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National Park Service

## Series: Prehistoric Life of Tule Springs

ARTICLE

# The Big Cats

Tule Springs Fossil Beds National Monument



*NPS illustration by Benji Paysnoe.*

## Introduction

During the late Pleistocene, Tule Springs Fossil Beds was home to two extinct large cats: *Smilodon fatalis* and *Panthera atrox*. These apex predators represent two distinct cat lineages; one of which was the last of its kind in North America.

## Saber-toothed Cat

### Scientific Name

*Smilodon fatalis*

### Description

*Smilodon fatalis* was the second largest extinct cat at Tule Springs, reaching over 3 feet tall at the shoulder, with a body length of nearly 6 feet, and weighing between 350-620 lbs. Its scientific name, *Smilodon fatalis*, means “fate scalpel tooth”, referring to the elongated blade-like upper canines that could reach 11 inches in length. The forearm bones of the saber-toothed cat are more robust than most other large cats, suggesting they bore powerful muscles for grasping and restraining prey. It also had a shortened tail, much like the living bobcat.

The first *Smilodon* fossils were discovered in the 1830's in Brazil and were named *Smilodon populator* by Danish naturalist Peter Wilhem Lund in 1842. The first *Smilodon fatalis* fossils from North America were discovered from a cave in Texas and were named by American Paleontologist Joseph Leidy in 1869. Thousands of *Smilodon fatalis* fossils have been collected from Rancho La Brea in Los Angeles, California and thus is the California state fossil.

### Relationships

Though sometimes called a “saber-toothed tiger”, *Smilodon* is not directly related to tigers or other pantherine cats such as lions, leopards, and jaguars. *Smilodon* was one of the last of the machairodonts, or Machairodontinae, an extinct branch of the cat family tree that evolved elongated saber-like upper canine teeth. The other major branch of cats, called the Felinae, include all living cats we see today. The ancestor of *Smilodon* evolved in Eurasia and entered North America approximately 5 million years ago. The oldest *Smilodon* is called *Smilodon gracilis*, which lived 2.5 million years ago and was a smaller and less robust species. After crossing the Isthmus of Panama roughly 2 million years ago, *Smilodon* evolved into two separate species: The North American *Smilodon fatalis*, and the larger South American *Smilodon populator*. Both the North and South American species of *Smilodon* went extinct roughly 10,000 years ago.

## Distribution and Habitat

Fossils of *Smilodon fatalis* have been found as far north as Alberta, Canada and as far south as parts of northwestern South America. Fossils also suggested that *Smilodon* occurred on both the Atlantic and Pacific coasts. It has been previously suggested that *Smilodon* may have preferred open to mixed woodlands because it was rarely found in areas of open habitats such as grasslands.

## Diet

*Smilodon* was a carnivore that hunted large mammals. Isotopic analysis of the bones of *Smilodon* suggest they had a prey preference of ruminant grazers such as bison and camels (both common at Tule Springs) as well as forest dwelling browsers such as deer and tapirs.



The sabertooth cat, or *Smilodon fatalis*, was named for its nearly foot-long canines.

NPS illustration by Benji Paysnoe.

## Age and Behavior

The anatomy of the saber-toothed cat suggests it was an ambush predator and had a relatively good jumping ability. The hyoid bones in the throat of the saber-toothed cat suggest it could communicate by roaring like modern big cats. There are also several *Smilodon* fossils that exhibit healed injuries, which have led some paleontologist to suggest that they had some form of social structure that shared resources. These social groups could have been similar to African lion prides or perhaps monogamous pairs with offspring.

Juvenile saber-toothed cats were born with robust builds, similar to adults, and their saber-like canine teeth started to develop around 12 to 19 months in age, and fully formed by 3 years of age, which is a longer growth period compared to modern big cats.

## Tule Springs Saber-toothed Cat

The saber-toothed cat is a recent addition to the fauna of Tule Springs Fossil Beds and was the first record of *Smilodon* in southern Nevada. The first described fossils of *Smilodon* from Tule Springs are an upper and lower arm bones (humerus and radius) and sacral vertebrae collected in 2003 and described in detail in 2016. These fossils raised questions about the habitat preferences of *Smilodon*, which is known to have preferred woodlands in Southern California.

## American Lion

### Scientific Name

*Panthera atrox*

### Description

The American lion was the largest extinct cat to live in North America during the Pleistocene. It is estimated to have measured between 5-8 feet in length and nearly 4 feet in height at the shoulder. It was 25% larger than today's African lion. It may have weighed between 500-800 pounds, while some of the largest specimens are estimated to have weighed 1,000 pounds or more.

The first American lion fossils were identified and named by American paleontologist Joseph Leidy. The scientific name *Panthera atrox* means "fearsome panther" in Latin. The oldest evidence of the American lion dates to about 340,000 years ago, and later disappeared from the fossil record approximately 11,000 years ago.



*The American lion was one of the first large carnivores to be identified from Tule Springs Fossil Beds.*

*NPS illustration by Benji Paysnoe.*

## Relationships

Historically the American lion was considered either a close relative to living tigers, a large type of jaguar, or a sub-species of the African lion. Recent genetic work on some fossil remains of American lion, other extinct pantherine cats, and living large cats suggests that the American lion is a distinct species with a close relationship to the extinct Eurasian cave lion.

## Distribution and Habitat

The American lion has been found as far north as southern Alaska, as far south as southern Mexico, as far east as Maryland, and west to California. At present, fossil evidence of American lions is absent in the northeastern United States and eastern Canada, which may be due to the extensive Pleistocene boreal forest that occurred there. It has been suggested that American lions preferred open habitats such as grasslands and open woodlands, but they may have used caves and rocky overhangs as denning sites.

## Diet

American lions were carnivores that hunted large mammals. Isotopic analysis of the bones of American lions suggests that they fed on a variety of prey including deer, horses, camels, tapirs, bison, and mammoths. A frozen mummified carcass of an extinct bison from Alaska shows clear claw and bite marks attributed to the American lion.

## Age and Behavior

Fossil evidence suggest that the American lion may have lived in small groups or had a degree of social structures similar to that of African lions we see today.

## Tule Springs American Lion

The American lion was one of the first large carnivores to be identified from Tule Springs Fossil Beds; this specimen was a phalanx, or toe bone, collected from an expedition in 1919.

## Related Links

- [Tule Springs Fossil Beds National Monument – a Pleistocene treasure trove](#)
- [Tule Springs—Science and Research](#)
- [National Fossil Day](#)
- [NPS—Fossils and Paleontology](#)
- Tule Springs Fossil Beds National Monument, Nevada—[\[Geodiversity Atlas\]](#) [\[Park Home\]](#)

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