

"Each individual tells a slightly different story," Balisi said. "Each individual also lived at a different point in time when issues were slightly different."

Based on evidence found in the tar deposits, scientists know that dire wolves were social animals. The fossils recovered at La Brea show mixed ages.

"Different animals with different behaviors are expected to be preserved in different numbers," Balisi said. "If you have an animal that hunts in a solitary way, that is not social, then you might find only adults or only babies, but rarely a mix of the two. At the Tar Pits though, we have a range of ages of dire wolves."

The details suggest that dire wolves hunted and traveled in packs that were family groups.

Balisi says dire wolves might have been both active hunters and scavengers because they could crush bones.

"All of that suggests dire wolves were able to eat animals that were larger than them," Balisi said. "... That is challenging, unless you hunt with a pack. These are building blocks that we are piecing together ... and they suggest that dire wolves were active hunters."

Balisi says that based on calculations done by scientists in the 1990s, large animals like dire



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## EVERYBODY COMES [TO THE TAR PITS] FOR THE BIGGER ANIMALS, BUT THERE'S A BIGGER STORY HERE THAT IS VERY RELEVANT TO OUR ISSUES TODAY.

—Mairin Balisi Postdoctoral research fellow at La Brea Tar Pits

wolves that weigh around 150 pounds needed to eat large prey to survive.

The packs roamed the Santa Monica Mountains and the open grasslands and plains, like the former Rancho La Brea area. They did not migrate in search of food. They lived and hunted in lowlands where large herbivores were present.

## Angelenos Create Tar Pits Misconceptions

The pits raise misconceptions among Angelenos. Danaan De Neve Weeks is a postdoctoral research scientist at La Brea Tar Pits, and says that while some people think the tar is hot, others believe it acts like quicksand.

"The tar is more like flypaper or like a sticky rattrap," Weeks said. "That is a lot more horrific in a lot of ways, because something would wander in and get stuck to the surface ... and die of starvation and dehydration."

Some believe there are dinosaur fossils in the tar. Others think the museum is a Disneyland-like attraction.

"They think that everything is staged," Weeks said. "That the people in the fishbowl lab are actors."

Weeks created filters of Pleistocene megafauna to help people see what Ice Age giants looked like. The filters show anatomically correct animals and can be used with apps like Snapchat and Instagram.

"We are creating several augmented reality learning experiences," Weeks said. "We are testing if people are learning more from them, than they are learning from traditional museum signage."

## Dire Wolves Share Distant Relative with Gray Wolves

A group of 49 scientists studied dire wolf DNA from fossils dating from 13,000 to more than 50,000 years ago. The research provides new information on North America's biodiversity changes over hundreds of thousands of years. Dire wolves were not wolves after all, but only a distant cousin of the gray wolf from the canid genus.

Dr. Kieren Mitchell conducts research at the Australian Centre for Ancient DNA (ACAD). He is one of the study's authors and says the new findings show dire wolves evolved in isolation.

"Instead of being a close relative or subspecies of the gray wolf, we now know that the dire wolf belonged to a distinct canid lineage," Mitchell said. "They were so different that—unlike gray wolves and coyotes—dire wolves and gray wolves could not interbreed."

Mauricio Anton is a well known paleoartist who recreates ancient worlds through art. His dire wolf illustrations evolved over time. In the past, based on fossil studies, Anton depicted dire wolves that looked similar to gray wolves. In 2021, after scientists made new discoveries about dire wolves, he changed the look of the carnivores to reflect those findings.

"The researchers ... asked me to depict the dire wolf with a reddish coat in order to tell it more easily apart visually from the gray wolf," Anton said. "But we don't have any direct evidence from the fossil record about the coat color of the dire wolf."

Balisi says it is harder to determine the fur color of mammals.

"For example, early birds feathers can have actual color cells that you can look at under the microscope and be like oh this is a color cell for this particular color," Balisi said. "Mammals don't have that so much and that's why we don't know for sure what the [dire wolves'] color was. Scientists are looking at dire wolves as they were most closely related to jackals and maybe dire wolves looked like that."

## **Research Opens Window into Ancient World**

The Last Ice Age is long gone, but Southern California did not look much different back then, than it does today. To remove all modern-era roads and buildings and leave the place bare of civilization would be as close a look at the Last Ice Age as possible.

Balisi says the landscape is the same. The Santa Monica Mountains were already here when the dire wolves roamed.

Southern California was not an icy place. Balisi says that the period is named Ice Age because glaciers were covering more of the planet than they do now. The climate was different in the Los