

Climate change threatens hotspots of genetic diversity

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Grey long-eared bat, *Plecotus austriacus*, in flight. Credit: Antton Alberdi

(Phys.org) —Past climates shaped the current hotspots of genetic diversity for the grey long-eared bat, one of the UK's rarest mammals, but future climate change threatens these biodiversity hotspots, according to researchers from the University of Bristol, working in collaboration with scientists from the University of Sheffield and from across Europe.

This is particularly worrying because genetic diversity is important for the long-term survival of species and their ability to adapt to environmental changes.

The grey long-eared bat, *Plecotus austriacus*, is found in Europe and does not commonly disperse across far distances, and so is a good example of the potential effects of future climate change on many temperate European species.

Professor Gareth Jones from the University of Bristol said: "Although climate change has been recognised as a major threat to species, populations and communities of animals and plants, its consequences for genetic diversity have been neglected.

"By modelling the past and future, we show that genetic diversity is concentrated in southern Europe, where populations survived past glaciation events, but these areas are predicted to become too warm and arid for the [bat species](#) under future climate change."

Dr Orly Razgour from the University of Bristol and University of Stirling added: "The ability of bats to move in pursuit of suitable climatic conditions may be limited by geographical barriers, like the Pyrenees mountain range, and by the loss of [suitable habitats](#) due to farming. This means that much of the grey long-eared bat's [genetic diversity](#) may be trapped inside Spain and Portugal.

"If the bats can't move north, they will need to adapt to the new warmer and more [arid climate](#) in order to survive, and our future study is looking at whether populations in warmer areas are already more adapted to warmer conditions."

More information: Razgour, O. et al. The shaping of genetic variation in edge-of-range populations under past and future climate change, *Ecology Letters*. [onlinelibrary.wiley.com/doi/10 ... 1/ele.12158/abstract](https://onlinelibrary.wiley.com/doi/10.1111/ele.12158/abstract)

Provided by University of Bristol

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