

# Gene drives may help control invasive grey squirrel in the UK

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Eastern Grey Squirrel (*Sciurus carolinensis*). Credit: Wikimedia/public domain

Existing gene drive technologies could be combined to help control the

invasive grey squirrel population in the UK with little risk to other populations, according to a modelling study published in *Scientific Reports*.

Gene drives introduce genes into a population that have been changed to induce infertility in females, allowing for the control of population size. However, they face [technical challenges](#), such as controlling the spread of altered genes as gene drive individuals mate with wild individuals, and the development of genetic resistance, which may render the gene drive ineffective.

To address these challenges, Nicky Faber and colleagues used computer modelling to investigate the effectiveness of a combination of three gene drive technologies using the grey squirrel as a case study.

The authors found that the combined gene drive—HD-ClvR—effectively suppressed a targeted grey squirrel population, with little risk to other populations by combining the advantages of its individual components: homing, cleave-and-rescue and daisyfield. Homing ensures that the altered gene is passed on to [future generations](#) by inserting it into the germline—the cells that pass on genetic information to offspring. Cleave-and-rescue ensures that offspring with resistant gene variants do not develop. Daisyfield limits the number of altered genes that can be passed on from one individual to the next, thus containing their spread outside the target population. The findings suggest that HD-ClvR may effectively control an [invasive species](#) while limiting the risk to [native species](#).

The authors caution that HD-ClvR has not been tested in live animals, and further research is needed before these [gene drives](#) could be used. For example, the impacts that an abrupt suppression of the grey squirrel population might have on the ecosystem as a whole would need to be considered.

**More information:** Novel combination of CRISPR-based gene drives eliminates resistance and localises spread, *Scientific Reports* (2021). [DOI: 10.1038/s41598-021-83239-4](https://doi.org/10.1038/s41598-021-83239-4) , [www.nature.com/articles/s41598-021-83239-4](https://www.nature.com/articles/s41598-021-83239-4)

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