

Preface

Research on all aspects of mammals continues at a rapid pace. Given this acceleration and the extent of new findings about mammals, it continues to be a challenge to produce a textbook that balances both breadth and depth of coverage for a one-semester upper-level undergraduate or graduate mammalogy course. In this fourth edition, we have retained the general format of previous editions with 30 chapters arranged in 5 parts. Part 1 (chapters 1 through 6) introduces the subject of mammalogy; provides a history of the discipline and an overview of current methods and molecular techniques important in systematics and population analyses; and presents the topics of mammalian phylogeny, evolution and dentition of mammals, and zoogeography. Part 2 (chapters 7 through 11) covers biological functions and the physical structure of mammals. Adaptive radiation in form and function among the 29 currently recognized mammalian orders is discussed in part 3 (chapters 12 through 21). Morphology, fossil records, conservation and economics, updated phylogeny and current classification, and a synopsis of all extant families are included for each order. Part 4 (chapters 22 through 27) focuses on new insights in behavior and ecology. Finally, in part 5 (chapters 28 through 30), we explore mammalian parasites and diseases, including zoonoses; domestication of mammals; and many current conservation issues. As in previous editions, all literature citations are collected at the end of the text to avoid redundancy. Technical terms throughout each chapter are in boldfaced type when they are first introduced, and those terms are defined in both the text and the glossary. Although there is continuity between sections and chapters of the text, instructors can select certain chapters based on individual interest, emphasis, or time constraints without sacrificing clarity and understanding.

Changes to the Fourth Edition

The major impetus for this edition of *Mammalogy: Adaptation, Diversity, Ecology* arose from significant changes in higher-level taxonomy of mammals. As noted in the introduction to part 3 (Adaptive Radiation and Diversity), the number of recognized mammalian species is rapidly approaching 6,000. This edition includes 2 new orders and 13 new families resulting from the considerable molecular and morphological work of the past decade. We have updated recent advances in anatomy and physiology, behavioral ecology, conservation, zoogeography, paleontology, and other areas of mammalogy. The fourth edition includes hundreds of new citations to recent literature, numerous new photos and figures, study questions designed to help generate critical thinking and discussion,

and suggested readings. More specifically, part 1 includes a timely new chapter on mammalian phylogeny, with in-depth discussion of the relationships of extant orders as well as timing of mammalian radiations. Part 2 has updated information in all chapters. Taxonomic revisions, including new orders and families, as well as a variety of new species, are discussed in part 3. There, new fossil evidence and updated phylogenies that have recently become available for many orders are presented, as are advances in natural history for numerous families along with the current conservation status of threatened species. All chapters in part 4 have been updated. Part 5 includes discussion of current trends in Lyme disease and other zoonoses, as well as current material on domesticated species and conservation issues of various mammalian groups.

In terms of form and function, feeding and locomotion, mammals represent the most diverse class of vertebrates. Mammals are terrestrial, arboreal, freshwater, or marine; they burrow, run, glide, or fly; and they feed on meat, nectar, blood, pollen, leaves, or a variety of other things. They range in size from 2-gram white-toothed pygmy shrews and hog-nosed bats to 160-million-gram blue whales. We continue to explore the fascinating diversity and complexity of all aspects of mammals in this fourth edition. We hope this book does justice to past and present mammalogists on whose research and teaching efforts it is based. We also trust that it will continue to prove to be useful to students, the mammalogists of the future, as they explore and better appreciate the mysteries of mammals—those “fabulous furballs.”

The five authors bring a combined total of nearly 200 years of field and laboratory research experience working with mammals in a variety of settings—as well as many decades of teaching—to the collaborative endeavor of this book. Each of us has also benefited from years of suggestions, ideas, and constructive criticism from many teachers, colleagues, students, and friends and from rewarding discussions with them.

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