BOOK REVIEWS

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Thorington, R. W., Jr., and K. E. Ferrell. 2006. SQUIRRELS: THE ANIMAL ANSWER GUIDE. Johns Hopkins University Press, Baltimore, Maryland, 208 pp. ISBN 0-8018-8403-9, price (paper), $24.95.

Richard Thorington has been an inspiration to many emerging mammalogists and those developing an interest in mammals for 4 decades. Working at the Smithsonian Institution for more than 36 years, Dr. Thorington is renowned for his expertise regarding both squirrels and New World primates, but especially for his love of squirrels. Thor has worked tirelessly to document sciurid biology and educate the public. Along with Katie Ferrell, also a scientist at the Smithsonian Institution working on sciurid morphology and genetics, the authors of *Squirrels: The Animal Answer Guide* provide both a thorough synthesis of the science and a primer for educators and the general public.

The back cover of the book provides teasers that will make most readers want to crack the cover, such as, "Did you know that a groundhog is really a type of squirrel?" "That squirrels control their body temperature with their tails?" "That some squirrels have yellow-tinted eye lenses that work like sunglasses to reduce glare?" "That tree squirrels can turn their hind feet completely around when climbing down a tree head-first?" Once in, the reader is hooked.

The rodent family Sciuridae is diverse, with 278 species that inhabit all continents except Antarctica and Australia. They can be as small as a large mouse (40 g—lesser pygmy flying squirrel [*Petaurillus emiliae*]) or as large as a medium-sized carnivore (8.5 kg—gray marmot [*Marmota baibacina*]). Everyone knows what squirrels are and could probably come up with a story about them. They are fascinating and accessible to us in that they are diurnal and often share areas occupied by humans. To some they are pests. To most they are amusements and sources of inspiration in media as varied as ancient mythologies to David Letterman's Central Park squirrel-nuts jokes, or "Hammy" in Dream Works' *Over the Hedge*. Squirrels are one of the "most watched" mammals on the planet. This is where *Squirrels: The Animal Answer Guide* is an appropriate and useful addition to the bookshelf. Within 184 pages of text, 12 chapters, 74 black and white photos, 38 color photos, and about a dozen other figures, the authors engage the reader in squirrel biology as if sitting together with the reader over coffee. The chapters include basic taxonomy and characters of major groups of squirrels (chapter 1); basics on anatomy and physiology, morphology, and genetics (chapters 2 and 3); behavior and ecology (chapters 4 and 5); reproduction and development (chapter 6); and feeding ecology (chapter 7). From those foundation chapters, the authors then provide 5 chapters that focus on the special relationships squirrels have with humans by asking questions such as "Do squirrels make good pets?" "Why are squirrels important?" "Are squirrels pests?" "Do people hunt and eat squirrels?" These chapters present "Squirrel Problems" from a human viewpoint (chapter 9) and from a squirrel's viewpoint (chapter 10). To complete the book, the authors provide a rich sampling of how squirrels have been portrayed in poetry, literature, and characterized in religion and mythology.

"Squirrelology" (chapter 12) provides the reader a good discussion on the best- and least-known squirrels and how scientists recognize individual squirrels in the field by using a series of tools such as tags, dyes, and natural markings. Much of this last portion of the book could have been incorporated elsewhere, or if the authors wanted these topics to be emphasized, they could have bolstered these final chapters for greater emphasis. This is a minor but noticeable inconsistency of the presentation of the book. The only other aspect, and more difficult to resolve from the writer's point of view, is that I found the style of the question-and-answer or frequently-asked-questions format a bit erratically presented.

So the authors are in love with squirrels; who isn't? Clearly, this book ought to secure sciurids their place among other popular, well-known groups such as marine mammals and primates. What a treat. Buy it, read it, but don't squirrel it away—pass it on!—WILLIAM L. GANNON, *UNM Office of Research and Department of Biology, MSC03 2020, University of New Mexico, Albuquerque, NM 87131, USA; wgannon@unm.edu.*

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Wilson, D. E., and D. M. Reeder (eds.). 2005. MAMMAL SPECIES OF THE WORLD: A TAXONOMIC AND GEOGRAPHIC REFERENCE. 3rd edition. Johns Hopkins University Press, Baltimore, Maryland, 2,142 pp. ISBN 0-8018-8221-4, 2 volumes, price (hardbound), $125.00.

This is the 3rd edition of the now classic and official (endorsed by the American Society of Mammalogists), compendium of the living or recently extinct mammal species of the world. This edition is issued in a 2-volume set (the 2nd volume for Rodentia only), including 9,373 references and an index of scientific and common names. As were many of our colleagues, we were waiting for this revised edition since 2003 when it became common knowledge that the revision was essentially complete. Our interests were further enhanced by some chapters being circulated individually as preprinted copies. We can say that the wait was worth it. Benefits of this kind of effort are innumerable, as attested by its wide use as *the reference* for lists of local, regional, and national fauna; conservation status; updating taxonomic accounts in museums, zoos, and similar institutions; or even as a source of common names. In this volume, as in the previous one, D. E. Wilson and D. M. Reeder are general editors for 41 sections corresponding

to 29 orders plus 1 infraorder, 1 superfamily, and 10 family accounts. This work resulted from contributions of 26 authors, fewer than 10 of them living outside the United States. The format of accounts in this edition is similar to the previous volume, with the order Rodentia deserving a more detailed revision through subordinal division. Given the positive reviews received for the 2nd edition (Corbet and Hill 1994; Patterson 1994), this arrangement seems to be well accepted by the scientific community. Under this format, each author has freedom to organize their correspondent section in terms of systematic and taxonomic decisions, following minimal requirements (e.g., geographic distribution, common names, conservation status, and identification of synonyms) set by the editors.

The scope and aim of the work are defined in the *Introduction*: "... this work is primarily a checklist at the species level ...," and pointing to expected differences of opinion in regard to definition of species limits. Table 1, labeled as *Comparison of Genera and Species since the Second Edition*, is extremely useful as an overview of the diversity recognized in this edition. It is not as "comparative" as the corresponding table of the 2nd edition because table 1 does not include the number of genera and species in the previous edition, just the number of newly described species since the 2nd edition. However, to determine how many species, genera, families, or orders have been added in this edition is not difficult (see our Appendix I).

For the 787 species added since the 2nd edition (5,416 versus 4,629), the number of actual newly described species is 260 (or 33% of the newly added species). This rate is a sign of the elevation of old synonym and subspecies names by recognition of taxonomic discontinuities within previously thought natural species (e.g., Patterson 1996, 2000). Appendix I shows how these 260 newly described species are distributed among families. More than 85% of these are small mammals; more than 44% are neotropical, with almost 50 species being sigmodontine rodents. This is significant not because there are more unrecognized species in the Sigmodontinae or in the neotropical region (Patterson 2001), but it indicates that more research was concentrated in this group or area, and we should expect similar growth when other taxa and other regions are studied as intensively.

The number of recognized genera also increased; the 1,229 listed genera (versus 1,135 in the 1993 edition) represent an addition of 94 genera. Most changes result from taxonomic revisions of the respective groups, including: 2 Didelphidae, 5 Dasyuridae, 2 Peramelidae, 1 Pseudocheiridae, 1 Dasypodidae, 2 Chrysochloridae, 3 Erinaceidae, 3 Soricidae, 1 Cynocephalidae, 6 Phyllostomidae, 2 Natalidae, 13 Vespertilionidae, 4 Molossidae, 1 Lemuridae, 1 Cheirogaleidae, 1 Lorisidae, 3 Cercopithecidae, 3 Hylobatidae, 3 Phocidae, 3 Cervidae, 5 Bovidae, 1 Sciuridae, 1 Geomyidae, 1 Dipodidae, 1 Gliridae, 1 Erethizontidae, 1 Caviidae, 2 Octodontidae, 1 Abrocomidae, and 1 Echimyidae. Extreme change occurred in some orders, and these are reflected in the number of genera recognized by previous and current editions of the list, as seen in the Primates (e.g., Cebidae), Carnivora (e.g., Viverridae and Felidae), and Rodentia (e.g., Muridae).

We identify 28 newly described genera in 6 orders, including the following: Didelphimorphia: *Hyladelphys* Voss, Lunde, and Simmons, and *Tlacuatzin* Voss and Jansa; Dasyuromorphia: *Micromurexia*, *Murexechinus*, *Paramurexia*, and *Phascomurexia*, all by Van Dyck; Primates: *Pseudopotto* Schwartz; Carnivora: *Neovison* Baryshnikov and Abramov; Artiodactyla: *Pseudoryx* Dung, Giao, Chinh, Tuoc, Arctander, and MacKinnon; Rodentia: *Monticolomys* Carleton and Goodman, *Voalavo* Carleton and Goodman, *Amphinectomys* Malygin, *Brucepattersonius* Hershkovitz, *Handleyomys* Voss, Gómez-Laverde, and Pacheco, *Juliomys* Gonzales, *Lundomys* Voss and Carleton, *Microakodontomys* Hershkovitz, *Noronhomys* Carleton and Olson, *Pearsonomys* Patterson, *Salinomys* Braun and Mares, *Tapecomys* Anderson and Yates, *Mammelomys* Menzies, *Pithecheirops* Emmons, *Sommeromys* Musser and Durden, *Pipanacoctomys* and *Salinoctomys* Mares, Braun, Barquez, and Diaz, *Cuscomys* Emmons, and *Callistomys* Emmons and Vucetich. Neotropical rodents account for 14 of 19 new genera in that region.

Other taxonomic changes include an increase of 17 recognized families (153 versus 136). Most of these changes are due to the systematic and taxonomic rearrangement of several groups, a particular case represented by the Carnivora, but also in Peramelemorphia, Diprotodontia, Pilosa, Scandentia, Chiroptera, Primates, Cetacea, Lagomorpha, and Rodentia (see Appendix I). Five additional orders appear in this edition, former Xenarthra is now Pilosa and Cingulata, and Insectivora was split into Afrosoricida, Erinaceomorpha, and Soricomorpha, mostly following McKenna and Bell (1997). Xenarthra and Insectivora are no longer recognized as valid ordinal names.

From orders to genera, the basic taxonomic arrangement follows that of McKenna and Bell (1997), with recent modifications representing the conclusions of corresponding authors (expressed as hypotheses of relationships) added and noted in the text. Similarly, taxonomic and distributional comments are provided by each author. These comments include references published before 2003, plus a few more recent ones accessible to authors during the final review process. As expected, taxonomic works (especially at such a large scale) are always susceptible to new findings and publications that make the process of updating a never-ending job. In this edition, phylogenetic sequence is generally used for families or subfamilies. However, genera, subgenera, and species are alphabetically listed.

What is New in This Edition?

1. Font size and type is larger and easier to read.
2. Common names are added for each species, and also are indexed at the end of 2nd volume. Previously, these were in a separate book (Wilson and Cole 2000).

3. Conservation status is added for each species, in most cases including status according the World Conservation Union (IUCN), Convention on International Trade in Endangered Species (CITES), and the United States Endangered Species Act as of February 2004.
4. Synonyms include currently recognized subspecies; some authors indicate them by using boldface type. As a rule, synonyms for these subspecies follow those bold-typed names.
5. Authority and date for each synonym are included.
6. No appendices are included in this edition, although something similar to appendix I of the 2nd edition would be welcome, as the International Commission on Zoological Nomenclature continues ruling over many complex taxonomic issues. However, many of the relevant data are already included in individual comments.
7. A list of museum acronyms or abbreviations is provided, which is necessary because some authors make reference to specific specimens in their taxonomic accounts. From a preliminary review, it is only used by Musser and Carleton in their section on muroid rodents. These authors go into details seen nowhere else in this edition, listing individual specimen vouchers to support taxonomic and systematic decisions. It is remarkable that many of Musser and Carleton's conclusions on higher taxonomy of rodents have been confirmed by subsequent analyses of genetic (Jansa and Weksler 2004; Steppan et al. 2004) or morphological data in a larger data set (Jenkins et al. 2005). Praise for them!
8. The editors saved considerable space and created a much more user friendly index by listing the species level alphabetically referenced to each genus, but removing a list of species in each genus (as in the previous edition).

What are the Reasons for Those Major Taxonomic Changes?

Genetic data are playing a major role in the understanding of biological diversity, and this is evident in the recognition of new taxa at every level. Although many of the newly described genera represent new species so distinct in terms of morphology that they are granted generic level (e.g., *Cuscomys* Emmons, 1999), when genetic evidence "breaks down" a nonmonophyletic taxon (e.g., Tonatia; see Lee et al. 2002) the result is usually the recognition of full generic status for names previously considered junior synonyms or subgenera (i.e., *Lophostoma* d' Orbigny, 1836). If no name is suitable to represent the new grouping, then a new name is proposed (e.g., *Tlacuatzin* Voss and Jansa, 2003). The monophyly criterion, as demonstrated by 1 or 2 sets of evidence (one of them usually DNA sequences analyses), is becoming more important and this is noticeable in the new arrangement proposed for many taxa.

Comments clearly reflect the experience and dedication of the authors, but also the larger amount of information available to them. Changes in the diversity of some genera are quite remarkable, as exemplified by changes in the numbers of species from the 2nd to the 3rd edition: *Cryptotis* (14 to 30), *Sorex* (70 to 77), *Hipposideros* (53 to 67), *Myotis* (84 to 103), *Callithrix* (9 to 21), *Callicebus* (13 to 28), *Cercopithecus* (18 to 25), *Rattus* (56 to 66), *Oryzomys* (36 to 43), *Thomasomys* (25 to 36), *Ctenomys* (38 to 60), *Ochotona* (25 to 30), or the impressive *Crocidura* (151 to 172, the most diverse mammal genus). In some cases, diversity within a genus is reduced as a result of comprehensive studies of intraspecific variation or by splitting polyphyletic genera, as occurs in *Eptesicus* (32 to 23), *Pipistrellus* (50 to 31), *Gazella* (16 to 10), or *Proechimys* (32 to 25). Whenever relevant to these current estimates of diversity, detailed morphological, karyotypic, and genetic data are provided. However, sometimes this results in difficulty to cross reference taxa when no indication is made to their treatment in the previous edition (Wilson and Reeder 1993).

How Much Change Can We Expect for a Next Edition?

Recently, Baker and Bradley (2006) suggested that although catalogs and species lists are not uniform in terms of the species concept they apply, the biological species concept as an extension of morphological differences between taxa is the prevailing view. They argued that a strict application of monophyly, as based on genetic data, and genetic isolation (rather than reproductive isolation) should demonstrate that current diversity is underestimated. If their predictions are valid, a future edition of the *Mammal Species of the World* should have an increase of almost 40% in the number of species. As taxonomic and geographic sampling increase, most of the potential changes will be those produced by the recognition of species-level taxa now listed as synonyms or subspecies. The editors (p. xix) recognize the significant impact of molecular techniques, and anticipate continued changes to the present arrangement.

A paper by Weksler et al. (2006), introducing 10 new generic names from a review of rats of the genus *Oryzomys*, and recent research on the bat genus *Carollia* (Baker et al. 2002; Hoffmann and Baker 2003; Solari and Baker 2006), are examples of this trend. The power of DNA sequence data to document monophyly and paraphyly, and the resulting understanding of morphological and karyotypic variation in a phylogenetic framework is an immediate product of the interface of genetics and the systematic arrangement in Wilson and Reeder's volume.

What is the Impact of These Rearrangements in the "Real World"?

Changes in this edition were used to reorganize the collection of mammals housed in the National Sciences Research Laboratory, Museum of Texas Tech University, and the same is happening in other collections of mammals (e.g.,

Museum of Southwestern Biology, New Mexico–W. L. Gannon, pers. comm.). In the case of the National Sciences Research Laboratory, 641 taxonomic changes were made to the database, which includes 2,520 species and almost 108,000 records. However, this number does not include required revision of actual specimens for species that are being split in 2 or more taxa. Updating databases to keep a standard and current nomenclature (like that of present edition) will require significant effort. Time and human resources needed for such an effort will require careful planning. In addition, because changes have been made at several taxonomic levels, and taxonomic organization differs among individual collections, ad hoc criteria should be applied.

A book of this scope is rarely error free and, although not our aim, we noted a few minor mistakes in this edition: in table 1 (p. xxvi), Peramelemorphia is misspelled ''Paramelemorphia''; there are 6 (not 5) newly described species of Macropodidae, and 52 (not 53) of Cricetidae. In the order Didelphimorphia, the distribution of *D. albiventris* extends as far north as Colombia (p. 5), but in its restricted meaning it goes up to Bolivia (Lemos and Cerqueira 2002), and *Monodelphis osgoodi* was not included in *M. adusta* (p. 15) in the previous edition (see 1993:21). In the Chiroptera, *rosenbergi*, a synonym of *Artibeus glaucus*, is misspelled ''*rosenbergii*'' (p. 418), ''Buenos Aires'' is listed as type locality for *Eumops patagonicus* (p. 438), but this actually correspond to ''Chubut'' (see Barquez et al. 1999), and *Myotis caucensis*, a synonym of *M. nigricans* (p. 513) was described by J. A. Allen (1914), not Miller and G. M. Allen (1928). In the Rodentia, the type locality for *Amphinectomys savamis* (Cricetidae: Sigmodontinae) is given as: ''Henaro Errera'' (p. 1101), but the correct name should be Jenaro Herrera (Patterson 2000).

One mistake from the previous volume was related to the account of species by families and orders in table 1. The total sum of species by families was 4,631, an increase of 2 with respect to the actual 4,629 species (as from orders). Medellín (1995) noted this, but attributed it to errors in the number of Sciurognathi rodent and mustelid species. However, the error was actually in the number of bat species, which is 925. The total by families given for bats is 927; the additional 2 were a mistake in the total for phyllostomids, only 141 not 143. None of these minor errors diminish the value and merit of this edition; rather they speak volumes about the work of both editors and authors, and the value of the information in such a well-organized format.

We acknowledge the collaboration of several members of our laboratory in the Department of Biology, and in the Natural Science Research Laboratory, Museum of Texas Tech University, especially to M. R. Marchán for her data on the collection catalog.—Sergio Solari and Robert J. Baker, *Department of Biological Sciences and The Museum, Texas Tech University, Lubbock, TX 79409-3131, USA; sergio.solari@ttu.edu.*

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APPENDIX I

Species diversity as recognized in the 3rd edition of *Mammal Species of the World* (MSW), compared to its equivalent in the 2nd edition. The difference (Diff.) in number of species, and the actual number of newly described species (Descr.) are listed. Extreme changes in some groups (see the text) hinder straightforward comparisons.

MSW 1993	No. spp.	MSW 2005	No. spp.	Diff.	Descr.
Mammalia	4,629	Mammalia	5,416	787	260
Monotremata–Tachyglossidae	2	Monotremata–Tachyglossidae	4	2	1
Monotremata–Ornithorhynchidae	1	Monotremata–Ornithorhynchidae	1	0	
Didelphimorphia–Didelphidae	63	Didelphimorphia–Didelphidae	87	24	2
Paucituberculata–Caenolestidae	5	Paucituberculata–Caenolestidae	6	1	1
Microbiotheria–Microbiotheriidae	1	Microbiotheria–Microbiotheriidae	1	0	
Notoryctemorphia–Notoryctidae	2	Notoryctemorphia–Notoryctidae	2	0	
Dasyuromorphia–Thylacinidae	1	Dasyuromorphia–Thylacinidae	1	0	
Dasyuromorphia–Myrmecobiidae	1	Dasyuromorphia–Myrmecobiidae	1	0	
Dasyuromorphia–Dasyuridae	61	Dasyuromorphia–Dasyuridae	69	8	5
Peramelemorphia–Peramelidae	—	Peramelemorphia–Thylacomyidae	2	2	
Peramelemorphia–Peramelidae	—	Peramelemorphia–Chaeropodidae	1	1	
Peramelemorphia–Peramelidae + Peroryctidae	21	Peramelemorphia–Peramelidae	18	−3	
Diprotodontia–Phascolarctidae	1	Diprotodontia–Phascolarctidae	1	0	
Diprotodontia–Vombatidae	3	Diprotodontia–Vombatidae	3	0	
Diprotodontia–Burramyidae	5	Diprotodontia–Burramyidae	5	0	
Diprotodontia–Phalangeridae	18	Diprotodontia–Phalangeridae	27	9	3
Diprotodontia–Pseudocheiridae	14	Diprotodontia–Pseudocheiridae	17	3	
Diprotodontia–Petauridae	10	Diprotodontia–Petauridae	11	1	
Diprotodontia–Tarsipedidae	1	Diprotodontia–Tarsipedidae	1	0	
Diprotodontia–Acrobatidae	2	Diprotodontia–Acrobatidae	2	0	
Diprotodontia–Potoroidae	—	Diprotodontia–Hypsiprymnodontidae	1	1	
Diprotodontia–Potoroidae	9	Diprotodontia–Potoroidae	10	1	
Diprotodontia–Macropodidae	54	Diprotodontia–Macropodidae	65	11	6
Insectivora–Tenrecidae	24	Afrosoricida–Tenrecidae	30	6	5
Insectivora–Chrysochloridae	18	Afrosoricida–Chrysochloridae	21	3	1
Macroscelidea–Macroscelididae	15	Macroscelidea–Macroscelididae	15	0	
Tubulidentata–Orycteropodidae	1	Tubulidentata–Orycteropodidae	1	0	
Hyracoidea–Procaviidae	6	Hyracoidea–Procaviidae	4	−2	
Proboscidea–Elephantidae	2	Proboscidea–Elephantidae	3	1	
Sirenia–Dugongidae	2	Sirenia–Dugongidae	2	0	
Sirenia–Trichechidae	3	Sirenia–Trichechidae	3	0	
Xenarthra–Dasypodidae	20	Cingulata–Dasypodidae	21	1	1
Xenarthra–Bradypodidae	3	Pilosa–Bradypodidae	4	1	1
Xenarthra–Megalonychidae	2	Pilosa–Megalonychidae	2	0	
Xenarthra–Myrmecophagidae	—	Pilosa–Cyclopedidae	1	1	
Xenarthra–Myrmecophagidae	4	Pilosa–Myrmecophagidae	3	−1	
Scandentia–Tupaiidae	19	Scandentia–Tupaiidae	19	0	
Scandentia–Tupaiidae	—	Scandentia–Ptilocercidae	1	1	
Dermoptera–Cynocephalidae	2	Dermoptera–Cynocephalidae	2	0	
Primates–Cheirogaleidae	7	Primates–Cheirogaleidae	21	14	6
Primates–Lemuridae	10	Primates–Lemuridae	19	9	
Primates–Megaladapidae	7	Primates–Lepilemuridae	8	1	
Primates–Indriidae	5	Primates–Indriidae	11	6	1
Primates–Daubentoniidae	1	Primates–Daubentoniidae	1	0	
Primates–Loridae	6	Primates–Lorisidae	9	3	1
Primates–Galagonidae	11	Primates–Galagidae	19	8	1
Primates–Tarsiidae	5	Primates–Tarsiidae	7	2	
Primates–Cebidae + Callitrichidae	84	Primates–Cebidae	56	−28	8
Primates–Cebidae	—	Primates–Aotidae	8	8	
Primates–Cebidae	—	Primates–Pitheciidae	40	40	3
Primates–Cebidae	—	Primates–Atelidae	24	24	
Primates–Cercopithecidae	81	Primates–Cercopithecidae	132	51	4
Primates–Hylobatidae	11	Primates–Hylobatidae	14	3	
Primates–Hominidae	5	Primates–Hominidae	7	2	
Rodentia–Aplodontiidae	1	Rodentia–Aplodontiidae	1	0	
Rodentia–Sciuridae	273	Rodentia–Sciuridae	278	5	
Rodentia–Myoxidae	26	Rodentia–Gliridae	28	2	1
Rodentia–Castoridae	2	Rodentia–Castoridae	2	0	
Rodentia–Heteromyidae	59	Rodentia–Heteromyidae	60	1	2

APPENDIX I.—Continued.

MSW 1993	No. spp.	MSW 2005	No. spp.	Diff.	Descr.
Rodentia—Geomyidae	35	Rodentia—Geomyidae	40	5	
Rodentia—Dipodidae	51	Rodentia—Dipodidae	51	0	
Rodentia—Muridae	—	Rodentia—Platacanthomyidae	2	2	
Rodentia—Muridae	—	Rodentia—Spalacidae	36	36	4
Rodentia—Muridae	—	Rodentia—Calomyscidae	8	8	
Rodentia—Muridae	—	Rodentia—Nesomyidae	61	61	6
Rodentia—Muridae	—	Rodentia—Cricetidae	681	681	52
Rodentia—Muridae	1,326	Rodentia—Muridae	730	−596	33
Rodentia—Anomaluridae	7	Rodentia—Anomaluridae	7	0	
Rodentia—Pedetidae	1	Rodentia—Pedetidae	2	1	
Rodentia—Ctenodactylidae	5	Rodentia—Ctenodactylidae	5	0	
Rodentia—Bathyergidae	12	Rodentia—Bathyergidae	16	4	2
Rodentia—Hystricidae	11	Rodentia—Hystricidae	11	0	
Rodentia—Petromuridae	1	Rodentia—Petromuridae	1	0	
Rodentia—Thryonomyidae	2	Rodentia—Thryonomyidae	2	0	
Rodentia—Erethizontidae	12	Rodentia—Erethizontidae	16	4	2
Rodentia—Chinchillidae	6	Rodentia—Chinchillidae	7	1	
Rodentia—Dinomyidae	1	Rodentia—Dinomyidae	1	0	
Rodentia—Caviidae + Hydrochaeridae	15	Rodentia—Caviidae	18	3	2
Rodentia—Dasyproctidae	13	Rodentia—Dasyproctidae	13	0	
Rodentia—Agoutidae	2	Rodentia—Cuniculidae	2	0	
Rodentia—Ctenomyidae	38	Rodentia—Ctenomyidae	60	22	5
Rodentia—Octodontidae	9	Rodentia—Octodontidae	13	4	3
Rodentia—Abrocomidae	3	Rodentia—Abrocomidae	10	7	2
Rodentia—Echimyidae	78	Rodentia—Echimyidae	90	12	13
Rodentia—Myocastoridae	1	Rodentia—Myocastoridae	1	0	
Rodentia—Capromyidae	20	Rodentia—Capromyidae	20	0	
Rodentia—Heptaxodontidae	5	Rodentia—Heptaxodontidae	4	−1	
Lagomorpha—Ochotonidae	26	Lagomorpha—Ochotonidae	30	4	2
Lagomorpha—Ochotonidae	—	Lagomorpha—Prolagidae	1	1	
Lagomorpha—Leporidae	54	Lagomorpha—Leporidae	61	7	3
Insectivora—Erinaceidae	21	Erinaceomorpha—Erinaceidae	24	3	1
Insectivora—Nesophontidae	8	Soricomorpha—Nesophontidae	9	1	
Insectivora—Solenodontidae	3	Soricomorpha—Solenodontidae	4	1	1
Insectivora—Soricidae	312	Soricomorpha—Soricidae	376	64	17
Insectivora—Talpidae	42	Soricomorpha—Talpidae	39	−3	
Chiroptera—Pteropodidae	166	Chiroptera—Pteropodidae	186	20	6
Chiroptera—Rhinolophidae	130	Chiroptera—Rhinolophidae	77	−53	4
Chiroptera—Rhinolophidae	—	Chiroptera—Hipposideridae	81	81	7
Chiroptera—Megadermatidae	5	Chiroptera—Megadermatidae	5	0	
Chiroptera—Rhinopomatidae	3	Chiroptera—Rhinopomatidae	4	1	
Chiroptera—Craseonycteridae	1	Chiroptera—Craseonycteridae	1	0	
Chiroptera—Emballonuridae	47	Chiroptera—Emballonuridae	51	4	2
Chiroptera—Nycteridae	12	Chiroptera—Nycteridae	16	4	
Chiroptera—Myzopodidae	1	Chiroptera—Myzopodidae	1	0	
Chiroptera—Mystacinidae	2	Chiroptera—Mystacinidae	2	0	
Chiroptera—Phyllostomidae	141	Chiroptera—Phyllostomidae	160	19	9
Chiroptera—Mormoopidae	8	Chiroptera—Mormoopidae	10	2	
Chiroptera—Noctilionidae	2	Chiroptera—Noctilionidae	2	0	
Chiroptera—Furipteridae	2	Chiroptera—Furipteridae	2	0	
Chiroptera—Thyropteridae	2	Chiroptera—Thyropteridae	3	1	1
Chiroptera—Natalidae	5	Chiroptera—Natalidae	8	3	
Chiroptera—Molossidae	80	Chiroptera—Molossidae	100	20	2
Chiroptera—Vespertilionidae	318	Chiroptera—Vespertilionidae	407	89	18
Pholidota—Manidae	7	Pholidota—Manidae	8	1	
Carnivora—Felidae	36	Carnivora—Felidae	40	4	
Carnivora—Viverridae	34	Carnivora—Viverridae	35	1	1
Carnivora—Viverridae	—	Carnivora—Eupleridae	8	8	
Carnivora—Viverridae	—	Carnivora—Nandiniidae	1	1	
Carnivora—Herpestidae	37	Carnivora—Herpestidae	33	−4	
Carnivora—Hyaenidae	4	Carnivora—Hyaenidae	4	0	
Carnivora—Canidae	34	Carnivora—Canidae	35	1	
Carnivora—Ursidae	9	Carnivora—Ursidae	8	−1	
Carnivora—Ursidae	—	Carnivora—Ailuridae	1	1	

APPENDIX I.—Continued.

MSW 1993	No. spp.	MSW 2005	No. spp.	Diff.	Descr.
Carnivora–Otariidae	14	Carnivora–Otariidae	16	2	
Carnivora–Odobenidae	1	Carnivora–Odobenidae	1	0	
Carnivora–Phocidae	19	Carnivora–Phocidae	19	0	
Carnivora–Mustelidae	65	Carnivora–Mustelidae	59	−6	
Carnivora–Mustelidae		Carnivora–Mephitidae	12	12	
Carnivora–Procyonidae	18	Carnivora–Procyonidae	14	−4	
Perissodactyla–Equidae	9	Perissodactyla–Equidae	8	−1	
Perissodactyla–Tapiridae	4	Perissodactyla–Tapiridae	4	0	
Perissodactyla–Rhinocerotidae	5	Perissodactyla–Rhinocerotidae	5	0	
Artiodactyla–Suidae	16	Artiodactyla–Suidae	19	3	1
Artiodactyla–Tayassuidae	3	Artiodactyla–Tayassuidae	3	0	
Artiodactyla–Hippopotamidae	4	Artiodactyla–Hippopotamidae	2	−2	
Artiodactyla–Camelidae	6	Artiodactyla–Camelidae	4	−2	
Artiodactyla–Tragulidae	4	Artiodactyla–Tragulidae	8	4	
Artiodactyla–Moschidae	4	Artiodactyla–Moschidae	7	3	
Artiodactyla–Cervidae	43	Artiodactyla–Cervidae	51	8	5
Artiodactyla–Antilocapridae	1	Artiodactyla–Antilocapridae	1	0	2
Artiodactyla–Giraffidae	2	Artiodactyla–Giraffidae	2	0	
Artiodactyla–Bovidae	137	Artiodactyla–Bovidae	143	6	
Cetacea–Balaenidae	3	Cetacea–Balaenidae	4	1	
Cetacea–Balaenopteridae	6	Cetacea–Balaenopteridae	7	1	
Cetacea–Eschrichtiidae	1	Cetacea–Eschrichtiidae	1	0	
Cetacea–Neobalaenidae	1	Cetacea–Neobalaenidae	1	0	
Cetacea–Delphinidae	32	Cetacea–Delphinidae	34	2	
Cetacea–Monodontidae	2	Cetacea–Monodontidae	2	0	
Cetacea–Phocoenidae	6	Cetacea–Phocoenidae	6	0	
Cetacea–Physeteridae	3	Cetacea–Physeteridae	3	0	
Cetacea–Platanistidae	5	Cetacea–Platanistidae	2	−3	
Cetacea–Platanistidae	—	Cetacea–Iniidae	3	3	
Cetacea–Ziphiidae	19	Cetacea–Ziphiidae	21	2	1