

### **Biology of the Snapping Turtle (*Chelydra serpentina*)**

Edited by A. C. Steyermark, M. S. Finkler, and R. J. Brooks. 2008. The Johns Hopkins University Press, 2715 North Charles Street, Baltimore, Maryland 21218-4363. x + 225 pages 75 USD.

The *Biology of the Snapping Turtle* consists of 17 review papers on various aspects of the life history of one of the most recognizable turtles of North America. Part 1, Taxonomy and Systematics, consists of four chapters covering the systematics of the family Chelydridae, the fossil history of the family, the anatomy of the skull, and molecular insights into the systematics of the family. Part 2, Physiology, Energetics, and Growth, consists of seven chapters covering such disparate topics as respiration, reproductive physiology, thermal ecology, energetics, embryology, overwintering adaptations and growth patterns. The final section of the book, Life History and Ecology, consists of six chapters on nesting ecology, water relations of the eggs, sex determination, physiology of hatchlings, population biology and geographic variation in life history traits.

Although many of the chapters are strictly review papers, a number of the authors have included previously unpublished data from their own work or the work of others. For example, H. Bradley Shaffer and his co-authors include their analysis of the genetic variation across the currently recognized four subspecies of Snapping Turtle. Their results are consistent with earlier less extensive work: first of all, there is no molecular evidence to support the recognition of the Florida Snapping Turtle *C. s. osceola* as a distinct taxa; second of all, the Central American Snapping Turtle *C. s. rossignonii* and the South American Snapping Turtle *C. s. acutirostris* both appear to be separate evolutionary lineages and should be viewed as separate species.

While many of the papers in this volume are tightly focussed on the Snapping Turtle, a number of the papers could just as easily have appeared in a volume on the biology of turtles in general. For example, Gordon Ultsch and Scott Reese's paper on overwintering is a thorough review of the literature on turtle physiology with regards to hibernation.

Overall, the quality of the papers is high. One of the highlights of the book is the chapter on nesting ecology written by researchers involved in three long-term studies of Snapping Turtles at Algonquin Park, Ontario; the Edwin S. George Reserve, Michigan; and the Savannah River Site, North Carolina. There are also a few careless mistakes in the book that more careful editing could have caught. The Wood Turtle (*Glyptemys insculpta*) and the Bog Turtle (*G. muhlenbergii*) are still placed in the genus *Clemmys* in the text and in the index. There is also more overlap in material than is required. Growth of the embryo is discussed in both the chapter on the embryo and the chapter on growth. The relationship between clutch size and body size is thoroughly charted in the chapter on nesting ecology, discussed in the chapter on population biology and re-visited in the chapter on geographic variation. The editors are also strangely silent. There is no introduction from them explaining the origin or rationale for the volume or any kind of concluding chapter synthesizing the themes of the volume. Nonetheless, anyone with a technical interest in the biology of turtles (not just Snapping Turtles) will find this an extremely valuable reference work.

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### **Wildlife of North America: A Naturalist's Lifest**

By Whit Bronaugh. 2006. University Press of Florida, Gainesville, Florida, USA. 565 pages. 29.95 USD.

This is a bold and daring compilation that few would have the courage to undertake and present. It is a contribution to the attempt to promote systematic record keeping by the vast number of casual or non-academic naturalists. The volume is essentially a checklist of all native and introduced mammals, birds, reptiles, amphibians, freshwater fishes, butterflies, dragonflies and damselflies recorded to date for North America. These groups include relatively large and often conspicuous animals for which a naturalist can identify a significant number of species on sight.

It is based on the latest (at the time of publication) authoritative listing for each group with the full realization that work is ongoing for all group names and species recognition is constantly changing with each new study that produces new knowledge that necessi-

tates revisions. Despite this, probably enough stability has been reached in each included group that names used here will still be able to at least be equated with those that will be current in another decade or two hence.

The contents include a Preface (the author's purpose and how he came to compile the book and his acknowledgments), a Checklist of North American Orders and Families for the included groups, A List of Symbols (indicating species extinct and since when), an Introduction to the main text, How to Use this Book, Biodiversity and Zoogeography of North America (with maps of number of species in each province and state) and Extinct Species. The bulk of the book follows (pages 83 to 430) listing English and scientific name for each species by family and blank spaces for user remarks such as first observation date, place or other data considered relevant. The

are additional blank entry spaces at the end of each group section for addition of species defined after the publication of this book. The book concludes with an Appendix of recent taxonomic and nomenclatural changes which depart from standard field guides (pages 431-478), Works Cited (pages 469-478), Index to Scientific Names (479-528), and Index to Common Names (pages 529-565). The last two are particularly valuable for equating a name used in older field guides to the name recognized currently.

What this is not is a field book. It is far too large and bulky to be carried on outings. It is a book for post-expedition entries. It is devoid of keys or text on identifications, these are left to consultation of the many guides listed in the references. But even naturalists who may purchase the book with the best of, but later unrealised, intentions, will find it a valued quick reference for their library for its analysis of North America distribution patterns, comparative species totals, and post-Pleistocene zoogeography, among many other con-

siderations, all carefully compiled from recent authoritative sources.

Whit Bronaugh now lives in Oregon and makes a living as a nature writer and photographer, but he grew up among the carefully manicured horse farms of central Kentucky and did not really discover nature until a university field course in Africa. He has remained in awe of the diversity of animal life ever since and, as an initial lifelist of birds expanded to include other groups, the concept to this book was generated initially to fill his own needs. His other work has appeared in popular periodicals such as *Wildlife Conservation*, *National Geographic*, *Natural History*, and *Smithsonian*. His photography presented here is restricted to a few small black-and-white reproductions in the book itself and colour ones on the attractive dust jacket.

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## BOTANY

### Grasses of Colorado

By Robert B. Shaw. 2008. University Press of Colorado, 5589 Arapahoe Avenue, Suite 206C, Boulder, Colorado 80303 USA. xi + 647 pages. 75 USD Cloth.

The grasses constitute one of the most important families of flowering plants in the world, both economically and ecologically. They are extremely diverse and generally comprise about one-tenth of the vascular flora in many parts of North America. They are dominant in many ecosystems, including several of the most extensive ecosystems in Colorado. *Grasses of Colorado* provides a thorough, up-to-date treatment of the 335 species of grasses known to occur outside of cultivation in the state. The book is arranged in several sections. The introductory section deals mostly with utilitarian aspects of grasses, including food and forage, soil conservation, turf and ornamental uses, and harmful grasses. The ecological significance of grasses receives rather limited discussion, despite the prominent role of the family in the state's major ecosystems. Following the introduction is a section on the physiography and ecoregions of Colorado which is informative and useful in understanding the distribution patterns of the grasses in the state. Maps outlining the major landforms, river systems, mountain ranges, and ecological subdivisions assist considerably in understanding these patterns. This section is followed by a chapter on grass morphology which contains good illustrations that cover most of the important features that are used in grass identification. These illustrations are particularly helpful when coupled with the illustrations of each species that are interspersed in the main taxonomic, descriptive part of the book.

The bulk of the book is comprised of the taxonomic treatments, including keys, descriptions of subfamilies, tribes, genera, and species, illustrations, and range maps depicting counties of occurrence. The species descriptions are quite detailed, including the important floral and vegetative characteristics. A concerted effort has been made to ensure that all descriptions are parallel, not just between species within a genus, but across all genera. Each species treatment also contains information on major synonyms, common names, origin (native vs. alien), a general habitat description, and a section for comments on status in the state, taxonomic issues, and similar species. The accompanying illustrations are reproduced with permission from the two grass volumes of the *Flora of North America* (Barkworth et al. 2003, 2007). These generally are excellent and, when used in conjunction with the keys and descriptions, should enable successful identification. On occasion, I found the comment subsection in the species treatments to be redundant (same information repeated for several species within a genus), but more often than not, there was useful supplementary information there.

In general, Shaw follows the taxonomic concepts espoused by other grass experts, as reflected in the *Flora of North America*. However, there are a few departures, such as the segregation of *Melica* into two genera, *Melica* and *Bromelica*, the segregation of *Bromus* into four genera, *Anisantha*, *Bromopsis*, *Bromus*, and *Ceratochloa*, corresponding to the sections of *Bromus* in most other North American treatments, and the separation of *Critesion* from *Hordeum*. Most of the rest of the taxonomic treatment will be familiar