation biology that are classified under 3 themes: (1) the current status of insect conservation, and major avenues for progress and hindrances (6 papers); (2) insects as model organisms in conservation biology (6 papers); and (3) future directions in insect conservation biology (6 papers).

Dr. Timothy Schowalter has succeeded in creating a unique, updated treatment of insect ecology. This revised and expanded text looks at how insects adapt to environmental conditions while maintaining the ability to substantially alter their environment. It covers a range of topics- from individual insects that respond to local changes in the environment and affect resource distribution, to entire insect communities that have the capacity to modify ecosystem conditions. Insect Ecology, Second Edition, synthesizes the latest research in the field and has been produced in full color throughout. It is ideal for students in both entomology and ecology-focused programs. NEW TO THIS EDITION: * New topics such as elemental defense by plants, chaotic models, molecular methods to measure disperson, food web relationships, and more * Expanded sections on plant defenses, insect learning, evolutionary tradeoffs, conservation biology and more * Includes more than 350 new references * More than 40 new full-color figures

Insects are a dominant component of biodiversity in terrestrial ecosystems and play a key role in mediating the relationship between plants and ecosystem processes. This volume examines their effects on ecosystem functioning, focusing mainly, but not exclusively, on herbivorous insects. Renowned authors with extensive experience in the field of plant-insect interactions, contribute to the volume using examples from their own work.

Australia’s varied grasslands have suffered massive losses and changes since European settlement, and those changes continue under increasingly intensive human pressures for development and

agricultural production. The values of native grasslands for conservation of endemic native biodiversity, both flora and fauna, have led to strong interests in the protection of remaining fragments, especially near urban centres, and documentation of the insects and other inhabitants of grasslands spanning tropical to cool temperate parts of the country. Attention to conservation of grassland insects in Australia is relatively recent, but it is increasingly apparent that grasslands harbour many localised and ecologically specialised endemic species. Their conservation necessarily advances from very incomplete documentation, and draws heavily on lessons from the far better-documented grasslands elsewhere, most notably in the northern hemisphere, and undertaken over far longer periods. From those cases, and the extensive background to grassland management to harmonise conservation with production and amenity values through honing use of processes such as grazing, mowing and fire, the needs and priorities for Australia can become clearer, together with needs for grassland restoration at a variety of scales. This book is a broad overview of conservation needs of grassland insects in Australia, drawing on the background provided elsewhere in the world on the responses to disturbances, and the ecological importance, of some key insect groups (notably Orthoptera, Hemiptera and Lepidoptera) to suggest how insect conservation in native, pastoral and urban grasslands may be advanced. The substantial references given for each chapter facilitate entry for non-entomologist grassland managers and stewards to appreciate the diversity and importance of Australia’s grassland insects, their vulnerabilities to changes, and the possibilities for conserving them and the wider ecological roles in which they participate.
"In this book, you will get to imagine that you are an insect living in Melbourne's parks! Imagine drinking nectar from flowers, flying over the swings, or crawling on the ground in between blades of grass. You will also get to learn some words in the Boon wurrung Aboriginal language. Do you know that the Boon wurrung word for insect is 'kam-kam-koor'? Let's meet some of the amazing insects living with us in the City of Melbourne!"--Page [2].