

NEW YORK STATE

CONSERVATIONIST



**MARVELOUS
MAMMALS!**

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THE BEAVER
is the largest native rodent found in North America. They chew down trees to build lodges and dams. The beaver has been New York State's official mammal since 1975.

In this issue,

students will learn about mammals. They will get an introduction to what mammals are, learn about some of the different types of mammals found in New York State, and also learn about some of the mammals that were once found in New York State, but are now extinct. Finally, students will learn about some of the mammal research happening at the New York State Department of Environmental Conservation (DEC), and how to take part in citizen science efforts.

Cover photo: Gray fox by Robert F. Cook

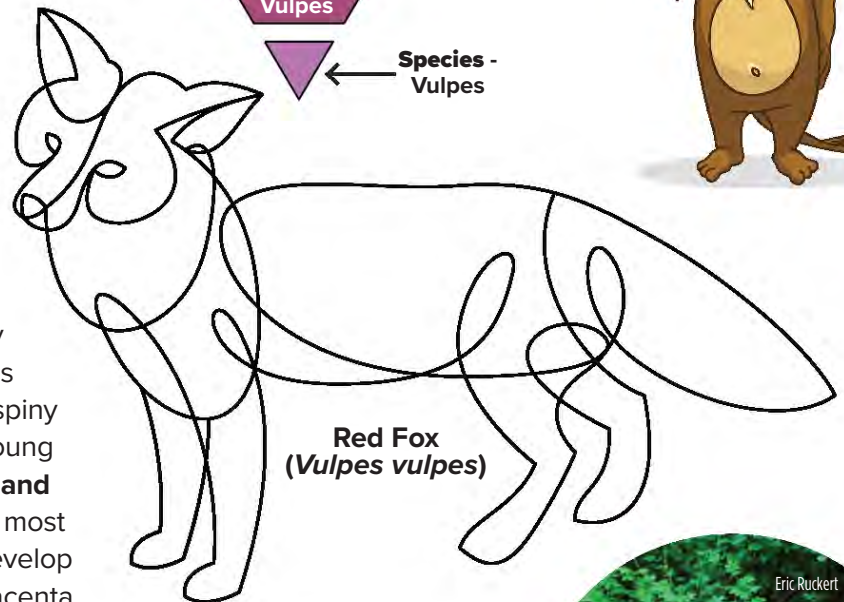
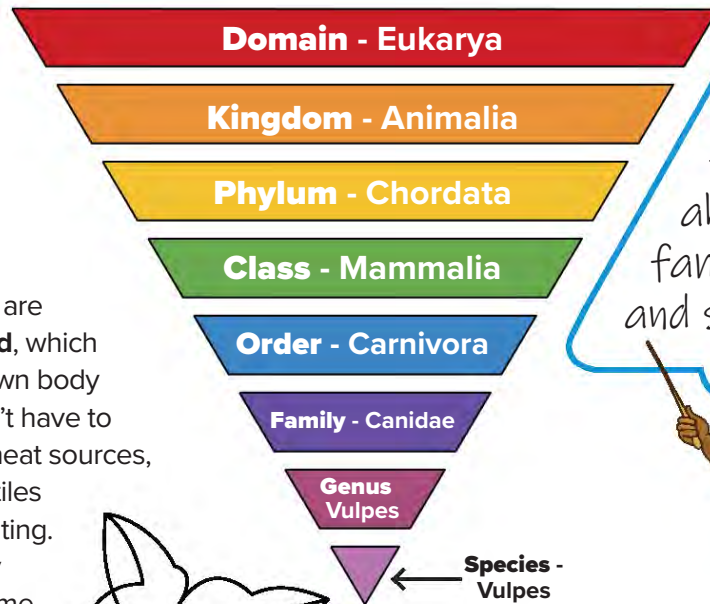
What is a Mammal?

Mammals are part of the kingdom known as Animalia, or animals. They belong to a phylum (group) of animals called Chordata (vertebrates), which means they have a backbone. Other vertebrates are birds, fish, reptiles, and amphibians. Mammals belong to the **class called Mammalia**, which is one of the groups within the **phylum named Chordata**. Like birds, mammals are **endotherms, also called warm-blooded**, which means they are able to regulate their own body temperature from within. Mammals don't have to rely on the warmth of the sun or other heat sources, as ectotherms like amphibians and reptiles do, and can cool off by panting or sweating. Mammals have bodies that are typically **covered in hair**, although the hair of some of these animals has been modified, such as the quills of a porcupine.

Mammals **give birth to live young**, which have developed inside the female. One exception is the group of Australian mammals known as **monotremes**, which lay eggs. These include the duck-billed platypus and echidnas, which are sometimes called spiny anteaters. Mammals that give birth to live young are divided into two groups, **the placentals and the marsupials**. Placental mammals are the most abundant group of mammals. The young develop inside the mother, in an organ called the placenta, and are **born fully developed**. The placenta is a fluid-filled organ that provides oxygen and nutrients to the developing young. Marsupials

are a group of mammals in which the young are **born prematurely and develop in an external pouch**. Marsupials include kangaroos, koalas, wombats, and the only marsupial found north of Mexico, the Virginia opossum.

BIOLOGICAL CLASSIFICATION OF RED FOX



Turn the page to learn about order, family, genus, and species!



White-tailed deer
(*Odocoileus virginianus*)

Another unique characteristic of mammals is that **the females produce milk, which they feed to their young**. Some mammals nurse (drink milk from their mothers) for long periods of time, even years, while other mammals only nurse for a few weeks or months.



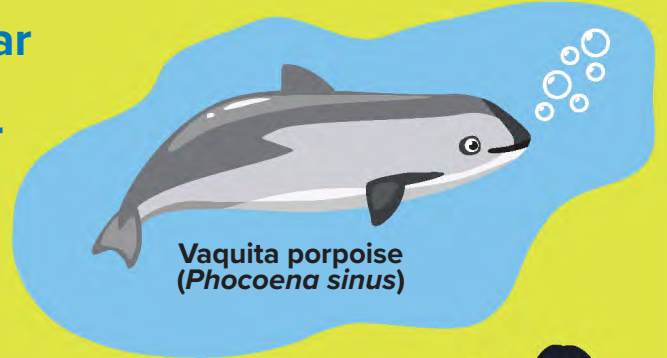
Eric Ruckert



Platypus
(*Ornithorhynchus anatinus*)

Types of Mammals

Types of organisms that share similar characteristics are put into groups called orders, and orders are further divided into families, genera (plural of genus), and species.



Vaquita porpoise
(*Phocoena sinus*)

What is a species?

A species is one specific kind of animal, which shares the same characteristics. Each species has a unique scientific name that consists of two parts, the genus and the



species, which are both italicized or underlined. The scientific name for the **North American beaver** is *Castor canadensis*.

There are more than 5,400 known species of mammals in the world, and more than 400 species of mammals are found in the United States.

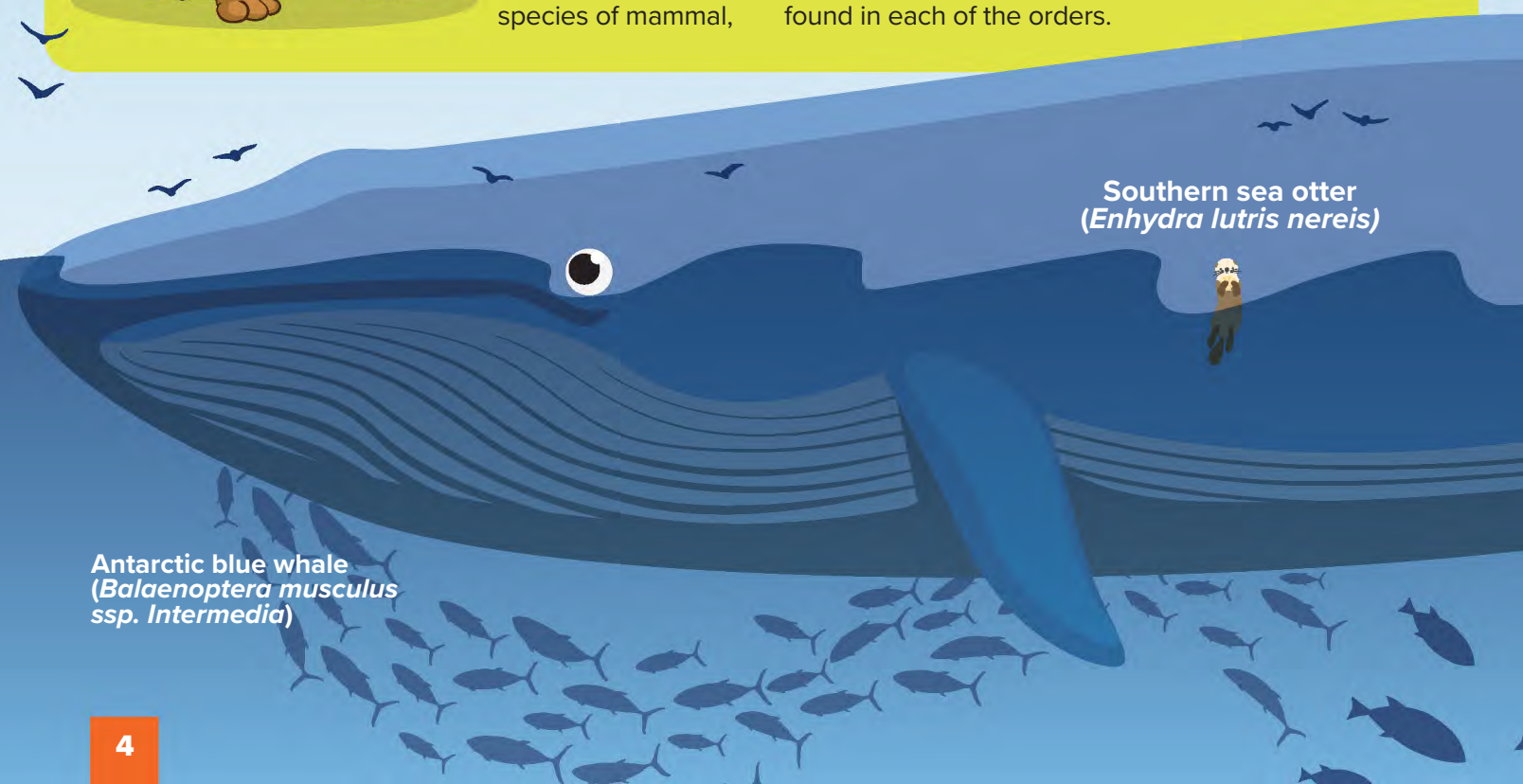
Humans are likely the most numerous species of mammal,

while the rarest mammal is the **vaquita**, a type of porpoise found only in the waters off of western Mexico. The largest land mammal is the **African bush elephant**, and the smallest is the **bumblebee bat**. The largest marine mammal (mammals that live in or very near the ocean) is the **Antarctic blue whale**, and the smallest is the **southern sea otter**.

There are more than 70 species of mammals found in New York State, and they are members of eight different orders. In this section, we will learn about the different orders of wild mammals found in New York State and some examples of the species found in each of the orders.



Humans
(*Homo sapiens*)



Southern sea otter
(*Enhydra lutris nereis*)

Antarctic blue whale
(*Balaenoptera musculus*
ssp. Intermedia)

8 Orders of Wild Mammals Found in New York State

David Capraert, Biowood.org



Virginia opossum

Virginia opossum.

Didelphimorphia – These are a group of opossums found in the Western Hemisphere (“New World”). Opossums are marsupials, and the only opossum species found in New York State is the

Richard Poort



Masked shrew

Insectivores in the order Eulipotyphla found in New York State include the **North American least shrew**, the **masked shrew**, the **star-nosed mole**, and the **eastern mole**.

Eulipotyphla – Mammals in this order include shrews and moles. Shrews look like mice, and moles are burrowing mammals. These mammals are all insectivores, meaning that they eat insects.

Dave Doe



Snowshoe hare

Lagomorphs are the animals known as rabbits and hares, and in New York State include the **snowshoe hare**, **eastern cottontail**, and **New England cottontail**.

Lagomorpha – The lagomorphs are a group of mammals once considered to be rodents, but are now separated into their own order. Lagomorphs are herbivores, meaning they eat plant material,

Jeremy Taylor



Eastern chipmunk

Rodents found in New York State include the **North American beaver**, **voles**, **muskrats**, **mice**, **lemmings**, **rats**, **groundhogs**, **North American porcupines**, **squirrels**, and **chipmunks**.

Rodentia – This is the group of mammals known as rodents, which is the largest order of mammals, making up approximately 40 percent of known mammal species. Rodents have two incisors in their upper and lower jaws,

Ivan Kuzmin



Big brown bat

Chiroptera – This group is made up of the only mammals able to sustain flight, the bats. Bats have forelimbs (arms) that evolved into wings, and make up approximately 20 percent of

Can you name a mammal that lives near you?



known mammal species. Species of bats found in New York State are the **hoary**, **silver-haired**, **eastern red**, **small-footed**, **big brown**, **little brown**, **northern long-eared**, **Indiana**, and **tricolored bats**. Bats are very important in helping control insect populations, as they eat large numbers of mosquitoes, moths, and other flying insects. Some species of bats are also important pollinators, while others are important seed dispersers, responsible for regeneration of tropical rainforests.

Robert F. Cook



Eastern coyote

Other members of this order that were once found in New York State include the American bison, eastern elk, caribou, and wild boar (which were an introduced species).

Carnivora – These are the carnivores, or mammals that mostly eat meat. Within this order, there are seven different families: canids (**coyote**, **foxes**), procyonids (**raccoon**), ursids (**black bear**),

Gary Lee



Moose

Artiodactyla – These are known as even-toed ungulates, or hoofed animals with four toes. They are herbivores, and in New York State are represented by the cervids (**moose** and **white-tailed deer**).

Dennis Glennon



Humpback whale

Species of whales and dolphins that can be found in the coastal waters off of New York State include the **North Atlantic right whale**, **common minke whale**, **sei whale**, **blue whale**, **fin whale**, **humpback whale**, **sperm whale**, **pilot whale**, **Atlantic white-sided dolphin**, **common bottlenose dolphin**, and **harbor porpoise**.



Jefferson's ground sloth

American mastodon

Giant beaver

Flat-headed peccary

Stag-moose

Beth Zaiken

Missing Mammals

A number of mammal species were once found in New York State, but no longer live here.

Some of these mammals have gone **extinct**, meaning they no longer exist in the wild, and some are considered to be **extirpated**, meaning they can still be found in the wild, but not in New York State.

Where are they now?



Woolly mammoth

During the **Pleistocene Epoch**, a period of time that lasted from 2.6 million years ago to 11,700 years ago, New York State was home to a variety of mammals, some of which have gone extinct, and some that have been extirpated, but can still be found in other places.

Some of the most common mammals found in New York State during the Pleistocene were the **American mastodon** and **woolly mammoth**, both of which looked like hairy elephants, but are only distantly related to modern elephants. Both went extinct during the late Pleistocene, primarily due to climate change and over-hunting. Other animals that lived in New York State during the Pleistocene but went extinct include the **ground sloth**, **giant beaver**, **giant short-faced bear**, **flat-headed peccary**, **giant bison**, **California tapir**, and **stag-moose**.



Muskox

Animals that existed in New York during the Pleistocene but have become extirpated in New York State include the **muskox** and the **caribou**. They can still be found in other parts of North America, primarily the far northern/Arctic regions.



Ground sloth

Following the Pleistocene, many of the mammals we are now familiar with started to move into what is now New York State. For a variety of reasons, including habitat loss and overhunting, some of them can no longer be found here. These include the **Allegheny woodrat** (extirpated, although one was discovered in southern New York State in 2021), **eastern wolf** (extirpated), **cougar** (extirpated; some consider the eastern cougar subspecies to be extinct), **wolverine** (extirpated), **elk** (extirpated, the eastern elk subspecies is extinct), and **American bison** (extirpated).



American bison

Mammal Research at DEC

DEC scientists (including wildlife biologists, ecologists, and research scientists) study many different species of mammals in New York State. Some mammal species populations are decreasing, or even becoming endangered, and scientists study them to try to determine what is happening to their populations, and/or ways to help increase their numbers. Other species are increasing in population, and scientists study them to monitor their health and keep track of their numbers. Some species, such as game animals (animals that can be legally hunted), are studied by scientists to make sure their populations are not negatively impacted by hunting, and to help determine how many can be removed each year without hurting the population.

DEC scientists are currently studying the populations of **fisher**, **moose**, and other mammals, working with scientists from colleges and other organizations to monitor their health and determine how their populations are doing. Some of these species once existed in large numbers in New York State, but their populations have been reduced by overhunting. If populations reach large enough numbers, some hunting of certain species may be allowed in order to keep their populations from becoming larger than their habitat can handle. Other species being studied include **endangered species**, such as the **New England cottontail**, the **Indiana bat**, and the **northern long-eared bat**. Research is being done to help **protect their important habitats** and **protect them from diseases** that threaten them with possible extinction. Over the years, some species that were almost extirpated from New York State have significantly increased their populations, thanks in large part to the work of DEC scientists. These include the **beaver** and **North American river otter**.

Some DEC scientists **study marine mammals** to determine their population numbers and help make decisions about managing the fish populations that some whales feed on. Most of the whale species found in the waters off of New York State are endangered due to changes in the populations of the fish and other organisms that they eat, as well as being hit by ships, becoming tangled in fishing gear, or eating plastic trash.



DEC biologist examines a sedated eastern coyote



Black bear cub getting an examination.

A habitat is a place where an animal makes its home. A habitat meets all the environmental conditions an animal needs to survive.



Staff place a sturdy GPS collar on a blindfolded moose.



Bat researchers surveying a bat cave.



Fisher getting a health check and tracking collar.

Get Outside!

BE A CITIZEN SCIENTIST

YOU DON'T HAVE TO BE A WILDLIFE BIOLOGIST TO HELP STUDY MAMMALS IN NEW YORK!

You can become a citizen scientist and help provide important information and observations to DEC and other organizations, which help them better understand the populations of animals that they study. If you spot a moose in New York State, you can report it to DEC here: www.dec.ny.gov/animals/6964.html. Sightings of furbearers (mammals that historically and/or currently have commercially valuable fur, such as fisher, bobcats, or otters) can be reported here: www.dec.ny.gov/animals/30770.html.

Marine mammal sightings can be reported here: www.dec.ny.gov/animals/108573.html.

Other ways you can help scientists is by reporting your sightings on websites such as iSeeMammals (iseemammals.org) or iNaturalist (www.inaturalist.org). You can share photos and other observations, and help scientists learn more at the same time! Use the space below to write down or draw any observations you make about mammals that you see.



1. Big brown bat



2. Bobcat



3. Black bear



4. Moose



5. Gray squirrel



6. Eastern mole



7. Long-tailed weasel



8. Fisher



9. Red fox



10. American marten



11. Eastern cottontail



12. River otter



13. Muskrat



14. Porcupine



15. Raccoon



16. Groundhog



23. Mink



22. Humpback whale



21. Striped skunk



20. Harbor seals



19. Southern flying squirrel



18. Hoary bat



17. White-tailed deer



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Conservationist for Kids **Supplement for Classroom Teachers – Marvelous Mammals** **April 2023**

Types of Animals

Approximately 75 percent of the species on earth belong to the Kingdom called Animalia. As was discussed in this issue of *Conservationist for Kids*, mammals are one of the groups of animals within the group known as vertebrates, the Phylum Chordata. Within this group, there are five Classes of animals: amphibians, reptiles, birds, fish, and mammals. The other major group of animals are those without backbones, known as invertebrates. Invertebrates make up approximately 95 percent of animals. Most invertebrates belong to the Phylum Arthropoda, which includes insects, crustaceans, and arachnids, but other types of invertebrates include worms, mollusks, and sponges. Although there are only eight Orders of wild mammals found in New York State, there are more than 20 Orders of mammals found worldwide. This number varies depending on the classification system used, but it is generally recognized that there are between 26 and 29 different Orders of mammals.

Why Study Mammals?

Although mammals are not the most diverse class of animals (that distinction belongs to insects), mammals are something that everyone is familiar with, at least to some extent. Whether your students have a pet such as a cat or dog, live on a farm, or have seen wild mammals such as rabbits, deer, or squirrels in their neighborhoods, it is likely that all of them at least know what a mammal is. As humans are mammals, by studying mammals, students are learning more about what we are as well. Humans have a very long history with other mammal species – humans began domesticating mammals more than 15,000 years ago! Grey wolves slowly became domesticated and evolved into the many varieties of domestic dogs that we see today. Similarly, approximately 11,000 years ago, humans began domesticating wild aurochs (ancestors of modern cattle), boars (ancestors of modern pigs), sheep, and goats. Even such pets as rats, mice, hamsters, gerbils, and guinea pigs, among others, began as wild mammals that were slowly domesticated over time.

Mammals in Conservation

Many conservation organizations and agencies often focus their efforts on one or two mammal species, often called “umbrella species,” for a number of reasons. Mammals often need larger habitat areas than other types of animals, and by protecting the habitats they need, other types of animals will also benefit. Additionally, it has been shown that people care about many of the mammals that are used by conservation organizations as symbols of their efforts, or as a focus species for their projects. By focusing on “charismatic megafauna,” such as elephants, rhinoceroses, whales, tigers, and giant pandas, many conservation organizations are able to raise money critical to the success of their programs, while at the same time helping to protect a variety of habitats and ecosystems. These efforts may not be nearly as successful without the mammal ambassador species that are chosen to represent the conservation projects.

Teacher Workshops

For teachers who have participated in a Project WILD, there are a number of activities that complement this issue of *Conservationist for Kids*. Visit www.dec.ny.gov/education/1913.html for information about workshops and how to obtain curriculum and activity guides.

Online Resources*

DEC Mammals - www.dec.ny.gov/animals/263.html

DEC Furbearers - www.dec.ny.gov/animals/6969.html

DEC List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State - www.dec.ny.gov/animals/7494.html

DEC Marine Mammals of New York - www.dec.ny.gov/animals/108573.html

DEC New York Nature Explorer - www.dec.ny.gov/animals/57844.html

DEC Watchable Wildlife - www.dec.ny.gov/outdoor/55423.html

New York Natural Heritage Program - www.nynhp.org

DK findout! – Mammals www.dkfindout.com/us/animals-and-nature/mammals/

Easy Science for Kids – Mammals - easyscienceforkids.com/category/animals/mammals/

List of Mammals of New York - en.wikipedia.org/wiki/List_of_mammals_of_New_York

National Geographic Kids: Mammals - kids.nationalgeographic.com/animals/mammals

Books*

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