

# Dodo 'de-extinction' announcement causes conservation debate

February 16 2023, by James Ashworth

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The dodo is a potent sign of the risk humanity's actions can have on nature - but could a restored dodo be a sign of hope? Credit: The Trustees of the Natural History Museum, London

The dodo has joined an exclusive club, becoming one of the species suggested for de-extinction.

While some argue de-extinction could help to restore damaged

ecosystems, others believe it is an expensive distraction from the threats facing living species.

One of the icons of extinction could walk the Earth again, if a biotech firm has its way.

Colossal Biosciences first hit the headlines after announcing projects aiming to resurrect extinct species such as the woolly mammoth and thylacine. The dodo is now within its sights following the injection of a reported \$150 million into the company.

[In a video](#) explaining the reasoning behind the project, the firm said that "through bringing back this cherished species, we will develop the knowledge base and tools required to halt the harrowing decline in our [bird population](#)."

"In doing so, we'll bring conservation to the forefront of our cultural zeitgeist, bring balance back to [avian species](#) and the countless ecosystems they inhabit, and bring a little bit of magic back to Mauritius."

However, as with Colossal's previous "de-extinction" announcements, the dodo project has been met with a healthy dose of skepticism.

## **When is a dodo not a dodo?**

The original species is, as the saying goes, dead as a dodo. Nothing short of a [time machine](#) would allow the species to exist today.

Instead, Colossal is proposing to make a living replica of the species. Among the team working on the project is Professor Beth Shapiro, an expert on ancient genomics who has previously sequenced a fragment of mitochondrial DNA from a dodo specimen.

To recreate the species Colossal hopes to use a fully-sequenced dodo genome, which Shapiro announced that her team had reconstructed last year. At the time of writing, however, the genome is yet to have been published in a scientific journal.

Using this as a guide, the team then hope to genetically modify the genome of the bird's closest living relative—the Nicobar pigeon—to make it more similar to that of the dodo's.



Credit: AI-generated image ([disclaimer](#))

Dr. Martin Stervander, who researches the genomics of flightless birds at the Museum, says, "This project is not aiming to resurrect the dodo as it originally was, but instead produce a hybrid lineage which resembles the dodo to a reasonable degree."

Colossal has said that they hope to speed this up through the development of new methods, with an emphasis on using technology to develop more efficient genetic editing techniques and automate the process. Otherwise, this process will take quite some time.

"Even with a fully sequenced genome, and recent breakthroughs in gene editing technologies, achieving this will not be easy," Martin adds. "And even if Colossal succeeds, I don't think we will see anything beyond a de-extinct hybrid lineage in the foreseeable future."

The genome will be used as a guide to incrementally edit the genetics of the Nicobar pigeon until a surrogate would be able to lay an egg of Colossal's dodo. Doing this will be incredibly difficult.

## **The challenges of dodo de-extinction**

The main issues that will be faced in resurrecting the dodo relate to the differences in the reproduction between birds and mammals. While the cell's nucleus, which contains an organism's DNA, is easy to locate in mammals, it is much harder to locate in a developing bird egg [simply due to its size](#).

Even if the nucleus is found, scientists are yet to find a way to remove, edit and then reinsert it back into the egg after it has begun to form.

Because of this Colossal plans to take a different approach by modifying what are known as [primordial germ cells](#) (PGCs). In fully grown animals these cells give rise to the sperm and egg cells (gametes) and migrate through the embryo to the developing gonads.

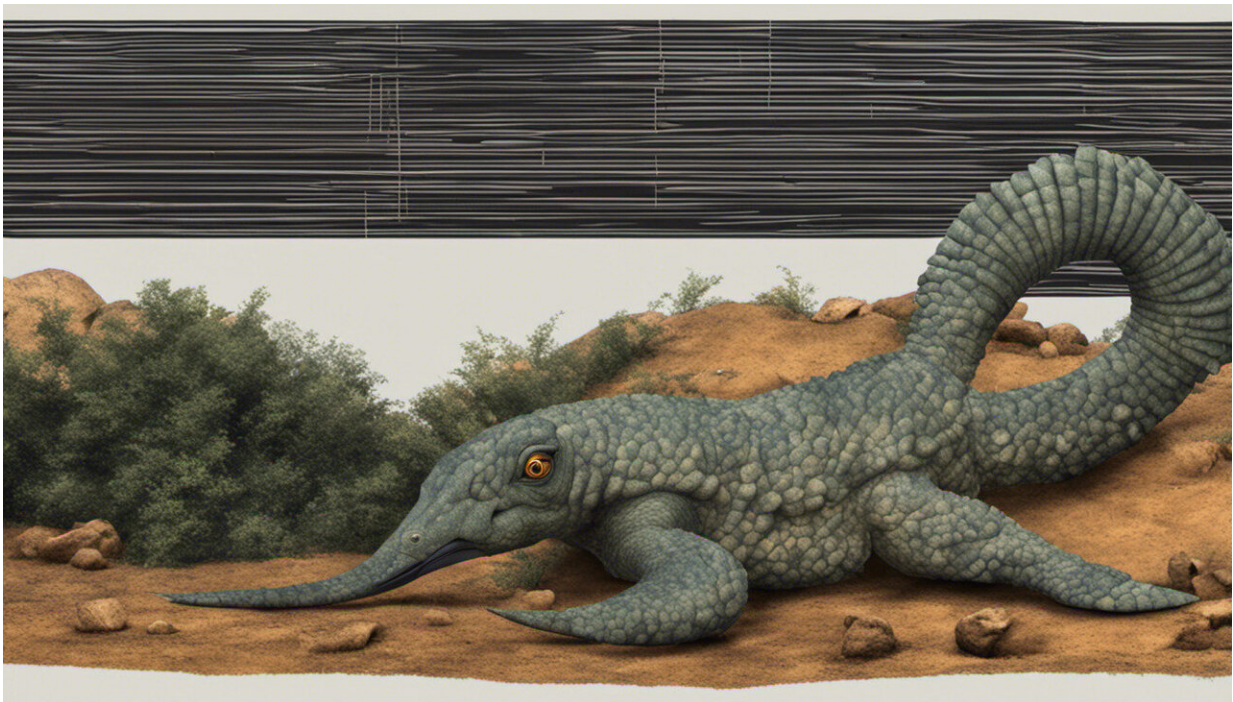
But in birds this process happens slightly differently, as the PGCs travel to the gonads through the blood. Colossal plan to extract these PGCs from a Nicobar pigeon embryo grown in a lab, and then genetically

modify them to have a genome more like a dodo.

What form these modifications will take is still not known, but they would presumably have to include characteristics such as flightlessness and an enlarged bill.

As bird PGCs travel through the blood, it means they can then be injected into a bird once it hatches. This host will then grow up with sperm or eggs which carry the dodo-like genome, and not their own.

[A similar technique](#) was used to produce a hatchling of the vulnerable Houbara bustard. In this case, the PGCs that would go on to form the sperm of a male chicken were replaced with those from the bustard and was used to fertilize the egg of a female of the threatened species.



Credit: AI-generated image ([disclaimer](#))

Once the dodo gametes are made, Nicobar pigeons will be used as surrogates to give rise to the de-[extinct species](#). By tackling this challenge, Colossal has said that it hopes to create techniques that can be applied more widely to help conserve endangered living birds.

Whether their ambitions will become a reality remains to be seen.

## **Is it worth bringing back the dodo?**

Bringing back the dodo is an expensive business. Millions of dollars will need to be invested in laying the groundwork even before the first of Colossal's dodos can hatch out of their shells.

This money could perhaps be better spent on saving other animals still clinging on today. For instance, saving the threatened pink pigeon of Mauritius would involve captive breeding programs which would cost a fraction of the dodo de-extinction project.

Dr. Julian Hume, a Research Associate at the Museum and expert on extinct island birds, told CNN, "There are so many species that desperately need our help and money. Why would you even bother trying to save something long gone, when there are so many things that are desperate right now?"

Of course, there is no guarantee that investors in dodo de-extinction would have put their money into other more conventional conservation projects. Backers of the project also add that the restoration of Mauritian ecosystems is a necessary part of the dodo's return.

Professor Beth Shapiro says, "The dodo is a prime example of a species that became extinct because we—people—made it impossible for them to survive in their native habitat."

"Having focused on genetic advancements in ancient DNA for my entire career, I am thrilled to collaborate with Colossal and the people of Mauritius on the de-extinction and eventual re-wilding of the dodo."

To ensure that Colossal's dodo doesn't go the same way as its forebear, it's likely funding for conventional restoration projects will still be necessary. For instance, invasive species such as macaques and rats that were instrumental in wiping out the dodo remain a major issue on Mauritius today.

[A 2002 study](#) found that during the [breeding season](#), almost two thirds of artificial bird nests were preyed upon by these species. Any attempt to bring back the dodo would have to deal with these threats for any reintroduction on a large scale to be a success.

"There is no point reintroducing the dodo if the threats that originally faced it on Mauritius are not dealt with," Martin says. "The prospect of a resurrected [dodo](#) might drive further efforts to restore habitats and deal with invasive species on the island, as its reputation means that people will sit up and take notice."

At the time of writing, none of Colossal's three de-extinction projects are anywhere near to completion. Only time will tell whether they mark a turning point in humanity's impact on the planet, or a footnote in the annals of history.

*This story is republished courtesy of Natural History Museum. Read the original story [here](#).*

Provided by Natural History Museum

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