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Long, C. A. 2008. *THE WILD MAMMALS OF WISCONSIN*. Pensoft Series Faunistica 68, Pensoft Publishers, Sofia, Bulgaria, 544 pp. + 27 colored illustrations. ISBN 978-954-642-303-0, price (hardbound) EURO 78; ISBN 978-954-642-313-9, price (paper) EURO 45.

The state of Wisconsin is fortunate to have a number of state parks, national protected areas, private and public lands set aside for wildlife management, and regenerating forests—at least 194 scientific areas have been preserved by the state. Wisconsin is in an interesting transition region between northern boreal forests heavily dominated by pine and now birch, mixed hardwood forests, and prairie. The mammal fauna is a complex overlap representing each biotic region, and a wealth of new information and detailed summary of previous research on the state's mammals is now available in Charles Long's long-awaited *The Wild Mammals of Wisconsin*. Long is a classically trained mammalogist and *The Wild Mammals of Wisconsin* is a classic "mammals of . . ."—type volume. The state's rich mammal fauna is documented by Long with 69 full accounts of native species and briefer accounts of 7 hypothetical or invading species.

Long's extensive studies of the state's small mammal fauna, especially the shrews and rodents, are incorporated into quite thorough species accounts. Accounts include descriptions, geographic range, habitat, foods, reproduction, home range, movements, den and nest sites, geographic variation, predators, parasites, evaluations of subspecific variation, and more. Discussions include geographic variation in the region, with discussions on the appropriate subspecies names. Long provides keys to the orders, families, genera, and species. Appendices on longevity of common species, preparation of mammal study skins, photographs of skulls, and conversion of English to metric measurements will make this work appealing to educators working with younger students. There is an inclusive glossary of mammalogical terms. An index to scientific and vernacular names is provided that is complete and quite useful. Distribution maps for North America and Wisconsin are included for each species. Abbreviated accounts are provided for the species that are extirpated from the state, referring the reader back to Hartley H. T. Jackson's classic *Mammals of Wisconsin* (1961). Abbreviated taxonomic synonymies include original names and synonyms. Listings of specimens examined are abbreviated. Providing additional "color" to standard species accounts is accomplished with the use of old black-and-white drawings, extracts of older natural history writing, and quotes from the noted Wisconsin conservation biologist Aldo Leopold and others.

Long's strong sense of history is apparent throughout this work. Especially interesting accounts detail the extirpation, recent range expansion, reintroductions, and aspects of the ecology of the state's carnivores, including the American marten, fisher, coyote, and wolf. Quite comprehensive overviews of these species can now be assembled using the combination of Jackson's (1961) early- and mid-20th century

information and Long's late-20th century data. He reviews the impressive amount of research that has been undertaken on the natural recolonization of wolves in Wisconsin, as well as the associated political issues.

Topics Long addresses have implications far beyond Wisconsin's borders. The rapid range expansion of the white-footed mouse (*Peromyscus leucopus*) in the upper Midwest is discussed and Long plots (p. 244) Jackson's view of its distribution in the middle 20th century and his own understanding of its distribution throughout much of Wisconsin and occurrence in southernmost portions of Michigan's Upper Peninsula by the end of the 20th century. Ongoing research in Michigan documents that the white-footed mouse is now found throughout most of Michigan's Upper Peninsula (Myers et al. 2005). This amazing and rapid range expansion is being attributed to climate change and highlights the continued value of high-quality state and regional faunal works. With changing habitats and climates, our ability to accurately assess changing distributions of mammals is only possible when researchers provide documentation and voucher specimens for the era during which they conducted their studies. Although Professor Long undertook most of this research and writing in a different era, aspects of what is presented herein provide documentation of the seemingly rapid changes in distributions that are occurring in some species of mammals.

His account of the diminutive prairie vole (*Microtus ochrogaster minor*) of central Wisconsin is a tragic case study in conservation biology. This distinctive vole almost surely merits recognition as a full species, yet few aspects of its biology have ever been studied; it clearly represents a unique genetic entity as evidenced by its small size, distinctive coloration, and unique behavior. Long documents that the known populations have decreased in the past few decades and that the vole is close to extinction, with no real hope in sight. Thus, an endemic species is being allowed to slip into extinction. This loss is not from direct persecution by humans, but rather through gradual habitat degradation—where are the wildlife managers and conservation biologists? Clearly jaguars have better press agents than do mice.

Long documents what is known concerning a population of the Eurasian stone marten (*Martes foina*) that occurs in southeastern Wisconsin, apparently stemming from a release of animals from a fur farm decades ago. Long's documentation of the success and distribution of this alien species provides the baseline that future wildlife biologists will need in evaluating this introduced carnivore.

Long has been a prolific publisher his entire career, and the 66-page Literature Cited includes 94 citations to papers he has published that are pertinent to this work. Some of these papers are in outlets that are not readily available so having them summarized here in a single, integrated resource is a definite asset. The bibliographic references, he tells us, are to a great extent a compilation since publication of Jackson's *Mammals of Wisconsin* (1961), and not an attempt to duplicate it.

To Long's credit, he follows quite recent nomenclatural changes, including using *Perimyotis* rather than *Pipistrellus* for

the pipistrelle, and *Neovison* rather than *Mustela* for the American mink. However, Marsupialia is used as an ordinal-level section heading, which includes a discussion of the more generally accepted ordinal name Didelphimorphia. He retains the use of Zapodidae, rather than using Dipodidae, for the North American jumping mice, and recognizes *Pitymys* as the correct generic name for the prairie vole and pine vole, providing cogent arguments for these choices of names; both are in contrast to recent usage as summarized in Wilson and Reeder (2005).

Updates are inevitable in such an ambitious work and one of the values of 1st-rate regional faunistic studies is to stimulate researchers to undertake more-detailed studies on selected species. The rock vole (*Microtus chrotorrhinus*) is listed as a species of possible occurrence in Wisconsin. In adjacent Minnesota to the west, it is known from several specimens and localities (Timm et al. 1977) rather than the single specimen that Long mentions (p. 62); however, given its habitat in Minnesota I would not expect it to be found in Wisconsin. I also concur with Long that the smoky shrew (*Sorex fumeus*) is unlikely to occur in the state.

A new *Mammals of Wisconsin* immediately invites comparison with Jackson's classic *Mammals of Wisconsin*, which has long served as the bible for regional faunistic monographs for the upper Midwest, as well as the entire United States. Long fully acknowledges Jackson's spectacularly rich volume and makes no attempt to duplicate it, but rather builds this new work upon the solid foundation that Jackson began. Jackson's well-illustrated book is especially useful today for its historical treatment of the region's mammals with respect to the use (and abuse) of wildlife by humans. Jackson provides rich historically valuable treatments for indigenous peoples' use of mammals, the early fur trade by French-Canadian trappers, and later colonization of Wisconsin by trappers, loggers, and settlers from the eastern United States. Long sets this historical information in a modern systematic treatment, calling his book a successor to that of Jackson. Long's distribution maps are of particular value in that specific points are plotted rather than broad shaded distributions, and he plots Jackson's (1961) points for both specimen records and sight records as well as his own so that readers have both available on a single map.

Long received his Ph.D. in 1963 under the tutelage of E. Raymond Hall at the University of Kansas, where a number of graduate students undertook comprehensive, technical treatise "mammals of . . ."—type dissertations. Long's dissertation was the *The Mammals of Wyoming* (1965). Long's 1st position was at the University of Illinois. He moved to a faculty position at the University of Wisconsin-Stevens Point in 1966 and spent the remainder of his career there. Upon arriving in Wisconsin, he began study of the state's mammal fauna in earnest, created the Museum of Natural History at the University, and trained hundreds of students. In teaching a variety of zoology, field-related, and museum-related courses, Long has worked with a number of good undergraduate students to build the collections and amass an unprecedented depth of knowledge on Wisconsin's

mammal fauna. University of Wisconsin-Stevens Point is noted for its success in placing its graduates in advanced degree programs. Culminating Long's efforts and energies devoted to study of mammals in the upper Midwest for more than 4 decades, his knowledge of the state's mammal fauna is now available as a single, comprehensive, user-friendly volume.

In examining both a paperback and hardbound copy, both appear to be well bound and able to withstand the rigors of regular use. Reproduction of the illustrations is mixed; some are excellent, some less so. Many of the skull photographs would be more valuable if they were larger. Long informed me that there was a production error on p. 307 and the occlusal view of an upper molar row of *Napaeozapus* is erroneously labeled as *Zapus*.

Wisconsin educators, students, conservation biologists, and resource managers, as well as students of mammalian ecology and evolution, are indeed fortunate to have the companion volumes of Jackson's and Long's *Mammals of Wisconsin* books that superbly document the state's rich mammalian fauna from the early 1800s to the present time.

Pensoft Publishers is one of a new genre of publishers that are referred to as "print on demand," taking advantage of renovations in computer-assisted printing technology. Pensoft primarily publishes entomological monographs, but has produced a number of volumes on various aspects of mammalogy, most of which involve European species. Print on demand is going to be an increasing popular outlet for publishing monograph-length works with production costs continuing to rise, and authors will wish to carefully research publishers so that they are fully aware of their strengths, weaknesses, and capabilities because they are quite variable. Pensoft Publishers informed me that a reduced price will be negotiated for bulk orders for students. Orders can be placed at orders@pensoft.net or info@pensoft.net or phone +359-2-8704281 or through www.pensoft.net.—ROBERT M. TIMM, *Natural History Museum and Biodiversity Research Center & Department of Ecology and Evolutionary Biology, University of Kansas, Lawrence, KS 66045-7561, USA; e-mail: btimm@ku.edu.*

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