

RECENSIONE

DENNIS, R. L. H. 2010. *A Resource-Based Habitat View for Conservation: Butterflies in the British Landscape*. Wiley-Blackwell, Chichester, UK, 420 pp. Hardback, ISBN: 978-1-4051-9945-2. £ 50,00 / € 57,50.

Looking at the variety and complexity of the themes involved in this book, it seems incredible that a single author was able to manage all of them so profoundly. Indeed, for such a hard task, the author needs to be skilled in a number of fields, ranging from ecological entomology to biogeography, from biostatistics to population biology, and so on. In an era of hyper-specialisation as our time, few researchers can boast such an encyclopaedic culture. Roger L.H. Dennis is one of these enviable exceptions.

The book includes nine chapters. Chapters 1 and 2 offer an exceptionally detailed discussion of the habitat definition, with special reference to butterflies. Chapters 3 and 4 concentrate on the concept of 'resource'. Chapter 5 discusses the concept of biotope. Chapter 6 explains the link between the resource based habitat concept and metapopulation biology, while Chapter 7 discusses the habitat concept from a landscape ecology perspective. Chapter 8 is dedicated to species distributions. Just to give an idea of the beauty of this chapter, I would like to cite an intriguing graph, which offers a diagrammatic representation of changing butterfly habitats over the past 22,000 years by comparing temporal changes in geology, temperatures, precipitation, forest cover, butterfly thermal tolerance and limits, hostplant and biotope limits, arrival sequence of the species, and human culture. This chapter also includes a detailed discussion of the influence of climate and land use changes on present and future distributions. The last, ninth Chapter is dedicated to the importance of habitat study in butterfly conservation.

In each chapter, the author presents detailed discussions of literature data coupled with a number of original analyses based on published and unpublished data. It is really incredible how the author was able to present such comprehensive and advanced analyses in a plain and simple style, producing a book of the highest scientific content and, at the same time, understandable even by undergraduate students. Most of the statistical analyses used in this book are described in the commonest textbooks of statistics. When particular statistics are referred to, they are explained. For example, Box 7.1 is an easy-to-follow introduction to the problem of autocorrelation, one of the most debated (and mathematically most difficult) issues in numerical ecology.

All chapters are furnished with boxes which present collateral themes and which are particularly attractive even for readers not directly interested in insect ecology and conservation. A number of boxes illustrate central themes of general ecology, including a mini-review of the concept of ecological niche (Box 2.2), an excellent synthesis of the concepts of weather and climate (Box 2.4, while certain effects of climate on butterflies are shown in Box 8.3), and an intriguing discussion on life history strategies (Box 5.4). Boxes 7.2 and 7.3 present an outline of the UK geology and soils, but they include a summary of concepts and terms whose application extends far beyond UK, while Box 7.4 is a nice description of the main processes of landform evolution. These boxes may represent excellent lectures even for undergraduate students in biology and natural sciences, but can represent intriguing mini-reviews for any ecologist as well.

Since this book is based on an exciting integration of principles of metapopulation biology with landscape ecology, we expect to find boxes dedicated to these fields. The book contains several of such boxes. For example, Box 3.3 is a beautiful summary of population dynamics, while Box 6.1 (coupled with the case study reported in Box 6.2)

is a short but comprehensive review of metapopulation principles. Box 3.1 is a powerful introduction to the mathematical study of the basic dimensions of a landscape, whereas Boxes 6.3, 6.4 and especially 6.5 introduce the reader to the exciting field of landscape topology. Box 7.5 is an appreciable summary of concepts involved in the measure of relief and its representation by digital elevation models. Box 7.7 is an extremely useful discussion of the metrics for describing the landscape (possibly the most complete available, with a wide selection of references). Thus, all these boxes can be used as first reading for any reader who wants to have an updated synthesis in the fields of landscape ecology and metapopulation biology.

A leitmotif of this book is the interplay between butterflies and plants. Butterflies depend strictly on plants, both as larvae and as adults, and thus qualify as excellent subjects to investigate ecological interrelations and coevolution processes between phytophagous insects and plants. Box 2.3 offers an illuminating essay on food specialisation in herbivorous insects, but there are various other boxes that form collectively a mini-handbook covering the main themes in plant ecology. Because animals depend (more or less directly) on plants, plant ecology is the obvious framework for many researches in animal ecology. However, scientists interested in animal ecology typically do not have a solid background in plant ecology. In this book, we can find various sections which are particularly useful for the reader who is not expert in plant ecology and who needs a primer in this field. In particular, Boxes 5.2 and 5.3 offer an exceptionally clear presentation of principles and terms used in plant geography and ecological succession, two subjects of the highest importance in animal ecology, but which typically trouble zoologists.

The author has an important background in geography and published many seminal papers on butterfly biogeography. Biogeography seems to be not strictly related to the themes involved in this book. Nothing is further from the truth. The study of species distribution is fundamental in conservation biology and the recent development of a 'new' discipline, 'conservation biogeography', simply confirms that conservation roots in biogeography. Biogeographical issues are discussed in most of the chapters of this book, but they form in particular the bulk of Chapter 8 (Habitat issues in butterfly geographical ranges), which is particularly stimulating for those interested in ecological biogeography and in the study of distributional changes determined by climate warming. A univocal definition of terms used to describe species distribution would be essential to avoid misunderstandings in biogeography, yet most biogeographers use as synonymous a number of terms which, in fact, refer to different concepts. Box 8.1 presents a definition of these terms (such as extent of occurrence, area of occupancy, realised distribution, realised range, potential distribution, potential range), and it is therefore a recommended lecture to everyone interested in biogeographical issues.

Because conservation is the central theme of this book, principles of conservation biology are widely discussed through all chapters. Among the boxes specifically dedicated to conservation biology, I found particularly interesting for a general readership: Boxes 9.3 and 9.4 (which focus on some basic concepts of preserve design and ecological networks for bio-conservation), Box 8.6 (a discussion of the decline of British butterflies because of climatic change and habitat destruction, full of suggestions for further studies on the impact of climatic change on species distribution), and Box 8.7 (which presents a classification scheme for migrant and resident species which can be used as a baseline to investigate how migrant insects change their status because of the effects of climatic warming).

The book also includes seven synoptic Appendices, which collect an incredible amount of data. Appendix 1 reports biodiversity action plan status, legal protection, and taxonomic relationships for British butterflies. Appendix 2 lists for each butterfly species the respective hostplants (with their ecological attributes, such as phenology, biotopes, growth forms, Ellenberg values and life history strategies). Appendix 3 reports the nectar sources. Appendix 4 reports 14 different kinds of statistics on larval host use and adult

feeding. Appendix 5 is a precious synthesis of utility resources and life history data, while adult and larval behaviours are summarised in Appendix 6. Finally, biotope preferences are indicated in Appendix 7.

This splendid book, lavishly produced and beautifully illustrated, is a 'must have' publication not only for lepidopterologists, but also for any entomologist interested in insect ecology and conservation.

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