

INTRODUCTION

A Moose crosses the road and traffic stops. Fearful campers scrutinize a Black Bear as it moves through their campsite. Even a mouse scurrying across the ground in the back yard will attract notice. Mammals command attention. Except for a few common species, most of our 462 mammal species are rarely seen; when they do show themselves, it can be quite exciting.

Mammals arouse our emotions, often in contradictory ways. The fluffy Gray Squirrel is awfully cute, until it nests in your attic. The charismatic Wolf is a majestic symbol of wilderness, until it threatens your livestock. Depending on your point of view, a White-tailed Deer is a precious little Bambi, a trophy to be mounted on the wall, a hunk of meat to be sizzling on the grill, a pest that won't leave your garden alone, or a 300-pound road-block that could jump in front of your car at any moment.

These anthropomorphic views are obvious, but the less obvious ecological duties fulfilled by our mammals may be even more important. The diverse ways in which they make a living means that they play myriad ecological roles that are at the very core of a healthy environment. Granivorous mammals (e.g. squirrels and mice) eat seeds, killing many potential plant offspring; but they also disperse some seeds away from the shade of the mother plant unharmed and into a good environment for germination. Thus they sometimes act as a friend of the plant, sometimes as a foe. Folivorous mammals (e.g. deer and rabbits) eat the leaves of plants and can keep certain species from overgrowing an area. Carnivorous mammals (e.g. weasels, Bobcats, and Killer Whales) keep their prey populations in check by eating the most abundant species. Predators can actually increase prey diversity by preventing a single species from becoming overabundant and driving others out. Insectivorous mammals (e.g. bats and shrews) help control insect populations, including many pest species. Our diverse and abundant mammal fauna constitute an important, well integrated part of our varied ecosystems.

There are a number of reasons why one might want to identify a mammal, from idle curiosity to hard-core scientific inquiry. Anyone with a nose for nature will be curious about mammals encountered in the wild. The relative rarity of those encounters makes them all the more special, and our "biophilia," or attraction to animals, carries with it a strong desire to identify whatever we see. For most of us, this book will serve as a handy guide in pocket or vehicle, for casual encounters with mammals. For others, it may be a useful companion on field trips or research projects designed to find and identify specific mammal species.

SPECIES INCLUDED

This field guide is designed to efficiently and accurately identify all 462 mammal species known from North America, north of Mexico. In addition to native species, this includes tropical species that rarely venture north across the border, exotic species introduced from foreign lands, and extinct species.

Some species on our list have very rarely been recorded in North America (e.g. Margay and Hairy-legged Vampire Bat), but deserve coverage in a field guide so that naturalists know what to look for in the event that these species recolonize.

Selecting which introduced mammal species to include in a field guide is a bit tricky. We selected only exotic mammal species known to survive and reproduce in the wild. This includes a number of ungulate and rodent species that could be confused with our native species. We decided not to include species such as the domestic horse or domestic cat, which have feral populations but are known to everyone, and unlikely to be confused with any native mammals. Because they are unlikely to be confused with native fauna, we did not include the various monkey species known to have escaped from zoos or breeding centers and that may survive in some areas in Florida, and perhaps Texas.

WHAT IS A SPECIES?

Scientists continue to refine our definition of the term species. Traditionally, we recognized independent evolutionary lineages that were reproductively isolated from other such lineages as species. This biological species concept is often difficult to apply in real life. Recent advances in molecular technology that allow much greater resolution of evolutionary relationships have led to a continuing re-examination of our ideas about what constitutes a species. For the purposes of this book, we have followed Wilson and Reeder (2005) in determining which species to recognize. In addition we have followed the more recent scientific literature and recognized a few additional species or name changes published subsequent to Wilson and Reeder (2005). So, for our purposes, a species is an evolutionary lineage of mammal that is recognized as distinct from other such lineages by appropriate authorities in the field of mammalogy.

WHAT INFORMATION IS INCLUDED?

We designed this book to be useful both to amateur naturalists and professional mammalogists. We have packed as much detail into this volume as possible, but also worked hard to keep it concise and efficient, so that it is not unwieldy in the field. All the information for a given species is displayed on two facing pages.

— ARTWORK

The 110 color plates are the core of this guide and will be the most useful component for mammal identification. Each species is represented by an illustration, and some species have a number of illustrations to show variations in their appearance due to age, sex, season, or geographic variation. All paintings are original works of art created for this book and are the result of close collaboration between the artists and ourselves. Credits for each plate are listed on the copyright page.

— A NOTE ON SKELETAL MATERIAL

Most species can be identified based on external appearances. However, sometimes two species of mammal can be distinguished only by a dental or skeletal character. In these cases we include an illustration of such differences.

— DISTRIBUTION MAPS

The maps show the most recent geographic distribution data for each species. Data for these maps were provided by NatureServe in collaboration with Bruce Patterson, Wes Sechrest, Marcelo Tognelli, Gerardo Ceballos, The Nature Conservancy, Conservation International, World Wildlife Fund, and Environment Canada. Mammal ranges are dynamic, with some populations expanding into new areas and others becoming extirpated locally. Readers should therefore be on the lookout for species outside of their normal geographic range.

— SPECIES ACCOUNTS

Each species account has a brief paragraph noting a species' common name, scientific name, measurements, and details about appearance, general ecology, and behavior. All species accounts are written with a specific formula to make it easy to find the bit of information you are looking for:

COMMON NAME *Genus species* total length, tail length, weight
(with differences for male and female where significant)

- 1) The single most important piece of information for identifying the species.
- 2) Description of the physical traits of the species. Details of within-species variation and how to tell it apart from similar species.
- 3) Description of behavior, where relevant, including vocalizations.
- 4) Description of habitats used by a species.

— SCAT ILLUSTRATIONS

Mammals are often elusive, but their scat (feces) can be easy to find. This makes scat an excellent tool to document the presence of local mammals, and some mammalogists get quite excited over a good scat discovery. To aid in scat study, we have included examples of mammal scat shapes (*see* pages 236–239). While

some species have very characteristic scats, others can be quite variable, with the shape and size dependent on the contents of the animal's last meal. Generally, herbivores have more consistent diet, and therefore their scat can be more reliably identified. Carnivores and omnivores have more variable diets, and therefore are much more difficult to identify by scat alone.

— MAMMAL TRACKS

Most big or medium-sized mammals have characteristic footprints that can be detected and identified in soft mud or snow. We have provided illustrations of these tracks, with a range of measurements, on the inside flap of the cover of this guide.

WHAT INFORMATION IS NOT INCLUDED?

While this book has all the information you need to identify every mammal species in North America, it does not have much more. To keep this field guide efficient to use, small, and easy to take into the field, we have minimized discussion about the ecology, behavior, evolution, and conservation of each species. We encourage readers to read more about the mammals they see and identify, and recommend the following sources for their bookshelves and coffee tables – but not necessarily for their field backpack.

FURTHER READING

- Elbroch, M. 2003. *Mammal Tracks & Sign: A Guide to North American Species*. Stackpole Books, Mechanicsburg, PA.
- Glass, Brian P., and Monte L. Thies, 1997. *A Key to the Skulls of North American Mammals*, 3rd edn. Oklahoma State University.
- Nowak, Ronald M., 1999. *Walker's Mammals of the World*, 6th edn, vols 1 & 2. Johns Hopkins University Press.
- Wilson, Don, and Sue Ruff (eds), 1999. *The Smithsonian Book of North American Mammals*. Smithsonian Institution Press, Washington.
- Wilson, Don E., and DeeAnn M. Reeder (eds), 2005, *Mammal Species of the World*. Johns Hopkins University Press.
- Regional Tracking guides*, by J. Halfpenny, published by Pequot Press.
- The Journal of Mammalogy*, published 6 times a year. Hard-core science, not for the faint of heart.

RECOMMENDED INTERNET RESOURCES

- The Animal Diversity Web: <http://animaldiversity.ummz.umich.edu>
- Mammal Species of the World Web Site: <http://www.bucknell.edu/msw3/>
- The American Society of Mammalogists: <http://www.mammalogy.org>
- North American Mammals, including interactive maps: <http://www.mnh.si.edu/mna/>

USING THIS BOOK TO IDENTIFY A MAMMAL

1. WHAT GENERAL TYPE OF MAMMAL IS IT?

Whale? Bat? Mouse? Consult the mammal chart on the next page for hints on general mammal classification, and appropriate page numbers.

2. LOOK AT THE MAMMAL PICTURES.

Examine the artwork that covers your mammal type. Look for pictures similar to your mystery mammal.

3. CONSIDER RANGE MAPS.

Species that don't live where the mystery animal originated are unlikely, but not impossible, candidates.

4. COMPARE THE CANDIDATES.

Look carefully at the illustrations of species that resemble your mystery mammal and are known to live in your area. These should be on the same, or neighboring pages, allowing easy comparisons.

5. READ THE DETAILS.

The text for each species provides additional details that may help in species identification. If no illustrations match your mystery mammal, look here for details about known variation in size and color. If more than one species seems to match your mystery mammal, look here for details about small characters or measurements that distinguish similar species. Sometimes the distinguishing character is quite technical, and may require examining features of the bones or teeth (e.g. some shrews, some western chipmunks), which may not be practical for all situations. Don't forget to consider habitat type, which is always described in the final sentence of a paragraph, and can sometimes be quite specific and useful in identification.

6. MAKE IDENTIFICATION.

In most cases this book will help you precisely identify your mystery mammal to the species level. However, the species of some groups are very difficult to identify, requiring skeletal material, or even genetic tests (e.g. some gophers and ground squirrels). If this is the case, you may have to settle with a genus level identification (e.g. *Thomomys* sp.) or a species group identification (e.g. the Richardson's Ground Squirrel Species Group).