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## Woolly Mammoth Resurrection, "Jurassic Park" Planned

**Stefan Lovgren**  
for [National Geographic News](#)

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A team of Japanese genetic scientists aims to bring woolly mammoths back to life and create a Jurassic Park-style refuge for resurrected species. The effort has garnered new attention as a frozen mammoth is drawing crowds at the 2005 World Exposition in Aichi, Japan ([see photo](#)).

The team of scientists, which is not associated with the exhibit, wants to do more than just put a carcass on display. They aim to revive the Ice Age plant-eaters, 10,000 years after they went extinct.

Their plan: to retrieve sperm from a mammoth frozen in tundra, use it to impregnate an elephant, and then raise the offspring in a safari park in the Siberian wild.

"If we create a mammoth, we will know much more about these animals, their history, and why they went extinct," said Kazufumi Goto, head scientist at the Mammoth Creation Project. The venture is privately funded and includes researchers from various institutions in Japan.

Many mammoth experts scoff at the idea, calling it scientifically impossible and even morally irresponsible.

"DNA preserved in ancient tissues is fragmented into thousands of tiny pieces nowhere near sufficiently preserved to drive the development of a baby mammoth," said Adrian Lister, a paleontologist at University College London in England.

Furthermore, Lister added, "the natural habitat of the mammoth no longer exists. We would be creating an animal as a theme park attraction. Is this ethical?"

### **Ice Age Giants**

Mammoths first appeared in Africa about four million years ago, then migrated north and dispersed widely across Europe and Asia.

At first a fairly generalized elephant species, mammoths evolved into several specialized species adapted to their environments. The hardy woolly mammoths, for instance, thrived in the cold of Ice Age Siberia.

In carvings and cave paintings, Ice Age humans immortalized the giant beasts, which stood about 11 feet (3.4 meters) tall at the shoulder and weighed about seven tons.

"It is hard to imagine that woolly mammoths browsed around the places where we live now, and our ancestors saw them, lived with them, and even hunted them," said Andrei Sher, a paleontologist and mammoth expert at the Severtsov Institute of Ecology and Evolution in Moscow, Russia.

At the end of the last ice age, about 10,000 years ago, woolly mammoths dwindled to extinction as warming weather diminished their food sources, most scientists believe.

There are believed to be ten million mammoths buried in permanently frozen soil in Siberia. Because of the sparse human population in the region, though, only about a hundred specimens have been discovered, including two dozen complete skeletons. Only a handful of complete carcasses have been found.

In 2002 hunters stumbled across the mammoth now on display in Japan. After a period of relatively warm weather, the head of the beast had been left protruding through the snow and ice cover.

### Viable DNA?

The scientists with the Mammoth Creation Project are hoping to find a mammoth that is sufficiently well preserved in the ice to enable them to extract sperm DNA from the frozen remains.

They will then inject the sperm DNA into a female elephant, the mammoth's modern-day counterpart. By repeating the procedure with offspring, scientists say, they could produce a creature that is 88 percent mammoth within 50 years.

"This is possible with modern technology we already have," said Akira Iritani, who is chairman of the genetic engineering department at Kinki University in Japan and a member of the Mammoth Creation Project.

In 1986 Iritani's lab successfully fertilized rabbit eggs artificially, employing a technique now used in humans. In 1990 his colleague Goto, the Mammoth Creation Project head scientist, pioneered a breeding plan to save a native Japanese cow species by injecting dead sperm cells into mature eggs.

The current challenge, however, is finding viable woolly mammoth DNA. The DNA in mammoth remains found to date has been unusable, damaged by time and climate changes.

"From a geologist's point of view, the preservation of viable sperm is very unlikely, and this is so far confirmed by the poor condition of cells in the mammoth carcasses," said Sher, the Russian paleontologist.

Current Siberian permafrost temperatures are 10 to 18 degrees Fahrenheit (minus 12 to 8 degrees Celsius), which may not be cold enough for DNA survival.

Sperm is not the only possible DNA source, and mammoth-elephant crossbreeding isn't the only potential way to resurrect the woolly mammoth.

An alternative method would be to clone a mammoth from DNA found in mammoth muscles or skin. To do this, however, scientists would need preserved cells with some unbroken strands of DNA.

"There is no evidence this exists, and even if it did, it is very unlikely to be preserved without significant errors having accumulated—probably leading to birth defects," said Lister, the London paleontologist.

### Safari Park

The Japanese scientists, however, are not deterred.

Iritani is planning a summer expedition to Siberia to search for more carcasses.

His team has already picked out a home for living mammoths in northern Siberia. The preserve, dubbed Pleistocene Park, could feature not only mammoths, but also extinct species of deer, woolly rhinoceroses, and even saber-toothed cats, he said.

"This is an extension of my work for the past 20 years in trying to save endangered species," Iritani said.

Other scientists are less enthusiastic about the project.

"Even if the cloning experiment is successful, they are not reconstructing the past but rather creating a new mammoth-like creature," said Anatoly Lozhkin, an Ice Age expert at the Northeast Interdisciplinary Scientific Research Institute in Magadan, Russia.

"Scientists are always able to learn from every experiment, but I am not sure that cloning a mammoth will help us significantly move forward our understanding of the animal or the conditions under which it lived," Lozhkin said.

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