

Florissant Fossil Beds

Fossil Vertebrates

National Park Service
U.S. Department of the Interior

Florissant Fossil Beds
National Monument



Giant redwood trees and buzzing insects called Florissant home, but they were not the only inhabitants. Florissant was also home to tiny horses and vibrant birds, as well as other vertebrates. Vertebrates include mammals, reptiles, birds, fish and amphibians. Vertebrate fossils are rare at Florissant due to the environment they lived in and the difficulty in preserving their bodies, as they needed to be transported to the water for preservation.

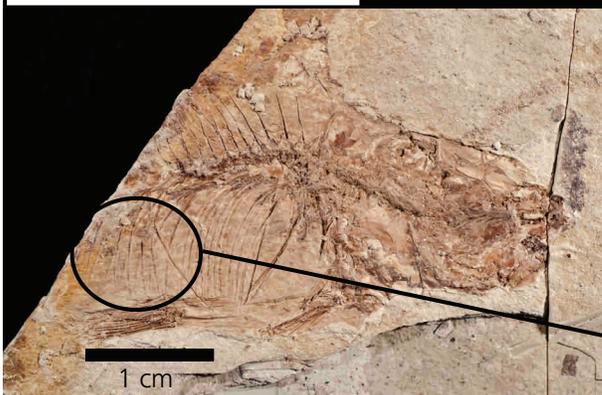
How do vertebrates fossilize?

There are a few ways that vertebrates can fossilize. Bones and teeth are usually the only parts that preserve since they are hard and durable. Although rarer, sometimes feather and scale impressions can be preserved. Generally the harder the body part, the greater likelihood of it being fossilized. There are a few modes of fossilization at Florissant like impressions or carbonization. It is also possible to have several forms of fossilization in one fossil.

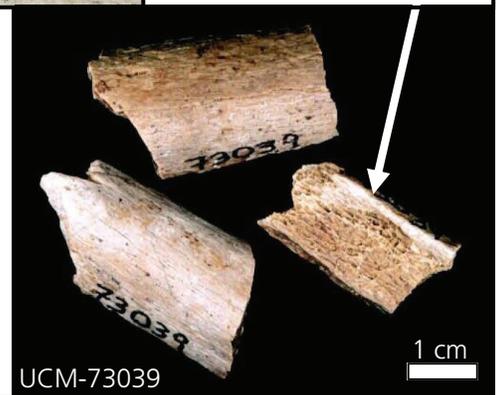
Carbonization forms the thin, black films of carbon of a fossil. This occurs when an organism's body is compressed and decays all the organic compounds except for carbon. This bird's feathers were carbonized after it drowned and then was rapidly buried. The thin layer of carbon still show the fine details of the feathers when they were compressed.



Permineralization occurs when a buried bone is penetrated by groundwater with dissolved minerals through the bone's pores. Dissolved minerals can be calcite, iron or silica. Over time, the dissolved water will deposit small crystals of the dissolved minerals into the tiny pores. The permineralized bone shards below still have visible pores inside the bone.



Impressions form when the hard parts of an animal are imprinted in soft sediment, like mud, after burial. The hard part, which later decays away, then creates a mold. Impressions include scales, bones and feathers. This unidentified fish had its ribs pressed into the mud before becoming a rock, after which the bones were destroyed.



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What vertebrates existed in Eocene Florissant?

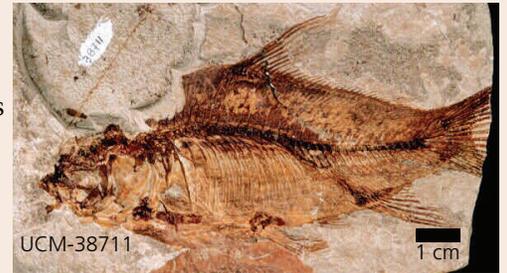


Mouse Opossum (genus *Nanodelphys*)

These marsupials were once plentiful in North America but later became extirpated here after having migrated to the southern hemisphere, where they diversified. They typically measured 4 to 5 inches (10-13 cm) from head to tail and their diet consisted of insects and small fruits. It is likely they spent most of their time in the trees to avoid predators using their prehensile tail to aid in climbing.

Suckers (genus *Amyzon*)

Suckers were 3 to 5 in (7-13cm) freshwater fish that lived at the bottom of the lake. *Amyzon* suckers were a common fish, with three specimens collected from Florissant's deposits. They would have been omnivorous, feeding on the both plants and aquatic organisms. While the genus *Amyzon* died out at the end of the Paleogene (23mya), the family Catostomidae continues to this day in North America.



Brontotheres (genus *Megacerops*)



The largest of the animals to walk through Lake Florissant's forests were brontotheres. These giants were 8 feet (2.4m) tall and weighing as much as two tons(1.8 tonnes). They sported a huge bifurcated horn above their nose for protection against predators and by males to settle rivalries. They are most closely related to rhinos, but filled an ecological role similar to modern day elephants. Unable to cope with the changing climate, brontotheres went extinct at the end of the Eocene.

Primitive Horses (genus *Mesohippus*)

Considered to be transitional from the small ancestral horses to today's large modern horses, *Mesohippus* evolved greater speed with longer legs and three toes. These primitive horses were only 3 feet (90cm) tall, which aided their ability to hide from predators. Based on the structure of their teeth, *Mesohippus* were browsers (fed on shrubs and trees), not grazers (grass eaters) like modern horses.



Rail (family Rallidae)

Rails were slender birds with compact bodies that measured about a foot from head to toe. Their long legs allowed them to wade through shallow water in search of food. They fed on aquatic insects and crustaceans by using their long beaks to dig prey out. Rails are still around today, inhabiting all continents except Antarctica, though they are elusive and hard to find.

Are there more vertebrates?

Today, the monument has identified over 30 vertebrates. The collections contain other birds including a cuckoo and a roller. A few years ago, a snake vertebra was found, which is the first reptile found at Florissant. The fish are the most abundant fossils in the Florissant fossil record. This is because fish lived and died in the water whereas other animals' carcasses would have to be transported to the lake to be preserved. As excavations continue to take place, more bones, teeth and other hard parts may be uncovered to reveal more animals that lived in the Florissant ecosystem.

Specimen photos labeled UCM for University of Colorado, or USNM for National Museum of Natural History are the locations where they are housed in. Unlabeled ones are stored in the monument's collections.



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