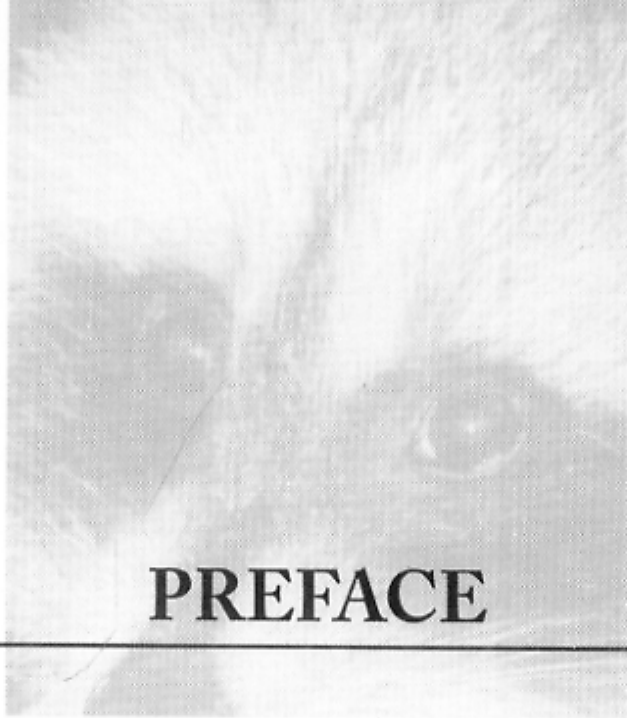




PREFACE

The amount of information available on mammals has increased dramatically in the last 25 years. In *Mammalogy: Adaptation, Diversity, and Ecology*, we have attempted to “make sense” of this information explosion. Any such attempt is a balancing act between breadth and depth—enough breadth to include numerous subject areas within mammalogy and sufficient depth to avoid superficiality. In terms of form and function, the approximately 4600 species of mammals represent the most diverse class of vertebrates. Mammals are terrestrial, arboreal, or marine; they burrow, run, or fly; and they feed on meat, nectar, blood, pollen, leaves, or a variety of other things. They range in size from 3-gram pygmy shrews and hog-nosed bats to 160-million-gram blue whales. Mammalogy can be approached from a variety of directions and subdisciplines—anatomy and physiology, behavioral ecology, molecular genetics, systematics, conservation, zoogeography, and paleontology, to list a few—all of which ultimately are complementary and inter-related. We explore the diversity and complexity of mammalian form and function in this textbook, as well as phylogenetic and ecological relationships.

Mammalogy: Adaptation, Diversity, and Ecology is intended for use in upper-division undergraduate and graduate courses with students who have a basic background in vertebrate biology. The book's length is tailored to a one-semester mammalogy course.

The text consists of 29 chapters arranged in 5 parts. In part I (chapters 1 through 4), we introduce the subject of mammalogy, the history of the discipline, methods (including current molecular techniques important in systematics and population analyses), and the evolution of mammals. In part II (chapters 5 through 9), we discuss biological functions and physical structure of mammals. Adaptive radiation in form and structure among the currently recognized orders is covered in part III (chapters 10 through 19). Morphology, fossil history, conservation and economics, and a brief synopsis of all extant families are covered for each order. Behavioral, ecological, and zoogeographical considerations are the focus of part IV (chapters 20 through 26). Finally, in part V (chapters 27

through 29), we explore mammalian parasites and diseases, including zoonoses, domestication of mammals, and conservation issues. **Suggested readings** and **questions** designed to help generate critical thinking and discussion are found at the conclusion of each chapter. **Literature cited** within a chapter is collected at the end of the text to avoid redundancy. **Technical terms** are in boldfaced type the first time they appear and are defined in both the text and the **glossary**. Although there is continuity between the part divisions and chapters of the text, instructors can select certain chapters based on individual interest, emphasis, or time constraints without sacrificing clarity and understanding.

All four of us bring several years of field and laboratory experience with mammals in a variety of settings—as well as our individual specializations, viewpoints, and biases—to the endeavor of writing this book. We have benefited from this collaboration and hope it is reflected in the text. More important, we have profited through the years from the suggestions, ideas, and constructive criticism of many teachers, colleagues, students, and friends.

We want to express our appreciation to the many reviewers who read drafts of this text in part or in whole.

Reviewers

David M. Armstrong *University of Colorado, Boulder*

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 Wm. David Webster *University of North Carolina, Wilmington*
 John O. Whitaker, Jr. *Indiana State University*
 Bruce A. Wunder *Colorado State University*

Many other persons helped significantly in the preparation of the text, including Marge Kemp, Kathy Loewenberg, Gloria Schiesl, Mary Reeg, Jodi Banowetz, Sandra Seigny, LouAnn Wilson, and Linda Davoli. We also thank science librarian Kathy Fahey and her staff at Southern Illinois University at Carbondale for their assistance throughout this project. Thanks also to Marjorie K. Laughrey, Colleen Hannaken, and Kristin Vessey for their editorial assistance.

We hope this book does justice to past and present mammalogists upon whose research and teaching efforts it is largely based. Just as important, we hope that it will prove useful to students who will be the mammalogists of the future and that through it, students will better appreciate and explore the mysteries of mammals—those “fabulous furballs.”

About the Authors

George A. Feldhamer is an associate professor of zoology, and coordinator of the Environmental Studies Program, at Southern Illinois University at Carbondale. His research has focused exclusively on mammalian populations, ecology, and management; introduced cervid biology; and threatened and endangered species. He is a former associate editor of the *Wildlife Society Bulletin*, and coeditor of *Wild Mammals of North America: Biology, Management, and Economics*. He is curator of the mammal collection at SIUC and has 20 years of experience teaching an upper division mammalogy course.

Lee C. Drickamer is a professor of zoology at Northern Arizona University. Prior to this he, had been a professor of zoology at Southern Illinois University at Carbondale for 11 years. He is a past-president of the Animal Behaviour Society, past-secretary-general of the International Council of Ethnologists, past chair of the Division of Animal Behavior of what is now the Society for Integrative and Comparative Biology, and former editor of *Animal Behaviour*. His research emphases have included social factors affecting development and reproduction in house mice and swine, behavioral ecology of house mice and deer mice, social biology of primates, intrauterine position effects on behavior and reproduction of mice and swine, and the consequences of mate selection for offspring viability in house mice.

Stephen H. Vessey is professor emeritus of biological sciences at Bowling Green State University. His research interests include the behavioral ecology of mammals, especially primates and rodents. He has been studying a population of white-footed mice in northwestern Ohio for more than 25 years. He is a former associate editor of the *Journal of Mammalogy* and is a Fellow of the Animal Behavior Society. He has taught mammalogy and animal behavior at Bowling Green for 28 years, coauthoring a textbook in animal behavior with Lee Drickamer.

Joseph F. Merritt is the resident director of Powdermill Biological Station, the field station of the Carnegie Museum of Natural History. He is a physiological ecologist specializing in adaptations of small mammals to cold. Dr. Merritt is the author of *Guide to Mammals of Pennsylvania*, published by the University of Pittsburgh Press, and editor of several technical monographs on specific taxa of mammals. He has served on the Editorial Committee of the American Society of Mammalogists since 1990, and is currently the managing editor of the *Journal of Mammalogy*. Dr. Merritt teaches mammalogy at the University of Pittsburgh's Pymatuning Laboratory of Ecology and courses in mammalian ecology at Antioch New England Graduate School and at the Adirondack Ecological Center, SUNY College of Environmental Science and Forestry.