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Book Reviews

Middleton, N., A. Froud, and K. French. 2014. Social calls of the bats of Britain and Ireland. Pelagic Publishing, Exeter, 176 pp. ISBN 978-1-907807-97-8 (pbk), £29.99.

Acoustic studies of bats have been increasing steadily since the 1980s; but it is studies of echolocation calls that constitute the majority of published work to date. With this book (accompanied by a sound library) Neil Middleton and his two colleagues contribute to filling in an obvious gap in the area of social calls emitted by European bats. So far, except for some papers limited to the description of social calls of a particular species, the thesis in German by Pfalzer (2002) and the article by Pfalzer and Kush (2003) were the main descriptive references. The authors have an experience of 10–20 years in the study and conservation of bats across Europe. They are the main contributors to this sound library with further contributions by some 20 or more people.

A brief first part (Chapter 1) presents, through the use of summary tables, the species occurring in Great Britain and their biology. Chapter 2 deals with social calls in bats, their differences from echolocation calls, and the situations in which these calls are emitted in different contexts: generic roost sites; distress; mother and offspring interaction; co-ordination and group cohesion; mating behaviour (subdivided in three sections: resource defense polygyny, female defense polygyny, promiscuity); food patch defense. Chapter 3 attempts to better structure the classification of the different types of social calls by proposing a nomenclature. The methodology for the collection and analysis of social calls is detailed in Chapter 4, while Chapter 5 lists the possible applications of the study of signals of social communication.

The bulk of the book (pp. 50–149) is devoted to case studies of the 23 species included, with a predominantly narrative description illustrated by numerous spectrograms. For each species, standardized headings are summarized in tabular form, making information clear and easily accessible. For some complex cases (such as the three pipistrelles: *P. pipistrellus*, *P. pygmaeus*, *P. kuhlii*) distinguishing criteria are broken down by categories in a summary table. Parameters measured from the signals (e.g., frequency, duration) are regrettably not quantified. Nevertheless, the original 178 '.wave' recordings can be downloaded from a link provided at the start of the book, allowing the reader to perform any measurements and listen to acoustic criteria in time expansion.

As the authors point out themselves in the preface, the subject is far from being exhaustively covered despite their important research. The acoustic social repertoire of bats is expected to be rich and complex due to at least three factors: the large number of species, the fact that the acoustic emissions are a centerpiece of their biology and ecology, and the highly social nature of their behavior between conspecifics. Therefore, our knowledge on this topic is at its infancy, both in terms of specific repertoires and their meanings. The announced purpose of this book is to present a current overview, richly illustrated by picture and sound, to motivate Chiropterologists for greater consideration of this component at the border between acoustics and ethology. And in this aim, they are successful; I highly recommend this book, it being both useful and enjoyable at the same time.

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Pfalzer, G., and J. Kush. 2003. Structure and variability of bat social calls: implications for specificity and individual recognition. Journal of Zoology (London), 261: 21–33.

Dietz, M. (ed.). 2013. Populationsökologie und Habitatansprüche der Bechsteinfledermaus *Myotis bechsteinii*. Beïtrage zur Fachtagung in der Trinkkuranlage Bad Nauheim 25–26. Februar 2011. 344 pp. ISBN: 978-3-00-043875-2 (hb), €30.00.

This book of proceedings includes 19 contributions to the symposium "Populationsökologie und Habitatansprüche der Bechsteinfledermaus *Myotis bechsteinii*", held in February 2011. The objective of the symposium was to collect and summarize the considerable existing knowledge from the species, and to communicate it to decision makers, land owners and the general public the latest results of research on population ecology and habitat requirements for Bechstein's bat (*M. bechsteinii),* and their implications for the species' conservation.

The book combines papers written in German and in English, and is illustrated with a collection of brilliant photos by Markus Dietz, René Guttinger and others. These conference proceedings provide a good summary of the current knowledge about *M. bechsteinii*, with regard to diet, habitat use and spatial ecology and sociality; at least in its main distribution range, located in Western and Central Europe. The volume offers not only new experimental evidence and updated distribution data, but also new insights on relatively poorly explored areas.

The first article, by Gerald Kerth and collaborators (p. 35), summarizes the main findings in 20 years of research on the importance of social structure and the environment on the genetic composition, ecology and behaviour of Bechstein's bat populations. Using Bechstein's bats as models, Kerth and coauthors have published a large collection of articles on sociality and decision making, some of which have became key references in the field, especially concerning fission-fusion systems, of which *M. bechsteinii* is a good example.

The bulk of the publication relies on traditional radiotracking studies and acoustic monitoring to examine the use of roosts and foraging habitats (e.g., Schmidt *et al*., p. 247). The conclusions of the studies support the well established idea that *M. bechsteinii* is a habitat specialist, dependent on old-growth deciduous forest lowlands. In accordance to the thermophilous character of this strict forest dweller (Baagøe, 2001), the factors that best explain distribution of Bechstein's bats are diurnal temperature and the existence of deciduous (beech, oak) forests (Pir, p. 193; Dietz *et al*., p. 216; Reiners *et al*., p. 233). Forest management is another factor influencing the distribution and future development for the population (p. 217). Similarly, Wolz (p. 51) revisits previous works on *M. bechsteinii*'s diet to conclude that it is a diet generalist, which preys on a wide array on non-airborne arthropods, with strong indication for an opportunistic foraging behaviour (p. 65).

Interestingly, traditional orchards are identified as habitats of importance, at least at certain times of the year, not only for *M. bechsteinii* but also for other many bat species (Bögelsack and Dietz, p. 151; Hillen, p. 257). The results resemble those published by Napal *et al*. (2010) on Mediterranean dehesas, and diverge from the most extended view that *M, bechsteinii* requires large, continuous forests. Dehesas, like traditional orchards, are hotspots for diversity and could compensate for the loss of primary habitats. These cultural landscapes can be threatened by intensive fruit plantations (and the abandonment of traditional agricultural practices and lands).

Some of the conference papers have a strong focus on conservation; one of the pearls of the book is the proposal of concrete measures which are based on experimental evidence. Güttinger and Burkhard (p. 105) defend oaks in forest edge as priority habitat; Bögelsack and Dietz (p. 151) signal traditional orchards, and suggest conserving well managed forests, with trees at regular intervals and undergrowth kept short by grazing. Strictly based on structural concerns, our own work cast doubt about this recommendation: colonies may benefit to a certain extent from spaced trees likely receiving more insolation or less obstructed roost entrances, but foraging also occurs on top of bushes in areas with a dense understory; the manoeuvrable Bechstein's bats do not seem particularly affected. However, in orchards the effect of mowing and grazing on insect abundance and diversity is likely a factor to be considered. More decisive seems to be the availability of suitable roosts. In this sense, the authors correctly maintain that ancient trees should be retained, in a connected mosaic of landscapes.

Without detracting from the considerable volume of new data on habitat selection, foraging ecology and distribution (with some first records), probably the most remarkable contribution are the new data involving 180 hibernacula in Thüringen (Biedermann *et al*., p. 233), which contrasts strongly with the general paucity of data about current hibernation sites for *M. bechsteinii*, in comparison with the abundance of fossil and subfossil remains in cave deposits during the Holocene.

This book of proceedings contains other interesting pieces of reading on wing mites (Baulechner *et al*., p. 309) or aspects of physiology, such as the use of thermorregulation (Hörig and Dietz, p. 281). Worth mentioning are the papers on differences in roost selection and spatial ecology (Krannich and Dietz, p. 131), but especially the comparison of the digestive physiology of three sympatrically occurring gleaners (Roswag *et al.*, p. 299). These articles provide new evidence which can contribute to explaining the mechanisms that allow for coexistence with sympatrically ocurring strict forest dwelling gleaners, such as *Plecotus auritus* and *Myotis nattereri*, a field of study that remains relatively unexplored. Shared species of mites evidence coexistence, and probably use of the same roost, at the same time or sequentially, by *M. nattereri*.

On the whole, there are many valuable data provided in this book. The majority of the articles follow traditional ways to explore conventional topics in the main centre of distribution, and just add to mainstream knowledge, and changes little the picture formed over about 20 years of intensive research of the autoecology of a species. Some of the articles present innovative methodological or conceptual approaches that open avenues for future research.

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