

# Elephants that once threatened Rome could help save their descendants

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Approximately 415,000 African elephants live in the wild, according to the WWF. Credit: By Beks on Unsplash

Ivory from an ancient shipwreck off Spain is providing data that might aid conservation of modern elephant populations.

More than 2,500 years ago, a Phoenician ship, most likely a trader bringing luxury goods from the eastern Mediterranean and North Africa, ran into trouble off the coast near Cartagena, Spain. The vessel hit the rock reef of Bajo de la Campana.

Lurking just below the surface, this huge lump of rock has been wrecking ships for millennia. The Phoenician vessel sunk and spilled its cargo, which washed into a sea cave and remained there for the next few thousand years until excavations by archaeologists from Spain and the U.S. began in 2007.

## **Hannibal's herd**

The archaeologists have recovered ceramic and bronze artifacts, tin and copper ingots, nuggets of lead ore, amber and many [elephant tusks](#). The tusks could help scientists unlock the secrets of an extinct elephant population.

"If the ship was sailing from North Africa, the ivory could represent the North African elephant population, which went extinct at some point during Roman times," said Patrícia Pečnerová, a biologist at the University of Copenhagen in Denmark. "We don't really know anything at all about these elephants as there are few historical records."

The famous war elephants that Carthaginian general Hannibal led across the Alps in 218 BC during the Second Punic War were most likely North African. They probably ranged across the region north of the Sahara Desert and possibly down the east coast to Sudan and Eritrea.

But no one is sure what species they were.

"Some people think they might have been African savanna elephants, based on what is more plausible from the biological perspective,"

Pečnerová said. "But others say they were probably small so might have been African forest elephants."

And still others say the creatures could even have been Asian elephants—or a separate species altogether.

The ivory from the shipwreck offers a rare opportunity to generate [genetic data](#) on these extinct elephants and explore their origins.

Pečnerová was the lead researcher in the [STAMPEDE](#) project, which ended in May this year after 24 months and used [genetic information](#) on elephants across Africa to create a reference map of diversity.

This allows her to put ancient DNA extracted from the shipwreck ivory into today's map to see whether the elephants are genetically distinct or related to any of the present-day populations.

## **Window to the past**

Trait tools developed by the project could also be used to analyze genetic diversity and monitor populations in present-day elephants, assisting with their conservation.

Information from the ancient tusks could show scientists how genetically diverse elephants were before humans started intensively hunting them and destroying their habitats.

"The shipwreck ivory is a window to the past," said Pečnerová, a Slovak postdoctoral researcher who moved to Denmark in 2019. "We are looking at elephants as they were 2,500 years ago, predating the many anthropogenic pressures of today."

Knowing this baseline of natural diversity levels could help scientists

decide whether to be concerned about genetic diversity in modern elephants.

While human exploitation and linked population crashes often reduce genetic diversity in animals, some species have—and can cope with—naturally low levels of variation.

Having this information can aid conservation decisions such as whether breeding programs need to focus on increasing diversity.

## Poaching and trafficking

As in Phoenician times, ivory is still sold today.

While international commercial trade in ivory was banned in 1989, many countries still allow it to be sold within their borders. These domestic markets [are considered](#) major causes of elephant poaching and ivory trafficking.

The world has approximately 415,000 African elephants and 40,000 to 50,000 Asian elephants in the wild, according to the [WWF](#).

Every year, more than 10,000 elephants are killed for their tusks. Between 2002 and 2011, African forest elephants declined by 60%. There are now fewer than 200,000 of these critically endangered large herbivores left.

More than half of the remaining African forest elephants live in Gabon, almost 90% of which is covered by tropical forests. These [wooded areas](#) make it hard to tackle poaching by patrolling on foot or surveying from the air.

A project called [ForSE](#) hopes that the elephants themselves could alert

rangers to poachers.

"The idea is to actually use the movement behavior of forest elephants to try to first understand how they react to poaching activities and, more broadly, to human activities in general, and then infer the level of poaching based on their behavior and space-use patterns," said Marie Sigaud, the project's lead researcher.

ForSE, which began in August 2021 and runs through May next year, is a collaboration with the [National Agency for National Parks \(ANPN\)](#) in Gabon. Their patrols have been placing GPS tracking collars on elephants and providing data on poaching activity.

## **Danger zones**

In places where there is known poaching, Sigaud looks at how elephants behave and use the space—how far they range and whether they venture into forest clearings, for example.

A conservation biologist at the French [National Museum of Natural History](#) in Paris, she's also analyzing differences in elephant behavior in areas with varying levels of poaching.

Sigaud said that animals tend to avoid people, using any habitat they consider risky primarily when human activity is at its lowest. For instance, species that live in urban areas are often more active at night.

"So, one of our hypotheses is that, in areas with big canopy openings, forest elephants are more likely to be there at night than during the day," Sigaud said. "We believe this will be different in areas where poaching is low or absent."

Early results suggest that elephant behavior does change in line with

poaching risk. This is because elephants often know what they are facing, having previously been shot at or having seen other herd members killed.

"They are really smart," said Sigaud. "Many elephants have already experienced poaching events."

She said that the patrols sometimes capture and tag elephants with old bullet wounds.

In the future, the GPS data may be able to alert the ANPN to behavioral changes in elephants when they sense danger. That would allow patrols to be sent to the area to prevent poaching.

**More information:**

- [STAMPEDE](#)
- [ForSE](#)

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