Habitat Suitability and Distribution Models: With Applications in R. *Ecology, Biodiversity and Conservation.*

By Antoine Guisan, Wilfried Thuiller, and Niklaus E. Zimmermann; with contributions from Valeria Di Cola, Damien Georges, and Achilleas Psomas. Cambridge and New York: Cambridge University Press. $115.00 (hardcover); $49.99 (paper). xvii + 462 p. + 32 pl.; ill.; index. ISBN: 978-0-521-76513-8 (hc); 978-0-521-75836-9 (pb). 2017.

The development, analysis, and use of habitat suitability models, also known as species distribution models, environmental niche models, climate envelope models, or resource selection functions, is one of the most rapidly growing fields of basic and applied ecology. *Habitat Suitability and Distribution Models* fills a particular niche on the burgeoning bookshelf of volumes on this topic. It is best viewed as a cookbook filled with recipes for modeling past, present, and future realized environmental niches that can be baked with the R programming language. Along with its companion website that hosts the code and keeps track of errata (http://wp.unil.ch/hsdm/), this volume is destined to become a well-thumbed and well-used resource, much like Julia Child's *Mastering the Art of French Cooking* has been for more than 50 years.

Readers will find in this book's densely typeset pages: routines for acquiring environmental and species distribution data from a range of Web-based resources; algorithms for modeling habitats ranging from standard regression and distance-based methods to more recently developed machine-learning tools (including artificial neural networks, boosting, bagging, and maximum entropy); and methods for evaluating model fits and prospective forecasting. All routines, algorithms, and methods are presented both in prose and in R code, and will be easily adapted by readers conversant with R to their own data.

The authors have been leaders in the theoretical development and implementation of a wide range of habitat suitability models. Nonetheless, they have not written this volume to provide detailed theoretical explanations of habitat suitability modeling (i.e., the underlying mathematics or statistics that have gone into its development), and it assumes relatively strong (i.e., advanced undergraduate or graduate-level) understanding of ecology, macroecology, geographic analysis, and spatial statistics. Rather, the four introductory chapters provide—in less than 50 pages—only a brief review of said theory and background, but sufficient pointers to the literature to engage the more curious. The one crucial theoretical point that is not overlooked, however, is implicit in the authors' reference to the methods presented as "habitat suitability models." This choice of term (as opposed to the vastly more popular "species distribution models") correctly identifies what the models do. They use the distribution of species with respect to the current environment to identify potentially suitable habitats, now or in the future. Whether one or more species actually occur in these potentially suitable habitats is (or will be) constrained by a wide variety of biophysical, ecological, and anthropogenic processes. This subtle distinction generally is lost in discussions of "species distribution models," to the detriment of all concerned.

The upside of a cookbook, and of the current volume, is that its readers can easily use the methods presented. And I expect these will work just fine for most applied questions that can be addressed with existing data. The downside is that if the data available does not work exactly like the examples in the book, or if readers want to extend the recipes in new ways, they will need to delve into the more theoretical literature. But that is as the authors intend. *Habitat Suitability and Distribution Models* fills an important, but heretofore vacant, niche, while establishing a set of standards for use of, and future basic and applied research into, habitat suitability models.

Aaron M. Ellison, *Harvard Forest, Harvard University, Petersham, Massachusetts*

The Marine World: A Natural History of Ocean Life.

By Frances Dipper; illustrated by Marc Dando. Ithaca (New York): Cornell University Press (Comstock Publishing Associates). $59.95. 544 p.; ill.; index. ISBN: 978-1-5017-0989-0. [Originally published in the United Kingdom in 2016 by Wild Nature Press.] 2017.

The author takes us on a journey from the highest reaches of coastal sea cliffs and sand dunes to the lows of the rocky shores and infaunal benthic territories. We traverse through the pelagic realm from the neustonic surface layer down to the deep-sea trenches of the abyssopelagic. It is evident that Dipper is deeply captivated by the dynamic marine environment, its life, and how that life interacts. This book offers a conservationist perspective, and gives an educated summary of the expansive life and limits of the marine environment with an impressive representation of both the flora and fauna. I agree with the author that it would best serve a broad audience, including ocean enthusiasts, detailed hobbyists, divers, or even generally interested students and instructors who want to gain valuable introductory insight on physical ocean drivers, ecosystems, and biota. It highlights where a diver or naturalist may locate particular groups and functions as a starting point that might inspire further specialized research. In addition, it gives a more novice ocean audience some relatable terrestrial comparisons.