



## Case - Passenger Pigeons

### Description

This is the case study for unit 5 of the [Course on Genomics, Ethics and Society](#). This case discusses the possibility of bringing back passenger pigeons, a bird species that went extinct in 1914.

### Body

Though they were once the most abundant bird in North America, passenger pigeons have been extinct now for 100 years, the last member of the species dying in a zoo in 1914 (Blockstein, 2002; Ehrlich, Dobkin, & Wheye, 1988; Halliday, 1980; Johnson, Clayton, Dumbacher, & Fleischer, 2010). However, scientists have proposed using passenger pigeon genes to revive the species—what is called “de-extinction.” In 2012, an organization called Revive and Restore, which plans to pursue de-extinction for a number of species, decided to make passenger pigeons their first project.

If the process is successful, scientists could potentially bring other species back from extinction, particularly those thought to be important for conservation. Stewart Brand (2013), one of the directors of Revive and Restore, claims that the passenger pigeon project, and others like it, have the potential “To preserve biodiversity, to restore diminished ecosystems, to advance the science of preventing extinctions, and to undo harm that humans have caused in the past.”

Though many key methods remain untested, it is in principle feasible to recreate passenger pigeons. One proposed strategy is to modify the genome of the closely-related band-tailed pigeon to match that of the passenger pigeon. This could then be implanted into the egg of a band-tailed pigeon, or any other closely-related species

(current plans are to use the rock pigeon; Servick, 2013). Two offspring (a male and a female) produced in this way could then be bred to create individuals approximating the passenger pigeon. Though the offspring will not exactly match original passenger pigeons (since their genes will be intermixed with those of closely related species), an optimistic estimate predicts that they will be 80-90 percent similar (Mark, 2013). It is expected that genome sequencing of the passenger pigeon and rock pigeon will be completed sometime in 2014 (Hung et al., 2013; Servick, 2013).

There are significant technological limitations, however, which will require considerable time and resources to overcome. One problem is that modifying a genome as complex as that of a pigeon, in order to match another complex pigeon genome, is enormously difficult. Another is that none of the techniques involved have ever been used on pigeons. The closest related species in which the technology has been tested is chickens.

There are broader challenges as well, even if technological challenges can be met. One is that previous habitats of passenger pigeons have changed dramatically, and may not be able to sustain the species (Ehrlich, Dobkin, & Wheye, 1988; Sherkow & Greely, 2013). Another challenge is that passenger pigeons may be seen as pests. Lastly, it is predicted that thousands of individuals are needed to sustain breeding of the population, thus requiring substantial resources in order to fully bring the species back from extinction.

Despite these challenges, scientists are optimistic about the passenger pigeon because of what it could mean for conservation in the future. Passenger pigeons, like many other species, became extinct due to human activities. If this species could be brought back, plausibly many others could as well (Primmer, 2009). For instance, as has been suggested, certain species could be selected for de-extinction for their potential role in struggling ecosystems.

- ***Imagine you are a policy maker who has been asked to decide whether we should recreate and reintroduce species humans have made extinct. What social and ethical issues would you consider in making this decision? Would you select passenger pigeons for de-extinction, select some other species, or no species at all? Explain and justify your answer.***

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## References

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