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book review

DIY Guide for Reptilian Monitoring

Reptile Biodiversity: Standard Methods for Inventory and Monitoring, edited by Roy W. McDiarmid, Mercedes S. Foster, Craig Guyer, J. Whitfield Gibbons & Neil Chernoff, 2012, University of California Press, 412 pp. \$95 / £35 (hardback) ISBN: 978-0-520-26671-1; <http://www.ucpress.edu>

Studies assessing the biodiversity of reptiles present a unique set of challenges and sampling considerations. Reptiles display a staggering array of behaviours, are found in a diversity of habitats, and can vary in seasonal occurrence and abundance. Some taxa are potentially dangerous (crocodilians, large lizards and venomous snakes) and thus difficult to measure. Other taxa are cryptic, being nocturnal or fossorial in their habits. Sea turtles present a different set of challenges when assessing populations and biodiversity due to their ecological distribution and nesting behaviours. These species may only come ashore and be accessible to investigators during reproduction, resulting in data sets biased by gender and reproductive state, leading to apparent sex ratio-skews or biased interpretation of reproductive condition within populations. These challenges, as well as many others, are considered in this volume; the first of its kind to consider reptile monitoring. Previously the only way to access recommendations on handling and marking reptiles was in the context of animal welfare and safety concerns (ASIH 2004). Alternatively, information on methods for conducting field studies in reptile monitoring could be gleaned from issues of *Herpetological Review* (published by the Society for the Study of Amphibians and Reptiles, SSAR) or similar publications. This single volume is an authoritative and informative addition to the field of biodiversity assessment in reptiles, and expands the scope and detail of earlier resources.

This book is greatly enhanced by its editorial personnel and by a multitude of contributing authors – 70 individual researchers and authorities have written for this volume, most of them bringing their own expertise in conducting reptile

surveys. The book is divided into four parts. The opening *Introduction* sets the stage with two short chapters on the need for reptilian biodiversity studies and a taxonomic review of modern reptilian groups (exclusive of avian reptiles). This section outlines the ecological significance of reptiles and explores the historical roots for the lack of reptilian biodiversity assessment. The authors claim their primary goal is to set forth standardised methods for conducting reptile surveys, thus bringing legitimacy to data regardless of who collects it. As stated in the text, the target audience is “government personnel, conservationists, managers, professional scientists, and amateurs throughout the world.”

In *Planning a Diversity Study* (Chapters 3–10) the authors use eight major chapters to present considerations on how reptilian monitoring should be carried out. Throughout the book, authors address questions related to the rationale and justification for conducting monitoring surveys. Chapters and sections deal with a number of pre-survey considerations, including how data is to be collected, stored, and graphically represented. Of noteworthy inclusion are sections dealing with sampling bias, pseudoreplication and associated data. The authors make the point that there is a rich set of microhabitat data that could impact the interpretation of survey information. Additionally, use of computer-based mapping software is discussed in the context of maximizing the usefulness of data in time or space. Geographic Information Systems (GIS) have become an integral part of conservation management and habitat assessments, and these tools have significant potential in predicting species occurrence. Yet, potential habitats for specific reptilian taxa need to be verified by sur-

vey personnel. This requires basemaps of suitable resolution and microhabitat detail – data that may be lacking for remote areas (although I suspect smartphone technology will make this a reality in the near future). Throughout the text the authors point out the need for basic life-history and ecological data for many species – it is imperative to ‘know’ the species being surveyed. The chapter on capturing reptiles (Chapter 5) provides a succinct and accurate summary of capture methods for most taxa. Chapters 6 and 7 deal with the necessity of collecting and preparing voucher specimens. This is a critical aspect of documenting biodiversity studies that some individuals may find unpleasant, but is essential to validating the occurrence of target taxa. Properly prepared and documented museum material can serve as a basis for additional studies on basic biology and is essential for long-term verification of species distribution and occurrence. Seasonal collection of sufficient specimens can provide information on reproductive status and dietary habits.

The third section, *Sampling Reptile Diversity* (Chapters 11-16), presents many practical methods for sampling reptile diversity in field surveys. I find this section of the book to be the most valuable, as it standardises many field techniques. Contributors provide detailed information on constructing sampling and trapping devices including drift fences and pit-fall traps, use of telemetry for tracking and locating individuals, and a variety of other sampling techniques (including the use of trained canines in locating terrestrial turtles!). For certain sampling devices the authors provide a veritable shopping list of required materials. A series of side-bar case studies provide specific concerns for sampling in particular ecosystems (Central Asian deserts, South-east Asian forests and Madagascar). Chapters 14 and 15 are particularly important, as these address mathematic models for a number of biodiversity measures (species richness, evenness, diversity and numerous parametric measures)

and demographic parameters.

The final section looks at the future of reptilian biodiversity surveys and considers under-investigated taxa. Appendices present information on significant global museum collections of reptiles and websites of interest for materials, supplies and software vendors. This last list likely has a limited shelf life but it can serve as a starting point for information on these resources. The literature review is complete and diverse, and despite a North American emphasis, there is significant global representation.

In making an assessment of this publication I can only wonder where was this book when I was a graduate student? This is a veritable how-to manual for conducting reptilian survey studies. Information in this volume is useful not only for biodiversity assessment, but also in conducting any number of field studies examining an array of ecological questions focusing on reptiles. While some of this material will be outdated in a few years, the basic approaches and questions will always need to be considered. This volume is a concise, thoughtful accumulation of field protocols and marking techniques. This book is a valuable resource for all investigators studying reptile populations. This reviewer hopes that alternate-language versions of this publication will be forthcoming – only then can the authors’ dreams of universal, standardised survey methodology become a reality.

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Reference

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