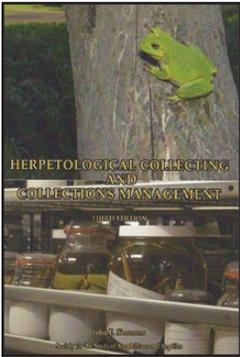


BOOK REVIEWS

Herpetological Review, 2016, 47(2), 320–321.
© 2016 by Society for the Study of Amphibians and Reptiles

Herpetological Collecting and Collections Management, Third Edition

John E. Simmons. 2015. Herpetological Circular No. 42, Society for the Study of Amphibians and Reptiles. 191 pp. Softcover. US \$20.00. ISBN 978-0-916984-90-8.



AMY LATHROP
ROSS MacCULLOCH

Department of Natural History,
Royal Ontario Museum,
100 Queens Park, Toronto,
Ontario M5S 2C6, Canada
e-mail: AMYL@rom.on.ca; ROSSM@rom.on.ca

The acquisition, maintenance, and care of natural history collections is an acquired skill in which experience and tradition have been the only guiding force. John Simmons has spent a lifetime dedicated to collection

management and museum studies and has a wealth of knowledge on these subjects. This book is intended for anyone who collects, preserves, documents, or is responsible for any specimens held in perpetuity, be that in a museum or a few jars in a small research collection. Anyone in these situations has the responsibility to make the most out of these sacrifices, and *Herpetological Collecting and Collections Management* is an excellent guide to achieve this mandate. To have all of this knowledge, experience, and extensive references on the subject in a single volume makes this book an invaluable resource.

The book is organized into four sections: historical review of systematic collections, planning and conducting field work, processing of captured animals, and storage and maintenance of collections. The target readership is both field collectors and collection managers (these are often the same people) and by making all the steps involved more transparent, it is hoped that specimens may be better preserved and documented for future research.

This third edition is an expansion and significant upgrade of the second edition (Simmons 2002). It is not simply a piecemeal revision, but has been almost totally rewritten. Typos are few, but there are some that did not appear in the 2002 edition, indicating that the third edition was completely rewritten, without wholesale copying of text from the earlier edition.

The third edition is longer (191 vs 153 pages) and follows the same general structure as the previous editions, with expanded and updated text; for example, the History section is twice the length it was in the second edition. The Literature Cited section has increased by 10 pages. The author has accumulated

148 references to works published since the second edition; the majority of these refer to various methods of trapping reptiles or amphibians and their efficacy. However, the added references to philosophy and data management are evidence that the field is changing.

Like many books or articles reviewing a particular topic, this volume represents a tremendous effort of assembling and seamlessly tying together the ideas, traditions, observations, and research results relevant to collecting and collection management from such disparate primary sources as the Newsletters from the Society for the Preservation of Natural History Collections (SPNHC), articles from the Natural Sciences Collections Associations (NatSCA), the handbook for Institutional Animal Care and Use Committee (IACUC), various ecological, environmental and systematic journals, not to mention countless articles from *Herpetological Review* and other herpetological resources. Although the title of the book is *Herpetological Collecting and Collection Management*, the book would have great relevance and value to anyone working with any fluid-preserved natural history collection.

The text runs the gamut from the underlying philosophy of managing collections to the minutiae of procedural details. Each section of the book lays out accepted, time-tested policies and procedures in a format that can easily be followed by collection workers at almost any level of experience. Even experienced collection managers will benefit from this book as a periodic review and reminder of recommended procedures and best practices.

The brief history on systematic collections is fascinating and goes in to just enough depth to illustrate how the philosophy and technology have changed, especially over the last 2,700 years. If you are looking for a review of herpetology collections and their collectors, there are other more exhaustive texts on this subject (Adler 1989, 2007, 2012). Simmons' review focuses on the techniques around the various types of specimen preparation. We were surprised to learn how the introduction and quality improvements to alcohol with the advent of glass jars radically transformed our ideas of collecting natural history specimens. We have always found specimens collected in the late 1800s to be important historical indicators of pristine ecosystems, a philosophy much different than that of the original collector.

We are approaching another monumental shift in collection management given the advancements in DNA isolation, bioinformatics, and ensuring that these ancillary data are linked to the voucher specimen sitting in our collections. Simmons seems skeptical of the reliance on digital media, and feels more secure when hard copies of all documents are archived. We have tossed this thinking around at our institution (ROM), and in a place where space is a premium and collections are stored offsite in dedicated alcohol facilities (a considerable distance away), storing documents digitally is not a luxury but a necessity. The benefits far outweigh the risks.

Where the book really shines is in the exhaustive treatment of the detailed procedures involved in the collection of specimens and the management of the collected material. The planning steps outlined are very US-centric, but in our case serve as a good mental checklist to anticipate any permit issues that might arise in the countries visited, as well as what might be required to bring the specimens into Canada and accession into our collection.

There is an extensive 25-page section on field collecting techniques. This is a great resource for anyone with limited experience in fieldwork. Methods for catching often-elusive creatures are cited and cross-referenced by technique, taxonomic group, and to a lesser extent by habitat. Simmons covers photography and audio recordings in this section which, given today's technology, there is no excuse for not taking the time to make digital photographs to document color and habitat, as well as audio recordings where possible.

The first mention of Institutional Animal Care and Use Committees is in Section III, Preservation of Specimens. This topic would be better included some 23 pages earlier following the section Ethics and Importance of Collecting. We would encourage anyone planning to collect, handle, or conduct experiments on reptiles or amphibians in the field (or laboratory setting) to understand the timeline, requirements, and procedures involved with getting protocols approved by your institution's Animal Care and Use Committee (IACUC). It is not uncommon, given the make up of the committee, for members to request clarification of your techniques for collecting and euthanasia, and ethical justification for numbers of animals to be collected. Just because a particular collecting method is listed in this book or a protocol for euthanasia is found in the ASIH guidelines does not guarantee its acceptance by your institution's IACUC.

To the inexperienced field collector, the section on Preservation of Specimens would be essential reading. For the rest of us, depending on our training, it serves as an excellent review to ensure that our documentation and preparation of specimens is making the most of these sacrifices.

From this point forward, any intern assisting in collection management tasks in our facility will be required to read Part IV, Museum Collections (pp. 71–83). This section outlines the various types of collections from documents and slide collections to alcohol facilities, making note of potential damage and best practices for their long term care.

Tissue samples are an increasingly important part of collections. The book provides a brief outline of the field procedures for collecting these samples (pp. 58–59) and storage practices (one paragraph on page 74). Given the increasing importance of molecular study in herpetology, we would have liked to see this section expanded to several pages, providing a more detailed guide to this important procedure, including the careful labeling of the tissue tubes (it has been estimated that up to 5–10% of tissues in large collections are mislabeled, a source of potential problems that may not be discovered for many years). Readers are referred to Gamble (2014), an SSAR Herpetological Circular on the subject of collecting and preserving genetic material. Simmons' and Gamble's books complement each other, and both should be on the bookshelf of anyone managing a large comprehensive collection.

The book contains several good Appendices of Sources of Information on 1) Permits, 2) Field Equipment, and 3) Sources of Supplies and Information on Collection Management. Fortunately, our proximity to the US allows us to take advantage of

some of these suppliers with a modest penalty, depending on the exchange rate. For those living outside of North America, we can only suggest that these appendices might best be used as a good starting point to finding more affordable suppliers in your country.

All in all, the book is definitely worth having. It is a resource that we would recommend to anyone relatively new to herpetological field work and would be a go-to resource for collections workers during all aspects of managing alcohol-preserved collections. The US \$20 price is a bargain.

LITERATURE CITED

- ADLER, K. (ed.). 1989. Contributions to the History of Herpetology. Volume 1. Society for the Study of Amphibians and Reptiles Contributions to Herpetology 5. 202 pp.
- . (ed.). 2007. Contributions to the History of Herpetology. Volume 2. Society for the Study of Amphibians and Reptiles Contributions to Herpetology 21. 465 pp.
- . (ed.). 2012. Contributions to the History of Herpetology. Volume 3. Society for the Study of Amphibians and Reptiles Contributions to Herpetology 29. 566 pp.
- GAMBLE, T. 2014. Collecting and Preserving Genetic Material for Herpetological Research. SSAR Herpetological Circular 41. 55 pp.
- SIMMONS, J. E. 2002. Herpetological Collecting and Collections Management, revised edition. SSAR Herpetological Circular 31. vi + 151 pp.

Herpetological Review, 2016, 47(2), 321–323.

© 2016 by Society for the Study of Amphibians and Reptiles

Marsupial Frogs: *Gastrotheca* & Allied Genera

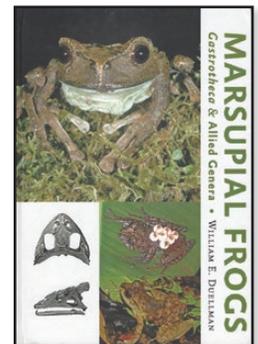
William E. Duellman. 2015. Johns Hopkins University Press, Baltimore, Maryland (www.press.jhu.edu). xv + 407 pp. Hardcover, US \$120.00. ISBN 978-4212-1675-5.

ALESSANDRO CATENAZZI

Department of Zoology,
Southern Illinois University-Carbondale,
1125 Lincoln Drive,
Carbondale, Illinois 62901-6501, USA
e-mail: acatenazzi@siu.edu

Marsupial frogs are patient egg brooders, and so has been William Duellman's interest in these somewhat intractable frogs, first aroused, according to the book's introduction, one night in July 1963. Readers will agree that this book is a marsupial *opus*, synthesizing a trove of previously published and unpublished information on the biology of these unique frogs, collected over more than five decades. Although the bulk of the book is taken up by species accounts, the introductory chapters provide brief but informative compendia on phylogeny, morphological features, osteology, reproductive biology and vocalization, and biogeography.

It is hard not to become fascinated with marsupial frogs. These Central and South American hemiphractid frogs (genus *Gastrotheca*) reproduce like no other frog. The female lays eggs externally and the male fertilizes them, but unlike any other anuran, he then introduces the eggs into the female's dorsal brooding pouch. In this protected environment, embryos develop until hatching either as tadpoles or, in the majority of species, as fully developed and miniature versions of the adults.



The ancestral condition in this group is direct development: marsupial frogs are the only group of anurans in which species laying feeding tadpoles have evolved from direct developing ancestors, with reversal to direct development in some derived species. The embryos have gigantic bell-shaped gills, a unique characteristic only shared with other genera in the family Hemiphraetidae.

Readers will enjoy the compendium on reproductive biology of marsupial frogs in Chapter 7. This richly illustrated chapter combines conceptual figures, drawings, phylogenies and photographs of embryos, amplexant pairs and parturitional females, emphasizing the unique morphological characteristics of the dorsal pouch and of the developing embryos. The shape and size of the external gills of embryos are of particular interest due to their role in embryonic respiration. Some authors have hypothesized that these large and highly vascularized gills might allow exchange of nutrients, although del Pino et al. (1975), cited in the book, did not find evidence for such transfer in one species. Future studies will undoubtedly investigate any additional roles embryonic gills may play during development.

The stated goal for the book is to provide a phylogenetic and taxonomic context for testing hypotheses regarding the evolution of egg brooding, developmental mode, and associated features in marsupial frogs and closely related genera. Marsupial frogs often share very similar coloration and overall appearance, and thus an integrative approach is needed to tell many species apart. This book provides a solid foundation for anyone interested in pursuing evolutionary studies and in contributing to our knowledge of amphibian biodiversity. Duellman's previous book on Peruvian terrestrial-breeding frogs, coauthored with Edgar Lehr (Duellman and Lehr 2009), spurred a wave of species descriptions that many researchers are still riding, a phenomenon that this book is likely to reproduce among marsupial frog aficionados.

There are eight introductory chapters preceding the genera and species accounts. The first chapter summarizes the data sets and describes the procedures and analyses used for studying marsupial frogs. This is an important part of the book because the legends of several figures presented throughout the book to illustrate these analyses do not provide details on how they were produced. Although this first chapter explains the general approach for statistical and phylogenetic analyses, it would have been useful to include additional details on which data sets were used, the numbers and types of variables or traits considered, and type of analysis for each of the figures, particularly for those that do not appear in previous publications. For example, Fig. 4.11 compares the phylogeny inferred using molecular data with the phylogeny of combined molecular and osteological data, but we don't know how these two phylogenies were produced, which specific and osteological features were used, or the support values for the combined phylogeny. Similarly, several figures illustrating multivariate analyses in the species accounts are difficult to interpret without knowing what the axes represent. Page 5 mentions that reproductive modes were hypothesized from egg size for some species with unknown mode, and it would have been useful to label such species in phylogenies so that they can be differentiated from species with known reproductive modes.

Chapters 2 and 3 discuss the phylogeny of marsupial frogs and related genera. The position and monophyly of these groups within the anuran phylogeny have remained obscure until relatively recently for several reasons, including limitations in the use of morphological data and inadequate species sampling.

The book presents a phylogeny of marsupial frogs and related genera based on two nuclear and two mitochondrial genes sampled from 80% of known species. This is considerably better than previous studies, and is used as a framework for classification and to propose new subgenera names. Duellman correctly anticipates that this classification might change as more genes and taxa are sampled, because a study published the same month the book was published (Castroviejo-Fisher et al. 2015) proposed a different phylogeny based on up to 20 genes sampled from a slightly greater number of taxa. Although there is broad agreement for the basal *Gastrotheca* clades, this alternative phylogeny provides little support for the two most derived subgenera recognized by Duellman. As more derived species are discovered and described, our understanding of their phylogenetic relationships will probably continue to change.

The fourth chapter is authored by Linda Trueb and covers osteology, from a general description of bone features among hemiphraetid frogs to a detailed survey of variation of cranial osteological characters in marsupial frogs. The latter follows the new classification and subgenera mentioned above. The outstanding quality of the illustrations and text's clarity are such that even readers with rudimentary knowledge of amphibian osteology should be able to appreciate the diversity of cranial osteological features in marsupial frogs. What emerges, perhaps not surprisingly given the discordance described for the molecular phylogenies, is a general lack of characterization of cranial osteological traits among the most derived taxa as well as a road map for species that should be targeted for future osteological studies.

Chapter 5 describes the morphological features used in species descriptions. Considering that Duellman has authored or coauthored the description of more than half of the species of marsupial frogs (and many other authors have followed his format for other descriptions), this chapter will become a standard reference for the alpha taxonomy of this group. Chapter 6 is a potpourri of chromosomes, throat muscles, and vocalization, none of which are treated extensively, but which support the integrative approach used in the species accounts. The first half of the book is then completed by a short chapter on biogeography, which includes an ecological component with photographs of the various habitats of marsupial frogs.

The chapters presenting species accounts include keys to species and are exhaustive in their coverage of available information. This is impressive, because several of these species have been seen by only a handful of herpetologists or are known solely from the publication describing them. This breadth of knowledge and the systematic information organization will facilitate comparisons among species and with new material, thus benefiting future taxonomic work.

In the Andes of southern Peru, marsupial frogs, which are known as *cheqlla*, vocalize intensely during the cold nights of the dry season. The local interpretation is that frogs are crying because they want rain. This lament, however improbable, might foreshadow ongoing and future changes in climate that could be very detrimental to marsupial frogs. A dedicated ecological and conservation chapter would have been pertinent considering that many species of marsupial frogs are threatened by climate change, habitat loss, and disease. Instead, information on threats is scattered among species accounts, and seem to be derived mostly from IUCN Red List assessments. Because species assessments are frequently updated resulting in changes in a frog's threat status, the paragraphs on conservation should

have been supported by the reference and year of the most recent IUCN assessment.

There are some typos (e.g., p. 6 when defining secondary notes, p. 93 between the Weinland and Weygoldt references), but overall great care has been taken in producing this book. Color and photographic reproductions are of excellent quality. Many photographs are digital and will be available through the Kansas University Digital Archive (at the time of writing this review, the database was being updated and the photographs were not accessible). This open access spirit did not extend to morphometric datasets and georeferenced locations, but the appendices (which can be downloaded from the publisher's website) do give access to lists of specimens examined for morphological features and considered for molecular analyses.

In conclusion, this excellent systematic monograph brings much deserved attention to a group of remarkable frogs and is highly recommended reading for herpetologists, tropical biologists, and evolutionary biologists studying the diversity of reproductive modes and development.

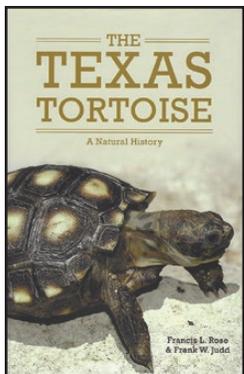
LITERATURE CITED

- CASTROVIEJO-FISHER, S., J. M. PADIAL, I. DE LA RIVA, J. P. POMBAL, JR., H. R. DA SILVA, F. J. M. ROJAS-RUNJAIC, E. MEDINA-MENDEZ, AND D. R. FROST. 2015. Phylogenetic systematics of egg-brooding frogs (Anura: Hemiphraetidae) and the evolution of direct development. *Zootaxa* 4004(1):1–75.
- DEL PINO, E. M., M. L., GALARZA, C. M. DE ALBUJA, AND A. A. HUMPHRIES, JR. 1975. The maternal pouch and development in the marsupial frog *Gastrotheca riobambae* (Fowler). *Biol. Bull. Mar. Biol. Lab Woods Hole* 149:480–491.
- DUCELLMAN, W. E., AND E. LEHR. 2009. Terrestrial-breeding Frogs (Strabomantidae) in Peru. *Natur und Tier-Verlag GmbH, Münster, Germany*. 382 pp.

Herpetological Review, 2016, 47(2), 323–324.
© 2016 by Society for the Study of Amphibians and Reptiles

The Texas Tortoise: A Natural History

Francis L. Rose and Frank W. Judd. 2014. University of Oklahoma Press, Norman, Oklahoma (<http://www.oupres.com>). 188 pp. Hardcover. US \$39.95. ISBN 978-0-80614-451-1.



ERIC HELLGREN

Department of Wildlife Ecology and Conservation
University of Florida
Gainesville, Florida 32611
e-mail: hellgren@ufl.edu

The Texas Tortoise (*Gopherus berlandieri*) is the smallest and least-studied of the five species of North American *Gopherus*. The other four species are federally or internationally listed as endangered or threatened, and have been the focus of considerable scientific, conservation, and management attention. In this necessarily thin but comprehensive volume, Francis Rose and Frank Judd summarize available knowledge on biology and habitat, and provide recommendations for management and conservation, of *G. berlandieri*. Their stated goal is to “convey how this... creature ... functions in and interacts with its environment.” Overall, I think that they have succeeded.

The book opens with the discovery and description of the species by Jean Louis Berlandier and Louis Agassiz, respectively, in the 1820s–1850s. The initial chapters cover the phylogenetics of the genus *Gopherus*, the geographic range and general habitat features encountered by *G. berlandieri*, and the niche of the species in the biotic community. Chapter 3 ends with an interesting treatment of the cactus-tortoise-wood rat-rattlesnake community; this section provides fodder for future examination of this hypothesized multi-trophic interaction. Rose and Judd also suggest that mesopredator release may threaten the viability of tortoise populations as a result of the loss of large carnivores in the Tamaulipan Biotic Province, which forms the major part of the distribution. The next two chapters cover the morphology, anatomy, and growth of the species in great detail, followed by two additional chapters on physiology (e.g., sensory, thermoregulation, water balance).

These first seven chapters highlight the breadth of research conducted by the authors and other scientists on the natural history of the species. Not surprisingly, their work dominates the text. Rose and Judd cite 15 papers that one or both authored on the species, with the bulk of the work conducted between 1977 and 1989. They studied wild and captive populations, and addressed many aspects of species-specific natural history. Throughout the book, the authors provide questions to address in future research projects. Since the early 2000s, nearly no new ecological information on the species has been published. The charismatic *G. berlandieri* deserves better! The authors bemoan the decline of natural history practitioners and refer to the tension between lab-cloistered scientists and field scientists. Certainly, most publications since 1989 that have included the species have been phylogenetic studies of *Gopherus*.

The next set of chapters (8–10) on behavior and population dynamics are not as strong as the preceding material in my view. Over the past 50 years, demography and behavior of *G. berlandieri* have been studied in only two areas: the Lower Rio Grande Valley in southern Texas and the Chaparral Wildlife Management Area in the western Rio Grande Plains. Demographics of populations in Mexico, which encompasses two-thirds of the species range, are essentially unknown, as pointed out by the authors. The fine work of Rich Kazmaier (disclosure: I served as the chair of his doctoral committee) on the relationship of *G. berlandieri* behavior and demographics to grazing is cited, but given short shrift relative to the work of Rose and Judd. For example, Chapter 8 (Behavior) is based primarily on behavioral observations made in captivity. Kazmaier et al. (2001c) made > 2000 observations of telemetered tortoises in the field, and explored effects of sex, age, size, and cattle grazing on behavior; this paper was not cited in the current book. In addition, Rose and Judd provide a lengthy discussion of determining home range size by mark-recapture on grids and dismiss modern telemetric techniques. Their home-range section is thus dated, although admittedly no new data on space use by *G. berlandieri* have been published in 15 years. Another paper, Kazmaier et al. (2001a) on habitat selection, is cited but key conclusions are ignored. Finally, the important implications from Kazmaier et al. (2001b) on the broad relationship of *Gopherus* responses to grazing and other disturbance are not mentioned. For example, conclusions about the generality of cattle grazing effects on *Gopherus* species should be avoided unless placed in the context of rainfall, primary productivity, and grazing regime.

Population ecology is covered in three different chapters (5, 9, and 10), and would have been better served being presented

in a single chapter. As a consequence, the topic coverage is a bit disjointed. However, Rose and Judd point out the most interesting demographic detail observed within the species: wide regional variation in life-history parameters. Individuals in the coastal populations are larger, older, occur at higher densities, have less sexual dimorphism, and larger clutch sizes than those in the inland population. Annual survival rates in the two areas are consistent with these differences (~0.80 in the inland population compared to 0.81–0.91 in two coastal populations). It is worth mentioning that the survival rate differences between regions are smaller than the differences in age structure (McCoy et al. 2014), with the much older coastal populations showing evidence of poor recruitment into the reproductive age classes. There is fertile ground for research on mechanisms behind these demographic differences. Basic data on nesting, nest survival, hatchling survival, and juvenile survival in native habitats are also lacking.

The last chapters discuss conservation and management of *G. berlandieri* in the future. Rose and Judd comprehensively cover the variety of threats to the species, ranging from the pet trade to brush control and resource extraction (e.g., oil and gas drilling). They also underline the need for large-scale status assessment, especially in Mexico, and applied studies of tortoise responses to management. Finally, they provide suggestions on care and maintenance of captive tortoises while simultaneously recognizing that having tortoises in captivity is not recommended.

My personal knowledge of the species is limited to involvement with a single multi-year study, but I appreciate the passion exhibited by Rose and Judd about their subject. The book concludes with the authors recommending conservation of habitat within the Tamaulipan Biotic Province as the way to conserve *G. berlandieri*, its “poster child.” They also emphasize the many characteristics of the species as a classic model species for life-history study. I wholeheartedly agree. Several features of the book were highly enjoyable and contributed to a fast, easy read. Interesting epigraphs from a variety of august sources, two sets of color plates totaling 34 photos, and a number of amusing quotes from the authors (“mentally challenged sphenoccephalic drivers who intentionally run over tortoises ... [should] be reincarnated as a flea on a Hell Hound’s back”) kept my attention. In conclusion, Rose and Judd have produced a volume that should be in the library of any dedicated *Gopherus* biologist or any wild-life manager within the range of a *Gopherus* species.

LITERATURE CITED

- KAZMAIER, R. T., E. C. HELLGREN, AND D. C. RUTHVEN, III. 2001a. Habitat selection by the Texas tortoise in a managed thornscrub ecosystem. *J. Wildl. Manage.* 65:653–660.
- , ———, ———, AND D. R. SYNATZSKE. 2001b. Effect of grazing on demography and growth of the Texas tortoise. *Conserv. Biol.* 15:1091–1101.
- , ———, AND D. R. SYNATZSKE. 2001c. Patterns of behavior in *Gopherus berlandieri*: A multivariate ordination approach. *Can. J. Zool.* 79:1363–1371.
- MCCOY, E. D., G. AGUIRRE., R. T. KAZMAIER, AND C. R. TRACY. 2014. Demography of North American tortoises. In D. C. Rostal, E. D. McCoy, and H. R. Mushinsky [eds.], *Biology and Conservation of North American Tortoises*, pp 134–142. Johns Hopkins University Press, Baltimore, Maryland.

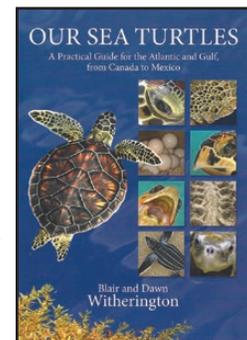
Herpetological Review, 2016, 47(2), 324–325.
© 2016 by Society for the Study of Amphibians and Reptiles

Our Sea Turtles. A Practical Guide for the Atlantic and Gulf, from Canada to Mexico

Blair and Dawn Witherington. 2015. Pineapple Press, Inc. Sarasota, Florida (www.pineapplepress.com). 282 pp. Softcover. US \$24.95. ISBN 978-1-56164-736-1.

GEORGE R. ZUG

Department of Vertebrate Zoology,
National Museum of Natural History,
Smithsonian Institution,
Washington, DC 20013-7012, USA
e-mail: zyangon@gmail.com



Kudos to the Witheringtons for a superbly attractive and accurate portrait of the common sea turtles of North America. Principal among the authors’ goals is to introduce anyone and everyone interested in sea turtles to the turtles’ lifestyle, biology, and conservation needs. They succeed and admirably so by their division of information into three sections: *Understanding*, *Experiencing*, and *Saving*, and an accurate and highly readable text. No page is without illustration, usually in multiples that are attractive and accurate, in a well-designed graphic landscape. I know of no herpetological book, whether for laity or biologists, that matches the graphics in appropriateness to adjacent text and visual attractiveness.

As noted above, the book has three sections. The first part, *Understanding Our Sea Turtles*, addresses the essence of being a turtle, their origins, relationships, and basic anatomy. This is followed by a discussion of what constitutes a species, then detailed yet concise species accounts of Green Turtles, Loggerheads, Hawksbills, Kemp’s Ridleys, and Leatherbacks. Each account is data-dense, portraying the major aspects of each species’ biology. The next chapter, my favorite, is *Sea Turtle Form and Function*. It is well and beautifully illustrated with photographs and colored graphics; the text is accurate and thorough without being dense. This chapter is followed by one on *Life Cycle and Life History*. The final chapter of this section, *Ecology*, is the briefest, though presenting much useful information on epibionts and predators.

Section two, *Experiencing Our Sea Turtles*, emphasizes the reproductive and near-shore aspects of the sea turtles’ life histories. The chapters therein present much of the basic biology of sea turtles and unfortunately the gauntlet of human disruptions (intentional and unintentional) to sea turtles pursuing their lives. Again the choice and quality of the images is excellent, even if a few are saddening. The final section, *Saving Our Sea Turtles*, is the shortest. Nevertheless, this section contains most of the threats to sea turtle survival and the means to counteract these threats. I especially liked the subsection on threats because of its graphic depiction of the hazards followed by a tabulation of the threats cross-indexed to the pages in the preceding sections that provide information on how the threat affects a sea turtle’s life.

It is obvious from the preceding comments that I am highly impressed by the high quality of text and illustration. I urge anyone with even a slight interest in reptiles, and especially those teaching aspects of reptilian biology, to have a copy within arm’s

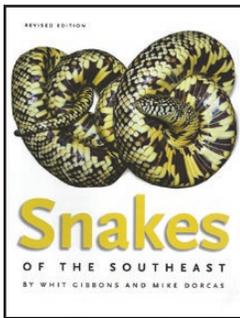
length of their writing desk or keyboard. If I have one lament about this book, it is that *Our Sea Turtles* will not receive the full audience of readers that it deserves. A copy should be in every school and public library within a hundred miles of our Gulf and Atlantic coasts. This book must be held in hand, read, and enjoyed. Its wealth of information cannot be Googled.

Herpetological Review, 2016, 47(2), 325–326.

© 2016 by Society for the Study of Amphibians and Reptiles

Snakes of the Southeast (Revised Edition)

Whit Gibbons and Mike Dorcas. 2015. University of Georgia Press, Athens, Georgia (<http://www.ugapress.org>). 280 pp., 335 color photos, 178 maps. Softcover. US \$28.95. ISBN 978-0-8203-4901-5.



WILLIAM B. SUTTON

Department of Agricultural and
Environmental Sciences
Tennessee State University,
Nashville, Tennessee 37209, USA
e-mail: wsutton@tnstate.edu

The southeastern United States is home to nearly 50% of the United States' snake species diversity. The combination of diverse climates, ecoregions, and overall species diversity makes this region very impor-

tant for snake ecology research and conservation efforts. The second volume of the Snakes of the Southeast (SOTS hereafter) by Whit Gibbons and Mike Dorcas provides an excellent introduction to snake identification, behavior, and ecology. This guide is part of an ongoing series by the authors and represents another successful addition to the field of snake biology. Although state-specific field guides provide great information on snake biology and identification, the SOTS provides a much-needed regional guide that informs readers on the complete suite of southeastern snake species.

Gibbons and Dorcas have done an excellent job of “keeping it simple” by providing 1–2 page “vignettes” on various topics of snake biology and ecology, including, but not limited to, taxonomic considerations, feeding strategies, locomotion, reproduction, and activity patterns. Do not confuse the simplicity of this book with a lack of valuable information, because the authors provide an abundance of information in each vignette. Gibbons and Dorcas conclude the introductory section with various strategies to identify snake species that one might encounter in the region. The authors discuss the importance of scale keeling, anal scale patterns, and body shape patterns, which are all essential for correct snake identification.

Each species account provides a wealth of information and includes a brief but informative description of identifying features for both adult and juvenile snakes. The authors include thorough information on sub-specific variation, which can be extensive for some species. Each species account also includes information on habitat use, basic ecology, reproductive strategies, and conservation status. Accounts are accompanied by a detailed map that provides an approximate distribution of each species and any sub-specific variation. Professional photographs accompany each of the species descriptions and many of the accounts have multiple photographs, which are useful if a species' phenotype differs throughout the region. The authors have tackled an important issue of snake identification by

including size charts that estimate the approximate total length of juveniles, typical adults, and maximum size for each species. These sizing charts can be very helpful in situations where questions arise as to whether an encountered snake is a juvenile of a much larger snake species or a full-grown adult of a smaller species. Species accounts are not arranged solely based on taxonomy, but by body size and whether a snake is primarily terrestrial or aquatic (e.g., large terrestrial snakes). This provides users less familiar with taxonomy a quick way to access a likely list of snake identifications.

Throughout the book, sections entitled “Did You Know?” highlight interesting aspects of snake biology and ecology. The authors have taken great care to select important facts for these sections, many of which dispel commonly-communicated snake myths. An example of an excellent “Did You Know” can be found on p. 124 of the SOTS where Gibbons and Dorcas explain that many non-venomous snakes, including racers, kingsnakes, and ratsnakes, vibrate their tails when frightened. As a snake biologist, this is a question I get repeatedly because it is generally thought that rattlesnakes are the only species that vibrate their tails when frightened. The “Did You Know?” sections are a great aspect of this guide and represent another feature that sets this guide apart from other similar resources.

In regards to the species accounts focused on venomous snakes, the authors have included a “How Dangerous Are They?” section that explains the relative danger if one was to be bitten by a venomous species. These sections are well written and provide information related to venom composition along with a description of where and when bites are most likely to occur. I greatly appreciate the section describing how to differentiate the Coral Snake (*Micrurus fulvius*) from the closely patterned Scarlet Kingsnake (*Lampropeltis elapsoides*). The authors have taken special care to let readers know that the often-heard “red touch yellow, kill a fellow—red touch black, friend of Jack” only applies to North American identification situations and should not be used for coral snake relatives potentially encountered in Latin America.

One of the major improvements over the previous version of the SOTS is the inclusion of species accounts for invasive and exotic snakes that have become established in the southeastern United States. These accounts are important for readers unfamiliar with the catastrophic ecological impacts that exotic and invasive snakes have had in areas where they have become established. As these species have established breeding populations in the region (primarily Florida), the authors have made a very good decision to include these species accounts in the revised SOTS.

Near the conclusion of the book, the authors include a vignette that focuses on interactions of humans with snakes. The vignette begins with a description of what a herpetologist is and does professionally. This section is important for any budding herpetologist to think about how he/she can fine-tune their craft in preparation for a professional career in herpetology. Additional sub-sections within the “People and Snakes” vignette include Backyard Snakes, Snakes as Pets, Snake Conservation, and Attitudes towards Snakes. Collectively, these sub-sections focus on the various impacts that humans have on snake populations (primarily conservation) and how snakes have a large impact (both positive and negative) on our psyche.

Although more extensive texts exist regarding snake biology and ecology (e.g., Greene 1997; Ernst and Ernst 2003), the SOTS is grounded in simplicity. As a winner of The Outdoor Book

Award attests, this guide has hit the mark perfectly and is suited for a wide audience. If another revision were to be undertaken, the authors may consider more extensive sections focused on snake conservation. For example, the authors did not discuss the emergence of snake fungal disease as a potential threat to long-term snake conservation. In addition, very little information was provided on the negative impacts that over-collection of wild specimens through the pet trade and “wildlife shows” (e.g., rattlesnake round-ups) have on snake populations. It is important to inform readers of all the anthropogenic impacts that humans have on wild snake populations as conservation can only occur through education. All things considered, the SOTS is an excellent field guide and introduction to snake biology and ecology. The authors have crafted a very successful model field guide that provides easily accessible information designed for a broad readership.

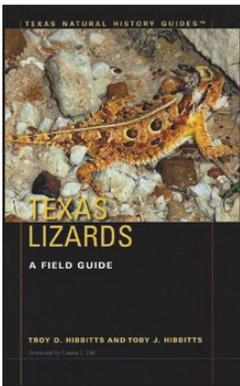
LITERATURE CITED

- ERNST, C. H., AND E. M. ERNST. 2003. *Snakes of the United States and Canada*. Smithsonian Books, Washington, D.C. 668 pp.
 GREENE, H. W. 1997. *Snakes: The Evolution of Mystery in Nature*. University of California Press, Berkeley, California. 351 pp.

Herpetological Review, 2016, 47(2), 326.
 © 2016 by Society for the Study of Amphibians and Reptiles

Texas Lizards, A Field Guide

Troy D. Hibbitts and Toby J. Hibbitts. 2015. *Texas Natural History Guides*, University of Texas Press, Austin, Texas. 333 pp. Softcover. US \$24.95. ISBN 978-0292-75934-3.



**SAMANTHA S. KAHL
 GAD PERRY**

*Department of Natural Resources Management,
 Texas Tech University, Box 42125,
 Lubbock, Texas 79409, USA
 e-mail: samantha.kahl@ttu.edu*

Texas amateur herpetologists have not had an easy time in recent years. A few years ago, those interested in amphibians were happy to see a new field guide (Tipton et al. 2012) replacing the out-of-print (and out of date) Bartlett and Bartlett (1999) effort, but the reptile folks were out of luck.

For snakes, the field guide of Tennant (most recently updated in 2006) is both out of date and out of print. Werler and Dixon's (2010) book is still available, but is not suitable for being placed in a pocket for a field trip. Price's (2010) venomous snake guide is also still available. For lizards, Bartlett and Bartlett (1999) and the even older and harder to get Garrett and Barker (1987) were pretty much it. Dixon's (2013) contribution is available and more up-to-date, but not well-suited for the general public to use in the field. Several books have wider geographic coverage, but additional species always make identification of the animal right in front of you more difficult.

This field guide is similar in format to many current offerings. A detailed and well thought-out introduction offers information on lizards in general, their distribution in Texas, and factors that affect their habitat and survival. It is followed by a dichotomous key to identifying species, with some examples of scales, femoral pores, and scale rows to help readers properly identify their finds.

Most modern field guides do not include a key, and we commend the authors for providing this tool for readers who want to be more systematic and not just flip through photographs. Additional graphic examples of specific key steps would have been helpful for amateur herpetologists, but technical terms are defined in the glossary at the end of the book.

The species account portion of the text starts about a third into the book and is organized systematically. Each account contains a Texas range map, which shows county boundaries but not ecoregions, and two to three color pictures that generally do an excellent job of illustrating shape and coloration. There are subsections on distribution, natural history, size, morphological and behavioral characteristics, reproduction, and similar species, as well as one with authors' comments and information on conservation. This final subsection is particularly useful for finding interesting little tidbits of information and even possible explanations of species distribution. The authors devote about three and a half pages to each species, compared to one and a half in older offerings such as Garrett and Barker (1987). The larger format of books such as Jones and Lovich (2009) allows additional text, but some information relates to populations outside of Texas and so may be less relevant to a locally-focused reader, especially one who has to carry the book into the field.

The book ends with thoughtful appendices covering species reported from the state that are not likely to be found there, ones introduced but not established, sources for additional information, a larger map with county names added, a glossary, short bibliography, and indices of common and scientific names.

The *Texas Lizards* field guide feels like classic herpetological field guides: it is pocket-sized, perfect for tossing into a backpack; has a rugged binding; and provides measuring strips (both Metric and the more traditional US inches—both types of units are also given throughout the text) printed on the inner covers to aid in field identification. Overall, this is a great addition to bookshelves for Texas species identification guidebooks, and will be convenient for weekend herp enthusiasts and lifelong lizard lovers alike.

LITERATURE CITED

- BARTLETT, R. D., AND P. P. BARTLETT. 1999. *A Field Guide to Texas Reptiles & Amphibians*. Gulf Publishing Co., Houston, Texas. 280 pp.
 DIXON, J. R. 2013. *Amphibians and Reptiles of Texas: with Keys, Taxonomic Synopses, Bibliography, and Distribution Maps*. 3rd Edition. Texas A&M Univ. Press, College Station, Texas. 460 pp.
 GARRETT, J. M., AND D. G. BARKER. 1987. *A Field Guide to Reptiles and Amphibians of Texas*. Texas Monthly Press, Austin, Texas. 225 pp.
 JONES, L. L. C., AND R. E. LOVICH (EDS.). 2009. *Lizards of the American Southwest: A Photographic Field Guide*. Rio Nuevo Publishers, Tucson, Arizona. 567 pp.
 PRICE, A. H. 2010. *Venomous Snakes of Texas, A Field Guide*. University of Texas Press, Austin, Texas. 116 pp.
 TENNANT, A. 2006. *Lone Star Field Guide to Texas Snakes*, 3rd Edition. Taylor Trade Publishing, Lanham, Maryland. 263 pp.
 TIPTON, B. L., T. L. HIBBITTS, T. D. HIBBITTS, T. J. HIBBITTS, AND T. J. LADUC. 2012. *Texas Amphibians, A Field Guide*. University of Texas Press, Austin, Texas. 325 pp.
 WERLER, J. E., AND J. R. DIXON. 2010. *Texas Snakes: Identification, Distribution, and Natural History*. University of Texas Press, Austin, Texas. 437 pp.

Herpetological Review, 2016, 47(2), 327–328.
© 2016 by Society for the Study of Amphibians and Reptiles

Wasserfallen für Amphibien: Praktische Anwendung im Artenmonitoring

Edited by Andreas Kronshage and Dieter Glandt. 2014.
Abhandlungen aus dem Westfaelischen Museum für Naturkunde, LWL Museum für Naturkunde, Band 77. 368 pp. (www.lwl-naturkundemuseum-muenster.de. email: naturkundemuseum@lwl.org). Hardcover €24.80 (approx. US \$28.00), Softcover €19.80 (approx. US \$22.00). ISBN 978-3-940726-28-5.



JOHN W. FERNER

Department of Biological Sciences,
Thomas More College
Crestview Hills, Kentucky 41017, USA
e-mail: fernerjw@gmail.com

This volume brings together 17 papers reviewing the use of funnel traps in amphibian field studies. It represents the proceedings of a workshop on funnel trap techniques and study results held in October 2012. All but two of the papers are in German with English abstracts. The editors indicate that one of the goals of this effort is to help

standardize techniques for better comparative studies as has also been attempted by others, including Karns (1986), Heyer et al. (1994), and Dodd (2010). Another significant goal of this work is to provide extensive analysis of the pros and cons of using specific traps in a variety of field situations.

The introductory paper entitled “Funnel traps as tools for monitoring Amphibians—an analysis of recent status” by Dieter Glandt is a thorough review of the most common types of traps used in Central Europe with detailed photographs of each. The more traditional use of dip netting is compared with funnel traps in terms of ecosystem disturbance, physical labor, time savings, procedure and objectivity. Glandt concludes that there is no ideal funnel trap optimizing catch rate, durability, cost, handling, animal welfare and availability. He suggests more research is needed such as mark-recapture studies to analyze trap effectiveness, particularly related to catch rates and animal welfare.

The second paper is a review of minnow traps from North America with results from four species of European newts. Written in English with a German summary, this report also has photographs of the seven types of funnel traps tested and compares them on parameters of construction material, color, length, width, outer and inner opening diameters, mesh width and cost. Kronshage and Glandt believe this is the first time various North American minnow traps have been used for amphibian study in Europe. While this is an ongoing project, the authors have found some of the minnow traps to be unsatisfactory due to a low catch rate and negative animal welfare. Overall, having too large a mesh width, thus reducing catch retention and allowing invertebrate predators access to the newts, in addition to cost of traps from the USA were the major problems.

Five papers in this compendium document studies using modified plastic bottles as funnel traps in ponds. Bliesener and Schlüpmann used bottle traps suspended on poles at different depths to study the significance of distance from shore and water depth to newts and their larvae. In general, these traps have the top of a severed one liter bottle inserted in the bottom

of another bottle to create a funnel into the top bottle which is capped and perforated for water and gas exchange. Another paper by Schlüpmann reports on the success of a variety of bottle traps and details their construction. He includes the use of bottle funnels that empty into plastic buckets and finds that these are more successful in capturing males of some newt species and larvae of other species. Therefore, a combination of different bottle and bucket funnel traps is recommended. The report by Gonschorrek, “Studying the native newts in northern Westphalia – A comparison of methods,” evaluates bottle traps along with four other types. She concludes that each has advantages in certain applications, so selection is dependent on circumstances. These bottle traps functioned very well in terms of success relative to the size of the opening of the trap. Evaluation of bottle traps in comparison to other techniques is included in an extensive review entitled “Recommendations for the use of funnel traps in amphibian surveys” by Kronshage et al. This paper is very helpful in providing information needed to select the best type of funnel trap for a particular study. A negative impact of bottle traps on newt survival was reported by Blosat who established an online platform for colleagues to report similar problems.

In the other chapter written in English with a German summary, “A Novel, Effective and Safe Newt Trap,” Dewsbury describes a trap that has been used for more than three years and captured more than 3000 newts with no mortality and no indications of animal stress. Used in ponds in the United Kingdom, this trap has a plastic box base weighted to secure it to the substrate with a plastic bag extending up to the surface and suspended with a float. Newts enter through a plastic net funnel at the base of the trap. All aspects of the construction and use of these traps are discussed extensively in the paper with an update added at the time of publication in 2014, two years after the funnel trap workshop!

Additional papers in this volume report on the use of a variety of traps in ongoing studies, some projects lasting as long as 15 years. Most studies use more than one technique to deal with different species, life stages, and sex ratios in populations. Often commercial traps are modified in some way to fit the needs of a study such as changes in the funnel dimensions. Two reports deal with the risk of spreading diseases such as chytrid fungus and crayfish plague by using contaminated equipment.

In a final paper, Kronshage and Glandt provided a helpful selected bibliography on the use of funnel traps in amphibian studies. This list of primarily European and American literature is not annotated, but at least is a good starting point for investigators seeking the best technique for their project.

In addition to its importance as an extensive review of funnel traps, this publication also has valuable information on the habitats and ecology of numerous species in Germany, France, and the United Kingdom. These include the newts *Lissotriton helveticus*, *L. vulgaris*, *Mesotriton alpestris*, *Salamandra salamandra*, and *Triturus cristatus* and the anurans *Bufo bufo*, *Pelophylax* sp., *Rana arvalis*, and *R. temporaria*.

The editorial review of these contributions seems excellent with a few minor exceptions. Only two articles included key words after the summary. This may impact the indexing of the articles by various search engines. Only one website was given for the various types of commercial traps evaluated in these studies, but the name of the each trap is generally all that seems to be necessary for locating their sources via internet search engines. In spite of this, an additional summary contribution by

the editors before the selected bibliography with a list of traps and their sources would have been helpful. Multicolored summary comparison graphs were used in several papers and some of these were difficult to read (for example Fig. 6 on p. 217) due to small print and the clashing colors used.

This book will be a valuable addition to any institutional research library or laboratory conducting field research with amphibians. While published for the most part in German, the technical nature of the subject makes translation relatively straight forward. The editors and some contributors stress that sampling techniques using funnel traps are so dependent on the species and nature of the study that standardization is difficult. They encourage further research and design modifications to continue to improve the effectiveness of funnel traps. The book succeeds in providing extensive data on the relative success of numerous types of traps in a variety of field studies.

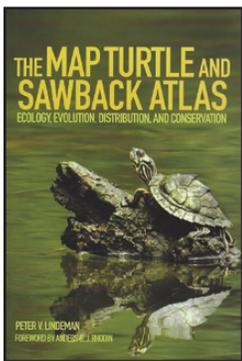
LITERATURE CITED

- DODD, C. K., JR. (ED.). 2010. *Amphibian Ecology and Conservation, A Handbook of Techniques*. Oxford University Press, Oxford, UK. 556 pp.
- KARNS, D. R. 1986. *Field Herpetology: Methods for the study of amphibians and reptiles in Minnesota*. James Ford Bell Museum of Natural History, Occasional Paper 18.
- HEYER, W. R., M.A. DONNELLY, R.W. McDIARMID, L.-A. HAYEK, AND M.S. FOSTER (EDS.). 1994. *Measuring and Monitoring Biological Diversity. Standard Methods for Amphibians*. Smithsonian Institution Press, Washington DC. 364 pp.

Herpetological Review, 2016, 47(2), 328–329.
© 2016 by Society for the Study of Amphibians and Reptiles

The Map Turtle and Sawback Atlas. Ecology, Evolution, Distribution, and Conservation

Peter V. Lindeman. 2013. University of Oklahoma Press, Norman. xxi + 460 pp., 127 black and white illustrations, 15 maps with colored dots, 34 tables, 72 photos in color. US \$45.00 (hardcover). ISBN 978-0-8061-4406-1.



RICHARD C. VOGT

INPA/CBIO, Av. André Araújo, nº 2936, Petrópolis
CEP 69.067-375 Manaus, Amazonas, Brazil
e-mail: vogt@inpa.gov.br

The Map Turtle and Sawback Atlas is hardbound with a good binding and an attractive cover jacket. It begins with a one-page table of contents, a nine-page list of figures, a foreword by Anders Rhodin of four pages, and three pages of acknowledgments before reaching the first of 11 chapters. The short introduction to map turtles (Chapter

1) is followed by a lengthy account of the history of *Graptemys* studies from Le Seuer in 1817 to Lindeman in 2000 (Chapter 2). For me, this was the most interesting section of the book because it includes stories and folklore of the Cagle Field Crews, replete with interviews from some of his students, including Ernie Liner, Allan Chaney, Richard Etheridge, Bob Webb, and Clarence Smith. Unfortunately, Lindeman did not interview Cagle's last student, Jim Dobie. I knew Jim better than Cagle's other former students and suffered non-stop discussions of the old days while in the

field with him across southern Alabama, Mississippi, and Louisiana in the mid 1970s. From this personal context, Peter may have some of his stories from Cagle's students confused, or maybe the good old boys themselves changed their stories as they got older. For example, I never met Cagle, but the ham story was different according to Dobie. Dobie recollected (while smacking his lips) how on occasion Cagle would splurge and buy a whole ham and cook it in the field for his students. This was a rare event, but the students did not always have to save up their money to buy a ham. Peter also seems to have confused incidents from my interview. For example, when Jim Bull was at University of Wisconsin studying TSD with me, he was a postdoc of Jim Crow in the Genetics Department, not a fellow graduate student. Although we were the same age, he had recently completed his PhD with John M. Legler at the University of Utah. Peter says that commercial fishermen taught me how to use fyke nets to trap turtles, but this was not true as I used DNR fyke nets to develop the technique myself. Commercial fishermen in Wisconsin did not use fyke nets, but they did teach me about driving turtles with a carp horn into gill nets, which I extended to trammel nets.

Lindeman presents a good discussion of the evolutionary history and phylogenetic relationships within *Graptemys* in Chapter 3. Perhaps the most useful chapter to turtle biologists, however, is Chapter 4 on ecology (at 108 pp., the longest chapter in the book), where he discusses habitat, movements, diet, age at maturity, body size, survival and longevity, reproduction, community ecology, thermoregulatory behavior, hibernation, parasites and pathogens, interactions with other species, competition for basking space, predators, and mutualistic and commensal interactions. Within these sections, he often has very extensive tables summarizing comparative data among *Graptemys* species, e.g., four pages for parasites and two pages for clutch size and body size. These sections are profusely corroborated with citations to the original work. Unlike a number of other turtle books, Lindeman does not throw out unsupported ideas and speculation, or wax on about his personal achievements. Further, he does not talk about the research of others without documenting the original published papers. This is very helpful in that the reader knows where the information came from and can find the original papers if more details are needed. This may not be necessary, however, as Lindeman is very good at synthesizing the work of others and making marvelous comparative tables. Indeed, I would have liked him to fantasize here about things that are not known or need to be done, but he waits for the last three chapters in the book to do this. The text is very readable, with profuse tables, graphs, and photos to keep the mind occupied, at least until you get to the descriptive species accounts.

There are many color photos, but they are rather disappointing, especially since these are some of the most colorful turtles in the world. Perhaps part of the fault is the publisher's, but many of Lindeman's photos were taken using a spotting scope. These are not known for their detail, and color patterns are often lost due to glare. His spotting scope photos are interesting in documenting the basking behavior of map turtles as well as demonstrating the usefulness of this technique. Although he mentions that McCoy and Vogt used this technique for their surveys of *Graptemys* in 1979, he failed to note that we were the first to use this technique in a quantitative way and that we also backed up this information with fyke net sampling. Peter demonstrates his skill using spotting scope photography throughout the book. However, they lack the detail and color of a truly good portrait photo, which is needed in a book of this nature, particularly for the novice. A

good telephoto on a digital camera would have produced higher definition photos for publications, but admittedly this was not his intent in the surveys.

Chapters 5 and 6, respectively, cover Conservation Status and Conservation Biology. He discusses the status of each species in different states and internationally, and comments on the threats to populations such as river engineering, river bed mining, contaminants, the pet trade, human consumption, the biological supply house trade, wanton shooting, accidental mortality, and human disturbance. Chapter 6 is rather short. Here he emphasizes the importance of basic ecological research, habitat management (e.g., dead wood restoration), and managing captive populations. Chapter 7 is entitled Additional Biological Aspects, and includes much information on physiology (hibernation physiology, overwintering physiology of hatchlings in the nest, thermoregulatory physiology, and additional topics on physiology). After these, he covers morphology, head markings and coloration, and shell and limb morphology. Lindeman barely breezes through the population genetics of *Graptemys* in a little over a page, with one additional page on *Graptemys* taxonomy.

Chapter 8 includes species accounts of the 14 *Graptemys* species described to date. The species accounts are extensive (105 pp.), and it would have been much better to have included the color photos and range maps with each species account rather than in one section (note: this is a problem with other books from UO Press). All accounts are orderly with sections on common names, description, taxonomic history, range, habitat, reproduction and life history, natural history, populations, conservation status and actions, and terminates with discussions of needed research. At the beginning of each species account, Lindeman inserts quotes or quips from eminent (or not) turtle biologists concerning the species in question. I had one small problem with the accounts, i.e., I could not discern what kind of order they were in since they are not alphabetical by common or scientific name. This is rather irritating, especially when you want to look up a species. It would have been helpful if the running head on the right hand page had the species name, but 52 page headings saying "Species Accounts" are fairly useless.

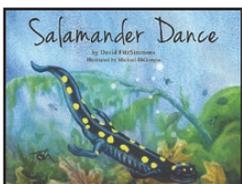
Finally in the last three chapters, Lindeman lets loose with his ideas on Future Perspectives in Ecology (Chapter 9), Evolutionary Biology and Phylogeny (Chapter 10), and Conservation Biology (Chapter 11). In Chapter 9, he notes the need for detailed studies on habitat and microhabitat parameters that are important for maintaining each species in its designated habitat, and that such studies are lacking for all species. He further emphasizes the need for community ecology studies, studies of TSD, and life histories. Chapter 10 begins with a discussion of the need for new genetic markers in nuclear genes since the variability in markers now available makes them insufficient to separate species, yet alone populations. This, alas, is not a new problem with turtles. Lindeman suggests that every population of turtles in each isolated river system may be a new species, and even though the genetic data do not support this, he presents several phylogenies for the group. Although the genetic data are not robust, he feels that there will be more species described in the near future, most from allopatric populations in small drainages. Perhaps. Chapter 11 stresses the need for more surveys on upstream abundances, filling in the holes in species' distribution maps, standardized basking surveys, and quantitative density studies to determine the meaning of basking surveys. Dead wood for basking sites and substrates for growing food need to be managed, as do populations of these species stranded in reservoirs. What will happen to sex ratios and nesting areas with global climate change and a rise in sea level? The book concludes with an index and 41 pages of references; at ca. 20 per page, this is > 800 references.

Everyone who has even a mild interest in map turtles should buy this book. Indeed, *all people* who study freshwater turtles should buy it as a primer to the research that has been conducted on this genus and as an example of what needs to be done for all species groups of turtles in the world; there is no other book of this kind anywhere for any species group. The text is very readable for both turtle enthusiasts and scientists. Hail to Peter Lindeman for a book well done! As Jack McCoy would have said, "You done yourself proud!"

PUBLICATIONS RECEIVED

Salamander Dance

David FitzSimmons. Illustrations by Michael DiGiorgio. 2016. Wild Iris Publishing, Bellville, Ohio (www.wildirispublishing.com). 32 pp. Hardcover. US \$17.99. ISBN-978-1-936607-00-6.



Salamander Dance is a beautifully illustrated account of the life history of the Spotted Salamander, particularly during its spring breeding season when males vie for females, hence the title of the book. The author provides a short text on each page describing the salamanders' activities, accompanied by detailed color artwork by award-winning illustrator Michael DiGiorgio. At the vernal pools, Spotted Salamanders and Wood Frogs intermingle in their spring mating rituals and

then depart for their long seasons away from the pools. By connecting spring breeding seasons, the salamander's life history is presented as a circle of life, rather than as a linear series of events. The book is intended for preschoolers through age 8. Of note to parents, the end of the book contains information on the importance of vernal pools, more detailed information on Spotted Salamanders, and a glossary of terms. These help make this book not just another child's book on nature, but provide an opportunity to teach children about how nature works. Perhaps the book will even inspire young children and their parents to venture forth on a cold spring night to see this wondrous event unfold. David FitzSimmons has published numerous books, particularly a series centered on "Curious Critters." Artist Michael DiGiorgio has provided illustrations for many wildlife publications, including the Peterson Field Guide series.

then depart for their long seasons away from the pools. By connecting spring breeding seasons, the salamander's life history is presented as a circle of life, rather than as a linear series of events. The book is intended for preschoolers through age 8. Of note to parents, the end of the book contains information on the importance of vernal pools, more detailed information on Spotted Salamanders, and a glossary of terms. These help make this book not just another child's book on nature, but provide an opportunity to teach children about how nature works. Perhaps the book will even inspire young children and their parents to venture forth on a cold spring night to see this wondrous event unfold. David FitzSimmons has published numerous books, particularly a series centered on "Curious Critters." Artist Michael DiGiorgio has provided illustrations for many wildlife publications, including the Peterson Field Guide series.