Acta Chiropterologica, 19(2): 455–456, 2017
PL ISSN 1508-1109 © Museum and Institute of Zoology PAS

Book Reviews

Perrow, M. R. (ed.). 2017. Wildlife and wind farms, conflicts and solutions. Volume 1: Onshore: Potential effects. ISBN 978-1-78427-119-0 (pbk), 289 pp. Volume 2: Onshore: Monitoring and mitigation. ISBN 978-1-78427-123-7 (pbk), 217 pp. Pelagic Publishing, Exeter, UK. Price GBP 34.99 (each volume).

Recently, courtesy of the Pelagic Publishing, I received the first two volumes of the book on wildlife and wind farms, edited by Martin R. Perrow from ECON Ecological Consultancy Ltd (Ireland) and written by leading specialists from Europe, North America, and Australia. The subject of the book is a really contentious topic, as there is considerable concern over the effects of wind farms on wildlife, especially on birds and bats. However, in many countries electricity-generating wind turbines are of great hope for renewable energy. This is a global issue of high importance to both wildlife conservation and public acceptance of development of wind farms.

In the first volume, containing 11 chapters, the authors focus on the potential effects of wind farms on abiotic and biotic components of the environment. The book starts with the introduction to the subject of wind farms (chapter 1), their influence on meteorological conditions at local and regional scales (chapter 2), and assessment of the impact of wind farms on the existing vegetation (chapter 3). The next chapters provide an estimation of how wind farms affect different groups of animals: terrestrial invertebrates (chapter 4), aquatic organisms (chapter 5), reptiles and amphibians (chapter 6), birds (chapters 7 & 8 — on displacement and collision), bats (chapter 9), and terrestrial mammals (chapter 10). The book ends with chapter 11 forming a unifying synthesis of the effects and impacts. In the chapter on bats, which was written by Robert M. R. Barclay, Erin F. Baerwald, and Jens Rydell, the authors provide an updated knowledge on the effects of wind turbines on these animals. They also assess different hypotheses (taking into account random collisions to non-random events, such as attraction to turbine noise or to insects drawn at turbines) used to explain why bats are killed at wind farms. The problem is really serious as there are millions of bat fatalities at wind turbines globally each year, which exceed those of birds in North America and Europe (i.e. on the continents with the bulk of well-documented studies). Fatalities are also more 'concentrated' (in terms of species diversity) in bats than in birds, as the majority of bats killed belong to a few high-flying open-space species. This relationship is clear although there are some geographical differences; in North America almost 80% of fatalities occurred in three species, including *Lasiurus cinereus*, whereas in Europe more than 60% of fatalities concerned four species, including *Pipistrellus pipistrellus*, *Nyctalus noctula*, and *Pipistrellus nathusii*.

In the 2nd volume, there are nine chapters focusing on monitoring and mitigation issues, including chapters on monitoring birds and bats (chapters 1 & 2), modelling collision risk and populations (chapter 3), statistical principles of monitoring post-construction fatalities (chapter 4), spatial planning (chapter 5), mitigating for birds (chapter 6), turbine siting for raptors (chapter 7), mitigating for bats (chapter 8), and proposing the best-practice approach to future planning (chapter 9) . In the first chapter dealing with bats, Cris D. Hein summarizes information on how to predict risk and quantify the impact of wind turbines on these animals during pre- and post-construction periods. He also discusses several methods used in monitoring bats, including acoustic surveys, mist-nesting, radio-tracking, infrared imaging, radar detection, and fatality searching. In the next chapter on bats, Edward B. Arnett provides a review of mitigating options for bats at wind farms, showing that in fact after the facility is built, they are limited to either increasing cut-in speed by 1.5–3 m/s or feathering blades and slowing rotor speed-up. In his concluding remarks, the author indicated that mitigation is not temporary but should be in focus throughout the entire lifespan of a wind farm. Bats also appear in some other chapters of this volume, e.g., while estimating fatality for rare species (using *Nyctalus leisleri* as an example) in the chapter on statistical principles (which I also read with great interest).

The book itself has an attractive format, clearly written chapters, well identified paragraphs, with some interesting case studies shown in boxes, and with the subject index ending each volume. It reads smoothly. The only thing I am not fully satisfied with are figures and photos, which should be larger. Otherwise, this is the must read book for everybody interested in wind farms and wildlife, which will be the next step in our better understanding of relationships between renewable energy, wildlife and the environment.

Wiesław Bogdanowicz — *Museum and Institute of Zoology, Polish Academy of Sciences, Wilcza 64, 00-679 Warszawa; E-mail: wieslawb@miiz.waw.pl*

Jacobs, D. S. 2016. Evolution's chimera: bats and the marvel of evolutionary adaptation. University of Cape Town Press, Cape Town, South Africa, 204 pp. ISBN 978-1-77582-212-7 (pbk), price ZAR 299.

Bats are 'extreme' mammals possessing surprising skills, so a journey into the way such skills evolved is indeed very fascinating. Illustrating the beauty of evolution using bats as model organisms is a challenging goal, and David Jacobs successfully achieved it with his new book, 'Evolution's chimera: bats and the marvel of evolutionary adaptation.'

The title does justice to bats — indeed, these mammals are evolution's chimeras. According to Greek mythology, chimeras were hybrid organisms made of parts of different animals, and,

as the author puts it, “Superficially, …, bats combine the body of a mouse, the face of a gargoyle or fox and the wing of a pterosaur” — some of the traces left behind by over 52 million years of evolutionary history.

The book first covers the general basics of evolution simply, but elegantly, linking evolutionary processes to ecological aspects such as competition, predation and antipredatory strategies. Jacobs then moves on to present bat natural history, looking at bat diversity (size, diet, adaptation to flight, echolocation) and exploring the evolutionary history of bats. The puzzling matter of how and when echolocation evolved is also comprehensively analysed. The remaining chapters illustrate selected topics that make wonderful examples of evolutionary processes in bats. A classic case of evolutionary arms race, coevolution of predatory and antipredatory responses between bats and moths; but also an enjoyable overview of whether hard evidence exists for present or past occurrence of interspecific competition among bat species, leading to resource partitioning and promoting character displacement patterns, and ultimately determining diversity within bat communities. Space is also given to perhaps one of the least intuitive concepts to grasp for beginners in evolutionary biology, namely sympatric speciation: Jacobs uses harmonic hopping in high-duty cycle bats as an effective example of how changes in echolocation may have promoted rapid linear divergence in bats. The book ends with a chapter spotlighting the detrimental effects of human action on bat populations and remarking the value of modern scientific research to inform conservation and thus avoid the disappearance of these evolution’s chimeras along with the crucial ecosystem services they provide.

‘Evolution’s chimera: bats and the marvel of evolutionary adaptation’ is beautifully illustrated with clear drawings and graphs and captivating photography by Jens Rydell, Brock Fenton and the author himself. Although the book is meant for an audience of biology students, it certainly makes for enjoyable reading for bat biologists, zoologists or more generally anyone with an interest in evolution and natural history.

Danilo Russo — *Wildlife Research Unit, Laboratorio di Ecologia Applicata, Dipartimento di Agraria, Università degli Studi di Napoli Federico II, via Università, 100, 80055 Portici, Napoli, Italy; E-mail: danrusso@unina.it*