

Resurrecting extinct species comes with legal issues

Opposing Viewpoints Online Collection, 2018
From *Opposing Viewpoints in Context*

“We run the risk of ending up with a [species](#) that, legally, we’re unsure what to do with.”

John Timmer is the science editor at *Ars Technica*. In the following viewpoint, Timmer examines the legal problems presented by de-[extinction](#), which refers to a variety of processes and techniques (including [cloning](#)) that enable scientists to resurrect extinct species or bring back extinct gene lines within existing species, thereby creating new hybrid species. Timmer shows how the existing legal framework for classifying species does not account for the possibility of new species. He also notes that the specific way a species is brought back would have bearing on its legal classification, which would affect the way it is regulated under the [Endangered Species Act](#).

As you read, consider the following questions:

1. According to Timmer, why is it a problem that there is no general agreement on the definition of a species in terms of [DNA](#) differences?
2. What unique problems arise if de-extinct or new species are classified as [genetically modified organisms](#) (GMOs), according to the author?
3. Timmer suggests that, without revising current laws and regulations, new species could end up taking conservation funding away from already-existing endangered and threatened species. Do you agree that the laws and regulations should change before the technology advances too much further? Explain your reasoning.

Modern biology has developed a number of technologies—stem cells, genome editing, and more—that have largely drawn attention due to their potential use in medicine. But these techniques also raise an exciting possibility: we might be able to bring species back from the dead. “De-extinction” raises the prospects of both taking whiteout to some of our species’ careless past and recreating [ecosystems](#) that haven’t been seen in thousands of years.

De-extinction raises myriad ethical and environmental issues. But, according to a perspective in this week’s issue of *Science*, legal issues are involved as well. And, complicating matters further, the legal issues that apply depend on precisely how we de-extinct a species.

Lots of options

As the authors of the piece note, species can be brought back in a number of ways. The first is relatively simple: selective breeding. A handful of extinct species have left some of their genomic legacy behind either through hybridization with species that survive or through domestication. Past attempts to bring a species back from extinction through selective breeding for a specific appearance include the quagga and the auroch. But this clearly doesn’t re-create the ancestral species; we didn’t end up with an auroch, but an auroch-lookalike cow.

With advances in sequencing older DNA, however, it's now possible to guide these breeding efforts based on the underlying genetics. In some cases, it may be possible to guide breeding such that the end result is an animal whose genome is nearly identical to the extinct species.

Is that a successful de-extinction? To an extent, that depends on how we define a species in terms of DNA differences, and there's no general consensus about how much two individuals can differ at the DNA level and still belong to the same species.

Similar issues are raised by another approach that's being considered. In many cases, we don't have a hybrid around that has most of the genetic legacy of an extinct species, but we do have the sequence of the extinct species' genome. The advent of DNA-editing technology (primarily CRISPR-cas) could allow us to start with the genome of a related species and edit it until it resembles the extinct one. That's the approach that's been suggested for the woolly mammoth, using the elephant as a genome source and surrogate.

But editing large sections of the genome will be expensive and time consuming, so, in all likelihood, the final product will primarily be that of the donor species. Key visible traits, however, will make it look like the desired species.

For a few species, there's also a third option: a genuine resurrection. For a number of organisms, we now know how to create a clone by transplanting a cell's nucleus into an unfertilized egg. All that's needed is a viable cell to provide a source of the nucleus. While this wouldn't create a perfect genetic copy (mitochondrial DNA would be provided by whatever species donated the egg), the resurrected species would still be the real thing.

Legal species

The precise method used actually makes a big difference for how the law views the result of any de-extinction attempt. For example, there are almost no restrictions on selective breeding, and the end product would face the same restrictions that the parent species would. If, however, the de-extincted animals were generated by genome editing, they'd qualify as genetically modified organisms in most jurisdictions. In the US, releasing a GMO into the wild requires an environmental impact assessment. A similar restriction exists in the EU, and local governments typically have even more stringent standards.

It's also worth noting the GMOs can be patented. So, if you're hoping to make your own mammoth-like elephant, you may end up facing licensing fees.

Things get even more complicated if the results of the breeding or engineering produce what's considered a new species. There'd be no way to start that species with anything more than a tiny population, which would almost certainly place it within the realm of conservation laws like the Endangered Species Act. The same is true for a species that's been resurrected through cloning. In fact, if the species had only died out recently, it may have already been declared an endangered

species and be subject to a variety of regulations.

Should that occur, it also raises the risk that some of the limited money and resources we have available for species preservation would be dedicated to the recently resurrected species. That, in turn, would mean less money available for the species that we haven't managed to kill off yet.

The authors make the argument that we can avoid some of these issues simply by being careful about if and how we designate any new species that arise from our de-extinction efforts. But the issues seem to be large enough that we might want to consider revising the laws and regulations in advance of the technology progressing much further. Otherwise, we run the risk of ending up with a species that, legally, we're unsure what to do with.

Full Text: COPYRIGHT 2018 Gale, a Cengage Company.

Source Citation

Timmer, John. "Resurrecting extinct species comes with legal issues." *Opposing Viewpoints Online Collection*, Gale, 2018. *Opposing Viewpoints in Context*, <http://link.galegroup.com/apps/doc/JZNTGG944188938/OVIC?u=colo86472&xid=a624defe>. Accessed 19 Feb. 2018. Originally published as "Resurrecting extinct species comes with legal issues," *Ars Technica*, 11 June 2017.

Gale Document Number: GALE|JZNTGG944188938