

## Herpetology [Fourth edition]

By F. Harvey Pough, Robin M. Andrews, Martha L. Crump, Alan H. Savitzky, Kentwood D. Wells, and Matthew C. Brandley. 2015. Sinauer Associates Inc., 23 Plumtree Road, PO Box 407, Sunderland, MA, USA, 01375-0407. 591 pages, 99.95 USD, Cloth.

Linnaeus, in the definitive 10th edition of his *Systema Naturae* in 1758, dumped those vertebrates for which he had little regard into his Class Amphibia (which initially included reptiles and several miscellaneous forms), dismissing them all as “foul and loathsome” and concluding that the creator had not bothered to make many of them. This soon proved to be a northern bias. Subsequent attention to the tropics and the recent use of DNA analysis revealed a multitude of species. Current totals are 7,300 amphibians (salamanders and newts, frogs and toads, and caecilians) and 10,000 reptiles (crocodilians, tuataras, lizards and snakes). By contrast, mammals have only about 5,500 species whereas birds total 10,500.

Since Darwin replaced the concept of divine creation of each species with gradual evolution, many group relationships have been revised to reflect changing con-

cepts. Based on recent advances in palaeontology and DNA analysis, birds have been reassigned to “reptiles” by most systematists and, together with crocodilians, are regarded as one distinct evolutionary line. Some now regard turtles as another distinct line, and leave only lizards, snakes, and the tuataras as reptiles. However, Pough and his coauthors argue that the traditional living reptiles share with amphibians dependence on external heat sources, in contrast to birds and mammals which generate heat internally from consumed food. Dependence on external heat sources results in many common patterns in activity and distribution of reptiles and amphibians that justify the traditional combined study of the two groups together (i.e., omitting birds) as herpetology, despite each group’s long, separate evolution.

This comprehensive 591-page, 2-column, thought-provoking coffee table book is divided into 17 chapters, addressing four deceptively simple questions: I. What are amphibians and reptiles? (Chapters 1-5), II. How do they work? (6-11), III. What do they do? (12-16), and IV. What are their prospects for survival? (17). Changing perspectives are discussed in Chapter 1 “Why study herpetology?” which emphasizes the diversity of amphibians and reptiles, their shared characteristics, place in terrestrial ecosystems, and their future. Chapter 2 delves into phylogenetic systematics and origins of amphibians and reptiles. Chapters 3 and 4 summarize the systematics and diversity of extant amphibians and reptiles respectively. Chapter 5 outlines the biogeography of both groups. Chapter 6 discusses water and temperature relations, emphasizing thermoregulation, and Chapter 7 energetics and performance, ending with hibernation, aestivation, freeze resistance and tolerance. Chapters 8 and 9 cover reproduction and life histories of amphibians and reptiles, respectively. Chapter 10 focuses on body support and locomotion, Chapter 11 on feeding, Chapter 12 on spatial ecology, 13 on communication, 14 on mating systems and sexual selection, 15 on diets, foraging, and interactions with parasites and predators, and 16 on populations and species assemblages. The wrap-up chapter (17) discusses conservation and the future of amphibians and reptiles, touching on a mix of their declining populations, biodiversity conservation, human perceptions and impact (exotic species introductions, pollution, commerce, hallucinogens, hunting, magic, medicine, pets, use in research and teaching, global climate change and interactions among these). Then patterns of species extinction and extirpation are outlined, leading to discussion of conservation options and declining amphibians as a model issue, and finally the rediscovery of species and de-extinction attempts to revive extinct species from surviving relatives.

A Preface draws attention to the prominent use of colour throughout the 549 illustrations of both animals and concepts in this edition. The range maps use splashes of colour to convey approximations of distributions of groups of species but lacks precision, particularly for those which penetrate into northern Canada.

The text is intended for use in an undergraduate or graduate university course, and also as an information source for hobbyists and naturalists. It presents not just comprehensive coverage with citations to original research and overview papers, but also alternative views in controversial areas and the authors’ perspectives and speculations on the future for these animals. It even has flashes of humour, such as the description of a tadpole as “a sieve with a gut attached”, and human interest items, like that the origin of the name Tuatara is from the native Maori word for the unique New Zealand lizard-like reptile.

Acknowledgments to the multitude of colleagues for encouragement and their published and unpublished data are given after the listing of contents. Contributors of photographs follow as well as thanks to librarians and publisher’s staff and others. Separate sections at the end of the book present (in 3 to 4 columns) an 8-page Glossary of Terms (from acrodont to zygotrota-phy), a 92-page Literature Cited, a 12-page Taxonomic Index, and a 16-page Subject Index.

Each Chapter concludes with a Summary which outlines its main points and gives directions to the *Herpetology* companion website at: [sites.sinauer.com/herpetology4e](http://sites.sinauer.com/herpetology4e) for links to other relevant material. Various options aimed at making the book affordable for a student are available, including the option to purchase the text for limited time periods online at reduced cost.

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