Mammals
FROM ILLINOIS' PAST

SURVIVORS

black bear *Ursus americanus*

caribou
Rangifer tarandus

wapiti
Cervus elaphus

bison *Bos bison*

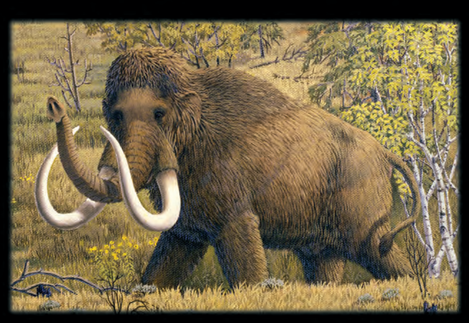
gray wolf *Canis lupus*

giant beaver
Castoroides ohioensis

flat-headed peccary
Platygonus compressus

Jefferson's ground sloth
Megalonyx jeffersonii

Harlan's muskox
Bootherium bombifrons



woolly mammoth
Mammuthus primigenius

American mastodont
Mammut americanum

stag-moose
Cervalces scotti

EXTINCT

The Quaternary Period of Earth history, including the **Pleistocene** (earlier, also called the "Ice Age") and **Holocene** (later, also called Recent) epochs, is the interval of time from 1.8 million years ago to the present day. During the Pleistocene, from approximately 1.8 million to 13,000 years ago, continental glaciers extended from eastern Canada southward into what is today the United States. The most extensive of these, reaching into southern Illinois, and thus called the Illinois Glaciation, covered nearly 90 percent of the state prior to 130,000 years ago. In their growth and movement these glaciers ground up rocks from northern regions and upon melting, left this debris behind in deposits up to 400 feet (121 meters) thick. These deposits include windblown silt (termed loess), sand and gravel outwash, glacial lake deposits, and glacial till that, with cave fillings, and for later times archaeological sites, are the primary sources of Quaternary fossils throughout the state. These glaciations, characterizing the Pleistocene/"Ice Age," were nevertheless interrupted by warm intervals, termed interglacials.

Survivors

The Holocene, representing the last 13,000 years of the Quaternary Period is an interglacial characterized by a warm climate and essentially modern plant and animal communities. Some mammals of Illinois' past that are representative of the Holocene are the gray wolf, black bear, wapiti, caribou, and bison. The gray wolf, black bear, caribou, and wapiti are known from Pleistocene fossils, indicating they are species that survived the large-mammal extinction event marking the close of that epoch 13,000 years ago. The modern bison evolved within the Holocene, but from Pleistocene ancestors. The gray wolf, black bear, wapiti, and bison continued to inhabit Illinois well into the 1800s, and the gray wolf may now be re-inhabiting the state.

Extinct

The Pleistocene, from 1.8 million until 13,000 years ago, was a time of successive cold climates and vastly different animal communities, compared to those of today. The close of the Pleistocene and the beginning of the Holocene was a time of rapid climatic warming. Although there were survivors, the close of the Pleistocene is marked, approximately 13,000 years ago, by an extinction event that affected many species of large mammals that previously inhabited Illinois. Some of these species are shown here. Their bones persist, but the animals are gone forever.

Please note that the objects associated with each illustration are not shown natural size.

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Illinois Department of Natural Resources

Division of Education
Illinois State Museum

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Survivors

(top and center) human-modified left half of a lower jaw, Tazewell County, Illinois, 2,000 years ago (bottom) the upper end of a wolf-chewed bison humerus, Peoria County, Illinois, Holocene, age unknown

gray wolf, *Canis lupus*

Order Carnivora (carnivores)
Family Canidae (dogs, wolves, coyotes, jackals, and foxes)

Gray wolves are relatively common large carnivores found in North American Ice Age paleontological sites, and, because of their associations with humans, in later archaeological sites as well. From these we know the gray wolf of the last Ice Age was very similar in appearance, and presumably behavior, to its modern relatives. Although known from both fossil and recent remains in Illinois, gray wolves are not common in paleontological or archaeological deposits in our state. Historical accounts however, indicate that the gray wolf was, in very recent times until the mid-1800s, common in northern and central Illinois.

perforated canine teeth, Fulton County, Illinois, 2,000 years ago

black bear, *Ursus americanus*

Order Carnivora (carnivores)
Family Ursidae (bears)

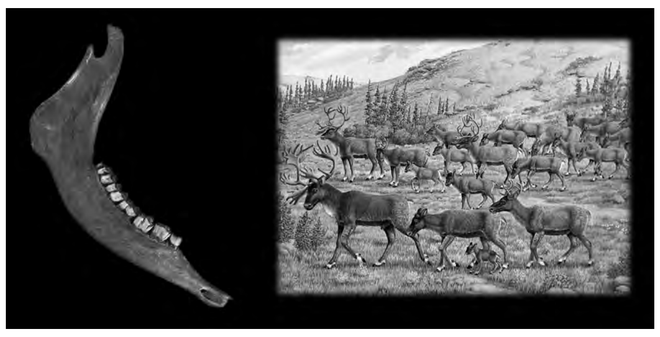
Previously common in northern, central, and southern Illinois, the black bear is by far the most commonly found bear in the late Pleistocene of North America. A surviving species, the black bear still has a wide range in more sparsely populated areas. In the late Ice Age, however, black bears were of larger size, in some cases as large as present day grizzly bears. At the close of the Ice Age, black bears underwent a marked decrease in size throughout most of their range, with the exception of Florida, where very large black bears are still to be found. Fossil remains of black bears are commonly found in caves, suggesting death during hibernation as well as from falls and entrapment.

partial skull (right) and two cervical (neck) vertebrae (left), Whiteside County, Illinois, 9,000 years ago

wapiti, *Cervus elaphus*

Order Artiodactyla (even-toed ungulates)
Family Cervidae (deer, moose, wapiti, and caribou)

The wapiti, also called the American elk, is known from fossils found throughout the state. The wapiti, although primarily a browser, feeds on grasses and herbs as well as twigs and bark of trees and shrubs. In addition to Pleistocene occurrences, the species continued into Recent times. The species was noted to occur throughout Illinois in the 17th to mid-19th centuries and was especially abundant along the Illinois River during the 17th and 18th centuries.



right half of lower jaw, Kendall County, Illinois, 13,500 - 18,000 years ago

caribou, *Rangifer tarandus*

Order Artiodactyla (even-toed ungulates)
Family Cervidae (deer, moose, wapiti, and caribou)

The caribou, like the muskox (*Ovibos moschatus*), brings to mind cold northern regions. In spite of such an image, the caribou survived in the northeastern United States until relatively recent times. In Illinois, however, the record of the species is restricted to the Pleistocene. Although the Illinois record is very sparse—the animal is known only from single localities in northern and central Illinois—this does not mean the animals were exceedingly rare. Caribou today are herding animals moving together in great numbers. Their numbers and long distance movements, the latter of which are patterned and predictable, make caribou especially vulnerable to predation by both human and non-human hunters. Caribou are of appreciable size, but their bones are relatively delicate. This makes caribou carcasses attractive to a wide variety of scavengers, with the result that their remains are less likely to be rapidly buried and thus preserved as fossils. As with other members of the deer family, caribou fossils often consist of antlers or antler fragments, these being for the most part dense and nonedible (except by rodents) portions. In instances where these antlers had been shed, they are indicators only of the animal's passage, not its immediate presence, less so its demise. Accordingly, the late Ice Age caribou from Kendall County, Illinois, is of especial significance, including as it does numerous well preserved parts of a single skeleton.

skull with horn cores and lower jaws, La Salle County, Illinois, 4,000 years ago

bison, *Bos bison*

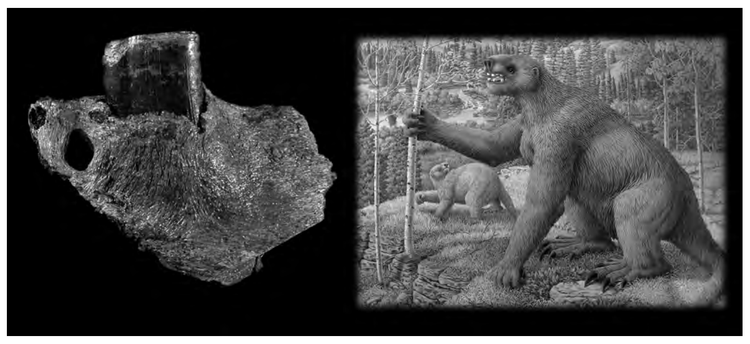
Order Artiodactyla (even-toed ungulates)
Family Bovidae (bovids)

Pleistocene fossils of bison are exceedingly rare in Illinois, known only from extreme northwestern and west central portions of the state. The species represented at these few localities have yet to be determined. Presumably the late Ice Age environments that favored on the one hand woolly mammoths (cold, dry periods) and on the other American mastodonts (cool, moist periods) were not conducive to the habits of ancient bison.

The record of bison in Illinois increases during the Holocene, however, most notably after 9,000 years ago until the 1800s. Holocene bison remains are of the modern species. Their recovery indicates them to have been common in northern and central Illinois and rarer in southern portions of the state.

Modern bison are grazing animals favoring prairie grasslands. In Illinois they found such suitable habitat during the middle and late Holocene, persisting here until perhaps 1830, when hunting, for food, hides, and trade, eliminated the last of the species from the state.

Extinct



tooth in lower jaw fragment, Bureau County, Illinois, 13,500 years ago

Jefferson's ground sloth, *Megalonyx jeffersonii*

Order Edentata (edentates)
Family Megalonychidae (Megalonychid ground sloths)

Jefferson's ground sloth, one of four species of ground sloths inhabiting the United States at the end of the Ice Age, is the only species so far known for Illinois. It was previously common in the northern and central portions of the state.

Ground sloths were large relatives of modern tree sloths. Although possessing very large claws, ground sloths were nevertheless herbivores. Jefferson's ground sloth, of medium size as ground sloths go, was about the size of an ox. It is considered a woodland or forest species, whereas another species found in the Midwest (but not yet in Illinois)-*Glossotherium harlani*, Harlan's ground sloth, was adapted to more open grassland environments.

The wide hips and straddle indicate ground sloths could stand up on their hind legs, supported by a strong tail. This stance would have been particularly advantageous to Jefferson's ground sloth, allowing it to reach high (to 12 feet, about 3 meters) into trees for the best leaves and twigs.

left upper third molar, Cass County, Illinois, Pleistocene, age unknown

American mastodont, *Mammut americanum*

Order Proboscidea (proboscideans)
Family Mammutidae (mastodonts)

American mastodonts roamed throughout North America from about 4 million to 13,000 years ago. As adults they stood between 8-10 feet (2.5-3 meters) at the shoulder and weighed between 4-8 tons (3500 -7000 kilograms). Their teeth had blunt cones, ideally suited for browsing on herbs, shrubs, and trees.

Fossils of American mastodonts are common in northern and central Illinois and rarer in the southern portions of the state. They are especially abundant in the northeastern portion of the state where the receding glaciers of the last Ice Age left behind wet mires conducive to the preservation of the remains of large animals.

right lower fourth deciduous premolar, Pope County, Illinois (left = occlusal view, right = labial view), Pleistocene, age unknown

woolly mammoth, *Mammuthus primigenius*

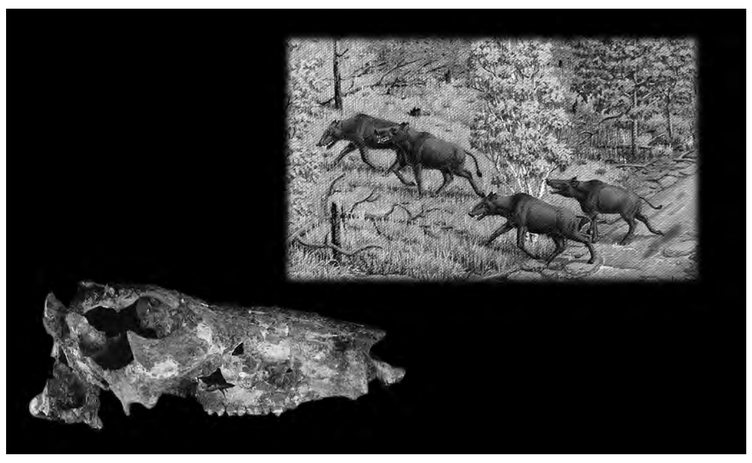
Order Proboscidea (proboscideans)
Family Elephantidae (elephants)

Two species of mammoth are known from Illinois: Jefferson's mammoth (*Mammuthus jeffersonii*) and the woolly mammoth (*Mammuthus primigenius*). Of the two, the woolly mammoth is indicated to have been more numerous. It is known from fossils, most often isolated teeth and bones, commonly found in northern and central Illinois and more rarely in southern portions of the state.

As adults, woolly mammoths stood at about 10 feet (3-3.2 meters) at the shoulder and weighed between 6-7 tons (5500-6300 kilograms).

Mammoth teeth are composed of vertical enamel plates bound together by a substance called cement. As the teeth were used, these plates were worn into a washboard-like surface well-suited for a primary diet of grass. For this reason mammoth fossils are most common in areas that at the time of their existence were covered by savannas, grasslands, or steppe tundra during the last Ice Age. These were cold regions, and the woolly mammoth is an indicator of very cold times in the past.

The woolly mammoth evolved in northeast Asia and came across the Bering Land Bridge (now the Bering Strait) into North America less than 500,000 years ago. Although occurring from North Dakota to New York across the lower 48 states, the specimen shown here, from near Hardin, in Pope County, represents one of the southern-most finds for the species.



skull, Taney County, Missouri, 13,500 - 40,000 years ago

flat-headed peccary, *Platygonus compressus*

Order Artiodactyla (even-toed ungulates)
Family Tayassuidae (peccaries)

Peccaries are New World relatives of the Old World true pigs (family Suidae). Two species of peccary were present in North America north of Mexico during the late Ice Age, and both were common in the Midwestern United States. The two species are the flat-headed peccary (*Platygonus compressus*) and the long-nosed peccary (*Mylohyus nasutus*). Of these, only the flat-headed peccary is known from Illinois.

The flat-headed peccary was about 30 inches tall (about 3/4 meter) at the shoulder and probably weighed around 110 pounds (50 kg). It apparently lived in herds that regularly used caves as shelters. For example, Bat Cave, Missouri, contained the remains of 98 individuals of this species. Because Illinois is not generally known as a "cave state," the lack of caves in our state may be a reason for the rarity of occurrence of fossils of this species from the state. That is, the rarity of fossils may not be a true indicator of past rarity of individuals, but rather an indicator of their lack of preservation. In support of this conclusion is the fact that three-fourths of the localities known for the flat-headed peccary in Illinois are fissures or caves in the northern and southern part of the state.

partial skull with antlers, Kane County, Illinois, 13,500-18,000 years ago

stag-moose, *Cervalces scotti*

Order Artiodactyla (even-toed ungulates)
Family Cervidae (deer, moose, wapiti, and caribou)

The stag-moose is an extinct deer slightly larger than the modern moose. Its name, stag-moose, refers to the fact that it looks much like a cross between an elk and a moose.

The stag-moose is found in deposits that indicate it probably preferred swamps, mires, and other wetlands in environments like the tundra and spruce parklands, where it was a browser. This habitat is similar to that preferred by modern moose, and the stag-moose probably led a lifestyle very similar to that of the modern moose.

Although not extremely common, specimens of the stag-moose have been found in most Midwestern states and among these states, is relatively well represented in Illinois, especially in the northern and central portions of the state, where over a dozen occurrences are known.

partial female skull with horn cores, Gibson County, Indiana, Pleistocene, age unknown

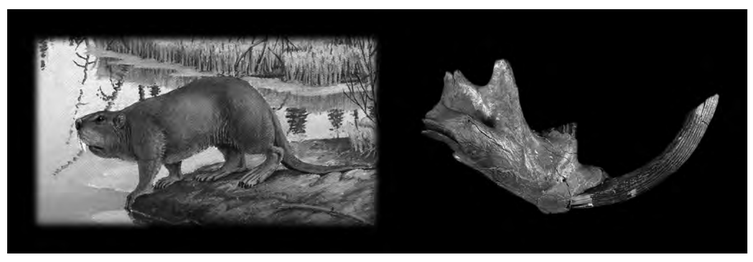
Harlan's muskox, *Bootherium bombifrons*

Order Artiodactyla (even-toed ungulates)
Family Bovidae (bovids)

Two species of muskox inhabited Illinois during the last Ice Age: the modern muskox (*Ovibos moschatus*) and Harlan's muskox (*Bootherium bombifrons*). *Ovibos moschatus* is still found in the arctic today, whereas Harlan's muskox is extinct. Harlan's muskox was taller and possessed a more slender build than the modern muskox.

Of the two species, Harlan's muskox was more common in Illinois, especially in the central portions of the state. In northern and southern Illinois, remains of Harlan's muskox are more rarely found. Harlan's muskox is thought to have inhabited woodland and plains; thus giving rise to another common name for the species, the woodland muskox.

The original specimen of *Bootherium bombifrons* was discovered at Big Bone Lick, Kentucky, in 1807 on an expedition sent by Thomas Jefferson. For many years paleontologists considered two different types of woodland muskox to be represented by fossils found throughout the middle regions of North America. The two recognized forms were a species with larger, heavier horn cores that coalesced on top of the skull (*Symbos cavifrons*) and a species with smaller, more slender horn cores that did not coalesce on top of the skull (the original *Bootherium bombifrons*). Now the consensus of opinion among paleontologists is that these two forms represent the male and female of a single species, referred to as *Bootherium bombifrons*.



right half of lower jaw, Sangamon County, Illinois, 17,000 years ago

giant beaver, *Castoroides ohioensis*

Order Rodentia (rodents)
Family Castoridae (beavers)

The giant beaver, an animal the size of a black bear, was the largest rodent in North America during the Pleistocene. It is frequently found with the remains of American mastodonts and most numerously in the Great Lakes region. These indicators suggest cool and wet environmental conditions. It was previously common in northern and central Illinois and rarer in southern portions of the state.

The giant beaver did not possess teeth conducive to felling trees, and thus did not construct dams to modify its environment. But its sheer size suggests it required large bodies of water, and because its skeleton indicates it was even more cumbersome on land than is the modern beaver, it seems to have been restricted to these water bodies, thus its habits were perhaps more like those of muskrats than like those of the modern beaver.

Giant beaver characteristics include enormous but blunt-tipped incisor teeth, short front legs and small front feet (those behind were much larger), and a long narrow tail.

Further Reading

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Agency Resources

More information about mammal species that once lived in Illinois is available from the Illinois Department of Natural Resources (IDNR). Illinois State Museum (ISM) scientists study mammals from Illinois' past and maintain a collection of fossil remains. The ISM Education Section offers programs and other information about these ancient species. The IDNR Division of Education provides educational materials and programs on a wide variety of topics.

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