

changes in content in this edition. The authors have also wisely split the chapter on reproduction into two chapters, one each for amphibians and reptiles. The section on conservation has also been expanded, reflecting the growing concern over many species in both groups.

It is hard to find much wrong with this exhaustive examination of the current state of herpetology. The one conspicuous absence is a glossary, something that would surely be important in any comprehensive textbook such as this. Overall, the combined talents of

six experts with diverse research interests is hard to beat. After two previous editions, the authors have resolved most of the inevitable errors and contradictions resulting from integrating the writing of so many people. It is hard to imagine a better single volume overview of these fascinating creatures.

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Lizards: Windows to the Evolution of Diversity

By Eric R. Pianka and Laurie J. Vitt. 2003. University of California Press, 2120 Berkeley Way, Berkeley, California, USA. xii + 333 pages. U.S.\$45 Cloth.

Individually, each author of this volume has more than 30 years of lizard study in various areas of the world. These include the southwestern (both) and southeastern (Vitt) United States, as well as Africa and Australia (Pianka) and Central and South America (Vitt). Each has included a personalized capsule biography of his background and interests, each emphasizing what first attracted him to lizards.

This book is number 5 in the University of California Press series *Organisms and Environments*. The introduction explains that it grew from a resolve by authors 10 years ago. At that time, while working on a third lizard ecology symposium volume, they envisioned production of a comprehensive semi-popular book on the group. In a review of the earlier work, the 1994 *Lizard Ecology: Historical and Experimental Perspectives*, Robert W. Murphy (1995. *The Canadian Field-Naturalist* 109(1): 135-136), while generally praising its standards of "highest academic acumen", thought it "not necessarily well suited for bedside reading by the merely curious. And it will not make a good coffee table book as there are no high-gloss photographs".

The latter criticism has been particularly well responded to in the new volume. It is not only coffee-table size in design (28.6 × 22.5 cm) but has the requisite high-gloss photographs scattered throughout. These, often emphasizing activity or displays, splendidly illustrate the diversity of behaviour as well as form and pattern for a well-chosen variety of lizards. There are also a scattering of graphs, tables, diagrams, and maps to illustrate particular points. Included are evolutionary relationships between groups of lizards, biotic and abiotic factors affecting a lizard's well-being, avenue of heat gain and loss for a diurnal basking lizard, comparison of mean percent use of the seven most important prey categories by neotropical and desert lizards, prey size vs lizard size, independent evolution of body type in Jamaica and Puerto Rico, and population size for species of land iguanas on islands of the Caribbean, to choose a few at random.

The introduction raises the question: "what good are lizards?" This is first summarily dismissed with a curt retort, emphasizing the authors' abhorrence of anthropocentrism, "what good are people?". Subsequently, the instructive value of lizards in relation to the ecosystem is attributed to their multitude of forms and the variety of habitats they have successfully occupied. They can thus effectively serve as "model" organisms for broad understanding of ecology and the diversity of animal life, a theme also emphasized in the earlier symposium volumes.

Following the introduction are three major parts with seven, six, and two sections: (1) Lizard Life-styles: Evolutionary history and phylogeny, Getting around in a complex world, Lizards as predators, Escaping predators, Social behavior, Reproduction and life history, and Reflections of a real world; (2) Lizard Diversity: Iguanians, From Geckos to Blind Lizards, From Racerunners to Night Lizards, Skinks, From Girdled Lizards to Knob-scaled Lizards, Monsters and Dragons of the Lizard World; (3) Synthesis: Historical perspective, Lizards and humans. In the initial section it is pointed out that as a group "lizards" is paraphyletic due to excluding the snakes. The latter are omitted as they traditionally have been treated as a separate equal group, though now recognized in contemporary clarification as just an offshot within varanoid lizards (as shown in Figure 1.4, page 16).

The major partitions are followed by a four-page Taxonomic Summary (with number of species in each family or subfamily (if it has been subdivided) listing all included genera). The species totals are given (by major subdivisions) as Iguania 1340+; Scleroglossa: Gekkota 973+, Incertae sedis 151+; Autarchoglossa (excluding snakes but inclusive of Scincomorpha: Lacertoidea, Scincoidea: Anguimorpha [including Varoidea]) 1745+; or collectively over 4200. The book concludes with a three-page Glossary (abiotic to zygodactyly), an 18-page references section, and a nine-page index.

Throughout, the book is a pleasant mix of formal and informal styles. Scientific discussions have shuffled among them separate blocks of personal observations, often field experiences of one or the other author. As stated (page 7) "Throughout this book, we continu-

ally return to questions we asked as children in an attempt to encourage readers to open their minds and to ask questions". This responds splendidly to the earlier reviewer's wish for a text "well suited for bedside reading by the merely curious". Unfortunately, the large coffee table format and the glossy reflective pages make it awkward to handle in bed and read by bedside light. But as an up-to date comprehensive survey of world lizards it has no equal. It provides

great perspective of their global importance, a fact strictly Canadian naturalists, who have only six species belonging three families of non-snake lizards to observe in their entire country, have little first-hand chance to appreciate.

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Raptors of Western North America

Brian K. Wheeler. Princeton University Press, 41 William Street, Princeton, New Jersey 08540-5237 USA. 544 pages, 625 colour photographs, 56 maps, U.S.\$49.50 Cloth

This book is both a tour de force and a labour of love, and the immediate new standard for diurnal raptors in western North America. Raptors are known for their variable plumages, and standard field guides cannot cover the almost infinite permutations and combinations; hence, erroneous identifications are legion among regular birders, and even among raptor enthusiasts. No full-time museum, government or university employee has dared to undertake a book of this scope; it is all the more astounding that this hiatus was filled by a truck driver. More incredibly, Wheeler has developed the skills to take the great majority of the photographs himself. His experience and enthusiasm are evident throughout. He has reviewed the literature carefully and has been given access to unpublished information from graduate students and others; for example, numbers of Northern Goshawk and Bald Eagle territories are provided for each state. There are nearly two pages about the ten-year cycle of the Snowshoe Hare and Northern Goshawk, absent from most other raptor books; goshawks peaked at Duluth, Minnesota, during the irruption years of 1972, 1982, 1992 and 2001, mostly adults fleeing the mixed forest following each Snowshoe Hare crash.

Excellent historical accounts include notably that for the California Condor. There are four excellent glossaries: general, anatomy and feather, plumage and molt, and displays. The detailed descriptions of raptor plumages are unprecedented and unequalled. Fortunately, important points are highlighted in bold, making the tedious mass of description more user-friendly.

Readers will be amazed by the remarkable variability of plumage in species such as the Ferruginous Hawk (25 photos), Rough-legged Hawk (39 photos), and Swainson's Hawk (40 photos), and especially the Red-tailed Hawk; variants within the latter species are depicted in 82 photographs, 22 pages of verbal description and six maps.

John Economidy has contributed clear, accurate range maps for 33 species, six for the Red-tailed Hawk alone. The maps are incredibly precise, but I noticed four minor errors for Saskatchewan species: the Big Muddy area of Saskatchewan is omitted from the Golden Eagle; the two southern year-round localities for Bald Eagle should be winter only; recent small southerly extensions of Osprey and Northern Goshawk ranges are not shown; the two races of the Merlin are not known to overlap between Saskatoon and Prince Albert. The maps also give no indication of range changes in the past.

Since this veritable encyclopaedia of western raptors (an eastern counterpart became available simultaneously) is too heavy for most backpacks and too large for most glove compartments, most of us will use it as a reference in our libraries. One hesitates to quibble about the first edition of such a superb book. Yet the title is misleading, since owls are not included; inclusion of the term "diurnal" would have made the title more accurate. The ground squirrel has not lost half its range in western Canada, as it has in Idaho (page 521). Use of dieldrin, not DDT, was coincident with the early 1960s crash of the Merlin on the Canadian prairies (page 447). Use of "very uncommon" sometimes contradicts his definitions in the introduction. I detected few errors, but "verses" in place of "versus" jarred me (page 199). Wheeler has been involved in two previous hawk identification books, each excellent, each with William S. Clark as co-author. The first was *Hawks* in the Peterson Field Guide series and the second, *A Photographic Guide to North American Raptors*. For most general birders, either would suffice, although many plumages are omitted from both of the smaller books. If you are a raptor aficionado, don't let the cost of the new book deter you; the 603 colour photographs easily justify the price and the 33 colour maps are more detailed than anything previously available.

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